Filed by:
G. Scott Shepherd, Site Development Specialist II - SBA Communications
134 Flanders Rd., Suite 125, Westborough, MA 01581
508.251.0720 x 3807 - gshepherd@sbasite.com

July 28, 2020

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

RE: Notice of Exempt Modification
940 Meriden Road
Latitude: N.41.553182
Longitude: W.**-72.993386**
T-Mobile Site #: CTNH331B_Anchor

Dear Ms. Bachman:

T-Mobile currently maintains ten (10) antennas at the 99-foot level of the existing 119-foot Monopole Tower at 940 Meriden Road, Waterbury, CT. The 119-foot tower is owned by SBA Infrastructure, LLC. The property is owned by Pine Grove Cemetery Association, Inc. T-Mobile now intends to install three (3) new 2500MHz antennas. The new antennas would be installed at the 99-foot level of the tower.

Please note: Per the Connecticut Siting Council Website: CSC COVID 19 Guidelines. *In order to prevent the spread of Coronavirus and protect the health and safety of our members and staff, as of March 18, 2020, the Connecticut Siting Council shall convert to full remote operations until March 30, 2020. Please be advised that during this time period, all hard copy filing requirements will be waived in lieu of an electronic filing. Please also be advised that the March 26, 2020 regular meeting shall be held via teleconference. The Council's website is not equipped with an on-line filing fee receipt service. Therefore, filing fees and/or direct cost charges associated with matters received electronically during the above-mentioned time period will be directly invoiced at a later date.*

Planned Modifications:

TOWER

Remove:
- N/A

Remove and Replace:
- N/A

Install New:

- (3) Ericsson AIR64449 B41 (antenna)
- (3) Ericsson Radio 4415 B25 (RRU)
- (1) 1-5/8" Hybrid

Existing Equipment to Remain:

- (3) RFS APX16DWV-16DWVS-E-A20 (antenna)
- (3) RFS APXVAARR24_43-U-NA20 (antenna)
- (4) Ericsson AIR32 KRD901146-1-B66A (antenna)
- (3) KRY 112 489/2 (TMA)
- (3) KRY 112 144/1 (TMA)
- (3) Ericsson Radio 4449 B71 (RRU)
- (12) 1-5/8" Coax
- (2) 1-5/8" hybrid

Entitlements:

- (1) 1-5/8" hybrid

GROUND

Install New:

- Breaker within existing PPC/Equipment cabinet
- (2) Ericsson B160 Battery Cabinet mounted to existing concrete pad
- (2) 2" conduit to existing RBS6102 Equipment cabinet

This facility was approved by Council on February 27, 2007 under Case #321. Approval was given for a steel monopole no taller than 110' above ground level to provide telecom services to both public and private entities. A recalculated power density report was to be produced as changes in operation caused change in power density levels. Upon establishment of any new state or federal radio frequency standards applicable to the frequencies of facility, the facility to be brought into compliance with same. The certificate holder was to permit public and private entities shared space for fair consideration or to provide any requesting entity with reasons precluding such sharing. Reasonable space was to be provided on the tower for no compensation to any City public safety services. And any non-functioning antennas or associated mounts were to be removed with sixty days. There were no further post construction stipulations set. On January 7, 2010, Council approved a 10' tower extension under Petition 927. Please see attached.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. §16.50j-72(b)(2). In accordance with R.C.S.A. § 16.50j-73, a copy of this letter is being sent to the City of Waterbury's Mayor, Neil M. O'Leary, and City Planner, James Sequin, as well as to the property owner. (Separate notice is not being sent to tower owner, as it belongs to SBA.)

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 modification 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 modification 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 telecommunication facility constitute an exempt modifications under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

G. Scott Shepherd
Site Development Specialist II
SBA COMMUNICATIONS CORPORATION
134 Flanders Rd., Suite 125
Westborough, MA 01581
508.251.0720 x3807 + T
508.366.2610 + F
508.868.6000 + C
gshepherd@sbasite.com

Attachments

cc: The Honorable Neil M. O'Leary / with attachments
City of Waterbury, City Hall Building, 235 Grand Street, Waterbury, CT 06702
James Sequin, AICO, City Planner / with attachments
City of Waterbury, City Hall Building, 235 Grand Street, Waterbury, CT 06702
Pine Grove Cemetery Association / with attachments
850 Meriden Rd., Waterbury, CT 06705

Exhibit List

Exhibit 1	Check Copy	x
Exhibit 2	Notification Receipts	x
Exhibit 3	Property Card	x
Exhibit 4	Property Map	x
Exhibit 5	Original Zoning Approval	Petition 927 1/7/2010, CSC 2/27/07
Exhibit 6	Construction Drawings	Chappell Engineering Assoc. 7/21/20
Exhibit 7	Structural Analysis	TES 6/24/20
Exhibit 8	Mount Analysis	TES 6/22/20
Exhibit 9	EME Report	EBI Consulting 7/25/20

EXHIBIT 1

Normally, Exhibit 1 would contain a copy of the check for the filing fee.

EXHIBIT 2

After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.
Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com.FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim.Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental,consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss.Maximum for items of extraordinary value is $1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

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EXHIBIT 3

The Assessor's office is responsible for the maintenance of records on the ownership of properties. Assessments are computed at 70% of the estimated market value of real property at the time of the last revaluation which was 2017.

CITY OF WATERBURY

Information on the Property Records for the Municipality of Waterbury was last updated on 5/16/2019.

Parcel Information

Location:	940 MERIDEN RD	Property Use:	Church	Primary Use:	Church - Sanctuary (Chapel)
Unique ID:	030203770070	Map Block Lot:	0302-0377-0070	Acres:	104.00
490 Acres:	0.00	Zone:	RL	Volume / Page:	368/ 217
Developers Map / Lot:		Census:			

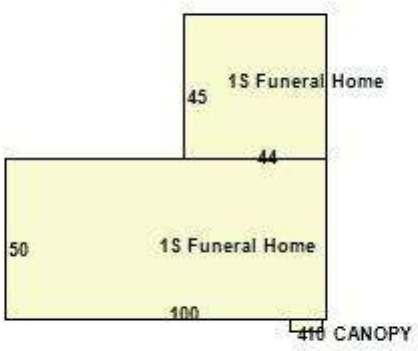
Value Information

	Appraised Value	Assessed Value
Land	1,505,248	1,053,670
Buildings	349,237	244,470
Detached Outbuildings	64,660	45,260
Total	1,919,145	1,343,400

Owner's Information

Owner's Data
PINE GROVE CEMETERY ASSOCIATION 850 MERIDEN RD WATERBURY CT 06705-0000

Building 1



Category:	Public Use	Use:	Funeral Home	GLA:	6,980
Stories:	1.00	Construction:	Average	Year Built:	1984
Heating:	Forced Air	Fuel:		Cooling Percent:	0%
Siding:	Wood Siding /Metal on Steel Frame	Roof Material:		Beds/Units:	0

Special Features

Sprinklers	5584

Attached Components

Type:	Year Built:	Area:
Canopy	1984	40

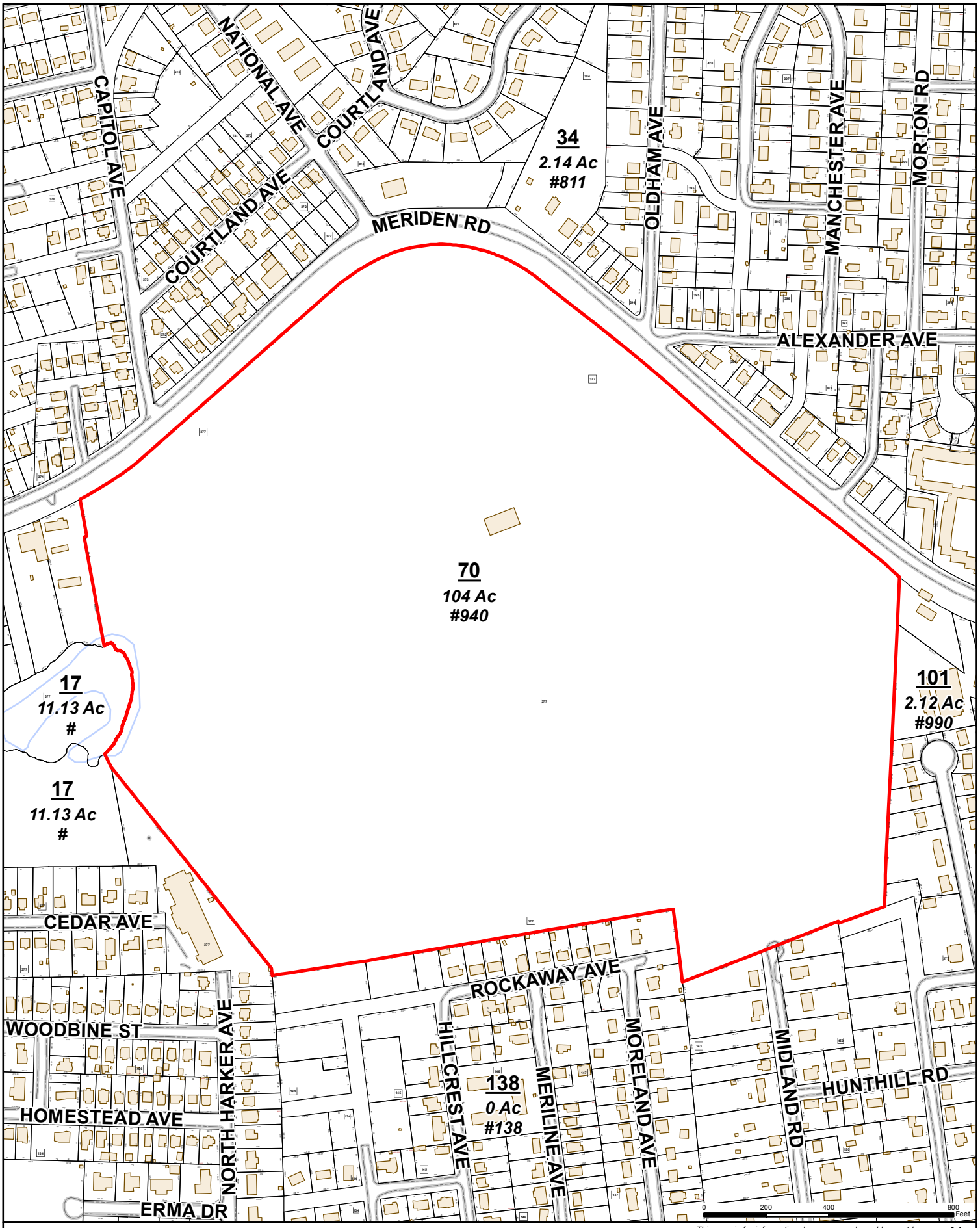
Detached Outbuildings

Type:	Year Built:	Length:	Width:	Area:
Asphalt Paving	1984			61,000

Building Permits

Permit Number	Permit Type	Date Opened	Date Closed	Permit Status	Reason
2018.2576	Electrical	09/14/2018		Open Permit	REPLACE 3 CELL SITE ANTENNAS AT EXISTING TELECOMMUNICATION FACILITY PINE GROVE CEMETERY
2018.1556	Electrical	06/12/2018		Closed	INSTALL 25 KW GENERATOR FOR T-MOBILE CELL SITE
2016.2277	Electrical	08/03/2016		Closed	REPLACE 3 EXISTING ANTENNA WITH 3 NEW ANTENNA
2015.3462	Electrical	11/17/2015		Closed	INSTALL 3 NEW ANTENNAS TO EXISTING POLE
2015.3463	Electrical	11/17/2015		Closed	UPGRADE EQUIPMENT IN EXISTING CELL TOWER SHELTER PINE GROVE CEMETARY
2015.1894	Mechanical	07/20/2015		Closed	INSTALL A/C CONDENSOR AND COIL
2015.0049	Commercial Demolition	01/08/2015		Closed	DECONSTRUCT CELL TOWER/REMOVE ANTENNAS & EQUIPMENT
2013.2811	Electrical	10/02/2013		Closed	REPLACE 1 COAXIAL CABLE1 FIBER OPTIC ETC

EXHIBIT 4



City of Waterbury
Public Works Department

MBL: **0302-0377-0070**

ADDRESS: 940 MERIDEN RD

N

EXHIBIT 5

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

Petition No. 927
Clearwire
Waterbury, Connecticut
Staff Report
January 7, 2010

On December 15, 2009, the Connecticut Siting Council (Council) received a petition from Clear Wireless LLC (Clearwire) for a declaratory ruling that no Certificate of Environmental Compatibility and Public Need is required for proposed modifications to an existing 110-foot monopole telecommunications tower located in the Pine Grove Cemetery at 940 Meriden Road in Waterbury. Council member Ed Wilensky visited the site with staff member David Martin on December 29, 2009 to review the proposal. Tom Flynn represented Clearwire at the field review.

Clearwire seeks to install a 10-foot tower extension at the top of the existing tower in order to install three panel antennas, two microwave dishes, and three remote radio heads at a centerline height of 118 feet above ground level. Clearwire would also install an equipment cabinet on a six-foot by six-foot concrete pad within the existing 60-foot by 60-foot fenced compound.

Currently, the tower hosts antennas of T-Mobile (at a centerline height of 97 feet), Verizon (at a centerline height of 87 feet), and Pocket Wireless (at a centerline height of 77 feet). Nextel has leased the top of the existing tower and plans to install antennas at a centerline height of 107 feet.

The structural analysis for Clearwire's modifications indicates that the existing tower has the structural capacity to accommodate Clearwire's extension without the need for any reinforcement.

This tower's cumulative power density with the addition of Clearwire's antennas would be 63.3% of the FCC maximum permissible emission.

The existing tower is located behind the cemetery's maintenance building. It is visible from areas to the north and west of the cemetery. Areas to the west with visibility are mostly located along Meriden Road, which is predominantly commercial. The tower has very little visibility to east and south. The proposed ten-foot extension should not significantly increase the areas from which the tower is visible.

Clearwire notified abutting property owners by certified mail of its planned extension. Neither the Council nor the applicant has received any calls regarding this proposal.

DOCKET NO. 321 – Optasite, Inc. and Omnipoint Communications, Inc. application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a telecommunications facility at 940 Meriden Road in Waterbury, Connecticut.	}	Connecticut Siting Council

February 27, 2007

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 Optasite, Inc. for the construction, maintenance and operation of a wireless telecommunications facility to be located at 940 Meriden Road in Waterbury, Connecticut.

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 steel monopole and shall be constructed no taller than 110 feet above ground level to provide telecommunications services to both public and private entities.

2. 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 the City of Waterbury and 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, antenna 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.

3. 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.

4. 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.

5. 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.

6. The Certificate Holder shall provide reasonable space on the tower for no compensation for any City of Waterbury public safety services (police, fire and medical services), provided such use can be accommodated and is compatible with the structural integrity of the tower.

7. Unless otherwise approved by the Council, if the facility authorized herein is not fully constructed and providing wireless services within eighteen months from the date of the mailing of the Council's Findings of Fact, Opinion, and Decision and Order (collectively called "Final Decision"), 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. The time between the filing and resolution of any appeals of the Council's Final Decision shall not be counted in calculating this deadline.

8. Any request for extension of the time period referred to in Condition 7 shall be filed with the Council not later than 60 days prior to the expiration date of this Certificate and shall be served on all parties and intervenors, as listed in the service list, and the City of Waterbury. Any proposed modifications to this Decision and Order shall likewise be so served.

9. If the facility 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.

10. The Certificate Holder shall remove any nonfunctioning antenna, and associated antenna mounting equipment, within 60 days of the date the antenna ceased to function.

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 site 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.

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 in this proceeding are:

Status Granted	**Status Holder (name, address & phone number)**	**Representative (name, address & phone number)**
Applicant	Optasite, Inc. One Research Drive, Suite 200C Westborough, MA 01581 Omnipoint Communications, Inc. 100 Filley Street Bloomfield, CT 06002	Julie Kohler, Esq. Carrie L. Larson, Esq. Cohen and Wolf, P.C. 1115 Broad Street Bridgeport, CT 06604 (203) 368-0211 (203) 394-9901 fax jkohler@cohenandwolf.com clarson@cohenandwolf.com
Intervenor *(approved at the hearing on November 21, 2006)*	Sprint/Nextel Corporation	Thomas J. Regan Brown Rudnick Berlack Israels LLP CityPlace I, 185 Asylum Street Hartford, CT 06103-3402 (860) 509-6500 (860) 509-6501 fax

CERTIFICATION

The undersigned members of the Connecticut Siting Council (Council) hereby certify that they have heard this case, or read the record thereof, in DOCKET NO. 321 – Optasite, Inc. and Omnipoint Communications, Inc. application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a telecommunications facility located at 940 Meriden Road in Waterbury, Connecticut, and voted as follows to approve the proposed site located at 940 Meriden Road in Waterbury, Connecticut:

Council Members	Vote Cast
Daniel F. Caruso, Chairman	Yes
Colin C. Tait, Vice Chairman	Absent
Commissioner Donald W. Downes Designee: Gerald J. Heffernan	Absent
Commissioner Gina McCarthy Designee: Brian J. Emerick	Yes
Philip T. Ashton	Absent
Daniel P. Lynch, Jr.	Yes
James J. Murphy, Jr.	Yes
Dr. Barbara Currier Bell	Yes
Edward S. Wilensky	Yes

Dated at New Britain, Connecticut, February 27, 2007.

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

Daniel F. Caruso
Chairman

March 2, 2007

Julie Kohler, Esq.
Carrie L. Larson, Esq.
Cohen and Wolf, P.C.
1115 Broad Street
Bridgeport, CT 06604

RE: **DOCKET NO. 321** – Optasite, Inc. and Omnipoint Communications, Inc. application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a telecommunications facility located at 940 Meriden Road in Waterbury, Connecticut.

Dear Attorney Kohler:

By its Decision and Order dated February 27, 2007, the Connecticut Siting Council (Council) granted a Certificate of Environmental Compatibility and Public Need (Certificate) for the construction, maintenance and operation of a telecommunications facility located at 940 Meriden Road in Waterbury, Connecticut.

Enclosed are the Council's Certificate, Findings of Fact, Opinion, and Decision and Order.

Very truly yours,

S. Derek Phelps
Executive Director

SDP/ap

Enclosures (4)

Daniel F. Caruso
Chairman

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

CERTIFICATE

OF

ENVIRONMENTAL COMPATIBILITY AND PUBLIC NEED

DOCKET NO. 321

Pursuant to General Statutes § 16-50k, as amended, the Connecticut Siting Council hereby issues a Certificate of Environmental Compatibility and Public Need to Optasite, Inc. for the construction, maintenance and operation of a telecommunications facility at 940 Meriden Road in Waterbury, Connecticut. This Certificate is issued in accordance with and subject to the terms and conditions set forth in the Decision and Order of the Council on February 27, 2007.

By order of the Council,

Daniel F. Caruso, Chairman

February 27, 2007

EXHIBIT 6

SPECIAL CONSTRUCTION NOTE (SBA-PROVIDED ANTENNA MOUNT STRUCTURAL MOD SPECIAL EQUIPMENT INSTALLATION REQUIREMENTS):
GENERAL CONTRACTOR SHALL FURNISH AND INSTALL ALL ANTENNA MOUNT STRUCTURAL AUGMENTS (STRUCTURAL MODIFICATIONS) AT THE T-MOBILE RAD/VERTICAL EQUIPMENT SPACE PER RECOMMENDATIONS FROM SBA-PROVIDED ANTENNA MOUNT STRUCTURAL ANALYSIS AND ANY SUPPLEMENTAL CONSTRUCTION DRAWINGS (PROVIDED BY OTHERS).

NH331/OPTA PINE GROVE

940 MERIDEN ROAD
WATERBURY, CT 06705
NEW HAVEN COUNTY

SITE NO.: CTNH331B

SITE TYPE: 119'± MONOPOLE

RF DESIGN GUIDELINE: 4Sec-67D5A994DBA OUTDOOR

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

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.

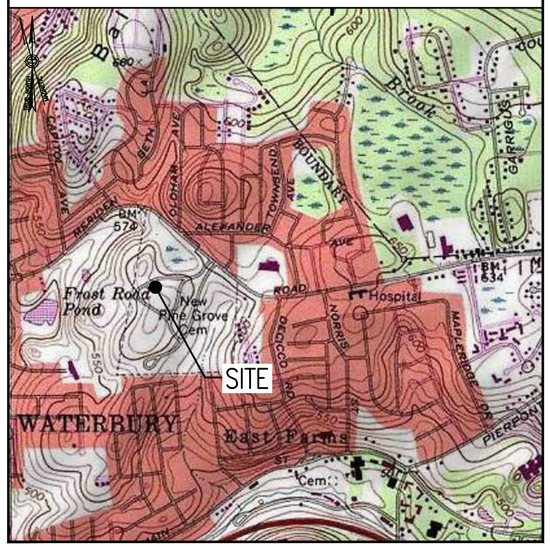
GENERAL NOTES

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"



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.

SHEET INDEX

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

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).

PROJECT SUMMARY

SITE NUMBER:	CTNH331B
SBA SITE NUMBER:	CT13070-A
SBA SITE NAME:	WATERBURY 4, CT
SITE ADDRESS:	940 MERIDEN ROAD WATERBURY, CT 06705
PROPERTY OWNER:	PINE GROVE CEMETERY ASSOCIATION 840 MERIDEN ROAD WATERBURY, CT 06705
TOWER OWNER:	SBA INFRASTRUCTURE, LLC 8501 CONGRESS AVENUE BOCA RATON, FL 33487 PHONE: 561-226-9523
COUNTY:	NEW HAVEN COUNTY
ZONING DISTRICT:	RL, LOW DENSITY RESIDENTIAL
STRUCTURE TYPE:	MONOPOLE
STRUCTURE HEIGHT:	119'
APPLICANT:	T-MOBILE NORTHEAST LLC 15 COMMERCE WAY, SUITE B NORTON, MA 02766
SBA RSM:	STEPHEN ROTH PHONE: 860-539-4920 EMAIL: SRoth@sbasite.com
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: N.41.553182° LONGITUDE W.-72.993386°

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
7/21/20

CHECKED BY: JMT

APPROVED BY: JMT

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
3	07/16/20	CONSTRUCTION REVISED	CMC
2	07/08/20	CONSTRUCTION REVISED	CMC
1	06/16/20	ISSUED FOR CONSTRUCTION	JRV
0	05/18/19	ISSUED FOR REVIEW	BDJ

SITE NUMBER:
CTNH331B

SITE ADDRESS:
940 MERIDEN ROAD
WATERBURY, CT 06705

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1

1815.116

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 (400PSI) 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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www.chappellengineering.com

STATE OF CONNECTICUT
JAMES M. FITZGERALD
No. 25937
LICENSED
PROFESSIONAL CIVIL ENGINEER
7/21/20

CHECKED BY: JMT

APPROVED BY: JMT

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
3	07/16/20	CONSTRUCTION REVISED	CMC
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0	05/18/19	ISSUED FOR REVIEW	BDJ

SITE NUMBER:
CTNH331B

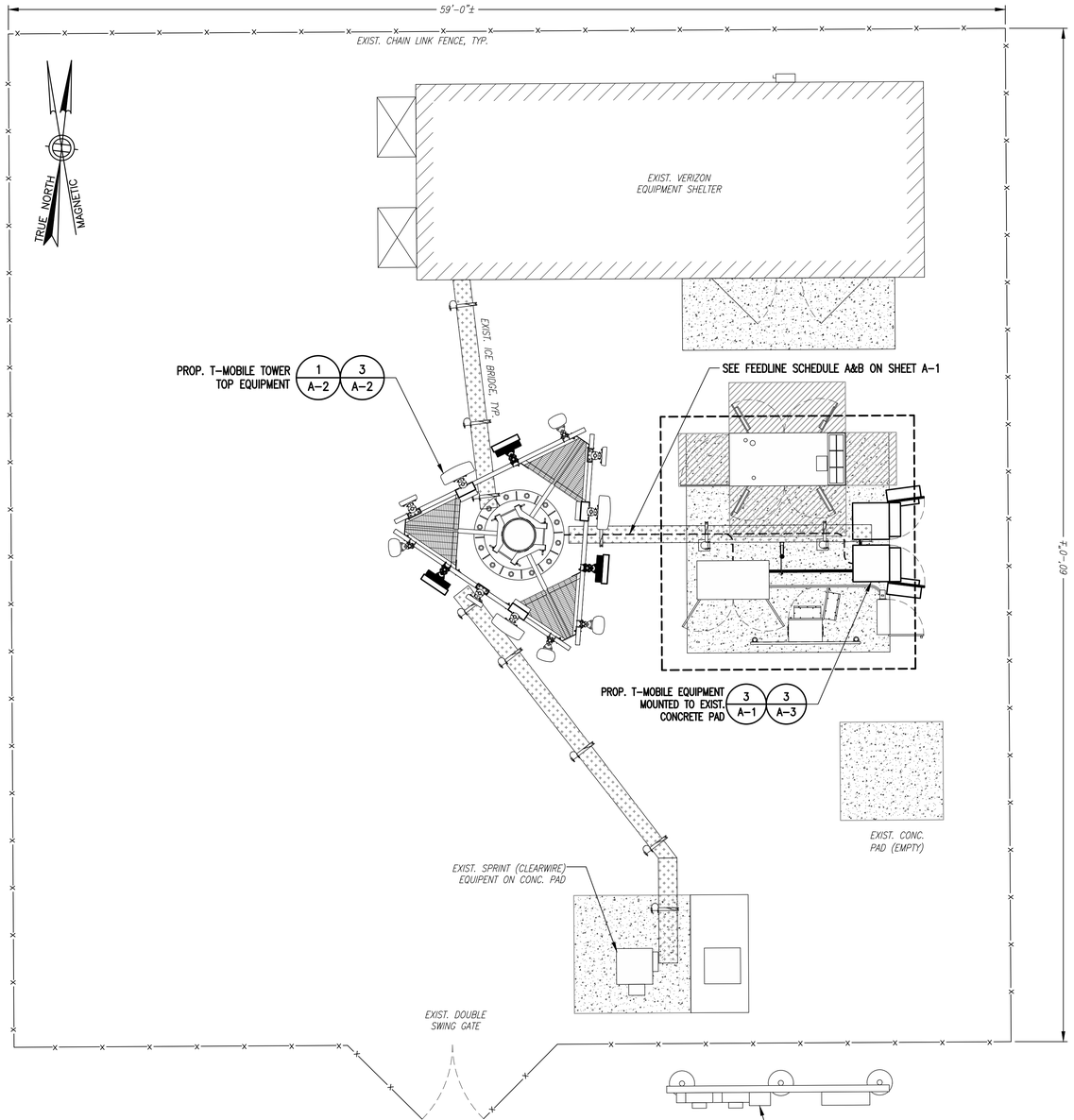
SITE ADDRESS:
940 MERIDEN ROAD
WATERBURY, CT 06705

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-1

1815.116

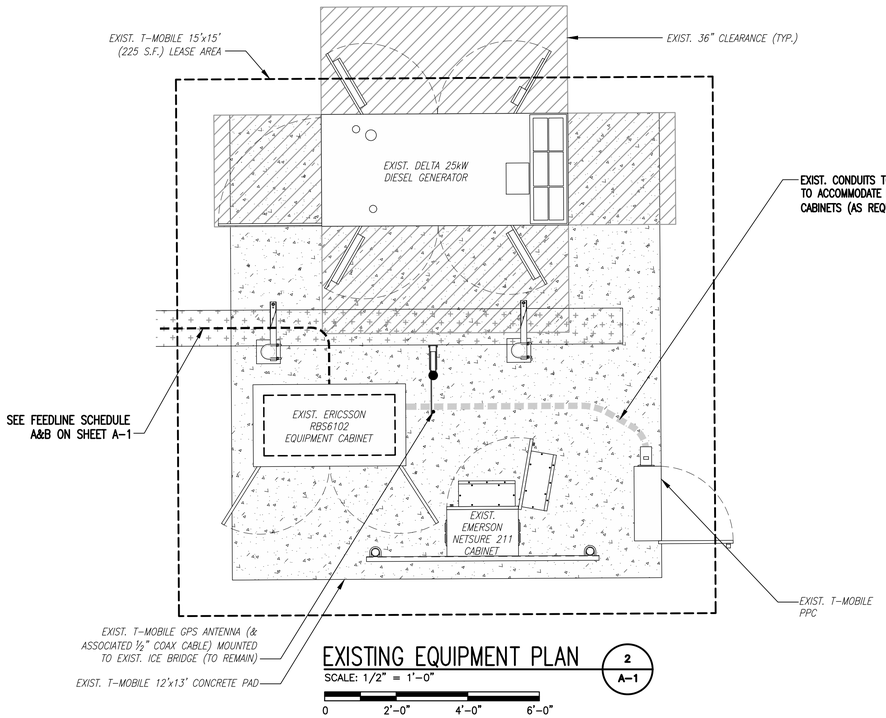
SPECIAL PRE-CONSTRUCTION WORK NOTE (SBA-PROVIDED TOWER STRUCTURAL ANALYSIS SPECIAL EQUIPMENT INSTALLATION REQUIREMENTS):
GENERAL CONTRACTOR SHALL FURNISH AND INSTALL ALL SPECIAL OR SUPPLEMENTAL ADDITIONAL TOWER-MOUNTED EQUIPMENT PER RECOMMENDATIONS FROM SBA-PROVIDED TOWER STRUCTURAL ANALYSIS FOR ANY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



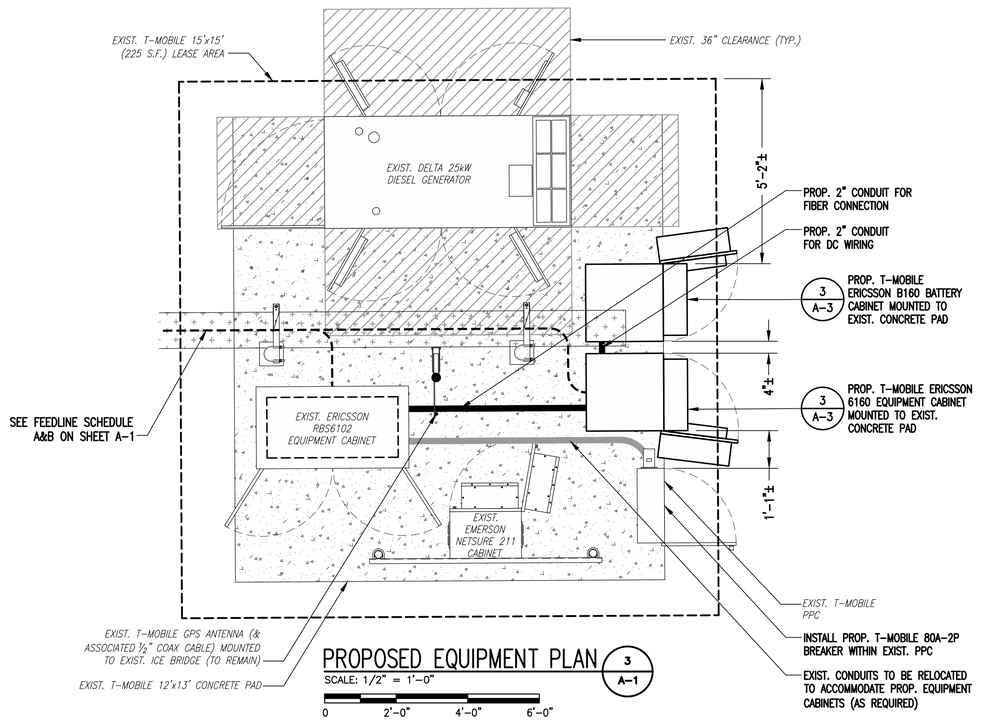
COMPOUND PLAN 1 A-1
SCALE: 1" = 4'-0"
0 4'-0" 8'-0" 12'-0"

FEEDLINE SCHEDULE	FEEDLINES		LOCATION
A	EXISTING TO REMAIN:	(12) 1-5/8" COAX CABLES (3) 6x12 (1-5/8") HCS FIBER CABLES	ROUTED PER STRUCTURAL ANALYSIS
	EXISTING TO BE REMOVED:	NONE	
B	PROPOSED:	(1) 6x12 (1-5/8") HCS FIBER CABLE	

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



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



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

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WATERBURY, CT 06705

SHEET TITLE
COMPOUND & EQUIPMENT PLAN

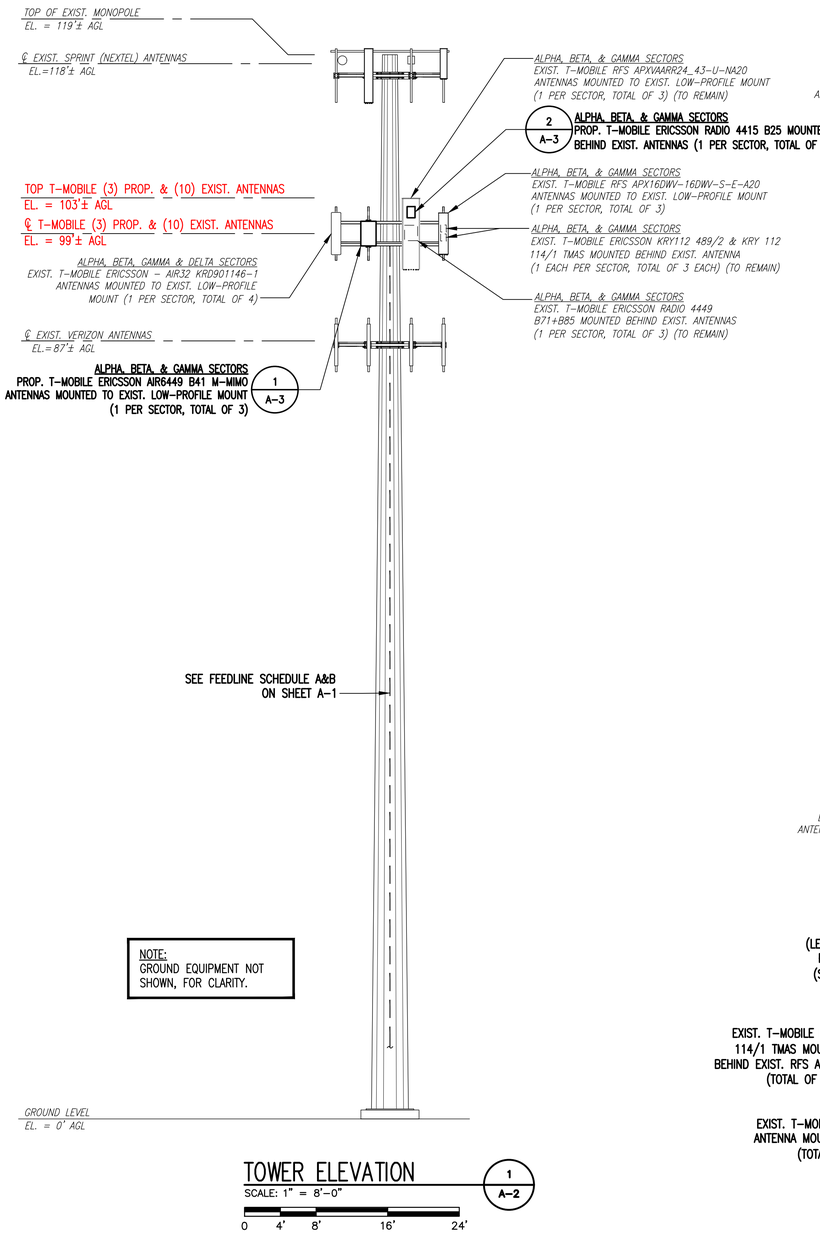
SHEET NUMBER
A-1

1815.116

SPECIAL CONSTRUCTION NOTE (SBA-PROVIDED ANTENNA MOUNT STRUCTURAL MOD SPECIAL EQUIPMENT INSTALLATION REQUIREMENTS):
GENERAL CONTRACTOR SHALL FURNISH AND INSTALL ALL ANTENNA MOUNT STRUCTURAL AUGMENTS (STRUCTURAL MODIFICATIONS) AT THE T-MOBILE RAD/VERTICAL EQUIPMENT SPACE PER RECOMMENDATIONS FROM SBA-PROVIDED ANTENNA MOUNT STRUCTURAL ANALYSIS AND ANY SUPPLEMENTAL CONSTRUCTION DRAWINGS (PROVIDED BY OTHERS).

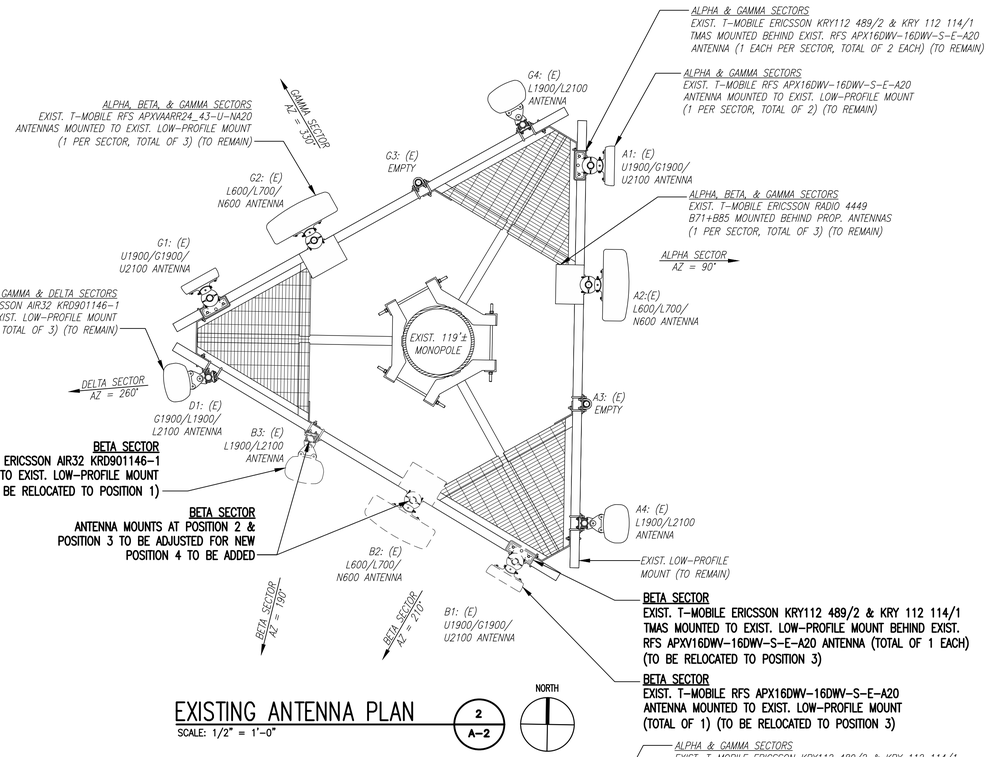
RAD CENTER NOTE:
T-MOBILE RAD CENTER SHOWN IN RED TEXT BASED ON SBA-PROVIDED CO-LOCATION APPLICATION, EQUIPMENT DATABASE, AND STRUCTURAL ANALYSIS. THE SBA-PROVIDED ANTENNA RAD CENTER SHALL SUPERSEDE ANY CONFLICTING INFORMATION DERIVED FROM THE T-MOBILE RFDS.

