Filed by:
G. Scott Shepherd, Sr. Property Specialist - SBA Communications
134 Flanders Rd., Suite 125, Westborough, MA 01581
508.251.0720 x 3807 - GShepherd@sbasite.com

August 8, 2019

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

RE: Notice of Exempt Modification
1294 Pleasant Valley Road North, Groton, CT 06340
Latitude: 41.399972
Longitude: -72.079222
T-Mobile Site #: CT11311G_L600

Dear Ms. Bachman:

T-Mobile currently maintains six (6) antennas at the 140-foot level of the existing 149-foot Monopole Tower at 1294 Pleasant Valley Road North, Groton, CT. The 149-foot tower is owned by SBA Infrastructure, LLC. The property is owned by JFM Enterprises, LLC. T-Mobile now intends to install three (3) new 600/700/1900/2100 MHz antennas. The new antennas would be installed at the 137-foot level of the tower.

Planned Modifications:

TOWER

Remove:
- (2) 1-5/8" Coax lines

Remove and Replace:
- n/a

Install New:
- (3) RFS APXVAARR24_43-U-NA20 600/700 MHz @ 137'
- (3) Ericsson Radio 4449 B71+B12 @ 137'
- (3) T-Arm Kit and Handrail Kit (MS-P-TARM_6)
- (2) 1-5/8" Hybrid fiber

Existing Equipment to Remain:
- (3) Ericsson - AIR 21 B2A/B4P – Panel 1900 MHz (relocating to 137')
- (3) Ericsson - AIR 32 – Panel 1900/2100 MHz (relocating to 137')
- (1) low profile platform
- (10) 1-5/8" lines
- (2) 1-5/8" fiber

Entitlements:

- (3) Ericsson - KRY 112 144/1 – TMA

GROUND

Install New:

- Equipment inside existing 6131 cabinet

This facility was approved by Council on June 7, 2007 under Docket 330. Approval was given for a steel monopole no taller than 140' above ground level to provide telecom services to both public and private entities. Additionally, the Town of Groton Department of Planning and Development Services stipulated that no advertising or signs, other than warning signs, were to be permitted on the tower. There were no other post construction stipulations set. 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 Town of Groton's Town Manager, John Burt, and Director of Planning, Jonathan J. Riener, 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

G. Scott Shepherd
Sr. Property Specialist
SBA COMMUNICATIONS CORPORATION
134 Flanders Rd., Suite 125
Westborough, MA 01581
508.251.0720 x3804 + T / 508.366.2610 + F
508.868.6000 + C
GShepherd@SBASite.com

Attachments

cc: John Burt, Town Manager / with attachments
45 Fort Hill Road, Groton, CT 06340
Jonathan J. Riener, AICP, Director of Planning / with attachments
45 Fort Hill Road, Groton, CT 06340
JFM Enterprises LLC c/o Jennifer Macierowski / with attachments
920 Pleasant Valley Rd., North, Groton, CT 06340

Exhibit List

Exhibit 1	Check Copy	
Exhibit 2	Notification Receipts	
Exhibit 3	Property Card	
Exhibit 4	Property Map	
Exhibit 5	Original Zoning Approval	
Exhibit 6	Construction Drawings	7/19/19
Exhibit 7	Structural Analysis	7/17/19
Exhibit 8	Post Mod Mount Analysis	7/25/19
Exhibit 9	Mount Mod Drawings	7/16/19
Exhibit 10	EME Report	5/21/19

EXHIBIT 1

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

Print Card

Commercial Property Card

Print Date: 5/15/2019

Card 1 of 1

Account	Location	Zoning	Deed Book/Page	Acres
178010470143	1294 PLEASANT VALLEY RD NORTH	RU-20	774/624	3.66

District	Use Code
POQUONNOCK BRIDGE	SMALL RETAIL AND SERVICE STORES

Current Owner

JFM ENTERPRISES LLC
C/O JENNIFER MACIEROWSKI
920 PLEASANT VALLEY RD N
GROTON CT 06340

Building Information

Building No:	1
Year Built:	1975
No of Units:	1
Structure Type:	RETAIL - SINGLE OCCUPANCY
Building Total Area:	2388 sqft.
Grade:	D+
Identical Units:	1

Valuation

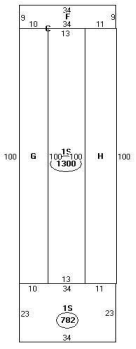
Land:	$197,900
Building:	$75,100
Total:	$273,000
Total Assessed Value:	$191,100

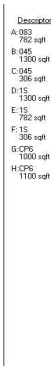
Recent Sales

Book/Page	Date	Price
651/124	10/1/1997	$123,380
721/770	10/23/2000	$140,000
774/624	6/20/2002	$150,000

Property Picture

Building Sketch





Sketch Legend

----	Main Living Area	1SMA	Masonry	GRHS	Attached Greenhouse
1FR	Frame	OMP	Open Masonry Porch	CAT	Cathedral Ceiling
OFP	Open Frame Porch	EMP	Enclosed Msry Porch	SOP	Screen Open Frame Prch
EFP	Enclosed Frame Porch	MUB	Masonry Utility	SMP	Screen Open Msnry Prch
FUB	Frame Utility Building	MB	Masonry Bay	CPAT	Concrete Patio
FB	Frame Bay	MOH	Masonry Overhang	B	Basement
FG	Frame Garage	.5MA	1/2 Story Masonry		
FOH	Frame Overhang	MP	Masonry Patio		
.5FR	1/2 Story Frame	WD	Wood Deck		
A(U)	Attic (Unfinished)	CPY	Canopy		
A(F)	Attic (Finished)				

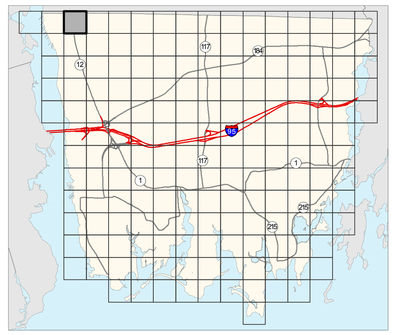
Exterior/Interior Information

Levels	Use Type	Ext. Walls	Const. Type	Heating	A/C	Condition
01 - 01	MULTI-USE SALES	CONCRETE BLOCK	WOOD JOIST	HOT AIR	NONE	NORMAL
01 - 01	WAREHOUSE	CONCRETE BLOCK	WOOD JOIST	HOT AIR	NONE	NORMAL
01 - 01	WAREHOUSE	FRAME	WOOD JOIST	NONE	NONE	NORMAL

EXHIBIT 4

Town of Groton

Property Map



Legend

- Map Boundary
- Block Boundary
- Sidewalk
- Bridge
- Main Road
- Paved Surface
- Unpaved Surface
- Water Body
- Wet Area
- Dock / Pier
- Swimming Pool
- Building
- Sports Field
- Woodland
- Fence
- Retaining Wall
- Misc. Wall
- Political Boundary
- Railway
- Parcel Line
- Railroad Right of Way
- Road Right of Way
- Townline
- Easement Line
- Stream
- 123 Deeded Lot Dimension
- (123) Calculated Lot Dimension
- *10* Developer Lot Number
- (1.3 A) Acreage
- 0139 Lot Number
- 12 Block Number
- 210 House Number

Disclaimer:

The planimetric and topographic information depicted on this map was compiled by The Sanborn Map Company based on an aerial flight performed in April, 2009. The parcel and property line information depicted on this map has been compiled from recorded deeds, maps, assessor records, and other sources of information in the Town of Groton. The intent of this map is to depict a graphical representation of real property information relative to the planimetric features for the Town of Groton and is subject to change as a more accurate survey may disclose. The Town of Groton and the mapping companies assume no legal responsibility for the information contained in this data.
THIS MAP IS NOT TO BE USED FOR THE TRANSFER OF PROPERTY.

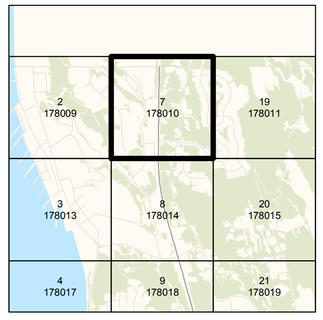
Horizontal Datum:
Connecticut State Plane Coordinates, North American Datum of 1983 (NAD83 Feet).

Vertical Datum:
North American Vertical Datum of 1988 (NAVD88).

N W E S

100 50 0 100 200 300 Feet

Map Scale: 1" = 100'



DATE: OCTOBER 1, 2009

MAP: 178010 TILE: 7

FILE: \\acfcbar\gis\depts\Assessor\projects\ArcGIS\TaxMapProjects\2009_Planimetrics.mxd

EXHIBIT 5

DOCKET NO. 330 – Optasite Towers, LLC 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 1294 Pleasant Valley Road North in Groton, Connecticut.	Connecticut Siting Council
	June 7, 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 Towers, LLC for the construction, maintenance and operation of a wireless telecommunications facility to be located at 1294 Pleasant Valley Road North in Groton, 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 140 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 Town of Groton 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.

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 New London Day and the Norwich Bulletin.

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 Towers, LLC 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

STATE OF CONNECTICUT)

ss. New Britain, Connecticut :

COUNTY OF HARTFORD)

I hereby certify that the foregoing is a true and correct copy of the Findings of Fact, Opinion, and Decision and Order issued by the Connecticut Siting Council, State of Connecticut.

ATTEST:

S. Derek Phelps
Executive Director
Connecticut Siting Council

I certify that a copy of the Findings of Fact, Opinion, and Decision and Order in Docket No. 330 has been forwarded by Certified First Class Return Receipt Requested mail on June 12, 2007, to all parties and intervenors of record as listed on the attached service list, dated February 26, 2007.

ATTEST:

Lisa A. Fontaine
Administrative Assistant
Connecticut Siting Council

TOWN OF GROTON

PLANNING AND DEVELOPMENT SERVICES
Planning Department

134 Groton Long Point Road
Groton, Connecticut 06340-4873
Telephone (860) 446-5970
Fax (860) 446-5978

April 18, 2007

S. Derek Phelps, Executive Director
State of Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

SUBJECT: Optasite Towers and Omnipoint Communications
1294 Pleasant Valley Road North, Groton, CT
Docket No. 330

Dear Mr. Phelps:

Please consider this a response of the Planning Department of the Town of Groton in the matter of the New Optasite Towers and Omnipoint Communications proposed communications facility at 1294 Pleasant Valley Road North in Groton. The Office of Planning and Development received your letter on March 21, 2007. This office reserves all other rights with regard to regulatory review of the project in accordance with the law. Please enter this information into the hearing record for April 18, 2007.

The Town of Groton currently has development standards in effect for review of Telecommunications Towers, Antennae and Facilities. These standards require that a comprehensive package of components be addressed by an applicant to assure that a proposal's siting, construction, and maintenance are accomplished in the public interest. In this regard, the Town's planning staff has identified the following items that still should be addressed in the proposal to the Connecticut Siting Council. These items include:

1. The plans and report should state "There shall be no advertising or signs, other than warning signs, permitted on any tower."

2. The plans and report should state that "The tower shall be removed from the site within 12 months of cessation of the use. In the event an unused tower is not removed within this time period, the tower and associated facilities may be removed by the Town and the cost of removal assessed against the property."

3. The plans should show that adequate fire access to any proposed tower. This usually includes a paved road that meets the Fire Department's width, clearance, and turn-around requirements and is able to hold a 60,000-lb. fire apparatus. Planning Staff suggests that the applicant work closely with the local Fire Marshal to obtain the appropriate access design.

4. The report needs to confirm that the tower design meets the updated State Building Code requirements for withstanding current pressure requirements. Please address.

These comments should provide you with a comprehensive record of the physical planning and design concerns associated with the project.

The Planning Department appreciates the efforts that have been made to allow for co-location of additional carriers as referred to in Exhibit A, page 15. The Town will continue to monitor the project to assure that the Town's concerns are adequately addressed. Also, feel free to call Susan C. Cullen, Planner I at this office if you have any questions.

Sincerely,

Matthew J. Davis
Manager, Planning & Development Services

SCC

cc: Julie Kohler, Esq.

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).

NORWICH/I-395 X83

26 MELL ROAD
LISBON, CT 06351
NEW LONDON COUNTY

SITE NO.: CT11150D

SITE TYPE: 195'± MONOPOLE

RF DESIGN GUIDELINE: 67D02C

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.

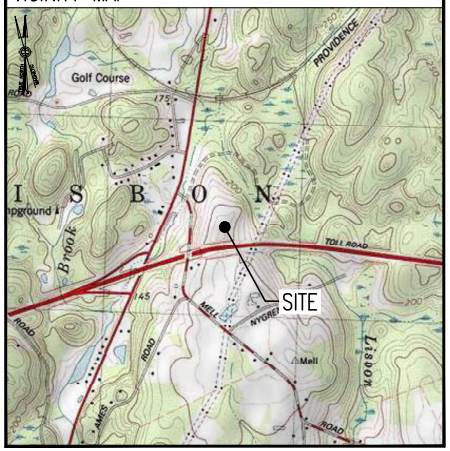
GENERAL NOTES

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 OWNPOINT 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

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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:	CT11150D
SBA SITE NUMBER:	CT00167-S
SBA SITE NAME:	LISBON
SITE ADDRESS:	26 MELL ROAD LISBON, CT 06351
PROPERTY OWNER:	STANLEY WILDOWSKY JR. C/O SBA TOWERS INC. 8051 CONGRESS AVE. BOCA RATON, FL 33487
TOWER OWNER:	SBA PROPERTIES, LLC 8501 CONGRESS AVENUE BOCA RATON, FL 33487 PHONE: 561-226-9523
COUNTY:	NEW LONDON COUNTY
ZONING DISTRICT:	LOW-DENSITY RESIDENTIAL
STRUCTURE TYPE:	MONOPOLE
STRUCTURE HEIGHT:	195'
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: 41.591033° N41°35'27.7188" LONGITUDE: -72.016960° W72°01'01.056"

T-MOBILE NORTHEAST LLC
15 COMMERCE WAY, SUITE B
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STATE OF CONNECTICUT
CLEMENT J. SAK
28376
LICENSED
PROFESSIONAL ENGINEER

CHECKED BY: JMT

APPROVED BY: JMT

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
1	07/18/19	ISSUED FOR CONSTRUCTION	CMC
0	06/03/19	ISSUED FOR REVIEW	CMC

SITE NUMBER:
CT11150D

SITE ADDRESS:
26 MELL ROAD
LISBON, CT 06351

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1

1815.053

GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

SITE WORK GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

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

CONCRETE AND REINFORCING STEEL NOTES:

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

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

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

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

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

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

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

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

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

STRUCTURAL STEEL NOTES:

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

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

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

4. NON-STRUCTURAL CONNECTIONS FOR STEEL GRATING MAY USE ⅜" 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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STATE OF CONNECTICUT
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26376
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PROFESSIONAL ENGINEER

CHECKED BY: JMT

APPROVED BY: JMT

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
1	07/18/19	ISSUED FOR CONSTRUCTION	CMC
0	06/03/19	ISSUED FOR REVIEW	CMC

SITE NUMBER:
CT11150D

SITE ADDRESS:
26 MELL ROAD
LISBON, CT 06351

SHEET TITLE
GENERAL NOTES

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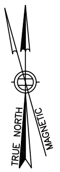
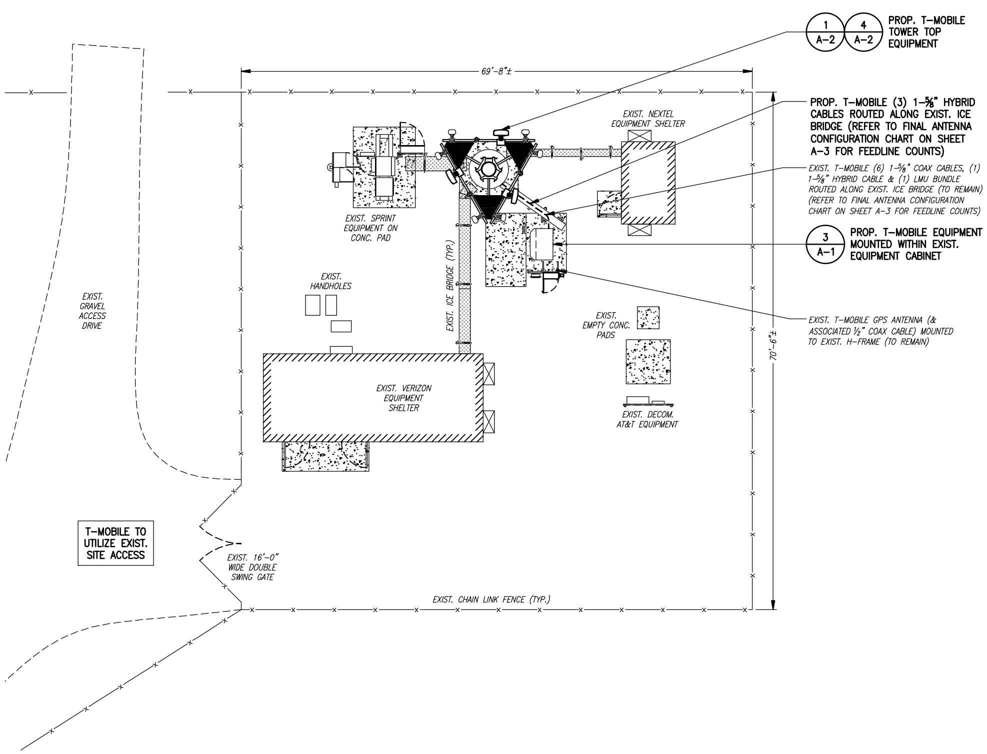
GN-1

1815.053

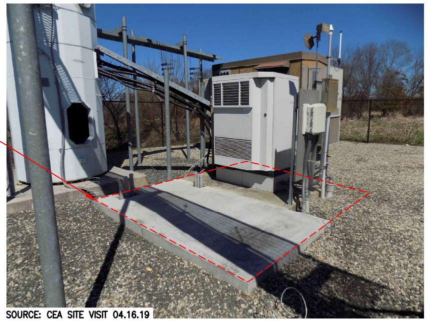
SPECIAL PRE-CONSTRUCTION WORK NOTE (SBA-PROVIDED TOWER STRUCTURAL ANALYSIS SPECIAL EQUIPMENT INSTALLATION REQUIREMENTS):
GENERAL CONTRACTOR SHALL FURNISH AND INSTALL ALL SPECIAL OR SUPPLEMENTAL ADDITIONAL TOWER-MOUNTED EQUIPMENT PER RECOMMENDATIONS FROM SBA-PROVIDED TOWER STRUCTURAL ANALYSIS FOR ANY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





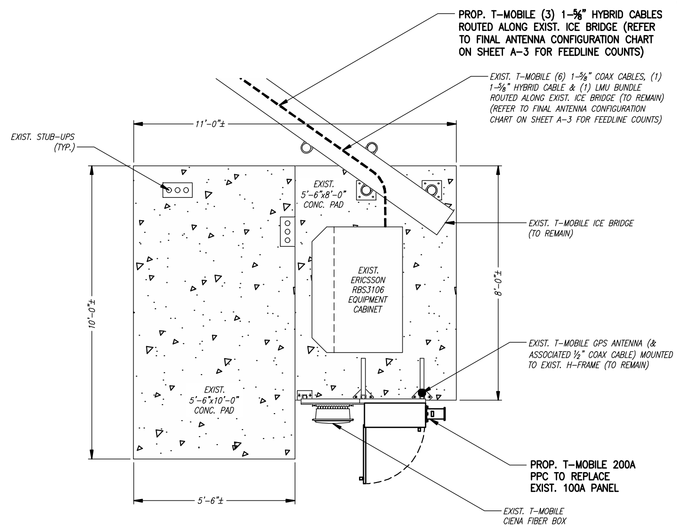
COMPOUND PLAN (1 / A-1)
SCALE: 1/8" = 1'-0"
0 2'-8" 5'-4" 8'-0"

EXIST. EQUIPMENT AREA (3 / A-1)



SOURCE: CEA SITE VISIT 04.16.19

EQUIPMENT AREA PHOTO (2 / A-1)
SCALE: N.T.S.



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

T-MOBILE NORTHEAST LLC
15 COMMERCE WAY, SUITE B
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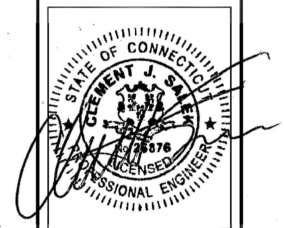

CHECKED BY: JMT

APPROVED BY: JMT

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
1	07/18/19	ISSUED FOR CONSTRUCTION	CMC
0	05/03/19	ISSUED FOR REVIEW	CMC

SITE NUMBER:
CT11150D

SITE ADDRESS:
26 MELL ROAD
LISBON, CT 06351

SHEET TITLE
COMPOUND & EQUIPMENT PLAN

SHEET NUMBER
A-1

1815.053

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):
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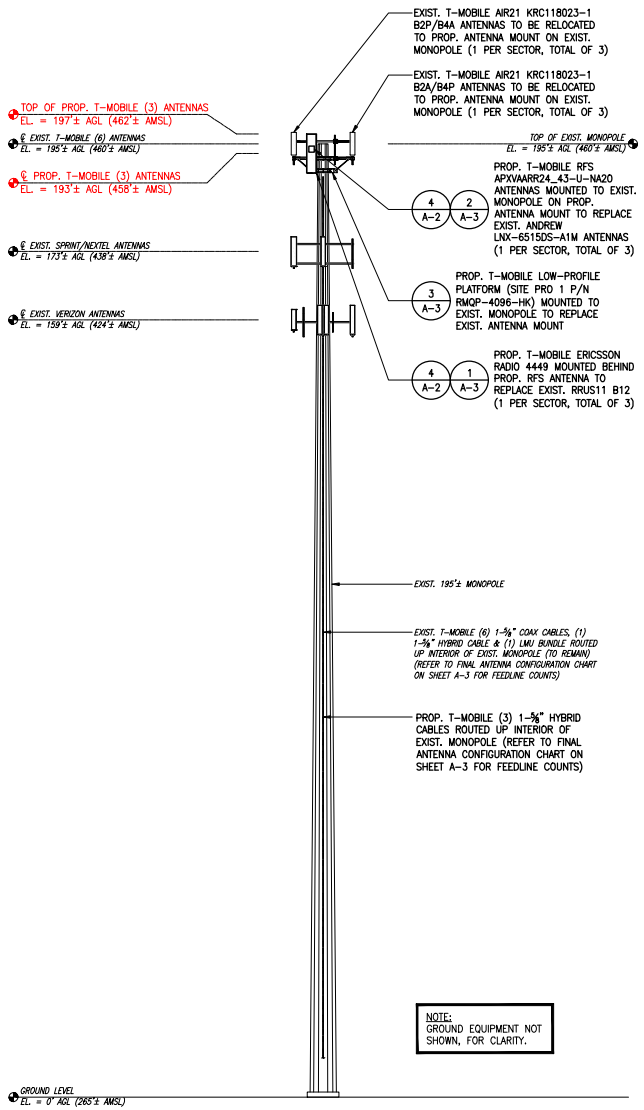
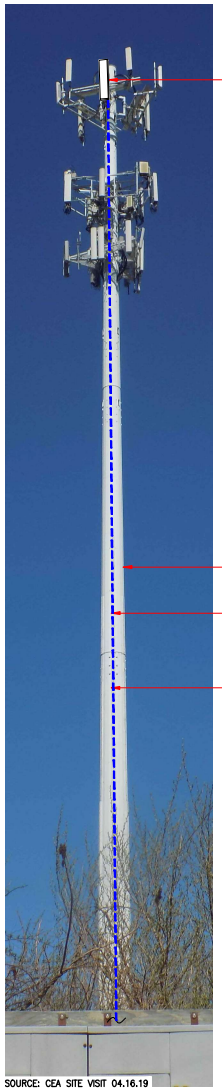


NOTE:
GROUND EQUIPMENT NOT SHOWN, FOR CLARITY.

TOWER ELEVATION (1 / A-2)
SCALE: 1" = 12'-0"
0 6' 12' 24' 36'



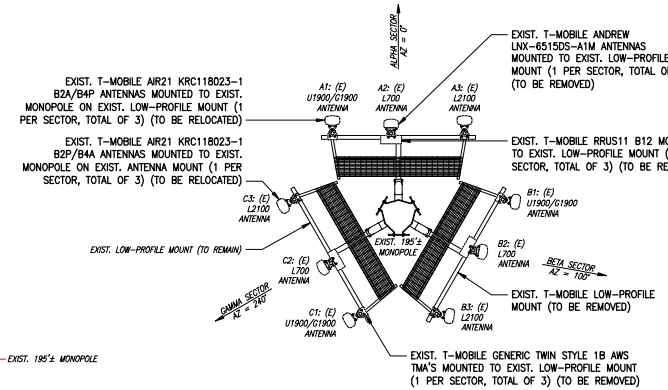
SOURCE: CEA SITE VISIT 04.16.19

NOTE:
PROPOSED T-MOBILE RRH'S NOT SHOWN, FOR CLARITY.

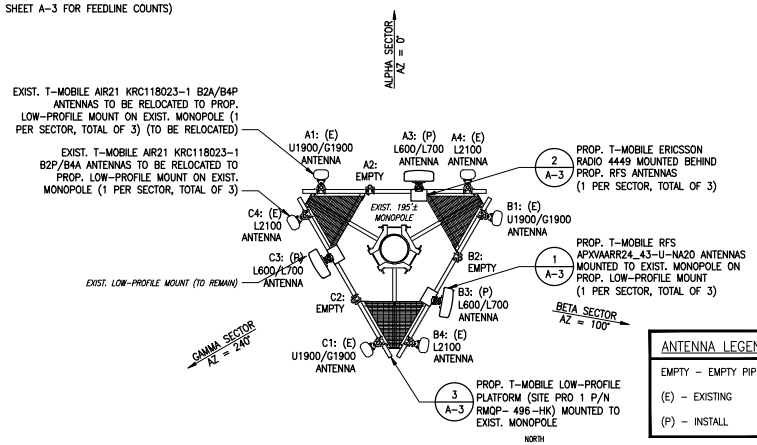
NOTE: ONE SECTOR SHOWN FOR CLARITY

TOWER PHOTO (2 / A-2)
SCALE: N.T.S.

4 A-2 / 1 A-3 / 2 A-3 / 3 A-3 INSTALL PROP. TOWER TOP EQUIPMENT



EXISTING ANTENNA PLAN (3 / A-2)
SCALE: N.T.S.



PROPOSED ANTENNA PLAN (4 / A-2)
SCALE: N.T.S.

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

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

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STATE OF CONNECTICUT
CLEMENT J. SAK
28376
LICENSED
PROFESSIONAL ENGINEER

CHECKED BY: JMT
APPROVED BY: JMT

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
1	07/18/19	ISSUED FOR CONSTRUCTION	CMC
0	06/03/19	ISSUED FOR REVIEW	CMC

SITE NUMBER:
CT11150D

SITE ADDRESS:
26 MELL ROAD
LISBON, CT 06351

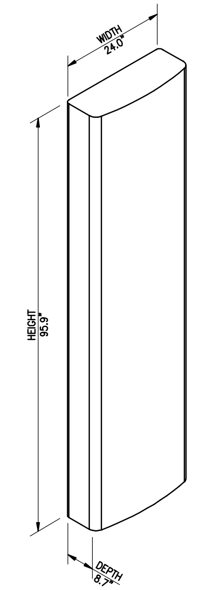
SHEET TITLE
TOWER ELEVATIONS & ANTENNA PLAN

SHEET NUMBER
A-2

1815.053

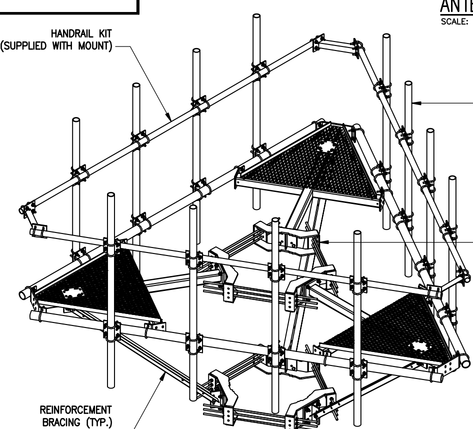
FINAL ANTENNA CONFIGURATION								
SECTOR	ANTENNA	RAD CENTER	AZIMUTH (TRUE NORTH)	MECHANICAL DOWNTILT	ELECTRICAL DOWNTILT	BAND	TMA/RADIOS	CABLES
ALPHA	*ERICSSON AIR21 KRC118023-1 B2A/B4P*	*195'± AGL*	*0°*	*0°*	*2°*	*U1900/G1900*	–	*(1) 1-5/8" HYBRID CABLES (SHARED)*
	RFS APXVAARR24_43-U-NA20	193'± AGL	0°	0°	2°	L600/L700	ERICSSON RADIO 4449 B71+B12	(1) 1-5/8" HYBRID CABLE
	ERICSSON AIR21 KRC118023-1 B2P/B4A	*195'± AGL*	*0°*	*0°*	*2°*	*L2100*	–	*(1) 1-5/8" HYBRID CABLES (SHARED)*
BETA	*ERICSSON AIR21 KRC118023-1 B2A/B4P*	*195'± AGL*	*100°*	*0°*	*2°*	*U1900/G1900*	–	*(1) 1-5/8" HYBRID CABLES (SHARED)*
	RFS APXVAARR24_43-U-NA20	193'± AGL	100°	0°	2°	L600/L700	ERICSSON RADIO 4449 B71+B12	(1) 1-5/8" HYBRID CABLE
	ERICSSON AIR21 KRC118023-1 B2P/B4A	*195'± AGL*	*100°*	*0°*	*2°*	*L2100*	–	*(1) 1-5/8" HYBRID CABLES (SHARED)*
GAMMA	*ERICSSON AIR21 KRC118023-1 B2A/B4P*	*195'± AGL*	*240°*	*0°*	*2°*	*U1900/G1900*	–	*(1) 1-5/8" HYBRID CABLES (SHARED)*
	RFS APXVAARR24_43-U-NA20	193'± AGL	240°	0°	2°	L600/L700	ERICSSON RADIO 4449 B71+B12	(1) 1-5/8" HYBRID CABLE
	ERICSSON AIR21 KRC118023-1 B2P/B4A	*195'± AGL*	*240°*	*0°*	*2°*	*L2100*	–	*(1) 1-5/8" HYBRID CABLES (SHARED)*

NOTE: EXISTING (6) 1-5/8" COAX CABLES & (1) LMU BUNDLE TO REMAIN DISCONNECTED.



RFS APXVAARR24_43-U-NA20 PANEL ANTENNA
DIMENSIONS: 95.9"H x 24.0"W x 8.7"D
WEIGHT: 128.0 LBS
1 PER SECTOR, TOTAL OF 3

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



SITE-PRO 1 12'-6" LOW-PROFILE CO-LOCATION PLATFORM W/HANDRAIL KIT
PART NUMBERS: RMQP- 496 -HK
(TOTAL OF 1 REQUIRED)

TYPICAL SITE PRO 1 12'-6" PLATFORM MOUNT (3/A-3)
SCALE: N.T.S.

ERICSSON RADIO 4449 B12+B71
DIMENSIONS: 14.9"H x 13.2"W x 9.3"D
WEIGHT: 74.0 LBS
1 PER SECTOR, TOTAL OF 3

RRU DETAIL (2/A-3)
SCALE: N.T.S.