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.

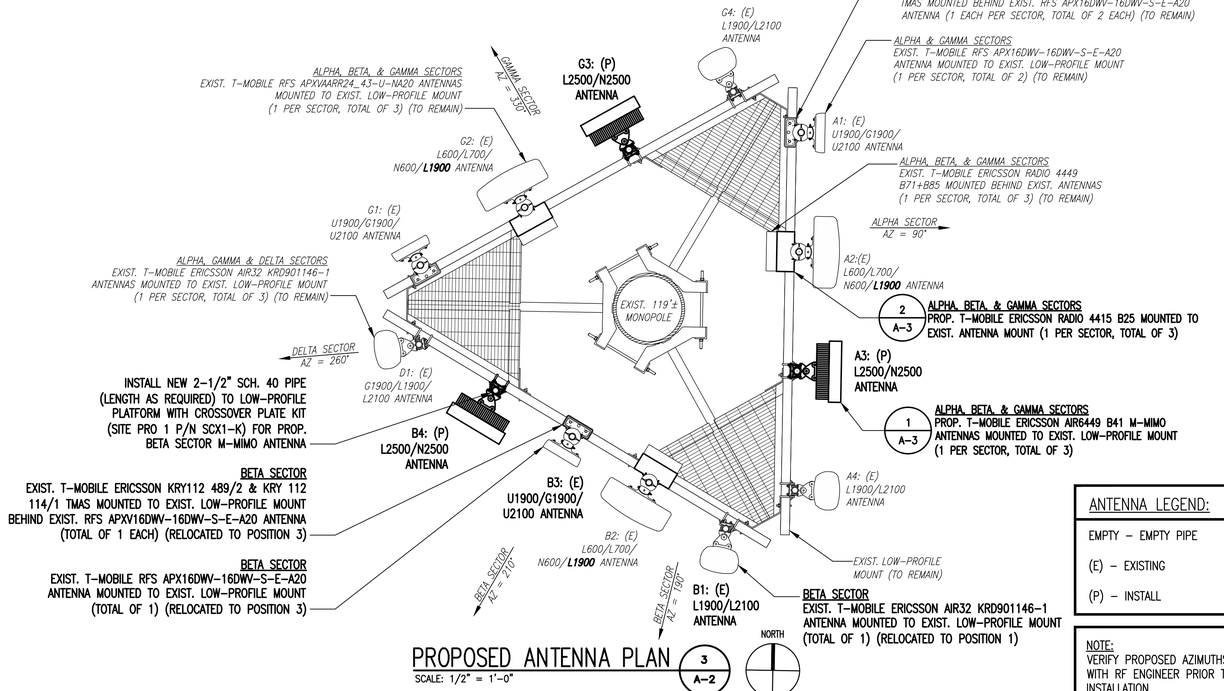


NOTE:
GROUND EQUIPMENT NOT SHOWN, FOR CLARITY.

TOWER ELEVATION
SCALE: 1" = 8'-0"
1 A-2
0 4' 8' 16' 24'



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



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

ANTENNA LEGEND:
EMPTY - EMPTY PIPE
(E) - EXISTING
(P) - INSTALL

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

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SHEET TITLE
TOWER ELEVATIONS & ANTENNA PLAN

SHEET NUMBER
A-2

1815.116

FINAL ANTENNA CONFIGURATION

SECTOR	ANTENNA	RAD CENTER	AZIMUTH (TRUE NORTH)	MECHANICAL DOWNTILT	ELECTRICAL DOWNTILT	BAND	TMA/RADIOS	CABLES
ALPHA	*RFS APX16DWV-16DWV-S-E-A20*	*99'± AGL*	*90°*	*0°*	*2°*	*U1900/G1900/U2100*	*KRY 112 144/1 TMA*	*(12) 1-5/8" COAX CABLES (3) 6x12 (1-5/8") HCS FIBER CABLES* **(1) 6x12 (1-5/8") HCS FIBER CABLE (135'±)**
							KRY 112 489/2 TMA	
	RFS APXVAARR24_43-U-NA20	*99'± AGL*	*90°*	*0°*	*2°*	*L700/L600/N600*	*RADIO 4449 B71+B85*	
						L1900	**RADIO 4415 B25**	
	ERICSSON M-MIMO AIR6449 B41	**99'± AGL**	**90°**	**0°**	**0°**	**L2500/N2500**	**–**	
	ERICSSON AIR32 KRD901146-1 B66A/B2A	*99'± AGL*	*90°*	*0°*	*2°*	*L2100/L1900*	–	
BETA	*ERICSSON AIR32 KRD901146-1 B66A/B2A*	*99'± AGL*	*190°*	*0°*	*2°*	*L2100/L1900*	–	
	RFS APXVAARR24_43-U-NA20	*99'± AGL*	*210°*	*0°*	*2°*	*L700/L600/N600*	*RADIO 4449 B71+B85*	
						L1900	**RADIO 4415 B25**	
	RFS APX16DWV-16DWV-S-E-A20	*99'± AGL*	*210°*	*0°*	*2°*	*U1900/G1900/U2100*	*KRY 112 144/1 TMA*	
							KRY 112 489/2 TMA	
	ERICSSON M-MIMO AIR6449 B41	**99'± AGL**	**210°**	**0°**	**0°**	**L2500/N2500**	**–**	
GAMMA	*RFS APX16DWV-16DWV-S-E-A20*	*99'± AGL*	*330°*	*0°*	*2°*	*U1900/G1900/U2100*	*KRY 112 144/1 TMA*	
							KRY 112 489/2 TMA	
	RFS APXVAARR24_43-U-NA20	*99'± AGL*	*330°*	*0°*	*2°*	*L700/L600/N600*	*RADIO 4449 B71+B85*	
						L1900	**RADIO 4415 B25**	
	ERICSSON M-MIMO AIR6449 B41	**99'± AGL**	**330°**	**0°**	**0°**	**L2500/N2500**	**–**	
	ERICSSON AIR32 KRD901146-1 B66A/B2A	*99'± AGL*	*330°*	*0°*	*2°*	*L2100/L1900*	–	
DELTA	*ERICSSON AIR32 KRD901146-1 B66A/B2A*	*99'± AGL*	*260°*	*0°*	*4°*	*L2100/L1900*	–	

CABLE NOTE: SEE FEEDLINE SCHEDULE A & B ON SHEET A-1.

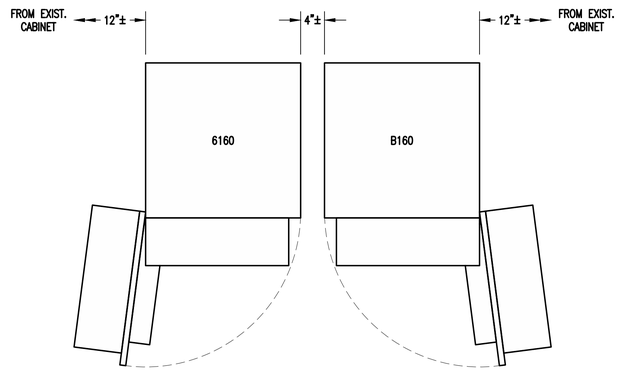
NOTE: RFDS VERSION 5 – 06/04/2020

ALPHA, BETA, & GAMMA SECTORS
ERICSSON M-MIMO AIR6449 B41 PANEL ANTENNA
DIMENSIONS: 33.1"H x 20.5"W x 8.3"D
WEIGHT: 103.0 LBS
1 PER SECTOR, TOTAL OF 3

ANTENNA DETAIL 1/A-3
SCALE: N.T.S.

ALPHA, BETA, & GAMMA SECTORS
ERICSSON RRUS 4415 B25
DIMENSIONS: 16.5"H x 13.4"W x 5.9"D
WEIGHT: 46 LBS
1 PER SECTOR, TOTAL OF 3

RRUS DETAIL 2/A-3
SCALE: N.T.S.



ERICSSON 6160 SITE SUPPORT CABINET
DIMENSIONS: 63.25"H x 26.0"W x 34.0"D
TOTAL OF 1

ERICSSON B160 BATTERY CABINET
DIMENSIONS: 63.25"H x 26.0"W x 34.0"D
TOTAL OF 1

EQUIPMENT DETAIL 3/A-3
SCALE: N.T.S.

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No. 25997
LICENSED PROFESSIONAL CIVIL ENGINEER
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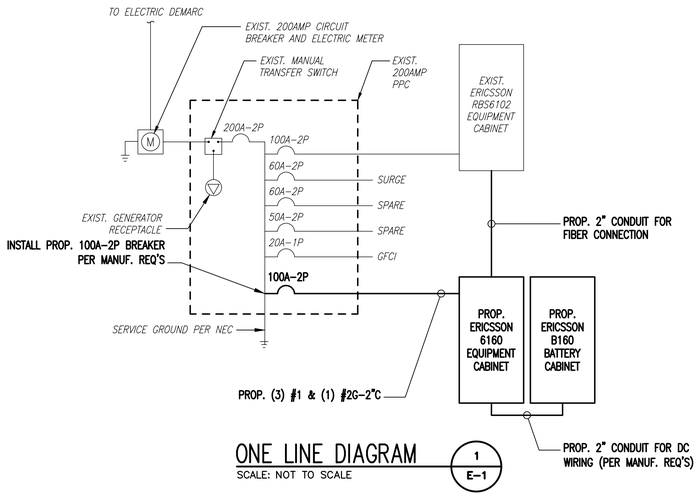
WATERBURY, CT 06705

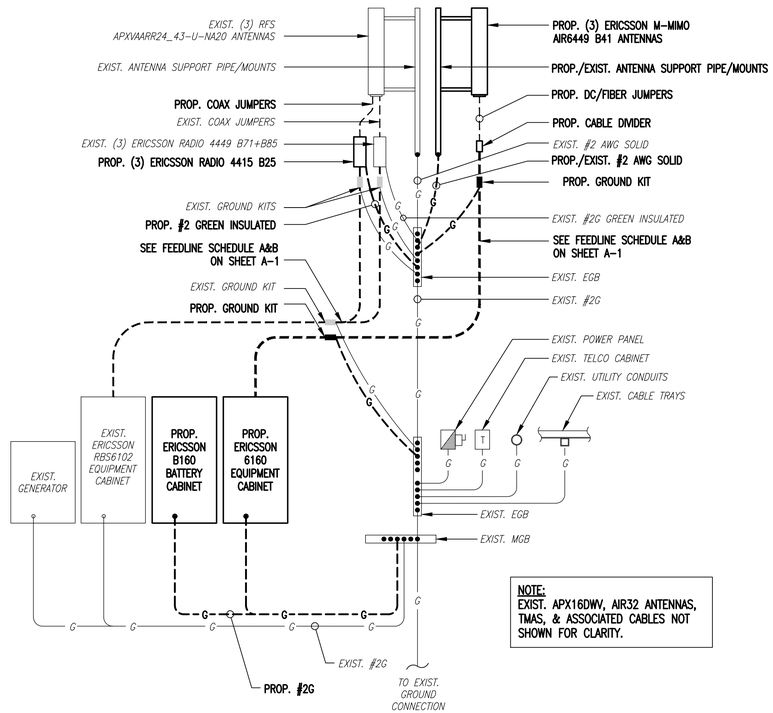
SHEET TITLE
SITE DETAILS

SHEET NUMBER
A-3

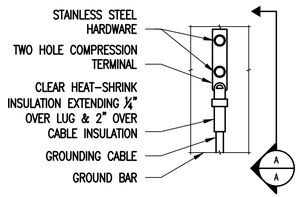
1815.116



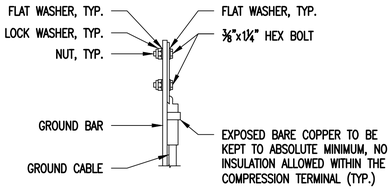
ONE LINE DIAGRAM (1 / E-1)
SCALE: NOT TO SCALE



GROUNDING RISER DIAGRAM (2 / E-1)
SCALE: NOT TO SCALE



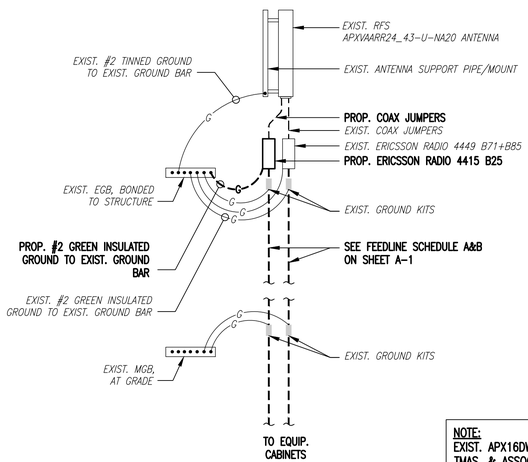
ELEVATION



SECTION A-A

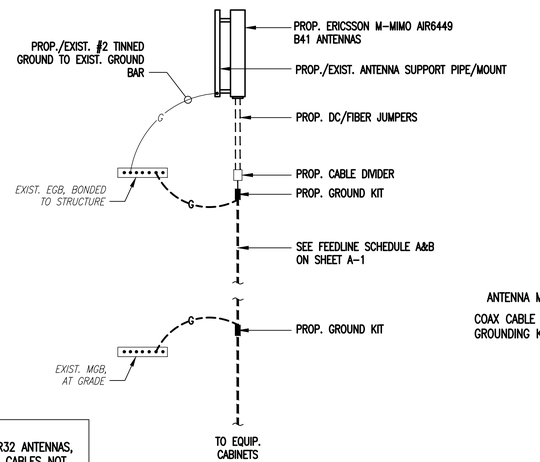
NOTES:
1. "DOUBLING UP" OR "STACKING" OF CONNECTION IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
3. CADWELL DOWNLEADS FROM UPPER EGB, LOWER EGB AND MGB.

TYPICAL GROUND BAR CONNECTIONS DETAIL (3 / E-1)
SCALE: NOT TO SCALE



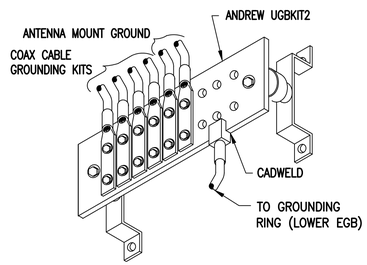
L700/L600/N600/L1900 ANTENNA

NOTE:
EXIST. APX16DWV, AIR32 ANTENNAS, TMAS, & ASSOCIATED CABLES NOT SHOWN FOR CLARITY.



L2500/N2500 ANTENNA

COAX CABLE CONNECTION AND GROUNDING DETAIL (4 / E-1)
SCALE: NOT TO SCALE



GROUND BAR (EGB) (5 / E-1)
SCALE: NOT TO SCALE

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 6" 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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SHEET TITLE
ELECTRICAL & GROUNDING DETAILS

SHEET NUMBER
E-1

1815.116

EXHIBIT 7

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

Structural Analysis Report

Existing 119 ft SABRE Monopole

Customer Name: SBA Communications Corp

Customer Site Number: CT13070-A

Customer Site Name: Waterbury 4, CT

Carrier Name: T-Mobile(App#: 116817, V2)

Carrier Site ID / Name: CTNH331B / NH331/OPTA Pine Grove

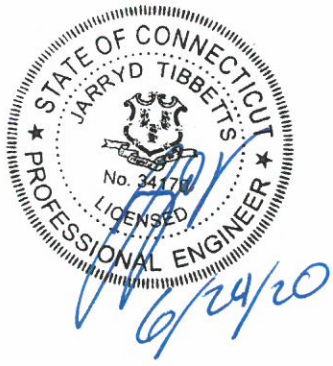
Site Location: 940 Meriden Road

Waterbury, Connecticut

New Haven County

Latitude: 41.553278

Longitude: -72.993361



Analysis Result:

Max Structural Usage: 66.0% [Pass]

Max Foundation Usage: 63.0% [Pass]

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

Report Prepared By : Dipika Dhungana

Introduction

The purpose of this report is to summarize the analysis results on the 119 ft SABRE 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	Tower Drawing prepared by Sabre, Job #07-03039 dated 4/23/07 Structural Analysis prepared by FDH, Project #12-06C54E S2 dated 6/17/11
Foundation Drawing	Foundatoin Drawing prepared by Sabre, Job #03039 dated 4/23/07
Geotechnical Report	Geotechnical Report prepared by Gemini Geotechnical Associates, Project #07023CT dated 3/13/07
Modification Drawings	Modification Drawing prepared by FDH, Project #09-01077E S3 dated 10/13/09

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 Vult =125.0 mph (3-Sec. Gust)/ Nominal Design Wind Speed V_{asd} = 97.0 mph (3-Sec. Gust)
Wind Speed with Ice:	50 mph (3-Sec. Gust) with 3/4" 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:	C
Structure Class:	II
Topographic Category:	1
Crest Height:	0 ft
Seismic Parameters:	S_S = 0.189, S_1 = 0.064

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	118.0	3	Nokia - AAHC - Panel	LP Platform w/ Handrail [RMQP-4096-HK]	(3) 1-1/4" Fiber (1) 1.689" Fiber (2) 1/2"	Sprint Nextel
2		3	Commscope - NNVV-65B-R4 - Panel			
3		2	Andrew - VHLP2.5-11 - Dish			
4		3	ALU - 1900 MHz RRH - RRU			
5		6	ALU - 800 MHz RRH - RRU			
6		3	ALU - TD-RRH8x20-25 - RRU			
-	99.0	3	RFS APX16DWV-16DWVS-E-A20	SitePro RMQLP-4096-HK [Platform w/ Handrail]	(12) 1 5/8" (2) 1-1/4" Hybrid	T-Mobile
-		3	RFS APXVAARR24_43-U-NA20 (Octa)			
-		4	Ericsson Air 32 KRD901146-1_B66A_B2A (Octo)			
-		3	Ericsson KRY 112 489/2			
-		3	Ericsson KRY 112 144/2			
-		3	Ericsson Radio 4449 B71 + B12			
15	87.0	3	Antel - BXA-80063/4CF - Panel	Low Profile Platform	(18) 1 5/8" (2) 1 5/8" Hybrid	Verizon
16		9	Andrew - SBNHH-1D65B - Panel			
17		3	Alcatel Lucent - RRH4X45-19 - RRU			
18		3	Alcatel Lucent - RRH2X60-700 - RRU			
20		3	Alcatel Lucent - RRH2X60-PCS - RRU			
21		2	RFS - DB-T1-6Z-8AB-0Z - Distribution Box			

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
7	99.0	3	RFS APX16DWV-16DWVS-E-A20	Platform w/ Handrail SitePro RMQP-4096-HK	(12) 1 5/8" (2) 1 5/8" Fiber (2) 1-1/4" Hybrid	T-Mobile
8		3	RFS APXVAARR24_43-U-NA20 (Octa)			
9		4	Ericsson Air 32 KRD901146-1_B66A_B2A (Octo)			
10		3	Ericsson AIR6449 B41			
11		3	Ericsson KRY 112 489/2			
12		3	Ericsson KRY 112 144/1			
13		3	Ericsson Radio 4449 B71 + B85			
14		3	Ericsson 4415 B25			

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:	**60.6%**	**66.0%**	**45.0%**
Pass/Fail	**Pass**	**Pass**	**Pass**

Foundations

	Moment (Kip-Ft)	Shear (Kips)
Analysis Reactions	2392.99	27.2

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 ANSI/TIA/EIA 222-G for the installed antennas. The maximum twist/sway at the elevation of the proposed equipment is 0.8031 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 ANSI/TIA/EIA 222-G 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 EIA/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 60.59% at 0.0ft

Structure:	CT13070-A-SBA	**Code:**	EIA/TIA-222-G	6/24/2020	
Site Name:	Waterbury 4, CT	**Exposure:**	C		
Height:	119.00 (ft)	**Gh:**	1.1		
Base Elev:	0.000 (ft)			Page: 1	

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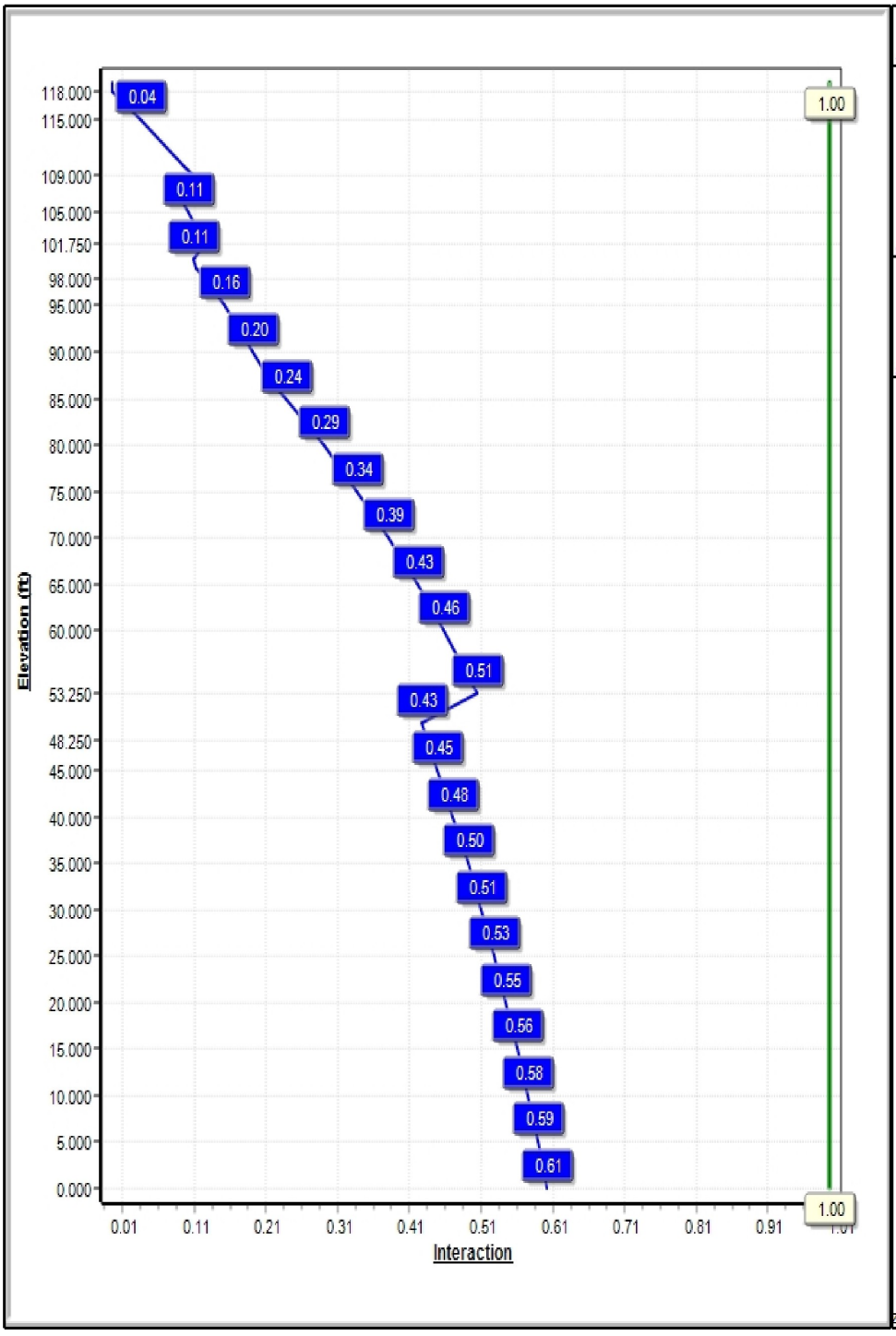
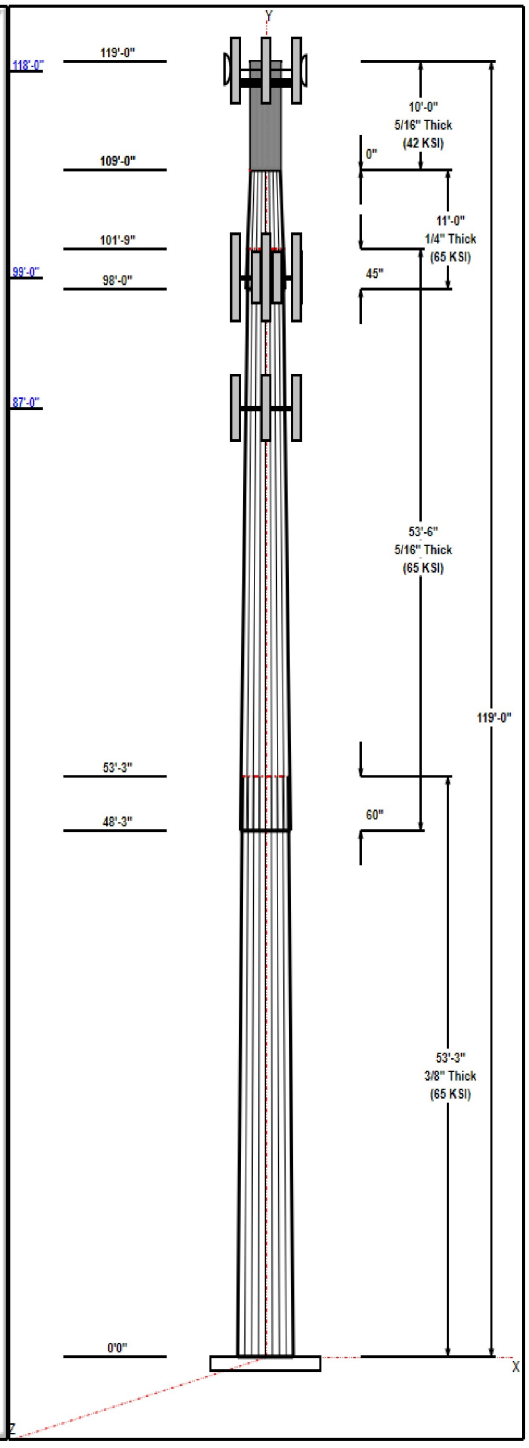
Dead Load Factor:	1.20	**Iterations:**	22
Wind Load Factor:	1.60		

Load Case : 1.2D + 1.6W 97 mph Wind





Structure: CT13070-A-SBA

Type: Custom
Site Name: Waterbury 4, CT
Height: 119.00 (ft)
Base Elev: 0.00 (ft)

Base Shape: 18 Sided
Taper: 0.21408

6/24/2020

Tower Engineering Solutions

Shaft Properties

Seq	Length (ft)	Top (in)	Bottom (in)	Thick (in)	Joint Type	Taper	Grade (ksi)
1	53.25	37.99	49.39	0.375		0.21408	65
2	53.50	28.23	39.69	0.313	Slip	0.21408	65
3	11.00	27.18	29.53	0.250	Slip	0.21408	65
4	10.00	26.00	26.00	0.312	Butt	0.00000	42

Discrete Appurtenances

Attach Elev (ft)	Force Elev (ft)	Qty	Description	Carrier
118.00	118.00	3	1900 MHz RRH	Sprint Nextel
118.00	118.00	6	800 MHz RRH	Sprint Nextel
118.00	118.00	3	TD-RRH8x20-25	Sprint Nextel
118.00	118.00	3	AAHC	Sprint Nextel
118.00	118.00	3	NNVV-65B-R4	Sprint Nextel
118.00	118.00	1	LP Platform w/ Handrail	Sprint Nextel
118.00	118.00	2	VHLP2.5-11	Sprint Nextel
99.00	99.00	3	KRY 112 144/1	SWS LLC
99.00	99.00	1	Low Profile Platform	T-Mobile
99.00	99.00	3	4449 B71+ B85	T-Mobile
99.00	99.00	3	APXVAARR24_43-U-NA20	T-Mobile
99.00	99.00	4	Air 32	T-Mobile
99.00	99.00	3	KRY 112 489/2	T-Mobile
99.00	99.00	3	AIR 6449 B41	T-Mobile
99.00	99.00	3	APX16DWV-16DWV-S-E-	T-Mobile
99.00	99.00	3	RRUS 4415 B25	T-Mobile
99.00	99.00	1	HRK12 (Handrail Kit)	T-Mobile
87.00	87.00	1	Low Profile Platform	Verizon
87.00	87.00	3	BXA-80063/4CF	Verizon
87.00	87.00	9	SBNHH-1D65B	Verizon
87.00	87.00	3	1900 MHz 4X45 RRH	Verizon
87.00	87.00	3	RRH2X60-PCS	Verizon
87.00	87.00	3	RRH2X60-700	Verizon
87.00	87.00	2	DB-T1-6Z-8AB-0Z	Verizon

Linear Appurtenances

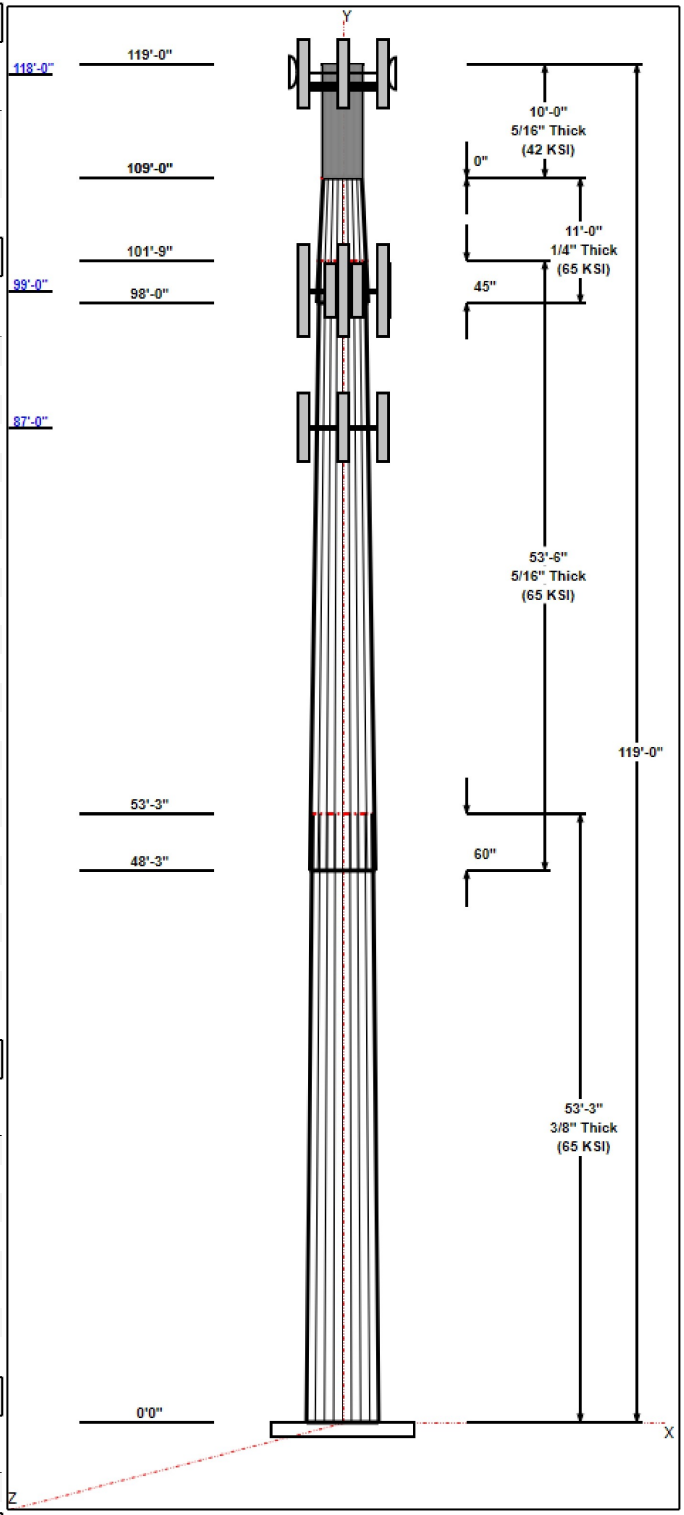
Elev From (ft)	Elev To (ft)	Placement	Description	Carrier
0.00	118.00	Inside	1-1/4" Fiber	Sprint Nextel
0.00	118.00	Inside	1.689" Fiber	Sprint Nextel
0.00	118.00	Inside	1/2" Coax	Sprint Nextel
0.00	99.00	Inside	1 5/8" Coax	T-Mobile
0.00	99.00	Inside	1 5/8" Fiber	T-Mobile
0.00	99.00	Inside	1-1/4" Hybrid	T-Mobile
0.00	87.00	Inside	1 5/8" Coax	Verizon
0.00	87.00	Inside	1 5/8" Hybrid	Verizon

Anchor Bolts

Qty	Specifications	Grade (ksi)	Arrangement
12	2.25" 18J	75.0	Cluster

Base Plate

Thickness (in)	Specifications (in)	Grade (ksi)	Geometry



3.0000	53.3	60.0	Clipped

Reactions

Load Case	Moment (FT-Kips)	Shear (Kips)	Axial (Kips)
1.2D + 1.6W 97 mph Wind	2392.3	27.2	37.1
0.9D + 1.6W 97 mph Wind	2373.9	27.1	27.9
1.2D + 1.0Di + 1.0Wi 50 mph Wind	631.4	7.3	57.8
1.2D + 1.0E	173.0	1.7	37.2
0.9D + 1.0E	171.6	1.7	27.9
1.0D + 1.0W 60 mph Wind	569.4	6.5	31.0

Structure: CT13070-A-SBA - Coax Line Placement

Type: Monopole
Site Name: Waterbury 4, CT
Height: 119.00 (ft)

6/24/2020

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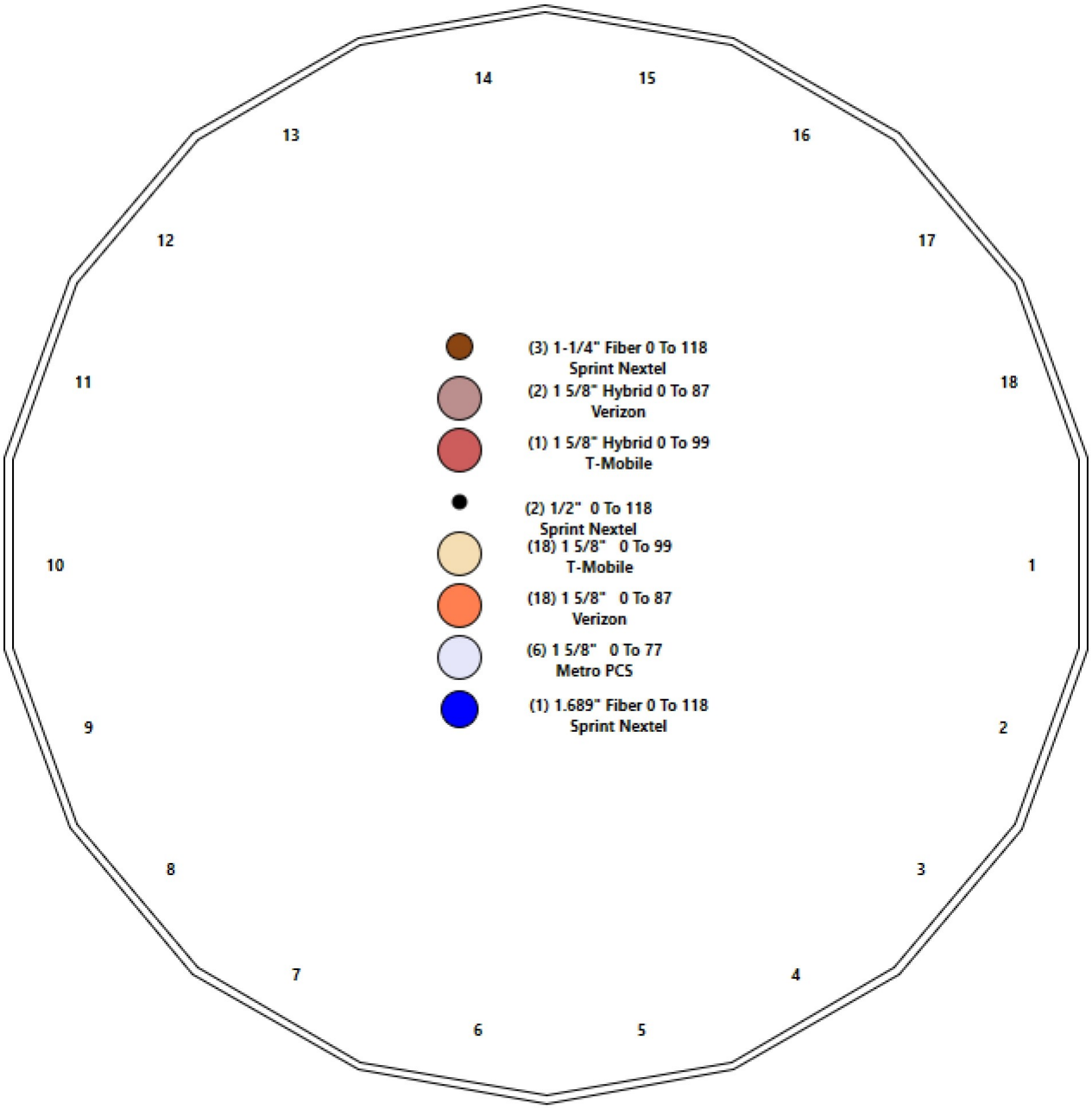

Shaft Properties

Structure:	CT13070-A-SBA		**Code:**	EIA/TIA-222-G	6/24/2020
Site Name:	Waterbury 4, CT		**Exposure:**	C	
Height:	119.00 (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

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Sec. No.	Shape	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Overlap (in)	Weight (lb)
1	18	53.250	0.3750	65		0.00	9,341
2	18	53.500	0.3125	65	Slip	60.00	6,075
3	18	11.000	0.2500	65	Slip	45.00	835
4	R	10.000	0.3120	42	Flange	0.00	857
					Total Shaft Weight:		**17,108**

	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	49.39	0.00	58.34	17707.72	21.81	131.71	37.99	53.25	44.77	8003.18	16.45	101.3	0.214083
2	39.69	48.25	39.05	7648.75	20.98	126.99	28.23	101.75	27.69	2727.23	14.52	90.34	0.214083
3	29.53	98.00	23.24	2517.77	19.42	118.14	27.18	109.00	21.37	1957.91	17.76	108.7	0.214083
4	26.00	109.0	25.18	2078.44	0.00	83.33	26.00	119.00	25.18	2078.44	0.00	83.33	0.000000

Load Summary

Structure:	CT13070-A-SBA	**Code:**	EIA/TIA-222-G	6/24/2020	
Site Name:	Waterbury 4, CT	**Exposure:**	C		
Height:	119.00 (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	

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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	118.00	1900 MHz RRH	3	60.00	2.77	0.67	141.46	4.008	0.67	0.00	0.00
2	118.00	800 MHz RRH	6	53.00	2.49	0.67	125.21	3.607	0.67	0.00	0.00
3	118.00	TD-RRH8x20-25	3	70.00	4.05	0.67	177.31	4.842	0.67	0.00	0.00
4	118.00	AAHC	3	103.70	4.21	0.75	206.82	5.002	0.75	0.00	0.00
5	118.00	NNVV-65B-R4	3	84.70	12.27	0.74	389.78	13.692	0.74	0.00	0.00
6	118.00	LP Platform w/ Handrail	1	2448.72	46.00	1.00	4952.05	79.232	1.00	0.00	0.00
7	118.00	VHLP2.5-11	2	48.00	8.43	1.00	218.01	10.096	1.00	0.50	0.00
8	99.00	KRY 112 144/1	3	11.02	0.41	0.67	21.38	0.866	0.67	0.00	0.00
9	99.00	Low Profile Platform	1	1500.00	22.00	1.00	2755.64	38.943	1.00	0.00	0.00
10	99.00	4449 B71+ B85	3	70.00	1.65	0.67	134.79	2.163	0.67	0.00	0.00
11	99.00	APXVAARR24_43-U-NA20	3	128.00	20.24	0.70	526.85	22.060	0.70	0.00	0.00
12	99.00	Air 32 KRD901146-1_B66A_B2A	4	132.20	6.51	0.87	307.75	7.641	0.87	0.00	0.00
13	99.00	KRY 112 489/2	3	15.40	0.65	0.67	32.30	1.237	0.67	0.00	0.00
14	99.00	AIR 6449 B41	3	133.20	6.53	0.70	289.53	7.554	0.70	0.00	0.00
15	99.00	APX16DWV-16DWV-S-E-A20	3	40.70	6.46	0.62	170.89	7.526	0.62	0.00	0.00
16	99.00	RRUS 4415 B25	3	46.00	1.64	0.67	85.43	2.134	0.67	0.00	0.00
17	99.00	HRK12 (Handrail Kit)	1	261.72	6.75	1.00	559.67	13.078	1.00	0.00	0.00
18	87.00	Low Profile Platform	1	1500.00	22.00	1.00	2739.52	38.725	1.00	0.00	0.00
19	87.00	BXA-80063/4CF	3	9.90	4.72	0.72	105.07	6.471	0.72	0.00	0.00
20	87.00	SBNHH-1D65B	9	40.00	8.16	0.82	230.41	9.386	0.82	0.00	0.00
21	87.00	1900 MHz 4X45 RRH	3	59.50	2.71	0.99	135.34	3.907	0.99	0.00	0.00
22	87.00	RRH2X60-PCS	3	55.00	2.20	0.89	134.05	2.799	0.90	0.00	0.00
23	87.00	RRH2X60-700	3	60.00	3.50	0.73	142.66	4.247	0.74	0.00	0.00
24	87.00	DB-T1-6Z-8AB-0Z	2	44.00	4.80	0.85	178.82	5.624	0.86	0.00	0.00
		Totals:	**72**	**9,942.60**			**23,937.52**				

Linear Appurtenances

Bottom Elev. (ft)	Top Elev. (ft)	Description	Exposed Width	Exposed
0.00	118.00	(3) 1-1/4" Fiber	0.00	Inside
0.00	118.00	(1) 1.689" Fiber	0.00	Inside
0.00	118.00	(2) 1/2" Coax	0.00	Inside
0.00	99.00	(12) 1 5/8" Coax	0.00	Inside
0.00	99.00	(2) 1 5/8" Fiber	0.00	Inside
0.00	99.00	(2) 1-1/4" Hybrid	0.00	Inside
0.00	87.00	(18) 1 5/8" Coax	0.00	Inside
0.00	87.00	(2) 1 5/8" Hybrid	0.00	Inside

Shaft Section Properties

Structure:	CT13070-A-SBA	**Code:**	EIA/TIA-222-G	6/24/2020	
Site Name:	Waterbury 4, CT	**Exposure:**	C		
Height:	119.00 (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		0.3750	49.390	58.338	17707.7	21.81	131.71	75.7	706.2	0.0
5.00		0.3750	48.320	57.064	16572.7	21.31	128.85	76.3	675.5	981.7
10.00		0.3750	47.249	55.790	15487.3	20.81	126.00	76.9	645.6	960.0
15.00		0.3750	46.179	54.516	14450.4	20.30	123.14	77.5	616.3	938.4
20.00		0.3750	45.108	53.242	13460.8	19.80	120.29	78.1	587.8	916.7
25.00		0.3750	44.038	51.968	12517.4	19.30	117.43	78.7	559.8	895.0
30.00		0.3750	42.968	50.694	11619.2	18.79	114.58	79.3	532.6	873.3
35.00		0.3750	41.897	49.420	10765.0	18.29	111.73	79.9	506.1	851.7
40.00		0.3750	40.827	48.146	9953.7	17.79	108.87	80.5	480.2	830.0
45.00		0.3750	39.756	46.872	9184.3	17.28	106.02	81.1	455.0	808.3
48.25	Bot - Section 2	0.3750	39.061	46.044	8706.0	16.96	104.16	81.5	439.0	513.8
50.00		0.3750	38.686	45.598	8455.5	16.78	103.16	81.7	430.5	504.3
53.25	Top - Section 1	0.3125	38.615	37.990	7041.7	20.38	123.57	0.0	0.0	923.6
55.00		0.3125	38.240	37.618	6837.1	20.17	122.37	77.7	352.2	225.1
60.00		0.3125	37.170	36.557	6274.4	19.56	118.94	78.4	332.5	631.0
65.00		0.3125	36.100	35.495	5743.5	18.96	115.52	79.1	313.4	612.9
70.00		0.3125	35.029	34.433	5243.4	18.35	112.09	79.8	294.8	594.9
75.00		0.3125	33.959	33.372	4773.2	17.75	108.67	80.5	276.8	576.8
80.00		0.3125	32.888	32.310	4332.0	17.15	105.24	81.2	259.4	558.8
85.00		0.3125	31.818	31.248	3918.8	16.54	101.82	81.9	242.6	540.7
87.00		0.3125	31.390	30.824	3761.2	16.30	100.45	82.2	236.0	211.2
90.00		0.3125	30.748	30.187	3532.8	15.94	98.39	82.5	226.3	311.4
95.00		0.3125	29.677	29.125	3173.0	15.33	94.97	82.5	210.6	504.6
98.00	Bot - Section 3	0.3125	29.035	28.488	2969.3	14.97	92.91	82.5	201.4	294.1
99.00		0.3125	28.821	28.276	2903.4	14.85	92.23	82.5	198.4	175.4
100.00		0.3125	28.607	28.063	2838.5	14.73	91.54	82.5	195.4	174.1
101.75	Top - Section 2	0.2500	28.732	22.600	2316.3	18.85	114.93	0.0	0.0	301.5
105.00		0.2500	28.036	22.048	2150.7	18.36	112.15	79.8	151.1	246.9
109.00	Top - Section 3	0.2500	27.180	21.368	1957.9	17.76	108.72	80.5	141.9	295.5
109.00	Bot - Section 4	0.3120	26.000	25.179	2078.4	14.23	87.12	41.2	159.9	
110.00		0.3120	26.000	25.179	2078.4	0.00	83.33	41.2	159.9	85.7
115.00		0.3120	26.000	25.179	2078.4	0.00	83.33	41.2	159.9	428.4
118.00		0.3120	26.000	25.179	2078.4	0.00	83.33	41.2	159.9	257.0
119.00		0.3120	26.000	25.179	2078.4	0.00	83.33	41.2	159.9	85.7
										17108.3

Wind Loading - Shaft

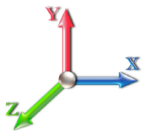
Structure:	CT13070-A-SBA	**Code:**	EIA/TIA-222-G	6/24/2020	
Site Name:	Waterbury 4, CT	**Exposure:**	C		
Height:	119.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 8	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 97 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	0.85	19.450	21.40	373.76	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	19.450	21.40	365.66	0.650	0.000	5.00	20.670	13.44	459.9	0.0	1178.1
10.00		1.00	0.85	19.450	21.40	357.55	0.650	0.000	5.00	20.217	13.14	449.9	0.0	1152.1
15.00		1.00	0.85	19.450	21.40	349.45	0.650	0.000	5.00	19.764	12.85	439.8	0.0	1126.0
20.00		1.00	0.90	20.638	22.70	351.62	0.650	0.000	5.00	19.312	12.55	455.9	0.0	1100.0
25.00		1.00	0.95	21.630	23.79	351.43	0.650	0.000	5.00	18.859	12.26	466.7	0.0	1074.0
30.00		1.00	0.98	22.477	24.72	349.54	0.650	0.000	5.00	18.406	11.96	473.3	0.0	1048.0
35.00		1.00	1.01	23.218	25.54	346.40	0.650	0.000	5.00	17.953	11.67	476.9	0.0	1022.0
40.00		1.00	1.04	23.880	26.27	342.33	0.650	0.000	5.00	17.500	11.37	478.1	0.0	996.0
45.00		1.00	1.07	24.479	26.93	337.51	0.650	0.000	5.00	17.047	11.08	477.4	0.0	970.0
48.25	Bot - Section 2	1.00	1.09	24.841	27.33	334.05	0.650	0.000	3.25	10.838	7.04	308.0	0.0	616.5
50.00		1.00	1.09	25.029	27.53	332.09	0.650	0.000	1.75	5.849	3.80	167.5	0.0	605.2
53.25	Top - Section 1	1.00	1.11	25.363	27.90	328.29	0.650	0.000	3.25	10.715	6.96	310.9	0.0	1108.4
55.00		1.00	1.12	25.536	28.09	331.58	0.650	0.000	1.75	5.691	3.70	166.2	0.0	270.1
60.00		1.00	1.14	26.008	28.61	325.26	0.650	0.000	5.00	15.953	10.37	474.6	0.0	757.2
65.00		1.00	1.16	26.450	29.09	318.57	0.650	0.000	5.00	15.500	10.07	469.0	0.0	735.5
70.00		1.00	1.17	26.866	29.55	311.54	0.650	0.000	5.00	15.047	9.78	462.5	0.0	713.9
75.00		1.00	1.19	27.259	29.98	304.22	0.650	0.000	5.00	14.594	9.49	455.1	0.0	692.2
80.00		1.00	1.21	27.632	30.39	296.64	0.650	0.000	5.00	14.141	9.19	447.0	0.0	670.5
85.00		1.00	1.22	27.987	30.79	288.82	0.650	0.000	5.00	13.688	8.90	438.3	0.0	648.8
87.00	Appurtenance(s)	1.00	1.23	28.124	30.94	285.64	0.650	0.000	2.00	5.349	3.48	172.1	0.0	253.5
90.00		1.00	1.24	28.325	31.16	280.79	0.650	0.000	3.00	7.887	5.13	255.6	0.0	373.7
95.00		1.00	1.25	28.650	31.51	272.56	0.650	0.000	5.00	12.783	8.31	419.0	0.0	605.5
98.00	Bot - Section 3	1.00	1.26	28.838	31.72	267.54	0.650	0.000	3.00	7.452	4.84	245.9	0.0	352.9
99.00	Appurtenance(s)	1.00	1.26	28.900	31.79	265.85	0.650	0.000	1.00	2.490	1.62	82.3	0.0	210.4
100.00		1.00	1.27	28.961	31.86	264.16	0.650	0.000	1.00	2.472	1.61	81.9	0.0	208.9
101.75	Top - Section 2	1.00	1.27	29.067	31.97	261.17	0.650	0.000	1.75	4.282	2.78	142.4	0.0	361.8
105.00		1.00	1.28	29.260	32.19	260.22	0.650	0.000	3.25	7.806	5.07	261.3	0.0	296.3
109.00	Top - Section 3	1.00	1.29	29.491	32.44	253.27	0.650	0.000	4.00	9.345	6.07	315.3	0.0	354.6
110.00		1.00	1.29	29.548	32.50	238.82	0.600	0.000	1.00	2.167	1.30	67.6	0.0	102.8
115.00		1.00	1.30	29.826	32.81	239.94	0.600	0.000	5.00	10.833	6.50	341.2	0.0	514.1
118.00	Appurtenance(s)	1.00	1.31	29.988	32.99	240.59	0.600	0.000	3.00	6.500	3.90	205.8	0.0	308.4
119.00		1.00	1.31	30.041	33.05	240.81	0.600	0.000	1.00	2.167	1.30	68.7	0.0	102.8
								Totals:	**119.00**			**10,535.9**		**20,530.0**

Discrete Appurtenance Forces

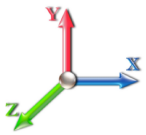
Structure:	CT13070-A-SBA	**Code:**	EIA/TIA-222-G	6/24/2020	
Site Name:	Waterbury 4, CT	**Exposure:**	C		
Height:	119.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 9	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 97 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	118.00	TD-RRH8x20-25	3	29.988	32.986	0.60	0.90	7.33	252.00	0.000	0.000	386.68	0.00	0.00
2	118.00	1900 MHz RRH	3	29.988	32.986	0.60	0.90	5.01	216.00	0.000	0.000	264.47	0.00	0.00
3	118.00	800 MHz RRH	6	29.988	32.986	0.60	0.90	9.01	381.60	0.000	0.000	475.47	0.00	0.00
4	118.00	VHLP2.5-11	2	29.988	32.986	1.00	1.00	16.86	115.20	1.583	0.000	889.84	880.57	0.00
5	118.00	AAHC	3	29.988	32.986	0.68	0.90	8.53	373.32	0.000	0.000	449.95	0.00	0.00
6	118.00	NNVV-65B-R4	3	29.988	32.986	0.67	0.90	24.52	304.92	0.000	0.000	1293.89	0.00	0.00
7	118.00	LP Platform w/ Handrail	1	29.988	32.986	1.00	1.00	46.00	2938.46	0.000	0.000	2427.80	0.00	0.00
8	99.00	HRK12 (Handrail Kit)	1	28.900	31.790	1.00	1.00	6.75	314.06	0.000	0.000	343.33	0.00	0.00
9	99.00	RRUS 4415 B25	3	28.900	31.790	0.50	0.75	2.47	165.60	0.000	0.000	125.75	0.00	0.00
10	99.00	APX16DWV-16DWV-S-E-	3	28.900	31.790	0.46	0.75	9.01	146.52	0.000	0.000	458.36	0.00	0.00
11	99.00	AIR 6449 B41	3	28.900	31.790	0.52	0.75	10.28	479.52	0.000	0.000	523.12	0.00	0.00
12	99.00	KRY 112 489/2	3	28.900	31.790	0.50	0.75	0.98	55.44	0.000	0.000	49.84	0.00	0.00
13	99.00	Air 32	4	28.900	31.790	0.65	0.75	16.99	634.56	0.000	0.000	864.22	0.00	0.00
14	99.00	4449 B71+ B85	3	28.900	31.790	0.50	0.75	2.49	252.00	0.000	0.000	126.52	0.00	0.00
15	99.00	Low Profile Platform	1	28.900	31.790	1.00	1.00	22.00	1800.00	0.000	0.000	1118.99	0.00	0.00
16	99.00	KRY 112 144/1	3	28.900	31.790	0.50	0.75	0.62	39.67	0.000	0.000	31.44	0.00	0.00
17	99.00	APXVAARR24_43-U-NA2	3	28.900	31.790	0.52	0.75	31.88	460.80	0.000	0.000	1621.42	0.00	0.00
18	87.00	SBNHH-1D65B	9	28.124	30.936	0.66	0.80	48.24	432.00	0.000	0.000	2387.57	0.00	0.00
19	87.00	Low Profile Platform	1	28.124	30.936	1.00	1.00	22.00	1800.00	0.000	0.000	1088.96	0.00	0.00
20	87.00	BXA-80063/4CF	3	28.124	30.936	0.65	0.90	9.15	35.64	0.000	0.000	452.92	0.00	0.00
21	87.00	RRH2X60-700	3	28.124	30.936	0.58	0.80	6.12	216.00	0.000	0.000	303.11	0.00	0.00
22	87.00	1900 MHz 4X45 RRH	3	28.124	30.936	0.79	0.80	6.42	214.20	0.000	0.000	317.75	0.00	0.00
23	87.00	RRH2X60-PCS	3	28.124	30.936	0.71	0.80	4.71	198.00	0.000	0.000	233.12	0.00	0.00
24	87.00	DB-T1-6Z-8AB-0Z	2	28.124	30.936	0.68	0.80	6.56	105.60	0.000	0.000	324.65	0.00	0.00
							Totals:		**11,931.12**			**16,559.15**		

Total Applied Force Summary

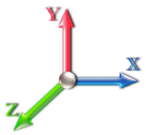
Structure:	CT13070-A-SBA		**Code:**	EIA/TIA-222-G	6/24/2020
Site Name:	Waterbury 4, CT		**Exposure:**	C	
Height:	119.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 10

TES Tower Engineering Solutions

Load Case: 1.2D + 1.6W 97 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		459.94	1427.48	0.00	0.00
10.00		449.86	1401.47	0.00	0.00
15.00		439.78	1375.46	0.00	0.00
20.00		455.93	1349.45	0.00	0.00
25.00		466.66	1323.44	0.00	0.00
30.00		473.27	1297.43	0.00	0.00
35.00		476.85	1271.42	0.00	0.00
40.00		478.08	1245.40	0.00	0.00
45.00		477.40	1219.39	0.00	0.00
48.25		307.99	778.66	0.00	0.00
50.00		167.47	692.45	0.00	0.00
53.25		310.90	1270.49	0.00	0.00
55.00		166.24	357.44	0.00	0.00
60.00		474.65	1006.63	0.00	0.00
65.00		469.01	984.95	0.00	0.00
70.00		462.46	963.27	0.00	0.00
75.00		455.11	941.60	0.00	0.00
80.00		447.02	919.92	0.00	0.00
85.00		438.26	898.25	0.00	0.00
87.00	(24) attachments	5280.16	3354.67	0.00	0.00
90.00		255.57	448.03	0.00	0.00
95.00		418.96	729.37	0.00	0.00
98.00		245.85	427.22	0.00	0.00
99.00	(27) attachments	5345.30	4583.39	0.00	0.00
100.00		81.90	213.89	0.00	0.00
101.75		142.40	370.55	0.00	0.00
105.00		261.29	312.56	0.00	0.00
109.00		315.27	374.64	0.00	0.00
110.00		67.61	107.83	0.00	0.00
115.00		341.20	539.16	0.00	0.00
118.00	(21) attachments	6393.93	4905.00	880.57	0.00
119.00		68.73	102.81	0.00	0.00
	Totals:	**27,095.05**	**37,193.70**	**880.57**	**0.00**

Calculated Forces

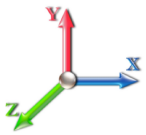
Structure:	CT13070-A-SBA	**Code:**	EIA/TIA-222-G	6/24/2020	
Site Name:	Waterbury 4, CT	**Exposure:**	C		
Height:	119.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 11	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 97 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	-37.15	-27.16	-0.87	-2392.2	-0.01	2392.29	3976.93	1988.46	8011.33	4011.62	0.00	0.000	0.000	0.606
5.00	-35.63	-26.81	-0.87	-2256.5	-0.01	2256.51	3920.48	1960.24	7723.84	3867.66	0.10	-0.187	0.000	0.593
10.00	-34.15	-26.47	-0.87	-2122.4	-0.01	2122.46	3862.67	1931.34	7438.74	3724.90	0.40	-0.375	0.000	0.579
15.00	-32.69	-26.12	-0.87	-1990.1	-0.01	1990.12	3803.51	1901.75	7156.21	3583.42	0.89	-0.564	0.000	0.564
20.00	-31.26	-25.76	-0.87	-1859.5	-0.01	1859.51	3742.99	1871.49	6876.43	3443.32	1.58	-0.753	0.000	0.549
25.00	-29.86	-25.37	-0.87	-1730.7	-0.01	1730.73	3681.11	1840.56	6599.58	3304.69	2.48	-0.943	0.000	0.532
30.00	-28.49	-24.97	-0.87	-1603.8	-0.01	1603.88	3617.88	1808.94	6325.84	3167.62	3.56	-1.132	-0.001	0.514
35.00	-27.15	-24.55	-0.87	-1479.0	-0.01	1479.05	3553.28	1776.64	6055.40	3032.20	4.85	-1.321	-0.001	0.496
40.00	-25.84	-24.13	-0.87	-1356.3	-0.01	1356.30	3487.33	1743.67	5788.43	2898.52	6.34	-1.508	-0.001	0.476
45.00	-24.57	-23.68	-0.87	-1235.6	-0.01	1235.66	3420.03	1710.01	5525.12	2766.66	8.02	-1.693	-0.001	0.454
48.25	-23.76	-23.39	-0.88	-1158.7	-0.01	1158.70	3375.55	1687.77	5356.01	2681.98	9.21	-1.814	-0.001	0.439
50.00	-23.04	-23.24	-0.88	-1117.7	-0.02	1117.77	3351.36	1675.68	5265.64	2636.73	9.89	-1.879	-0.001	0.431
53.25	-21.74	-22.92	-0.88	-1042.2	-0.02	1042.26	2647.50	1323.75	4165.57	2085.88	11.21	-1.997	-0.001	0.508
55.00	-21.34	-22.79	-0.88	-1002.1	-0.02	1002.16	2630.02	1315.01	4097.26	2051.68	11.95	-2.061	-0.001	0.497
60.00	-20.28	-22.34	-0.88	-888.23	-0.02	888.23	2579.17	1289.59	3903.72	1954.76	14.22	-2.257	-0.001	0.463
65.00	-19.24	-21.90	-0.88	-776.52	-0.02	776.52	2526.96	1263.48	3712.68	1859.10	16.69	-2.446	-0.002	0.426
70.00	-18.23	-21.45	-0.88	-667.04	-0.03	667.04	2473.39	1236.70	3524.34	1764.79	19.35	-2.625	-0.002	0.386
75.00	-17.26	-20.99	-0.88	-559.82	-0.03	559.82	2418.47	1209.23	3338.88	1671.92	22.19	-2.791	-0.002	0.342
80.00	-16.31	-20.54	-0.88	-454.85	-0.03	454.85	2362.18	1181.09	3156.47	1580.58	25.19	-2.943	-0.002	0.295
85.00	-15.40	-20.08	-0.88	-352.14	-0.04	352.14	2304.54	1152.27	2977.30	1490.86	28.35	-3.075	-0.003	0.243
87.00	-12.33	-14.64	-0.88	-311.98	-0.04	311.98	2281.10	1140.55	2906.58	1455.45	29.65	-3.123	-0.003	0.220
90.00	-11.87	-14.38	-0.88	-268.06	-0.04	268.06	2242.72	1121.36	2798.02	1401.09	31.63	-3.189	-0.003	0.197
95.00	-11.15	-13.93	-0.88	-196.18	-0.04	196.18	2163.84	1081.92	2603.70	1303.79	35.02	-3.283	-0.003	0.156
98.00	-10.73	-13.67	-0.88	-154.39	-0.04	154.39	2116.52	1058.26	2490.47	1247.09	37.10	-3.330	-0.003	0.129
99.00	-6.47	-8.06	-0.88	-140.72	-0.04	140.72	2100.74	1050.37	2453.28	1228.47	37.80	-3.344	-0.004	0.118
100.00	-6.25	-7.97	-0.88	-132.66	-0.04	132.66	2084.97	1042.48	2416.38	1209.99	38.50	-3.357	-0.004	0.113
101.75	-5.89	-7.81	-0.88	-118.71	-0.05	118.71	1611.41	805.70	1884.17	943.49	39.73	-3.379	-0.004	0.130
105.00	-5.59	-7.54	-0.88	-93.32	-0.05	93.32	1583.50	791.75	1805.91	904.30	42.05	-3.415	-0.004	0.107
109.00	-5.23	-7.20	-0.88	-63.18	-0.05	63.18	1548.36	774.18	1710.93	856.74	44.92	-3.457	-0.005	0.077
109.00	-5.23	-7.20	-0.88	-63.18	-0.05	63.18	933.38	466.69	986.46	590.00	44.92	-3.457	-0.005	0.113
110.00	-5.12	-7.13	-0.88	-55.98	-0.05	55.98	933.38	466.69	986.46	590.00	45.65	-3.465	-0.005	0.101
115.00	-4.60	-6.76	-0.88	-20.34	-0.05	20.34	933.38	466.69	986.46	590.00	49.29	-3.491	-0.005	0.040
118.00	-0.10	-0.07	0.00	-0.07	0.00	0.07	933.38	466.69	986.46	590.00	51.49	-3.496	-0.006	0.000
119.00	0.00	-0.07	0.00	0.00	0.00	0.00	933.38	466.69	986.46	590.00	52.22	-3.496	-0.006	0.000

Wind Loading - Shaft

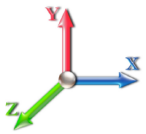
Structure:	CT13070-A-SBA	**Code:**	EIA/TIA-222-G	6/24/2020	
Site Name:	Waterbury 4, CT	**Exposure:**	C		
Height:	119.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 12	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 97 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	0.85	19.450	21.40	373.76	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	19.450	21.40	365.66	0.650	0.000	5.00	20.670	13.44	459.9	0.0	883.5
10.00		1.00	0.85	19.450	21.40	357.55	0.650	0.000	5.00	20.217	13.14	449.9	0.0	864.0
15.00		1.00	0.85	19.450	21.40	349.45	0.650	0.000	5.00	19.764	12.85	439.8	0.0	844.5
20.00		1.00	0.90	20.638	22.70	351.62	0.650	0.000	5.00	19.312	12.55	455.9	0.0	825.0
25.00		1.00	0.95	21.630	23.79	351.43	0.650	0.000	5.00	18.859	12.26	466.7	0.0	805.5
30.00		1.00	0.98	22.477	24.72	349.54	0.650	0.000	5.00	18.406	11.96	473.3	0.0	786.0
35.00		1.00	1.01	23.218	25.54	346.40	0.650	0.000	5.00	17.953	11.67	476.9	0.0	766.5
40.00		1.00	1.04	23.880	26.27	342.33	0.650	0.000	5.00	17.500	11.37	478.1	0.0	747.0
45.00		1.00	1.07	24.479	26.93	337.51	0.650	0.000	5.00	17.047	11.08	477.4	0.0	727.5
48.25	Bot - Section 2	1.00	1.09	24.841	27.33	334.05	0.650	0.000	3.25	10.838	7.04	308.0	0.0	462.4
50.00		1.00	1.09	25.029	27.53	332.09	0.650	0.000	1.75	5.849	3.80	167.5	0.0	453.9
53.25	Top - Section 1	1.00	1.11	25.363	27.90	328.29	0.650	0.000	3.25	10.715	6.96	310.9	0.0	831.3
55.00		1.00	1.12	25.536	28.09	331.58	0.650	0.000	1.75	5.691	3.70	166.2	0.0	202.6
60.00		1.00	1.14	26.008	28.61	325.26	0.650	0.000	5.00	15.953	10.37	474.6	0.0	567.9
65.00		1.00	1.16	26.450	29.09	318.57	0.650	0.000	5.00	15.500	10.07	469.0	0.0	551.6
70.00		1.00	1.17	26.866	29.55	311.54	0.650	0.000	5.00	15.047	9.78	462.5	0.0	535.4
75.00		1.00	1.19	27.259	29.98	304.22	0.650	0.000	5.00	14.594	9.49	455.1	0.0	519.1
80.00		1.00	1.21	27.632	30.39	296.64	0.650	0.000	5.00	14.141	9.19	447.0	0.0	502.9
85.00		1.00	1.22	27.987	30.79	288.82	0.650	0.000	5.00	13.688	8.90	438.3	0.0	486.6
87.00	Appurtenance(s)	1.00	1.23	28.124	30.94	285.64	0.650	0.000	2.00	5.349	3.48	172.1	0.0	190.1
90.00		1.00	1.24	28.325	31.16	280.79	0.650	0.000	3.00	7.887	5.13	255.6	0.0	280.3
95.00		1.00	1.25	28.650	31.51	272.56	0.650	0.000	5.00	12.783	8.31	419.0	0.0	454.1
98.00	Bot - Section 3	1.00	1.26	28.838	31.72	267.54	0.650	0.000	3.00	7.452	4.84	245.9	0.0	264.7
99.00	Appurtenance(s)	1.00	1.26	28.900	31.79	265.85	0.650	0.000	1.00	2.490	1.62	82.3	0.0	157.8
100.00		1.00	1.27	28.961	31.86	264.16	0.650	0.000	1.00	2.472	1.61	81.9	0.0	156.7
101.75	Top - Section 2	1.00	1.27	29.067	31.97	261.17	0.650	0.000	1.75	4.282	2.78	142.4	0.0	271.3
105.00		1.00	1.28	29.260	32.19	260.22	0.650	0.000	3.25	7.806	5.07	261.3	0.0	222.2
109.00	Top - Section 3	1.00	1.29	29.491	32.44	253.27	0.650	0.000	4.00	9.345	6.07	315.3	0.0	265.9
110.00		1.00	1.29	29.548	32.50	238.82	0.600	0.000	1.00	2.167	1.30	67.6	0.0	77.1
115.00		1.00	1.30	29.826	32.81	239.94	0.600	0.000	5.00	10.833	6.50	341.2	0.0	385.6
118.00	Appurtenance(s)	1.00	1.31	29.988	32.99	240.59	0.600	0.000	3.00	6.500	3.90	205.8	0.0	231.3
119.00		1.00	1.31	30.041	33.05	240.81	0.600	0.000	1.00	2.167	1.30	68.7	0.0	77.1
								Totals:	**119.00**			**10,535.9**		**15,397.5**

Discrete Appurtenance Forces

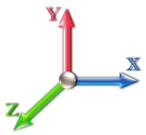
Structure:	CT13070-A-SBA	**Code:**	EIA/TIA-222-G	6/24/2020	
Site Name:	Waterbury 4, CT	**Exposure:**	C		
Height:	119.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 13	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 97 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	118.00	TD-RRH8x20-25	3	29.988	32.986	0.60	0.90	7.33	189.00	0.000	0.000	386.68	0.00	0.00
2	118.00	1900 MHz RRH	3	29.988	32.986	0.60	0.90	5.01	162.00	0.000	0.000	264.47	0.00	0.00
3	118.00	800 MHz RRH	6	29.988	32.986	0.60	0.90	9.01	286.20	0.000	0.000	475.47	0.00	0.00
4	118.00	VHLP2.5-11	2	29.988	32.986	1.00	1.00	16.86	86.40	1.583	0.000	889.84	880.57	0.00
5	118.00	AAHC	3	29.988	32.986	0.68	0.90	8.53	279.99	0.000	0.000	449.95	0.00	0.00
6	118.00	NNVV-65B-R4	3	29.988	32.986	0.67	0.90	24.52	228.69	0.000	0.000	1293.89	0.00	0.00
7	118.00	LP Platform w/ Handrail	1	29.988	32.986	1.00	1.00	46.00	2203.85	0.000	0.000	2427.80	0.00	0.00
8	99.00	HRK12 (Handrail Kit)	1	28.900	31.790	1.00	1.00	6.75	235.55	0.000	0.000	343.33	0.00	0.00
9	99.00	RRUS 4415 B25	3	28.900	31.790	0.50	0.75	2.47	124.20	0.000	0.000	125.75	0.00	0.00
10	99.00	APX16DWV-16DWV-S-E-	3	28.900	31.790	0.46	0.75	9.01	109.89	0.000	0.000	458.36	0.00	0.00
11	99.00	AIR 6449 B41	3	28.900	31.790	0.52	0.75	10.28	359.64	0.000	0.000	523.12	0.00	0.00
12	99.00	KRY 112 489/2	3	28.900	31.790	0.50	0.75	0.98	41.58	0.000	0.000	49.84	0.00	0.00
13	99.00	Air 32	4	28.900	31.790	0.65	0.75	16.99	475.92	0.000	0.000	864.22	0.00	0.00
14	99.00	4449 B71+ B85	3	28.900	31.790	0.50	0.75	2.49	189.00	0.000	0.000	126.52	0.00	0.00
15	99.00	Low Profile Platform	1	28.900	31.790	1.00	1.00	22.00	1350.00	0.000	0.000	1118.99	0.00	0.00
16	99.00	KRY 112 144/1	3	28.900	31.790	0.50	0.75	0.62	29.75	0.000	0.000	31.44	0.00	0.00
17	99.00	APXVAARR24_43-U-NA2	3	28.900	31.790	0.52	0.75	31.88	345.60	0.000	0.000	1621.42	0.00	0.00
18	87.00	SBNHH-1D65B	9	28.124	30.936	0.66	0.80	48.24	324.00	0.000	0.000	2387.57	0.00	0.00
19	87.00	Low Profile Platform	1	28.124	30.936	1.00	1.00	22.00	1350.00	0.000	0.000	1088.96	0.00	0.00
20	87.00	BXA-80063/4CF	3	28.124	30.936	0.65	0.90	9.15	26.73	0.000	0.000	452.92	0.00	0.00
21	87.00	RRH2X60-700	3	28.124	30.936	0.58	0.80	6.12	162.00	0.000	0.000	303.11	0.00	0.00
22	87.00	1900 MHz 4X45 RRH	3	28.124	30.936	0.79	0.80	6.42	160.65	0.000	0.000	317.75	0.00	0.00
23	87.00	RRH2X60-PCS	3	28.124	30.936	0.71	0.80	4.71	148.50	0.000	0.000	233.12	0.00	0.00
24	87.00	DB-T1-6Z-8AB-0Z	2	28.124	30.936	0.68	0.80	6.56	79.20	0.000	0.000	324.65	0.00	0.00
							Totals:		**8,948.34**			**16,559.15**		

Total Applied Force Summary

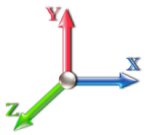
Structure:	CT13070-A-SBA		**Code:**	EIA/TIA-222-G	6/24/2020
Site Name:	Waterbury 4, CT		**Exposure:**	C	
Height:	119.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 14

TES Tower Engineering Solutions

Load Case: 0.9D + 1.6W 97 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		459.94	1070.61	0.00	0.00
10.00		449.86	1051.10	0.00	0.00
15.00		439.78	1031.59	0.00	0.00
20.00		455.93	1012.09	0.00	0.00
25.00		466.66	992.58	0.00	0.00
30.00		473.27	973.07	0.00	0.00
35.00		476.85	953.56	0.00	0.00
40.00		478.08	934.05	0.00	0.00
45.00		477.40	914.54	0.00	0.00
48.25		307.99	583.99	0.00	0.00
50.00		167.47	519.34	0.00	0.00
53.25		310.90	952.87	0.00	0.00
55.00		166.24	268.08	0.00	0.00
60.00		474.65	754.97	0.00	0.00
65.00		469.01	738.71	0.00	0.00
70.00		462.46	722.46	0.00	0.00
75.00		455.11	706.20	0.00	0.00
80.00		447.02	689.94	0.00	0.00
85.00		438.26	673.68	0.00	0.00
87.00	(24) attachments	5280.16	2516.00	0.00	0.00
90.00		255.57	336.02	0.00	0.00
95.00		418.96	547.03	0.00	0.00
98.00		245.85	320.41	0.00	0.00
99.00	(27) attachments	5345.30	3437.54	0.00	0.00
100.00		81.90	160.42	0.00	0.00
101.75		142.40	277.91	0.00	0.00
105.00		261.29	234.42	0.00	0.00
109.00		315.27	280.98	0.00	0.00
110.00		67.61	80.87	0.00	0.00
115.00		341.20	404.37	0.00	0.00
118.00	(21) attachments	6393.93	3678.75	880.57	0.00
119.00		68.73	77.11	0.00	0.00
	Totals:	**27,095.05**	**27,895.28**	**880.57**	**0.00**

Calculated Forces

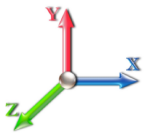
Structure:	CT13070-A-SBA	**Code:**	EIA/TIA-222-G	6/24/2020	
Site Name:	Waterbury 4, CT	**Exposure:**	C		
Height:	119.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 15	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 97 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	-27.85	-27.14	-0.87	-2373.9	-0.01	2373.94	3976.93	1988.46	8011.33	4011.62	0.00	0.000	0.000	0.599
5.00	-26.69	-26.77	-0.87	-2238.2	-0.01	2238.24	3920.48	1960.24	7723.84	3867.66	0.10	-0.185	0.000	0.586
10.00	-25.56	-26.39	-0.87	-2104.4	-0.01	2104.41	3862.67	1931.34	7438.74	3724.90	0.39	-0.372	0.000	0.572
15.00	-24.45	-26.03	-0.87	-1972.4	-0.01	1972.44	3803.51	1901.75	7156.21	3583.42	0.88	-0.559	0.000	0.557
20.00	-23.35	-25.64	-0.87	-1842.3	-0.01	1842.31	3742.99	1871.49	6876.43	3443.32	1.57	-0.747	0.000	0.541
25.00	-22.29	-25.23	-0.87	-1714.1	-0.01	1714.13	3681.11	1840.56	6599.58	3304.69	2.45	-0.935	0.000	0.525
30.00	-21.24	-24.81	-0.87	-1587.9	-0.01	1587.99	3617.88	1808.94	6325.84	3167.62	3.53	-1.122	-0.001	0.507
35.00	-20.22	-24.38	-0.87	-1463.9	-0.01	1463.96	3553.28	1776.64	6055.40	3032.20	4.81	-1.309	-0.001	0.489
40.00	-19.22	-23.94	-0.87	-1342.0	-0.01	1342.08	3487.33	1743.67	5788.43	2898.52	6.28	-1.494	-0.001	0.469
45.00	-18.26	-23.48	-0.88	-1222.4	-0.01	1222.40	3420.03	1710.01	5525.12	2766.66	7.95	-1.678	-0.001	0.447
48.25	-17.65	-23.18	-0.88	-1146.0	-0.01	1146.08	3375.55	1687.77	5356.01	2681.98	9.13	-1.797	-0.001	0.433
50.00	-17.10	-23.03	-0.88	-1105.5	-0.01	1105.51	3351.36	1675.68	5265.64	2636.73	9.80	-1.861	-0.001	0.425
53.25	-16.12	-22.71	-0.88	-1030.6	-0.02	1030.67	2647.50	1323.75	4165.57	2085.88	11.11	-1.978	-0.001	0.501
55.00	-15.81	-22.57	-0.88	-990.93	-0.02	990.93	2630.02	1315.01	4097.26	2051.68	11.85	-2.041	-0.001	0.489
60.00	-14.99	-22.12	-0.88	-878.07	-0.02	878.07	2579.17	1289.59	3903.72	1954.76	14.09	-2.235	-0.001	0.455
65.00	-14.21	-21.67	-0.88	-767.48	-0.02	767.48	2526.96	1263.48	3712.68	1859.10	16.53	-2.422	-0.002	0.419
70.00	-13.44	-21.21	-0.88	-659.16	-0.02	659.16	2473.39	1236.70	3524.34	1764.79	19.17	-2.599	-0.002	0.379
75.00	-12.70	-20.76	-0.88	-553.10	-0.03	553.10	2418.47	1209.23	3338.88	1671.92	21.98	-2.763	-0.002	0.336
80.00	-11.98	-20.31	-0.88	-449.31	-0.03	449.31	2362.18	1181.09	3156.47	1580.58	24.95	-2.912	-0.002	0.290
85.00	-11.30	-19.85	-0.88	-347.77	-0.03	347.77	2304.54	1152.27	2977.30	1490.86	28.07	-3.043	-0.003	0.238
87.00	-9.06	-14.45	-0.88	-308.07	-0.04	308.07	2281.10	1140.55	2906.58	1455.45	29.36	-3.091	-0.003	0.216
90.00	-8.72	-14.19	-0.88	-264.71	-0.04	264.71	2242.72	1121.36	2798.02	1401.09	31.32	-3.156	-0.003	0.193
95.00	-8.18	-13.75	-0.88	-193.75	-0.04	193.75	2163.84	1081.92	2603.70	1303.79	34.68	-3.248	-0.003	0.153
98.00	-7.87	-13.49	-0.88	-152.49	-0.04	152.49	2116.52	1058.26	2490.47	1247.09	36.73	-3.295	-0.003	0.126
99.00	-4.74	-7.96	-0.88	-139.00	-0.04	139.00	2100.74	1050.37	2453.28	1228.47	37.43	-3.309	-0.004	0.115
100.00	-4.58	-7.87	-0.88	-131.04	-0.04	131.04	2084.97	1042.48	2416.38	1209.99	38.12	-3.322	-0.004	0.111
101.75	-4.31	-7.71	-0.88	-117.27	-0.04	117.27	1611.41	805.70	1884.17	943.49	39.34	-3.344	-0.004	0.127
105.00	-4.09	-7.44	-0.88	-92.19	-0.05	92.19	1583.50	791.75	1805.91	904.30	41.63	-3.379	-0.004	0.105
109.00	-3.82	-7.11	-0.88	-62.43	-0.05	62.43	1548.36	774.18	1710.93	856.74	44.48	-3.420	-0.005	0.075
109.00	-3.82	-7.11	-0.88	-62.43	-0.05	62.43	933.38	466.69	986.46	590.00	44.48	-3.420	-0.005	0.110
110.00	-3.74	-7.04	-0.88	-55.31	-0.05	55.31	933.38	466.69	986.46	590.00	45.20	-3.429	-0.005	0.098
115.00	-3.36	-6.68	-0.88	-20.11	-0.05	20.11	933.38	466.69	986.46	590.00	48.80	-3.454	-0.005	0.038
118.00	-0.07	-0.07	0.00	-0.07	0.00	0.07	933.38	466.69	986.46	590.00	50.97	-3.459	-0.006	0.000
119.00	0.00	-0.07	0.00	0.00	0.00	0.00	933.38	466.69	986.46	590.00	51.70	-3.459	-0.006	0.000