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STATE OF CONNECTICUT
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No. 25876
LICENSED PROFESSIONAL ENGINEER

CHECKED BY: JMT

APPROVED BY: JMT

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0	05/03/19	ISSUED FOR REVIEW	CMC

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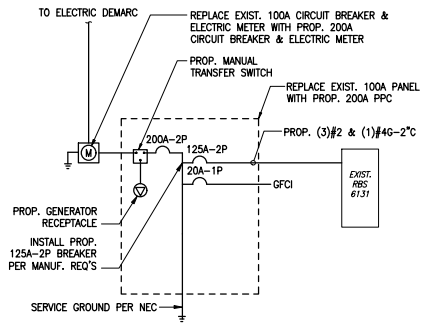
CT11150D

SITE ADDRESS:
26 MELL ROAD
LISBON, CT 06351

SHEET TITLE
SITE DETAILS

SHEET NUMBER
A-3

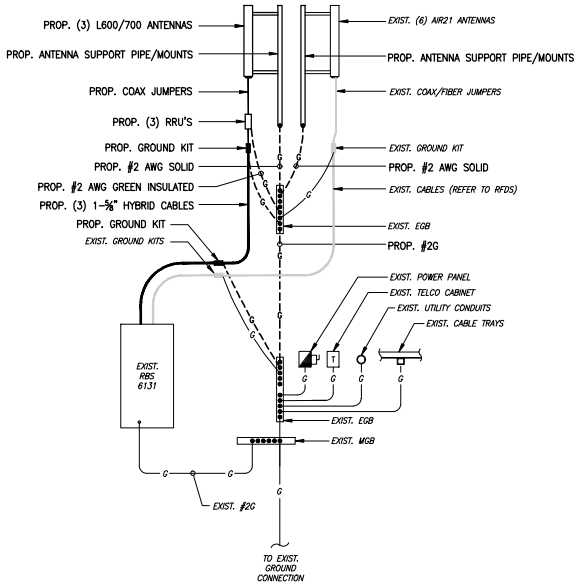
1815.053



ONE LINE DIAGRAM

SCALE: NOT TO SCALE

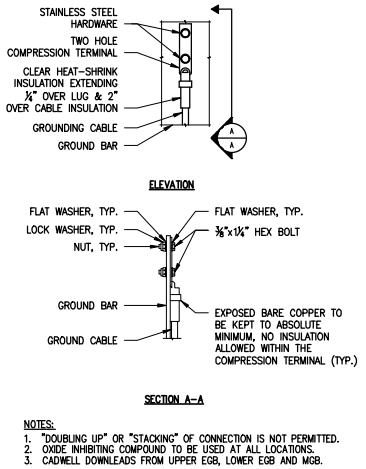
1 E-1



GROUNDING RISER DIAGRAM

SCALE: NOT TO SCALE

2 E-1



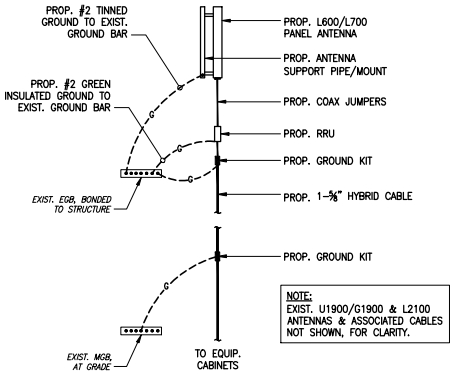
NOTES:

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

TYPICAL GROUND BAR CONNECTIONS DETAIL

SCALE: NOT TO SCALE

3 E-1

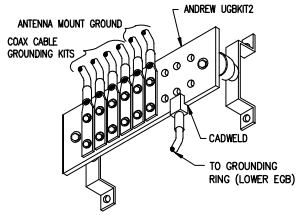


L600/L700

COAX CABLE CONNECTION AND GROUNDING DETAIL

SCALE: NOT TO SCALE

4 E-1



GROUND BAR (EGB)

SCALE: NOT TO SCALE

5 E-1

ELECTRICAL AND GROUNDING NOTES

1. ALL ELECTRICAL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC) AS WELL AS APPLICABLE STATE AND LOCAL CODES.
2. ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED AND PROCURED PER SPECIFICATION REQUIREMENTS.
3. THE ELECTRICAL WORK INCLUDES ALL LABOR AND MATERIAL DESCRIBED BY DRAWINGS AND SPECIFICATION INCLUDING INCIDENTAL WORK TO PROVIDE COMPLETE OPERATING AND APPROVED ELECTRICAL SYSTEM.
4. GENERAL CONTRACTOR SHALL PAY FEES FOR PERMITS, AND IS RESPONSIBLE FOR OBTAINING SAID PERMITS AND COORDINATION OF INSPECTIONS.
5. ELECTRICAL AND TELCO WIRING OUTSIDE A BUILDING AND EXPOSED TO WEATHER SHALL BE IN WATER TIGHT GALVANIZED RIGID STEEL CONDUITS OR SCHEDULE 80 PVC (AS PERMITTED BY CODE) AND WHERE REQUIRED IN LIQUID TIGHT FLEXIBLE METAL OR NONMETALLIC CONDUITS.
6. BURIED CONDUIT SHALL BE SCHEDULE 40 PVC.
7. ELECTRICAL WIRING SHALL BE COPPER WITH TYPE XHHW, THWN, OR THHNINSULATION.
8. RUN ELECTRICAL CONDUIT OR CABLE BETWEEN ELECTRICAL UTILITY DEMARCATION POINT AND PROJECT OWNER CELL SITE PPC AS INDICATED ON THIS DRAWING. PROVIDE FULL LENGTH PULL ROPE. COORDINATE INSTALLATION WITH UTILITY COMPANY.
9. RUN TELCO CONDUIT OR CABLE BETWEEN TELEPHONE UTILITY DEMARCATION POINT AND PROJECT OWNER CELL SITE TELCO CABINET AND BTS CABINET AS INDICATED ON THIS DRAWING PROVIDE FULL LENGTH PULL ROPE IN INSTALLED TELCO CONDUIT. PROVIDE GREENLEE CONDUIT MEASURING TAPE AT EACH END.
10. WHERE CONDUIT BETWEEN BTS AND PROJECT OWNER CELL SITE PPC AND BETWEEN BTS AND PROJECT OWNER CELL SITE TELCO SERVICE CABINET ARE UNDERGROUND USE PVC, SCHEDULE 40 CONDUIT. ABOVE THE GROUND PORTION OF THESE CONDUITS SHALL BE PVC CONDUIT.
11. ALL EQUIPMENT LOCATED OUTSIDE SHALL HAVE NEMA 3R ENCLOSURE.
12. PPC SUPPLIED BY PROJECT OWNER.
13. GROUNDING SHALL COMPLY WITH NEC ART. 250. ADDITIONALLY, GROUNDING, BONDING AND LIGHTNING PROTECTION SHALL BE DONE IN ACCORDANCE WITH "T-MOBILE BTS SITE GROUNDING STANDARDS".
14. GROUND COAXIAL CABLE SHIELDS MINIMUM AT BOTH ENDS USING MANUFACTURERS COAX CABLE GROUNDING KITS SUPPLIED BY PROJECT OWNER.
15. USE #6 COPPER STRANDED WIRE WITH GREEN COLOR INSULATION FOR ABOVE GRADE GROUNDING (UNLESS OTHERWISE SPECIFIED) AND #2 SOLID TINNED BARE COPPER WIRE FOR BELOW GRADE GROUNDING AS INDICATED ON THE DRAWING.
16. ALL GROUND CONNECTIONS TO BE BURNDY HYGROUND COMPRESSION TYPE CONNECTORS OR CADWELD EXOTHERMIC WELD. DO NOT ALLOW BARE COPPER WIRE TO BE IN CONTACT WITH GALVANIZED STEEL.
17. ROUTE GROUNDING CONDUCTORS ALONG THE SHORTEST AND STRAIGHTEST PATH POSSIBLE, EXCEPT AS OTHERWISE INDICATED. GROUNDING LEADS SHOULD NEVER BE BENT AT RIGHT ANGLE. ALWAYS MAKE AT LEAST 12" RADIUS BENDS. #6 WIRE CAN BE BENT AT 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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APPROVED BY: JMT

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CT11150D

SITE ADDRESS:
26 MELL ROAD
LISBON, CT 06351

SHEET TITLE
ELECTRICAL & GROUNDING DETAILS

SHEET NUMBER
E-1

1815.053

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 149 ft SABRE Monopole

Customer Name: SBA Communications Corp

Customer Site Number: CT13075-A

Customer Site Name: New London

Carrier Name: T-Mobile (App#: 116561, V1)

Carrier Site ID / Name: CT11311G / CT311/Opta Paws Place

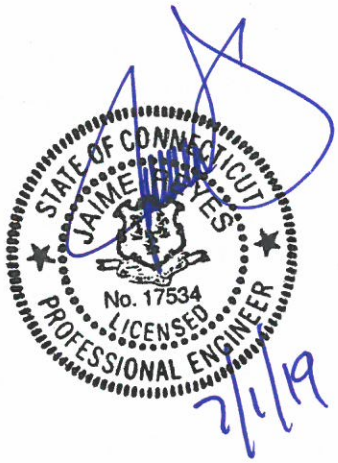
Site Location: 1294 Pleasant Valley Road North

Groton, Connecticut

New London County

Latitude: 41.399972

Longitude: -72.079222



Analysis Result:

Max Structural Usage: 87.4% [Pass]

Max Foundation Usage: 98.1% [Pass]

Additional Usage Caused by Mount Modification: +5.4%

Report Prepared By: Sital Shrestha

Introduction

The purpose of this report is to summarize the analysis results on the 149 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 Design prepared by Sabre, job # 08-07173, dated 08/09/2007
Foundation Drawing	Foundation Design prepared by Sabre, job # 08-07173-E, dated 08/09/2007
Geotechnical Report	Geotechnical Report prepared by Gemini Geotechnical Associates, job # 07079CT, dated 07/20/2007
Modification Drawings	N/A

Analysis Criteria

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

Wind Speed Used in the Analysis:	Ultimate Design Wind Speed V_{ult} =134.0mph (3-Sec. Gust)/ Nominal Design Wind Speed V_{asd} = 104.0 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:	ANSI/TIA/EIA 222-G / 2015 IBC / 2018 Connecticut State Building Code
Exposure Category:	C
Structure Class:	II
Topographic Category:	1
Crest Height:	0 ft
Seismic Parameters:	S_S = 0.163, S_1 = 0.059

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

Existing Antennas, Mounts and Transmission Lines

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

Items	Elevation (ft)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
1	150.5	3	Commscope - SBNHH-1D65B - Panel	Low Profile Platform	(12) 1 5/8" (2) 1 5/8" Hybriflex Fiber	Verizon
2	149.0	3	Commscope - LNX-6514DS-VTM - Panel			
3		3	Antel - BXA-80063/4CF - Panel			
4		3	Commscope - SBNHH-1D65B - Panel			
5		3	Alcatel-Lucent- RRH 2x60 700 - RRH			
6		3	Alcatel-Lucent - RRH 4X45 AWS - RRH			
7		3	Alcatel-Lucent - RRH 2x60W-1900MHz - RRH			
8		1	RFS - DB-TI-6Z-8AB-0Z - Distribution Box			
9		1	RFS - DB-T1-6Z-8AB-0Z - Distribution Box			
-	140.0	3	Ericsson - AIR 21 B2A/B4P - Panel	Low Profile Platform	(12) 1 5/8" (2) 1 5/8" Fiber	T-Mobile
-		3	Ericsson - AIR 32 - Panel			
-	138.0	3	Ericsson - KRY 112 144/1 - TMA			
15	127.0	6	Cci HPA65R-BU8A - Panel	MTC3607 Platform + HR & Kicker	(4) 1/2" Fiber (8) 3/4" DC Power (3) 3/8" RET Line	AT&T
16		3	Kaelus DBCT108F1V92-1 Diplexer			
17		3	Ericsson RRUS 4426 B66 RRU			
18		3	Ericsson RRUS 4415 B25 RRU			
19		3	Ericsson RRUS 4478 B5 RRU			
20		3	Ericsson RRUS 4478 B14 RRU			
21		6	Cci HPA-65R-BUU-H8 - Panel			
22		6	Ericsson RRUS-11 RRU			
23		3	Ericsson RRUS 32 RRU			
24		4	Raycap DC6-48-60-18-8F -SP			

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
10	137.0	3	Ericsson Air 21 B2A/B4P	(1) Low Profile Platform + (3)T-Arm Kit & Handrail Kit	(10) 1 5/8" Coax (4) 1 5/8" Fiber	T-Mobile
11		3	Ericsson Air 32			
12		3	RFS APXVAARR24_43-U-NA20			
13		3	Ericsson KRY 112 144/1			
14		3	Ericsson Radio 4449 B71+B12			

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	Flange Plate
Max. Usage:	**87.4%**	**79.6%**	**73.4%**	**59.1%**
Pass/Fail	**Pass**	**Pass**	**Pass**	**Pass**

Foundations

	Moment (Kip-Ft)	Shear (Kips)	Axial (Kips)
Analysis Reactions	5361.6	46.6	77.9

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 1.3936 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 87.37% at 100.8ft

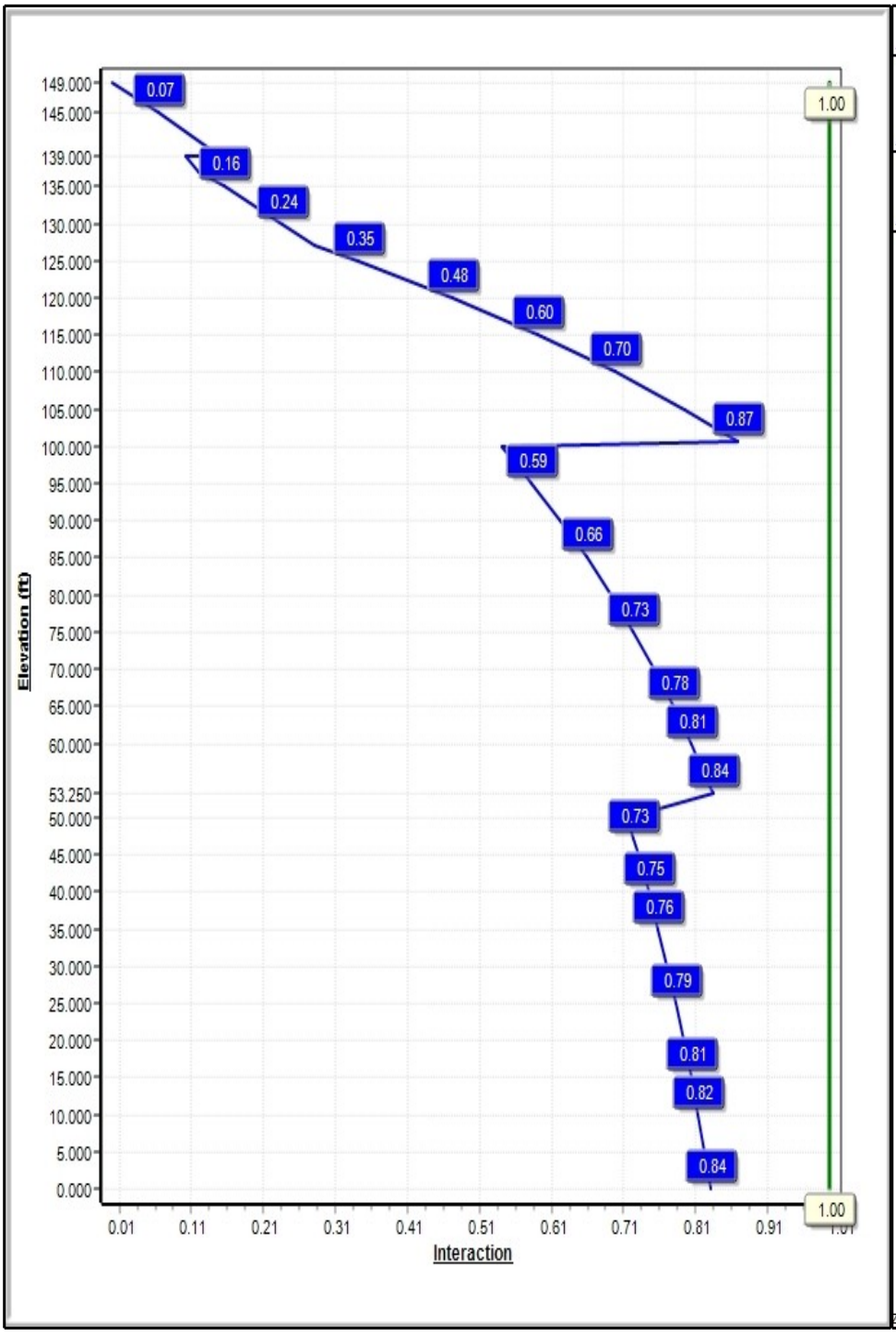
Structure:	CT13075-A-SBA	**Code:**	EIA/TIA-222-G	7/1/2019
Site Name:	New London	**Exposure:**	C	
Height:	149.00 (ft)	**Gh:**	1.1	
Base Elev:	0.000 (ft)			Page: 1

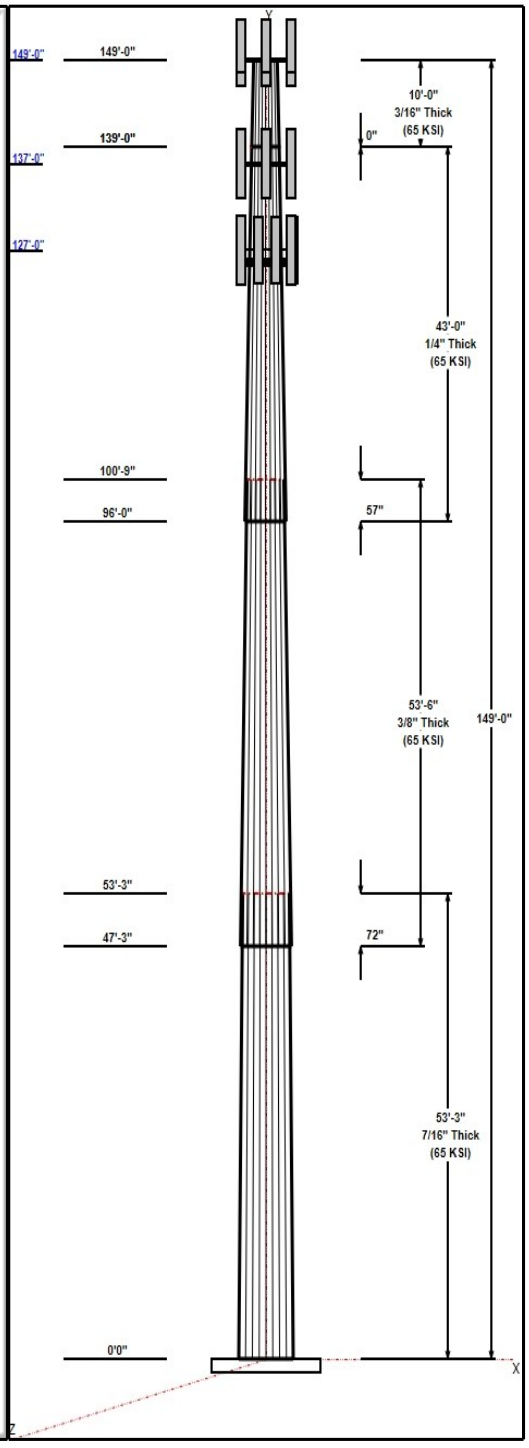
Tower Engineering Solutions

Dead Load Factor:	1.20
Wind Load Factor:	1.60

Load Case : 1.2D + 1.6W 104 mph Wind

Iterations: 23





Structure: CT13075-A-SBA

Type: Tapered
Site Name: New London
Height: 149.00 (ft)
Base Elev: 0.00 (ft)

Base Shape: 18 Sided
Taper: 0.23597

7/1/2019

Tower Engineering Solutions

Shaft Properties

Seq	Length (ft)	Top (in)	Bottom (in)	Thick (in)	Joint Type	Taper	Grade (ksi)
1	53.25	45.69	58.26	0.438		0.23597	65
2	53.50	35.24	47.86	0.375	Slip	0.23597	65
3	43.00	26.71	36.86	0.250	Slip	0.23597	65
4	10.00	24.35	26.71	0.188	Butt	0.23597	65

Discrete Appurtenances

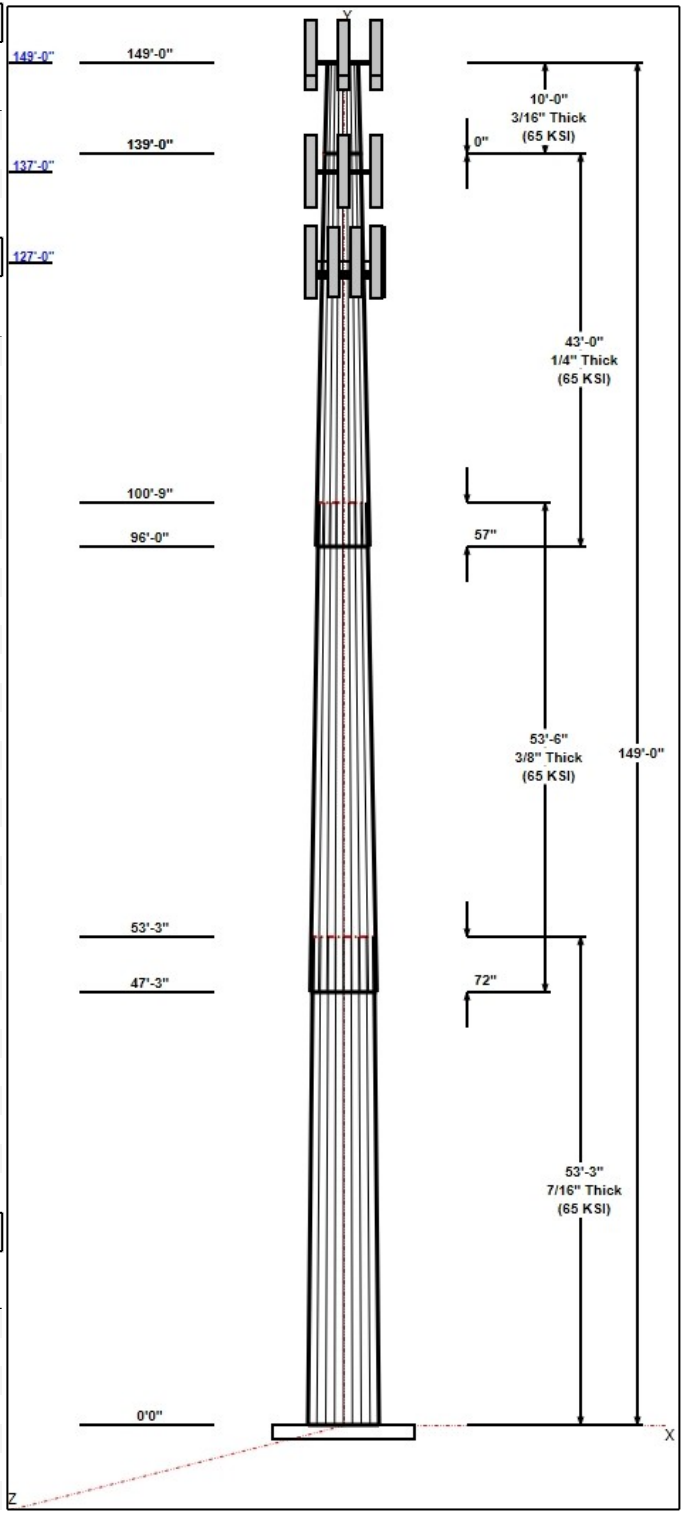
Attach Elev (ft)	Force Elev (ft)	Qty	Description	Carrier
149.00	149.00	3	Alcatel RRH2x60 700	Verizon
149.00	149.00	3	Alcatel RRH 4X45 AWS	Verizon
149.00	149.00	3	Alcatel RRH	Verizon
149.00	149.00	1	RFS DB-T1-6Z-8AB-0Z	Verizon
149.00	149.00	1	RFS DB-T1-6Z-8AB-0Z	Verizon
149.00	149.00	1	Low Profile	Verizon
149.00	149.00	3	Commscope	Verizon
149.00	149.00	3	Antel BXA-80063/4CF	Verizon
149.00	149.00	3	Commscope	Verizon
149.00	150.50	3	Commscope	Verizon
137.00	137.00	3	AIR 21, 1.3M, B2A B4P	T-Mobile
137.00	137.00	3	AIR32	T-Mobile
137.00	137.00	3	APXVAARR24_43-U-NA20	T-Mobile
137.00	137.00	3	KRY 112 76/1	T-Mobile
137.00	137.00	3	4449 B5/B12	T-Mobile
137.00	137.00	1	Low Profile Platform	T-Mobile
137.00	137.00	1	(3) T-Arm Kit	T-Mobile
137.00	137.00	3	Handrail Klt	T-Mobile
137.00	137.00	1	mount pipe	T-Mobile
127.00	127.00	12	Cci HPA-65R-BUU-H8	AT&T
127.00	127.00	6	Ericsson RRUS-11 RRU	AT&T
127.00	127.00	3	Ericsson RRUS 32 RRU	AT&T
127.00	127.00	4	Raycap DC6-48-60-18-8F	AT&T
127.00	127.00	1	MTC3607 Platform + HR &	AT&T
127.00	127.00	6	Cci HPA65R-BU8A	AT&T
127.00	127.00	3	Kaelus DBCT108F1V92-1	AT&T
127.00	127.00	3	Ericsson RRUS 4426 B66	AT&T
127.00	127.00	3	Ericsson RRUS 4415 B25	AT&T
127.00	127.00	3	Ericsson RRUS 4478 B5	AT&T
127.00	127.00	3	Ericsson RRUS 4478 B14	AT&T

Linear Appurtenances

Elev From (ft)	Elev To (ft)	Placement	Description	Carrier
0.00	149.00	Inside	1 5/8" Coax	Verizon
0.00	149.00	Inside	1 5/8" Hybriflex Fiber	Verizon
0.00	137.00	Inside	1 5/8" Coax	T-Mobile
0.00	137.00	Inside	1 5/8" Fiber	T-Mobile
0.00	127.00	Inside	1/2" Fiber	AT&T
0.00	127.00	Inside	3/4" DC	AT&T
0.00	127.00	Inside	3/8" RET	AT&T

Anchor Bolts

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



Base Plate

Thickness (in)	Specifications (in)	Grade (ksi)	Geometry
2.7500	65.4	60.0	Clipped

Reactions

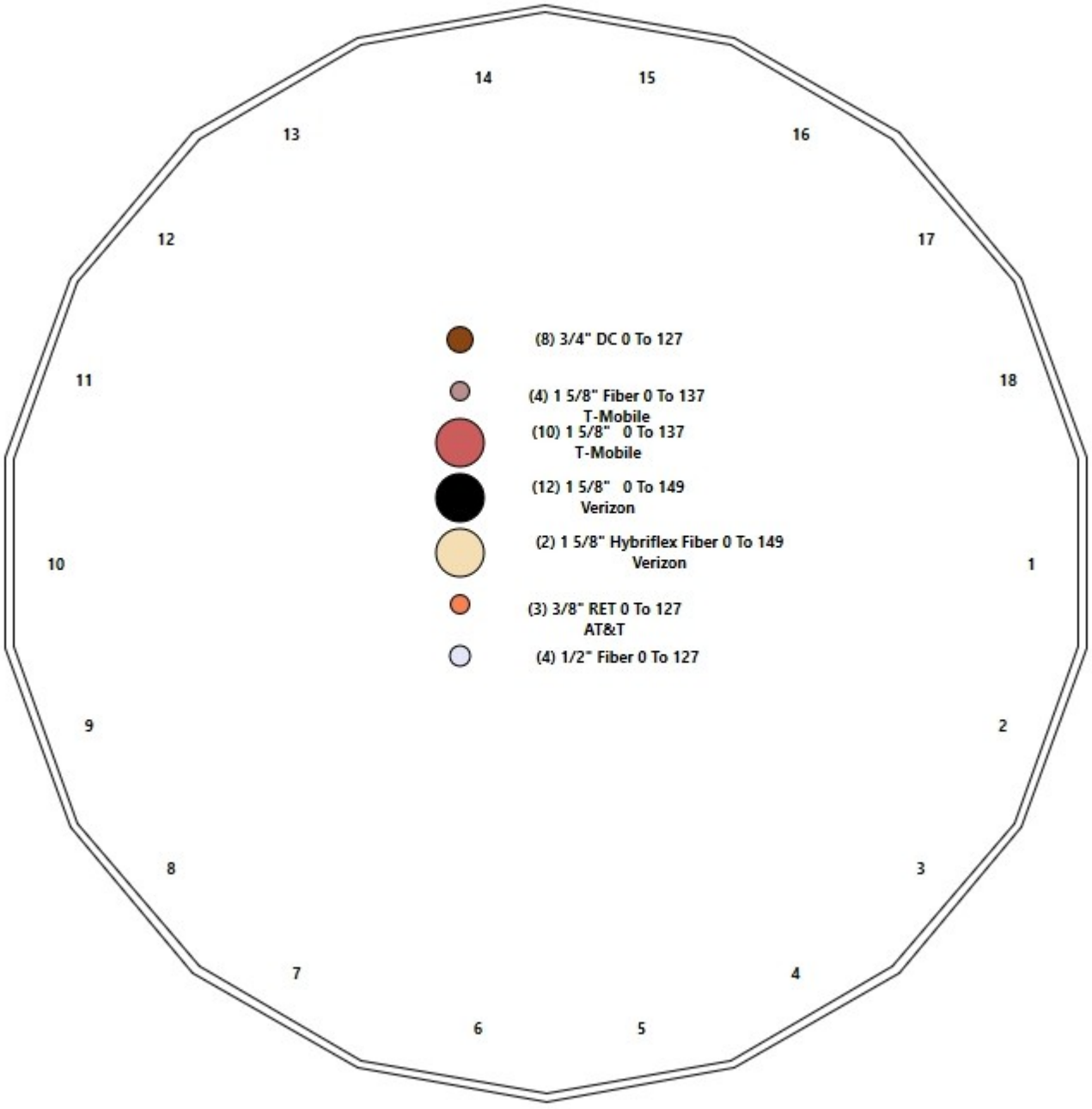
Load Case	Moment (FT-Kips)	Shear (Kips)	Axial (Kips)
1.2D + 1.6W 104 mph Wind	5361.6	46.6	49.0
0.9D + 1.6W 104 mph Wind	5314.6	46.6	36.7
1.2D + 1.0Di + 1.0Wi 50 mph Wind	1226.1	10.8	77.9
1.2D + 1.0E	221.6	1.9	49.1
0.9D + 1.0E	219.6	1.9	36.8
1.0D + 1.0W 60 mph Wind	1111.0	9.7	40.9

Structure: CT13075-A-SBA - Coax Line Placement

Type: Monopole
Site Name: New London
Height: 149.00 (ft)

7/1/2019

Tower Engineering Solutions



Shaft Properties

Structure:	CT13075-A-SBA		**Code:**	EIA/TIA-222-G	7/1/2019
Site Name:	New London		**Exposure:**	C	
Height:	149.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 5

Tower Engineering Solutions

Sec. No.	Shape	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Overlap (in)	Weight (lb)
1	18	53.250	0.4375	65		0.00	12,968
2	18	53.500	0.3750	65	Slip	72.00	8,921
3	18	43.000	0.2500	65	Slip	57.00	3,661
4	18	10.000	0.1875	65	Flange	0.00	513
					Total Shaft Weight:		**26,063**

	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	58.26	0.00	80.29	33916.66	22.07	133.17	45.69	53.25	62.84	16262.1	17.01	104.4	0.235973
2	47.86	47.25	56.52	16100.98	21.09	127.63	35.24	100.75	41.49	6370.66	15.16	93.96	0.235973
3	36.86	96.00	29.05	4917.70	24.58	147.43	26.71	139.00	21.00	1857.12	17.43	106.8	0.235973
4	26.71	139.0	15.78	1402.74	23.71	142.45	24.35	149.00	14.38	1060.65	21.49	129.8	0.235973

Load Summary

Structure:	CT13075-A-SBA	**Code:**	EIA/TIA-222-G	7/1/2019	
Site Name:	New London	**Exposure:**	C		
Height:	149.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 6	