Wind Loading - Shaft

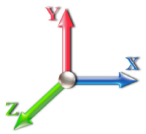
Structure:	CT13070-A-SBA	**Code:**	EIA/TIA-222-G	6/24/2020	
Site Name:	Waterbury 4, CT	**Exposure:**	C		
Height:	119.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 16	

Tower Engineering Solutions

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 20

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	0.85	5.168	5.68	0.00	1.200	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	5.168	5.68	0.00	1.200	1.242	5.00	21.705	26.05	148.1	381.7	1559.8
10.00		1.00	0.85	5.168	5.68	0.00	1.200	1.331	5.00	21.327	25.59	145.5	401.0	1553.0
15.00		1.00	0.85	5.168	5.68	0.00	1.200	1.386	5.00	20.920	25.10	142.7	408.8	1534.9
20.00		1.00	0.90	5.483	6.03	0.00	1.200	1.427	5.00	20.500	24.60	148.4	411.6	1511.7
25.00		1.00	0.95	5.747	6.32	0.00	1.200	1.459	5.00	20.074	24.09	152.3	411.5	1485.5
30.00		1.00	0.98	5.972	6.57	0.00	1.200	1.486	5.00	19.644	23.57	154.9	409.5	1457.5
35.00		1.00	1.01	6.169	6.79	0.00	1.200	1.509	5.00	19.210	23.05	156.4	406.0	1428.0
40.00		1.00	1.04	6.345	6.98	0.00	1.200	1.529	5.00	18.774	22.53	157.2	401.5	1397.5
45.00		1.00	1.07	6.504	7.15	0.00	1.200	1.547	5.00	18.336	22.00	157.4	396.2	1366.2
48.25	Bot - Section 2	1.00	1.09	6.600	7.26	0.00	1.200	1.558	3.25	11.682	14.02	101.8	255.0	871.6
50.00		1.00	1.09	6.650	7.32	0.00	1.200	1.564	1.75	6.305	7.57	55.3	138.7	743.8
53.25	Top - Section 1	1.00	1.11	6.739	7.41	0.00	1.200	1.574	3.25	11.568	13.88	102.9	254.8	1363.2
55.00		1.00	1.12	6.785	7.46	0.00	1.200	1.579	1.75	6.151	7.38	55.1	136.4	406.5
60.00		1.00	1.14	6.910	7.60	0.00	1.200	1.592	5.00	17.280	20.74	157.6	382.6	1139.8
65.00		1.00	1.16	7.028	7.73	0.00	1.200	1.605	5.00	16.838	20.21	156.2	375.2	1110.7
70.00		1.00	1.17	7.138	7.85	0.00	1.200	1.617	5.00	16.395	19.67	154.5	367.4	1081.2
75.00		1.00	1.19	7.243	7.97	0.00	1.200	1.628	5.00	15.951	19.14	152.5	359.2	1051.4
80.00		1.00	1.21	7.342	8.08	0.00	1.200	1.639	5.00	15.507	18.61	150.3	350.7	1021.2
85.00		1.00	1.22	7.436	8.18	0.00	1.200	1.649	5.00	15.062	18.07	147.8	342.0	990.9
87.00	Appurtenance(s)	1.00	1.23	7.473	8.22	0.00	1.200	1.653	2.00	5.899	7.08	58.2	135.4	388.9
90.00		1.00	1.24	7.526	8.28	0.00	1.200	1.658	3.00	8.716	10.46	86.6	199.8	573.5
95.00		1.00	1.25	7.612	8.37	0.00	1.200	1.667	5.00	14.172	17.01	142.4	323.9	929.4
98.00	Bot - Section 3	1.00	1.26	7.662	8.43	0.00	1.200	1.672	3.00	8.288	9.95	83.8	191.0	543.9
99.00	Appurtenance(s)	1.00	1.26	7.679	8.45	0.00	1.200	1.674	1.00	2.769	3.32	28.1	64.3	274.8
100.00		1.00	1.27	7.695	8.46	0.00	1.200	1.676	1.00	2.751	3.30	27.9	63.9	272.8
101.75	Top - Section 2	1.00	1.27	7.723	8.50	0.00	1.200	1.679	1.75	4.772	5.73	48.6	110.7	472.5
105.00		1.00	1.28	7.774	8.55	0.00	1.200	1.684	3.25	8.718	10.46	89.5	201.6	497.9
109.00	Top - Section 3	1.00	1.29	7.836	8.62	0.00	1.200	1.690	4.00	10.472	12.57	108.3	242.0	596.5
110.00		1.00	1.29	7.851	8.64	0.00	1.200	1.692	1.00	2.449	2.94	25.4	57.2	160.1
115.00		1.00	1.30	7.925	8.72	0.00	1.200	1.699	5.00	12.250	14.70	128.1	287.6	801.6
118.00	Appurtenance(s)	1.00	1.31	7.968	8.76	0.00	1.200	1.704	3.00	7.352	8.82	77.3	173.0	481.4
119.00		1.00	1.31	7.982	8.78	0.00	1.200	1.705	1.00	2.451	2.94	25.8	57.7	160.5
								Totals:	**119.00**			**3,527.1**		**29,228.1**

Discrete Appurtenance Forces

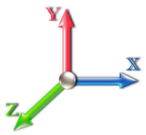
Structure:	CT13070-A-SBA	**Code:**	EIA/TIA-222-G	6/24/2020	
Site Name:	Waterbury 4, CT	**Exposure:**	C		
Height:	119.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 17	

Tower Engineering Solutions

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 20

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	118.00	TD-RRH8x20-25	3	7.968	8.765	0.60	0.90	8.76	573.93	0.000	0.000	76.78	0.00	0.00
2	118.00	1900 MHz RRH	3	7.968	8.765	0.60	0.90	7.25	388.67	0.000	0.000	63.55	0.00	0.00
3	118.00	800 MHz RRH	6	7.968	8.765	0.60	0.90	13.05	688.24	0.000	0.000	114.37	0.00	0.00
4	118.00	VHLP2.5-11	2	7.968	8.765	1.00	1.00	20.19	357.23	1.583	0.000	176.98	280.21	0.00
5	118.00	AAHC	3	7.968	8.765	0.68	0.90	10.13	607.67	0.000	0.000	88.78	0.00	0.00
6	118.00	NNVV-65B-R4	3	7.968	8.765	0.67	0.90	27.36	1044.67	0.000	0.000	239.76	0.00	0.00
7	118.00	LP Platform w/ Handrail	1	7.968	8.765	1.00	1.00	79.23	4490.52	0.000	0.000	694.43	0.00	0.00
8	99.00	HRK12 (Handrail Kit)	1	7.679	8.447	1.00	1.00	13.08	873.74	0.000	0.000	110.47	0.00	0.00
9	99.00	RRUS 4415 B25	3	7.679	8.447	0.50	0.75	3.22	255.69	0.000	0.000	27.18	0.00	0.00
10	99.00	APX16DWV-16DWV-S-E-	3	7.679	8.447	0.46	0.75	10.50	537.10	0.000	0.000	88.68	0.00	0.00
11	99.00	AIR 6449 B41	3	7.679	8.447	0.52	0.75	11.90	948.52	0.000	0.000	100.50	0.00	0.00
12	99.00	KRY 112 489/2	3	7.679	8.447	0.50	0.75	1.87	94.57	0.000	0.000	15.75	0.00	0.00
13	99.00	Air 32	4	7.679	8.447	0.65	0.75	19.94	1336.77	0.000	0.000	168.46	0.00	0.00
14	99.00	4449 B71+ B85	3	7.679	8.447	0.50	0.75	3.26	446.36	0.000	0.000	27.55	0.00	0.00
15	99.00	Low Profile Platform	1	7.679	8.447	1.00	1.00	38.94	2755.64	0.000	0.000	328.93	0.00	0.00
16	99.00	KRY 112 144/1	3	7.679	8.447	0.50	0.75	1.31	64.76	0.000	0.000	11.02	0.00	0.00
17	99.00	APXVAARR24_43-U-NA2	3	7.679	8.447	0.52	0.75	34.74	1657.35	0.000	0.000	293.47	0.00	0.00
18	87.00	SBNHH-1D65B	9	7.473	8.220	0.66	0.80	55.62	2145.72	0.000	0.000	457.19	0.00	0.00
19	87.00	Low Profile Platform	1	7.473	8.220	1.00	1.00	38.73	2739.52	0.000	0.000	318.32	0.00	0.00
20	87.00	BXA-80063/4CF	3	7.473	8.220	0.65	0.90	12.67	245.20	0.000	0.000	104.11	0.00	0.00
21	87.00	RRH2X60-700	3	7.473	8.220	0.59	0.80	7.55	403.59	0.000	0.000	62.09	0.00	0.00
22	87.00	1900 MHz 4X45 RRH	3	7.473	8.220	0.79	0.80	9.25	385.10	0.000	0.000	76.07	0.00	0.00
23	87.00	RRH2X60-PCS	3	7.473	8.220	0.72	0.80	6.03	435.15	0.000	0.000	49.54	0.00	0.00
24	87.00	DB-T1-6Z-8AB-0Z	2	7.473	8.220	0.69	0.80	7.72	375.25	0.000	0.000	63.47	0.00	0.00
							Totals:		**23,850.94**			**3,757.44**		

Total Applied Force Summary

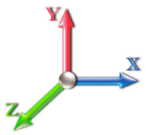
Structure:	CT13070-A-SBA		**Code:**	EIA/TIA-222-G	6/24/2020
Site Name:	Waterbury 4, CT		**Exposure:**	C	
Height:	119.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 18

TES Tower Engineering Solutions

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 20

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		148.07	1809.17	0.00	0.00
10.00		145.49	1802.44	0.00	0.00
15.00		142.71	1784.29	0.00	0.00
20.00		148.39	1761.09	0.00	0.00
25.00		152.29	1734.96	0.00	0.00
30.00		154.86	1706.90	0.00	0.00
35.00		156.43	1677.45	0.00	0.00
40.00		157.24	1646.93	0.00	0.00
45.00		157.43	1615.58	0.00	0.00
48.25		101.78	1033.67	0.00	0.00
50.00		55.35	831.13	0.00	0.00
53.25		102.90	1525.30	0.00	0.00
55.00		55.09	493.83	0.00	0.00
60.00		157.62	1389.26	0.00	0.00
65.00		156.20	1360.13	0.00	0.00
70.00		154.48	1330.63	0.00	0.00
75.00		152.50	1300.79	0.00	0.00
80.00		150.28	1270.67	0.00	0.00
85.00		147.85	1240.28	0.00	0.00
87.00	(24) attachments	1188.98	7218.15	0.00	0.00
90.00		86.59	647.87	0.00	0.00
95.00		142.40	1053.28	0.00	0.00
98.00		83.83	618.20	0.00	0.00
99.00	(27) attachments	1200.07	9270.02	0.00	0.00
100.00		27.95	277.83	0.00	0.00
101.75		48.65	481.29	0.00	0.00
105.00		89.47	514.19	0.00	0.00
109.00		108.31	616.59	0.00	0.00
110.00		25.38	165.07	0.00	0.00
115.00		128.14	826.72	0.00	0.00
118.00	(21) attachments	1531.97	8647.42	280.21	0.00
119.00		25.82	160.53	0.00	0.00
	Totals:	**7,284.51**	**57,811.67**	**280.21**	**0.00**

Calculated Forces

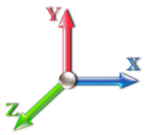
Structure:	CT13070-A-SBA	**Code:**	EIA/TIA-222-G	6/24/2020	
Site Name:	Waterbury 4, CT	**Exposure:**	C		
Height:	119.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 19	

Tower Engineering Solutions

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 20

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	-57.81	-7.31	-0.28	-631.44	0.00	631.44	3976.93	1988.46	8011.33	4011.62	0.00	0.000	0.000	0.172
5.00	-55.99	-7.21	-0.28	-594.90	0.00	594.90	3920.48	1960.24	7723.84	3867.66	0.03	-0.049	0.000	0.168
10.00	-54.18	-7.11	-0.28	-558.86	0.00	558.86	3862.67	1931.34	7438.74	3724.90	0.10	-0.099	0.000	0.164
15.00	-52.39	-7.01	-0.28	-523.32	0.00	523.32	3803.51	1901.75	7156.21	3583.42	0.24	-0.148	0.000	0.160
20.00	-50.63	-6.90	-0.28	-488.29	0.00	488.29	3742.99	1871.49	6876.43	3443.32	0.42	-0.198	0.000	0.155
25.00	-48.89	-6.78	-0.28	-453.81	0.00	453.81	3681.11	1840.56	6599.58	3304.69	0.65	-0.248	0.000	0.151
30.00	-47.18	-6.66	-0.28	-419.91	0.00	419.91	3617.88	1808.94	6325.84	3167.62	0.94	-0.298	0.000	0.146
35.00	-45.49	-6.53	-0.28	-386.62	0.00	386.62	3553.28	1776.64	6055.40	3032.20	1.28	-0.347	0.000	0.140
40.00	-43.84	-6.40	-0.28	-353.97	0.00	353.97	3487.33	1743.67	5788.43	2898.52	1.67	-0.396	0.000	0.135
45.00	-42.22	-6.26	-0.28	-321.97	0.00	321.97	3420.03	1710.01	5525.12	2766.66	2.11	-0.444	0.000	0.129
48.25	-41.19	-6.17	-0.28	-301.62	0.00	301.62	3375.55	1687.77	5356.01	2681.98	2.42	-0.476	0.000	0.125
50.00	-40.36	-6.12	-0.28	-290.83	0.00	290.83	3351.36	1675.68	5265.64	2636.73	2.60	-0.493	0.000	0.122
53.25	-38.83	-6.02	-0.28	-270.94	0.00	270.94	2647.50	1323.75	4165.57	2085.88	2.95	-0.523	0.000	0.145
55.00	-38.33	-5.98	-0.28	-260.40	0.00	260.40	2630.02	1315.01	4097.26	2051.68	3.14	-0.540	0.000	0.142
60.00	-36.94	-5.85	-0.28	-230.48	0.00	230.48	2579.17	1289.59	3903.72	1954.76	3.73	-0.591	0.000	0.132
65.00	-35.58	-5.70	-0.28	-201.25	0.00	201.25	2526.96	1263.48	3712.68	1859.10	4.38	-0.640	0.000	0.122
70.00	-34.24	-5.56	-0.28	-172.73	0.00	172.73	2473.39	1236.70	3524.34	1764.79	5.08	-0.686	-0.001	0.112
75.00	-32.94	-5.42	-0.28	-144.92	0.00	144.92	2418.47	1209.23	3338.88	1671.92	5.82	-0.729	-0.001	0.100
80.00	-31.67	-5.27	-0.28	-117.84	0.00	117.84	2362.18	1181.09	3156.47	1580.58	6.60	-0.768	-0.001	0.088
85.00	-30.43	-5.12	-0.28	-91.49	0.00	91.49	2304.54	1152.27	2977.30	1490.86	7.43	-0.803	-0.001	0.075
87.00	-23.23	-3.83	-0.28	-81.26	0.00	81.26	2281.10	1140.55	2906.58	1455.45	7.77	-0.815	-0.001	0.066
90.00	-22.58	-3.74	-0.28	-69.76	0.00	69.76	2242.72	1121.36	2798.02	1401.09	8.28	-0.832	-0.001	0.060
95.00	-21.53	-3.59	-0.28	-51.04	0.00	51.04	2163.84	1081.92	2603.70	1303.79	9.17	-0.857	-0.001	0.049
98.00	-20.91	-3.50	-0.28	-40.26	0.00	40.26	2116.52	1058.26	2490.47	1247.09	9.71	-0.869	-0.001	0.042
99.00	-11.66	-2.16	-0.28	-36.75	0.00	36.75	2100.74	1050.37	2453.28	1228.47	9.90	-0.873	-0.001	0.035
100.00	-11.38	-2.13	-0.28	-34.59	0.00	34.59	2084.97	1042.48	2416.38	1209.99	10.08	-0.876	-0.001	0.034
101.75	-10.90	-2.08	-0.28	-30.86	0.00	30.86	1611.41	805.70	1884.17	943.49	10.40	-0.882	-0.001	0.039
105.00	-10.39	-1.98	-0.28	-24.11	0.00	24.11	1583.50	791.75	1805.91	904.30	11.00	-0.891	-0.001	0.033
109.00	-9.77	-1.87	-0.28	-16.18	0.00	16.18	1548.36	774.18	1710.93	856.74	11.76	-0.902	-0.001	0.025
109.00	-9.77	-1.87	-0.28	-16.18	0.00	16.18	933.38	466.69	986.46	590.00	11.76	-0.902	-0.001	0.038
110.00	-9.61	-1.84	-0.28	-14.31	0.00	14.31	933.38	466.69	986.46	590.00	11.95	-0.904	-0.001	0.035
115.00	-8.78	-1.70	-0.28	-5.12	0.00	5.12	933.38	466.69	986.46	590.00	12.90	-0.911	-0.002	0.018
118.00	-0.16	-0.03	0.00	-0.03	0.00	0.03	933.38	466.69	986.46	590.00	13.47	-0.912	-0.002	0.000
119.00	0.00	-0.03	0.00	0.00	0.00	0.00	933.38	466.69	986.46	590.00	13.66	-0.912	-0.002	0.000

Seismic Segment Forces (Factored)

Structure:	CT13070-A-SBA	**Code:**	EIA/TIA-222-G	6/24/2020	
Site Name:	Waterbury 4, CT	**Exposure:**	C		
Height:	119.00 (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 + 1.0E							**Iterations**	19
Gust Response Factor	1.10				**Sds**	0.20		**Ss**	0.19
Dead Load Factor	1.20	**Seismic Load Factor**		1.00	**Sd1**	0.10		**S1**	0.06
Wind Load Factor	0.00	**Structure Frequency (f1)**		0.45	**SA**	0.05	**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		981.72	0.00	0.04	0.02	18.80	
10.00		960.04	0.01	0.06	0.03	26.02	
15.00		938.37	0.03	0.07	0.04	28.74	
20.00		916.69	0.05	0.07	0.04	29.69	
25.00		895.01	0.08	0.07	0.04	30.07	
30.00		873.34	0.12	0.07	0.03	30.30	
35.00		851.66	0.16	0.07	0.03	30.28	
40.00		829.99	0.21	0.06	0.02	29.56	
45.00		808.31	0.27	0.05	0.01	27.44	
48.25	Bot - Section 2	513.78	0.31	0.04	0.01	16.13	
50.00		504.30	0.33	0.04	0.01	14.84	
53.25	Top - Section 1	923.64	0.38	0.02	0.01	22.62	
55.00		225.12	0.40	0.02	0.01	4.76	
60.00		631.00	0.48	-0.01	0.01	5.70	
65.00		612.94	0.56	-0.04	0.01	-3.18	
70.00		594.88	0.65	-0.07	0.02	-10.90	
75.00		576.81	0.75	-0.10	0.04	-15.49	
80.00		558.75	0.85	-0.12	0.07	-15.84	
85.00		540.69	0.96	-0.12	0.11	-11.70	
87.00	Appurtenance(s)	2712.4	1.01	-0.11	0.14	-44.91	
90.00		311.41	1.08	-0.08	0.18	-1.98	
95.00		504.56	1.20	0.01	0.26	8.87	
98.00	Bot - Section 3	294.07	1.28	0.10	0.32	10.61	
99.00	Appurtenance(s)	3798.8	1.31	0.13	0.34	163.23	
100.00		174.06	1.33	0.17	0.37	8.74	
101.75	Top - Section 2	301.47	1.38	0.25	0.41	19.20	
105.00		246.88	1.47	0.43	0.51	22.62	
109.00	Top - Section 3	295.47	1.59	0.73	0.65	38.77	
110.00		85.68	1.61	0.83	0.69	12.17	
115.00		428.39	1.77	1.38	0.92	86.35	
118.00	Appurtenance(s)	4074.9	1.86	1.82	1.08	985.32	
119.00		85.68	1.89	1.98	1.14	21.93	
	Totals:	**27,050.9**				**1,588.8**	**Total Wind:** **27,095.1**

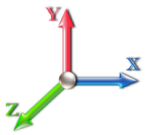
Seismic Base Shear is Less Than 50% of Wind Force - An Analysis is NOT Required

Calculated Forces

Structure:	CT13070-A-SBA	**Code:**	EIA/TIA-222-G	6/24/2020	
Site Name:	Waterbury 4, CT	**Exposure:**	C		
Height:	119.00 (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	

Tower Engineering Solutions

Load Case:	1.2D + 1.0E							**Iterations**	19
Gust Response Factor	1.10				**Sds**	0.20		**Ss**	0.19
Dead Load Factor	1.20	**Seismic Load Factor**	1.00		**Sd1**	0.10		**S1**	0.06
Wind Load Factor	0.00	**Structure Frequency (f1)**	0.45		**SA**	0.05	**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	-37.19	-1.70	0.00	-173.05	0.00	173.05	3976.93	1988.46	8011.33	4011.62		0.00	0.00	0.052
5.00	-35.77	-1.69	0.00	-164.57	0.00	164.57	3920.48	1960.24	7723.84	3867.66		0.01	-0.01	0.052
10.00	-34.36	-1.67	0.00	-156.14	0.00	156.14	3862.67	1931.34	7438.74	3724.90		0.03	-0.03	0.051
15.00	-32.99	-1.65	0.00	-147.80	0.00	147.80	3803.51	1901.75	7156.21	3583.42		0.06	-0.04	0.050
20.00	-31.64	-1.62	0.00	-139.57	0.00	139.57	3742.99	1871.49	6876.43	3443.32		0.12	-0.06	0.049
25.00	-30.31	-1.60	0.00	-131.46	0.00	131.46	3681.11	1840.56	6599.58	3304.69		0.18	-0.07	0.048
30.00	-29.02	-1.57	0.00	-123.46	0.00	123.46	3617.88	1808.94	6325.84	3167.62		0.26	-0.08	0.047
35.00	-27.74	-1.55	0.00	-115.59	0.00	115.59	3553.28	1776.64	6055.40	3032.20		0.36	-0.10	0.046
40.00	-26.50	-1.52	0.00	-107.85	0.00	107.85	3487.33	1743.67	5788.43	2898.52		0.47	-0.11	0.045
45.00	-25.28	-1.50	0.00	-100.22	0.00	100.22	3420.03	1710.01	5525.12	2766.66		0.60	-0.13	0.044
48.25	-24.50	-1.49	0.00	-95.35	0.00	95.35	3375.55	1687.77	5356.01	2681.98		0.69	-0.14	0.043
50.00	-23.81	-1.47	0.00	-92.75	0.00	92.75	3351.36	1675.68	5265.64	2636.73		0.74	-0.14	0.042
53.25	-22.54	-1.45	0.00	-87.97	0.00	87.97	2647.50	1323.75	4165.57	2085.88		0.84	-0.15	0.051
55.00	-22.18	-1.45	0.00	-85.43	0.00	85.43	2630.02	1315.01	4097.26	2051.68		0.90	-0.16	0.050
60.00	-21.17	-1.45	0.00	-78.20	0.00	78.20	2579.17	1289.59	3903.72	1954.76		1.07	-0.18	0.048
65.00	-20.19	-1.45	0.00	-70.97	0.00	70.97	2526.96	1263.48	3712.68	1859.10		1.27	-0.19	0.046
70.00	-19.22	-1.45	0.00	-63.73	0.00	63.73	2473.39	1236.70	3524.34	1764.79		1.48	-0.21	0.044
75.00	-18.28	-1.45	0.00	-56.48	0.00	56.48	2418.47	1209.23	3338.88	1671.92		1.71	-0.23	0.041
80.00	-17.36	-1.45	0.00	-49.22	0.00	49.22	2362.18	1181.09	3156.47	1580.58		1.95	-0.24	0.038
85.00	-16.46	-1.45	0.00	-41.96	0.00	41.96	2304.54	1152.27	2977.30	1490.86		2.21	-0.26	0.035
87.00	-13.11	-1.44	0.00	-39.06	0.00	39.06	2281.10	1140.55	2906.58	1455.45		2.32	-0.26	0.033
90.00	-12.66	-1.44	0.00	-34.75	0.00	34.75	2242.72	1121.36	2798.02	1401.09		2.49	-0.27	0.030
95.00	-11.93	-1.43	0.00	-27.55	0.00	27.55	2163.84	1081.92	2603.70	1303.79		2.78	-0.28	0.027
98.00	-11.50	-1.42	0.00	-23.27	0.00	23.27	2116.52	1058.26	2490.47	1247.09		2.96	-0.29	0.024
99.00	-6.92	-1.23	0.00	-21.85	0.00	21.85	2100.74	1050.37	2453.28	1228.47		3.02	-0.29	0.021
100.00	-6.71	-1.22	0.00	-20.62	0.00	20.62	2084.97	1042.48	2416.38	1209.99		3.08	-0.29	0.020
101.75	-6.34	-1.20	0.00	-18.49	0.00	18.49	1611.41	805.70	1884.17	943.49		3.19	-0.30	0.024
105.00	-6.02	-1.18	0.00	-14.59	0.00	14.59	1583.50	791.75	1805.91	904.30		3.40	-0.30	0.020
109.00	-5.65	-1.14	0.00	-9.88	0.00	9.88	1548.36	774.18	1710.93	856.74		3.65	-0.31	0.015
109.00	-5.65	-1.14	0.00	-9.88	0.00	9.88	933.38	466.69	986.46	590.00		3.65	-0.31	0.023
110.00	-5.54	-1.12	0.00	-8.75	0.00	8.75	933.38	466.69	986.46	590.00		3.72	-0.31	0.021
115.00	-5.00	-1.03	0.00	-3.13	0.00	3.13	933.38	466.69	986.46	590.00		4.05	-0.32	0.011
118.00	-0.10	-0.02	0.00	-0.02	0.00	0.02	933.38	466.69	986.46	590.00		4.25	-0.32	0.000
119.00	0.00	-0.02	0.00	0.00	0.00	0.00	933.38	466.69	986.46	590.00		4.31	-0.32	0.000

Seismic Segment Forces (Factored)

Structure:	CT13070-A-SBA		**Code:**	EIA/TIA-222-G	6/24/2020
Site Name:	Waterbury 4, CT		**Exposure:**	C	
Height:	119.00 (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:	0.9D + 1.0E							**Iterations**	19
Gust Response Factor	1.10				**Sds**	0.20		**Ss**	0.19
Dead Load Factor	0.90	**Seismic Load Factor**	1.00		**Sd1**	0.10		**S1**	0.06
Wind Load Factor	0.00	**Structure Frequency (f1)**	0.45		**SA**	0.05	**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		981.72	0.00	0.04	0.02	18.80	
10.00		960.04	0.01	0.06	0.03	26.02	
15.00		938.37	0.03	0.07	0.04	28.74	
20.00		916.69	0.05	0.07	0.04	29.69	
25.00		895.01	0.08	0.07	0.04	30.07	
30.00		873.34	0.12	0.07	0.03	30.30	
35.00		851.66	0.16	0.07	0.03	30.28	
40.00		829.99	0.21	0.06	0.02	29.56	
45.00		808.31	0.27	0.05	0.01	27.44	
48.25	Bot - Section 2	513.78	0.31	0.04	0.01	16.13	
50.00		504.30	0.33	0.04	0.01	14.84	
53.25	Top - Section 1	923.64	0.38	0.02	0.01	22.62	
55.00		225.12	0.40	0.02	0.01	4.76	
60.00		631.00	0.48	-0.01	0.01	5.70	
65.00		612.94	0.56	-0.04	0.01	-3.18	
70.00		594.88	0.65	-0.07	0.02	-10.90	
75.00		576.81	0.75	-0.10	0.04	-15.49	
80.00		558.75	0.85	-0.12	0.07	-15.84	
85.00		540.69	0.96	-0.12	0.11	-11.70	
87.00	Appurtenance(s)	2712.4	1.01	-0.11	0.14	-44.91	
90.00		311.41	1.08	-0.08	0.18	-1.98	
95.00		504.56	1.20	0.01	0.26	8.87	
98.00	Bot - Section 3	294.07	1.28	0.10	0.32	10.61	
99.00	Appurtenance(s)	3798.8	1.31	0.13	0.34	163.23	
100.00		174.06	1.33	0.17	0.37	8.74	
101.75	Top - Section 2	301.47	1.38	0.25	0.41	19.20	
105.00		246.88	1.47	0.43	0.51	22.62	
109.00	Top - Section 3	295.47	1.59	0.73	0.65	38.77	
110.00		85.68	1.61	0.83	0.69	12.17	
115.00		428.39	1.77	1.38	0.92	86.35	
118.00	Appurtenance(s)	4074.9	1.86	1.82	1.08	985.32	
119.00		85.68	1.89	1.98	1.14	21.93	
	Totals:	**27,050.9**				**1,588.8**	**Total Wind:** **27,095.1**

Seismic Base Shear is Less Than 50% of Wind Force - An Analysis is NOT Required

Calculated Forces

Structure:	CT13070-A-SBA	**Code:**	EIA/TIA-222-G	6/24/2020	
Site Name:	Waterbury 4, CT	**Exposure:**	C		
Height:	119.00 (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	

Tower Engineering Solutions

Load Case:	0.9D + 1.0E							**Iterations**	19
Gust Response Factor	1.10			**Sds**	0.20			**Ss**	0.19
Dead Load Factor	0.90	**Seismic Load Factor**	1.00	**Sd1**	0.10			**S1**	0.06
Wind Load Factor	0.00	**Structure Frequency (f1)**	0.45	**SA**	0.05	**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	-27.90	-1.70	0.00	-171.59	0.00	171.59	3976.93	1988.46	8011.33	4011.62		0.00	0.00	0.050
5.00	-26.82	-1.68	0.00	-163.11	0.00	163.11	3920.48	1960.24	7723.84	3867.66		0.01	-0.01	0.049
10.00	-25.77	-1.66	0.00	-154.70	0.00	154.70	3862.67	1931.34	7438.74	3724.90		0.03	-0.03	0.048
15.00	-24.74	-1.64	0.00	-146.39	0.00	146.39	3803.51	1901.75	7156.21	3583.42		0.06	-0.04	0.047
20.00	-23.73	-1.61	0.00	-138.20	0.00	138.20	3742.99	1871.49	6876.43	3443.32		0.11	-0.05	0.046
25.00	-22.74	-1.59	0.00	-130.13	0.00	130.13	3681.11	1840.56	6599.58	3304.69		0.18	-0.07	0.046
30.00	-21.76	-1.56	0.00	-122.18	0.00	122.18	3617.88	1808.94	6325.84	3167.62		0.26	-0.08	0.045
35.00	-20.81	-1.54	0.00	-114.37	0.00	114.37	3553.28	1776.64	6055.40	3032.20		0.36	-0.10	0.044
40.00	-19.87	-1.51	0.00	-106.69	0.00	106.69	3487.33	1743.67	5788.43	2898.52		0.47	-0.11	0.043
45.00	-18.96	-1.48	0.00	-99.14	0.00	99.14	3420.03	1710.01	5525.12	2766.66		0.59	-0.13	0.041
48.25	-18.37	-1.47	0.00	-94.32	0.00	94.32	3375.55	1687.77	5356.01	2681.98		0.68	-0.14	0.041
50.00	-17.86	-1.46	0.00	-91.74	0.00	91.74	3351.36	1675.68	5265.64	2636.73		0.73	-0.14	0.040
53.25	-16.90	-1.43	0.00	-87.01	0.00	87.01	2647.50	1323.75	4165.57	2085.88		0.83	-0.15	0.048
55.00	-16.63	-1.43	0.00	-84.50	0.00	84.50	2630.02	1315.01	4097.26	2051.68		0.89	-0.16	0.048
60.00	-15.88	-1.43	0.00	-77.35	0.00	77.35	2579.17	1289.59	3903.72	1954.76		1.06	-0.17	0.046
65.00	-15.14	-1.43	0.00	-70.21	0.00	70.21	2526.96	1263.48	3712.68	1859.10		1.26	-0.19	0.044
70.00	-14.42	-1.43	0.00	-63.07	0.00	63.07	2473.39	1236.70	3524.34	1764.79		1.46	-0.21	0.042
75.00	-13.71	-1.43	0.00	-55.91	0.00	55.91	2418.47	1209.23	3338.88	1671.92		1.69	-0.22	0.039
80.00	-13.02	-1.43	0.00	-48.75	0.00	48.75	2362.18	1181.09	3156.47	1580.58		1.93	-0.24	0.036
85.00	-12.35	-1.43	0.00	-41.58	0.00	41.58	2304.54	1152.27	2977.30	1490.86		2.19	-0.25	0.033
87.00	-9.83	-1.42	0.00	-38.72	0.00	38.72	2281.10	1140.55	2906.58	1455.45		2.30	-0.26	0.031
90.00	-9.49	-1.42	0.00	-34.45	0.00	34.45	2242.72	1121.36	2798.02	1401.09		2.47	-0.27	0.029
95.00	-8.95	-1.41	0.00	-27.34	0.00	27.34	2163.84	1081.92	2603.70	1303.79		2.75	-0.28	0.025
98.00	-8.63	-1.40	0.00	-23.10	0.00	23.10	2116.52	1058.26	2490.47	1247.09		2.93	-0.29	0.023
99.00	-5.19	-1.22	0.00	-21.70	0.00	21.70	2100.74	1050.37	2453.28	1228.47		2.99	-0.29	0.020
100.00	-5.03	-1.21	0.00	-20.48	0.00	20.48	2084.97	1042.48	2416.38	1209.99		3.05	-0.29	0.019
101.75	-4.75	-1.19	0.00	-18.36	0.00	18.36	1611.41	805.70	1884.17	943.49		3.16	-0.30	0.022
105.00	-4.52	-1.17	0.00	-14.49	0.00	14.49	1583.50	791.75	1805.91	904.30		3.36	-0.30	0.019
109.00	-4.24	-1.13	0.00	-9.81	0.00	9.81	1548.36	774.18	1710.93	856.74		3.62	-0.31	0.014
109.00	-4.24	-1.13	0.00	-9.81	0.00	9.81	933.38	466.69	986.46	590.00		3.62	-0.31	0.021
110.00	-4.15	-1.12	0.00	-8.68	0.00	8.68	933.38	466.69	986.46	590.00		3.68	-0.31	0.019
115.00	-3.75	-1.03	0.00	-3.11	0.00	3.11	933.38	466.69	986.46	590.00		4.01	-0.31	0.009
118.00	-0.08	-0.02	0.00	-0.02	0.00	0.02	933.38	466.69	986.46	590.00		4.20	-0.31	0.000
119.00	0.00	-0.02	0.00	0.00	0.00	0.00	933.38	466.69	986.46	590.00		4.27	-0.31	0.000

Wind Loading - Shaft

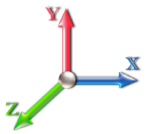
Structure:	CT13070-A-SBA	**Code:**	EIA/TIA-222-G	6/24/2020	
Site Name:	Waterbury 4, CT	**Exposure:**	C		
Height:	119.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 24	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 20