Tower Engineering Solutions

Discrete Appurtenances

				No Ice			Ice				
No.	Elev (ft)	Description	Qty	Weight (lb)	CaAa (sf)	CaAa Factor	Weight (lb)	CaAa (sf)	CaAa Factor	Hor. Ecc. (ft)	Vert Ecc (ft)
1	149.00	Alcatel RRH2x60 700	3	51.00	1.51	1.50	151.17	1.934	1.47	0.00	0.00
2	149.00	Alcatel RRH 4X45 AWS	3	64.00	2.60	0.80	147.52	3.304	0.80	0.00	0.00
3	149.00	Alcatel RRH 2X60W-1900MHz	3	46.00	1.88	0.84	115.05	2.466	0.84	0.00	0.00
4	149.00	RFS DB-T1-6Z-8AB-0Z	1	18.90	4.80	0.67	162.51	5.673	0.67	0.00	0.00
5	149.00	RFS DB-T1-6Z-8AB-0Z	1	18.90	4.80	0.67	162.51	5.673	0.67	0.00	0.00
6	149.00	Low Profile Platform-Round	1	1500.00	22.00	1.00	2808.04	39.650	1.00	0.00	0.00
7	149.00	Commscope LNX-6514DS-VTM	3	38.80	8.17	0.83	214.98	10.991	0.83	0.00	0.00
8	149.00	Antel BXA-80063/4CF	3	9.90	4.72	0.72	110.33	6.567	0.72	0.00	0.00
9	149.00	Commscope SBNHH-1D65B	3	40.60	8.08	0.83	242.97	9.459	0.83	0.00	0.00
10	149.00	Commscope SBNHH-1D65B	3	40.00	8.16	0.83	242.97	9.459	0.83	0.00	1.50
11	137.00	AIR 21, 1.3M, B2A B4P	3	91.50	6.09	0.75	258.57	7.177	0.80	0.00	0.00
12	137.00	AIR32	3	108.20	6.51	0.75	290.61	7.679	0.80	0.00	0.00
13	137.00	APXVAARR24_43-U-NA20	3	128.00	20.24	0.75	541.69	22.122	0.80	0.00	0.00
14	137.00	KRY 112 76/1	3	15.40	0.71	0.75	35.05	1.328	0.80	0.00	0.00
15	137.00	4449 B5/B12	3	74.00	1.97	0.67	129.13	2.512	0.72	0.00	0.00
16	137.00	Low Profile Platform	1	1500.00	22.00	1.00	2797.10	39.502	1.00	0.00	0.00
17	137.00	(3) T-Arm Kit	1	500.00	16.50	1.00	1088.02	32.480	1.00	0.00	0.00
18	137.00	Handrail KIt	3	45.75	2.97	1.00	90.06	6.666	1.00	0.00	0.00
19	137.00	mount pipe	1	87.00	4.31	1.00	219.41	9.647	1.00	0.00	0.00
20	127.00	Cci HPA-65R-BUU-H8	12	68.00	12.98	0.79	353.46	14.567	0.79	0.00	0.00
21	127.00	Ericsson RRUS-11 RRU	6	50.70	2.52	0.67	138.10	3.160	0.67	0.00	0.00
22	127.00	Ericsson RRUS 32 RRU	3	77.00	3.31	0.67	124.43	2.219	0.67	0.00	0.00
23	127.00	Raycap DC6-48-60-18-8F -SP	4	31.80	2.20	1.00	92.60	3.230	1.00	0.00	0.00
24	127.00	MTC3607 Platform + HR & Kicker	1	2246.00	51.70	1.00	5330.04	89.325	1.00	0.00	0.00
25	127.00	Cci HPA65R-BU8A	6	69.00	11.22	0.89	339.99	12.850	0.89	0.00	0.00
26	127.00	Kaelus DBCT108F1V92-1 Diplexer	3	19.80	0.70	1.00	44.04	0.953	1.00	0.00	0.00
27	127.00	Ericsson RRUS 4426 B66 RRU	3	48.50	1.15	0.67	86.77	1.616	0.67	0.00	0.00
28	127.00	Ericsson RRUS 4415 B25 RRU	3	44.10	1.86	0.67	90.76	2.423	0.67	0.00	0.00
29	127.00	Ericsson RRUS 4478 B5 RRU	3	59.90	1.84	0.67	107.98	2.379	0.67	0.00	0.00
30	127.00	Ericsson RRUS 4478 B14 RRU	3	59.40	1.65	0.67	100.18	2.160	0.67	0.00	0.00
		Totals:	**92**	**10,717.75**			**29,420.82**				

Linear Appurtenances

Bottom Elev. (ft)	Top Elev. (ft)	Description	Exposed Width	Exposed
0.00	149.00	(12) 1 5/8" Coax	0.00	Inside
0.00	149.00	(2) 1 5/8" Hybriflex Fiber	0.00	Inside
0.00	137.00	(10) 1 5/8" Coax	0.00	Inside
0.00	137.00	(4) 1 5/8" Fiber	0.00	Inside
0.00	127.00	(4) 1/2" Fiber	0.00	Inside
0.00	127.00	(8) 3/4" DC	0.00	Inside
0.00	127.00	(3) 3/8" RET	0.00	Inside

Shaft Section Properties

Structure:	CT13075-A-SBA	**Code:**	EIA/TIA-222-G	7/1/2019	
Site Name:	New London	**Exposure:**	C		
Height:	149.00 (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	

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Increment Length: 5 (ft)

Elev (ft)	Description	Thick (in)	Dia (in)	Area (in^2)	Ix (in^4)	W/t Ratio	D/t Ratio	Fpy (ksi)	S (in^3)	Weight (lb)
0.00		0.4375	58.260	80.291	33916.7	22.07	133.17	75.4	1146.	0.0
5.00		0.4375	57.080	78.653	31882.5	21.59	130.47	76.0	1100.	1352.1
10.00		0.4375	55.900	77.014	29931.4	21.12	127.77	76.6	1054.	1324.2
15.00		0.4375	54.720	75.376	28061.5	20.64	125.08	77.1	1010.	1296.4
20.00		0.4375	53.541	73.738	26271.2	20.17	122.38	77.7	966.4	1268.5
25.00		0.4375	52.361	72.099	24558.7	19.69	119.68	78.2	923.8	1240.6
30.00		0.4375	51.181	70.461	22922.3	19.22	116.98	78.8	882.1	1212.8
35.00		0.4375	50.001	68.823	21360.3	18.74	114.29	79.4	841.4	1184.9
40.00		0.4375	48.821	67.184	19870.8	18.27	111.59	79.9	801.7	1157.0
45.00		0.4375	47.641	65.546	18452.3	17.79	108.89	80.5	762.9	1129.1
47.25	Bot - Section 2	0.4375	47.110	64.809	17836.6	17.58	107.68	80.7	745.7	499.0
50.00		0.4375	46.461	63.908	17103.0	17.31	106.20	81.0	725.0	1127.5
53.25	Top - Section 1	0.3750	46.444	54.832	14703.3	20.43	123.85	0.0	0.0	1312.3
55.00		0.3750	46.031	54.341	14311.4	20.23	122.75	77.6	612.4	325.1
60.00		0.3750	44.852	52.936	13230.3	19.68	119.60	78.3	581.0	912.6
65.00		0.3750	43.672	51.532	12205.1	19.12	116.46	78.9	550.5	888.7
70.00		0.3750	42.492	50.128	11234.3	18.57	113.31	79.6	520.7	864.8
75.00		0.3750	41.312	48.724	10316.3	18.01	110.17	80.2	491.8	840.9
80.00		0.3750	40.132	47.319	9449.8	17.46	107.02	80.9	463.8	817.0
85.00		0.3750	38.952	45.915	8633.2	16.90	103.87	81.5	436.5	793.1
90.00		0.3750	37.772	44.511	7865.0	16.35	100.73	82.2	410.1	769.2
95.00		0.3750	36.593	43.106	7143.9	15.80	97.58	82.5	384.5	745.4
96.00	Bot - Section 3	0.3750	36.357	42.826	7005.1	15.68	96.95	82.5	379.5	146.2
100.00		0.3750	35.413	41.702	6468.2	15.24	94.43	82.5	359.8	965.5
100.75	Top - Section 2	0.2500	35.736	28.157	4479.7	23.79	142.94	0.0	0.0	178.2
105.00		0.2500	34.733	27.361	4110.5	23.09	138.93	74.2	233.1	401.4
110.00		0.2500	33.553	26.425	3702.8	22.25	134.21	75.2	217.4	457.6
115.00		0.2500	32.373	25.489	3323.0	21.42	129.49	76.2	202.2	441.6
120.00		0.2500	31.193	24.553	2970.2	20.59	124.77	77.2	187.5	425.7
125.00		0.2500	30.013	23.616	2643.2	19.76	120.05	78.2	173.5	409.8
127.00		0.2500	29.541	23.242	2519.4	19.43	118.17	78.6	168.0	159.4
130.00		0.2500	28.833	22.680	2341.2	18.93	115.33	79.1	159.9	234.4
135.00		0.2500	27.654	21.744	2063.0	18.09	110.61	80.1	146.9	377.9
137.00		0.2500	27.182	21.370	1958.3	17.76	108.73	80.5	141.9	146.7
139.00	Top - Section 3	0.2500	26.710	20.995	1857.1	17.43	106.84	80.9	136.9	144.2
139.00	Bot - Section 4	0.1875	26.710	15.783	1402.7	23.24	142.45	73.5	103.4	
140.00		0.1875	26.474	15.643	1365.6	23.49	141.19	73.8	101.6	53.5
145.00		0.1875	25.294	14.941	1189.9	22.38	134.90	75.1	92.7	260.2
149.00		0.1875	24.350	14.379	1060.6	21.49	129.87	76.1	85.8	199.5
										26063.1

Wind Loading - Shaft

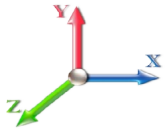
Structure:	CT13075-A-SBA	**Code:**	EIA/TIA-222-G	7/1/2019	
Site Name:	New London	**Exposure:**	C		
Height:	149.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 8	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 104 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 23

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	22.359	24.59	472.69	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	22.359	24.59	463.12	0.650	0.000	5.00	24.400	15.86	624.1	0.0	1622.5
10.00		1.00	0.85	22.359	24.59	453.55	0.650	0.000	5.00	23.901	15.54	611.3	0.0	1589.1
15.00		1.00	0.85	22.359	24.59	443.98	0.650	0.000	5.00	23.401	15.21	598.6	0.0	1555.6
20.00		1.00	0.90	23.724	26.10	447.46	0.650	0.000	5.00	22.902	14.89	621.6	0.0	1522.2
25.00		1.00	0.95	24.865	27.35	448.00	0.650	0.000	5.00	22.403	14.56	637.3	0.0	1488.8
30.00		1.00	0.98	25.838	28.42	446.40	0.650	0.000	5.00	21.904	14.24	647.4	0.0	1455.3
35.00		1.00	1.01	26.690	29.36	443.24	0.650	0.000	5.00	21.405	13.91	653.6	0.0	1421.9
40.00		1.00	1.04	27.451	30.20	438.91	0.650	0.000	5.00	20.906	13.59	656.5	0.0	1388.4
45.00		1.00	1.07	28.140	30.95	433.64	0.650	0.000	5.00	20.406	13.26	656.9	0.0	1355.0
47.25	Bot - Section 2	1.00	1.08	28.431	31.27	431.02	0.650	0.000	2.25	9.020	5.86	293.4	0.0	598.8
50.00		1.00	1.09	28.771	31.65	427.62	0.650	0.000	2.75	11.062	7.19	364.1	0.0	1353.0
53.25	Top - Section 1	1.00	1.11	29.155	32.07	423.36	0.650	0.000	3.25	12.878	8.37	429.5	0.0	1574.8
55.00		1.00	1.12	29.354	32.29	427.93	0.650	0.000	1.75	6.847	4.45	229.9	0.0	390.1
60.00		1.00	1.14	29.897	32.89	420.80	0.650	0.000	5.00	19.226	12.50	657.6	0.0	1095.1
65.00		1.00	1.16	30.405	33.45	413.20	0.650	0.000	5.00	18.727	12.17	651.4	0.0	1066.4
70.00		1.00	1.17	30.883	33.97	405.18	0.650	0.000	5.00	18.228	11.85	644.0	0.0	1037.8
75.00		1.00	1.19	31.335	34.47	396.80	0.650	0.000	5.00	17.728	11.52	635.5	0.0	1009.1
80.00		1.00	1.21	31.764	34.94	388.10	0.650	0.000	5.00	17.229	11.20	626.1	0.0	980.4
85.00		1.00	1.22	32.172	35.39	379.10	0.650	0.000	5.00	16.730	10.87	615.7	0.0	951.8
90.00		1.00	1.24	32.561	35.82	369.84	0.650	0.000	5.00	16.231	10.55	604.6	0.0	923.1
95.00		1.00	1.25	32.934	36.23	360.33	0.650	0.000	5.00	15.732	10.23	592.7	0.0	894.4
96.00	Bot - Section 3	1.00	1.25	33.007	36.31	358.40	0.650	0.000	1.00	3.086	2.01	116.5	0.0	175.4
100.00		1.00	1.27	33.291	36.62	350.60	0.650	0.000	4.00	12.315	8.00	469.0	0.0	1158.6
100.75	Top - Section 2	1.00	1.27	33.344	36.68	349.12	0.650	0.000	0.75	2.274	1.48	86.7	0.0	213.8
105.00		1.00	1.28	33.635	37.00	345.64	0.650	0.000	4.25	12.671	8.24	487.6	0.0	481.7
110.00		1.00	1.29	33.966	37.36	335.54	0.650	0.000	5.00	14.446	9.39	561.3	0.0	549.1
115.00		1.00	1.30	34.286	37.71	325.26	0.650	0.000	5.00	13.946	9.07	547.0	0.0	530.0
120.00		1.00	1.32	34.594	38.05	314.81	0.650	0.000	5.00	13.447	8.74	532.2	0.0	510.8
125.00		1.00	1.33	34.893	38.38	304.21	0.650	0.000	5.00	12.948	8.42	516.9	0.0	491.7
127.00	Appurtenance(s)	1.00	1.33	35.010	38.51	299.92	0.650	0.000	2.00	5.039	3.28	201.8	0.0	191.3
130.00		1.00	1.34	35.182	38.70	293.46	0.650	0.000	3.00	7.409	4.82	298.2	0.0	281.3
135.00		1.00	1.35	35.463	39.01	282.57	0.650	0.000	5.00	11.950	7.77	484.8	0.0	453.5
137.00	Appurtenance(s)	1.00	1.35	35.573	39.13	278.18	0.650	0.000	2.00	4.640	3.02	188.8	0.0	176.0
139.00	Top - Section 3	1.00	1.36	35.681	39.25	273.76	0.650	0.000	2.00	4.560	2.96	186.1	0.0	173.0
140.00		1.00	1.36	35.735	39.31	271.55	0.650	0.000	1.00	2.250	1.46	92.0	0.0	64.2
145.00		1.00	1.37	36.000	39.60	260.41	0.650	0.000	5.00	10.951	7.12	451.0	0.0	312.2
149.00	Appurtenance(s)	1.00	1.38	36.207	39.83	251.41	0.650	0.000	4.00	8.402	5.46	348.0	0.0	239.4
								Totals:	**149.00**			**17,619.9**		**31,275.7**

Discrete Appurtenance Forces

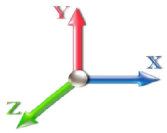
Structure:	CT13075-A-SBA	**Code:**	EIA/TIA-222-G	7/1/2019	
Site Name:	New London	**Exposure:**	C		
Height:	149.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 9	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 104 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 23

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	149.00	RFS DB-T1-6Z-8AB-0Z	1	36.207	39.828	0.67	1.00	3.22	22.68	0.000	0.000	204.94	0.00	0.00
2	149.00	Alcatel RRH2x60 700	3	36.207	39.828	1.50	1.00	6.79	183.60	0.000	0.000	433.01	0.00	0.00
3	149.00	Alcatel RRH 4X45 AWS	3	36.207	39.828	0.80	1.00	6.24	230.40	0.000	0.000	397.64	0.00	0.00
4	149.00	Alcatel RRH	3	36.207	39.828	0.84	1.00	4.74	165.60	0.000	0.000	301.90	0.00	0.00
5	149.00	RFS DB-T1-6Z-8AB-0Z	1	36.207	39.828	0.67	1.00	3.22	22.68	0.000	0.000	204.94	0.00	0.00
6	149.00	Commscope	3	36.284	39.912	0.83	1.00	20.32	144.00	0.000	1.500	1297.51	0.00	1946.27
7	149.00	Low Profile	1	36.207	39.828	1.00	1.00	22.00	1800.00	0.000	0.000	1401.94	0.00	0.00
8	149.00	Commscope	3	36.207	39.828	0.83	1.00	20.34	139.68	0.000	0.000	1296.37	0.00	0.00
9	149.00	Antel BXA-80063/4CF	3	36.207	39.828	0.72	1.00	10.20	35.64	0.000	0.000	649.68	0.00	0.00
10	149.00	Commscope	3	36.207	39.828	0.83	1.00	20.12	146.16	0.000	0.000	1282.08	0.00	0.00
11	137.00	mount pipe	1	35.573	39.130	1.00	1.00	4.31	104.40	0.000	0.000	269.84	0.00	0.00
12	137.00	Handrail KIt	3	35.573	39.130	1.00	1.00	8.91	164.70	0.000	0.000	557.61	0.00	0.00
13	137.00	(3) T-Arm Kit	1	35.573	39.130	1.00	1.00	16.50	600.00	0.000	0.000	1033.03	0.00	0.00
14	137.00	Low Profile Platform	1	35.573	39.130	1.00	1.00	22.00	1800.00	0.000	0.000	1377.37	0.00	0.00
15	137.00	4449 B5/B12	3	35.573	39.130	0.50	0.75	2.97	266.40	0.000	0.000	185.93	0.00	0.00
16	137.00	KRY 112 76/1	3	35.573	39.130	0.60	0.80	1.28	55.44	0.000	0.000	80.01	0.00	0.00
17	137.00	AIR32	3	35.573	39.130	0.60	0.80	11.72	389.52	0.000	0.000	733.64	0.00	0.00
18	137.00	AIR 21, 1.3M, B2A B4P	3	35.573	39.130	0.60	0.80	10.96	329.40	0.000	0.000	686.31	0.00	0.00
19	137.00	APXVAARR24 43-U-NA2	3	35.573	39.130	0.60	0.80	36.43	460.80	0.000	0.000	2280.93	0.00	0.00
20	127.00	MTC3607 Platform + HR &	1	35.010	38.511	1.00	1.00	51.70	2695.20	0.000	0.000	3185.59	0.00	0.00
21	127.00	Cci HPA-65R-BUU-H8	12	35.010	38.511	0.63	0.80	98.44	979.20	0.000	0.000	6065.58	0.00	0.00
22	127.00	Ericsson RRUS-11 RRU	6	35.010	38.511	0.54	0.80	8.10	365.04	0.000	0.000	499.36	0.00	0.00
23	127.00	Ericsson RRUS 32 RRU	3	35.010	38.511	0.54	0.80	5.32	277.20	0.000	0.000	327.95	0.00	0.00
24	127.00	Raycap DC6-48-60-18-8F	4	35.010	38.511	0.80	0.80	7.04	152.64	0.000	0.000	433.78	0.00	0.00
25	127.00	Ericsson RRUS 4426 B66	3	35.010	38.511	0.54	0.80	1.85	174.60	0.000	0.000	113.94	0.00	0.00
26	127.00	Cci HPA65R-BU8A	6	35.010	38.511	0.71	0.80	47.93	496.80	0.000	0.000	2953.41	0.00	0.00
27	127.00	Kaelus DBCT108F1V92-1	3	35.010	38.511	0.80	0.80	1.68	71.28	0.000	0.000	103.52	0.00	0.00
28	127.00	Ericsson RRUS 4415 B25	3	35.010	38.511	0.54	0.80	2.99	158.76	0.000	0.000	184.29	0.00	0.00
29	127.00	Ericsson RRUS 4478 B5	3	35.010	38.511	0.54	0.80	2.96	215.64	0.000	0.000	182.31	0.00	0.00
30	127.00	Ericsson RRUS 4478 B14	3	35.010	38.511	0.54	0.80	2.65	213.84	0.000	0.000	163.48	0.00	0.00
							Totals:		**12,861.30**			**28,887.89**		

Total Applied Force Summary

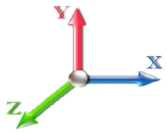
Structure:	CT13075-A-SBA		**Code:**	EIA/TIA-222-G	7/1/2019
Site Name:	New London		**Exposure:**	C	
Height:	149.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 10

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 104 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 23

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		624.11	1797.15	0.00	0.00
10.00		611.34	1763.70	0.00	0.00
15.00		598.58	1730.25	0.00	0.00
20.00		621.57	1696.80	0.00	0.00
25.00		637.26	1663.35	0.00	0.00
30.00		647.44	1629.90	0.00	0.00
35.00		653.56	1596.45	0.00	0.00
40.00		656.51	1563.00	0.00	0.00
45.00		656.93	1529.55	0.00	0.00
47.25		293.37	677.39	0.00	0.00
50.00		364.09	1449.02	0.00	0.00
53.25		429.53	1688.26	0.00	0.00
55.00		229.93	451.18	0.00	0.00
60.00		657.57	1269.72	0.00	0.00
65.00		651.38	1241.05	0.00	0.00
70.00		643.99	1212.38	0.00	0.00
75.00		635.52	1183.71	0.00	0.00
80.00		626.07	1155.04	0.00	0.00
85.00		615.74	1126.37	0.00	0.00
90.00		604.60	1097.69	0.00	0.00
95.00		592.71	1069.02	0.00	0.00
96.00		116.54	210.36	0.00	0.00
100.00		469.03	1298.30	0.00	0.00
100.75		86.73	240.03	0.00	0.00
105.00		487.58	630.14	0.00	0.00
110.00		561.32	723.67	0.00	0.00
115.00		547.02	704.55	0.00	0.00
120.00		532.19	685.44	0.00	0.00
125.00		516.85	666.32	0.00	0.00
127.00	(47) attachments	14415.04	6061.38	0.00	0.00
130.00		298.22	372.42	0.00	0.00
135.00		484.79	605.42	0.00	0.00
137.00	(21) attachments	7393.51	4407.47	0.00	0.00
139.00		186.15	208.22	0.00	0.00
140.00		91.99	81.78	0.00	0.00
145.00		451.02	400.29	0.00	0.00
149.00	(24) attachments	7818.01	3200.35	0.00	1946.27
	Totals:	**46,507.80**	**49,087.12**	**0.00**	**1,946.27**

Calculated Forces

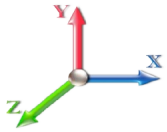
Structure:	CT13075-A-SBA	**Code:**	EIA/TIA-222-G	7/1/2019	
Site Name:	New London	**Exposure:**	C		
Height:	149.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 11	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 104 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 23

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-49.00	-46.60	0.00	-5361.5	0.00	5361.56	5451.60	2725.80	12956.4	6487.84	0.00	0.000	0.000	0.836
5.00	-47.02	-46.16	0.00	-5128.5	0.00	5128.55	5379.95	2689.97	12523.2	6270.95	0.12	-0.220	0.000	0.827
10.00	-45.08	-45.72	0.00	-4897.7	0.00	4897.76	5306.65	2653.32	12093.3	6055.68	0.47	-0.444	0.000	0.818
15.00	-43.18	-45.27	0.00	-4669.1	0.00	4669.19	5231.70	2615.85	11666.9	5842.16	1.06	-0.671	0.000	0.808
20.00	-41.31	-44.80	0.00	-4442.8	0.00	4442.83	5155.10	2577.55	11244.2	5630.50	1.88	-0.902	0.000	0.797
25.00	-39.47	-44.29	0.00	-4218.8	0.00	4218.85	5076.86	2538.43	10825.5	5420.83	2.95	-1.136	0.000	0.786
30.00	-37.67	-43.77	0.00	-3997.3	0.00	3997.39	4996.96	2498.48	10411.0	5213.26	4.27	-1.374	0.000	0.775
35.00	-35.91	-43.23	0.00	-3778.5	0.00	3778.56	4915.42	2457.71	10001.0	5007.93	5.84	-1.616	0.000	0.762
40.00	-34.19	-42.67	0.00	-3562.4	0.00	3562.44	4832.22	2416.11	9595.63	4804.95	7.66	-1.860	0.000	0.749
45.00	-32.55	-42.06	0.00	-3349.1	0.00	3349.10	4747.38	2373.69	9195.21	4604.44	9.75	-2.108	0.000	0.735
47.25	-31.79	-41.81	0.00	-3254.4	0.00	3254.46	4708.66	2354.33	9016.69	4515.05	10.77	-2.222	0.000	0.728
50.00	-30.25	-41.47	0.00	-3139.4	0.00	3139.48	4660.89	2330.44	8799.96	4406.52	12.09	-2.362	0.000	0.719
53.25	-28.49	-41.04	0.00	-3004.6	0.00	3004.69	3818.32	1909.16	7226.08	3618.41	13.75	-2.528	0.000	0.838
55.00	-27.91	-40.88	0.00	-2932.8	0.00	2932.88	3795.26	1897.63	7117.54	3564.06	14.70	-2.619	0.000	0.831
60.00	-26.48	-40.29	0.00	-2728.5	0.00	2728.50	3728.27	1864.14	6809.75	3409.94	17.59	-2.901	0.000	0.808
65.00	-25.08	-39.70	0.00	-2527.0	0.00	2527.05	3659.63	1829.82	6505.57	3257.62	20.78	-3.183	0.000	0.783
70.00	-23.71	-39.10	0.00	-2328.5	0.00	2328.57	3589.34	1794.67	6205.25	3107.24	24.27	-3.466	0.000	0.756
75.00	-22.38	-38.50	0.00	-2133.0	0.00	2133.06	3517.40	1758.70	5909.03	2958.91	28.05	-3.749	0.000	0.728
80.00	-21.09	-37.90	0.00	-1940.5	0.00	1940.54	3443.81	1721.91	5617.15	2812.75	32.12	-4.029	0.000	0.697
85.00	-19.83	-37.30	0.00	-1751.0	0.00	1751.03	3368.58	1684.29	5329.85	2668.89	36.49	-4.307	0.000	0.662
90.00	-18.61	-36.70	0.00	-1564.5	0.00	1564.51	3291.69	1645.84	5047.37	2527.44	41.14	-4.580	0.000	0.625
95.00	-17.49	-36.07	0.00	-1380.9	0.00	1380.99	3202.59	1601.29	4754.28	2380.67	46.08	-4.847	0.000	0.586
96.00	-17.21	-35.98	0.00	-1344.9	0.00	1344.92	3181.72	1590.86	4692.22	2349.60	47.10	-4.901	0.000	0.578
100.00	-15.88	-35.43	0.00	-1201.0	0.00	1201.00	3098.26	1549.13	4448.03	2227.32	51.29	-5.108	0.000	0.545
100.75	-15.57	-35.36	0.00	-1174.4	0.00	1174.43	1860.42	930.21	2714.89	1359.46	52.10	-5.147	0.000	0.874
105.00	-14.83	-34.89	0.00	-1024.1	0.00	1024.16	1828.32	914.16	2592.13	1297.99	56.77	-5.356	0.000	0.799
110.00	-13.97	-34.33	0.00	-849.73	0.00	849.73	1789.04	894.52	2449.03	1226.33	62.55	-5.680	0.000	0.702
115.00	-13.17	-33.78	0.00	-678.06	0.00	678.06	1748.11	874.06	2307.59	1155.51	68.65	-5.973	0.000	0.596
120.00	-12.41	-33.23	0.00	-509.16	0.00	509.16	1705.53	852.77	2168.05	1085.64	75.04	-6.228	0.000	0.478
125.00	-11.73	-32.67	0.00	-343.01	0.00	343.01	1661.30	830.65	2030.66	1016.84	81.67	-6.432	0.000	0.346
127.00	-7.31	-17.67	0.00	-277.68	0.00	277.68	1643.15	821.58	1976.36	989.65	84.37	-6.498	0.000	0.285
130.00	-6.94	-17.35	0.00	-224.66	0.00	224.66	1615.43	807.71	1895.65	949.24	88.48	-6.584	0.000	0.241
135.00	-6.38	-16.80	0.00	-137.93	0.00	137.93	1567.90	783.95	1763.28	882.95	95.42	-6.694	0.000	0.161
137.00	-2.86	-8.94	0.00	-104.33	0.00	104.33	1548.43	774.21	1711.12	856.83	98.23	-6.727	0.000	0.124
139.00	-2.67	-8.74	0.00	-86.44	0.00	86.44	1528.69	764.34	1659.43	830.95	101.04	-6.755	0.000	0.106
139.00	-2.67	-8.74	0.00	-86.44	0.00	86.44	1044.31	522.16	1138.99	570.34	101.04	-6.755	0.000	0.154
140.00	-2.60	-8.64	0.00	-77.71	0.00	77.71	1038.69	519.35	1122.71	562.19	102.46	-6.767	0.000	0.141
145.00	-2.25	-8.14	0.00	-34.52	0.00	34.52	1009.62	504.81	1041.96	521.75	109.56	-6.826	0.000	0.069
149.00	0.00	-7.82	0.00	-1.95	0.00	1.95	985.17	492.59	978.22	489.84	115.28	-6.843	0.000	0.004

Wind Loading - Shaft

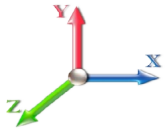
Structure:	CT13075-A-SBA	**Code:**	EIA/TIA-222-G	7/1/2019	
Site Name:	New London	**Exposure:**	C		
Height:	149.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 12	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 104 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 23

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	22.359	24.59	472.69	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	22.359	24.59	463.12	0.650	0.000	5.00	24.400	15.86	624.1	0.0	1216.9
10.00		1.00	0.85	22.359	24.59	453.55	0.650	0.000	5.00	23.901	15.54	611.3	0.0	1191.8
15.00		1.00	0.85	22.359	24.59	443.98	0.650	0.000	5.00	23.401	15.21	598.6	0.0	1166.7
20.00		1.00	0.90	23.724	26.10	447.46	0.650	0.000	5.00	22.902	14.89	621.6	0.0	1141.6
25.00		1.00	0.95	24.865	27.35	448.00	0.650	0.000	5.00	22.403	14.56	637.3	0.0	1116.6
30.00		1.00	0.98	25.838	28.42	446.40	0.650	0.000	5.00	21.904	14.24	647.4	0.0	1091.5
35.00		1.00	1.01	26.690	29.36	443.24	0.650	0.000	5.00	21.405	13.91	653.6	0.0	1066.4
40.00		1.00	1.04	27.451	30.20	438.91	0.650	0.000	5.00	20.906	13.59	656.5	0.0	1041.3
45.00		1.00	1.07	28.140	30.95	433.64	0.650	0.000	5.00	20.406	13.26	656.9	0.0	1016.2
47.25	Bot - Section 2	1.00	1.08	28.431	31.27	431.02	0.650	0.000	2.25	9.020	5.86	293.4	0.0	449.1
50.00		1.00	1.09	28.771	31.65	427.62	0.650	0.000	2.75	11.062	7.19	364.1	0.0	1014.7
53.25	Top - Section 1	1.00	1.11	29.155	32.07	423.36	0.650	0.000	3.25	12.878	8.37	429.5	0.0	1181.1
55.00		1.00	1.12	29.354	32.29	427.93	0.650	0.000	1.75	6.847	4.45	229.9	0.0	292.5
60.00		1.00	1.14	29.897	32.89	420.80	0.650	0.000	5.00	19.226	12.50	657.6	0.0	821.3
65.00		1.00	1.16	30.405	33.45	413.20	0.650	0.000	5.00	18.727	12.17	651.4	0.0	799.8
70.00		1.00	1.17	30.883	33.97	405.18	0.650	0.000	5.00	18.228	11.85	644.0	0.0	778.3
75.00		1.00	1.19	31.335	34.47	396.80	0.650	0.000	5.00	17.728	11.52	635.5	0.0	756.8
80.00		1.00	1.21	31.764	34.94	388.10	0.650	0.000	5.00	17.229	11.20	626.1	0.0	735.3
85.00		1.00	1.22	32.172	35.39	379.10	0.650	0.000	5.00	16.730	10.87	615.7	0.0	713.8
90.00		1.00	1.24	32.561	35.82	369.84	0.650	0.000	5.00	16.231	10.55	604.6	0.0	692.3
95.00		1.00	1.25	32.934	36.23	360.33	0.650	0.000	5.00	15.732	10.23	592.7	0.0	670.8
96.00	Bot - Section 3	1.00	1.25	33.007	36.31	358.40	0.650	0.000	1.00	3.086	2.01	116.5	0.0	131.6
100.00		1.00	1.27	33.291	36.62	350.60	0.650	0.000	4.00	12.315	8.00	469.0	0.0	869.0
100.75	Top - Section 2	1.00	1.27	33.344	36.68	349.12	0.650	0.000	0.75	2.274	1.48	86.7	0.0	160.4
105.00		1.00	1.28	33.635	37.00	345.64	0.650	0.000	4.25	12.671	8.24	487.6	0.0	361.3
110.00		1.00	1.29	33.966	37.36	335.54	0.650	0.000	5.00	14.446	9.39	561.3	0.0	411.8
115.00		1.00	1.30	34.286	37.71	325.26	0.650	0.000	5.00	13.946	9.07	547.0	0.0	397.5
120.00		1.00	1.32	34.594	38.05	314.81	0.650	0.000	5.00	13.447	8.74	532.2	0.0	383.1
125.00		1.00	1.33	34.893	38.38	304.21	0.650	0.000	5.00	12.948	8.42	516.9	0.0	368.8
127.00	Appurtenance(s)	1.00	1.33	35.010	38.51	299.92	0.650	0.000	2.00	5.039	3.28	201.8	0.0	143.5
130.00		1.00	1.34	35.182	38.70	293.46	0.650	0.000	3.00	7.409	4.82	298.2	0.0	211.0
135.00		1.00	1.35	35.463	39.01	282.57	0.650	0.000	5.00	11.950	7.77	484.8	0.0	340.1
137.00	Appurtenance(s)	1.00	1.35	35.573	39.13	278.18	0.650	0.000	2.00	4.640	3.02	188.8	0.0	132.0
139.00	Top - Section 3	1.00	1.36	35.681	39.25	273.76	0.650	0.000	2.00	4.560	2.96	186.1	0.0	129.7
140.00		1.00	1.36	35.735	39.31	271.55	0.650	0.000	1.00	2.250	1.46	92.0	0.0	48.1
145.00		1.00	1.37	36.000	39.60	260.41	0.650	0.000	5.00	10.951	7.12	451.0	0.0	234.2
149.00	Appurtenance(s)	1.00	1.38	36.207	39.83	251.41	0.650	0.000	4.00	8.402	5.46	348.0	0.0	179.6
								Totals:	**149.00**			**17,619.9**		**23,456.8**

Discrete Appurtenance Forces

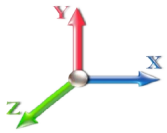
Structure:	CT13075-A-SBA	**Code:**	EIA/TIA-222-G	7/1/2019	
Site Name:	New London	**Exposure:**	C		
Height:	149.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 13	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 104 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 23

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	149.00	RFS DB-T1-6Z-8AB-0Z	1	36.207	39.828	0.67	1.00	3.22	17.01	0.000	0.000	204.94	0.00	0.00
2	149.00	Alcatel RRH2x60 700	3	36.207	39.828	1.50	1.00	6.79	137.70	0.000	0.000	433.01	0.00	0.00
3	149.00	Alcatel RRH 4X45 AWS	3	36.207	39.828	0.80	1.00	6.24	172.80	0.000	0.000	397.64	0.00	0.00
4	149.00	Alcatel RRH	3	36.207	39.828	0.84	1.00	4.74	124.20	0.000	0.000	301.90	0.00	0.00
5	149.00	RFS DB-T1-6Z-8AB-0Z	1	36.207	39.828	0.67	1.00	3.22	17.01	0.000	0.000	204.94	0.00	0.00
6	149.00	Commscope	3	36.284	39.912	0.83	1.00	20.32	108.00	0.000	1.500	1297.51	0.00	1946.27
7	149.00	Low Profile	1	36.207	39.828	1.00	1.00	22.00	1350.00	0.000	0.000	1401.94	0.00	0.00
8	149.00	Commscope	3	36.207	39.828	0.83	1.00	20.34	104.76	0.000	0.000	1296.37	0.00	0.00
9	149.00	Antel BXA-80063/4CF	3	36.207	39.828	0.72	1.00	10.20	26.73	0.000	0.000	649.68	0.00	0.00
10	149.00	Commscope	3	36.207	39.828	0.83	1.00	20.12	109.62	0.000	0.000	1282.08	0.00	0.00
11	137.00	mount pipe	1	35.573	39.130	1.00	1.00	4.31	78.30	0.000	0.000	269.84	0.00	0.00
12	137.00	Handrail KIt	3	35.573	39.130	1.00	1.00	8.91	123.53	0.000	0.000	557.61	0.00	0.00
13	137.00	(3) T-Arm Kit	1	35.573	39.130	1.00	1.00	16.50	450.00	0.000	0.000	1033.03	0.00	0.00
14	137.00	Low Profile Platform	1	35.573	39.130	1.00	1.00	22.00	1350.00	0.000	0.000	1377.37	0.00	0.00
15	137.00	4449 B5/B12	3	35.573	39.130	0.50	0.75	2.97	199.80	0.000	0.000	185.93	0.00	0.00
16	137.00	KRY 112 76/1	3	35.573	39.130	0.60	0.80	1.28	41.58	0.000	0.000	80.01	0.00	0.00
17	137.00	AIR32	3	35.573	39.130	0.60	0.80	11.72	292.14	0.000	0.000	733.64	0.00	0.00
18	137.00	AIR 21, 1.3M, B2A B4P	3	35.573	39.130	0.60	0.80	10.96	247.05	0.000	0.000	686.31	0.00	0.00
19	137.00	APXVAARR24 43-U-NA2	3	35.573	39.130	0.60	0.80	36.43	345.60	0.000	0.000	2280.93	0.00	0.00
20	127.00	MTC3607 Platform + HR &	1	35.010	38.511	1.00	1.00	51.70	2021.40	0.000	0.000	3185.59	0.00	0.00
21	127.00	Cci HPA-65R-BUU-H8	12	35.010	38.511	0.63	0.80	98.44	734.40	0.000	0.000	6065.58	0.00	0.00
22	127.00	Ericsson RRUS-11 RRU	6	35.010	38.511	0.54	0.80	8.10	273.78	0.000	0.000	499.36	0.00	0.00
23	127.00	Ericsson RRUS 32 RRU	3	35.010	38.511	0.54	0.80	5.32	207.90	0.000	0.000	327.95	0.00	0.00
24	127.00	Raycap DC6-48-60-18-8F	4	35.010	38.511	0.80	0.80	7.04	114.48	0.000	0.000	433.78	0.00	0.00
25	127.00	Ericsson RRUS 4426 B66	3	35.010	38.511	0.54	0.80	1.85	130.95	0.000	0.000	113.94	0.00	0.00
26	127.00	Cci HPA65R-BU8A	6	35.010	38.511	0.71	0.80	47.93	372.60	0.000	0.000	2953.41	0.00	0.00
27	127.00	Kaelus DBCT108F1V92-1	3	35.010	38.511	0.80	0.80	1.68	53.46	0.000	0.000	103.52	0.00	0.00
28	127.00	Ericsson RRUS 4415 B25	3	35.010	38.511	0.54	0.80	2.99	119.07	0.000	0.000	184.29	0.00	0.00
29	127.00	Ericsson RRUS 4478 B5	3	35.010	38.511	0.54	0.80	2.96	161.73	0.000	0.000	182.31	0.00	0.00
30	127.00	Ericsson RRUS 4478 B14	3	35.010	38.511	0.54	0.80	2.65	160.38	0.000	0.000	163.48	0.00	0.00
							Totals:		**9,645.98**			**28,887.89**		

Total Applied Force Summary

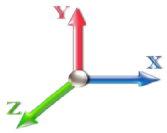
Structure:	CT13075-A-SBA		**Code:**	EIA/TIA-222-G	7/1/2019
Site Name:	New London		**Exposure:**	C	
Height:	149.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 14

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 104 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 23

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		624.11	1347.86	0.00	0.00
10.00		611.34	1322.77	0.00	0.00
15.00		598.58	1297.69	0.00	0.00
20.00		621.57	1272.60	0.00	0.00
25.00		637.26	1247.51	0.00	0.00
30.00		647.44	1222.43	0.00	0.00
35.00		653.56	1197.34	0.00	0.00
40.00		656.51	1172.25	0.00	0.00
45.00		656.93	1147.16	0.00	0.00
47.25		293.37	508.04	0.00	0.00
50.00		364.09	1086.77	0.00	0.00
53.25		429.53	1266.19	0.00	0.00
55.00		229.93	338.38	0.00	0.00
60.00		657.57	952.29	0.00	0.00
65.00		651.38	930.79	0.00	0.00
70.00		643.99	909.28	0.00	0.00
75.00		635.52	887.78	0.00	0.00
80.00		626.07	866.28	0.00	0.00
85.00		615.74	844.77	0.00	0.00
90.00		604.60	823.27	0.00	0.00
95.00		592.71	801.77	0.00	0.00
96.00		116.54	157.77	0.00	0.00
100.00		469.03	973.72	0.00	0.00
100.75		86.73	180.02	0.00	0.00
105.00		487.58	472.61	0.00	0.00
110.00		561.32	542.75	0.00	0.00
115.00		547.02	528.41	0.00	0.00
120.00		532.19	514.08	0.00	0.00
125.00		516.85	499.74	0.00	0.00
127.00	(47) attachments	14415.04	4546.03	0.00	0.00
130.00		298.22	279.32	0.00	0.00
135.00		484.79	454.06	0.00	0.00
137.00	(21) attachments	7393.51	3305.61	0.00	0.00
139.00		186.15	156.17	0.00	0.00
140.00		91.99	61.33	0.00	0.00
145.00		451.02	300.22	0.00	0.00
149.00	(24) attachments	7818.01	2400.26	0.00	1946.27
	Totals:	**46,507.80**	**36,815.34**	**0.00**	**1,946.27**

Calculated Forces

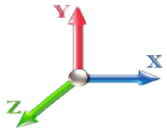
Structure:	CT13075-A-SBA	**Code:**	EIA/TIA-222-G	7/1/2019	
Site Name:	New London	**Exposure:**	C		
Height:	149.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 15	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 104 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 23

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	-36.72	-46.58	0.00	-5314.6	0.00	5314.62	5451.60	2725.80	12956.4	6487.84	0.00	0.000	0.000	0.826
5.00	-35.20	-46.09	0.00	-5081.7	0.00	5081.73	5379.95	2689.97	12523.2	6270.95	0.12	-0.218	0.000	0.817
10.00	-33.70	-45.60	0.00	-4851.2	0.00	4851.29	5306.65	2653.32	12093.3	6055.68	0.47	-0.440	0.000	0.808
15.00	-32.23	-45.12	0.00	-4623.2	0.00	4623.29	5231.70	2615.85	11666.9	5842.16	1.05	-0.665	0.000	0.798
20.00	-30.79	-44.60	0.00	-4397.7	0.00	4397.70	5155.10	2577.55	11244.2	5630.50	1.87	-0.893	0.000	0.787
25.00	-29.38	-44.06	0.00	-4174.6	0.00	4174.69	5076.86	2538.43	10825.5	5420.83	2.93	-1.125	0.000	0.776
30.00	-27.99	-43.51	0.00	-3954.3	0.00	3954.37	4996.96	2498.48	10411.0	5213.26	4.23	-1.361	0.000	0.764
35.00	-26.63	-42.93	0.00	-3736.8	0.00	3736.84	4915.42	2457.71	10001.0	5007.93	5.79	-1.600	0.000	0.752
40.00	-25.30	-42.35	0.00	-3522.1	0.00	3522.17	4832.22	2416.11	9595.63	4804.95	7.59	-1.841	0.000	0.739
45.00	-24.04	-41.73	0.00	-3310.4	0.00	3310.42	4747.38	2373.69	9195.21	4604.44	9.65	-2.086	0.000	0.724
47.25	-23.45	-41.47	0.00	-3216.5	0.00	3216.53	4708.66	2354.33	9016.69	4515.05	10.66	-2.199	0.000	0.718
50.00	-22.27	-41.12	0.00	-3102.5	0.00	3102.50	4660.89	2330.44	8799.96	4406.52	11.97	-2.338	0.000	0.709
53.25	-20.94	-40.68	0.00	-2968.8	0.00	2968.85	3818.32	1909.16	7226.08	3618.41	13.62	-2.502	0.000	0.826
55.00	-20.48	-40.51	0.00	-2897.6	0.00	2897.66	3795.26	1897.63	7117.54	3564.06	14.55	-2.592	0.000	0.819
60.00	-19.37	-39.90	0.00	-2695.1	0.00	2695.13	3728.27	1864.14	6809.75	3409.94	17.41	-2.870	0.000	0.796
65.00	-18.28	-39.29	0.00	-2495.6	0.00	2495.63	3659.63	1829.82	6505.57	3257.62	20.57	-3.149	0.000	0.772
70.00	-17.22	-38.68	0.00	-2299.1	0.00	2299.19	3589.34	1794.67	6205.25	3107.24	24.02	-3.428	0.000	0.745
75.00	-16.19	-38.07	0.00	-2105.8	0.00	2105.80	3517.40	1758.70	5909.03	2958.91	27.75	-3.707	0.000	0.717
80.00	-15.19	-37.46	0.00	-1915.4	0.00	1915.46	3443.81	1721.91	5617.15	2812.75	31.78	-3.984	0.000	0.686
85.00	-14.21	-36.85	0.00	-1728.1	0.00	1728.17	3368.58	1684.29	5329.85	2668.89	36.10	-4.258	0.000	0.652
90.00	-13.27	-36.25	0.00	-1543.9	0.00	1543.91	3291.69	1645.84	5047.37	2527.44	40.70	-4.528	0.000	0.615
95.00	-12.42	-35.63	0.00	-1362.6	0.00	1362.68	3202.59	1601.29	4754.28	2380.67	45.58	-4.791	0.000	0.577
96.00	-12.19	-35.52	0.00	-1327.0	0.00	1327.05	3181.72	1590.86	4692.22	2349.60	46.59	-4.844	0.000	0.569
100.00	-11.19	-35.00	0.00	-1184.9	0.00	1184.95	3098.26	1549.13	4448.03	2227.32	50.74	-5.048	0.000	0.536
100.75	-10.94	-34.92	0.00	-1158.7	0.00	1158.71	1860.42	930.21	2714.89	1359.46	51.53	-5.087	0.000	0.860
105.00	-10.36	-34.44	0.00	-1010.3	0.00	1010.31	1828.32	914.16	2592.13	1297.99	56.15	-5.293	0.000	0.785
110.00	-9.69	-33.88	0.00	-838.12	0.00	838.12	1789.04	894.52	2449.03	1226.33	61.86	-5.613	0.000	0.690
115.00	-9.06	-33.33	0.00	-668.72	0.00	668.72	1748.11	874.06	2307.59	1155.51	67.89	-5.902	0.000	0.585
120.00	-8.48	-32.78	0.00	-502.09	0.00	502.09	1705.53	852.77	2168.05	1085.64	74.20	-6.153	0.000	0.469
125.00	-7.96	-32.23	0.00	-338.22	0.00	338.22	1661.30	830.65	2030.66	1016.84	80.75	-6.354	0.000	0.339
127.00	-5.03	-17.40	0.00	-273.76	0.00	273.76	1643.15	821.58	1976.36	989.65	83.42	-6.420	0.000	0.280
130.00	-4.76	-17.08	0.00	-221.56	0.00	221.56	1615.43	807.71	1895.65	949.24	87.48	-6.504	0.000	0.237
135.00	-4.34	-16.55	0.00	-136.16	0.00	136.16	1567.90	783.95	1763.28	882.95	94.34	-6.612	0.000	0.157
137.00	-1.91	-8.83	0.00	-103.05	0.00	103.05	1548.43	774.21	1711.12	856.83	97.11	-6.645	0.000	0.122
139.00	-1.77	-8.63	0.00	-85.40	0.00	85.40	1528.69	764.34	1659.43	830.95	99.89	-6.673	0.000	0.104
139.00	-1.77	-8.63	0.00	-85.40	0.00	85.40	1044.31	522.16	1138.99	570.34	99.89	-6.673	0.000	0.152
140.00	-1.71	-8.53	0.00	-76.77	0.00	76.77	1038.69	519.35	1122.71	562.19	101.29	-6.685	0.000	0.138
145.00	-1.46	-8.05	0.00	-34.13	0.00	34.13	1009.62	504.81	1041.96	521.75	108.31	-6.743	0.000	0.067
149.00	0.00	-7.82	0.00	-1.95	0.00	1.95	985.17	492.59	978.22	489.84	113.96	-6.760	0.000	0.004

Wind Loading - Shaft

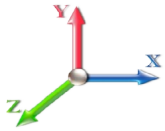
Structure:	CT13075-A-SBA	**Code:**	EIA/TIA-222-G	7/1/2019	
Site Name:	New London	**Exposure:**	C		
Height:	149.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 16	

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 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	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	25.435	30.52	173.5	453.8	2076.3
10.00		1.00	0.85	5.168	5.68	0.00	1.200	1.331	5.00	25.010	30.01	170.6	477.3	2066.4
15.00		1.00	0.85	5.168	5.68	0.00	1.200	1.386	5.00	24.557	29.47	167.5	487.2	2042.9
20.00		1.00	0.90	5.483	6.03	0.00	1.200	1.427	5.00	24.091	28.91	174.4	491.3	2013.5
25.00		1.00	0.95	5.747	6.32	0.00	1.200	1.459	5.00	23.619	28.34	179.2	491.8	1980.6
30.00		1.00	0.98	5.972	6.57	0.00	1.200	1.486	5.00	23.142	27.77	182.4	490.2	1945.5
35.00		1.00	1.01	6.169	6.79	0.00	1.200	1.509	5.00	22.662	27.19	184.5	486.8	1908.7
40.00		1.00	1.04	6.345	6.98	0.00	1.200	1.529	5.00	22.180	26.62	185.8	482.3	1870.7
45.00		1.00	1.07	6.504	7.15	0.00	1.200	1.547	5.00	21.696	26.03	186.3	476.7	1831.7
47.25	Bot - Section 2	1.00	1.08	6.571	7.23	0.00	1.200	1.555	2.25	9.603	11.52	83.3	213.3	812.1
50.00		1.00	1.09	6.650	7.32	0.00	1.200	1.564	2.75	11.778	14.13	103.4	262.7	1615.7
53.25	Top - Section 1	1.00	1.11	6.739	7.41	0.00	1.200	1.574	3.25	13.731	16.48	122.1	307.6	1882.4
55.00		1.00	1.12	6.785	7.46	0.00	1.200	1.579	1.75	7.307	8.77	65.4	164.8	554.8
60.00		1.00	1.14	6.910	7.60	0.00	1.200	1.592	5.00	20.553	24.66	187.5	463.2	1558.3
65.00		1.00	1.16	7.028	7.73	0.00	1.200	1.605	5.00	20.065	24.08	186.1	455.2	1521.7
70.00		1.00	1.17	7.138	7.85	0.00	1.200	1.617	5.00	19.575	23.49	184.4	446.8	1484.5
75.00		1.00	1.19	7.243	7.97	0.00	1.200	1.628	5.00	19.085	22.90	182.5	437.9	1447.0
80.00		1.00	1.21	7.342	8.08	0.00	1.200	1.639	5.00	18.595	22.31	180.2	428.7	1409.2
85.00		1.00	1.22	7.436	8.18	0.00	1.200	1.649	5.00	18.104	21.72	177.7	419.3	1371.0
90.00		1.00	1.24	7.526	8.28	0.00	1.200	1.658	5.00	17.613	21.14	175.0	409.5	1332.6
95.00		1.00	1.25	7.612	8.37	0.00	1.200	1.667	5.00	17.121	20.55	172.0	399.5	1293.9
96.00	Bot - Section 3	1.00	1.25	7.629	8.39	0.00	1.200	1.669	1.00	3.365	4.04	33.9	79.5	254.9
100.00		1.00	1.27	7.695	8.46	0.00	1.200	1.676	4.00	13.433	16.12	136.4	315.6	1474.2
100.75	Top - Section 2	1.00	1.27	7.707	8.48	0.00	1.200	1.677	0.75	2.483	2.98	25.3	58.9	272.8
105.00		1.00	1.28	7.774	8.55	0.00	1.200	1.684	4.25	13.864	16.64	142.3	326.4	808.2
110.00		1.00	1.29	7.851	8.64	0.00	1.200	1.692	5.00	15.856	19.03	164.3	373.4	922.5
115.00		1.00	1.30	7.925	8.72	0.00	1.200	1.699	5.00	15.363	18.44	160.7	362.6	892.5
120.00		1.00	1.32	7.996	8.80	0.00	1.200	1.707	5.00	14.870	17.84	156.9	351.6	862.4
125.00		1.00	1.33	8.065	8.87	0.00	1.200	1.714	5.00	14.376	17.25	153.0	340.4	832.2
127.00	Appurtenance(s)	1.00	1.33	8.092	8.90	0.00	1.200	1.716	2.00	5.612	6.73	59.9	134.4	325.7
130.00		1.00	1.34	8.132	8.95	0.00	1.200	1.720	3.00	8.270	9.92	88.8	197.5	478.7
135.00		1.00	1.35	8.197	9.02	0.00	1.200	1.727	5.00	13.389	16.07	144.9	317.7	771.2
137.00	Appurtenance(s)	1.00	1.35	8.222	9.04	0.00	1.200	1.729	2.00	5.217	6.26	56.6	125.2	301.3
139.00	Top - Section 3	1.00	1.36	8.247	9.07	0.00	1.200	1.732	2.00	5.138	6.17	55.9	123.4	296.4
140.00		1.00	1.36	8.260	9.09	0.00	1.200	1.733	1.00	2.539	3.05	27.7	61.2	125.4
145.00		1.00	1.37	8.321	9.15	0.00	1.200	1.739	5.00	12.401	14.88	136.2	294.4	606.6
149.00	Appurtenance(s)	1.00	1.38	8.369	9.21	0.00	1.200	1.744	4.00	9.564	11.48	105.7	227.9	467.4
								Totals:	**149.00**			**5,072.5**		**43,711.7**

Discrete Appurtenance Forces

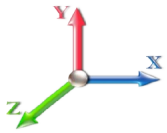
Structure:	CT13075-A-SBA	**Code:**	EIA/TIA-222-G	7/1/2019	
Site Name:	New London	**Exposure:**	C		
Height:	149.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 17	

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 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	149.00	RFS DB-T1-6Z-8AB-0Z	1	8.369	9.206	0.67	1.00	3.80	166.29	0.000	0.000	34.99	0.00	0.00
2	149.00	Alcatel RRH2x60 700	3	8.369	9.206	1.47	1.00	8.54	484.10	0.000	0.000	78.61	0.00	0.00
3	149.00	Alcatel RRH 4X45 AWS	3	8.369	9.206	0.80	1.00	7.93	480.95	0.000	0.000	72.99	0.00	0.00
4	149.00	Alcatel RRH	3	8.369	9.206	0.84	1.00	6.21	372.75	0.000	0.000	57.20	0.00	0.00
5	149.00	RFS DB-T1-6Z-8AB-0Z	1	8.369	9.206	0.67	1.00	3.80	166.29	0.000	0.000	34.99	0.00	0.00
6	149.00	Commscope	3	8.387	9.225	0.83	1.00	23.55	752.91	0.000	1.500	217.28	0.00	325.92
7	149.00	Low Profile	1	8.369	9.206	1.00	1.00	39.65	2808.04	0.000	0.000	365.01	0.00	0.00
8	149.00	Commscope	3	8.369	9.206	0.83	1.00	27.37	516.73	0.000	0.000	251.95	0.00	0.00
9	149.00	Antel BXA-80063/4CF	3	8.369	9.206	0.72	1.00	14.19	250.84	0.000	0.000	130.59	0.00	0.00
10	149.00	Commscope	3	8.369	9.206	0.83	1.00	23.33	750.50	0.000	0.000	214.81	0.00	0.00
11	137.00	mount pipe	1	8.222	9.044	1.00	1.00	9.65	205.81	0.000	0.000	87.25	0.00	0.00
12	137.00	Handrail KIt	3	8.222	9.044	1.00	1.00	20.00	254.88	0.000	0.000	180.86	0.00	0.00
13	137.00	(3) T-Arm Kit	1	8.222	9.044	1.00	1.00	32.48	1038.02	0.000	0.000	293.77	0.00	0.00
14	137.00	Low Profile Platform	1	8.222	9.044	1.00	1.00	39.50	2797.10	0.000	0.000	357.28	0.00	0.00
15	137.00	4449 B5/B12	3	8.222	9.044	0.54	0.75	4.07	400.00	0.000	0.000	36.81	0.00	0.00
16	137.00	KRY 112 76/1	3	8.222	9.044	0.64	0.80	2.55	97.28	0.000	0.000	23.07	0.00	0.00
17	137.00	AIR32	3	8.222	9.044	0.64	0.80	14.74	936.75	0.000	0.000	133.35	0.00	0.00
18	137.00	AIR 21, 1.3M, B2A B4P	3	8.222	9.044	0.64	0.80	13.78	830.61	0.000	0.000	124.63	0.00	0.00
19	137.00	APXVAARR24 43-U-NA2	3	8.222	9.044	0.64	0.80	42.47	1701.86	0.000	0.000	384.16	0.00	0.00
20	127.00	MTC3607 Platform + HR &	1	8.092	8.901	1.00	1.00	89.33	4775.24	0.000	0.000	795.11	0.00	0.00
21	127.00	Cci HPA-65R-BUU-H8	12	8.092	8.901	0.63	0.80	110.48	4404.75	0.000	0.000	983.38	0.00	0.00
22	127.00	Ericsson RRUS-11 RRU	6	8.092	8.901	0.54	0.80	10.16	889.41	0.000	0.000	90.45	0.00	0.00
23	127.00	Ericsson RRUS 32 RRU	3	8.092	8.901	0.54	0.80	3.57	419.49	0.000	0.000	31.76	0.00	0.00
24	127.00	Raycap DC6-48-60-18-8F	4	8.092	8.901	0.80	0.80	10.34	325.06	0.000	0.000	92.01	0.00	0.00
25	127.00	Ericsson RRUS 4426 B66	3	8.092	8.901	0.54	0.80	2.60	289.40	0.000	0.000	23.13	0.00	0.00
26	127.00	Cci HPA65R-BU8A	6	8.092	8.901	0.71	0.80	54.89	2122.72	0.000	0.000	488.62	0.00	0.00
27	127.00	Kaelus DBCT108F1V92-1	3	8.092	8.901	0.80	0.80	2.29	144.01	0.000	0.000	20.36	0.00	0.00
28	127.00	Ericsson RRUS 4415 B25	3	8.092	8.901	0.54	0.80	3.90	268.13	0.000	0.000	34.68	0.00	0.00
29	127.00	Ericsson RRUS 4478 B5	3	8.092	8.901	0.54	0.80	3.83	324.77	0.000	0.000	34.06	0.00	0.00
30	127.00	Ericsson RRUS 4478 B14	3	8.092	8.901	0.54	0.80	3.47	307.99	0.000	0.000	30.91	0.00	0.00
							Totals:		**29,282.65**			**5,704.05**		

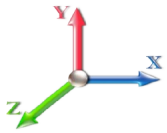
Total Applied Force Summary

Structure:	CT13075-A-SBA		**Code:**	EIA/TIA-222-G	7/1/2019
Site Name:	New London		**Exposure:**	C	
Height:	149.00 (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

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

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 22

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		173.51	2250.95	0.00	0.00
10.00		170.61	2240.96	0.00	0.00
15.00		167.52	2217.48	0.00	0.00
20.00		174.38	2188.06	0.00	0.00
25.00		179.18	2155.20	0.00	0.00
30.00		182.43	2120.06	0.00	0.00
35.00		184.54	2083.28	0.00	0.00
40.00		185.76	2045.26	0.00	0.00
45.00		186.27	2006.26	0.00	0.00
47.25		83.30	890.66	0.00	0.00
50.00		103.39	1711.76	0.00	0.00
53.25		122.14	1995.87	0.00	0.00
55.00		65.45	615.94	0.00	0.00
60.00		187.48	1732.95	0.00	0.00
65.00		186.13	1696.26	0.00	0.00
70.00		184.45	1659.13	0.00	0.00
75.00		182.46	1621.63	0.00	0.00
80.00		180.21	1583.78	0.00	0.00
85.00		177.70	1545.63	0.00	0.00
90.00		174.98	1507.20	0.00	0.00
95.00		172.04	1468.51	0.00	0.00
96.00		33.88	289.86	0.00	0.00
100.00		136.44	1613.89	0.00	0.00
100.75		25.26	298.97	0.00	0.00
105.00		142.28	956.59	0.00	0.00
110.00		164.32	1097.08	0.00	0.00
115.00		160.70	1067.15	0.00	0.00
120.00		156.94	1037.04	0.00	0.00
125.00		153.05	1006.76	0.00	0.00
127.00	(47) attachments	2684.41	14666.50	0.00	0.00
130.00		88.77	569.90	0.00	0.00
135.00		144.86	923.09	0.00	0.00
137.00	(21) attachments	1677.79	8624.33	0.00	0.00
139.00		55.93	331.59	0.00	0.00
140.00		27.68	143.00	0.00	0.00
145.00		136.21	694.66	0.00	0.00
149.00	(24) attachments	1564.06	7287.24	0.00	325.92
	Totals:	**10,776.53**	**77,944.45**	**0.00**	**325.92**

Calculated Forces

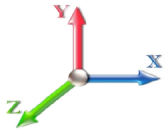
Structure:	CT13075-A-SBA	**Code:**	EIA/TIA-222-G	7/1/2019	
Site Name:	New London	**Exposure:**	C		
Height:	149.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 19	