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	0.85	7.442	8.19	231.19	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	7.442	8.19	226.18	0.650	0.000	5.00	20.670	13.44	110.0	0.0	981.7
10.00		1.00	0.85	7.442	8.19	221.17	0.650	0.000	5.00	20.217	13.14	107.6	0.0	960.0
15.00		1.00	0.85	7.442	8.19	216.16	0.650	0.000	5.00	19.764	12.85	105.2	0.0	938.4
20.00		1.00	0.90	7.896	8.69	217.50	0.650	0.000	5.00	19.312	12.55	109.0	0.0	916.7
25.00		1.00	0.95	8.276	9.10	217.38	0.650	0.000	5.00	18.859	12.26	111.6	0.0	895.0
30.00		1.00	0.98	8.600	9.46	216.21	0.650	0.000	5.00	18.406	11.96	113.2	0.0	873.3
35.00		1.00	1.01	8.883	9.77	214.27	0.650	0.000	5.00	17.953	11.67	114.0	0.0	851.7
40.00		1.00	1.04	9.137	10.05	211.75	0.650	0.000	5.00	17.500	11.37	114.3	0.0	830.0
45.00		1.00	1.07	9.366	10.30	208.77	0.650	0.000	5.00	17.047	11.08	114.2	0.0	808.3
48.25	Bot - Section 2	1.00	1.09	9.505	10.46	206.63	0.650	0.000	3.25	10.838	7.04	73.7	0.0	513.8
50.00		1.00	1.09	9.576	10.53	205.42	0.650	0.000	1.75	5.849	3.80	40.0	0.0	504.3
53.25	Top - Section 1	1.00	1.11	9.704	10.67	203.06	0.650	0.000	3.25	10.715	6.96	74.3	0.0	923.6
55.00		1.00	1.12	9.770	10.75	205.10	0.650	0.000	1.75	5.691	3.70	39.8	0.0	225.1
60.00		1.00	1.14	9.951	10.95	201.19	0.650	0.000	5.00	15.953	10.37	113.5	0.0	631.0
65.00		1.00	1.16	10.120	11.13	197.05	0.650	0.000	5.00	15.500	10.07	112.2	0.0	612.9
70.00		1.00	1.17	10.279	11.31	192.71	0.650	0.000	5.00	15.047	9.78	110.6	0.0	594.9
75.00		1.00	1.19	10.430	11.47	188.18	0.650	0.000	5.00	14.594	9.49	108.8	0.0	576.8
80.00		1.00	1.21	10.572	11.63	183.49	0.650	0.000	5.00	14.141	9.19	106.9	0.0	558.8
85.00		1.00	1.22	10.708	11.78	178.65	0.650	0.000	5.00	13.688	8.90	104.8	0.0	540.7
87.00	Appurtenance(s)	1.00	1.23	10.761	11.84	176.68	0.650	0.000	2.00	5.349	3.48	41.2	0.0	211.2
90.00		1.00	1.24	10.838	11.92	173.69	0.650	0.000	3.00	7.887	5.13	61.1	0.0	311.4
95.00		1.00	1.25	10.962	12.06	168.60	0.650	0.000	5.00	12.783	8.31	100.2	0.0	504.6
98.00	Bot - Section 3	1.00	1.26	11.034	12.14	165.49	0.650	0.000	3.00	7.452	4.84	58.8	0.0	294.1
99.00	Appurtenance(s)	1.00	1.26	11.057	12.16	164.44	0.650	0.000	1.00	2.490	1.62	19.7	0.0	175.4
100.00		1.00	1.27	11.081	12.19	163.39	0.650	0.000	1.00	2.472	1.61	19.6	0.0	174.1
101.75	Top - Section 2	1.00	1.27	11.121	12.23	161.55	0.650	0.000	1.75	4.282	2.78	34.1	0.0	301.5
105.00		1.00	1.28	11.195	12.31	160.96	0.650	0.000	3.25	7.806	5.07	62.5	0.0	246.9
109.00	Top - Section 3	1.00	1.29	11.284	12.41	156.66	0.650	0.000	4.00	9.345	6.07	75.4	0.0	295.5
110.00		1.00	1.29	11.305	12.44	147.72	0.600	0.000	1.00	2.167	1.30	16.2	0.0	85.7
115.00		1.00	1.30	11.412	12.55	148.42	0.600	0.000	5.00	10.833	6.50	81.6	0.0	428.4
118.00	Appurtenance(s)	1.00	1.31	11.474	12.62	148.82	0.600	0.000	3.00	6.500	3.90	49.2	0.0	257.0
119.00		1.00	1.31	11.494	12.64	148.95	0.600	0.000	1.00	2.167	1.30	16.4	0.0	85.7
								Totals:	**119.00**			**2,519.5**		**17,108.3**

Discrete Appurtenance Forces

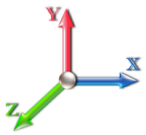
Structure:	CT13070-A-SBA	**Code:**	EIA/TIA-222-G	6/24/2020	
Site Name:	Waterbury 4, CT	**Exposure:**	C		
Height:	119.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 25	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 20

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	118.00	TD-RRH8x20-25	3	11.474	12.621	0.60	0.90	7.33	210.00	0.000	0.000	92.47	0.00	0.00
2	118.00	1900 MHz RRH	3	11.474	12.621	0.60	0.90	5.01	180.00	0.000	0.000	63.24	0.00	0.00
3	118.00	800 MHz RRH	6	11.474	12.621	0.60	0.90	9.01	318.00	0.000	0.000	113.70	0.00	0.00
4	118.00	VHLP2.5-11	2	11.474	12.621	1.00	1.00	16.86	96.00	1.583	0.000	212.79	336.92	0.00
5	118.00	AAHC	3	11.474	12.621	0.68	0.90	8.53	311.10	0.000	0.000	107.60	0.00	0.00
6	118.00	NNVV-65B-R4	3	11.474	12.621	0.67	0.90	24.52	254.10	0.000	0.000	309.41	0.00	0.00
7	118.00	LP Platform w/ Handrail	1	11.474	12.621	1.00	1.00	46.00	2448.72	0.000	0.000	580.57	0.00	0.00
8	99.00	HRK12 (Handrail Kit)	1	11.057	12.163	1.00	1.00	6.75	261.72	0.000	0.000	82.10	0.00	0.00
9	99.00	RRUS 4415 B25	3	11.057	12.163	0.50	0.75	2.47	138.00	0.000	0.000	30.07	0.00	0.00
10	99.00	APX16DWV-16DWV-S-E-	3	11.057	12.163	0.46	0.75	9.01	122.10	0.000	0.000	109.61	0.00	0.00
11	99.00	AIR 6449 B41	3	11.057	12.163	0.52	0.75	10.28	399.60	0.000	0.000	125.09	0.00	0.00
12	99.00	KRY 112 489/2	3	11.057	12.163	0.50	0.75	0.98	46.20	0.000	0.000	11.92	0.00	0.00
13	99.00	Air 32	4	11.057	12.163	0.65	0.75	16.99	528.80	0.000	0.000	206.66	0.00	0.00
14	99.00	4449 B71+ B85	3	11.057	12.163	0.50	0.75	2.49	210.00	0.000	0.000	30.25	0.00	0.00
15	99.00	Low Profile Platform	1	11.057	12.163	1.00	1.00	22.00	1500.00	0.000	0.000	267.59	0.00	0.00
16	99.00	KRY 112 144/1	3	11.057	12.163	0.50	0.75	0.62	33.06	0.000	0.000	7.52	0.00	0.00
17	99.00	APXVAARR24_43-U-NA2	3	11.057	12.163	0.52	0.75	31.88	384.00	0.000	0.000	387.73	0.00	0.00
18	87.00	SBNHH-1D65B	9	10.761	11.837	0.66	0.80	48.24	360.00	0.000	0.000	570.95	0.00	0.00
19	87.00	Low Profile Platform	1	10.761	11.837	1.00	1.00	22.00	1500.00	0.000	0.000	260.41	0.00	0.00
20	87.00	BXA-80063/4CF	3	10.761	11.837	0.65	0.90	9.15	29.70	0.000	0.000	108.31	0.00	0.00
21	87.00	RRH2X60-700	3	10.761	11.837	0.58	0.80	6.12	180.00	0.000	0.000	72.48	0.00	0.00
22	87.00	1900 MHz 4X45 RRH	3	10.761	11.837	0.79	0.80	6.42	178.50	0.000	0.000	75.98	0.00	0.00
23	87.00	RRH2X60-PCS	3	10.761	11.837	0.71	0.80	4.71	165.00	0.000	0.000	55.75	0.00	0.00
24	87.00	DB-T1-6Z-8AB-0Z	2	10.761	11.837	0.68	0.80	6.56	88.00	0.000	0.000	77.63	0.00	0.00
							Totals:		**9,942.60**			**3,959.83**		

Total Applied Force Summary

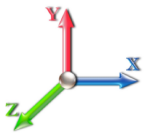
Structure:	CT13070-A-SBA		**Code:**	EIA/TIA-222-G	6/24/2020
Site Name:	Waterbury 4, CT		**Exposure:**	C	
Height:	119.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 26

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 20

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		109.99	1189.57	0.00	0.00
10.00		107.58	1167.89	0.00	0.00
15.00		105.17	1146.22	0.00	0.00
20.00		109.03	1124.54	0.00	0.00
25.00		111.59	1102.86	0.00	0.00
30.00		113.17	1081.19	0.00	0.00
35.00		114.03	1059.51	0.00	0.00
40.00		114.32	1037.84	0.00	0.00
45.00		114.16	1016.16	0.00	0.00
48.25		73.65	648.88	0.00	0.00
50.00		40.05	577.05	0.00	0.00
53.25		74.35	1058.74	0.00	0.00
55.00		39.75	297.87	0.00	0.00
60.00		113.50	838.85	0.00	0.00
65.00		112.16	820.79	0.00	0.00
70.00		110.59	802.73	0.00	0.00
75.00		108.83	784.66	0.00	0.00
80.00		106.90	766.60	0.00	0.00
85.00		104.80	748.54	0.00	0.00
87.00	(24) attachments	1262.66	2795.56	0.00	0.00
90.00		61.12	373.36	0.00	0.00
95.00		100.19	607.81	0.00	0.00
98.00		58.79	356.02	0.00	0.00
99.00	(27) attachments	1278.24	3819.49	0.00	0.00
100.00		19.59	178.24	0.00	0.00
101.75		34.05	308.79	0.00	0.00
105.00		62.48	260.47	0.00	0.00
109.00		75.39	312.20	0.00	0.00
110.00		16.17	89.86	0.00	0.00
115.00		81.59	449.30	0.00	0.00
118.00	(21) attachments	1529.00	4087.50	336.92	0.00
119.00		16.44	85.68	0.00	0.00
	Totals:	**6,479.31**	**30,994.75**	**336.92**	**0.00**

Calculated Forces

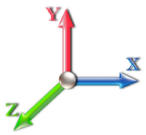
Structure:	CT13070-A-SBA	**Code:**	EIA/TIA-222-G	6/24/2020	
Site Name:	Waterbury 4, CT	**Exposure:**	C		
Height:	119.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 27	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 20

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	-30.99	-6.49	-0.34	-569.41	0.00	569.41	3976.93	1988.46	8011.33	4011.62	0.00	0.000	0.000	0.150
5.00	-29.80	-6.40	-0.34	-536.95	0.00	536.95	3920.48	1960.24	7723.84	3867.66	0.02	-0.044	0.000	0.146
10.00	-28.62	-6.32	-0.34	-504.94	0.00	504.94	3862.67	1931.34	7438.74	3724.90	0.09	-0.089	0.000	0.143
15.00	-27.47	-6.23	-0.34	-473.35	0.00	473.35	3803.51	1901.75	7156.21	3583.42	0.21	-0.134	0.000	0.139
20.00	-26.35	-6.14	-0.34	-442.20	0.00	442.20	3742.99	1871.49	6876.43	3443.32	0.38	-0.179	0.000	0.135
25.00	-25.24	-6.04	-0.34	-411.50	0.00	411.50	3681.11	1840.56	6599.58	3304.69	0.59	-0.224	0.000	0.131
30.00	-24.15	-5.95	-0.34	-381.28	0.00	381.28	3617.88	1808.94	6325.84	3167.62	0.85	-0.269	0.000	0.127
35.00	-23.09	-5.84	-0.34	-351.55	0.00	351.55	3553.28	1776.64	6055.40	3032.20	1.15	-0.314	0.000	0.122
40.00	-22.05	-5.74	-0.34	-322.33	0.00	322.33	3487.33	1743.67	5788.43	2898.52	1.51	-0.359	0.000	0.118
45.00	-21.03	-5.63	-0.34	-293.63	0.00	293.63	3420.03	1710.01	5525.12	2766.66	1.91	-0.403	0.000	0.112
48.25	-20.38	-5.56	-0.34	-275.33	0.00	275.33	3375.55	1687.77	5356.01	2681.98	2.19	-0.431	0.000	0.109
50.00	-19.80	-5.53	-0.34	-265.59	0.00	265.59	3351.36	1675.68	5265.64	2636.73	2.35	-0.447	0.000	0.107
53.25	-18.74	-5.45	-0.34	-247.63	0.00	247.63	2647.50	1323.75	4165.57	2085.88	2.67	-0.475	0.000	0.126
55.00	-18.44	-5.42	-0.34	-238.10	0.00	238.10	2630.02	1315.01	4097.26	2051.68	2.84	-0.490	0.000	0.123
60.00	-17.60	-5.31	-0.34	-211.01	0.00	211.01	2579.17	1289.59	3903.72	1954.76	3.38	-0.537	-0.001	0.115
65.00	-16.77	-5.20	-0.34	-184.46	0.00	184.46	2526.96	1263.48	3712.68	1859.10	3.97	-0.582	-0.001	0.106
70.00	-15.97	-5.10	-0.34	-158.44	0.00	158.44	2473.39	1236.70	3524.34	1764.79	4.60	-0.624	-0.001	0.096
75.00	-15.18	-4.99	-0.34	-132.97	0.00	132.97	2418.47	1209.23	3338.88	1671.92	5.28	-0.664	-0.001	0.086
80.00	-14.41	-4.88	-0.34	-108.03	0.00	108.03	2362.18	1181.09	3156.47	1580.58	5.99	-0.699	-0.001	0.074
85.00	-13.66	-4.77	-0.34	-83.63	0.00	83.63	2304.54	1152.27	2977.30	1490.86	6.74	-0.731	-0.001	0.062
87.00	-10.88	-3.48	-0.34	-74.08	0.00	74.08	2281.10	1140.55	2906.58	1455.45	7.05	-0.742	-0.001	0.056
90.00	-10.51	-3.41	-0.34	-63.66	0.00	63.66	2242.72	1121.36	2798.02	1401.09	7.52	-0.758	-0.001	0.050
95.00	-9.90	-3.31	-0.34	-46.59	0.00	46.59	2163.84	1081.92	2603.70	1303.79	8.33	-0.780	-0.001	0.040
98.00	-9.55	-3.25	-0.34	-36.67	0.00	36.67	2116.52	1058.26	2490.47	1247.09	8.82	-0.791	-0.001	0.034
99.00	-5.75	-1.91	-0.34	-33.43	0.00	33.43	2100.74	1050.37	2453.28	1228.47	8.99	-0.795	-0.001	0.030
100.00	-5.57	-1.89	-0.34	-31.51	0.00	31.51	2084.97	1042.48	2416.38	1209.99	9.16	-0.798	-0.001	0.029
101.75	-5.26	-1.86	-0.34	-28.20	0.00	28.20	1611.41	805.70	1884.17	943.49	9.45	-0.803	-0.001	0.033
105.00	-5.00	-1.79	-0.34	-22.17	0.00	22.17	1583.50	791.75	1805.91	904.30	10.00	-0.812	-0.002	0.028
109.00	-4.69	-1.71	-0.34	-15.01	0.00	15.01	1548.36	774.18	1710.93	856.74	10.68	-0.822	-0.002	0.021
109.00	-4.69	-1.71	-0.34	-15.01	0.00	15.01	933.38	466.69	986.46	590.00	10.68	-0.822	-0.002	0.030
110.00	-4.60	-1.69	-0.34	-13.30	0.00	13.30	933.38	466.69	986.46	590.00	10.86	-0.824	-0.002	0.027
115.00	-4.15	-1.61	-0.34	-4.83	0.00	4.83	933.38	466.69	986.46	590.00	11.72	-0.830	-0.002	0.013
118.00	-0.09	-0.02	0.00	-0.02	0.00	0.02	933.38	466.69	986.46	590.00	12.24	-0.831	-0.002	0.000
119.00	0.00	-0.02	0.00	0.00	0.00	0.00	933.38	466.69	986.46	590.00	12.42	-0.831	-0.002	0.000

Final Analysis Summary

Structure:	CT13070-A-SBA	**Code:**	EIA/TIA-222-G	6/24/2020	
Site Name:	Waterbury 4, CT	**Exposure:**	C		
Height:	119.00 (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

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 97 mph Wind	27.2	0.00	37.15	0.01	0.87	2392.29
0.9D + 1.6W 97 mph Wind	27.1	0.00	27.85	0.01	0.87	2373.94
1.2D + 1.0Di + 1.0Wi 50 mph Wind	7.3	0.00	57.81	0.00	0.28	631.44
1.2D + 1.0E	1.7	0.00	37.19	0.00	0.00	173.05
0.9D + 1.0E	1.7	0.00	27.90	0.00	0.00	171.59
1.0D + 1.0W 60 mph Wind	6.5	0.00	30.99	0.00	0.34	569.41

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 97 mph Wind	-37.15	-27.16	-0.87	-2392.2	-0.01	-2392.2	3976.93	1988.4	8011.33	4011.62	0.00	0.606
0.9D + 1.6W 97 mph Wind	-27.85	-27.14	-0.87	-2373.9	-0.01	-2373.9	3976.93	1988.4	8011.33	4011.62	0.00	0.599
1.2D + 1.0Di + 1.0Wi 50 mph Wind	-57.81	-7.31	-0.28	-631.44	0.00	-631.44	3976.93	1988.4	8011.33	4011.62	0.00	0.172
1.2D + 1.0E	-37.19	-1.70	0.00	-173.05	0.00	-173.05	3976.93	1988.4	8011.33	4011.62	0.00	0.052
0.9D + 1.0E	-27.90	-1.70	0.00	-171.59	0.00	-171.59	3976.93	1988.4	8011.33	4011.62	0.00	0.050
1.0D + 1.0W 60 mph Wind	-30.99	-6.49	-0.34	-569.41	0.00	-569.41	3976.93	1988.4	8011.33	4011.62	0.00	0.150

Base Plate Summary

Structure:	CT13070-A-SB		**Code:**	EIA/TIA-222-G	6/24/2020
Site Name:	Waterbury 4, CT		**Exposure:**	C	
Height:	119.00 (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

Reactions	
Original Design	
Moment (kip-ft):	3142.00
Axial (kip):	42.00
Shear (kip):	29.00
Analysis (1.2D + 1.6W)	
Moment (kip-ft):	2392.29
Axial (kip):	37.15
Shear (kip):	27.16

Base Plate	
Yield (ksi):	60.00
Width (in):	53.25
Style:	Clipped
Polygon Sides:	0.00
Clip Length (in):	9.00
Effective Len (in):	10.37
Moment (kip-in):	561.15
Allow Stress (ksi):	81.00
Applied Stress (ksi):	36.45
Stress Ratio:	0.45

Anchor Bolts	
Bolt Circle:	55.75
Number Bolts:	12.00
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):	176.46
Allowable (kip):	260.00
Ratio:	0.70
Tension	
Force (kip):	166.83
Allowable (kip):	260.00
Ratio:	0.66

Monopole Mat Foundation Design

				Date
				6/24/2020
	Customer Name:	T-Mobile	**EIA/TIA Standard:**	EIA-222-G
	Site Name:		**Structure Height (Ft.):**	119
	Site Number:	CT13070-A-SBA	**Engineer Name:**	W. Velez
	Engr. Number:	94641	**Engineer Login ID:**	

Foundation Info Obtained from: Drawings/Calculations

Structure Type: Monopole

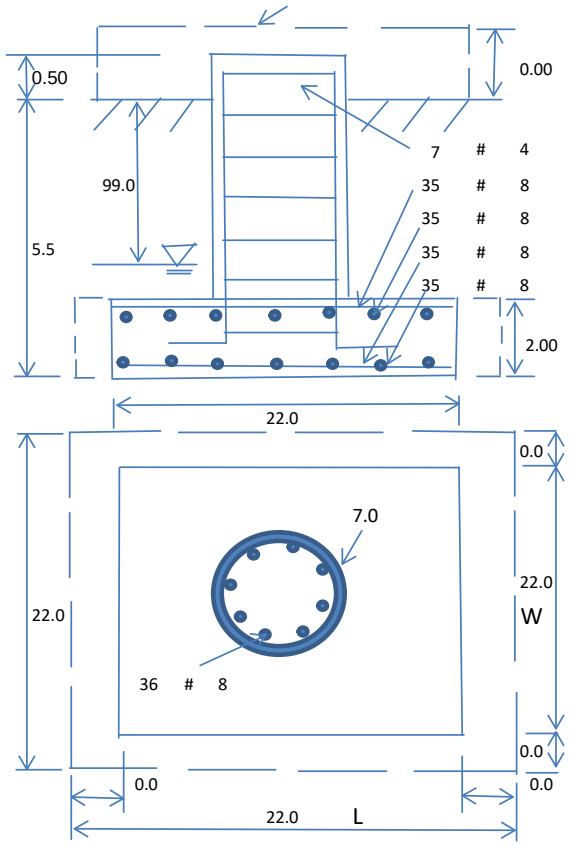
Analysis or Design? Analysis

Base Reactions (Factored):

Axial Load (Kips):	37.1	Shear Force (Kips):	27.2
Uplift Force (Kips):	0.0	Moment (Kips-ft):	2392.3
Allowable overstress %:	5.0%		

Foundation Geometries:

		Mods required -Yes/No ?:	No
Diameter of Pier (ft.):	7.0	Depth of Base BG (ft.):	5.5
Pier Height A. G. (ft.):	0.50	Thickness of Pad (ft):	2.00
Length of Pad (ft.):	22	Width of Pad (ft.):	22
Final Length of pad (ft)	22.0	Final width of pad (ft):	22.0



Material Properties and Reabr Info:

Concrete Strength (psi):	4000	Steel Elastic Modulus:	29000	ksi
Vertical bar yield (ksi)	60	Tie steel yield (ksi):	60	
Vertical Rebar Size #:	8	Tie / Stirrup Size #:	4	
Qty. of Vertical Rebars:	36	Tie Spacing (in):	12.0	
Pad Rebar Yield (Ksi):	60	Pad Steel Rebar Size (#):	8	
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):	35	Qty. of Rebar in Pad (W):	35	
Rebar at the top of the concrete pad:				
Qty. of Rebar in Pad (L):	35	Qty. of Rebar in Pad (W):	35	
Apply 1.35 factor for e/w Per G:	1.35			

Soil Design Parameters:

Soil Unit Weight (pcf):	130.0	Soil Buoyant Weight:	50.0	Pcf		
Water Table B.G.S. (ft):	99.0	Unit Weight of Water:	62.4	pcf	Angle from Top of Pad:	30
Ultimate Bearing Pressure (psf):	16000	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):	Yes		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.):	1559.30	Total Dry Soil Weight (Kips):	202.71
Total Buoyant Soil Volume (cu. Ft.):	0.00	Total Buoyant Soil Weight (Kips):	0.00
Total Effective Soil Weight (Kips):	202.71	Weight from the Concrete Block at Top (K):	0.00
Total Dry Concrete Volume (cu. Ft.):	1121.94	Total Dry Concrete Weight (Kips):	168.29
Total Buoyant Concrete Volume (cu. Ft.):	0.00	Total Buoyant Concrete Weight (Kips):	0.00
Total Effective Concrete Weight (Kips):	168.29	Total Vertical Load on Base (Kips):	408.10

Check Soil Capacities:

				Load/ Capacity Ratio	
Calculated Maxium Net Soil Pressure under the base (psf):	2569	<	Allowable Factored Soil Bearing (psf): 12000	0.21	OK!
Allowable Foundation Overturning Resistance (kips-ft.):	4081.0	>	Design Factored Momont (kips-ft): 2556	0.63	OK!
Factor of Safety Against Overturning (O. R. Moment/Design Moment):	1.60	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		
					Load/ Capacity Ratio	
(1) Concrete Pier:						
Vertical Steel Rebar Area (sq. in./each):	0.79		Tie / Stirrup Area (sq. in./each):	0.20		
Calculated Moment Capacity (Mn,Kips-Ft):	4845.7	>	Design Factored Moment (Mu, Kips-F	2501.1	0.52	OK!
Calculated Shear Capacity (Kips):	660.1	>	Design Factored Shear (Kips):	27.2	0.04	OK!
Calculated Tension Capacity (Tn, Kips):	1535.8	>	Design Factored Tension (Tu Kips):	0.0	0.00	OK!
Calculated Compression Capacity (Pn, Kips):	9747.6	>	Design Factored Axial Load (Pu Kips):	37.1	0.00	OK!
Moment & Axial Strength Combination:	0.52	OK!	Check Tie Spacing (Design/Required):		1	OK!
Pier Reinforcement Ratio:	0.005		Reinforcement Ratio is satisfied per ACI			
(2).Concrete Pad:						
One-Way Design Shear Capacity (L-Direction, Kips):	513.4	>	One-Way Factored Shear (L-D. Kips):	174.6	0.34	OK!
One-Way Design Shear Capacity (W-Direction, Kips):	513.4	>	One-Way Factored Shear (W-D., Kips)	174.6	0.34	OK!
One-Way Design Shear Capacity (Corner-Corner. Kips):	483.0	>	One-Way Factored Shear (C-C, Kips):	171.3	0.35	OK!
Lower Steel Pad Reinforcement Ratio (L-Direct.):	0.0051	OK!	Lower Steel Pad Reinf. Ratio (W-Direc	0.0051		
Lower Steel Pad Moment Capacity (L-Direction. Kips-ft):	2435.7	>	Moment at Bottom (L-Dir. K-Ft):	749.8	0.31	OK!
Lower Steel Pad Moment Capacity (W-Direction. Kips-ft):	2435.7	>	Moment at Bottom (W-Dir. K-Ft):	749.8	0.31	OK!
Lower Steel Pad Moment Capacity (Corner-Corner,K-ft):	3397.4	>	Moment at Bottom (C-C Dir. K-Ft):	1060.3	0.31	OK!
Upper Steel Pad Reinforcement Ratio (L-Direct.):	0.0051	OK!	Upper Steel Reinf. Ratio (W-Dir.):	0.0051		
Upper Steel Pad Moment Capacity (L-Direc. Kips-ft):	2435.7	>	Moment at the top (L-Dir K-Ft):	351.0	0.14	OK!
Upper Steel Pad Moment Capacity (W-Direc. Kips-ft):	2435.7	>	Moment at the top (W-Dir K-Ft):	351.0	0.14	OK!
Upper Steel Pad Moment Capacity (Corner-Corner. K-ft):	3397.4	>	Moment at the top (C-C Dir. K-Ft):	331.4	0.10	OK!
(3).Check Punching Shear Capacity due to Moment in the Pier:						
Moment transferred by punching shear:	956.9	k-ft.	Max. factored shear stress v_{u_CD}:		1.9	Psi
Max. factored shear stress v_{u_AB}:	11.2	Psi	Factored shear Strength ϕv_n:		189.7	Psi
Max. factored shear stress v_u:	11.2	Psi	Check Usage of Punching Shear Capacity:		0.06	OK!

EXHIBIT 8

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

Antenna Mount Analysis Report

Existing 119-Ft Monopole Tower

Customer Name: SBA Communications Corp

Customer Site Number: CT13070-A-SBA / Waterbury 4, CT

Customer Site Name: Waterbury 4, CT

Carrier Name: T-Mobile (App#: 116817, V2)

Carrier Site ID / Name: CTNH331B / NH331/OPTA Pine Grove

Site Location: 940 Meriden Road

Waterbury, Connecticut

New Haven County

Latitude: 41.553278

Longitude: -72.993361

6/22/20

Analysis Result:

Max Structural Usage: 58.9% [Pass]

Report Prepared By: Ishwor Dhakal

Introduction

The purpose of this report is to summarize the analysis results on the (1) SitePro RMQLP-4096-HK [Platform w/ Handrail] at 99.00' 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 Drawings	Mount Mapping by Engineered Tower Solutions, dated 06/19/2019.
Antenna Loading	SBA, Application #: 116817, v2.
Modification Drawings	N/A.

Analysis Criteria

Wind Speed Used in the Analysis: V_{ULT} = 125 mph (3-Sec. Gust) / Equivalent to
V_{ASD} = 97 mph (3-Sec. Gust)
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-222-G / 2015 IBC / 2018 CSBC
Exposure Category: C
Structure Class: II
Topographic Category: 1
Crest Height (Ft): 0

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) SitePro RMQLP-4096-HK [Platform w/ Handrail] at 99.00' elevation.

Final Antenna Configuration

3	RFS APX16DWV-16DWVS-E-A20
3	RFS APXVAARR24_43-U-NA20 (Octa)
4	Ericsson Air 32 KRD901146-1_B66A_B2A (Octo)
3	Ericsson AIR6449 B41
3	Ericsson KRY 112 489/2
3	Ericsson KRY 112 144/1
3	Ericsson Radio 4449 B71 + B85
3	Ericsson 4415 B25

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 mounts will be structurally adequate to support the proposed antenna configuration. The maximum structural usage is 58.9%, which occurs in the end connection plate member. 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.


06/19/2019 08:30


06/19/2019 09:25

Structure: CT13070-A-SBA - Waterbury 4, CT

Sector: A

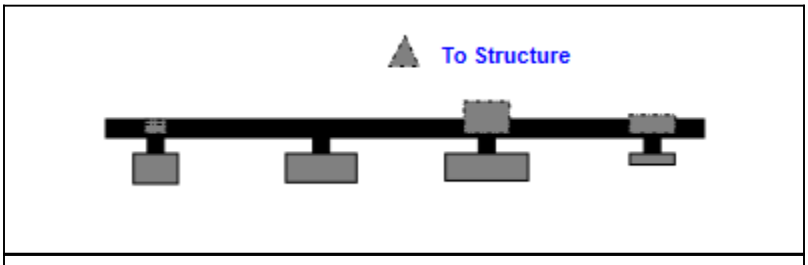
Structure Type: Monopole

Mount Elev: 99.00

6/22/2020

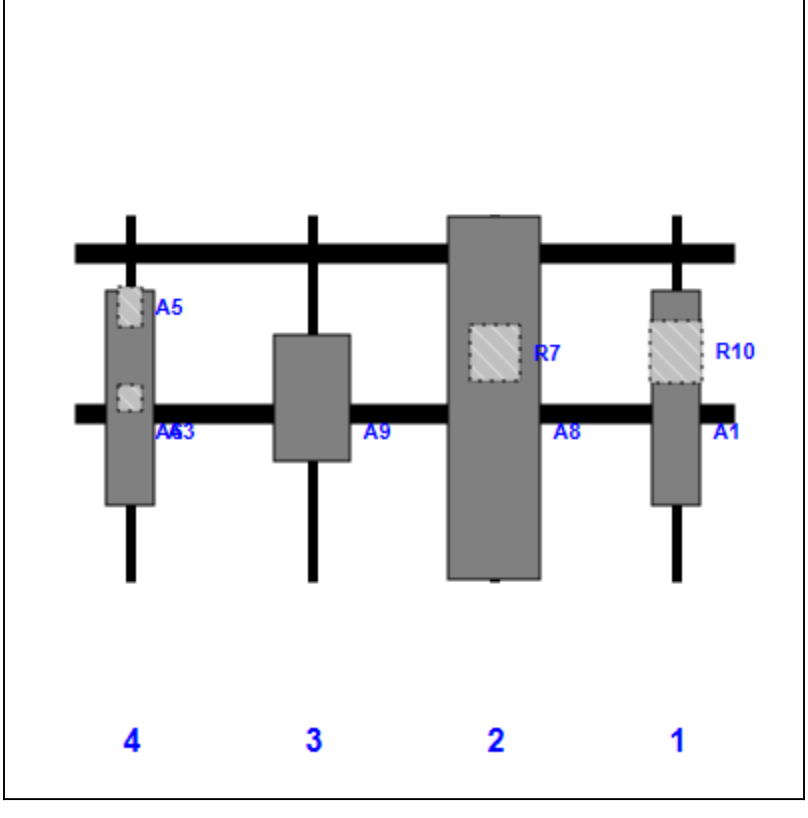
Tower Engineering Solutions

Plan View



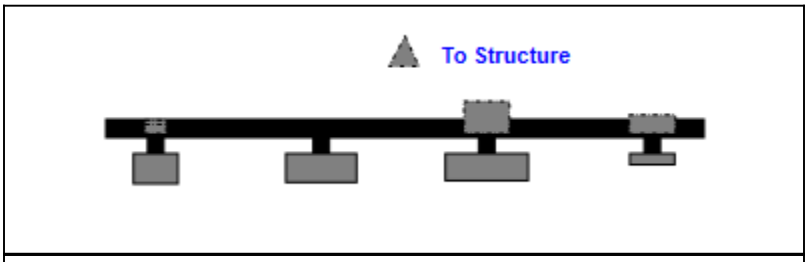
Front View

Looking Toward Structure



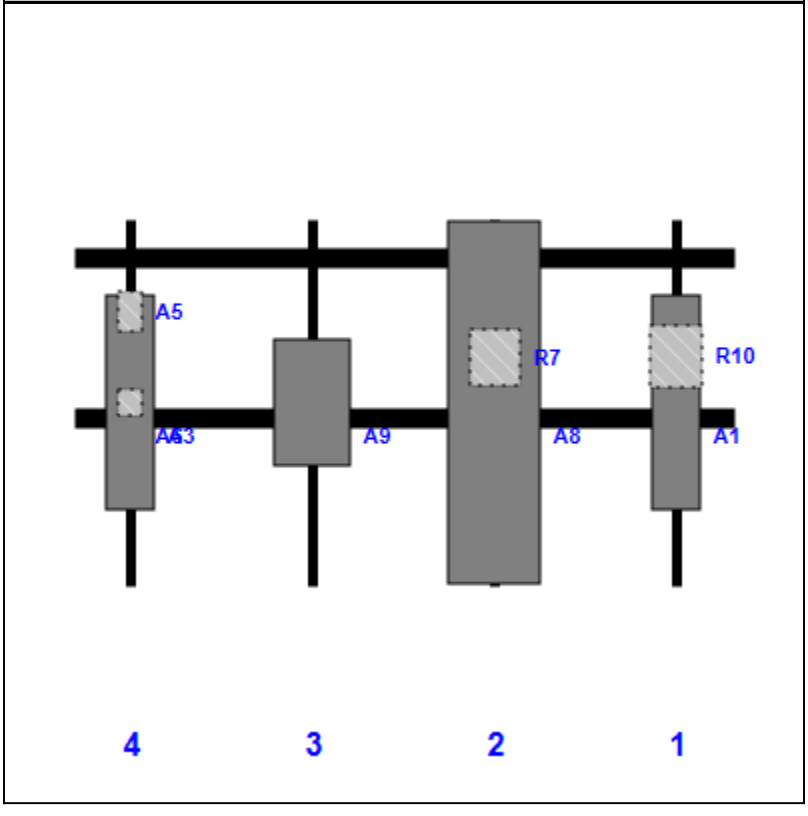
Ref #	Model	Height (in)	Width (in)	H Dist Left	Pipe #	Pipe Pos V	Pos	From Top	H Offset	Status	Validation
A1	APX16DWV-16DWVS-E-A20	55.90	13.00	159.0	1	a	Front	48.00			
R10	4415 B25	16.50	13.40	159.0	1	a	Behind	36.00			
A8	APXVAARR24_43-U-NA20	95.90	24.00	111.0	2	a	Front	48.00			
R7	Radio 4449 B71 + B85	15.00	13.20	111.0	2	a	Behind	36.00			
A9	AIR6449 B41	33.10	20.50	63.00	3	a	Front	48.00			
A3	Air 32	56.60	12.90	15.00	4	a	Front	48.00			
A5	KRY 112 489/2	11.00	6.10	15.00	4	a	Behind	24.00			
A6	KRY 112 144/1	6.90	6.10	15.00	4	a	Behind	48.00			

Plan View



Front View

Looking Toward Structure



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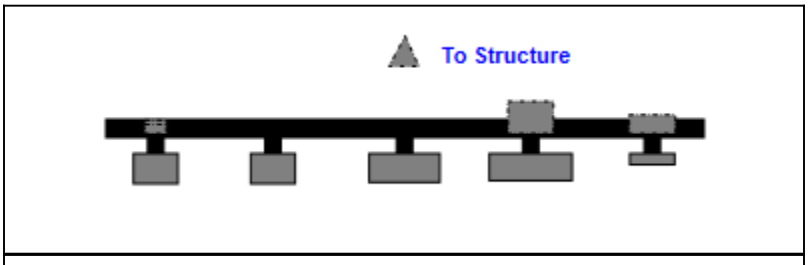
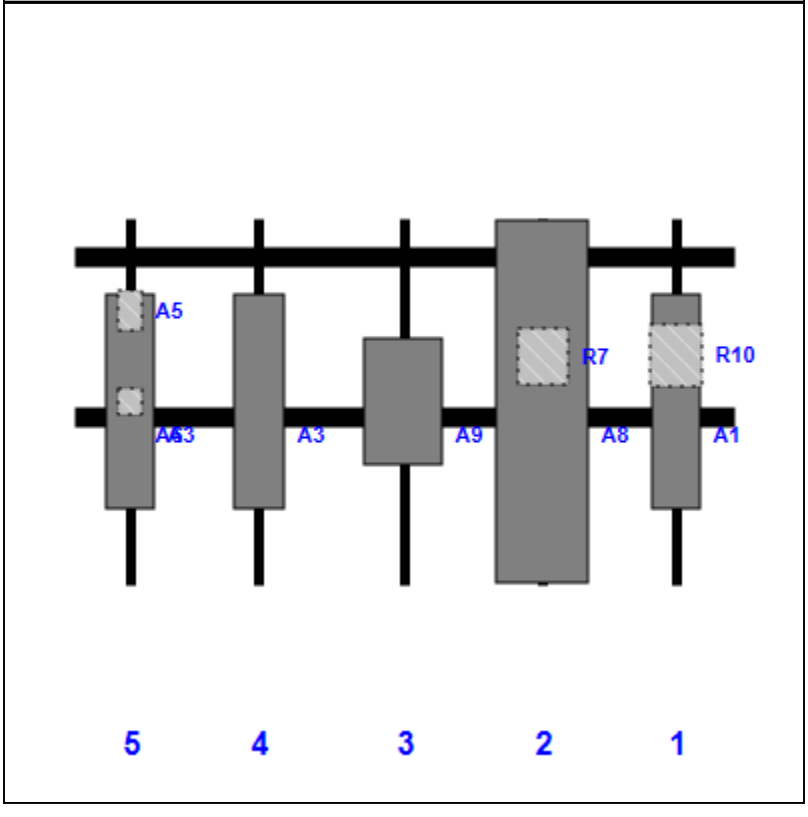
A8	APXVAARR24_43-U-NA20	95.90	24.00	111.0	2	a	Front	48.00			
R7	Radio 4449 B71 + B85	15.00	13.20	111.0	2	a	Behind	36.00			
A9	AIR6449 B41	33.10	20.50	63.00	3	a	Front	48.00			
A3	Air 32	56.60	12.90	15.00	4	a	Front	48.00			
A5	KRY 112 489/2	11.00	6.10	15.00	4	a	Behind	24.00			
A6	KRY 112 144/1	6.90	6.10	15.00	4	a	Behind	48.00			