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 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	-77.94	-10.81	0.00	-1226.1	0.00	1226.13	5451.60	2725.80	12956.4	6487.84	0.00	0.000	0.000	0.203
5.00	-75.68	-10.70	0.00	-1172.0	0.00	1172.07	5379.95	2689.97	12523.2	6270.95	0.03	-0.050	0.000	0.201
10.00	-73.43	-10.60	0.00	-1118.5	0.00	1118.55	5306.65	2653.32	12093.3	6055.68	0.11	-0.101	0.000	0.199
15.00	-71.20	-10.49	0.00	-1065.5	0.00	1065.57	5231.70	2615.85	11666.9	5842.16	0.24	-0.153	0.000	0.196
20.00	-69.01	-10.37	0.00	-1013.1	0.00	1013.13	5155.10	2577.55	11244.2	5630.50	0.43	-0.206	0.000	0.193
25.00	-66.84	-10.25	0.00	-961.28	0.00	961.28	5076.86	2538.43	10825.5	5420.83	0.67	-0.259	0.000	0.191
30.00	-64.71	-10.11	0.00	-910.05	0.00	910.05	4996.96	2498.48	10411.0	5213.26	0.98	-0.314	0.000	0.188
35.00	-62.62	-9.98	0.00	-859.47	0.00	859.47	4915.42	2457.71	10001.0	5007.93	1.33	-0.369	0.000	0.184
40.00	-60.57	-9.84	0.00	-809.58	0.00	809.58	4832.22	2416.11	9595.63	4804.95	1.75	-0.424	0.000	0.181
45.00	-58.56	-9.68	0.00	-760.40	0.00	760.40	4747.38	2373.69	9195.21	4604.44	2.22	-0.480	0.000	0.177
47.25	-57.66	-9.62	0.00	-738.63	0.00	738.63	4708.66	2354.33	9016.69	4515.05	2.46	-0.506	0.000	0.176
50.00	-55.94	-9.53	0.00	-712.18	0.00	712.18	4660.89	2330.44	8799.96	4406.52	2.76	-0.538	0.000	0.174
53.25	-53.95	-9.42	0.00	-681.21	0.00	681.21	3818.32	1909.16	7226.08	3618.41	3.14	-0.576	0.000	0.202
55.00	-53.32	-9.38	0.00	-664.73	0.00	664.73	3795.26	1897.63	7117.54	3564.06	3.35	-0.596	0.000	0.201
60.00	-51.58	-9.23	0.00	-617.82	0.00	617.82	3728.27	1864.14	6809.75	3409.94	4.01	-0.660	0.000	0.195
65.00	-49.88	-9.08	0.00	-571.64	0.00	571.64	3659.63	1829.82	6505.57	3257.62	4.74	-0.724	0.000	0.189
70.00	-48.21	-8.93	0.00	-526.22	0.00	526.22	3589.34	1794.67	6205.25	3107.24	5.53	-0.788	0.000	0.183
75.00	-46.58	-8.78	0.00	-481.57	0.00	481.57	3517.40	1758.70	5909.03	2958.91	6.39	-0.852	0.000	0.176
80.00	-44.99	-8.62	0.00	-437.68	0.00	437.68	3443.81	1721.91	5617.15	2812.75	7.32	-0.915	0.000	0.169
85.00	-43.44	-8.47	0.00	-394.57	0.00	394.57	3368.58	1684.29	5329.85	2668.89	8.31	-0.978	0.000	0.161
90.00	-41.93	-8.31	0.00	-352.24	0.00	352.24	3291.69	1645.84	5047.37	2527.44	9.37	-1.039	0.000	0.152
95.00	-40.46	-8.13	0.00	-310.70	0.00	310.70	3202.59	1601.29	4754.28	2380.67	10.49	-1.099	0.000	0.143
96.00	-40.16	-8.12	0.00	-302.56	0.00	302.56	3181.72	1590.86	4692.22	2349.60	10.72	-1.112	0.000	0.141
100.00	-38.55	-7.97	0.00	-270.10	0.00	270.10	3098.26	1549.13	4448.03	2227.32	11.67	-1.158	0.000	0.134
100.75	-38.25	-7.95	0.00	-264.12	0.00	264.12	1860.42	930.21	2714.89	1359.46	11.85	-1.167	0.000	0.215
105.00	-37.29	-7.83	0.00	-230.32	0.00	230.32	1828.32	914.16	2592.13	1297.99	12.91	-1.214	0.000	0.198
110.00	-36.18	-7.69	0.00	-191.16	0.00	191.16	1789.04	894.52	2449.03	1226.33	14.23	-1.287	0.000	0.176
115.00	-35.11	-7.54	0.00	-152.73	0.00	152.73	1748.11	874.06	2307.59	1155.51	15.61	-1.353	0.000	0.152
120.00	-34.07	-7.39	0.00	-115.03	0.00	115.03	1705.53	852.77	2168.05	1085.64	17.06	-1.410	0.000	0.126
125.00	-33.07	-7.23	0.00	-78.09	0.00	78.09	1661.30	830.65	2030.66	1016.84	18.56	-1.456	0.000	0.097
127.00	-18.47	-4.17	0.00	-63.64	0.00	63.64	1643.15	821.58	1976.36	989.65	19.18	-1.472	0.000	0.076
130.00	-17.90	-4.08	0.00	-51.12	0.00	51.12	1615.43	807.71	1895.65	949.24	20.11	-1.491	0.000	0.065
135.00	-16.98	-3.91	0.00	-30.73	0.00	30.73	1567.90	783.95	1763.28	882.95	21.68	-1.516	0.000	0.046
137.00	-8.41	-2.01	0.00	-22.90	0.00	22.90	1548.43	774.21	1711.12	856.83	22.32	-1.523	0.000	0.032
139.00	-8.08	-1.94	0.00	-18.88	0.00	18.88	1528.69	764.34	1659.43	830.95	22.96	-1.529	0.000	0.028
139.00	-8.08	-1.94	0.00	-18.88	0.00	18.88	1044.31	522.16	1138.99	570.34	22.96	-1.529	0.000	0.041
140.00	-7.93	-1.91	0.00	-16.94	0.00	16.94	1038.69	519.35	1122.71	562.19	23.28	-1.532	0.000	0.038
145.00	-7.24	-1.76	0.00	-7.37	0.00	7.37	1009.62	504.81	1041.96	521.75	24.89	-1.545	0.000	0.021
149.00	0.00	-1.56	0.00	-0.33	0.00	0.33	985.17	492.59	978.22	489.84	26.19	-1.548	0.000	0.001

Seismic Segment Forces (Factored)

Structure:	CT13075-A-SBA		**Code:**	EIA/TIA-222-G	7/1/2019
Site Name:	New London		**Exposure:**	C	
Height:	149.00 (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**	20
Gust Response Factor	1.10				**Sds**	0.17		**Ss**	0.16
Dead Load Factor	1.20	**Seismic Load Factor**	1.00		**Sd1**	0.09		**S1**	0.06
Wind Load Factor	0.00	**Structure Frequency (f1)**	0.39		**SA**	0.04	**Seismic Importance Factor**		1.00

Top Elev (ft)	Description	Wz (lb)	a	b	c	Lateral Fs (lb)	R: 1.50
0.00		0.00	0.00	0.00	0.00	0.00	
5.00		1352.1	0.00	0.03	0.02	20.45	
10.00		1324.2	0.01	0.05	0.03	29.56	
15.00		1296.3	0.02	0.06	0.04	33.65	
20.00		1268.5	0.03	0.07	0.04	35.35	
25.00		1240.6	0.05	0.07	0.04	35.97	
30.00		1212.7	0.08	0.07	0.04	36.17	
35.00		1184.8	0.10	0.07	0.04	36.24	
40.00		1157.0	0.14	0.07	0.03	36.21	
45.00		1129.1	0.17	0.07	0.03	35.89	
47.25	Bot - Section 2	499.01	0.19	0.06	0.02	15.89	
50.00		1127.4	0.21	0.06	0.02	35.77	
53.25	Top - Section 1	1312.3	0.24	0.06	0.02	40.91	
55.00		325.05	0.26	0.05	0.02	9.96	
60.00		912.60	0.31	0.04	0.01	25.57	
65.00		888.71	0.36	0.03	0.01	20.68	
70.00		864.82	0.42	0.01	0.01	13.93	
75.00		840.92	0.48	-0.01	0.01	5.64	
80.00		817.03	0.54	-0.03	0.01	-3.23	
85.00		793.14	0.62	-0.06	0.02	-11.32	
90.00		769.25	0.69	-0.08	0.03	-17.30	
95.00		745.35	0.77	-0.11	0.05	-20.27	
96.00	Bot - Section 3	146.20	0.78	-0.11	0.05	-4.04	
100.00		965.51	0.85	-0.12	0.07	-26.65	
100.75	Top - Section 2	178.20	0.86	-0.12	0.07	-4.86	
105.00		401.45	0.94	-0.12	0.10	-9.38	
110.00		457.56	1.03	-0.10	0.15	-6.60	
115.00		441.63	1.13	-0.05	0.20	-0.34	
120.00		425.70	1.23	0.03	0.27	7.50	
125.00		409.77	1.33	0.16	0.36	16.69	
127.00	Appurtenance(s)	4992.9	1.37	0.23	0.40	256.26	
130.00		234.39	1.44	0.36	0.47	16.09	
135.00		377.91	1.55	0.64	0.61	38.33	
137.00	Appurtenance(s)	3622.2	1.60	0.77	0.67	419.90	
139.00	Top - Section 3	144.16	1.64	0.92	0.73	18.92	
140.00		53.47	1.67	1.01	0.77	7.44	
145.00		260.18	1.79	1.49	0.96	47.34	
149.00	Appurtenance(s)	2608.2	1.89	1.98	1.14	573.58	
	Totals:	**36,780.9**				**1,765.9**	**Total Wind:** **46,507.8**

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

Calculated Forces

Structure:	CT13075-A-SBA	**Code:**	EIA/TIA-222-G	7/1/2019	
Site Name:	New London	**Exposure:**	C		
Height:	149.00 (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 20

Gust Response Factor	1.10			**Sds**	0.17			**Ss**	0.16
Dead Load Factor	1.20	**Seismic Load Factor**	1.00	**Sd1**	0.09			**S1**	0.06
Wind Load Factor	0.00	**Structure Frequency (f1)**	0.39	**SA**	0.04			**Seismic Importance Factor**	1.00

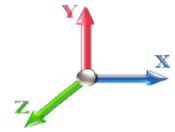
Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-49.09	-1.87	0.00	-221.60	0.00	221.60	5451.60	2725.80	12956.4	6487.84		0.00	0.00	0.043
5.00	-47.29	-1.86	0.00	-212.24	0.00	212.24	5379.95	2689.97	12523.2	6270.95		0.00	-0.01	0.043
10.00	-45.53	-1.84	0.00	-202.94	0.00	202.94	5306.65	2653.32	12093.3	6055.68		0.02	-0.02	0.042
15.00	-43.79	-1.81	0.00	-193.75	0.00	193.75	5231.70	2615.85	11666.9	5842.16		0.04	-0.03	0.042
20.00	-42.10	-1.78	0.00	-184.70	0.00	184.70	5155.10	2577.55	11244.2	5630.50		0.08	-0.04	0.041
25.00	-40.43	-1.75	0.00	-175.79	0.00	175.79	5076.86	2538.43	10825.5	5420.83		0.12	-0.05	0.040
30.00	-38.80	-1.72	0.00	-167.04	0.00	167.04	4996.96	2498.48	10411.0	5213.26		0.18	-0.06	0.040
35.00	-37.21	-1.69	0.00	-158.44	0.00	158.44	4915.42	2457.71	10001.0	5007.93		0.24	-0.07	0.039
40.00	-35.64	-1.66	0.00	-149.99	0.00	149.99	4832.22	2416.11	9595.63	4804.95		0.32	-0.08	0.039
45.00	-34.11	-1.62	0.00	-141.71	0.00	141.71	4747.38	2373.69	9195.21	4604.44		0.40	-0.09	0.038
47.25	-33.44	-1.61	0.00	-138.05	0.00	138.05	4708.66	2354.33	9016.69	4515.05		0.45	-0.09	0.038
50.00	-31.99	-1.58	0.00	-133.63	0.00	133.63	4660.89	2330.44	8799.96	4406.52		0.50	-0.10	0.037
53.25	-30.30	-1.53	0.00	-128.51	0.00	128.51	3818.32	1909.16	7226.08	3618.41		0.57	-0.11	0.043
55.00	-29.85	-1.53	0.00	-125.82	0.00	125.82	3795.26	1897.63	7117.54	3564.06		0.61	-0.11	0.043
60.00	-28.58	-1.51	0.00	-118.19	0.00	118.19	3728.27	1864.14	6809.75	3409.94		0.73	-0.12	0.042
65.00	-27.34	-1.49	0.00	-110.66	0.00	110.66	3659.63	1829.82	6505.57	3257.62		0.87	-0.13	0.041
70.00	-26.12	-1.48	0.00	-103.22	0.00	103.22	3589.34	1794.67	6205.25	3107.24		1.01	-0.15	0.040
75.00	-24.94	-1.47	0.00	-95.84	0.00	95.84	3517.40	1758.70	5909.03	2958.91		1.17	-0.16	0.039
80.00	-23.78	-1.48	0.00	-88.47	0.00	88.47	3443.81	1721.91	5617.15	2812.75		1.35	-0.17	0.038
85.00	-22.66	-1.48	0.00	-81.09	0.00	81.09	3368.58	1684.29	5329.85	2668.89		1.54	-0.18	0.037
90.00	-21.56	-1.48	0.00	-73.71	0.00	73.71	3291.69	1645.84	5047.37	2527.44		1.74	-0.20	0.036
95.00	-20.49	-1.48	0.00	-66.32	0.00	66.32	3202.59	1601.29	4754.28	2380.67		1.95	-0.21	0.034
96.00	-20.28	-1.48	0.00	-64.84	0.00	64.84	3181.72	1590.86	4692.22	2349.60		1.99	-0.21	0.034
100.00	-18.98	-1.48	0.00	-58.93	0.00	58.93	3098.26	1549.13	4448.03	2227.32		2.18	-0.22	0.033
100.75	-18.74	-1.48	0.00	-57.82	0.00	57.82	1860.42	930.21	2714.89	1359.46		2.21	-0.22	0.053
105.00	-18.11	-1.48	0.00	-51.54	0.00	51.54	1828.32	914.16	2592.13	1297.99		2.42	-0.24	0.050
110.00	-17.39	-1.48	0.00	-44.15	0.00	44.15	1789.04	894.52	2449.03	1226.33		2.67	-0.25	0.046
115.00	-16.68	-1.48	0.00	-36.75	0.00	36.75	1748.11	874.06	2307.59	1155.51		2.94	-0.27	0.041
120.00	-16.00	-1.47	0.00	-29.34	0.00	29.34	1705.53	852.77	2168.05	1085.64		3.23	-0.28	0.036
125.00	-15.33	-1.46	0.00	-21.97	0.00	21.97	1661.30	830.65	2030.66	1016.84		3.53	-0.29	0.031
127.00	-9.27	-1.17	0.00	-19.06	0.00	19.06	1643.15	821.58	1976.36	989.65		3.66	-0.30	0.025
130.00	-8.90	-1.15	0.00	-15.55	0.00	15.55	1615.43	807.71	1895.65	949.24		3.85	-0.30	0.022
135.00	-8.29	-1.11	0.00	-9.78	0.00	9.78	1567.90	783.95	1763.28	882.95		4.17	-0.31	0.016
137.00	-3.89	-0.67	0.00	-7.56	0.00	7.56	1548.43	774.21	1711.12	856.83		4.30	-0.31	0.011
139.00	-3.68	-0.65	0.00	-6.22	0.00	6.22	1528.69	764.34	1659.43	830.95		4.43	-0.32	0.010
139.00	-3.68	-0.65	0.00	-6.22	0.00	6.22	1044.31	522.16	1138.99	570.34		4.43	-0.32	0.014
140.00	-3.60	-0.64	0.00	-5.57	0.00	5.57	1038.69	519.35	1122.71	562.19		4.50	-0.32	0.013
145.00	-3.20	-0.59	0.00	-2.37	0.00	2.37	1009.62	504.81	1041.96	521.75		4.83	-0.32	0.008
149.00	0.00	-0.57	0.00	0.00	0.00	0.00	985.17	492.59	978.22	489.84		5.10	-0.32	0.000

Seismic Segment Forces (Factored)

Structure:	CT13075-A-SBA	**Code:**	EIA/TIA-222-G	7/1/2019	
Site Name:	New London	**Exposure:**	C		
Height:	149.00 (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**	20
Gust Response Factor	1.10			**Sds**	0.17	**Ss**	0.16
Dead Load Factor	0.90	**Seismic Load Factor**	1.00	**Sd1**	0.09	**S1**	0.06
Wind Load Factor	0.00	**Structure Frequency (f1)**	0.39	**SA**	0.04	**Seismic Importance Factor**	1.00



Top Elev (ft)	Description	Wz (lb)	a	b	c	Lateral Fs (lb)	R: 1.50
0.00		0.00	0.00	0.00	0.00	0.00	
5.00		1352.1	0.00	0.03	0.02	20.45	
10.00		1324.2	0.01	0.05	0.03	29.56	
15.00		1296.3	0.02	0.06	0.04	33.65	
20.00		1268.5	0.03	0.07	0.04	35.35	
25.00		1240.6	0.05	0.07	0.04	35.97	
30.00		1212.7	0.08	0.07	0.04	36.17	
35.00		1184.8	0.10	0.07	0.04	36.24	
40.00		1157.0	0.14	0.07	0.03	36.21	
45.00		1129.1	0.17	0.07	0.03	35.89	
47.25	Bot - Section 2	499.01	0.19	0.06	0.02	15.89	
50.00		1127.4	0.21	0.06	0.02	35.77	
53.25	Top - Section 1	1312.3	0.24	0.06	0.02	40.91	
55.00		325.05	0.26	0.05	0.02	9.96	
60.00		912.60	0.31	0.04	0.01	25.57	
65.00		888.71	0.36	0.03	0.01	20.68	
70.00		864.82	0.42	0.01	0.01	13.93	
75.00		840.92	0.48	-0.01	0.01	5.64	
80.00		817.03	0.54	-0.03	0.01	-3.23	
85.00		793.14	0.62	-0.06	0.02	-11.32	
90.00		769.25	0.69	-0.08	0.03	-17.30	
95.00		745.35	0.77	-0.11	0.05	-20.27	
96.00	Bot - Section 3	146.20	0.78	-0.11	0.05	-4.04	
100.00		965.51	0.85	-0.12	0.07	-26.65	
100.75	Top - Section 2	178.20	0.86	-0.12	0.07	-4.86	
105.00		401.45	0.94	-0.12	0.10	-9.38	
110.00		457.56	1.03	-0.10	0.15	-6.60	
115.00		441.63	1.13	-0.05	0.20	-0.34	
120.00		425.70	1.23	0.03	0.27	7.50	
125.00		409.77	1.33	0.16	0.36	16.69	
127.00	Appurtenance(s)	4992.9	1.37	0.23	0.40	256.26	
130.00		234.39	1.44	0.36	0.47	16.09	
135.00		377.91	1.55	0.64	0.61	38.33	
137.00	Appurtenance(s)	3622.2	1.60	0.77	0.67	419.90	
139.00	Top - Section 3	144.16	1.64	0.92	0.73	18.92	
140.00		53.47	1.67	1.01	0.77	7.44	
145.00		260.18	1.79	1.49	0.96	47.34	
149.00	Appurtenance(s)	2608.2	1.89	1.98	1.14	573.58	
	Totals:	**36,780.9**				**1,765.9**	**Total Wind:** **46,507.8**

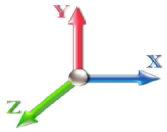
Seismic Base Shear is Less Than 50% of Wind Force - An Analysis is NOT Required

Calculated Forces

Structure:	CT13075-A-SBA	**Code:**	EIA/TIA-222-G	7/1/2019	
Site Name:	New London	**Exposure:**	C		
Height:	149.00 (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



Gust Response Factor	1.10			**Sds**	0.17	**Iterations**	20		
Dead Load Factor	0.90	**Seismic Load Factor**	1.00	**Sd1**	0.09	**Ss**	0.16		
Wind Load Factor	0.00	**Structure Frequency (f1)**	0.39	**SA**	0.04	**S1**	0.06	**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	-36.82	-1.87	0.00	-219.56	0.00	219.56	5451.60	2725.80	12956.4	6487.84		0.00	0.00	0.041
5.00	-35.47	-1.86	0.00	-210.20	0.00	210.20	5379.95	2689.97	12523.2	6270.95		0.00	-0.01	0.040
10.00	-34.14	-1.83	0.00	-200.92	0.00	200.92	5306.65	2653.32	12093.3	6055.68		0.02	-0.02	0.040
15.00	-32.85	-1.80	0.00	-191.75	0.00	191.75	5231.70	2615.85	11666.9	5842.16		0.04	-0.03	0.039
20.00	-31.57	-1.77	0.00	-182.73	0.00	182.73	5155.10	2577.55	11244.2	5630.50		0.08	-0.04	0.039
25.00	-30.33	-1.74	0.00	-173.87	0.00	173.87	5076.86	2538.43	10825.5	5420.83		0.12	-0.05	0.038
30.00	-29.10	-1.71	0.00	-165.16	0.00	165.16	4996.96	2498.48	10411.0	5213.26		0.18	-0.06	0.038
35.00	-27.91	-1.68	0.00	-156.61	0.00	156.61	4915.42	2457.71	10001.0	5007.93		0.24	-0.07	0.037
40.00	-26.73	-1.64	0.00	-148.23	0.00	148.23	4832.22	2416.11	9595.63	4804.95		0.31	-0.08	0.036
45.00	-25.59	-1.61	0.00	-140.01	0.00	140.01	4747.38	2373.69	9195.21	4604.44		0.40	-0.09	0.036
47.25	-25.08	-1.60	0.00	-136.39	0.00	136.39	4708.66	2354.33	9016.69	4515.05		0.44	-0.09	0.036
50.00	-23.99	-1.56	0.00	-132.00	0.00	132.00	4660.89	2330.44	8799.96	4406.52		0.50	-0.10	0.035
53.25	-22.72	-1.52	0.00	-126.93	0.00	126.93	3818.32	1909.16	7226.08	3618.41		0.57	-0.10	0.041
55.00	-22.39	-1.51	0.00	-124.27	0.00	124.27	3795.26	1897.63	7117.54	3564.06		0.61	-0.11	0.041
60.00	-21.43	-1.49	0.00	-116.71	0.00	116.71	3728.27	1864.14	6809.75	3409.94		0.73	-0.12	0.040
65.00	-20.50	-1.47	0.00	-109.27	0.00	109.27	3659.63	1829.82	6505.57	3257.62		0.86	-0.13	0.039
70.00	-19.59	-1.46	0.00	-101.92	0.00	101.92	3589.34	1794.67	6205.25	3107.24		1.00	-0.14	0.038
75.00	-18.70	-1.45	0.00	-94.62	0.00	94.62	3517.40	1758.70	5909.03	2958.91		1.16	-0.16	0.037
80.00	-17.84	-1.46	0.00	-87.35	0.00	87.35	3443.81	1721.91	5617.15	2812.75		1.33	-0.17	0.036
85.00	-16.99	-1.46	0.00	-80.07	0.00	80.07	3368.58	1684.29	5329.85	2668.89		1.52	-0.18	0.035
90.00	-16.17	-1.46	0.00	-72.78	0.00	72.78	3291.69	1645.84	5047.37	2527.44		1.72	-0.20	0.034
95.00	-15.37	-1.46	0.00	-65.49	0.00	65.49	3202.59	1601.29	4754.28	2380.67		1.93	-0.21	0.032
96.00	-15.21	-1.46	0.00	-64.03	0.00	64.03	3181.72	1590.86	4692.22	2349.60		1.97	-0.21	0.032
100.00	-14.24	-1.46	0.00	-58.20	0.00	58.20	3098.26	1549.13	4448.03	2227.32		2.15	-0.22	0.031
100.75	-14.05	-1.46	0.00	-57.10	0.00	57.10	1860.42	930.21	2714.89	1359.46		2.19	-0.22	0.050
105.00	-13.58	-1.46	0.00	-50.91	0.00	50.91	1828.32	914.16	2592.13	1297.99		2.39	-0.23	0.047
110.00	-13.04	-1.46	0.00	-43.62	0.00	43.62	1789.04	894.52	2449.03	1226.33		2.64	-0.25	0.043
115.00	-12.51	-1.46	0.00	-36.32	0.00	36.32	1748.11	874.06	2307.59	1155.51		2.91	-0.26	0.039
120.00	-12.00	-1.45	0.00	-29.01	0.00	29.01	1705.53	852.77	2168.05	1085.64		3.19	-0.28	0.034
125.00	-11.50	-1.44	0.00	-21.74	0.00	21.74	1661.30	830.65	2030.66	1016.84		3.49	-0.29	0.028
127.00	-6.95	-1.16	0.00	-18.87	0.00	18.87	1643.15	821.58	1976.36	989.65		3.61	-0.29	0.023
130.00	-6.67	-1.14	0.00	-15.40	0.00	15.40	1615.43	807.71	1895.65	949.24		3.80	-0.30	0.020
135.00	-6.22	-1.10	0.00	-9.70	0.00	9.70	1567.90	783.95	1763.28	882.95		4.12	-0.31	0.015
137.00	-2.91	-0.66	0.00	-7.49	0.00	7.49	1548.43	774.21	1711.12	856.83		4.25	-0.31	0.011
139.00	-2.76	-0.64	0.00	-6.17	0.00	6.17	1528.69	764.34	1659.43	830.95		4.38	-0.31	0.009
139.00	-2.76	-0.64	0.00	-6.17	0.00	6.17	1044.31	522.16	1138.99	570.34		4.38	-0.31	0.013
140.00	-2.70	-0.64	0.00	-5.53	0.00	5.53	1038.69	519.35	1122.71	562.19		4.45	-0.31	0.012
145.00	-2.40	-0.59	0.00	-2.35	0.00	2.35	1009.62	504.81	1041.96	521.75		4.78	-0.32	0.007
149.00	0.00	-0.57	0.00	0.00	0.00	0.00	985.17	492.59	978.22	489.84		5.04	-0.32	0.000

Wind Loading - Shaft

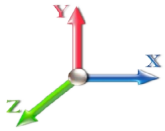
Structure:	CT13075-A-SBA	**Code:**	EIA/TIA-222-G	7/1/2019	
Site Name:	New London	**Exposure:**	C		
Height:	149.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 24	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 21

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.85	7.442	8.19	272.71	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	267.19	0.650	0.000	5.00	24.400	15.86	129.8	0.0	1352.1
10.00		1.00	0.85	7.442	8.19	261.66	0.650	0.000	5.00	23.901	15.54	127.2	0.0	1324.2
15.00		1.00	0.85	7.442	8.19	256.14	0.650	0.000	5.00	23.401	15.21	124.5	0.0	1296.4
20.00		1.00	0.90	7.896	8.69	258.15	0.650	0.000	5.00	22.902	14.89	129.3	0.0	1268.5
25.00		1.00	0.95	8.276	9.10	258.46	0.650	0.000	5.00	22.403	14.56	132.6	0.0	1240.6
30.00		1.00	0.98	8.600	9.46	257.54	0.650	0.000	5.00	21.904	14.24	134.7	0.0	1212.8
35.00		1.00	1.01	8.883	9.77	255.71	0.650	0.000	5.00	21.405	13.91	136.0	0.0	1184.9
40.00		1.00	1.04	9.137	10.05	253.21	0.650	0.000	5.00	20.906	13.59	136.6	0.0	1157.0
45.00		1.00	1.07	9.366	10.30	250.18	0.650	0.000	5.00	20.406	13.26	136.7	0.0	1129.1
47.25	Bot - Section 2	1.00	1.08	9.463	10.41	248.66	0.650	0.000	2.25	9.020	5.86	61.0	0.0	499.0
50.00		1.00	1.09	9.576	10.53	246.70	0.650	0.000	2.75	11.062	7.19	75.7	0.0	1127.5
53.25	Top - Section 1	1.00	1.11	9.704	10.67	244.24	0.650	0.000	3.25	12.878	8.37	89.4	0.0	1312.3
55.00		1.00	1.12	9.770	10.75	246.88	0.650	0.000	1.75	6.847	4.45	47.8	0.0	325.1
60.00		1.00	1.14	9.951	10.95	242.77	0.650	0.000	5.00	19.226	12.50	136.8	0.0	912.6
65.00		1.00	1.16	10.120	11.13	238.38	0.650	0.000	5.00	18.727	12.17	135.5	0.0	888.7
70.00		1.00	1.17	10.279	11.31	233.76	0.650	0.000	5.00	18.228	11.85	134.0	0.0	864.8
75.00		1.00	1.19	10.430	11.47	228.93	0.650	0.000	5.00	17.728	11.52	132.2	0.0	840.9
80.00		1.00	1.21	10.572	11.63	223.90	0.650	0.000	5.00	17.229	11.20	130.2	0.0	817.0
85.00		1.00	1.22	10.708	11.78	218.71	0.650	0.000	5.00	16.730	10.87	128.1	0.0	793.1
90.00		1.00	1.24	10.838	11.92	213.37	0.650	0.000	5.00	16.231	10.55	125.8	0.0	769.2
95.00		1.00	1.25	10.962	12.06	207.88	0.650	0.000	5.00	15.732	10.23	123.3	0.0	745.4
96.00	Bot - Section 3	1.00	1.25	10.986	12.08	206.77	0.650	0.000	1.00	3.086	2.01	24.2	0.0	146.2
100.00		1.00	1.27	11.081	12.19	202.27	0.650	0.000	4.00	12.315	8.00	97.6	0.0	965.5
100.75	Top - Section 2	1.00	1.27	11.098	12.21	201.42	0.650	0.000	0.75	2.274	1.48	18.0	0.0	178.2
105.00		1.00	1.28	11.195	12.31	199.41	0.650	0.000	4.25	12.671	8.24	101.4	0.0	401.4
110.00		1.00	1.29	11.305	12.44	193.58	0.650	0.000	5.00	14.446	9.39	116.8	0.0	457.6
115.00		1.00	1.30	11.412	12.55	187.65	0.650	0.000	5.00	13.946	9.07	113.8	0.0	441.6
120.00		1.00	1.32	11.514	12.67	181.62	0.650	0.000	5.00	13.447	8.74	110.7	0.0	425.7
125.00		1.00	1.33	11.614	12.78	175.50	0.650	0.000	5.00	12.948	8.42	107.5	0.0	409.8
127.00	Appurtenance(s)	1.00	1.33	11.653	12.82	173.03	0.650	0.000	2.00	5.039	3.28	42.0	0.0	159.4
130.00		1.00	1.34	11.710	12.88	169.30	0.650	0.000	3.00	7.409	4.82	62.0	0.0	234.4
135.00		1.00	1.35	11.803	12.98	163.02	0.650	0.000	5.00	11.950	7.77	100.8	0.0	377.9
137.00	Appurtenance(s)	1.00	1.35	11.840	13.02	160.49	0.650	0.000	2.00	4.640	3.02	39.3	0.0	146.7
139.00	Top - Section 3	1.00	1.36	11.876	13.06	157.94	0.650	0.000	2.00	4.560	2.96	38.7	0.0	144.2
140.00		1.00	1.36	11.894	13.08	156.66	0.650	0.000	1.00	2.250	1.46	19.1	0.0	53.5
145.00		1.00	1.37	11.982	13.18	150.24	0.650	0.000	5.00	10.951	7.12	93.8	0.0	260.2
149.00	Appurtenance(s)	1.00	1.38	12.051	13.26	145.04	0.650	0.000	4.00	8.402	5.46	72.4	0.0	199.5
								Totals:	**149.00**			**3,665.4**		**26,063.1**

Discrete Appurtenance Forces

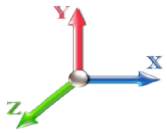
Structure:	CT13075-A-SBA	**Code:**	EIA/TIA-222-G	7/1/2019	
Site Name:	New London	**Exposure:**	C		
Height:	149.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 25	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 21

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	Orient Factor x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	149.00	RFS DB-T1-6Z-8AB-0Z	1	12.051	13.256	0.67	1.00	3.22	18.90	0.000	0.000	42.63	0.00	0.00
2	149.00	Alcatel RRH2x60 700	3	12.051	13.256	1.50	1.00	6.79	153.00	0.000	0.000	90.08	0.00	0.00
3	149.00	Alcatel RRH 4X45 AWS	3	12.051	13.256	0.80	1.00	6.24	192.00	0.000	0.000	82.72	0.00	0.00
4	149.00	Alcatel RRH	3	12.051	13.256	0.84	1.00	4.74	138.00	0.000	0.000	62.80	0.00	0.00
5	149.00	RFS DB-T1-6Z-8AB-0Z	1	12.051	13.256	0.67	1.00	3.22	18.90	0.000	0.000	42.63	0.00	0.00
6	149.00	Commscope	3	12.077	13.284	0.83	1.00	20.32	120.00	0.000	1.500	269.92	0.00	404.87
7	149.00	Low Profile	1	12.051	13.256	1.00	1.00	22.00	1500.00	0.000	0.000	291.64	0.00	0.00
8	149.00	Commscope	3	12.051	13.256	0.83	1.00	20.34	116.40	0.000	0.000	269.68	0.00	0.00
9	149.00	Antel BXA-80063/4CF	3	12.051	13.256	0.72	1.00	10.20	29.70	0.000	0.000	135.15	0.00	0.00
10	149.00	Commscope	3	12.051	13.256	0.83	1.00	20.12	121.80	0.000	0.000	266.71	0.00	0.00
11	137.00	mount pipe	1	11.840	13.024	1.00	1.00	4.31	87.00	0.000	0.000	56.13	0.00	0.00
12	137.00	Handrail KIt	3	11.840	13.024	1.00	1.00	8.91	137.25	0.000	0.000	116.00	0.00	0.00
13	137.00	(3) T-Arm Kit	1	11.840	13.024	1.00	1.00	16.50	500.00	0.000	0.000	214.90	0.00	0.00
14	137.00	Low Profile Platform	1	11.840	13.024	1.00	1.00	22.00	1500.00	0.000	0.000	286.53	0.00	0.00
15	137.00	4449 B5/B12	3	11.840	13.024	0.50	0.75	2.97	222.00	0.000	0.000	38.68	0.00	0.00
16	137.00	KRY 112 76/1	3	11.840	13.024	0.60	0.80	1.28	46.20	0.000	0.000	16.64	0.00	0.00
17	137.00	AIR32	3	11.840	13.024	0.60	0.80	11.72	324.60	0.000	0.000	152.62	0.00	0.00
18	137.00	AIR 21, 1.3M, B2A B4P	3	11.840	13.024	0.60	0.80	10.96	274.50	0.000	0.000	142.77	0.00	0.00
19	137.00	APXVAARR24 43-U-NA2	3	11.840	13.024	0.60	0.80	36.43	384.00	0.000	0.000	474.49	0.00	0.00
20	127.00	MTC3607 Platform + HR &	1	11.653	12.818	1.00	1.00	51.70	2246.00	0.000	0.000	662.68	0.00	0.00
21	127.00	Cci HPA-65R-BUU-H8	12	11.653	12.818	0.63	0.80	98.44	816.00	0.000	0.000	1261.79	0.00	0.00
22	127.00	Ericsson RRUS-11 RRU	6	11.653	12.818	0.54	0.80	8.10	304.20	0.000	0.000	103.88	0.00	0.00
23	127.00	Ericsson RRUS 32 RRU	3	11.653	12.818	0.54	0.80	5.32	231.00	0.000	0.000	68.22	0.00	0.00
24	127.00	Raycap DC6-48-60-18-8F	4	11.653	12.818	0.80	0.80	7.04	127.20	0.000	0.000	90.24	0.00	0.00
25	127.00	Ericsson RRUS 4426 B66	3	11.653	12.818	0.54	0.80	1.85	145.50	0.000	0.000	23.70	0.00	0.00
26	127.00	Cci HPA65R-BU8A	6	11.653	12.818	0.71	0.80	47.93	414.00	0.000	0.000	614.38	0.00	0.00
27	127.00	Kaelus DBCT108F1V92-1	3	11.653	12.818	0.80	0.80	1.68	59.40	0.000	0.000	21.53	0.00	0.00
28	127.00	Ericsson RRUS 4415 B25	3	11.653	12.818	0.54	0.80	2.99	132.30	0.000	0.000	38.34	0.00	0.00
29	127.00	Ericsson RRUS 4478 B5	3	11.653	12.818	0.54	0.80	2.96	179.70	0.000	0.000	37.92	0.00	0.00
30	127.00	Ericsson RRUS 4478 B14	3	11.653	12.818	0.54	0.80	2.65	178.20	0.000	0.000	34.01	0.00	0.00
							Totals:		**10,717.75**			**6,009.41**		

Total Applied Force Summary

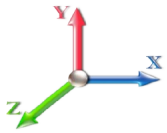
Structure:	CT13075-A-SBA		**Code:**	EIA/TIA-222-G	7/1/2019
Site Name:	New London		**Exposure:**	C	
Height:	149.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 26

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 21

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		129.83	1497.62	0.00	0.00
10.00		127.17	1469.75	0.00	0.00
15.00		124.52	1441.87	0.00	0.00
20.00		129.30	1414.00	0.00	0.00
25.00		132.57	1386.13	0.00	0.00
30.00		134.68	1358.25	0.00	0.00
35.00		135.96	1330.38	0.00	0.00
40.00		136.57	1302.50	0.00	0.00
45.00		136.66	1274.63	0.00	0.00
47.25		61.03	564.49	0.00	0.00
50.00		75.74	1207.52	0.00	0.00
53.25		89.35	1406.88	0.00	0.00
55.00		47.83	375.98	0.00	0.00
60.00		136.79	1058.10	0.00	0.00
65.00		135.50	1034.21	0.00	0.00
70.00		133.97	1010.32	0.00	0.00
75.00		132.20	986.42	0.00	0.00
80.00		130.24	962.53	0.00	0.00
85.00		128.09	938.64	0.00	0.00
90.00		125.77	914.75	0.00	0.00
95.00		123.30	890.85	0.00	0.00
96.00		24.24	175.30	0.00	0.00
100.00		97.57	1081.91	0.00	0.00
100.75		18.04	200.02	0.00	0.00
105.00		101.43	525.12	0.00	0.00
110.00		116.77	603.06	0.00	0.00
115.00		113.79	587.13	0.00	0.00
120.00		110.71	571.20	0.00	0.00
125.00		107.52	555.27	0.00	0.00
127.00	(47) attachments	2998.69	5051.15	0.00	0.00
130.00		62.04	310.35	0.00	0.00
135.00		100.85	504.51	0.00	0.00
137.00	(21) attachments	1538.04	3672.90	0.00	0.00
139.00		38.72	173.52	0.00	0.00
140.00		19.14	68.15	0.00	0.00
145.00		93.82	333.58	0.00	0.00
149.00	(24) attachments	1626.34	2666.96	0.00	404.87
	Totals:	**9,674.79**	**40,905.93**	**0.00**	**404.87**

Calculated Forces

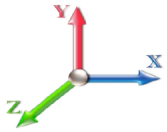
Structure:	CT13075-A-SBA	**Code:**	EIA/TIA-222-G	7/1/2019	
Site Name:	New London	**Exposure:**	C		
Height:	149.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 27	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 21

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	-40.90	-9.69	0.00	-1110.9	0.00	1110.98	5451.60	2725.80	12956.4	6487.84	0.00	0.000	0.000	0.179
5.00	-39.40	-9.59	0.00	-1062.5	0.00	1062.53	5379.95	2689.97	12523.2	6270.95	0.02	-0.046	0.000	0.177
10.00	-37.92	-9.49	0.00	-1014.5	0.00	1014.58	5306.65	2653.32	12093.3	6055.68	0.10	-0.092	0.000	0.175
15.00	-36.47	-9.40	0.00	-967.11	0.00	967.11	5231.70	2615.85	11666.9	5842.16	0.22	-0.139	0.000	0.173
20.00	-35.05	-9.29	0.00	-920.13	0.00	920.13	5155.10	2577.55	11244.2	5630.50	0.39	-0.187	0.000	0.170
25.00	-33.66	-9.18	0.00	-873.66	0.00	873.66	5076.86	2538.43	10825.5	5420.83	0.61	-0.235	0.000	0.168
30.00	-32.29	-9.07	0.00	-827.75	0.00	827.75	4996.96	2498.48	10411.0	5213.26	0.89	-0.285	0.000	0.165
35.00	-30.95	-8.95	0.00	-782.39	0.00	782.39	4915.42	2457.71	10001.0	5007.93	1.21	-0.335	0.000	0.163
40.00	-29.64	-8.84	0.00	-737.62	0.00	737.62	4832.22	2416.11	9595.63	4804.95	1.59	-0.385	0.000	0.160
45.00	-28.36	-8.71	0.00	-693.44	0.00	693.44	4747.38	2373.69	9195.21	4604.44	2.02	-0.436	0.000	0.157
47.25	-27.80	-8.66	0.00	-673.84	0.00	673.84	4708.66	2354.33	9016.69	4515.05	2.23	-0.460	0.000	0.155
50.00	-26.58	-8.59	0.00	-650.04	0.00	650.04	4660.89	2330.44	8799.96	4406.52	2.50	-0.489	0.000	0.153
53.25	-25.17	-8.50	0.00	-622.14	0.00	622.14	3818.32	1909.16	7226.08	3618.41	2.85	-0.524	0.000	0.179
55.00	-24.79	-8.46	0.00	-607.27	0.00	607.27	3795.26	1897.63	7117.54	3564.06	3.04	-0.542	0.000	0.177
60.00	-23.73	-8.34	0.00	-564.97	0.00	564.97	3728.27	1864.14	6809.75	3409.94	3.64	-0.601	0.000	0.172
65.00	-22.69	-8.21	0.00	-523.28	0.00	523.28	3659.63	1829.82	6505.57	3257.62	4.31	-0.659	0.000	0.167
70.00	-21.67	-8.09	0.00	-482.21	0.00	482.21	3589.34	1794.67	6205.25	3107.24	5.03	-0.718	0.000	0.161
75.00	-20.68	-7.97	0.00	-441.76	0.00	441.76	3517.40	1758.70	5909.03	2958.91	5.81	-0.776	0.000	0.155
80.00	-19.71	-7.84	0.00	-401.93	0.00	401.93	3443.81	1721.91	5617.15	2812.75	6.66	-0.834	0.000	0.149
85.00	-18.76	-7.72	0.00	-362.72	0.00	362.72	3368.58	1684.29	5329.85	2668.89	7.56	-0.892	0.000	0.141
90.00	-17.84	-7.60	0.00	-324.13	0.00	324.13	3291.69	1645.84	5047.37	2527.44	8.53	-0.949	0.000	0.134
95.00	-16.95	-7.47	0.00	-286.15	0.00	286.15	3202.59	1601.29	4754.28	2380.67	9.55	-1.004	0.000	0.126
96.00	-16.77	-7.45	0.00	-278.68	0.00	278.68	3181.72	1590.86	4692.22	2349.60	9.76	-1.015	0.000	0.124
100.00	-15.69	-7.34	0.00	-248.89	0.00	248.89	3098.26	1549.13	4448.03	2227.32	10.63	-1.058	0.000	0.117
100.75	-15.49	-7.32	0.00	-243.39	0.00	243.39	1860.42	930.21	2714.89	1359.46	10.80	-1.066	0.000	0.187
105.00	-14.96	-7.23	0.00	-212.27	0.00	212.27	1828.32	914.16	2592.13	1297.99	11.77	-1.109	0.000	0.172
110.00	-14.35	-7.11	0.00	-176.14	0.00	176.14	1789.04	894.52	2449.03	1226.33	12.96	-1.176	0.000	0.152
115.00	-13.76	-7.00	0.00	-140.57	0.00	140.57	1748.11	874.06	2307.59	1155.51	14.23	-1.237	0.000	0.130
120.00	-13.18	-6.89	0.00	-105.57	0.00	105.57	1705.53	852.77	2168.05	1085.64	15.56	-1.290	0.000	0.105
125.00	-12.63	-6.77	0.00	-71.13	0.00	71.13	1661.30	830.65	2030.66	1016.84	16.93	-1.332	0.000	0.078
127.00	-7.65	-3.66	0.00	-57.58	0.00	57.58	1643.15	821.58	1976.36	989.65	17.49	-1.346	0.000	0.063
130.00	-7.34	-3.59	0.00	-46.60	0.00	46.60	1615.43	807.71	1895.65	949.24	18.34	-1.364	0.000	0.054
135.00	-6.83	-3.48	0.00	-28.63	0.00	28.63	1567.90	783.95	1763.28	882.95	19.79	-1.387	0.000	0.037
137.00	-3.20	-1.86	0.00	-21.66	0.00	21.66	1548.43	774.21	1711.12	856.83	20.37	-1.394	0.000	0.027
139.00	-3.03	-1.81	0.00	-17.95	0.00	17.95	1528.69	764.34	1659.43	830.95	20.95	-1.399	0.000	0.024
139.00	-3.03	-1.81	0.00	-17.95	0.00	17.95	1044.31	522.16	1138.99	570.34	20.95	-1.399	0.000	0.034
140.00	-2.96	-1.79	0.00	-16.14	0.00	16.14	1038.69	519.35	1122.71	562.19	21.25	-1.402	0.000	0.032
145.00	-2.63	-1.69	0.00	-7.17	0.00	7.17	1009.62	504.81	1041.96	521.75	22.72	-1.414	0.000	0.016
149.00	0.00	-1.63	0.00	-0.40	0.00	0.40	985.17	492.59	978.22	489.84	23.91	-1.418	0.000	0.001

Final Analysis Summary

Structure:	CT13075-A-SBA		**Code:**	EIA/TIA-222-G	7/1/2019
Site Name:	New London		**Exposure:**	C	
Height:	149.00 (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 104 mph Wind	46.6	0.00	49.00	0.00	0.00	5361.56
0.9D + 1.6W 104 mph Wind	46.6	0.00	36.72	0.00	0.00	5314.62
1.2D + 1.0Di + 1.0Wi 50 mph Wind	10.8	0.00	77.94	0.00	0.00	1226.13
1.2D + 1.0E	1.9	0.00	49.09	0.00	0.00	221.60
0.9D + 1.0E	1.9	0.00	36.82	0.00	0.00	219.56
1.0D + 1.0W 60 mph Wind	9.7	0.00	40.90	0.00	0.00	1110.98

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 104 mph Wind	-15.57	-35.36	0.00	-1174.4	0.00	-1174.4	1860.42	930.21	2714.89	1359.46	100.75	0.874
0.9D + 1.6W 104 mph Wind	-10.94	-34.92	0.00	-1158.7	0.00	-1158.7	1860.42	930.21	2714.89	1359.46	100.75	0.860
1.2D + 1.0Di + 1.0Wi 50 mph Wind	-38.25	-7.95	0.00	-264.12	0.00	-264.12	1860.42	930.21	2714.89	1359.46	100.75	0.215
1.2D + 1.0E	-18.74	-1.48	0.00	-57.82	0.00	-57.82	1860.42	930.21	2714.89	1359.46	100.75	0.053
0.9D + 1.0E	-14.05	-1.46	0.00	-57.10	0.00	-57.10	1860.42	930.21	2714.89	1359.46	100.75	0.050
1.0D + 1.0W 60 mph Wind	-15.49	-7.32	0.00	-243.39	0.00	-243.39	1860.42	930.21	2714.89	1359.46	100.75	0.187

Base Plate Summary

Structure:	CT13075-A-SB		**Code:**	EIA/TIA-222-G	7/1/2019
Site Name:	New London		**Exposure:**	C	
Height:	149.00 (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		Base Plate		Anchor Bolts	
Original Design		**Yield (ksi):**	60.00	**Bolt Circle:**	64.88
Moment (kip-ft):	5442.50	**Width (in):**	65.38	**Number Bolts:**	20.00
Axial (kip):	53.57	**Style:**	Clipped	**Bolt Type:**	2.25" 18J
Shear (kip):	49.90	**Polygon Sides:**	8.00	**Bolt Diameter (in):**	2.25
Analysis		**Clip Length (in):**	14.00	**Yield (ksi):**	75.00
Moment (kip-ft):	5361.56	**Effective Len (in):**	8.93	**Ultimate (ksi):**	100.00
Axial (kip):	77.94	**Moment (kip-in):**	669.38	**Arrangement:**	Clustered
Shear (kip):	46.60	**Allow Stress (ksi):**	81.00	**Cluster Dist (in):**	6.00
		Applied Stress (ksi):	0.00	**Start Angle (deg):**	45.00
Moment Design %:	98.51	**Stress Ratio:**	0.73	Compression	
				Force (kip):	202.23
				Allowable (kip):	260.00
				Ratio:	0.80
				Tension	
				Force (kip):	194.43
				Allowable (kip):	260.00
				Ratio:	0.77

Monopole Mat Foundation Design

			Date: 7/1/2019
Customer Name:	T-Mobile	**EIA/TIA Standard:**	EIA-222-G
Site Name:		**Structure Height (Ft.):**	149
Site Number:	CT13075-A-SBA	**Engineer Name:**	J. Tibbetts
Engr. Number:	77988	**Engineer Login ID:**	

Foundation Info Obtained from: Drawings/Calculations

Structure Type: Monopole

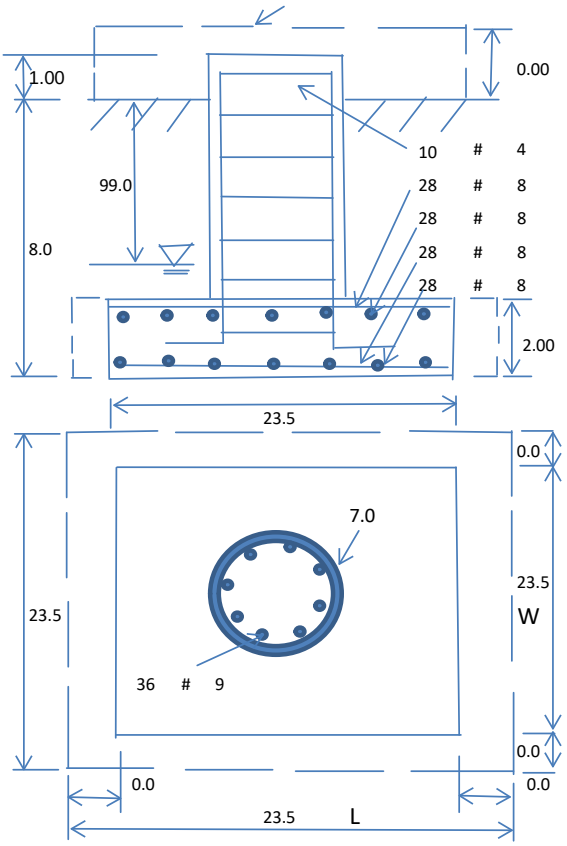
Analysis or Design? Analysis

Base Reactions (Factored):

Axial Load (Kips):	77.9	Shear Force (Kips):	46.6
Uplift Force (Kips):	0.0	Moment (Kips-ft):	5361.6
Allowable overstress %:	5.0%		

Foundation Geometries:

		Mods required -Yes/No ?:	No
Diameter of Pier (ft.):	7.0	Depth of Base BG (ft.):	8.0
Pier Height A. G. (ft.):	1.00	Thickness of Pad (ft):	2.00
Length of Pad (ft.):	23.5	Width of Pad (ft.):	23.5
Final Length of pad (ft)	23.5	Final width of pad (ft):	23.5



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 #:	9	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):	28	Qty. of Rebar in Pad (W):	28

Rebar at the top of the concrete pad:

Qty. of Rebar in Pad (L):	28	Qty. of Rebar in Pad (W):	28
Apply 1.35 factor for e/w Per G:	1.35		

Soil Design Parameters:

Soil Unit Weight (pcf):	100.0	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):	8000	Ultimate Skin Friction:	0	Psf	Angle from Bottm of Pad:	25
Consider Friction for O.T.M. (Y/N):	No	Consider Friction for bearing (Y/N):	No		Angle from Bottm of Pad:	25
Consider soil hor. resist. for OTM.:	No	Reduction factor on the maximum soil bearing pressure:	1.00			

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

Total Dry Soil Volume (cu. Ft.):	3082.59	Total Dry Soil Weight (Kips):	308.26
Total Buoyant Soil Volume (cu. Ft.):	0.00	Total Buoyant Soil Weight (Kips):	0.00
Total Effective Soil Weight (Kips):	308.26	Weight from the Concrete Block at Top (K):	0.00
Total Dry Concrete Volume (cu. Ft.):	1373.89	Total Dry Concrete Weight (Kips):	206.08
Total Buoyant Concrete Volume (cu. Ft.):	0.00	Total Buoyant Concrete Weight (Kips):	0.00
Total Effective Concrete Weight (Kips):	206.08	Total Vertical Load on Base (Kips):	592.24

Check Soil Capacities:

					Load/ Capacity Ratio	
Calculated Maxium Net Soil Pressure under the base (psf):	5867	<	Allowable Factored Soil Bearing (psf):	6000	0.98	OK!
Allowable Foundation Overturning Resistance (kips-ft.):	6354.5	>	Design Factored Momont (kips-ft):	5781	0.91	OK!
Factor of Safety Against Overturning (O. R. Moment/Design Moment):	1.10	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):	1.00		Tie / Stirrup Area (sq. in./each):	0.20		
Calculated Moment Capacity (Mn,Kips-Ft):	6026.1	>	Design Factored Moment (Mu, Kips-F	5687.8	0.94	OK!
Calculated Shear Capacity (Kips):	660.1	>	Design Factored Shear (Kips):	46.6	0.07	OK!
Calculated Tension Capacity (Tn, Kips):	1944.0	>	Design Factored Tension (Tu Kips):	0.0	0.00	OK!
Calculated Compression Capacity (Pn, Kips):	9734.2	>	Design Factored Axial Load (Pu Kips):	77.9	0.01	OK!
Moment & Axial Strength Combination:	0.94	OK!	Check Tie Spacing (Design/Required):		1	OK!
Pier Reinforcement Ratio:	0.006		Reinforcement Ratio is satisfied per ACI			
(2).Concrete Pad:						
One-Way Design Shear Capacity (L-Direction, Kips):	548.4	>	One-Way Factored Shear (L-D. Kips):	394.3	0.72	OK!
One-Way Design Shear Capacity (W-Direction, Kips):	548.4	>	One-Way Factored Shear (W-D., Kips)	394.3	0.72	OK!
One-Way Design Shear Capacity (Corner-Corner. Kips):	532.5	>	One-Way Factored Shear (C-C, Kips):	416.1	0.78	OK!
Lower Steel Pad Reinforcement Ratio (L-Direct.):	0.0038	OK!	Lower Steel Pad Reinf. Ratio (W-Direc	0.0038		
Lower Steel Pad Moment Capacity (L-Direction. Kips-ft):	1971.7	>	Moment at Bottom (L-Dir. K-Ft):	1717.2	0.87	OK!
Lower Steel Pad Moment Capacity (W-Direction. Kips-ft):	1971.7	>	Moment at Bottom (W-Dir. K-Ft):	1717.2	0.87	OK!
Lower Steel Pad Moment Capacity (Corner-Corner,K-ft):	2762.4	>	Moment at Bottom (C-C Dir. K-Ft):	2428.5	0.88	OK!
Upper Steel Pad Reinforcement Ratio (L-Direct.):	0.0038	OK!	Upper Steel Reinf. Ratio (W-Dir.):	0.0038		
Upper Steel Pad Moment Capacity (L-Direc. Kips-ft):	1971.7	>	Moment at the top (L-Dir K-Ft):	785.8	0.40	OK!
Upper Steel Pad Moment Capacity (W-Direc. Kips-ft):	1971.7	>	Moment at the top (W-Dir K-Ft):	785.8	0.40	OK!
Upper Steel Pad Moment Capacity (Corner-Corner. K-ft):	2762.4	>	Moment at the top (C-C Dir. K-Ft):	739.1	0.27	OK!
(3).Check Punching Shear Capacity due to Moment in the Pier:						
Moment transferred by punching shear:	2144.6	k-ft.	Max. factored shear stress v_{u_CD}:		5.0	Psi
Max. factored shear stress v_{u_AB}:	24.3	Psi	Factored shear Strength ϕv_n:		189.7	Psi
Max. factored shear stress v_u:	24.3	Psi	Check Usage of Punching Shear Capacity:		0.13	OK!

EXHIBIT 8

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

Post-Mod Antenna Mount Analysis Report

Existing 149-ft Monopole Tower

Customer Name: SBA Communications Corp

Customer Site Number: CT13075-A-SBA

Customer Site Name: New London

Carrier Name: T-Mobile (App#: 116561, V1)

Carrier Site ID / Name: CT11311G / CT311/Opta Paws Place

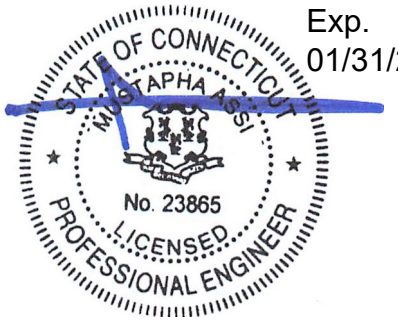
Site Location: 1294 Pleasant Valley Road North

Groton, Connecticut

New London County

Latitude: 41.399972

Longitude: -72.079222



Exp. 01/31/2020

07/25/2019

Analysis Result:

Max Structural Usage: 68.3% [Pass]

Report Prepared By: Khaibar Noorzad

Introduction

The purpose of this report is to summarize the analysis results on the (1) Platform at 137.00' elevation including the proposed modifications to support the proposed antenna configuration. Any existing modification listed under Sources of Information was assumed completed and was included in this analysis.

The proposed modification by **TES** listed under Sources of Information was considered completed and was included in this analysis.

Sources of Information

Mount Drawings	Mapping by SkyTower LLC; Dated 05/04/2019
Antenna Loading	Provided by SBA; Application #: 116561, v1
Existing Modification	N/A
Proposed Modification	TES Project No. 81110

Analysis Criteria

Wind Speed Used in the Analysis: V_{ULT} = 134 mph (3-Sec. Gust) / Equivalent to
V_{ASD} = 104 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 table 1604.5 of the IBC. 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) Platform at 137.00' elevation

Proposed Modifications

(1) MetroSite Heavy Collar Mount (MS-H1436)
(1) MetroSite Support Rail Kit (MS-P-TARM_6)
(3) 2" PST Antenna Mount Pipes (PST2375-8)

Final Antenna Configuration

3 Ericsson Air 21 B2A/B4P
3 Ericsson Air 32
3 RFS APXVAARR24_43-U-NA20
3 Ericsson KRY 112 144/1
3 Ericsson Radio 4449 B71+B12

Any proposed antennas not currently installed should be mounted such that the centers of the antennas do not exceed 0.5 ft vertically from the center of the Platform.

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 after the proposed modification is successfully completed. The maximum structural usage is 68.3%, which occurs in the antenna mount pipe. The proposed equipment must be installed as stipulated in the Final Antenna Configuration section of this report. The analysis results are void if the proposed equipment is not installed in accordance with this report.

Attachments

1. Mount Photos Before Modification
2. Antenna Placement Diagram
3. 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.


04 05 2019


05.05.2019

Structure: CT13075-A-SBA - New London

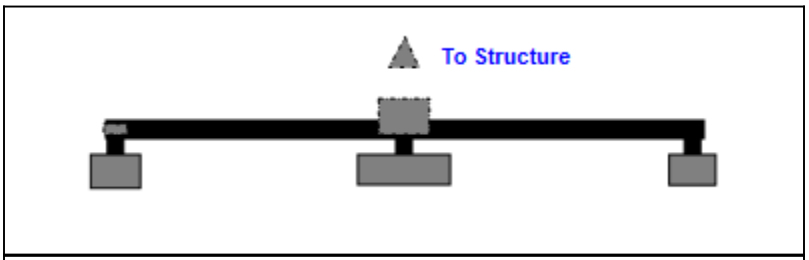
Sector: A

Structure Type: Monopole

Mount Elev: 137.00

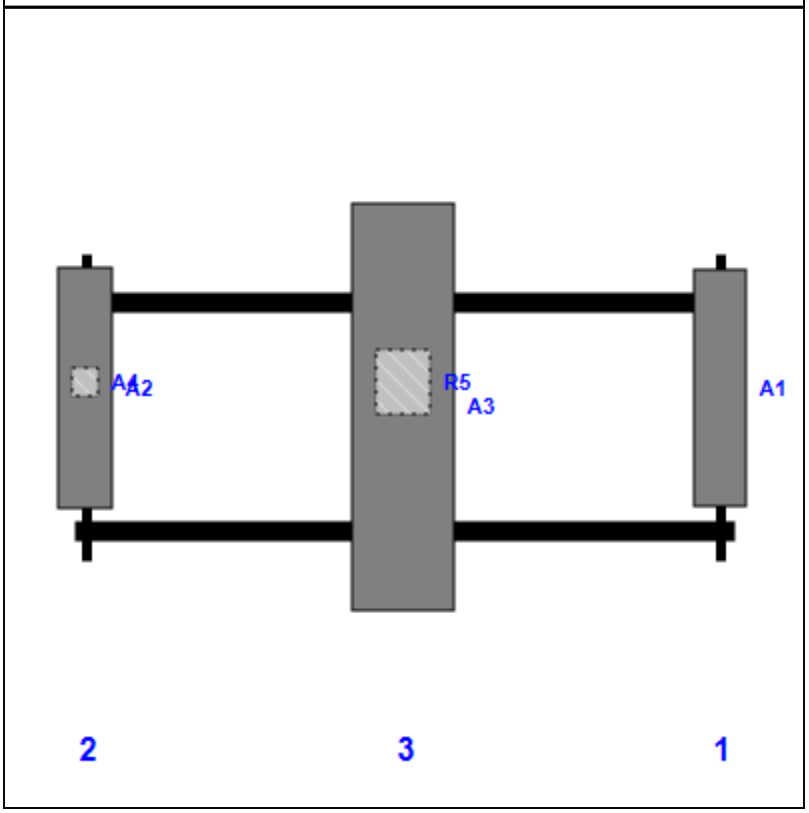
7/12/2019

Plan View



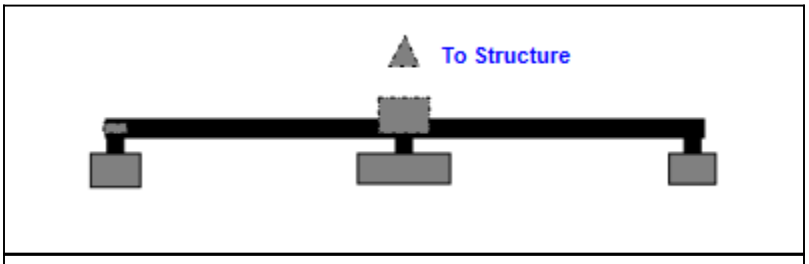
Front View

Looking Toward Structure



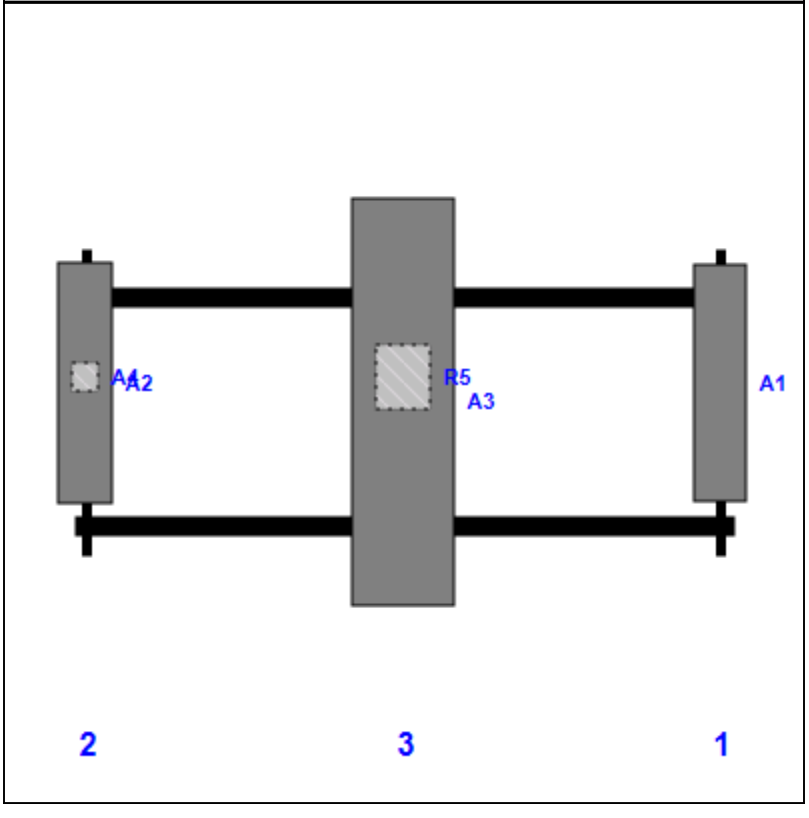
Ref #	Model	Height (in)	Width (in)	H Dist From Left	Pipe #	Pipe Pos V	Antenna Pos	Center Ant From Top	Antenna H Offset
A1	Air 21 B2A/B4P	56.00	12.10	153.00	1	a	Front	31.50	0.00
A2	Air 32	57.00	12.90	3.00	2	a	Front	31.50	0.00
A4	KRY 112 144/1	6.90	6.10	3.00	2	a	Behind	30.00	0.00
A3	APXVAARR24_43-U-NA20	95.90	24.00	78.00	3	a	Front	36.00	0.00
R5	Radio 4449 B71+B12	15.00	13.20	78.00	3	a	Behind	30.00	0.00