Plan View



Front View

Looking Toward Structure



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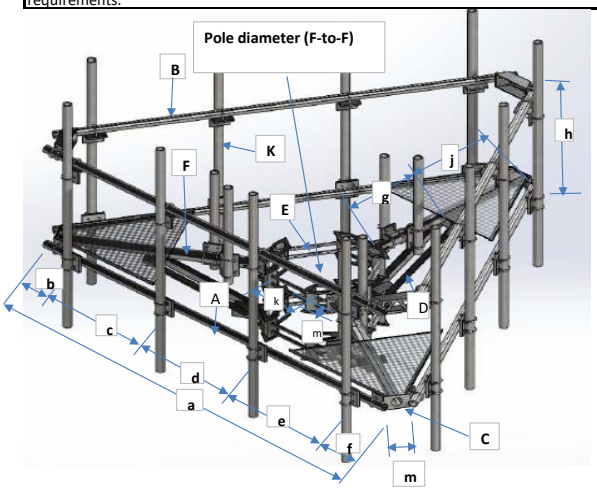
A1	APX16DWV-16DWVS-E-A20	55.90	13.00	159.0	1	a	Front	48.00			
R10	4415 B25	16.50	13.40	159.0	1	a	Behind	36.00			
A8	APXVAARR24_43-U-NA20	95.90	24.00	123.7	2	a	Front	48.00			
R7	Radio 4449 B71 + B85	15.00	13.20	123.7	2	a	Behind	36.00			
A9	AIR6449 B41	33.10	20.50	87.15	3	a	Front	48.00			
A3	Air 32	56.60	12.90	49.00	4	a	Front	48.00			
A3	Air 32	56.60	12.90	15.00	5	a	Front	48.00			
A5	KRY 112 489/2	11.00	6.10	15.00	5	a	Behind	24.00			
A6	KRY 112 144/1	6.90	6.10	15.00	5	a	Behind	48.00			

Antenna Mount Type "MT-V" Mapping Form (PATENT PENDING)

FCC # N/A

Tower Owner:	SBA	**Mapping Date:**	6/19/19
Site Name:	Waterbury 4	**Structure Type:**	Monopole
Site Number or ID:	CT13070-A	**Structure Height (Ft.):**	111
Mapping Contractor:	Engineered Tower Solutions	**Mount Height (Ft.):**	101



Geometries (Unit: inches)

a	174	**e**	48	**j**	62	**o**		**s**	
b	15	**f**	15	**k**	16	**p**		**t**	
c	48	**g**	16	**m**	10	**q**		**u ***	52
d	48	**h**	42	**n**		**r**		**v ***	96

Members/Bolts (Unit: inches) — * - See Ant. Layout for "u", "v" and member "K" (pipe)

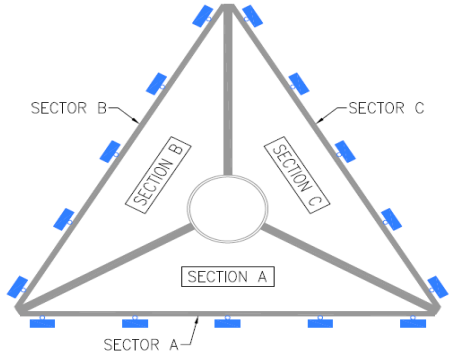
Items	Member	Lx (O.D.)	Ly (I.D.)	T	Items	Member	Lx (O.D.)	Ly (I.D.)	T
A	3.5 OD x 0.216 Pipe	3.5	3.068	0.216	**F**	Tubing 4x4x3/16	4	4	0.1875
B	2.375 OD x 0.154 Pipe	2.375	2.067	0.154	**G**				
C	1/2" Thick. Plate	12" x 3" x 6"			**H**				
D	L2 1/2x2 1/2x1/4	2.5	2.5	0.25	**J**				
E	5/8" Bolt				**K* (pipe)**	2.875 OD x 0.276 Pipe	2.875	2.323	0.276

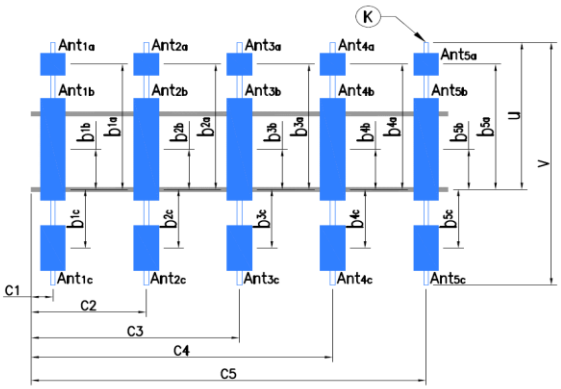
Distance from top of main platform member to lowest tip of ant./eqpt. of Carrier above. (N/A if > 10 ft.)	n/a
Distance from top of main platform member to highest tip of ant./eqpt. of Carrier below. (N/A if > 10 ft.)	n/a

Please enter the infomation below if members can't be found from the drop down lists

Cross arm perpendicular to "F" HSS 4x4x3/16x28.5" at j/g location

Member "D" is back-to-back double-angles



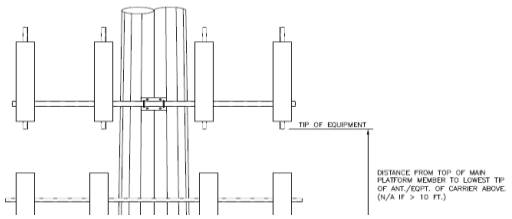


Antenna Layout

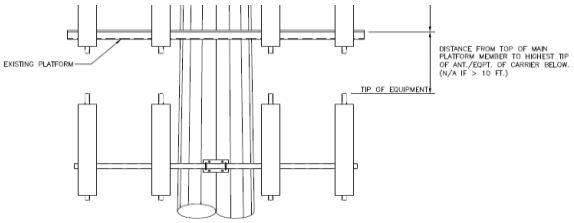
Ants. Items	Enter antenna model. If not labled, enter "Unknown". If no antenna at specified location, enter "N/A". If antennas and the locations are the same on all three sectors, only enter one sector.	Width (in.)	Depth (in.)	Height (in.)	Coax Size and Qty	Mounting Locations (Unit: inches) Vertical Distances"b_{1a}, b_{2a}, b_{3a}, b_{1b}...." (In.)	Horiz. offset (Use "-" if Ant. is inside)	Horiz. offset "C_1, C_2, C_3, C_4, C_5" (in.)	Photos of antennas Photo Numbers
Sector A									
Ant_{1a}	n/a							15	
Ant_{1b}	Ericsson Panel	13	9	58		24	10	15	61
Ant_{1c}	n/a							15	
Ant_{2a}	n/a							n/a	
Ant_{2b}	n/a							n/a	
Ant_{2c}	n/a							n/a	
Ant_{3a}	n/a							63	
Ant_{3b}	n/a							63	
Ant_{3c}	n/a							63	
Ant_{4a}	Ericsson RRUS					36	-4	111	60
Ant_{4b}	RFS APXVAARR24_43					24	7	111	60
Ant_{4c}	n/a							111	
Ant_{5a}	Ericsson TMA	7	8	3		10	0	159	59
Ant_{5b}	Unknown Panel	13	3.5	56		18	6	159	59
Ant_{5c}	Ericsson TMA	5	6	3		-6	0	159	59
Are Ant same as sector A?	Yes	**Antennas on Sector B are the same as Sector A**							

Azimuth (Degree) of Each Sector and Climbing Information

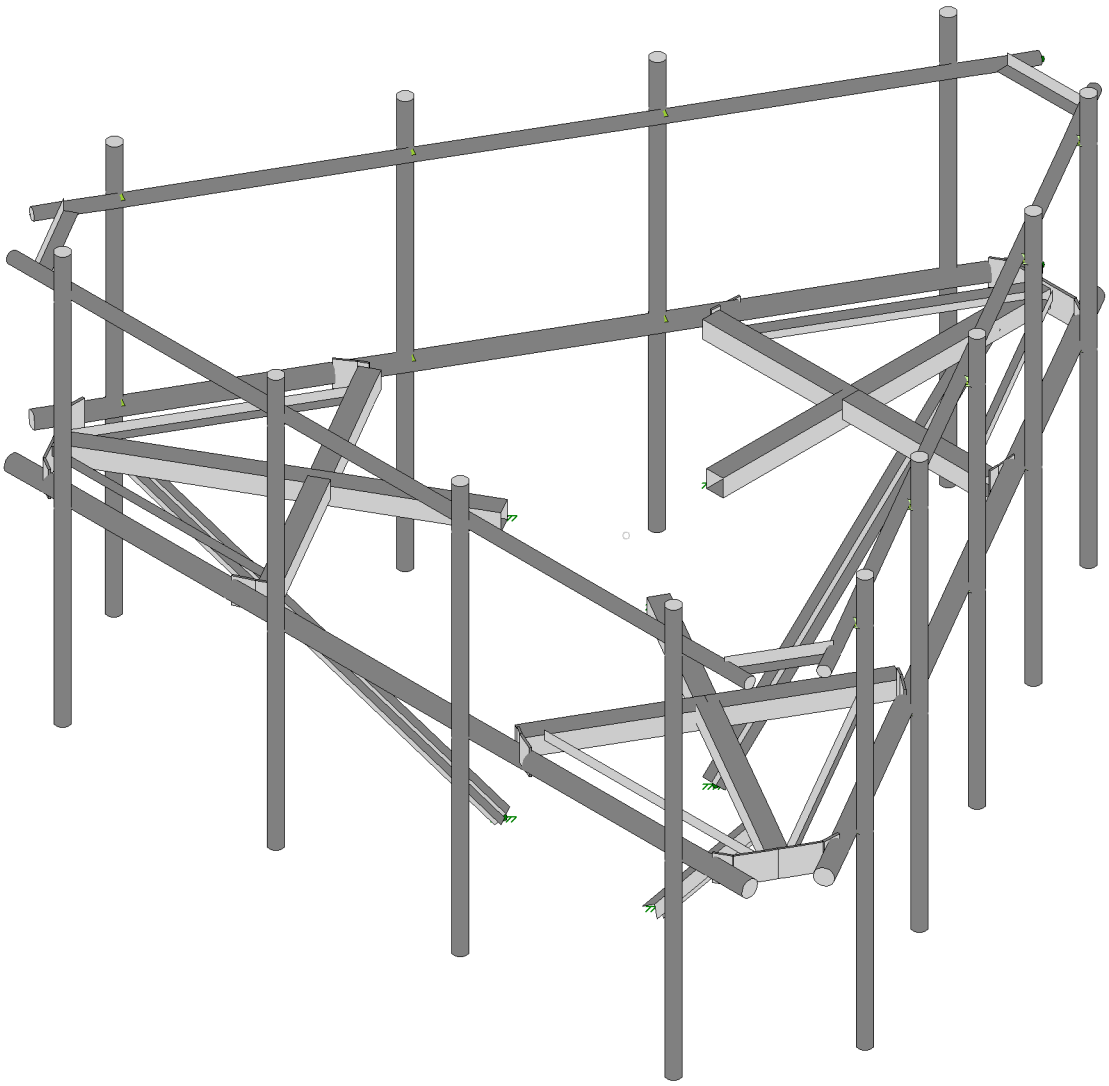
Sector A:	0	Deg	
Sector B:	120	Deg	
Sector C:	240	Deg	
Climbing		Deg	Located at Section B
Climbing Facility	Corrosion Type:		Good condition
	Access:		Climbing path was unobstructed.
	Condition:		N/A



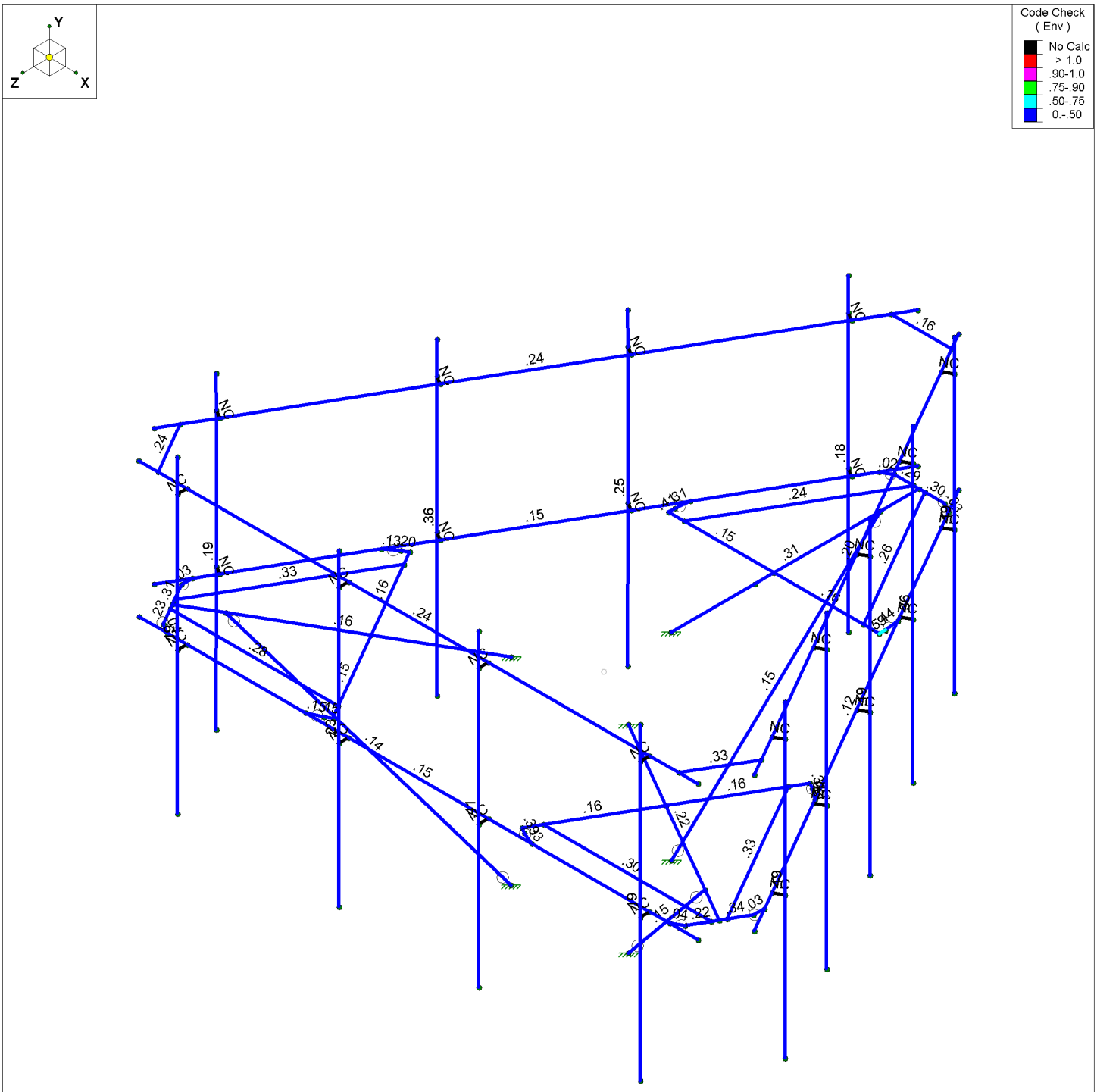
Are Ant same as sector A/B?	No	**Sector C**							
Ant_{1a}	n/a							15	
Ant_{1b}	Ericsson Panel	13	9	58		24	10	15	61
Ant_{1c}	n/a							15	
Ant_{2a}	n/a							63	
Ant_{2b}	Ericsson Panel	13	9	58		24	10	63	
Ant_{2c}	n/a							63	
Ant_{3a}	n/a							n/a	



Ant_{3b}	n/a							n/a	
Ant_{3c}	n/a							n/a	
Ant_{4a}	Ericsson RRUS					36	-4	111	60
Ant_{4b}	RFS APXVAARR24_43					24	7	111	60
Ant_{4c}	n/a							111	
Ant_{5a}	Ericsson TMA	7	8	3		10	0	159	59
Ant_{5b}	Unknown Panel	13	3.5	56		18	6	159	59
Ant_{5c}	Ericsson TMA	5	6	3		-6	0	159	59

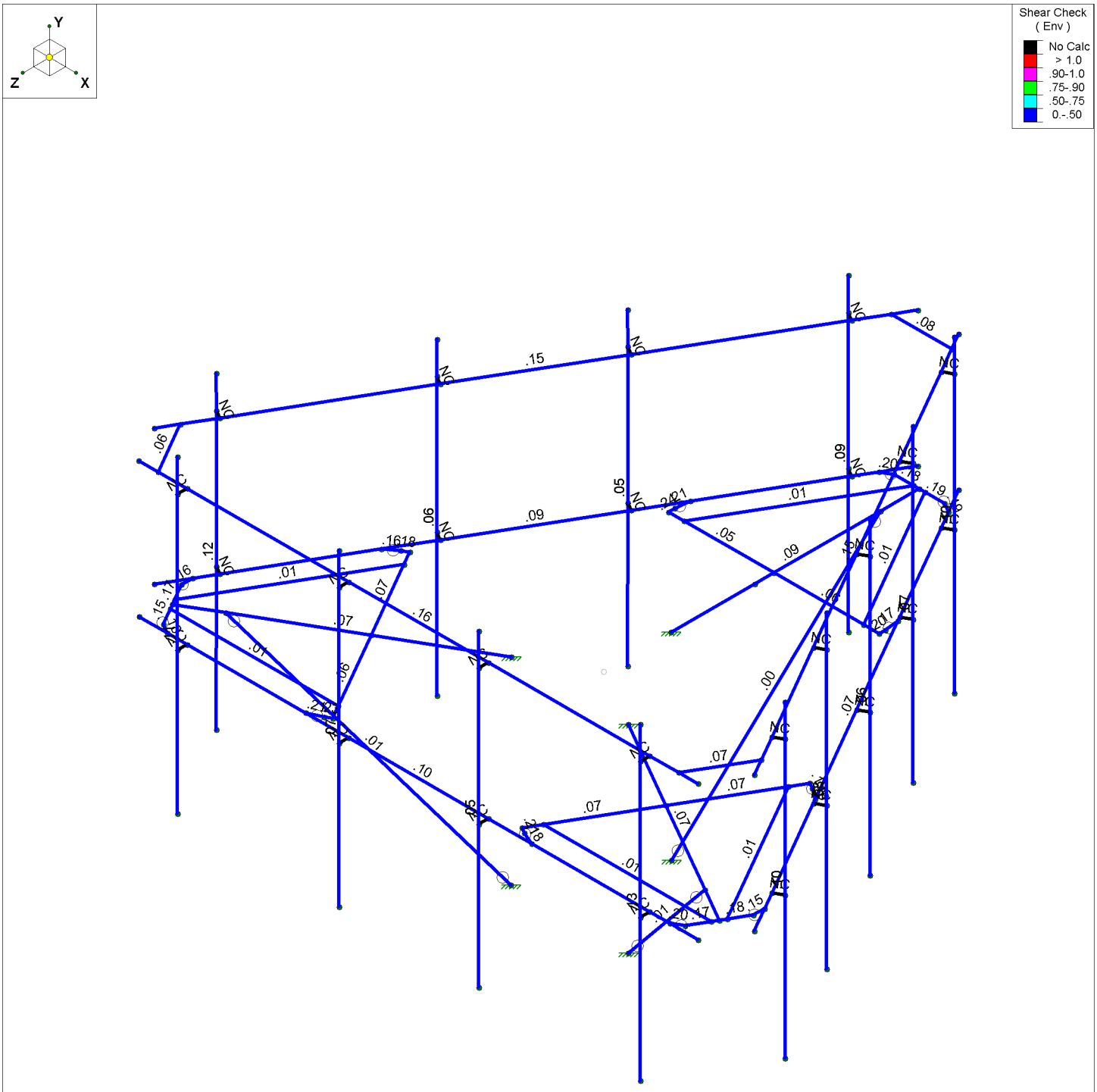


Tower Engineering Solutio...	CT13070-A-SBA_MT_LO_Loads Only_G	SK - 1
		June 22, 2020 at 10:56 AM
TES Project No. 94640		CT13070-A-SBA_94640_G_RISA_L...



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

Tower Engineering Solutio...	CT13070-A-SBA_MT_LO_Loads Only_G	SK - 2
		June 22, 2020 at 10:56 AM
TES Project No. 94640		CT13070-A-SBA_94640_G_RISA_L...



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

Basic Load Cases

	BLC Description	Category	X Grav...	Y Grav...	Z Gravi...	Joint	Point	Distrib...	Area(M...	Surface(Plate/Wall)
1	Antenna D	None					38			
2	Antenna Di	None					38			
3	Antenna W Front	None					38			
4	Antenna Wi Front	None					38			
5	Antenna W Side	None					38			
6	Antenna Wi Side	None					38			
7	Service Lm1	None					1			
8	Service Lm2	None					1			
9	Structure D	None		-1					3	
10	Structure Di	None						64	3	
11	Structure W Front	None						64		
12	Structure Wi Front	None						64		
13	Structure W Side	None						64		
14	Structure Wi Side	None						64		
15	BLC 9 Transient Area ...	None						57		
16	BLC 10 Transient Are...	None						57		

Load Combinations

	Description	Solve	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	1.2D+1.6W (Front)	Yes	Y		1	1.2	9	1.2	3	1.6	11	1.6														
2	1.2D+1.6W (Back)	Yes	Y		1	1.2	9	1.2	3	-1.6	11	-1.6														
3	1.2D+1.6W (Left)	Yes	Y		1	1.2	9	1.2	5	1.6	13	1.6														
4	1.2D+1.6W (Right)	Yes	Y		1	1.2	9	1.2	5	-1.6	13	-1.6														
5	1.2D+1.0Di+1.0Wi (Fro...	Yes	Y		1	1.2	9	1.2	2	1	10	1	4	1	12	1										
6	1.2D+1.0Di+1.0Wi (Back)	Yes	Y		1	1.2	9	1.2	2	1	10	1	4	-1	12	-1										
7	1.2D+1.0Di+1.0Wi (Left)	Yes	Y		1	1.2	9	1.2	2	1	10	1	6	1	14	1										
8	1.2D+1.0Di+1.0Wi (Rig...	Yes	Y		1	1.2	9	1.2	2	1	10	1	6	-1	14	-1										
9	1.2D+1.5L1+.16W (Mai...	Yes	Y		1	1.2	9	1.2	7	1.5	3	.16	11	.16												
10	1.2D+1.5L2+.16W (Mai...	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																		

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
1	NP4	-7.251306	0	4.802255	0	
2	NP1	7.248694	0	4.802255	0	
3	CG	0	0	0	0	
4	N56	-1e-14	0	-1.75	0	
5	N30	-0.001303	0	-3.92336	0	
6	N145	-1e-14	-5.125	-1.760626	0	
7	N148	-0.001783	0	-7.18	0	
8	N158	-7.251306	3.5	4.802256	0	
9	N161	7.248694	3.5	4.802256	0	
10	N162	6.748694	3.5	4.802256	0	
11	N163	-6.751306	3.5	4.802256	0	
12	N71	-6.001309	3.5	4.802256	0	

Joint Coordinates and Temperatures (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
13	N72	-6.001309	4.333333	5.052256	0	
14	N73	-6.001309	-3.666667	5.052256	0	
15	N76	-1.81119	4.333333	5.052256	0	
16	N77	-1.81119	-3.666667	5.052256	0	
17	N78	1.81119	4.333333	5.052256	0	
18	N79A	1.81119	-3.666667	5.052256	0	
19	N104	-6.001309	0	4.802255	0	
20	N106	-1.81119	0	4.802255	0	
21	N107	1.81119	0	4.802255	0	
22	N109	-1.81119	3.5	4.802256	0	
23	N110	1.81119	3.5	4.802256	0	
24	N49	7.782569	0	3.877557	0	
25	N50A	0.532569	0	-8.679812	0	
26	N51A	-0.535181	0	-8.679812	0	
27	N52	-7.785181	0	3.877557	0	
28	N53A	0.898555	0	-8.045904	0	
29	N55	0.64726	0	-8.189494	0	
30	N58	-0.902122	0	-8.044251	0	
31	N60	-0.650827	0	-8.187841	0	
32	N61	2.690222	0	-4.942646	0	
33	N63	2.730594	0	-4.581055	0	
34	N66	-2.693788	0	-4.940994	0	
35	N68	-2.73416	0	-4.579402	0	
36	N69	-0.001783	0	-8.188668	0	
37	N65	2.730594	0	-4.414388	0	
38	N70	-2.733206	0	-4.414388	0	
39	N69C	-0.001783	0	-4.414388	0	
40	N70A	-2.329431	0	-4.414388	0	
41	N71A	2.326819	0	-4.414388	0	
42	N76B	0.146296	0	-8.188856	0	
43	N77B	-0.149125	0	-8.18848	0	
44	N48	-1.517503	0	0.873869	0	
45	N49A	-1.526706	-5.125	0.879182	0	
46	N50	-6.218973	0	3.59	0	
47	N51	-7.419194	0	3.243649	0	
48	N52A	-7.417899	0	3.533072	0	
49	N53	-6.517424	0	4.802255	0	
50	N54	-6.767424	0	4.656422	0	
51	N55A	-5.627527	0	0.140391	0	
52	N56A	-5.334566	0	-0.075367	0	
53	N57	-2.934091	0	4.802255	0	
54	N58A	-2.600757	0	4.656422	0	
55	N59	-7.092662	0	4.094747	0	
56	N60A	-5.190228	0	-0.158701	0	
57	N61A	-2.458328	0	4.573089	0	
58	N62	-3.824562	0	2.206702	0	
59	N63A	-2.660882	0	4.222255	0	
60	N64	-4.988341	0	0.190979	0	
61	N65A	-7.166864	0	3.966601	0	
62	N66A	-7.018828	0	4.222255	0	
63	N67	1.513585	0	0.876131	0	
64	N68A	1.522788	-5.125	0.881444	0	

Joint Coordinates and Temperatures (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
65	N69A	6.217152	0	3.59	0	
66	N70B	6.516721	0	4.802255	0	
67	N71B	6.766721	0	4.656422	0	
68	N72A	7.415628	0	3.241996	0	
69	N73A	7.414333	0	3.531419	0	
70	N74A	2.933387	0	4.802255	0	
71	N75A	2.600054	0	4.656422	0	
72	N76A	5.623961	0	0.138739	0	
73	N77A	5.330999	0	-0.07702	0	
74	N78A	7.090527	0	4.093921	0	
75	N79	2.455716	0	4.573089	0	
76	N80	5.187616	0	-0.158701	0	
77	N81	3.821382	0	2.207686	0	
78	N82	4.985729	0	0.190979	0	
79	N83	2.65827	0	4.222255	0	
80	N84	7.016651	0	4.222255	0	
81	N85	7.164035	0	3.966225	0	
82	N86	7.78257	3.5	3.877556	0	
83	N87	0.53257	3.5	-8.679812	0	
84	N88	-0.535182	3.5	-8.679812	0	
85	N89	-7.785182	3.5	3.877556	0	
86	N94	5.904017	4.333333	0.123809	0	
87	N95	5.904017	-3.666667	0.123809	0	
88	N96	2.842827	4.333333	-5.178328	0	
89	N97	2.842827	-3.666667	-5.178328	0	
90	N102	-3.471746	4.333333	-4.093533	0	
91	N103	-3.471746	-3.666667	-4.093533	0	
92	N104A	-5.282936	4.333333	-0.95646	0	
93	N105A	-5.282936	-3.666667	-0.95646	0	
94	N106A	0.78257	3.5	-8.246799	0	
95	N107A	7.53257	3.5	3.444543	0	
96	N108A	-7.535182	3.5	3.444543	0	
97	N109A	-0.785182	3.5	-8.246799	0	
98	N112	5.68751	0	0.248809	0	
99	N113	2.62632	0	-5.053328	0	
100	N116	-3.255239	0	-3.968533	0	
101	N117	-5.066429	0	-0.83146	0	
102	N120	5.687512	3.5	0.248809	0	
103	N121	2.626322	3.5	-5.053328	0	
104	N124	-3.25524	3.5	-3.968533	0	
105	N125	-5.06643	3.5	-0.83146	0	
106	N106B	5.998697	4.333333	5.052256	0	
107	N107B	5.998697	-3.666667	5.052256	0	
108	N108	7.374077	4.333333	2.670028	0	
109	N109B	7.374077	-3.666667	2.670028	0	
110	N110A	1.374074	4.333333	-7.722283	0	
111	N111	1.374074	-3.666667	-7.722283	0	
112	N112A	-1.376686	4.333333	-7.722283	0	
113	N113A	-1.376686	-3.666667	-7.722283	0	
114	N114	-7.376689	4.333333	2.670028	0	
115	N115	-7.376689	-3.666667	2.670028	0	
116	N116A	5.998697	0	4.802255	0	

Joint Coordinates and Temperatures (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
117	N117A	5.998697	3.5	4.802256	0	
118	N118	7.15757	0	2.795028	0	
119	N119	1.157567	0	-7.597283	0	
120	N120A	-1.160179	0	-7.597283	0	
121	N121A	-7.160182	0	2.795028	0	
122	N122	7.157572	3.5	2.795028	0	
123	N123	1.157568	3.5	-7.597283	0	
124	N124A	-1.16018	3.5	-7.597283	0	
125	N125A	-7.160184	3.5	2.795028	0	
126	N126	-6.001309	3.5	5.052256	0	
127	N127	-6.001309	0	5.052255	0	
128	N128	-1.81119	0	5.052255	0	
129	N129	1.81119	0	5.052255	0	
130	N130	-1.81119	3.5	5.052256	0	
131	N131	1.81119	3.5	5.052256	0	
132	N132	5.998697	0	5.052255	0	
133	N133	5.998697	3.5	5.052256	0	
134	N142	7.376036	3.5	2.671159	0	
135	N143	7.376036	0	2.671159	0	
136	N144	5.905976	0	0.12494	0	
137	N145A	2.844786	0	-5.177196	0	
138	N146	5.905976	3.5	0.12494	0	
139	N147	2.844786	3.5	-5.177196	0	
140	N148A	1.376032	0	-7.721152	0	
141	N149	1.376033	3.5	-7.721152	0	
142	N158A	-1.374727	3.5	-7.723414	0	
143	N159	-1.374727	0	-7.723414	0	
144	N160	-3.469787	0	-4.094664	0	
145	N161A	-5.280977	0	-0.957591	0	
146	N162A	-3.469787	3.5	-4.094664	0	
147	N163A	-5.280977	3.5	-0.957591	0	
148	N164	-7.37473	0	2.668897	0	
149	N165	-7.374731	3.5	2.668896	0	
150	N150	4.367827	4.333333	-2.53695	0	
151	N151	4.367827	-3.666667	-2.53695	0	
152	N152	4.15132	0	-2.41195	0	
153	N153	4.151322	3.5	-2.41195	0	
154	N154	4.369786	0	-2.535819	0	
155	N155	4.369786	3.5	-2.535819	0	

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design ...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Footrails	PIPE_3.0	Beam	Pipe	A53 Gr.B	Typical	2.07	2.85	2.85	5.69
2	Grating Angles	L2x2x3	Beam	Single Angle	A36 Gr.36	Typical	.722	.271	.271	.009
3	Handrails	PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
4	Standoff Arm	HSS4x4x4	Beam	SquareTube	A500 Gr.46	Typical	3.37	7.8	7.8	12.8
5	Plan Bracing	HSS4x4x4	Beam	SquareTube	A500 Gr.46	Typical	3.37	7.8	7.8	12.8
6	Kickers	LL2.5x2.5x3x3	Beam	Double Angle (3/8 Gap)	A36 Gr.36	Typical	1.8	2.46	1.07	.023
7	Mount Pipes	PIPE_2.5	Beam	Pipe	A53 Gr.B	Typical	1.61	1.45	1.45	2.89
8	Footrail Connecti...	PL1/2x6	Beam	RECT	A36 Gr.36	Typical	3	.063	9	.237

Hot Rolled Steel Section Sets (Continued)

	Label	Shape	Type	Design List	Material	Design ...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
9	Plan Bracing Con...	PL3/8x6	Beam	RECT	A36 Gr.36	Typical	2.25	.026	6.75	.101
10	Handrail Corner ...	L2.5x2.5x4	Beam	Single Angle	A36 Gr.36	Typical	1.19	.692	.692	.026

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1E...	Density[k/ft...	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
2	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	58	1.2
3	A992	29000	11154	.3	.65	.49	50	1.1	58	1.2
4	A500 Gr.42	29000	11154	.3	.65	.49	42	1.3	58	1.1
5	A500 Gr.46	29000	11154	.3	.65	.49	46	1.2	58	1.1
6	A53 Gr.B	29000	11154	.3	.65	.49	35	1.5	58	1.2
7	Q235	29000	11154	.3	.65	.49	34	1.5	58	1.2
8	J429-Gr5	29000	11154	.3	.65	.49	92	1.5	120	1.2

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M28	N69	N55			Footrail Conne...	Beam	RECT	A36 Gr.36	Typical
2	M33	N76B	N71A			Grating Angles	Beam	Single Angle	A36 Gr.36	Typical
3	M34	N77B	N70A		270	Grating Angles	Beam	Single Angle	A36 Gr.36	Typical
4	M37	N69	N56			Standoff Arm	Beam	SquareTube	A500 Gr.46	Typical
5	M38	N70	N69C			Plan Bracing	Beam	SquareTube	A500 Gr.46	Typical
6	M39	N69C	N65			Plan Bracing	Beam	SquareTube	A500 Gr.46	Typical
7	M42	NP4	NP1			Footrails	Beam	Pipe	A53 Gr.B	Typical
8	M140	N145	N148			Kickers	Beam	Double Angle (...	A36 Gr.36	Typical
9	M154	N158	N161			Handrails	Beam	Pipe	A53 Gr.B	Typical
10	MP4A	N72	N73			Mount Pipes	Beam	Pipe	A53 Gr.B	Typical
11	MP3A	N76	N77			Mount Pipes	Beam	Pipe	A53 Gr.B	Typical
12	MP2A	N78	N79A			Mount Pipes	Beam	Pipe	A53 Gr.B	Typical
13	M25	N49	N50A			Footrails	Beam	Pipe	A53 Gr.B	Typical
14	M26	N51A	N52			Footrails	Beam	Pipe	A53 Gr.B	Typical
15	M28A	N55	N53A			Footrail Conne...	Beam	RECT	A36 Gr.36	Typical
16	M29A	N60	N58			Footrail Conne...	Beam	RECT	A36 Gr.36	Typical
17	M32A	N63	N61			Plan Bracing C...	Beam	RECT	A36 Gr.36	Typical
18	M33A	N68	N66			Plan Bracing C...	Beam	RECT	A36 Gr.36	Typical
19	M35A	N69	N60			Footrail Conne...	Beam	RECT	A36 Gr.36	Typical
20	M33B	N65	N63			Plan Bracing C...	Beam	RECT	A36 Gr.36	Typical
21	M36A	N70	N68			Plan Bracing C...	Beam	RECT	A36 Gr.36	Typical
22	M23	N59	N52A			Footrail Conne...	Beam	RECT	A36 Gr.36	Typical
23	M24	N65A	N64			Grating Angles	Beam	Single Angle	A36 Gr.36	Typical
24	M25A	N66A	N63A		270	Grating Angles	Beam	Single Angle	A36 Gr.36	Typical
25	M26A	N59	N48			Standoff Arm	Beam	SquareTube	A500 Gr.46	Typical
26	M27	N61A	N62			Plan Bracing	Beam	SquareTube	A500 Gr.46	Typical
27	M28B	N62	N60A			Plan Bracing	Beam	SquareTube	A500 Gr.46	Typical
28	M29	N49A	N50			Kickers	Beam	Double Angle (...	A36 Gr.36	Typical
29	M30	N52A	N51			Footrail Conne...	Beam	RECT	A36 Gr.36	Typical
30	M31	N54	N53			Footrail Conne...	Beam	RECT	A36 Gr.36	Typical
31	M32	N56A	N55A			Plan Bracing C...	Beam	RECT	A36 Gr.36	Typical
32	M33C	N58A	N57			Plan Bracing C...	Beam	RECT	A36 Gr.36	Typical
33	M34A	N59	N54			Footrail Conne...	Beam	RECT	A36 Gr.36	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
34	M35	N60A	N56A			Plan Bracing C...	Beam	RECT	A36 Gr.36	Typical
35	M36	N61A	N58A			Plan Bracing C...	Beam	RECT	A36 Gr.36	Typical
36	M37A	N78A	N71B			Footrail Conne...	Beam	RECT	A36 Gr.36	Typical
37	M38A	N84	N83			Grating Angles	Beam	Single Angle	A36 Gr.36	Typical
38	M39A	N85	N82		270	Grating Angles	Beam	Single Angle	A36 Gr.36	Typical
39	M40	N78A	N67			Standoff Arm	Beam	SquareTube	A500 Gr.46	Typical
40	M41	N80	N81			Plan Bracing	Beam	SquareTube	A500 Gr.46	Typical
41	M42A	N81	N79			Plan Bracing	Beam	SquareTube	A500 Gr.46	Typical
42	M43	N68A	N69A			Kickers	Beam	Double Angle (...	A36 Gr.36	Typical
43	M44	N71B	N70B			Footrail Conne...	Beam	RECT	A36 Gr.36	Typical
44	M45	N73A	N72A			Footrail Conne...	Beam	RECT	A36 Gr.36	Typical
45	M46	N75A	N74A			Plan Bracing C...	Beam	RECT	A36 Gr.36	Typical
46	M47	N77A	N76A			Plan Bracing C...	Beam	RECT	A36 Gr.36	Typical
47	M48	N78A	N73A			Footrail Conne...	Beam	RECT	A36 Gr.36	Typical
48	M49	N79	N75A			Plan Bracing C...	Beam	RECT	A36 Gr.36	Typical
49	M50	N80	N77A			Plan Bracing C...	Beam	RECT	A36 Gr.36	Typical
50	M51	N86	N87			Handrails	Beam	Pipe	A53 Gr.B	Typical
51	M52	N88	N89			Handrails	Beam	Pipe	A53 Gr.B	Typical
52	MP4C	N94	N95			Mount Pipes	Beam	Pipe	A53 Gr.B	Typical
53	MP2C	N96	N97			Mount Pipes	Beam	Pipe	A53 Gr.B	Typical
54	MP3B	N102	N103			Mount Pipes	Beam	Pipe	A53 Gr.B	Typical
55	MP2B	N104A	N105A			Mount Pipes	Beam	Pipe	A53 Gr.B	Typical
56	M61	N163	N108A			Handrail Corne...	Beam	Single Angle	A36 Gr.36	Typical
57	M62	N162	N107A			Handrail Corne...	Beam	Single Angle	A36 Gr.36	Typical
58	M63	N109A	N106A			Handrail Corne...	Beam	Single Angle	A36 Gr.36	Typical
59	MP1A	N106B	N107B			Mount Pipes	Beam	Pipe	A53 Gr.B	Typical
60	MP5C	N108	N109B			Mount Pipes	Beam	Pipe	A53 Gr.B	Typical
61	MP1C	N110A	N111			Mount Pipes	Beam	Pipe	A53 Gr.B	Typical
62	MP4B	N112A	N113A			Mount Pipes	Beam	Pipe	A53 Gr.B	Typical
63	MP1B	N114	N115			Mount Pipes	Beam	Pipe	A53 Gr.B	Typical
64	M64	N71	N126			RIGID	None	None	RIGID	Typical
65	M65	N104	N127			RIGID	None	None	RIGID	Typical
66	M66	N109	N130			RIGID	None	None	RIGID	Typical
67	M67	N106	N128			RIGID	None	None	RIGID	Typical
68	M68	N110	N131			RIGID	None	None	RIGID	Typical
69	M69	N107	N129			RIGID	None	None	RIGID	Typical
70	M70	N117A	N133			RIGID	None	None	RIGID	Typical
71	M71	N116A	N132			RIGID	None	None	RIGID	Typical
72	M72	N122	N142			RIGID	None	None	RIGID	Typical
73	M73	N118	N143			RIGID	None	None	RIGID	Typical
74	M74	N120	N146			RIGID	None	None	RIGID	Typical
75	M75	N112	N144			RIGID	None	None	RIGID	Typical
76	M76	N121	N147			RIGID	None	None	RIGID	Typical
77	M77	N113	N145A			RIGID	None	None	RIGID	Typical
78	M78	N123	N149			RIGID	None	None	RIGID	Typical
79	M79	N119	N148A			RIGID	None	None	RIGID	Typical
80	M80	N124A	N158A			RIGID	None	None	RIGID	Typical
81	M81	N120A	N159			RIGID	None	None	RIGID	Typical
82	M82	N124	N162A			RIGID	None	None	RIGID	Typical
83	M83	N116	N160			RIGID	None	None	RIGID	Typical
84	M84	N125	N163A			RIGID	None	None	RIGID	Typical
85	M85	N117	N161A			RIGID	None	None	RIGID	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
86	M86	N125A	N165			RIGID	None	None	RIGID	Typical
87	M87	N121A	N164			RIGID	None	None	RIGID	Typical
88	MP3C	N150	N151			Mount Pipes	Beam	Pipe	A53 Gr.B	Typical
89	M89	N153	N155			RIGID	None	None	RIGID	Typical
90	M90	N152	N154			RIGID	None	None	RIGID	Typical

Member Advanced Data

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Analysis ...	Inactive	Seismic Design ...
1	M28						Yes			None
2	M33						Yes			None
3	M34						Yes			None
4	M37						Yes			None
5	M38						Yes			None
6	M39						Yes			None
7	M42						Yes			None
8	M140	BenPIN	BenPIN				Yes			None
9	M154						Yes			None
10	MP4A						Yes			None
11	MP3A						Yes			None
12	MP2A						Yes			None
13	M25						Yes			None
14	M26						Yes			None
15	M28A		BenPIN				Yes			None
16	M29A		BenPIN				Yes			None
17	M32A		BenPIN				Yes			None
18	M33A		BenPIN				Yes			None
19	M35A						Yes			None
20	M33B						Yes			None
21	M36A						Yes			None
22	M23						Yes			None
23	M24						Yes			None
24	M25A						Yes			None
25	M26A						Yes			None
26	M27						Yes			None
27	M28B						Yes			None
28	M29	BenPIN	BenPIN				Yes			None
29	M30		BenPIN				Yes			None
30	M31		BenPIN				Yes			None
31	M32		BenPIN				Yes			None
32	M33C		BenPIN				Yes			None
33	M34A						Yes			None
34	M35						Yes			None
35	M36						Yes			None
36	M37A						Yes			None
37	M38A						Yes			None
38	M39A						Yes			None
39	M40						Yes			None
40	M41						Yes			None
41	M42A						Yes			None
42	M43	BenPIN	BenPIN				Yes			None

Member Advanced Data (Continued)

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Analysis ...	Inactive	Seismic Design ...
43	M44		BenPIN				Yes			None
44	M45		BenPIN				Yes			None
45	M46		BenPIN				Yes			None
46	M47		BenPIN				Yes			None
47	M48						Yes			None
48	M49						Yes			None
49	M50						Yes			None
50	M51						Yes			None
51	M52						Yes			None
52	MP4C						Yes			None
53	MP2C						Yes			None
54	MP3B						Yes			None
55	MP2B						Yes			None
56	M61						Yes			None
57	M62						Yes			None
58	M63						Yes			None
59	MP1A						Yes			None
60	MP5C						Yes			None
61	MP1C						Yes			None
62	MP4B						Yes			None
63	MP1B						Yes			None
64	M64						Yes			None
65	M65						Yes			None
66	M66						Yes			None
67	M67						Yes			None
68	M68						Yes			None
69	M69						Yes			None
70	M70						Yes			None
71	M71						Yes			None
72	M72						Yes			None
73	M73						Yes			None
74	M74						Yes			None
75	M75						Yes			None
76	M76						Yes			None
77	M77						Yes			None
78	M78						Yes			None
79	M79						Yes			None
80	M80						Yes			None
81	M81						Yes			None
82	M82						Yes			None
83	M83						Yes			None
84	M84						Yes			None
85	M85						Yes			None
86	M86						Yes			None
87	M87						Yes			None
88	MP3C						Yes			None
89	M89						Yes			None
90	M90						Yes			None

Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[ft]	Lcomp bot[ft]	L-torqu...	Kyy	Kzz	Cb	Function
1	M28	Footrail Con...	.649			Lbyy			.65	.65		Lateral
2	M33	Grating Ang...	4.359			Lbyy			.65	.65		Lateral
3	M34	Grating Ang...	4.359			Lbyy			.65	.65		Lateral
4	M37	Standoff Arm	6.439			Lbyy			2.1	2.1		Lateral
5	M38	Plan Bracing	2.731			Lbyy			.65	.65		Lateral
6	M39	Plan Bracing	2.732			Lbyy			.65	.65		Lateral
7	M42	Footrails	14.5			Lbyy			1	1		Lateral
8	M140	Kickers	7.459			Lbyy			1	1		Lateral
9	M154	Handrails	14.5			Lbyy			1	1		Lateral
10	MP4A	Mount Pipes	8			Lbyy			1	1		Lateral
11	MP3A	Mount Pipes	8			Lbyy			1	1		Lateral
12	MP2A	Mount Pipes	8			Lbyy			1	1		Lateral
13	M25	Footrails	14.5			Lbyy			1	1		Lateral
14	M26	Footrails	14.5			Lbyy			1	1		Lateral
15	M28A	Footrail Con...	.289			Lbyy			.8	.8		Lateral
16	M29A	Footrail Con...	.289			Lbyy			.8	.8		Lateral
17	M32A	Plan Bracin...	.364			Lbyy			.8	.8		Lateral
18	M33A	Plan Bracin...	.364			Lbyy			.8	.8		Lateral
19	M35A	Footrail Con...	.649			Lbyy			.65	.65		Lateral
20	M33B	Plan Bracin...	.167			Lbyy			.65	.65		Lateral
21	M36A	Plan Bracin...	.165			Lbyy			.65	.65		Lateral
22	M23	Footrail Con...	.649			Lbyy			.65	.65		Lateral
23	M24	Grating Ang...	4.359			Lbyy			.65	.65		Lateral
24	M25A	Grating Ang...	4.358			Lbyy			.65	.65		Lateral
25	M26A	Standoff Arm	6.439			Lbyy			2.1	2.1		Lateral
26	M27	Plan Bracing	2.732			Lbyy			.65	.65		Lateral
27	M28B	Plan Bracing	2.731			Lbyy			.65	.65		Lateral
28	M29	Kickers	7.459			Lbyy			1	1		Lateral
29	M30	Footrail Con...	.289			Lbyy			.8	.8		Lateral
30	M31	Footrail Con...	.289			Lbyy			.8	.8		Lateral
31	M32	Plan Bracin...	.364			Lbyy			.8	.8		Lateral
32	M33C	Plan Bracin...	.364			Lbyy			.8	.8		Lateral
33	M34A	Footrail Con...	.649			Lbyy			.65	.65		Lateral
34	M35	Plan Bracin...	.167			Lbyy			.65	.65		Lateral
35	M36	Plan Bracin...	.165			Lbyy			.65	.65		Lateral
36	M37A	Footrail Con...	.649			Lbyy			.65	.65		Lateral
37	M38A	Grating Ang...	4.358			Lbyy			.65	.65		Lateral
38	M39A	Grating Ang...	4.359			Lbyy			.65	.65		Lateral
39	M40	Standoff Arm	6.439			Lbyy			2.1	2.1		Lateral
40	M41	Plan Bracing	2.732			Lbyy			.65	.65		Lateral
41	M42A	Plan Bracing	2.731			Lbyy			.65	.65		Lateral
42	M43	Kickers	7.459			Lbyy			1	1		Lateral
43	M44	Footrail Con...	.289			Lbyy			.8	.8		Lateral
44	M45	Footrail Con...	.289			Lbyy			.8	.8		Lateral
45	M46	Plan Bracin...	.364			Lbyy			.8	.8		Lateral
46	M47	Plan Bracin...	.364			Lbyy			.8	.8		Lateral
47	M48	Footrail Con...	.649			Lbyy			.65	.65		Lateral
48	M49	Plan Bracin...	.167			Lbyy			.65	.65		Lateral
49	M50	Plan Bracin...	.165			Lbyy			.65	.65		Lateral
50	M51	Handrails	14.5			Lbyy			1	1		Lateral
51	M52	Handrails	14.5			Lbyy			1	1		Lateral

Hot Rolled Steel Design Parameters (Continued)

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[ft]	Lcomp bot[ft]	L-torqu...	Kyy	Kzz	Cb	Function
52	MP4C	Mount Pipes	8			Lbyy			1	1		Lateral
53	MP2C	Mount Pipes	8			Lbyy			1	1		Lateral
54	MP3B	Mount Pipes	8			Lbyy			1	1		Lateral
55	MP2B	Mount Pipes	8			Lbyy			1	1		Lateral
56	M61	Handrail Co...	1.568			Lbyy			.65	.65		Lateral
57	M62	Handrail Co...	1.568			Lbyy			.65	.65		Lateral
58	M63	Handrail Co...	1.568			Lbyy			.65	.65		Lateral
59	MP1A	Mount Pipes	8			Lbyy			1	1		Lateral
60	MP5C	Mount Pipes	8			Lbyy			1	1		Lateral
61	MP1C	Mount Pipes	8			Lbyy			1	1		Lateral
62	MP4B	Mount Pipes	8			Lbyy			1	1		Lateral
63	MP1B	Mount Pipes	8			Lbyy			1	1		Lateral
64	MP3C	Mount Pipes	8			Lbyy			1	1		Lateral

Joint Loads and Enforced Displacements

Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), (lb*s^2...
No Data to Print ...			

Member Point Loads (BLC 1 : Antenna D)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[ft,%]
1	MP1A	Y	-20.35	2
2	MP1A	Y	-20.35	6
3	MP1B	Y	-20.35	2
4	MP1B	Y	-20.35	6
5	MP1C	Y	-20.35	2
6	MP1C	Y	-20.35	6
7	MP2A	Y	-64	0
8	MP2A	Y	-64	7
9	MP2B	Y	-64	0
10	MP2B	Y	-64	7
11	MP2C	Y	-64	0
12	MP2C	Y	-64	7
13	MP4A	Y	-66.1	1.5
14	MP4A	Y	-66.1	6.5
15	MP4B	Y	-66.1	1.5
16	MP4B	Y	-66.1	6.5
17	MP4C	Y	-66.1	1.5
18	MP4C	Y	-66.1	6.5
19	MP5C	Y	-66.1	1.5
20	MP5C	Y	-66.1	6.5
21	MP4A	Y	-15.4	2
22	MP4B	Y	-15.4	2
23	MP5C	Y	-15.4	2
24	MP4A	Y	-11	4
25	MP4B	Y	-11	4
26	MP5C	Y	-11	4
27	MP2A	Y	-70	3
28	MP2B	Y	-70	3
29	MP2C	Y	-70	3

Member Point Loads (BLC 1 : Antenna D) (Continued)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[ft,%]
30	MP3A	Y	-51.5	2.5
31	MP3A	Y	-51.5	5.5
32	MP3B	Y	-51.5	2.5
33	MP3B	Y	-51.5	5.5
34	MP3C	Y	-51.5	2.5
35	MP3C	Y	-51.5	5.5
36	MP1A	Y	-46	3
37	MP1B	Y	-46	3
38	MP1C	Y	-46	3

Member Point Loads (BLC 2 : Antenna Di)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[ft,%]
1	MP1A	Y	-65.097	2
2	MP1A	Y	-65.097	6
3	MP1B	Y	-65.097	2
4	MP1B	Y	-65.097	6
5	MP1C	Y	-65.097	2
6	MP1C	Y	-65.097	6
7	MP2A	Y	-205.443	0
8	MP2A	Y	-205.443	7
9	MP2B	Y	-205.443	0
10	MP2B	Y	-205.443	7
11	MP2C	Y	-205.443	0
12	MP2C	Y	-205.443	7
13	MP4A	Y	-87.235	1.5
14	MP4A	Y	-87.235	6.5
15	MP4B	Y	-87.235	1.5
16	MP4B	Y	-87.235	6.5
17	MP4C	Y	-87.235	1.5
18	MP4C	Y	-87.235	6.5
19	MP5C	Y	-87.235	1.5
20	MP5C	Y	-87.235	6.5
21	MP4A	Y	-23.365	2
22	MP4B	Y	-23.365	2
23	MP5C	Y	-23.365	2
24	MP4A	Y	-15.297	4
25	MP4B	Y	-15.297	4
26	MP5C	Y	-15.297	4
27	MP2A	Y	-64.785	3
28	MP2B	Y	-64.785	3
29	MP2C	Y	-64.785	3
30	MP3A	Y	-72.806	2.5
31	MP3A	Y	-72.806	5.5
32	MP3B	Y	-72.806	2.5
33	MP3B	Y	-72.806	5.5
34	MP3C	Y	-72.806	2.5
35	MP3C	Y	-72.806	5.5
36	MP1A	Y	-55.555	3
37	MP1B	Y	-55.555	3
38	MP1C	Y	-55.555	3

Member Point Loads (BLC 3 : Antenna W Front)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[ft,%]
1	MP1A	Z	-102.68	2
2	MP1A	Z	-102.68	6
3	MP1B	Z	-51.57	2
4	MP1B	Z	-51.57	6
5	MP1C	Z	-51.57	2
6	MP1C	Z	-51.57	6
7	MP2A	Z	-321.71	0
8	MP2A	Z	-321.71	7
9	MP2B	Z	-186.388	0
10	MP2B	Z	-186.388	7
11	MP2C	Z	-186.388	0
12	MP2C	Z	-186.388	7
13	MP4A	Z	-103.475	1.5
14	MP4A	Z	-103.475	6.5
15	MP4B	Z	-82.044	1.5
16	MP4B	Z	-82.044	6.5
17	MP4C	Z	-82.044	1.5
18	MP4C	Z	-82.044	6.5
19	MP5C	Z	-82.044	1.5
20	MP5C	Z	-82.044	6.5
21	MP4A	Z	-15.497	2
22	MP4B	Z	-10.343	2
23	MP5C	Z	-10.343	2
24	MP4A	Z	-9.775	4
25	MP4B	Z	-5.226	4
26	MP5C	Z	-5.226	4
27	MP2A	Z	-39.34	3
28	MP2B	Z	-30.622	3
29	MP2C	Z	-30.622	3
30	MP3A	Z	-89.805	2.5
31	MP3A	Z	-89.805	5.5
32	MP3B	Z	-51.248	2.5
33	MP3B	Z	-51.248	5.5
34	MP3C	Z	-51.248	2.5
35	MP3C	Z	-51.248	5.5
36	MP1A	Z	-43.87	3
37	MP1B	Z	-24.518	3
38	MP1C	Z	-24.518	3

Member Point Loads (BLC 4 : Antenna Wi Front)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[ft,%]
1	MP1A	Z	-31.784	2
2	MP1A	Z	-31.784	6
3	MP1B	Z	-17.612	2
4	MP1B	Z	-17.612	6
5	MP1C	Z	-17.612	2
6	MP1C	Z	-17.612	6
7	MP2A	Z	-93.166	0
8	MP2A	Z	-93.166	7
9	MP2B	Z	-56.321	0
10	MP2B	Z	-56.321	7

Member Point Loads (BLC 4 : Antenna Wi Front) (Continued)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[ft,%]
11	MP2C	Z	-56.321	0
12	MP2C	Z	-56.321	7
13	MP4A	Z	-32.025	1.5
14	MP4A	Z	-32.025	6.5
15	MP4B	Z	-26.013	1.5
16	MP4B	Z	-26.013	6.5
17	MP4C	Z	-26.013	1.5
18	MP4C	Z	-26.013	6.5
19	MP5C	Z	-26.013	1.5
20	MP5C	Z	-26.013	6.5
21	MP4A	Z	-5.651	2
22	MP4B	Z	-4.522	2
23	MP5C	Z	-4.522	2
24	MP4A	Z	-3.908	4
25	MP4B	Z	-2.716	4
26	MP5C	Z	-2.716	4
27	MP2A	Z	-13.706	3
28	MP2B	Z	-11.088	3
29	MP2C	Z	-11.088	3
30	MP3A	Z	-27.796	2.5
31	MP3A	Z	-27.796	5.5
32	MP3B	Z	-16.723	2.5
33	MP3B	Z	-16.723	5.5
34	MP3C	Z	-16.723	2.5
35	MP3C	Z	-16.723	5.5
36	MP1A	Z	-15.1	3
37	MP1B	Z	-9.255	3
38	MP1C	Z	-9.255	3

Member Point Loads (BLC 5 : Antenna W Side)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[ft,%]
1	MP1A	X	34.533	2
2	MP1A	X	34.533	6
3	MP1B	X	85.643	2
4	MP1B	X	85.643	6
5	MP1C	X	85.643	2
6	MP1C	X	85.643	6
7	MP2A	X	141.281	0
8	MP2A	X	141.281	7
9	MP2B	X	276.602	0
10	MP2B	X	276.602	7
11	MP2C	X	276.602	0
12	MP2C	X	276.602	7
13	MP4A	X	74.901	1.5
14	MP4A	X	74.901	6.5
15	MP4B	X	96.331	1.5
16	MP4B	X	96.331	6.5
17	MP4C	X	96.331	1.5
18	MP4C	X	96.331	6.5
19	MP5C	X	96.331	1.5
20	MP5C	X	96.331	6.5

Member Point Loads (BLC 5 : Antenna W Side) (Continued)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[ft,%]
21	MP4A	X	11.5	2
22	MP4B	X	18.372	2
23	MP5C	X	18.372	2
24	MP4A	X	4.945	4
25	MP4B	X	11.012	4
26	MP5C	X	11.012	4
27	MP2A	X	36.955	3
28	MP2B	X	48.578	3
29	MP2C	X	48.578	3
30	MP3A	X	38.395	2.5
31	MP3A	X	38.395	5.5
32	MP3B	X	76.953	2.5
33	MP3B	X	76.953	5.5
34	MP3C	X	76.953	2.5
35	MP3C	X	76.953	5.5
36	MP1A	X	24.089	3
37	MP1B	X	49.892	3
38	MP1C	X	49.892	3

Member Point Loads (BLC 6 : Antenna Wi Side)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[ft,%]
1	MP1A	X	12.888	2
2	MP1A	X	12.888	6
3	MP1B	X	27.06	2
4	MP1B	X	27.06	6
5	MP1C	X	27.06	2
6	MP1C	X	27.06	6
7	MP2A	X	44.039	0
8	MP2A	X	44.039	7
9	MP2B	X	80.884	0
10	MP2B	X	80.884	7
11	MP2C	X	80.884	0
12	MP2C	X	80.884	7
13	MP4A	X	24.009	1.5
14	MP4A	X	24.009	6.5
15	MP4B	X	30.021	1.5
16	MP4B	X	30.021	6.5
17	MP4C	X	30.021	1.5
18	MP4C	X	30.021	6.5
19	MP5C	X	30.021	1.5
20	MP5C	X	30.021	6.5
21	MP4A	X	5.528	2
22	MP4B	X	7.033	2
23	MP5C	X	7.033	2
24	MP4A	X	3.092	4
25	MP4B	X	4.681	4
26	MP5C	X	4.681	4
27	MP2A	X	13.62	3
28	MP2B	X	17.111	3
29	MP2C	X	17.111	3
30	MP3A	X	13.032	2.5

Member Point Loads (BLC 6 : Antenna Wi Side) (Continued)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[ft,%]
31	MP3A	X	13.032	5.5
32	MP3B	X	24.105	2.5
33	MP3B	X	24.105	5.5
34	MP3C	X	24.105	2.5
35	MP3C	X	24.105	5.5
36	MP1A	X	9.743	3
37	MP1B	X	17.536	3
38	MP1C	X	17.536	3

Member Point Loads (BLC 7 : Service Lm1)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[ft,%]
1	M42	Y	-500	0

Member Point Loads (BLC 8 : Service Lm2)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[ft,%]
1	M42	Y	-500	%100

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	CG						
2	N56	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
3	N145	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
4	N48	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
5	N49A	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
6	N67	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
7	N68A	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	N56	max	2256.088	4	848.518	8	5469.678	1	1.349	8	4.305	3	.425	3
2		min	-2256.553	3	316.029	9	-3136.555	2	.498	9	-4.324	4	-.273	4
3	N145	max	75.905	4	3041.022	5	-800.469	2	0	1	0	2	0	1
4		min	-75.851	3	733.067	2	-3122.183	5	0	1	0	1	0	2
5	N48	max	4587.097	4	815.096	5	1886.342	1	-.034	1	1.328	1	-.13	9
6		min	-2825.446	3	169.439	9	-2906.021	2	-.618	6	-1.336	2	-1.191	5
7	N49A	max	-655.115	3	2714.255	8	1398.039	8	0	4	0	3	0	3
8		min	-2398.966	8	675.092	3	341.354	3	0	3	0	4	0	4
9	N67	max	2755.462	4	857.144	8	2401.718	1	.041	1	2.81	2	1.222	5
10		min	-4731.252	3	197.844	10	-3575.857	2	-.714	6	-2.79	1	.207	10
11	N68A	max	2623.922	7	2958.666	7	1526.352	7	0	3	0	3	0	3
12		min	752.231	4	780.69	4	396.638	4	0	4	0	4	0	4
13	Totals:	max	9217.463	4	10913.713	5	9196.3	1						
14		min	-9217.546	3	4386.661	2	-9196.31	2						

Envelope Joint Displacements

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [...	LC	Y Rotation [...	LC	Z Rotation [...	LC
1	NP4	max	.105	4	.011	1	.17	4	5.641e-03	2	3.816e-03	4	2.056e-03	9
2		min	-.104	3	-.077	9	-.171	3	-5.054e-03	1	-3.915e-03	3	-1.387e-03	7
3	NP1	max	.105	4	.019	1	.175	3	6.364e-03	2	3.995e-03	4	1.716e-03	8
4		min	-.104	3	-.071	10	-.176	4	-6.039e-03	1	-3.932e-03	3	-2.014e-03	10
5	CG	max	0	1	0	1	0	1	0	1	0	1	0	1
6		min	0	1	0	1	0	1	0	1	0	1	0	1
7	N56	max	0	3	0	9	0	2	0	9	0	4	0	4
8		min	0	4	0	8	0	1	0	8	0	3	0	3
9	N30	max	.064	3	-.007	9	.001	2	-2.714e-04	2	3.289e-03	4	5.98e-04	4
10		min	-.064	4	-.018	5	-.002	1	-7.882e-04	5	-3.257e-03	3	-9.321e-04	3
11	N145	max	0	3	0	2	0	5	0	1	0	1	0	2
12		min	0	4	0	5	0	2	0	1	0	2	0	1
13	N148	max	.169	3	0	2	.003	2	2.566e-04	2	2.41e-03	4	1.855e-03	4
14		min	-.171	4	-.017	5	-.005	1	-4.925e-04	1	-2.365e-03	3	-2.329e-03	3
15	N158	max	.041	1	.034	1	.141	2	5.055e-03	2	7.272e-03	1	1.923e-03	2
16		min	-.037	2	-.063	2	-.14	1	-5.031e-03	1	-7.468e-03	2	-2.125e-03	1
17	N161	max	.041	1	.048	1	.258	2	5.405e-03	2	7.372e-03	2	2.723e-03	1
18		min	-.038	2	-.075	2	-.27	1	-6.451e-03	1	-7.519e-03	1	-3.111e-03	2
19	N162	max	.041	1	.032	1	.303	2	5.405e-03	2	7.375e-03	2	2.724e-03	1
20		min	-.038	2	-.057	2	-.315	1	-6.451e-03	1	-7.521e-03	1	-3.11e-03	2
21	N163	max	.041	1	.022	1	.186	2	5.055e-03	2	7.275e-03	1	1.922e-03	2
22		min	-.037	2	-.052	2	-.183	1	-5.031e-03	1	-7.47e-03	2	-2.126e-03	1
23	N71	max	.041	1	.006	1	.249	2	5.919e-03	2	6.206e-03	1	1.399e-03	4
24		min	-.037	2	-.051	9	-.245	1	-6.071e-03	1	-6.447e-03	2	-1.52e-03	3
25	N72	max	.07	1	.024	1	.309	2	5.925e-03	2	6.206e-03	1	1.405e-03	4
26		min	-.066	2	-.055	2	-.306	1	-6.077e-03	1	-6.447e-03	2	-1.526e-03	3
27	N73	max	.057	4	.024	1	.169	4	3.584e-03	2	3.733e-03	4	1.078e-03	9
28		min	-.094	3	-.055	2	-.198	3	-2.95e-03	1	-3.846e-03	3	-1.696e-03	4
29	N76	max	.058	1	.009	1	.701	2	1.289e-02	2	4.885e-03	1	1.176e-03	4
30		min	-.053	2	-.106	6	-.677	1	-1.262e-02	1	-4.899e-03	2	-1.274e-03	3
31	N77	max	.08	4	.009	1	.229	1	7.618e-03	2	2.588e-03	1	-6.648e-05	3
32		min	-.114	3	-.106	6	-.263	2	-6.802e-03	1	-2.566e-03	2	-1.339e-03	8
33	N78	max	.036	1	.007	1	.874	2	1.809e-02	2	1.749e-03	2	2.291e-03	4
34		min	-.033	2	-.122	6	-.858	1	-1.796e-02	1	-1.478e-03	1	-2.241e-03	3
35	N79A	max	.067	3	.007	1	.078	2	1.999e-03	1	1.368e-03	2	4.821e-03	3
36		min	-.029	4	-.121	6	-.115	1	-1.182e-03	2	-1.3e-03	1	-3.988e-03	4
37	N104	max	.105	4	.009	1	.113	4	5.768e-03	2	3.733e-03	4	1.079e-03	9
38		min	-.104	3	-.052	9	-.113	3	-5.133e-03	1	-3.846e-03	3	-1.186e-03	7
39	N106	max	.105	4	-.015	1	.079	2	8.561e-03	2	2.588e-03	1	-1.676e-05	4
40		min	-.104	3	-.096	6	-.078	1	-7.743e-03	1	-2.566e-03	2	-1.275e-03	7
41	N107	max	.105	4	-.012	1	.113	2	7.168e-03	2	1.368e-03	2	1.039e-03	7
42		min	-.104	3	-.112	6	-.114	1	-6.349e-03	1	-1.3e-03	1	-3.77e-05	4
43	N109	max	.041	1	-.027	4	.572	2	1.288e-02	2	4.885e-03	1	1.17e-03	4
44		min	-.037	2	-.095	6	-.551	1	-1.262e-02	1	-4.899e-03	2	-1.268e-03	3
45	N110	max	.041	1	-.033	2	.695	2	1.732e-02	2	1.749e-03	2	1.948e-03	4
46		min	-.038	2	-.109	5	-.68	1	-1.719e-02	1	-1.478e-03	1	-1.899e-03	3
47	N49	max	.037	4	.006	4	.192	3	2.006e-03	2	2.583e-03	4	3.878e-03	2
48		min	-.041	3	-.026	3	-.192	4	-3.796e-03	1	-2.799e-03	3	-4.116e-03	1
49	N50A	max	.178	3	.011	2	.067	3	3.11e-03	4	8.026e-04	3	5.414e-03	4
50		min	-.181	4	-.027	5	-.068	4	-2.226e-03	3	-7.437e-04	4	-7.017e-03	3
51	N51A	max	.192	3	.012	3	.048	4	3.115e-03	3	1.828e-03	1	6.658e-03	4

Envelope Joint Displacements (Continued)

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [...	LC	Y Rotation [...	LC	Z Rotation [...	LC
52		min	-.195	4	-.02	4	-.049	3	-2.441e-03	4	-1.846e-03	2	-5.823e-03	3
53	N52	max	.055	4	.019	3	.191	4	2.105e-03	2	3.492e-03	4	3.577e-03	4
54		min	-.053	3	-.025	4	-.189	3	-3.349e-03	1	-3.374e-03	3	-3.772e-03	3
55	N53A	max	.184	3	.01	4	.064	3	3.111e-03	4	8.045e-04	3	5.413e-03	4
56		min	-.187	4	-.046	7	-.065	4	-2.225e-03	3	-7.456e-04	4	-7.017e-03	3
57	N55	max	.197	3	.009	4	.041	3	3.323e-03	4	7.581e-03	4	2.248e-03	4
58		min	-.2	4	-.038	7	-.042	4	-2.082e-03	3	-7.618e-03	3	-2.917e-03	3
59	N58	max	.187	3	.013	3	.051	4	3.116e-03	3	1.827e-03	1	6.659e-03	4
60		min	-.189	4	-.031	4	-.052	3	-2.44e-03	4	-1.845e-03	2	-5.823e-03	3
61	N60	max	.197	3	.011	3	.033	4	3.243e-03	3	5.929e-03	4	2.415e-03	4
62		min	-.199	4	-.027	4	-.034	3	-2.276e-03	4	-5.906e-03	3	-2.754e-03	3
63	N61	max	.184	3	-.014	4	.064	3	3.661e-03	4	1.255e-03	1	4.273e-03	4
64		min	-.184	4	-.116	7	-.067	4	-3.673e-03	3	-1.102e-03	2	-5.874e-03	3
65	N63	max	.099	3	-.01	4	.074	3	-5.906e-04	2	1.286e-02	4	1.538e-03	4
66		min	-.099	4	-.11	7	-.076	4	-1.745e-03	5	-1.289e-02	3	-3.23e-03	3
67	N66	max	.157	3	.004	3	.07	4	4.151e-03	3	1.15e-04	4	7.034e-03	4
68		min	-.157	4	-.071	8	-.07	3	-3.533e-03	4	-1.091e-04	3	-5.933e-03	3
69	N68	max	.095	3	.008	3	.077	4	-5.488e-04	2	9.525e-03	4	3.314e-03	4
70		min	-.096	4	-.064	8	-.077	3	-1.653e-03	5	-9.519e-03	3	-2.436e-03	3
71	N69	max	.197	3	.002	2	.003	2	1.55e-04	2	2.331e-03	4	2.264e-03	4
72		min	-.199	4	-.027	5	-.005	1	-8.766e-04	5	-2.288e-03	3	-2.762e-03	3
73	N65	max	.083	3	-.008	4	.074	3	-5.741e-04	2	2.182e-03	1	-2.382e-04	4
74		min	-.084	4	-.106	7	-.076	4	-1.69e-03	5	-2.17e-03	2	-3.307e-03	7
75	N70	max	.083	3	.01	3	.077	4	-5.299e-04	2	2.093e-03	4	1.901e-03	8
76		min	-.084	4	-.061	8	-.077	3	-1.599e-03	5	-2.051e-03	3	-3.415e-04	3
77	N69C	max	.083	3	-.008	2	.001	2	-1.643e-04	2	2.888e-03	4	7.331e-04	4
78		min	-.083	4	-.022	5	-.002	1	-5.519e-04	5	-2.849e-03	3	-1.143e-03	3
79	N70A	max	.083	3	.008	3	.067	4	-4.834e-04	2	2.093e-03	4	1.854e-03	8
80		min	-.084	4	-.052	8	-.067	3	-1.436e-03	5	-2.054e-03	3	-3.31e-04	3
81	N71A	max	.083	3	-.007	4	.065	3	-5.218e-04	2	2.057e-03	1	-2.408e-04	4
82		min	-.084	4	-.09	7	-.067	4	-1.516e-03	5	-2.035e-03	2	-3.262e-03	7
83	N76B	max	.197	3	.002	2	.008	2	8.134e-04	4	3.198e-03	4	2.255e-03	4
84		min	-.199	4	-.029	5	-.009	1	-7.549e-04	3	-3.315e-03	3	-2.81e-03	3
85	N77B	max	.197	3	.001	2	.004	2	6.647e-04	3	2.921e-03	4	2.31e-03	4
86		min	-.199	4	-.025	5	-.005	1	-6.528e-04	4	-2.733e-03	3	-2.756e-03	3
87	N48	max	0	3	0	9	0	2	0	6	0	2	0	5
88		min	0	4	0	5	0	1	0	1	0	1	0	9
89	N49A	max	0	8	0	3	0	3	0	3	0	4	0	4
90		min	0	3	0	8	0	8	0	4	0	3	0	3
91	N50	max	.064	4	0	3	.119	4	2.265e-03	9	3.339e-03	4	8.135e-04	4
92		min	-.065	3	-.015	8	-.117	3	-1.211e-03	1	-3.328e-03	3	-7.573e-04	3
93	N51	max	.029	1	.012	3	.175	4	2.104e-03	2	3.494e-03	4	3.576e-03	4
94		min	-.028	2	-.031	8	-.174	3	-3.35e-03	1	-3.376e-03	3	-3.773e-03	3
95	N52A	max	.049	4	.012	3	.175	4	2.644e-03	9	5.743e-03	4	1.801e-03	4
96		min	-.049	3	-.028	4	-.174	3	-1.132e-03	5	-5.913e-03	3	-2.653e-03	3
97	N53	max	.105	4	.01	1	.137	4	5.641e-03	2	3.816e-03	4	1.615e-03	9
98		min	-.104	3	-.06	9	-.137	3	-5.054e-03	1	-3.915e-03	3	-1.389e-03	7
99	N54	max	.1	4	.01	1	.145	4	2.538e-03	2	2.577e-03	4	5.171e-04	2
100		min	-.1	3	-.048	9	-.144	3	-2.749e-03	1	-2.296e-03	3	-3.099e-03	9
101	N55A	max	.079	3	-.012	3	.112	4	2.174e-03	3	3.102e-03	4	4.496e-03	4
102		min	-.081	4	-.094	8	-.113	3	-3.61e-03	4	-3.082e-03	3	-4.467e-03	3
103	N56A	max	.088	3	-.009	3	.1	4	1.508e-03	3	4.095e-03	4	2.514e-03	8

Envelope Joint Displacements (Continued)

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [...	LC	Y Rotation [...	LC	Z Rotation [...	LC
104		min	-.089	4	-.088	8	-.099	3	-1.955e-03	4	-4.356e-03	3	-2.332e-04	3
105	N57	max	.105	4	-.006	1	.045	2	7.667e-03	2	2.205e-03	1	-2.922e-04	9
106		min	-.104	3	-.076	6	-.043	1	-6.895e-03	1	-2.181e-03	2	-1.481e-03	5
107	N58A	max	.098	4	-.002	1	.035	2	3.032e-03	2	3.286e-03	4	1.566e-03	1
108		min	-.098	3	-.071	6	-.035	1	-1.524e-03	1	-2.937e-03	3	-1.1e-03	2
109	N59	max	.084	4	.002	3	.155	4	2.965e-03	9	3.467e-03	4	1.116e-03	4
110		min	-.085	3	-.026	9	-.153	3	-1.353e-03	1	-3.456e-03	3	-8.036e-04	3
111	N60A	max	.093	3	-.008	3	.092	4	1.248e-04	3	4.647e-03	4	2.66e-03	8
112		min	-.094	4	-.085	8	-.091	3	-1.523e-03	8	-4.659e-03	3	5.483e-04	3
113	N61A	max	.095	4	-.001	1	.037	2	2.532e-03	6	2.743e-03	4	5.19e-04	1
114		min	-.096	3	-.067	6	-.037	1	2.347e-04	1	-2.701e-03	3	-3.353e-04	2
115	N62	max	.015	4	-.005	9	.03	4	6.549e-04	2	2.671e-03	4	6.402e-04	5
116		min	-.016	3	-.021	8	-.029	3	-5.019e-04	1	-2.657e-03	3	-1.648e-04	9
117	N63A	max	.084	4	-.001	1	.031	2	2.421e-03	6	2.791e-03	4	4.672e-04	1
118		min	-.084	3	-.057	6	-.031	1	2.21e-04	1	-2.757e-03	3	-3.664e-04	2
119	N64	max	.073	3	-.007	3	.081	4	9.353e-05	3	4.502e-03	4	2.502e-03	8
120		min	-.074	4	-.072	8	-.08	3	-1.565e-03	8	-4.508e-03	3	5.111e-04	3
121	N65A	max	.077	4	.004	3	.159	4	2.69e-03	9	4.981e-03	4	9.723e-04	1
122		min	-.078	3	-.024	8	-.157	3	-1.269e-03	1	-5.19e-03	3	-1.144e-03	2
123	N66A	max	.088	4	0	1	.152	4	2.74e-03	9	2.568e-03	1	5.418e-04	4
124		min	-.089	3	-.031	9	-.151	3	-1.637e-03	1	-2.362e-03	2	-7.531e-04	9
125	N67	max	0	3	0	10	0	2	0	6	0	1	0	10
126		min	0	4	0	8	0	1	0	1	0	2	0	5
127	N68A	max	0	4	0	4	0	4	0	4	0	4	0	4
128		min	0	7	0	7	0	7	0	3	0	3	0	3
129	N69A	max	.067	4	0	4	.121	3	1.805e-03	10	3.347e-03	4	3.702e-04	2
130		min	-.065	3	-.016	7	-.12	4	-1.792e-03	1	-3.325e-03	3	-9.399e-04	1
131	N70B	max	.105	4	.018	1	.141	3	6.364e-03	2	3.995e-03	4	1.719e-03	8
132		min	-.104	3	-.054	10	-.141	4	-6.039e-03	1	-3.932e-03	3	-1.575e-03	10
133	N71B	max	.101	4	.016	1	.148	3	2.544e-03	2	2.229e-03	1	2.685e-03	10
134		min	-.099	3	-.044	10	-.148	4	-3.617e-03	1	-2.248e-03	3	-1.136e-03	2
135	N72A	max	.017	4	0	4	.18	3	2.005e-03	2	2.585e-03	4	3.879e-03	2
136		min	-.02	3	-.038	7	-.181	4	-3.797e-03	1	-2.801e-03	3	-4.116e-03	1
137	N73A	max	.044	4	.003	4	.18	3	1.959e-03	10	7.508e-03	4	3.099e-03	2
138		min	-.045	3	-.033	7	-.181	4	-1.521e-03	5	-6.972e-03	3	-2.478e-03	1
139	N74A	max	.105	4	-.001	1	.09	2	6.865e-03	2	1.487e-03	4	1.783e-03	7
140		min	-.104	3	-.091	6	-.092	1	-6.165e-03	1	-1.46e-03	3	2.507e-04	4
141	N75A	max	.1	4	.002	1	.046	2	2.95e-03	2	6.63e-03	1	9.114e-04	2
142		min	-.098	3	-.085	6	-.045	1	-1.399e-03	1	-6.38e-03	2	-1.541e-03	1
143	N76A	max	.071	3	-.02	2	.127	3	1.918e-03	4	2.666e-03	4	4.345e-03	4
144		min	-.067	4	-.093	5	-.132	4	-3.252e-03	3	-2.765e-03	3	-5.155e-03	3
145	N77A	max	.087	3	-.016	2	.104	3	1.321e-03	2	6.851e-03	4	-8.985e-06	4
146		min	-.087	4	-.086	5	-.105	4	-2.048e-03	1	-6.122e-03	3	-2.557e-03	7
147	N78A	max	.087	4	0	4	.157	3	2.405e-03	10	3.481e-03	4	2.878e-04	2
148		min	-.085	3	-.027	10	-.156	4	-2.062e-03	1	-3.457e-03	3	-1.27e-03	1
149	N79	max	.097	4	.004	1	.041	2	3.035e-03	6	2.673e-03	4	2.883e-04	2
150		min	-.096	3	-.081	6	-.04	1	1.665e-04	1	-2.664e-03	3	-6.153e-04	1
151	N80	max	.093	3	-.014	2	.095	3	-4.224e-06	2	4.747e-03	4	-8.025e-04	4
152		min	-.093	4	-.083	5	-.095	4	-1.422e-03	5	-4.686e-03	3	-2.669e-03	7
153	N81	max	.022	1	-.005	10	.04	2	6.333e-04	2	2.709e-03	4	7.43e-05	2
154		min	-.021	2	-.023	6	-.039	1	-7.147e-04	1	-2.699e-03	3	-6.159e-04	1
155	N82	max	.073	3	-.012	2	.083	3	-4.141e-05	2	4.573e-03	4	-7.601e-04	4