Plan View



Front View

Looking Toward Structure



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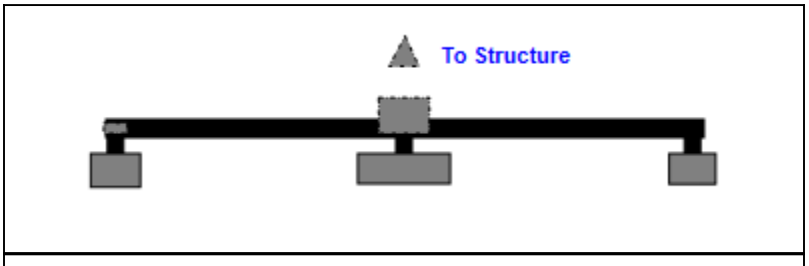
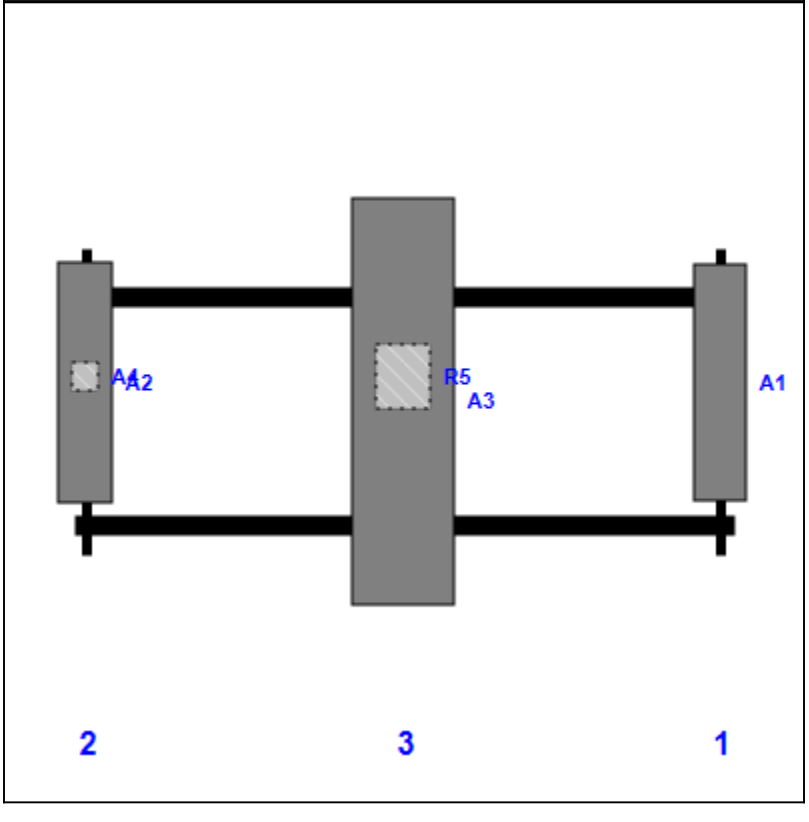
Plan View



Front View

Looking Toward Structure



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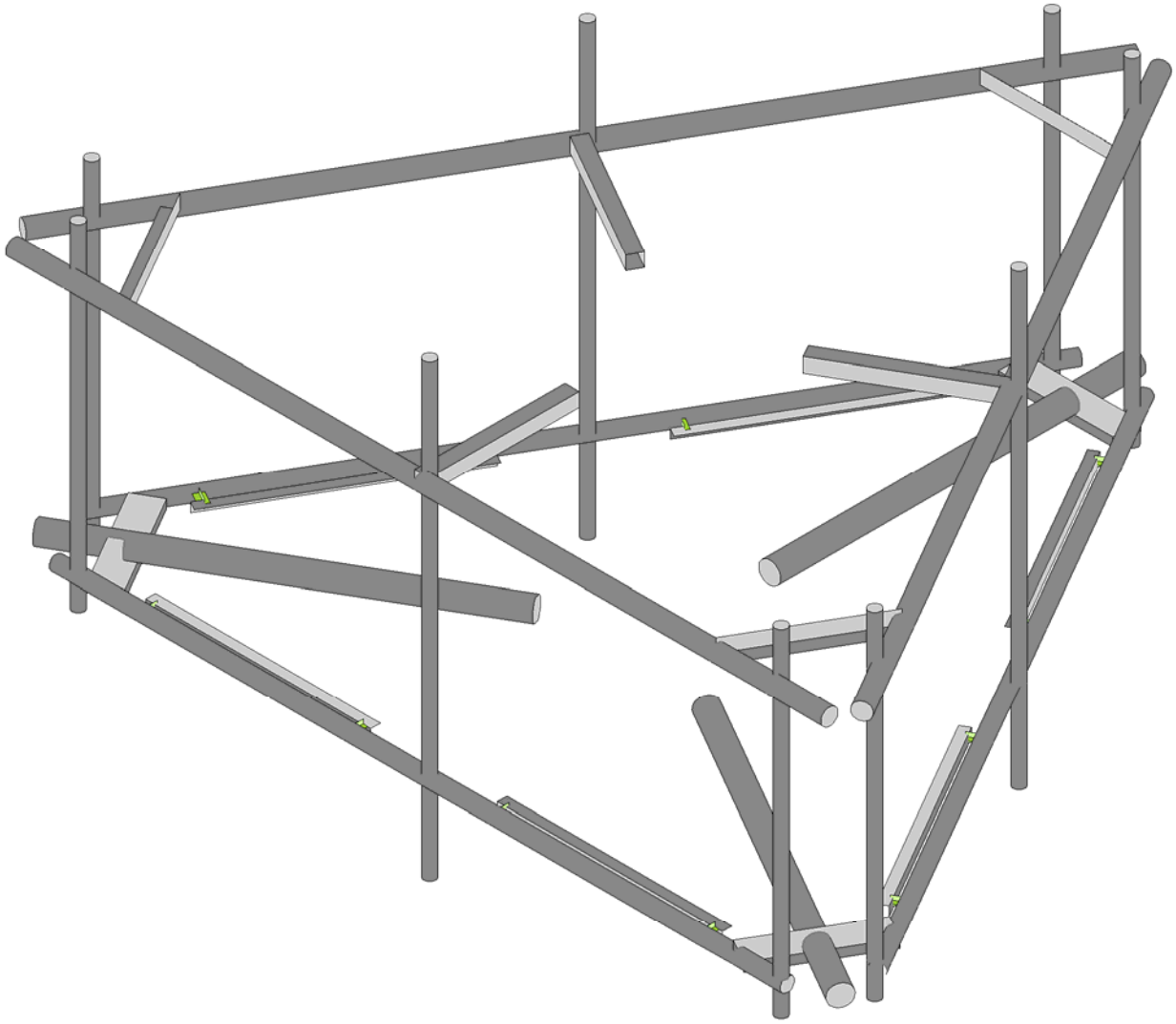

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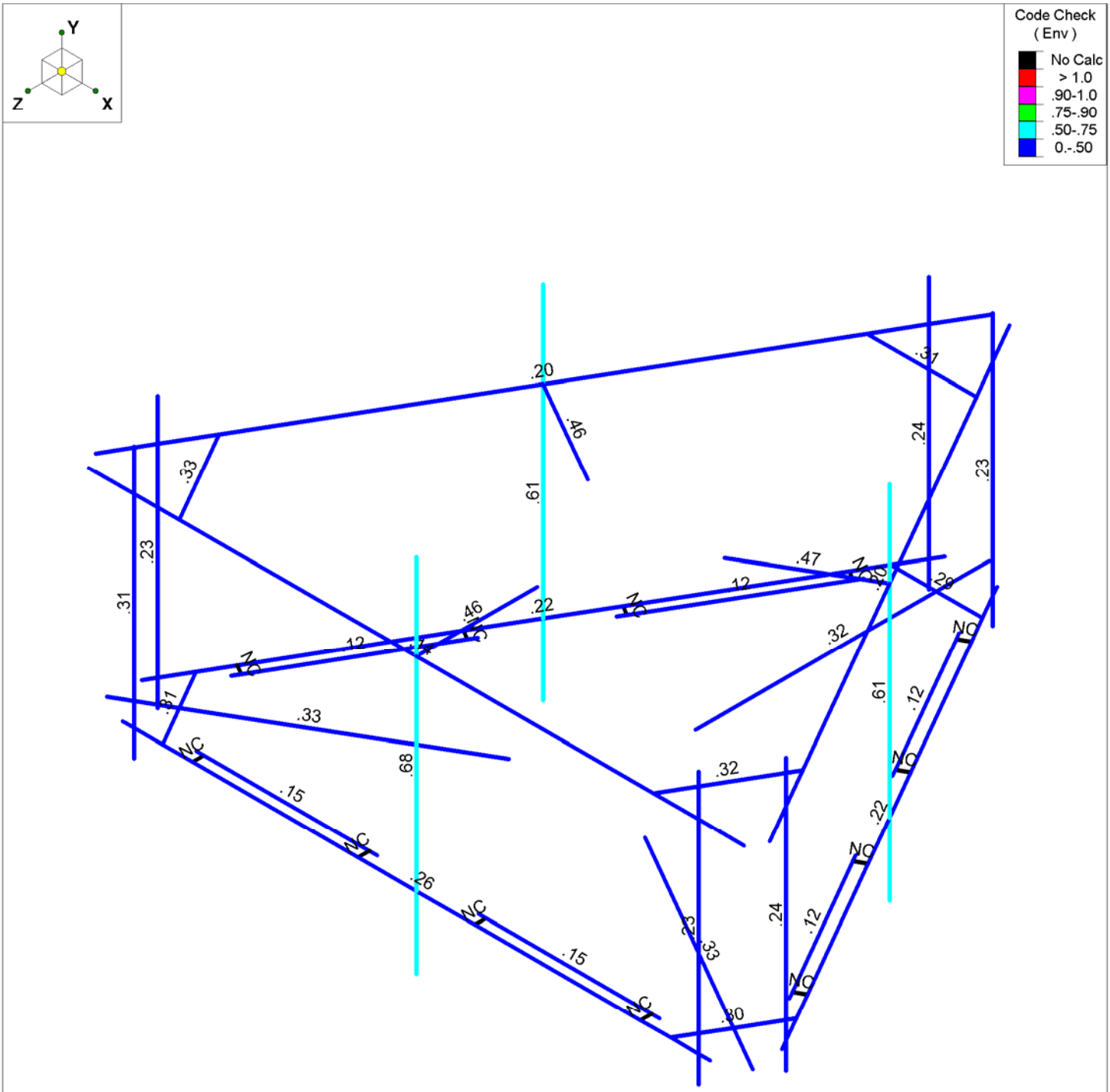
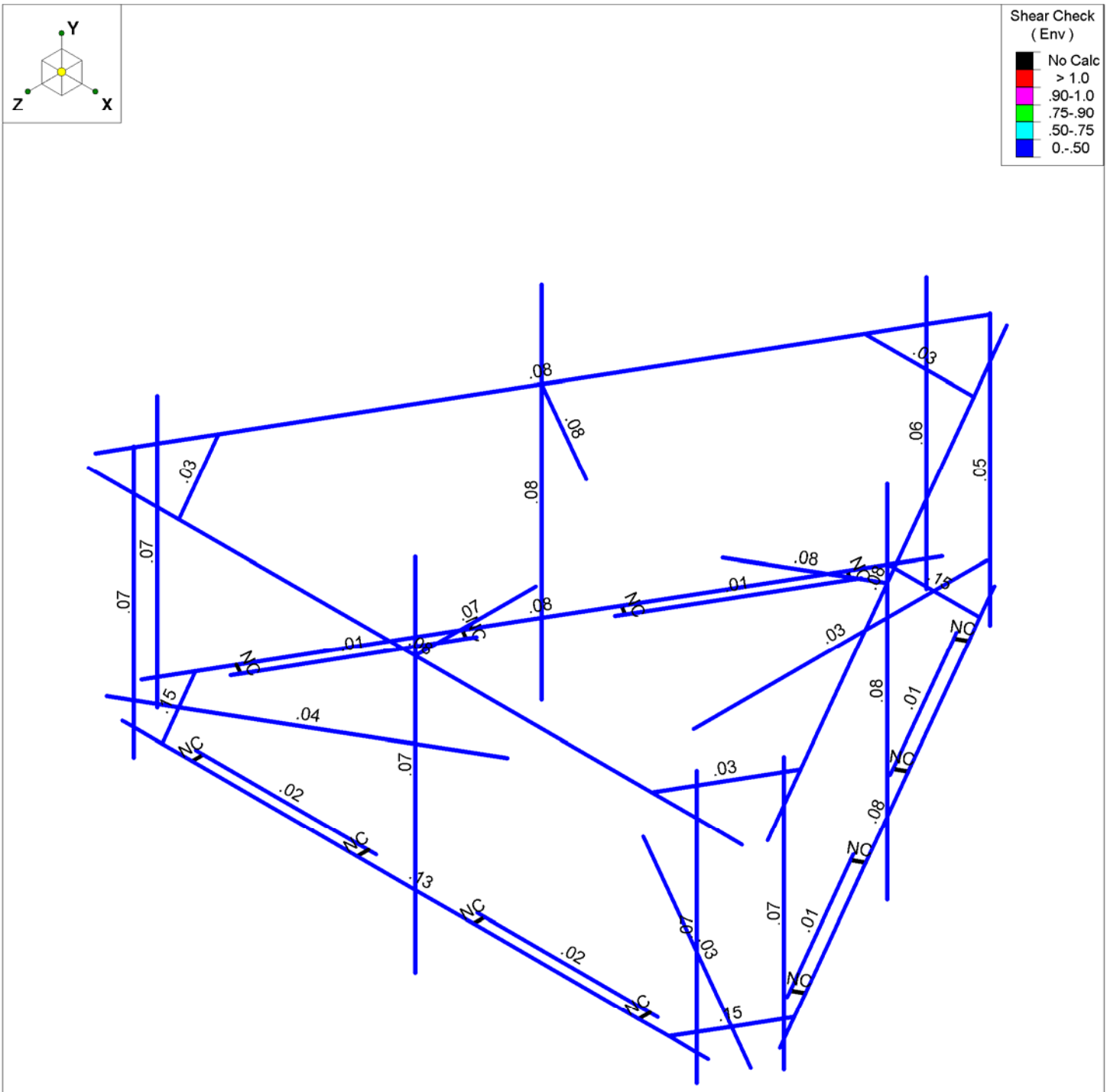
		July 12, 2019 at 4:47 PM
TES Project No. 81110		CT13075-A-SBA_81110_G_RISA_L...



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



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

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		July 12, 2019 at 4:48 PM
TES Project No. 81110		CT13075-A-SBA_81110_G_RISA_L...

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Memb...	Surface(...
1	Antenna D	None					24			
2	Antenna Di	None					24			
3	Antenna W Front	None					24			
4	Antenna Wi Front	None					24			
5	Antenna W Side	None					24			
6	Antenna Wi Side	None					24			
7	Service Lm1	None					1			
8	Service Lm2	None					1			
9	Structure D	None		-1					3	
10	Structure Di	None						33	3	
11	Structure W Front	None						33		
12	Structure Wi Front	None						33		
13	Structure W Side	None						33		
14	Structure Wi Side	None						33		
15	BLC 9 Transient Area Loa...	None						18		
16	BLC 10 Transient Area Lo...	None						18		

Load Combinations

	Description	So..	P...	S...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	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 (Front)	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 (Right)	Yes	Y		1	1.2	9	1.2	2	1	10	1	6	-1	14	-1								
9	1.2D+1.5L1+.16W (Maint...	Yes	Y		1	1.2	9	1.2	7	1.5	3	.16	11	.16										
10	1.2D+1.5L2+.16W (Maint...	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 Diaphragm
1	N1	-1.515544	0	.875	0	
2	N2	1.515544	0	.875	0	
3	N3	0	0	-1.75	0	
4	N4	-6.5	0	4.426352	0	
5	N5	6.5	0	4.426352	0	
6	N6	7.083333	0	3.415989	0	
7	N7	0.583333	0	-7.842341	0	
8	N8	-0.583333	0	-7.842341	0	
9	N9	-7.083333	0	3.415989	0	
10	N10	6.25	5.416667	4.426352	0	
11	N11	6.25	-0.583333	4.426352	0	
12	N12	-6.25	5.416667	4.426352	0	
13	N13	-6.25	-0.583333	4.426352	0	
14	N14	-6.958333	5.416667	3.199483	0	
15	N15	-6.958333	-0.583333	3.199483	0	
16	N16	-0.708333	5.416667	-7.625835	0	
17	N17	-0.708333	-0.583333	-7.625835	0	

Joint Coordinates and Temperatures (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diaphragm
18	N18	0.708333	5.416667	-7.625835	0	
19	N19	0.708333	-0.583333	-7.625835	0	
20	N20	6.958333	5.416667	3.199483	0	
21	N21	6.958333	-0.583333	3.199483	0	
22	CENTER	0	0	0	0	
23	N23	0	0	-8.25	0	
24	N24	1.020833	0	-7.084569	0	
25	N25	-1.020833	0	-7.084569	0	
26	N26	0	0	-7.084569	0	
27	N27	-7.14471	0	4.125	0	
28	N28	-6.645833	0	2.658217	0	
29	N29	-5.625	0	4.426352	0	
30	N30	7.14471	0	4.125	0	
31	N31	5.625	0	4.426352	0	
32	N32	6.645833	0	2.658217	0	
33	N33	-1.292	0	4.426352	0	
34	N34	4.958	0	4.426352	0	
35	N35	1.292	0	4.426352	0	
36	N36	-4.958	0	4.426352	0	
37	N37	1.125	0	4.176352	0	
38	N38	-5.125	0	4.176352	0	
39	N39	5.125	0	4.176352	0	
40	N40	-1.292	0	4.176352	0	
41	N41	4.958	0	4.176352	0	
42	N42	1.292	0	4.176352	0	
43	N43	-4.958	0	4.176352	0	
44	N44	-1.125	0	4.176352	0	
45	N45	4.479333	0	-1.094271	0	
46	N46	1.354333	0	-6.50693	0	
47	N47	3.187333	0	-3.332081	0	
48	N48	6.312333	0	2.080578	0	
49	N49	3.054327	0	-3.062455	0	
50	N50	1.054327	0	-6.526556	0	
51	N51	4.262827	0	-0.969271	0	
52	N52	1.137827	0	-6.38193	0	
53	N53	2.970827	0	-3.207081	0	
54	N54	6.095827	0	2.205578	0	
55	N55	4.179327	0	-1.113897	0	
56	N56	6.179327	0	2.350204	0	
57	N57	-3.187333	0	-3.332081	0	
58	N58	-6.312333	0	2.080578	0	
59	N59	-4.479333	0	-1.094271	0	
60	N60	-1.354333	0	-6.50693	0	
61	N61	-4.179327	0	-1.113897	0	
62	N62	-6.179327	0	2.350204	0	
63	N63	-2.970827	0	-3.207081	0	
64	N64	-6.095827	0	2.205578	0	
65	N65	-4.262827	0	-0.969271	0	
66	N66	-1.137827	0	-6.38193	0	
67	N67	-3.054327	0	-3.062455	0	
68	N68	-1.054327	0	-6.526556	0	
69	N69	6.25	0	4.426352	0	
70	N70	-6.25	0	4.426352	0	
71	N71	0.708333	0	-7.625835	0	
72	N72	6.958333	0	3.199483	0	
73	N73	-6.958333	0	3.199483	0	
74	N74	-0.708333	0	-7.625835	0	

Joint Coordinates and Temperatures (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diaphragm
75	N75	-6.135417	0	3.542284	0	
76	N76	6.135417	0	3.542284	0	
77	N77	0	6.416667	4.426352	0	
78	N78	0	-1.583333	4.426352	0	
79	N79	3.833333	6.416667	-2.213176	0	
80	N80	3.833333	-1.583333	-2.213176	0	
81	N81	-3.833333	6.416667	-2.213176	0	
82	N82	-3.833333	-1.583333	-2.213176	0	
83	N83	0	0	4.426352	0	
84	N84	3.833333	0	-2.213176	0	
85	N85	-3.833333	0	-2.213176	0	
86	N86	-7.25	4.5	4.426352	0	
87	N87	7.25	4.5	4.426352	0	
88	N88	7.458333	4.5	4.065508	0	
89	N89	0.208333	4.5	-8.49186	0	
90	N90	-0.208333	4.5	-8.49186	0	
91	N91	-7.458333	4.5	4.065508	0	
92	N92	5.25	4.5	4.426352	0	
93	N93	-5.25	4.5	4.426352	0	
94	N94	1.208333	4.5	-6.759809	0	
95	N95	6.458333	4.5	2.333457	0	
96	N96	-6.458333	4.5	2.333457	0	
97	N97	-1.208333	4.5	-6.759809	0	
98	N98	-1.2e-13	4.5	1.75	0	
99	N99	0	4.5	4.426352	0	
100	N100	1.515544	4.5	-.875	0	
101	N101	3.833333	4.5	-2.213176	0	
102	N102	-1.515544	4.5	-0.875	0	
103	N103	-3.833333	4.5	-2.213176	0	
104	N104	6.25	4.5	4.426352	0	
105	N105	-6.25	4.5	4.426352	0	
106	N106	-6.958333	4.5	3.199483	0	
107	N107	-0.708333	4.5	-7.625835	0	
108	N108	0.708333	4.5	-7.625835	0	
109	N109	6.958333	4.5	3.199483	0	

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design ...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	New Support Rail	PIPE_3.0	Beam	Pipe	A53 Gr.B	Typical	2.07	2.85	2.85	5.69
2	New Mount Pipes	PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
3	New SR End Connection	L3X3X4	Beam	Single Angle	A36 Gr.36	Typical	1.44	1.23	1.23	.031
4	New T-Arm	HSS3X3X4	Beam	SquareTube	A500 Gr.B ...	Typical	2.44	3.02	3.02	5.08

Cold Formed Steel Section Sets

	Label	Shape	Type	Design List	Material	Design R...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	CF	4CU5.25X0375	Beam	CU	A570 Gr.33	Typical	4.854	13.238	12.817	.228

Aluminum Section Sets

	Label	Shape	Type	Design List	Material	Design R...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	AL1A	AACS14...	Beam	AA Channel	3003-H14	Typical	11.8	44.7	401	1.19

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (/1...	Density[k/...	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A992	29000	11154	.3	.65	.49	50	1.1	65	1.1
2	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
3	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	.3	.65	.527	42	1.4	58	1.3
5	A500 Gr.B Rect	29000	11154	.3	.65	.527	46	1.4	58	1.3
6	A53 Gr.B	29000	11154	.3	.65	.49	35	1.6	60	1.2
7	A1085	29000	11154	.3	.65	.49	50	1.4	65	1.3

Cold Formed Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (/1E5 F)	Density[k/ft^3]	Yield[ksi]	Fu[ksi]
1	A570 Gr.33	29500	11346	.3	.65	.49	33	52
2	A607 C1 Gr.55	29500	11346	.3	.65	.49	55	70

Aluminum Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (...	Density[...	Table B.4	kt	Ftu[ksi]	Fty[ksi]	Fcy[ksi]	Fsu[ksi]	Ct
1	3003-H14	10100	3787.5	.33	1.3	.173	Table B....	1	19	16	13	12	141
2	6061-T6	10100	3787.5	.33	1.3	.173	Table B....	1	38	35	35	24	141
3	6063-T5	10100	3787.5	.33	1.3	.173	Table B....	1	22	16	16	13	141
4	6063-T6	10100	3787.5	.33	1.3	.173	Table B....	1	30	25	25	19	141
5	5052-H34	10200	3787.5	.33	1.3	.173	Table B....	1	34	26	24	20	141
6	6061-T6 W	10100	3787.5	.33	1.3	.173	Table B....	1	24	15	15	15	141

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotat...	Section/Shape	Type	Design List	Material	Design ...
1	M1	N4	N5			PIPE_2.5	Beam	Pipe	A53 Gr.B	DR1
2	M2	N6	N7			PIPE_2.5	Beam	Pipe	A53 Gr.B	DR1
3	M3	N8	N9			PIPE_2.5	Beam	Pipe	A53 Gr.B	DR1
4	M6	N3	N23			PIPE_4.0X	Beam	Pipe	A53 Gr.B	DR1
5	MP1A	N10	N11			PIPE_2.0	Beam	Pipe	A53 Gr.B	DR1
6	MP2A	N12	N13			PIPE_2.0	Beam	Pipe	A53 Gr.B	DR1
7	MP1B	N14	N15		300	PIPE_2.0	Beam	Pipe	A53 Gr.B	DR1
8	MP2B	N16	N17		300	PIPE_2.0	Beam	Pipe	A53 Gr.B	DR1
9	MP1C	N18	N19		60	PIPE_2.0	Beam	Pipe	A53 Gr.B	DR1
10	MP2C	N20	N21		60	PIPE_2.0	Beam	Pipe	A53 Gr.B	DR1
11	M14	N25	N24		90	C6X8.2	Beam	Channel	A36 Gr.36	Typical
12	M12	N1	N27			PIPE_4.0X	Beam	Pipe	A53 Gr.B	DR1
13	M13	N29	N28		90	C6X8.2	Beam	Channel	A36 Gr.36	Typical
14	M14A	N2	N30			PIPE_4.0X	Beam	Pipe	A53 Gr.B	DR1
15	M15	N32	N31		90	C6X8.2	Beam	Channel	A36 Gr.36	Typical
16	M16	N43	N36			RIGID	Beam	None	RIGID	DR1
17	M17	N40	N33			RIGID	Beam	None	RIGID	DR1
18	M18	N42	N35			RIGID	Beam	None	RIGID	DR1
19	M19	N41	N34			RIGID	Beam	None	RIGID	DR1
20	M20	N37	N39		180	L2x2x4	Beam	Single Angle	A36 Gr.36	Typical
21	M21	N44	N38		90	L2x2x4	Beam	Single Angle	A36 Gr.36	Typical
22	M22	N54	N48			RIGID	Beam	None	RIGID	DR1
23	M23	N51	N45			RIGID	Beam	None	RIGID	DR1
24	M24	N53	N47			RIGID	Beam	None	RIGID	DR1
25	M25	N52	N46			RIGID	Beam	None	RIGID	DR1
26	M26	N49	N50		180	L2x2x4	Beam	Single Angle	A36 Gr.36	Typical
27	M27	N55	N56		90	L2x2x4	Beam	Single Angle	A36 Gr.36	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotat...	Section/Shape	Type	Design List	Material	Design ...
28	M28	N66	N60			RIGID	Beam	None	RIGID	DR1
29	M29	N63	N57			RIGID	Beam	None	RIGID	DR1
30	M30	N65	N59			RIGID	Beam	None	RIGID	DR1
31	M31	N64	N58			RIGID	Beam	None	RIGID	DR1
32	M32	N61	N62		180	L2x2x4	Beam	Single Angle	A36 Gr.36	Typical
33	M33	N67	N68		90	L2x2x4	Beam	Single Angle	A36 Gr.36	Typical
34	MP3A	N77	N78			New Mount Pipes	Beam	Pipe	A53 Gr.B	Typical
35	MP3C	N79	N80			New Mount Pipes	Beam	Pipe	A53 Gr.B	Typical
36	MP3B	N81	N82			New Mount Pipes	Beam	Pipe	A53 Gr.B	Typical
37	M37	N86	N87			New Support Rail	Beam	Pipe	A53 Gr.B	Typical
38	M38	N88	N89			New Support Rail	Beam	Pipe	A53 Gr.B	Typical
39	M39	N90	N91			New Support Rail	Beam	Pipe	A53 Gr.B	Typical
40	M40	N92	N95			New SR End Connect...	Beam	Single Angle	A36 Gr.36	Typical
41	M41	N94	N97			New SR End Connect...	Beam	Single Angle	A36 Gr.36	Typical
42	M42	N96	N93			New SR End Connect...	Beam	Single Angle	A36 Gr.36	Typical
43	M43	N98	N99			New T-Arm	Beam	SquareTube	A500 Gr.B Rect	Typical
44	M44	N100	N101			New T-Arm	Beam	SquareTube	A500 Gr.B Rect	Typical
45	M45	N102	N103			New T-Arm	Beam	SquareTube	A500 Gr.B Rect	Typical

Member Advanced Data

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl Rat...	Analysis ...	Inactive	Seismic...
1	M1						Yes				None
2	M2						Yes				None
3	M3						Yes				None
4	M6						Yes				None
5	MP1A						Yes		-z		None
6	MP2A						Yes		-z		None
7	MP1B						Yes		+z		None
8	MP2B						Yes		+z		None
9	MP1C						Yes		+z		None
10	MP2C						Yes		+z		None
11	M14						Yes				None
12	M12						Yes				None
13	M13						Yes				None
14	M14A						Yes				None
15	M15						Yes				None
16	M16						Yes				None
17	M17						Yes				None
18	M18						Yes				None
19	M19						Yes				None
20	M20						Yes				None
21	M21						Yes				None
22	M22						Yes				None
23	M23						Yes				None
24	M24						Yes				None
25	M25						Yes				None
26	M26						Yes				None
27	M27						Yes				None
28	M28						Yes				None
29	M29						Yes				None
30	M30						Yes				None
31	M31						Yes				None
32	M32						Yes				None
33	M33						Yes				None
34	MP3A						Yes		-z		None

Member Advanced Data (Continued)

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl Rat...	Analysis ...	Inactive	Seismic...
35	MP3C						Yes		-z		None
36	MP3B						Yes		-z		None
37	M37						Yes				None
38	M38						Yes				None
39	M39						Yes				None
40	M40						Yes				None
41	M41						Yes				None
42	M42						Yes				None
43	M43						Yes				None
44	M44						Yes				None
45	M45						Yes				None

Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[..	Lcomp bot[..	L-torqu...	Kyy	Kzz	Cb	Functi...
1	M1	PIPE_2.5	13			Lbyy						Gravity
2	M2	PIPE_2.5	13			Lbyy						Gravity
3	M3	PIPE_2.5	13			Lbyy						Gravity
4	M6	PIPE_4.0X	6.5			Lbyy			2.1	2.1		Lateral
5	MP1A	PIPE_2.0	6			Lbyy			2.1	2.1		Gravity
6	MP2A	PIPE_2.0	6			Lbyy			2.1	2.1		Gravity
7	MP1B	PIPE_2.0	6			Lbyy			2.1	2.1		Gravity
8	MP2B	PIPE_2.0	6			Lbyy			2.1	2.1		Gravity
9	MP1C	PIPE_2.0	6			Lbyy			2.1	2.1		Gravity
10	MP2C	PIPE_2.0	6			Lbyy			2.1	2.1		Gravity
11	M14	C6X8.2	2.042			Lbyy						Lateral
12	M12	PIPE_4.0X	6.5			Lbyy			2.1	2.1		Lateral
13	M13	C6X8.2	2.042			Lbyy						Lateral
14	M14A	PIPE_4.0X	6.5			Lbyy			2.1	2.1		Lateral
15	M15	C6X8.2	2.042			Lbyy						Lateral
16	M20	L2x2x4	4			Lbyy						Lateral
17	M21	L2x2x4	4			Lbyy						Lateral
18	M26	L2x2x4	4			Lbyy						Lateral
19	M27	L2x2x4	4			Lbyy						Lateral
20	M32	L2x2x4	4			Lbyy						Lateral
21	M33	L2x2x4	4			Lbyy						Lateral
22	MP3A	New Mount Pipes	8			Lbyy			2.1	2.1		Lateral
23	MP3C	New Mount Pipes	8			Lbyy			2.1	2.1		Lateral
24	MP3B	New Mount Pipes	8			Lbyy			2.1	2.1		Lateral
25	M37	New Support Rail	14.5			Lbyy						Lateral
26	M38	New Support Rail	14.5			Lbyy						Lateral
27	M39	New Support Rail	14.5			Lbyy						Lateral
28	M40	New SR End Conne...	2.417			Lbyy						Lateral
29	M41	New SR End Conne...	2.417			Lbyy						Lateral
30	M42	New SR End Conne...	2.417			Lbyy						Lateral
31	M43	New T-Arm	2.676			Lbyy			2.1	2.1		Lateral
32	M44	New T-Arm	2.676			Lbyy			2.1	2.1		Lateral
33	M45	New T-Arm	2.676			Lbyy			2.1	2.1		Lateral

Cold Formed Steel Design Parameters

Label	Shape	Len...	Lbyy[ft]	Lbzz[ft]	Lcomp..	Lcomp..	L-torq...	Kyy	Kzz	Cm...	Cm...	Cb	R	a[ft]	y s...	z s...
No Data to Print ...																

Aluminum Design Parameters

Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[ft]	Lcomp bot[ft]	L-torq...	Kyy	Kzz	Cb	Function
No Data to Print ...											