Envelope Joint Displacements (Continued)

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [...	LC	Y Rotation [...	LC	Z Rotation [...	LC
156		min	-.072	4	-.071	5	-.083	4	-1.463e-03	5	-4.524e-03	3	-2.506e-03	7
157	N83	max	.086	4	.003	1	.039	2	2.909e-03	6	2.734e-03	4	3.303e-04	2
158		min	-.085	3	-.069	6	-.038	1	1.425e-04	1	-2.721e-03	3	-5.581e-04	1
159	N84	max	.091	4	.001	1	.154	3	2.15e-03	10	2.134e-03	4	4.349e-04	10
160		min	-.089	3	-.03	10	-.154	4	-2.445e-03	1	-2.347e-03	3	-6.903e-04	3
161	N85	max	.079	4	.002	4	.161	3	2.125e-03	10	5.539e-03	4	1.159e-03	2
162		min	-.077	3	-.027	7	-.161	4	-1.905e-03	1	-5.289e-03	3	-1.617e-03	1
163	N86	max	.134	1	.025	4	.224	2	2.01e-03	2	6.768e-03	4	4.389e-03	2
164		min	-.126	2	-.066	3	-.229	1	-2.543e-03	1	-7.58e-03	3	-4.703e-03	1
165	N87	max	.438	3	.036	4	.121	2	5.44e-03	4	5.972e-03	3	4.518e-03	4
166		min	-.434	4	-.073	3	-.123	1	-5.392e-03	3	-5.335e-03	4	-5.025e-03	3
167	N88	max	.445	3	.031	3	.102	2	4.409e-03	3	4.6e-03	3	3.95e-03	4
168		min	-.438	4	-.059	4	-.098	1	-4.242e-03	4	-4.497e-03	4	-4.474e-03	3
169	N89	max	.072	3	.039	3	.184	4	1.318e-03	9	9.25e-03	4	4.858e-03	4
170		min	-.066	4	-.065	4	-.182	3	-1.183e-03	1	-9.13e-03	3	-5.136e-03	3
171	N94	max	.452	3	-.007	2	.301	2	3.637e-03	2	5.159e-03	4	6.864e-03	4
172		min	-.408	4	-.1	5	-.333	1	-4.434e-03	1	-5.53e-03	3	-7.318e-03	3
173	N95	max	.138	2	-.007	2	.277	3	1.886e-03	4	2.617e-03	4	3.728e-03	2
174		min	-.172	1	-.1	5	-.224	4	-3.181e-03	3	-2.729e-03	3	-4.598e-03	1
175	N96	max	.748	3	.004	4	.249	2	5.867e-03	4	3.261e-03	1	1.224e-02	4
176		min	-.704	4	-.126	7	-.271	1	-5.847e-03	3	-2.787e-03	2	-1.316e-02	3
177	N97	max	.171	3	.004	4	.227	3	3.921e-03	1	1.207e-03	1	1.847e-03	2
178		min	-.242	4	-.126	7	-.229	4	-3.948e-03	2	-1.044e-03	2	-3.443e-03	1
179	N102	max	.676	3	.019	3	.171	2	5.407e-03	3	2.093e-03	2	1.062e-02	4
180		min	-.69	4	-.101	8	-.18	1	-5.4e-03	4	-2.324e-03	1	-1.048e-02	3
181	N103	max	.14	4	.019	3	.226	4	4.018e-03	3	1.086e-03	2	6.652e-03	4
182		min	-.094	3	-.101	8	-.244	3	-3.602e-03	4	-1.137e-03	1	-5.58e-03	3
183	N104A	max	.674	3	.001	3	.237	2	5.562e-03	3	4.393e-03	4	1.325e-02	4
184		min	-.692	4	-.123	8	-.249	1	-5.729e-03	4	-4.288e-03	3	-1.31e-02	3
185	N105A	max	.159	3	.001	3	.267	4	3.616e-03	1	3.021e-03	4	3.123e-03	1
186		min	-.145	4	-.123	8	-.222	3	-4.662e-03	2	-3.007e-03	3	-2.735e-03	2
187	N106A	max	.469	3	.021	4	.128	2	5.44e-03	4	5.974e-03	3	4.517e-03	4
188		min	-.462	4	-.062	7	-.132	1	-5.392e-03	3	-5.337e-03	4	-5.025e-03	3
189	N107A	max	.162	1	.012	4	.238	2	2.009e-03	2	6.77e-03	4	4.389e-03	2
190		min	-.15	2	-.055	7	-.245	1	-2.544e-03	1	-7.582e-03	3	-4.703e-03	1
191	N108A	max	.119	3	.025	3	.156	4	1.317e-03	9	9.252e-03	4	4.857e-03	4
192		min	-.114	4	-.051	4	-.155	3	-1.184e-03	1	-9.132e-03	3	-5.137e-03	3
193	N109A	max	.469	3	.021	3	.101	2	4.41e-03	3	4.602e-03	3	3.951e-03	4
194		min	-.462	4	-.049	4	-.096	1	-4.241e-03	4	-4.499e-03	4	-4.473e-03	3
195	N112	max	.067	3	-.019	2	.13	3	1.889e-03	4	2.617e-03	4	4.305e-03	4
196		min	-.064	4	-.091	5	-.134	4	-3.186e-03	3	-2.729e-03	3	-5.132e-03	3
197	N113	max	.185	3	-.012	4	.064	3	3.654e-03	4	1.207e-03	1	4.26e-03	4
198		min	-.185	4	-.115	7	-.066	4	-3.679e-03	3	-1.044e-03	2	-5.85e-03	3
199	N116	max	.159	3	-.003	3	.068	4	4.023e-03	3	1.086e-03	2	7.533e-03	4
200		min	-.16	4	-.092	8	-.068	3	-3.607e-03	4	-1.137e-03	1	-6.46e-03	3
201	N117	max	.117	3	-.015	3	.09	4	2.802e-03	3	3.021e-03	4	5.043e-03	4
202		min	-.119	4	-.114	8	-.091	3	-3.84e-03	4	-3.007e-03	3	-4.684e-03	3
203	N120	max	.37	3	-.025	2	.264	2	3.631e-03	2	5.159e-03	4	6.857e-03	4
204		min	-.332	4	-.093	5	-.288	1	-4.428e-03	1	-5.53e-03	3	-7.312e-03	3
205	N121	max	.618	3	-.035	4	.197	2	5.867e-03	4	3.261e-03	1	1.157e-02	4
206		min	-.583	4	-.113	7	-.218	1	-5.847e-03	3	-2.787e-03	2	-1.25e-02	3
207	N124	max	.573	3	-.016	3	.135	2	5.407e-03	3	2.093e-03	2	1.061e-02	4

Envelope Joint Displacements (Continued)

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [...	LC	Y Rotation [...	LC	Z Rotation [...	LC
208		min	-.585	4	-.092	8	-.144	1	-5.4e-03	4	-2.324e-03	1	-1.048e-02	3
209	N125	max	.538	3	-.023	9	.184	2	5.561e-03	3	4.393e-03	4	1.258e-02	4
210		min	-.555	4	-.113	8	-.195	1	-5.728e-03	4	-4.288e-03	3	-1.243e-02	3
211	N106B	max	.013	4	.035	1	.439	2	7.055e-03	2	6.881e-03	2	1.537e-03	1
212		min	-.01	9	-.055	2	-.459	1	-7.892e-03	1	-6.778e-03	1	-1.646e-03	2
213	N107B	max	.143	4	.035	1	.156	1	5.012e-03	2	3.925e-03	4	1.42e-03	7
214		min	-.098	3	-.055	2	-.174	4	-4.637e-03	1	-3.852e-03	3	-1.026e-03	10
215	N108	max	.249	1	.007	2	.279	2	3.231e-03	2	6.145e-03	4	4.602e-03	2
216		min	-.227	2	-.055	7	-.291	1	-3.488e-03	1	-6.857e-03	3	-4.818e-03	1
217	N109B	max	.161	2	.007	2	.292	3	9.762e-04	4	2.56e-03	4	3.891e-03	2
218		min	-.179	1	-.055	7	-.223	4	-2.583e-03	3	-2.793e-03	3	-4.282e-03	1
219	N110A	max	.573	3	.029	4	.169	2	4.915e-03	4	4.833e-03	3	6.598e-03	4
220		min	-.559	4	-.07	3	-.177	1	-4.867e-03	3	-4.231e-03	4	-6.823e-03	3
221	N111	max	.083	2	.029	4	.168	3	3.174e-03	4	7.21e-04	3	4.147e-03	4
222		min	-.154	1	-.07	3	-.201	4	-2.479e-03	3	-6.399e-04	4	-5.697e-03	3
223	N112A	max	.559	3	.035	3	.121	2	3.932e-03	3	2.808e-03	3	6.001e-03	4
224		min	-.547	4	-.06	4	-.114	1	-3.674e-03	4	-2.926e-03	4	-6.528e-03	3
225	N113A	max	.054	2	.035	3	.174	4	3.176e-03	3	1.775e-03	1	4.61e-03	4
226		min	-.021	1	-.059	4	-.196	3	-2.686e-03	4	-1.806e-03	2	-3.821e-03	3
227	N114	max	.255	3	.02	3	.159	2	2.724e-03	2	8.725e-03	4	4.962e-03	4
228		min	-.248	4	-.046	8	-.157	1	-2.645e-03	1	-8.471e-03	3	-5.323e-03	3
229	N115	max	.138	1	.019	3	.281	4	1.334e-03	3	3.486e-03	4	2.904e-03	1
230		min	-.14	2	-.046	8	-.231	3	-2.453e-03	4	-3.359e-03	3	-2.958e-03	2
231	N116A	max	.105	4	.017	1	.116	3	6.507e-03	2	3.925e-03	4	1.521e-03	8
232		min	-.104	3	-.046	10	-.116	4	-6.132e-03	1	-3.852e-03	3	-1.026e-03	10
233	N117A	max	.041	1	.011	1	.368	2	7.049e-03	2	6.881e-03	2	1.537e-03	1
234		min	-.038	2	-.045	10	-.38	1	-7.886e-03	1	-6.778e-03	1	-1.646e-03	2
235	N118	max	.007	1	-.003	4	.171	3	2.072e-03	2	2.56e-03	4	3.897e-03	2
236		min	-.008	2	-.048	7	-.173	4	-3.707e-03	1	-2.793e-03	3	-4.289e-03	1
237	N119	max	.188	3	.01	4	.061	3	3.176e-03	4	7.21e-04	3	5.479e-03	4
238		min	-.191	4	-.06	7	-.063	4	-2.48e-03	3	-6.399e-04	4	-7.03e-03	3
239	N120A	max	.183	3	.015	3	.053	4	3.18e-03	3	1.775e-03	1	6.681e-03	4
240		min	-.185	4	-.038	4	-.054	3	-2.69e-03	4	-1.806e-03	2	-5.89e-03	3
241	N121A	max	.014	1	.008	3	.164	4	2.151e-03	2	3.486e-03	4	3.767e-03	4
242		min	-.014	2	-.04	8	-.164	3	-3.29e-03	1	-3.359e-03	3	-3.853e-03	3
243	N122	max	.196	1	-.005	4	.253	2	3.224e-03	2	6.145e-03	4	4.602e-03	2
244		min	-.177	2	-.052	7	-.264	1	-3.482e-03	1	-6.857e-03	3	-4.818e-03	1
245	N123	max	.512	3	.004	4	.139	2	4.915e-03	4	4.833e-03	3	6.592e-03	4
246		min	-.499	4	-.062	7	-.147	1	-4.867e-03	3	-4.231e-03	4	-6.817e-03	3
247	N124A	max	.498	3	.012	3	.1	2	3.932e-03	3	2.808e-03	3	5.995e-03	4
248		min	-.491	4	-.039	4	-.095	1	-3.673e-03	4	-2.926e-03	4	-6.522e-03	3
249	N125A	max	.189	3	.005	3	.143	2	2.718e-03	2	8.725e-03	4	4.956e-03	4
250		min	-.185	4	-.043	8	-.142	1	-2.639e-03	1	-8.471e-03	3	-5.317e-03	3
251	N126	max	.059	1	.024	1	.249	2	5.919e-03	2	6.206e-03	1	1.399e-03	4
252		min	-.056	2	-.055	2	-.245	1	-6.071e-03	1	-6.447e-03	2	-1.52e-03	3
253	N127	max	.116	4	.024	1	.113	4	5.768e-03	2	3.733e-03	4	1.079e-03	9
254		min	-.115	3	-.055	2	-.113	3	-5.133e-03	1	-3.846e-03	3	-1.186e-03	7
255	N128	max	.105	4	.009	1	.079	2	8.561e-03	2	2.588e-03	1	-1.676e-05	4
256		min	-.104	3	-.106	6	-.078	1	-7.743e-03	1	-2.566e-03	2	-1.275e-03	7
257	N129	max	.105	4	.007	1	.113	2	7.168e-03	2	1.368e-03	2	1.039e-03	7
258		min	-.104	3	-.121	6	-.114	1	-6.349e-03	1	-1.3e-03	1	-3.77e-05	4
259	N130	max	.056	1	.009	1	.572	2	1.288e-02	2	4.885e-03	1	1.17e-03	4

Envelope Joint Displacements (Continued)

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [...	LC	Y Rotation [...	LC	Z Rotation [...	LC
260		min	-.052	2	-.106	6	-.551	1	-1.262e-02	1	-4.899e-03	2	-1.268e-03	3
261	N131	max	.036	1	.007	1	.695	2	1.732e-02	2	1.749e-03	2	1.948e-03	4
262		min	-.032	2	-.122	6	-.68	1	-1.719e-02	1	-1.478e-03	1	-1.899e-03	3
263	N132	max	.117	4	.035	1	.116	3	6.507e-03	2	3.925e-03	4	1.521e-03	8
264		min	-.115	3	-.055	2	-.116	4	-6.132e-03	1	-3.852e-03	3	-1.026e-03	10
265	N133	max	.028	4	.035	1	.368	2	7.049e-03	2	6.881e-03	2	1.537e-03	1
266		min	-.024	3	-.055	2	-.38	1	-7.886e-03	1	-6.778e-03	1	-1.646e-03	2
267	N142	max	.201	1	.007	2	.247	2	3.224e-03	2	6.145e-03	4	4.602e-03	2
268		min	-.181	2	-.055	7	-.256	1	-3.482e-03	1	-6.857e-03	3	-4.818e-03	1
269	N143	max	.009	1	.007	2	.179	3	2.072e-03	2	2.56e-03	4	3.897e-03	2
270		min	-.01	2	-.055	7	-.18	4	-3.707e-03	1	-2.793e-03	3	-4.289e-03	1
271	N144	max	.071	3	-.007	2	.137	3	1.889e-03	4	2.617e-03	4	4.305e-03	4
272		min	-.068	4	-.1	5	-.141	4	-3.186e-03	3	-2.729e-03	3	-5.132e-03	3
273	N145A	max	.185	3	.004	4	.065	3	3.654e-03	4	1.207e-03	1	4.26e-03	4
274		min	-.186	4	-.126	7	-.068	4	-3.679e-03	3	-1.044e-03	2	-5.85e-03	3
275	N146	max	.379	3	-.007	2	.265	2	3.631e-03	2	5.159e-03	4	6.857e-03	4
276		min	-.339	4	-.1	5	-.288	1	-4.428e-03	1	-5.53e-03	3	-7.312e-03	3
277	N147	max	.618	3	.004	4	.204	2	5.867e-03	4	3.261e-03	1	1.157e-02	4
278		min	-.583	4	-.126	7	-.227	1	-5.847e-03	3	-2.787e-03	2	-1.25e-02	3
279	N148A	max	.187	3	.029	4	.059	3	3.176e-03	4	7.21e-04	3	5.479e-03	4
280		min	-.19	4	-.07	3	-.061	4	-2.48e-03	3	-6.399e-04	4	-7.03e-03	3
281	N149	max	.505	3	.029	4	.146	2	4.915e-03	4	4.833e-03	3	6.592e-03	4
282		min	-.493	4	-.07	3	-.155	1	-4.867e-03	3	-4.231e-03	4	-6.817e-03	3
283	N158A	max	.494	3	.035	3	.099	2	3.932e-03	3	2.808e-03	3	5.995e-03	4
284		min	-.487	4	-.06	4	-.095	1	-3.673e-03	4	-2.926e-03	4	-6.522e-03	3
285	N159	max	.184	3	.035	3	.055	4	3.18e-03	3	1.775e-03	1	6.681e-03	4
286		min	-.186	4	-.059	4	-.056	3	-2.69e-03	4	-1.806e-03	2	-5.89e-03	3
287	N160	max	.159	3	.02	3	.067	4	4.023e-03	3	1.086e-03	2	7.533e-03	4
288		min	-.16	4	-.101	8	-.067	3	-3.607e-03	4	-1.137e-03	1	-6.46e-03	3
289	N161A	max	.121	3	.001	3	.098	4	2.802e-03	3	3.021e-03	4	5.043e-03	4
290		min	-.124	4	-.123	8	-.099	3	-3.84e-03	4	-3.007e-03	3	-4.684e-03	3
291	N162A	max	.571	3	.019	3	.141	2	5.407e-03	3	2.093e-03	2	1.061e-02	4
292		min	-.584	4	-.101	8	-.15	1	-5.4e-03	4	-2.324e-03	1	-1.048e-02	3
293	N163A	max	.545	3	.001	3	.186	2	5.561e-03	3	4.393e-03	4	1.258e-02	4
294		min	-.561	4	-.123	8	-.197	1	-5.728e-03	4	-4.288e-03	3	-1.243e-02	3
295	N164	max	.01	1	.019	3	.173	4	2.151e-03	2	3.486e-03	4	3.767e-03	4
296		min	-.01	2	-.045	8	-.172	3	-3.29e-03	1	-3.359e-03	3	-3.853e-03	3
297	N165	max	.202	3	.02	3	.137	4	2.718e-03	2	8.725e-03	4	4.956e-03	4
298		min	-.199	4	-.046	8	-.137	3	-2.639e-03	1	-8.471e-03	3	-5.317e-03	3
299	N150	max	.639	3	-.018	4	.276	2	4.467e-03	4	3.983e-03	4	8.783e-03	4
300		min	-.584	4	-.141	7	-.31	1	-5.008e-03	3	-3.9e-03	3	-9.687e-03	3
301	N151	max	.131	2	-.018	4	.255	3	3.077e-03	4	2.154e-03	4	4.6e-03	4
302		min	-.179	1	-.141	7	-.226	4	-3.85e-03	3	-2.07e-03	3	-5.805e-03	3
303	N152	max	.154	3	-.035	2	.08	3	3.081e-03	4	2.154e-03	4	5.479e-03	4
304		min	-.152	4	-.13	7	-.085	4	-3.854e-03	3	-2.07e-03	3	-6.685e-03	3
305	N153	max	.536	3	-.041	2	.238	2	4.467e-03	4	3.983e-03	4	8.777e-03	4
306		min	-.491	4	-.13	5	-.266	1	-5.008e-03	3	-3.9e-03	3	-9.681e-03	3
307	N154	max	.158	3	-.018	4	.086	3	3.081e-03	4	2.154e-03	4	5.479e-03	4
308		min	-.155	4	-.141	7	-.09	4	-3.854e-03	3	-2.07e-03	3	-6.685e-03	3
309	N155	max	.542	3	-.018	4	.243	2	4.467e-03	4	3.983e-03	4	8.777e-03	4
310		min	-.496	4	-.141	7	-.271	1	-5.008e-03	3	-3.9e-03	3	-9.681e-03	3

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

	Member	Shape	Code Check	Loc[ft]	LC	Shear..	Loc[ft]	Dir	LC	phi*Pnc..	phi*Pnt...	phi*Mn ..	phi*Mn ..	Cb	Eqn
1	M33B	PL3/8x6	.589	0	3	.204	0	y	4	72193....	72900	.57	9.113	1...	H1-1b
2	M32A	PL3/8x6	.437	0	4	.171	0	y	4	68871....	72900	.57	9.113	1...	H1-1b
3	MP2A	PIPE_2.5	.413	4.333	2	.045	4.333		2	30038....	50715	3.596	3.596	1...	H1-1b
4	M36A	PL3/8x6	.411	0	3	.239	0	y	3	72204....	72900	.57	9.113	1...	H1-1b
5	M49	PL3/8x6	.391	0	1	.206	0	y	1	72193....	72900	.57	9.113	1...	H1-1b
6	MP2C	PIPE_2.5	.363	4.333	3	.068	4.333		1	30038....	50715	3.596	3.596	1...	H1-1b
7	MP2B	PIPE_2.5	.361	4.333	3	.060	4.333		4	30038....	50715	3.596	3.596	1...	H1-1b
8	M48	PL1/2x6	.337	0	3	.180	0	y	6	91104....	97200	1.012	12.15	1...	H1-1b
9	M39A	L2x2x3	.335	4.359	3	.012	0	z	6	15647....	23392.8	.558	1.219	2...	H2-1
10	M46	PL3/8x6	.328	0	1	.180	0	y	2	68871....	72900	.57	9.113	1...	H1-1b
11	M62	L2.5x2.5x4	.326	1.568	2	.071	0	y	2	37271....	38556	1.114	2.537	1...	H2-1
12	M24	L2x2x3	.325	4.359	4	.013	0	y	6	15646....	23392.8	.558	1.22	2...	H2-1
13	M50	PL3/8x6	.315	0	1	.186	0	y	4	72204....	72900	.57	9.113	1...	H1-1b
14	M33A	PL3/8x6	.311	0	3	.209	0	y	3	68871....	72900	.57	9.113	1...	H1-1b
15	M23	PL1/2x6	.308	0	4	.167	0	y	6	91104....	97200	1.012	12.15	1...	H1-1b
16	M37	HSS4x4x4	.306	6.439	4	.090	6.439	z	3	64913....	139518	16.181	16.181	1...	H1-1b
17	M28	PL1/2x6	.304	0	1	.195	0	y	8	91104....	97200	1.012	12.15	1...	H1-1b
18	M38A	L2x2x3	.298	4.358	2	.014	0	y	7	15648....	23392.8	.558	1.239	2...	H2-1
19	M35A	PL1/2x6	.285	0	1	.179	0	y	7	91104....	97200	1.012	12.15	1...	H1-1b
20	M25A	L2x2x3	.282	4.358	2	.012	0	z	8	15649....	23392.8	.558	1.235	2...	H2-1
21	M33	L2x2x3	.256	4.359	1	.013	0	y	8	15646....	23392.8	.558	1.231	2...	H2-1
22	MP3B	PIPE_2.5	.245	4.333	3	.051	4.333		1	30038....	50715	3.596	3.596	2...	H1-1b
23	M52	PIPE_2.0	.245	9.062	4	.146	13.1...		4	4678.524	32130	1.872	1.872	3...	H1-1b
24	M61	L2.5x2.5x4	.242	0	4	.057	1.568	y	1	37271....	38556	1.114	2.537	1...	H2-1
25	M154	PIPE_2.0	.241	9.063	2	.162	13.8...		2	4678.524	32130	1.872	1.872	4...	H1-1b
26	M34	L2x2x3	.237	4.359	1	.014	0	z	5	15647....	23392.8	.558	1.231	2...	H2-1
27	M34A	PL1/2x6	.233	0	2	.152	0	y	8	91104....	97200	1.012	12.15	1...	H1-1b
28	MP3A	PIPE_2.5	.232	4.333	1	.068	4.333		1	30038....	50715	3.596	3.596	2...	H1-1b
29	M40	HSS4x4x4	.224	6.439	2	.072	6.439	z	1	64913....	139518	16.181	16.181	1...	H1-1b
30	M37A	PL1/2x6	.220	0	2	.171	0	y	5	91104....	97200	1.012	12.15	1...	H1-1b
31	M47	PL3/8x6	.212	0	1	.162	0	y	4	68871....	72900	.57	9.113	1...	H1-1b
32	M51	PIPE_2.0	.205	10.4...	3	.149	13.8...		4	4678.524	32130	1.872	1.872	1...	H1-1b
33	MP4C	PIPE_2.5	.203	4.333	2	.077	4.333		3	30038....	50715	3.596	3.596	2...	H1-1b
34	M35	PL3/8x6	.201	0	1	.179	0	y	3	72193....	72900	.57	9.113	1...	H1-1b
35	MP4A	PIPE_2.5	.195	4.333	4	.109	4.333		2	30038....	50715	3.596	3.596	1...	H1-1b
36	MP3C	PIPE_2.5	.190	4.333	4	.057	4.333		4	30038....	50715	3.596	3.596	1...	H1-1b
37	MP5C	PIPE_2.5	.188	4.333	2	.097	4.333		3	30038....	50715	3.596	3.596	2...	H1-1b
38	MP1C	PIPE_2.5	.187	4.333	5	.100	4.333		3	30038....	50715	3.596	3.596	2...	H1-1b
39	MP1A	PIPE_2.5	.185	4.333	3	.129	4.333		2	30038....	50715	3.596	3.596	1...	H1-1b
40	MP1B	PIPE_2.5	.185	4.333	2	.124	4.333		4	30038....	50715	3.596	3.596	2...	H1-1b
41	MP4B	PIPE_2.5	.183	4.333	1	.094	4.333		3	30038....	50715	3.596	3.596	2...	H1-1b
42	M42A	HSS4x4x4	.163	0	6	.073	2.333	z	2	137689..	139518	16.181	16.181	1...	H1-1b
43	M63	L2.5x2.5x4	.162	1.568	4	.085	0	y	4	37271....	38556	1.114	2.537	2...	H2-1
44	M26A	HSS4x4x4	.162	3.823	3	.075	1.006	y	9	64913....	139518	16.181	16.181	2...	H1-1b
45	M41	HSS4x4x4	.161	2.732	7	.071	.398	z	3	137688..	139518	16.181	16.181	1...	H1-1b
46	M39	HSS4x4x4	.160	0	5	.060	2.334	z	1	137688..	139518	16.181	16.181	1...	H1-1b
47	M28B	HSS4x4x4	.155	0	8	.071	2.333	z	4	137689..	139518	16.181	16.181	1...	H1-1b
48	M26	PIPE_3.0	.154	9.062	4	.087	9.062		3	21266.02	65205	5.749	5.749	1...	H1-1b
49	M140	LL2.5x2.5x3x3	.153	0	5	.005	7.459	z	4	28541....	58320	3.954	2.55	1	H1-1b*
50	M42	PIPE_3.0	.150	9.063	2	.102	4.38		2	21266.02	65205	5.749	5.749	3...	H1-1b
51	M38	HSS4x4x4	.149	2.731	8	.054	.398	z	1	137689..	139518	16.181	16.181	1...	H1-1b

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

	Member	Shape	Code Check	Loc[ft]	LC	Shear..	Loc[ft]	Dir	LC	phi*Pnc..	phi*Pnt...	phi*Mn ..	phi*Mn ..	Cb	Eqn
52	M36	PL3/8x6	.149	0	2	.231	0	y	1	72204....	72900	.57	9.113	1...	H1-1b
53	M43	LL2.5x2.5x3x3	.149	0	7	.006	0	y	3	28539....	58320	3.954	2.55	1...	H1-1b*
54	M33C	PL3/8x6	.148	0	2	.208	0	y	1	68871....	72900	.57	9.113	1...	H1-1b
55	M27	HSS4x4x4	.146	2.732	6	.062	.398	z	1	137688..	139518	16.181	16.181	1...	H1-1b
56	M29	LL2.5x2.5x3x3	.136	0	8	.006	7.459	y	4	28542....	58320	3.954	2.55	1...	H1-1b*
57	M32	PL3/8x6	.134	0	1	.158	0	y	3	68871....	72900	.57	9.113	1...	H1-1b
58	M25	PIPE_3.0	.116	7.401	3	.070	4.078		3	21266.02	65205	5.749	5.749	1...	H1-1b
59	M31	PL1/2x6	.040	0	4	.175	0	y	2	95322....	97200	1.012	12.15	1...	H1-1b
60	M44	PL1/2x6	.037	0	3	.195	0	y	2	95322....	97200	1.012	12.15	1...	H1-1b
61	M45	PL1/2x6	.031	0	8	.148	0	y	3	95322....	97200	1.012	12.15	1...	H1-1b
62	M28A	PL1/2x6	.031	0	5	.191	0	y	3	95322....	97200	1.012	12.15	1...	H1-1b
63	M30	PL1/2x6	.025	0	2	.157	0	y	4	95322....	97200	1.012	12.15	1...	H1-1b
64	M29A	PL1/2x6	.022	0	5	.197	0	y	4	95322....	97200	1.012	12.15	1...	H1-1b

EXHIBIT 9

EBI Consulting

environmental | engineering | due diligence

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

T-Mobile Existing Facility

Site ID: CTNH331B

NH331/OPTA Pine Grove
940 Meriden Road
Waterbury, Connecticut 06705

July 25, 2020

EBI Project Number: 6220003082

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**34.02%**

July 25, 2020

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

Emissions Analysis for Site: CTNH331B - NH331/OPTA Pine Grove

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **940 Meriden Road** in **Waterbury, Connecticut** for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

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

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

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

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

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at 940 Meriden Road in Waterbury, Connecticut using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was focused at the base of the tower. For this report, the sample point is the top of a 6-foot person standing at the base of the tower.

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

1) 2 LTE channels (600 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

2) 1 NR channel (600 MHz Band) was considered for each sector of the proposed installation. This Channel has a transmit power of 80 Watts.

3) 2 LTE channels (700 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

4) 4 GSM channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

5) 2 UMTS channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

6) 4 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

7) 2 UMTS channels (AWS Band - 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

8) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

9) 2 LTE channels (BRS Band - 2500 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

10) 2 NR channels (BRS Band - 2500 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

11) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

12) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

13) The antennas used in this modeling are the RFS APX16DWV-16DWV-S-EA20 for the 1900 MHz / 1900 MHz / 2100 MHz channel(s), the RFS APXVAARR24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz channel(s), the Ericsson AIR 32 for the 1900 MHz / 2100 MHz channel(s) in Sector A, the Ericsson AIR 32 for the 1900 MHz / 2100 MHz channel(s), the RFS APXVAARR24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz channel(s), the RFS APX16DWV-16DWV-S-EA20 for the 1900 MHz / 1900 MHz / 2100 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz channel(s) in Sector B, the Ericsson AIR 32 for the 1900 MHz / 2100 MHz channel(s), the RFS APXVAARR24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz channel(s), the RFS APX16DWV-16DWV-S-EA20 for the 1900 MHz / 1900 MHz / 2100 MHz

channel(s) in Sector C, the Ericsson AIR 32 for the 1900 MHz / 1900 MHz / 2100 MHz channel(s) in Sector D. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

14) The antenna mounting height centerline of the proposed antennas is 99 feet above ground level (AGL).

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

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

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C	Sector:	D
Antenna #:	1	Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	RFS APX16DWV-16DWV-S-EA20	Make / Model:	Ericsson AIR 32	Make / Model:	Ericsson AIR 32	Make / Model:	Ericsson AIR 32
Frequency Bands:	1900 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	1900 MHz / 2100 MHz	Frequency Bands:	1900 MHz / 2100 MHz	Frequency Bands:	1900 MHz / 1900 MHz / 2100 MHz
Gain:	15.9 dBd / 15.9 dBd / 15.9 dBd	Gain:	15.35 dBd / 15.85 dBd	Gain:	15.35 dBd / 15.85 dBd	Gain:	15.35 dBd / 15.35 dBd / 15.85 dBd
Height (AGL):	99 feet	Height (AGL):	99 feet	Height (AGL):	99 feet	Height (AGL):	99 feet
Channel Count:	8	Channel Count:	4	Channel Count:	4	Channel Count:	8
Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts	Total TX Power (W):	360 Watts
ERP (W):	9,337.08	ERP (W):	8,728.31	ERP (W):	8,728.31	ERP (W):	9,337.08
Antenna A1 MPE %:	**3.42%**	Antenna B1 MPE %:	**3.20%**	Antenna C1 MPE %:	**3.20%**	Antenna D1 MPE %:	**4.71%**
Antenna #:	2	Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	N/A
Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz	Frequency Bands:	N/A
Gain:	12.95 dBd / 12.95 dBd / 13.35 dBd / 15.65 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.35 dBd / 15.65 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.35 dBd / 15.65 dBd	Gain:	N/A
Height (AGL):	99 feet	Height (AGL):	99 feet	Height (AGL):	99 feet	Height (AGL):	N/A
Channel Count:	7	Channel Count:	7	Channel Count:	7	Channel Count:	N/A
Total TX Power (W):	320 Watts	Total TX Power (W):	320 Watts	Total TX Power (W):	320 Watts	Total TX Power (W):	N/A
ERP (W):	8,466.41	ERP (W):	8,466.41	ERP (W):	8,466.41	ERP (W):	N/A
Antenna A2 MPE %:	**5.17%**	Antenna B2 MPE %:	**5.17%**	Antenna C2 MPE %:	**5.17%**	Antenna D2 MPE %:	N/A
Antenna #:	3	Antenna #:	3	Antenna #:	3	Antenna #:	3
Make / Model:	Ericsson AIR 6449	Make / Model:	RFS APX16DWV-16DWV-S-EA20	Make / Model:	Ericsson AIR 6449	Make / Model:	N/A
Frequency Bands:	2500 MHz / 2500 MHz	Frequency Bands:	1900 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	2500 MHz / 2500 MHz	Frequency Bands:	N/A
Gain:	22.05 dBd / 22.05 dBd	Gain:	15.9 dBd / 15.9 dBd / 15.9 dBd	Gain:	22.05 dBd / 22.05 dBd	Gain:	N/A
Height (AGL):	99 feet	Height (AGL):	99 feet	Height (AGL):	99 feet	Height (AGL):	N/A
Channel Count:	4	Channel Count:	8	Channel Count:	4	Channel Count:	N/A
Total TX Power (W):	160 Watts	Total TX Power (W):	240 Watts	Total TX Power (W):	160 Watts	Total TX Power (W):	N/A
ERP (W):	25,651.93	ERP (W):	9,337.08	ERP (W):	25,651.93	ERP (W):	N/A

Antenna A3 MPE %:	**9.41%**	Antenna B3 MPE %:	**3.42%**	Antenna C3 MPE %:	**9.41%**	Antenna D3 MPE %:	N/A
Antenna #:	**4**	Antenna #:	**4**	Antenna #:	**4**	Antenna #:	**4**
Make / Model:	Ericsson AIR 32	Make / Model:	Ericsson AIR 6449	Make / Model:	RFS APX16DWV-16DWV-S-EA20	Make / Model:	N/A
Frequency Bands:	1900 MHz / 2100 MHz	Frequency Bands:	2500 MHz / 2500 MHz	Frequency Bands:	1900 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	N/A
Gain:	15.35 dBd / 15.85 dBd	Gain:	22.05 dBd / 22.05 dBd	Gain:	15.9 dBd / 15.9 dBd / 15.9 dBd	Gain:	N/A
Height (AGL):	99 feet	Height (AGL):	99 feet	Height (AGL):	99 feet	Height (AGL):	N/A
Channel Count:	4	Channel Count:	4	Channel Count:	8	Channel Count:	N/A
Total TX Power (W):	240 Watts	Total TX Power (W):	160 Watts	Total TX Power (W):	240 Watts	Total TX Power (W):	N/A
ERP (W):	8,728.31	ERP (W):	25,651.93	ERP (W):	9,337.08	ERP (W):	N/A
Antenna A3 MPE %:	**3.20%**	Antenna B3 MPE %:	**9.41%**	Antenna C3 MPE %:	**3.42%**	Antenna D4 MPE %:	N/A

Site Composite MPE %	
Carrier	MPE %
T-Mobile (Max at Sector A):	21.20%
Nextel	0.37%
Clearwire	3.57%
Sprint	0.22%
Metro PCS	2.41%
Verizon	6.25%
Site Total MPE % :	34.02%

T-Mobile MPE % Per Sector	
T-Mobile Sector A Total:	21.20%
T-Mobile Sector B Total:	21.20%
T-Mobile Sector C Total:	21.20%
T-Mobile Sector D Total:	4.71%
Site Total MPE % :	34.02%

T-Mobile Maximum MPE Power Values (Sector A)

T-Mobile Frequency Band / Technology (Sector A)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density (μW/cm²)	Frequency (MHz)	Allowable MPE (μW/cm²)	Calculated % MPE
T-Mobile 1900 MHz GSM	4	1167.14	99.0	17.12	1900 MHz GSM	1000	1.71%
T-Mobile 1900 MHz UMTS	2	1167.14	99.0	8.56	1900 MHz UMTS	1000	0.86%
T-Mobile 2100 MHz UMTS	2	1167.14	99.0	8.56	2100 MHz UMTS	1000	0.86%
T-Mobile 600 MHz LTE	2	591.73	99.0	4.34	600 MHz LTE	400	1.09%
T-Mobile 600 MHz NR	1	1577.94	99.0	5.79	600 MHz NR	400	1.45%
T-Mobile 700 MHz LTE	2	648.82	99.0	4.76	700 MHz LTE	467	1.02%
T-Mobile 1900 MHz LTE	2	2203.69	99.0	16.17	1900 MHz LTE	1000	1.62%
T-Mobile 2500 MHz LTE	2	6412.98	99.0	47.05	2500 MHz LTE	1000	4.70%
T-Mobile 2500 MHz NR	2	6412.98	99.0	47.05	2500 MHz NR	1000	4.70%
T-Mobile 1900 MHz LTE	2	2056.61	99.0	15.09	1900 MHz LTE	1000	1.51%
T-Mobile 2100 MHz LTE	2	2307.55	99.0	16.93	2100 MHz LTE	1000	1.69%
						Total:	**21.20%**

• NOTE: Totals may vary by approximately 0.01% due to summation of remainders in calculations.

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:	21.20%
Sector B:	21.20%
Sector C:	21.20%
Sector D	4.71%
T-Mobile Maximum MPE % (Sector A):	21.20%
Site Total:	34.02%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **34.02%** 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.