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	-45.75	.25
2	MP1A	Y	-45.75	5
3	MP1B	Y	-45.75	.25
4	MP1B	Y	-45.75	5
5	MP1C	Y	-45.75	.25
6	MP1C	Y	-45.75	5
7	MP2A	Y	-66.1	.25
8	MP2A	Y	-66.1	5
9	MP2B	Y	-66.1	.25
10	MP2B	Y	-66.1	5
11	MP2C	Y	-66.1	.25
12	MP2C	Y	-66.1	5
13	MP3A	Y	-64	0
14	MP3A	Y	-64	6
15	MP3B	Y	-64	0
16	MP3B	Y	-64	6
17	MP3C	Y	-64	0
18	MP3C	Y	-64	6
19	MP2A	Y	-11	2.5
20	MP2B	Y	-11	2.5
21	MP2C	Y	-11	2.5
22	MP3A	Y	-70	2.5
23	MP3B	Y	-70	2.5
24	MP3C	Y	-70	2.5

Member Point Loads (BLC 2 : Antenna Di)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[ft,%]
1	MP1A	Y	-83.535	.25
2	MP1A	Y	-83.535	5
3	MP1B	Y	-83.535	.25
4	MP1B	Y	-83.535	5
5	MP1C	Y	-83.535	.25
6	MP1C	Y	-83.535	5
7	MP2A	Y	-91.204	.25
8	MP2A	Y	-91.204	5
9	MP2B	Y	-91.204	.25
10	MP2B	Y	-91.204	5
11	MP2C	Y	-91.204	.25
12	MP2C	Y	-91.204	5
13	MP3A	Y	-206.843	0
14	MP3A	Y	-206.843	6
15	MP3B	Y	-206.843	0
16	MP3B	Y	-206.843	6
17	MP3C	Y	-206.843	0

Member Point Loads (BLC 2 : Antenna Di) (Continued)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[ft,%]
18	MP3C	Y	-206.843	6
19	MP2A	Y	-16.081	2.5
20	MP2B	Y	-16.081	2.5
21	MP2C	Y	-16.081	2.5
22	MP3A	Y	-67.474	2.5
23	MP3B	Y	-67.474	2.5
24	MP3C	Y	-67.474	2.5

Member Point Loads (BLC 3 : Antenna W Front)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[ft,%]
1	MP1A	Z	-121.453	.25
2	MP1A	Z	-121.453	5
3	MP1B	Z	-94.832	.25
4	MP1B	Z	-94.832	5
5	MP1C	Z	-94.832	.25
6	MP1C	Z	-94.832	5
7	MP2A	Z	-129.829	.25
8	MP2A	Z	-129.829	5
9	MP2B	Z	-103.544	.25
10	MP2B	Z	-103.544	5
11	MP2C	Z	-103.544	.25
12	MP2C	Z	-103.544	5
13	MP3A	Z	-403.647	0
14	MP3A	Z	-403.647	6
15	MP3B	Z	-223.4	0
16	MP3B	Z	-223.4	6
17	MP3C	Z	-223.4	0
18	MP3C	Z	-223.4	6
19	MP2A	Z	-12.265	2.5
20	MP2B	Z	-6.557	2.5
21	MP2C	Z	-6.557	2.5
22	MP3A	Z	-49.359	2.5
23	MP3B	Z	-38.421	2.5
24	MP3C	Z	-38.421	2.5

Member Point Loads (BLC 4 : Antenna Wi Front)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[ft,%]
1	MP1A	Z	-32.455	.25
2	MP1A	Z	-32.455	5
3	MP1B	Z	-26.059	.25
4	MP1B	Z	-26.059	5
5	MP1C	Z	-26.059	.25
6	MP1C	Z	-26.059	5
7	MP2A	Z	-34.727	.25
8	MP2A	Z	-34.727	5
9	MP2B	Z	-28.235	.25
10	MP2B	Z	-28.235	5
11	MP2C	Z	-28.235	.25
12	MP2C	Z	-28.235	5
13	MP3A	Z	-100.042	0
14	MP3A	Z	-100.042	6
15	MP3B	Z	-58.086	0
16	MP3B	Z	-58.086	6
17	MP3C	Z	-58.086	0
18	MP3C	Z	-58.086	6
19	MP2A	Z	-4.257	2.5

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

	Member Label	Direction	Magnitude[lb,k-ft]	Location[ft,%]
20	MP2B	Z	-2.971	2.5
21	MP2C	Z	-2.971	2.5
22	MP3A	Z	-14.803	2.5
23	MP3B	Z	-11.99	2.5
24	MP3C	Z	-11.99	2.5

Member Point Loads (BLC 5 : Antenna W Side)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[ft,%]
1	MP1A	X	85.958	.25
2	MP1A	X	85.958	5
3	MP1B	X	112.579	.25
4	MP1B	X	112.579	5
5	MP1C	X	112.579	.25
6	MP1C	X	112.579	5
7	MP2A	X	94.782	.25
8	MP2A	X	94.782	5
9	MP2B	X	121.067	.25
10	MP2B	X	121.067	5
11	MP2C	X	121.067	.25
12	MP2C	X	121.067	5
13	MP3A	X	163.318	0
14	MP3A	X	163.318	6
15	MP3B	X	343.565	0
16	MP3B	X	343.565	6
17	MP3C	X	343.565	0
18	MP3C	X	343.565	6
19	MP2A	X	6.205	2.5
20	MP2B	X	13.816	2.5
21	MP2C	X	13.816	2.5
22	MP3A	X	46.368	2.5
23	MP3B	X	60.951	2.5
24	MP3C	X	60.951	2.5

Member Point Loads (BLC 6 : Antenna Wi Side)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[ft,%]
1	MP1A	X	23.927	.25
2	MP1A	X	23.927	5
3	MP1B	X	30.323	.25
4	MP1B	X	30.323	5
5	MP1C	X	30.323	.25
6	MP1C	X	30.323	5
7	MP2A	X	26.071	.25
8	MP2A	X	26.071	5
9	MP2B	X	32.563	.25
10	MP2B	X	32.563	5
11	MP2C	X	32.563	.25
12	MP2C	X	32.563	5
13	MP3A	X	44.101	0
14	MP3A	X	44.101	6
15	MP3B	X	86.057	0
16	MP3B	X	86.057	6
17	MP3C	X	86.057	0
18	MP3C	X	86.057	6
19	MP2A	X	3.39	2.5
20	MP2B	X	5.104	2.5
21	MP2C	X	5.104	2.5

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

	Member Label	Direction	Magnitude[lb,k-ft]	Location[ft,%]
22	MP3A	X	14.736	2.5
23	MP3B	X	18.487	2.5
24	MP3C	X	18.487	2.5

Member Point Loads (BLC 7 : Service Lm1)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[ft,%]
1	M1	Y	-500	0

Member Point Loads (BLC 8 : Service Lm2)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[ft,%]
1	M1	Y	-500	%50

Member Distributed Loads (BLC 10 : Structure Di)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,...	Start Location[ft,%]	End Location[ft,%]
1	M1	Y	-9.729	-9.729	0	%100
2	M2	Y	-9.729	-9.729	0	%100
3	M3	Y	-9.729	-9.729	0	%100
4	M6	Y	-13.162	-13.162	0	%100
5	MP1A	Y	-8.672	-8.672	0	%100
6	MP2A	Y	-8.672	-8.672	0	%100
7	MP1B	Y	-8.672	-8.672	0	%100
8	MP2B	Y	-8.672	-8.672	0	%100
9	MP1C	Y	-8.672	-8.672	0	%100
10	MP2C	Y	-8.672	-8.672	0	%100
11	M14	Y	-13.236	-13.236	0	%100
12	M12	Y	-13.162	-13.162	0	%100
13	M13	Y	-13.236	-13.236	0	%100
14	M14A	Y	-13.162	-13.162	0	%100
15	M15	Y	-13.236	-13.236	0	%100
16	M20	Y	-7.707	-7.707	0	%100
17	M21	Y	-7.707	-7.707	0	%100
18	M26	Y	-7.707	-7.707	0	%100
19	M27	Y	-7.707	-7.707	0	%100
20	M32	Y	-7.707	-7.707	0	%100
21	M33	Y	-7.707	-7.707	0	%100
22	MP3A	Y	-8.672	-8.672	0	%100
23	MP3C	Y	-8.672	-8.672	0	%100
24	MP3B	Y	-8.672	-8.672	0	%100
25	M37	Y	-11.05	-11.05	0	%100
26	M38	Y	-11.05	-11.05	0	%100
27	M39	Y	-11.05	-11.05	0	%100
28	M40	Y	-10.397	-10.397	0	%100
29	M41	Y	-10.397	-10.397	0	%100
30	M42	Y	-10.397	-10.397	0	%100
31	M43	Y	-12.724	-12.724	0	%100
32	M44	Y	-12.724	-12.724	0	%100
33	M45	Y	-12.724	-12.724	0	%100

Member Distributed Loads (BLC 11 : Structure W Front)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,...	Start Location[ft,%]	End Location[ft,%]
1	M1	PZ	-11.467	-11.467	0	%100
2	M2	PZ	-11.467	-11.467	0	%100
3	M3	PZ	-11.467	-11.467	0	%100
4	M6	PZ	-17.949	-17.949	0	%100

Member Distributed Loads (BLC 11 : Structure W Front) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,...	Start Location[ft,%]	End Location[ft,%]
5	MP1A	PZ	-9.473	-9.473	0	%100
6	MP2A	PZ	-9.473	-9.473	0	%100
7	MP1B	PZ	-9.473	-9.473	0	%100
8	MP2B	PZ	-9.473	-9.473	0	%100
9	MP1C	PZ	-9.473	-9.473	0	%100
10	MP2C	PZ	-9.473	-9.473	0	%100
11	M14	PZ	-39.886	-39.886	0	%100
12	M12	PZ	-17.949	-17.949	0	%100
13	M13	PZ	-39.886	-39.886	0	%100
14	M14A	PZ	-17.949	-17.949	0	%100
15	M15	PZ	-39.886	-39.886	0	%100
16	M20	PZ	-13.295	-13.295	0	%100
17	M21	PZ	-13.295	-13.295	0	%100
18	M26	PZ	-13.295	-13.295	0	%100
19	M27	PZ	-13.295	-13.295	0	%100
20	M32	PZ	-13.295	-13.295	0	%100
21	M33	PZ	-13.295	-13.295	0	%100
22	MP3A	PZ	-9.473	-9.473	0	%100
23	MP3C	PZ	-9.473	-9.473	0	%100
24	MP3B	PZ	-9.473	-9.473	0	%100
25	M37	PZ	-13.96	-13.96	0	%100
26	M38	PZ	-13.96	-13.96	0	%100
27	M39	PZ	-13.96	-13.96	0	%100
28	M40	PZ	-19.943	-19.943	0	%100
29	M41	PZ	-19.943	-19.943	0	%100
30	M42	PZ	-19.943	-19.943	0	%100
31	M43	PZ	-19.943	-19.943	0	%100
32	M44	PZ	-19.943	-19.943	0	%100
33	M45	PZ	-19.943	-19.943	0	%100

Member Distributed Loads (BLC 12 : Structure Wi Front)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,...	Start Location[ft,%]	End Location[ft,%]
1	M1	PZ	-5.729	-5.729	0	%100
2	M2	PZ	-5.729	-5.729	0	%100
3	M3	PZ	-5.729	-5.729	0	%100
4	M6	PZ	-7.198	-7.198	0	%100
5	MP1A	PZ	-5.276	-5.276	0	%100
6	MP2A	PZ	-5.276	-5.276	0	%100
7	MP1B	PZ	-5.276	-5.276	0	%100
8	MP2B	PZ	-5.276	-5.276	0	%100
9	MP1C	PZ	-5.276	-5.276	0	%100
10	MP2C	PZ	-5.276	-5.276	0	%100
11	M14	PZ	-12.173	-12.173	0	%100
12	M12	PZ	-7.198	-7.198	0	%100
13	M13	PZ	-12.173	-12.173	0	%100
14	M14A	PZ	-7.198	-7.198	0	%100
15	M15	PZ	-12.173	-12.173	0	%100
16	M20	PZ	-6.143	-6.143	0	%100
17	M21	PZ	-6.143	-6.143	0	%100
18	M26	PZ	-6.143	-6.143	0	%100
19	M27	PZ	-6.143	-6.143	0	%100
20	M32	PZ	-6.143	-6.143	0	%100
21	M33	PZ	-6.143	-6.143	0	%100
22	MP3A	PZ	-5.276	-5.276	0	%100
23	MP3C	PZ	-5.276	-5.276	0	%100
24	MP3B	PZ	-5.276	-5.276	0	%100

Member Distributed Loads (BLC 12 : Structure Wi Front) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,...	Start Location[ft,%]	End Location[ft,%]
25	M37	PZ	-6.294	-6.294	0	%100
26	M38	PZ	-6.294	-6.294	0	%100
27	M39	PZ	-6.294	-6.294	0	%100
28	M40	PZ	-7.651	-7.651	0	%100
29	M41	PZ	-7.651	-7.651	0	%100
30	M42	PZ	-7.651	-7.651	0	%100
31	M43	PZ	-7.651	-7.651	0	%100
32	M44	PZ	-7.651	-7.651	0	%100
33	M45	PZ	-7.651	-7.651	0	%100

Member Distributed Loads (BLC 13 : Structure W Side)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,...	Start Location[ft,%]	End Location[ft,%]
1	M1	PX	11.467	11.467	0	%100
2	M2	PX	11.467	11.467	0	%100
3	M3	PX	11.467	11.467	0	%100
4	M6	PX	17.949	17.949	0	%100
5	MP1A	PX	9.473	9.473	0	%100
6	MP2A	PX	9.473	9.473	0	%100
7	MP1B	PX	9.473	9.473	0	%100
8	MP2B	PX	9.473	9.473	0	%100
9	MP1C	PX	9.473	9.473	0	%100
10	MP2C	PX	9.473	9.473	0	%100
11	M14	PX	39.886	39.886	0	%100
12	M12	PX	17.949	17.949	0	%100
13	M13	PX	39.886	39.886	0	%100
14	M14A	PX	17.949	17.949	0	%100
15	M15	PX	39.886	39.886	0	%100
16	M20	PX	13.295	13.295	0	%100
17	M21	PX	13.295	13.295	0	%100
18	M26	PX	13.295	13.295	0	%100
19	M27	PX	13.295	13.295	0	%100
20	M32	PX	13.295	13.295	0	%100
21	M33	PX	13.295	13.295	0	%100
22	MP3A	PX	9.473	9.473	0	%100
23	MP3C	PX	9.473	9.473	0	%100
24	MP3B	PX	9.473	9.473	0	%100
25	M37	PX	13.96	13.96	0	%100
26	M38	PX	13.96	13.96	0	%100
27	M39	PX	13.96	13.96	0	%100
28	M40	PX	19.943	19.943	0	%100
29	M41	PX	19.943	19.943	0	%100
30	M42	PX	19.943	19.943	0	%100
31	M43	PX	19.943	19.943	0	%100
32	M44	PX	19.943	19.943	0	%100
33	M45	PX	19.943	19.943	0	%100

Member Distributed Loads (BLC 14 : Structure Wi Side)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,...	Start Location[ft,%]	End Location[ft,%]
1	M1	PX	5.729	5.729	0	%100
2	M2	PX	5.729	5.729	0	%100
3	M3	PX	5.729	5.729	0	%100
4	M6	PX	7.198	7.198	0	%100
5	MP1A	PX	5.276	5.276	0	%100
6	MP2A	PX	5.276	5.276	0	%100
7	MP1B	PX	5.276	5.276	0	%100
8	MP2B	PX	5.276	5.276	0	%100

Member Distributed Loads (BLC 14 : Structure Wi Side) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,...	Start Location[ft,%]	End Location[ft,%]
9	MP1C	PX	5.276	5.276	0	%100
10	MP2C	PX	5.276	5.276	0	%100
11	M14	PX	12.173	12.173	0	%100
12	M12	PX	7.198	7.198	0	%100
13	M13	PX	12.173	12.173	0	%100
14	M14A	PX	7.198	7.198	0	%100
15	M15	PX	12.173	12.173	0	%100
16	M20	PX	6.143	6.143	0	%100
17	M21	PX	6.143	6.143	0	%100
18	M26	PX	6.143	6.143	0	%100
19	M27	PX	6.143	6.143	0	%100
20	M32	PX	6.143	6.143	0	%100
21	M33	PX	6.143	6.143	0	%100
22	MP3A	PX	5.276	5.276	0	%100
23	MP3C	PX	5.276	5.276	0	%100
24	MP3B	PX	5.276	5.276	0	%100
25	M37	PX	6.294	6.294	0	%100
26	M38	PX	6.294	6.294	0	%100
27	M39	PX	6.294	6.294	0	%100
28	M40	PX	7.651	7.651	0	%100
29	M41	PX	7.651	7.651	0	%100
30	M42	PX	7.651	7.651	0	%100
31	M43	PX	7.651	7.651	0	%100
32	M44	PX	7.651	7.651	0	%100
33	M45	PX	7.651	7.651	0	%100

Member Distributed Loads (BLC 15 : BLC 9 Transient Area Loads)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,...	Start Location[ft,%]	End Location[ft,%]
1	M12	Y	-14.889	-8.695	1.3	3.25
2	M12	Y	-8.695	-2.501	3.25	5.2
3	M21	Y	-8.084	-4.711	.4	2.2
4	M21	Y	-4.711	-1.338	2.2	4
5	M32	Y	-8.084	-4.711	.4	2.2
6	M32	Y	-4.711	-1.338	2.2	4
7	M6	Y	-14.889	-8.695	1.3	3.25
8	M6	Y	-8.695	-2.501	3.25	5.2
9	M26	Y	-8.084	-4.711	.4	2.2
10	M26	Y	-4.711	-1.338	2.2	4
11	M33	Y	-8.084	-4.711	.4	2.2
12	M33	Y	-4.711	-1.338	2.2	4
13	M14A	Y	-14.889	-8.695	1.3	3.25
14	M14A	Y	-8.695	-2.501	3.25	5.2
15	M20	Y	-8.084	-4.711	.4	2.2
16	M20	Y	-4.711	-1.338	2.2	4
17	M27	Y	-8.084	-4.711	.4	2.2
18	M27	Y	-4.711	-1.338	2.2	4

Member Distributed Loads (BLC 16 : BLC 10 Transient Area Loads)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,...	Start Location[ft,%]	End Location[ft,%]
1	M12	Y	-36.473	-21.299	1.3	3.25
2	M12	Y	-21.299	-6.126	3.25	5.2
3	M21	Y	-19.802	-11.54	.4	2.2
4	M21	Y	-11.54	-3.279	2.2	4
5	M32	Y	-19.802	-11.54	.4	2.2
6	M32	Y	-11.54	-3.279	2.2	4
7	M6	Y	-36.473	-21.299	1.3	3.25

Member Distributed Loads (BLC 16 : BLC 10 Transient Area Loads) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,...	Start Location[ft,%]	End Location[ft,%]
8	M6	Y	-21.299	-6.126	3.25	5.2
9	M26	Y	-19.802	-11.54	.4	2.2
10	M26	Y	-11.54	-3.279	2.2	4
11	M33	Y	-19.802	-11.54	.4	2.2
12	M33	Y	-11.54	-3.279	2.2	4
13	M14A	Y	-36.473	-21.299	1.3	3.25
14	M14A	Y	-21.299	-6.126	3.25	5.2
15	M20	Y	-19.802	-11.54	.4	2.2
16	M20	Y	-11.54	-3.279	2.2	4
17	M27	Y	-19.802	-11.54	.4	2.2
18	M27	Y	-11.54	-3.279	2.2	4

Member Area Loads (BLC 9 : Structure D)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[ksf]
1	N43	N64	N65	N40	Y	Two Way	-.005
2	N66	N52	N53	N63	Y	Two Way	-.005
3	N41	N54	N51	N42	Y	Two Way	-.005

Member Area Loads (BLC 10 : Structure Di)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[ksf]
1	N43	N64	N65	N40	Y	Two Way	-.013
2	N66	N52	N53	N63	Y	Two Way	-.013
3	N54	N41	N42	N51	Y	Two Way	-.013

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	N1	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	N2	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
3	N3	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
4	CENTER						
5	N23						
6	N27						
7	N30						
8	N98	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
9	N100	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
10	N102	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	N1	max	1551.785	4	1065.506	8	952.842	1	-.605	1	1.244	1	-.905	3
2		min	-1519.878	3	282.606	3	-968.67	2	-2.386	6	-1.233	2	-4.061	8
3	N2	max	1527.562	4	1065.461	7	942.216	1	-.571	1	1.233	2	4.089	7
4		min	-1554.983	3	283.166	4	-965.834	2	-2.336	6	-1.214	1	.926	4
5	N3	max	800.601	4	1049.811	5	2082.675	1	4.631	5	1.974	3	.085	3
6		min	-805.138	3	260.47	2	-2037.334	2	.975	2	-1.959	4	-.123	4
7	N98	max	1151.782	4	1753.564	6	1540.716	1	-.886	1	1.847	4	.194	3
8		min	-1157.105	3	661.188	1	-1595.064	2	-3.619	6	-1.86	3	-.197	4
9	N100	max	1563.467	4	1784.788	7	1385.715	1	1.776	5	2.055	2	3.118	7
10		min	-1612.231	3	644.242	9	-1356.892	2	.393	2	-2.056	1	.77	4
11	N102	max	1604.899	4	1784.936	8	1394.105	1	1.779	5	2.062	1	-.768	3
12		min	-1550.758	3	657.126	2	-1374.471	2	.397	2	-2.086	2	-3.116	8
13	Totals:	max	8200.096	4	8405.779	7	8298.267	1						

Envelope Joint Reactions (Continued)

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
14		min	-8200.092	3	3286.478	4	-8298.266	2						

Envelope Member Section Forces

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-...	LC	y-y Mome...	LC	z-z Mom...	LC
1	M1	1	max	0	11	0	11	0	11	0	11	0	11	0	11
2			min	0	1	-750	9	0	1	0	1	0	1	0	1
3		2	max	670.092	4	1	10	272.41	1	.175	2	.039	4	.083	9
4			min	-571.137	3	-88.317	7	-241.06	2	-.095	1	-.047	3	-.01	3
5		3	max	783.507	2	218.065	8	228.729	1	.177	2	.883	1	.571	7
6			min	-571.604	1	-218.775	7	-182.212	2	-.043	3	-.77	2	.091	10
7		4	max	678.273	3	87.246	8	240.987	2	.1	1	.039	3	.05	9
8			min	-576.196	4	-1.592	10	-272.366	1	-.166	2	-.047	4	-.011	4
9		5	max	0	11	0	11	0	11	0	11	0	11	0	11
10			min	0	1	0	1	0	1	0	1	0	1	0	1
11	M2	1	max	0	11	.002	2	.002	4	0	11	0	11	0	11
12			min	0	1	0	8	0	2	0	1	0	1	0	1
13		2	max	630.946	3	-4.94	2	200.448	4	.151	3	.014	2	.042	6
14			min	-526.776	4	-102.8	5	-167.988	3	-.086	4	-.021	1	.001	1
15		3	max	904.039	3	224.502	6	170.932	4	.152	3	.692	4	.635	5
16			min	-685.62	4	-234.156	5	-101.252	2	-.101	4	-.57	3	.247	9
17		4	max	837.434	1	94.648	7	179.516	3	.072	4	.025	1	.039	1
18			min	-734.152	2	1.937	4	-211.464	4	-.123	3	-.033	2	-.012	2
19		5	max	0	11	0	7	0	4	0	11	0	11	0	11
20			min	0	1	-.002	1	0	2	0	1	0	1	0	1
21	M3	1	max	0	11	.002	1	0	2	0	11	0	11	0	11
22			min	0	1	0	8	0	3	0	1	0	1	0	1
23		2	max	827.325	1	-2.043	3	211.401	3	.131	4	.025	1	.054	9
24			min	-726.796	2	-95.626	8	-179.417	4	-.067	3	-.033	2	-.012	2
25		3	max	908.007	4	233.558	5	100.679	2	.106	3	.692	3	.631	5
26			min	-687.288	3	-225.193	6	-171.272	3	-.143	4	-.569	4	.291	4
27		4	max	637.417	4	101.821	5	168.29	4	.091	3	.014	2	.04	6
28			min	-530.545	3	4.77	2	-200.73	3	-.142	4	-.021	1	0	1
29		5	max	0	11	0	7	0	2	0	11	0	11	0	11
30			min	0	1	-.002	2	-.002	3	0	1	0	1	0	1
31	M6	1	max	2037.334	2	1047.01	5	800.573	4	.123	4	1.974	3	4.631	5
32			min	-2082.675	1	262.555	2	-805.117	3	-.085	3	-1.959	4	.975	2
33		2	max	2037.334	2	981.105	5	753.906	4	.123	4	.703	3	2.972	5
34			min	-2082.675	1	229.48	2	-758.45	3	-.085	3	-.696	4	.571	2
35		3	max	2037.334	2	865.374	5	707.239	4	.123	4	.491	4	1.476	5
36			min	-2082.675	1	180.022	2	-711.783	3	-.085	3	-.491	3	.24	2
37		4	max	2037.334	2	780.253	5	660.573	4	.123	4	1.602	4	.143	5
38			min	-2082.675	1	140.629	2	-665.116	3	-.085	3	-1.61	3	-.019	2
39		5	max	0	11	0	11	0	11	0	11	0	11	0	11
40			min	0	1	0	1	0	1	0	1	0	1	0	1
41	MP1A	1	max	0	4	.017	4	.067	1	0	7	0	11	0	11
42			min	0	7	-.174	7	-.189	6	0	4	0	5	0	1
43		2	max	126.887	6	141.452	6	94.624	6	.069	2	-.038	1	.254	8
44			min	-12.557	1	29.67	10	13.134	1	-.064	1	-.19	7	.047	10
45		3	max	146.144	6	146.666	8	92.369	5	.069	2	-.001	1	.043	4
46			min	-6.31	1	29.67	10	27.357	4	-.064	1	-.053	7	-.017	3
47		4	max	165.4	6	154.58	8	100.284	5	.069	2	.092	5	-.042	10
48			min	-.062	1	8.659	3	9.823	2	-.064	1	-.007	2	-.186	8
49		5	max	0	4	.008	7	.003	6	0	4	0	11	0	11
50			min	0	7	0	4	-.001	1	0	7	0	1	0	1
51	MP2A	1	max	0	3	.216	8	.093	1	0	3	0	11	0	11

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-...	LC	y-y Mome...	LC	z-z Mom...	LC
52			min	0	8	-.024	3	-.243	6	0	8	0	5	0	1
53		2	max	126.667	6	-34.411	10	114.456	9	.065	1	-.042	1	-.054	10
54			min	-196.238	9	-221.515	9	4.236	1	-.071	2	-.204	8	-.35	9
55		3	max	175.205	6	-34.411	10	118.692	9	.065	1	-.009	1	.02	4
56			min	-176.79	9	-221.515	9	33.489	3	-.071	2	-.054	5	-.047	3
57		4	max	194.461	6	-12.13	4	120.966	9	.065	1	.152	9	.315	9
58			min	-170.543	9	-221.515	9	11.4	2	-.071	2	.004	2	.049	10
59		5	max	0	3	0	3	.004	6	0	8	0	11	0	11
60			min	0	8	-.008	8	-.001	1	0	3	0	1	0	1
61	MP1B	1	max	0	8	.171	6	.178	8	0	6	0	3	0	11
62			min	0	3	-.01	1	-.058	3	0	1	0	5	0	1
63		2	max	112.996	8	-48.892	3	-14.003	3	.075	4	.186	6	-.054	2
64			min	-24.932	3	-154.207	9	-93.268	8	-.07	3	.042	3	-.265	9
65		3	max	132.252	8	-36	2	-23.415	1	.075	4	.051	6	.014	2
66			min	-18.684	3	-156.176	9	-91.627	6	-.07	3	.006	3	-.037	1
67		4	max	151.509	8	-16.311	2	-12.048	1	.075	4	-.005	4	.204	9
68			min	-12.437	3	-160.246	5	-97.659	7	-.07	3	-.091	7	.054	2
69		5	max	0	3	0	1	.001	3	0	1	0	11	0	11
70			min	0	8	-.008	6	-.003	8	0	6	0	1	0	1
71	MP2B	1	max	0	5	.013	2	.219	8	0	2	0	11	0	11
72			min	0	2	-.216	5	-.059	3	0	5	0	5	0	1
73		2	max	109.477	5	155.968	5	-12.334	3	.043	2	.197	5	.266	6
74			min	-.046	2	53.752	2	-104.928	8	-.048	1	.058	3	.077	1
75		3	max	158.015	5	155.622	6	-29.004	4	.043	2	.052	7	.047	2
76			min	19.402	2	48.826	1	-101.518	7	-.048	1	.015	3	-.02	1
77		4	max	177.271	5	162.477	6	-9.315	4	.043	2	-.007	4	-.071	3
78			min	25.649	2	29.136	1	-108.372	7	-.048	1	-.106	7	-.199	8
79		5	max	0	2	.008	5	0	2	0	5	0	11	0	11
80			min	0	5	0	2	-.004	5	0	2	0	1	0	1
81	MP1C	1	max	0	2	.174	5	.17	7	0	5	0	11	0	11
82			min	0	5	-.009	2	-.044	4	0	2	0	1	0	1
83		2	max	109.875	5	-54.642	9	-20.943	4	.048	1	.183	5	-.066	1
84			min	-6.409	2	-146.879	5	-92.361	7	-.043	2	.053	4	-.255	6
85		3	max	129.131	5	-45.641	1	-27.253	3	.048	1	.05	6	.017	1
86			min	-.161	2	-147.89	6	-91.138	8	-.043	2	.007	4	-.043	2
87		4	max	148.387	5	-25.952	1	-7.564	3	.048	1	.004	3	.189	7
88			min	6.086	2	-154.745	6	-97.992	8	-.043	2	-.092	8	.064	4
89		5	max	0	2	0	2	.001	2	0	2	0	11	0	11
90			min	0	5	-.008	5	-.003	5	0	5	0	1	0	1
91	MP2C	1	max	0	4	.014	1	.23	7	0	1	0	11	0	11
92			min	0	7	-.212	6	-.079	4	0	6	0	1	0	1
93		2	max	112.2	7	160.558	7	-5.473	4	.071	4	.199	6	.27	5
94			min	-16.158	4	45.49	4	-105.837	7	-.076	3	.046	4	.066	2
95		3	max	160.737	7	161.027	5	-29.075	1	.071	4	.052	8	.041	1
96			min	3.289	4	39.739	2	-101.218	8	-.076	3	.014	4	-.017	2
97		4	max	179.993	7	167.882	5	-16.42	3	.071	4	-.016	3	-.062	2
98			min	9.537	4	20.05	2	-108.072	8	-.076	3	-.105	8	-.211	5
99		5	max	0	4	.009	6	.001	4	0	6	0	11	0	11
100			min	0	7	0	1	-.004	7	0	1	0	1	0	1
101	M14	1	max	394.104	3	963.526	2	372.298	5	.116	6	-.047	4	.389	4
102			min	-238.81	4	-978.28	1	66.351	2	.042	9	-.22	7	-.499	3
103		2	max	394.104	3	996.1	2	384.035	5	.116	6	.035	4	.667	1
104			min	-238.81	4	-1010.854	1	71.332	2	.042	9	-.06	3	-.776	2
105		3	max	394.104	3	1028.673	2	395.773	5	.045	4	.181	5	1.191	1
106			min	-216.75	2	-1043.428	1	-128.286	3	-.12	6	-.02	2	-1.293	2
107		4	max	375.125	4	1006.892	1	-28.654	2	-.045	4	.031	3	.668	1
108			min	-224.367	3	-975.951	2	-323.227	5	-.12	6	-.053	4	-.776	2

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-...	LC	y-y Mome...	LC	z-z Mom...	LC
109		5	max	375.125	4	974.318	1	-23.673	2	-.045	4	-.03	3	.398	3
110			min	-224.367	3	-943.377	2	-311.49	5	-.12	6	-.185	8	-.515	4
111	M12	1	max	1637.083	3	1063.248	8	589.373	2	.227	9	1.244	1	4.709	8
112			min	-1671.939	4	284.487	3	-591.719	1	-.08	1	-1.233	2	1.096	3
113		2	max	1616.876	3	997.343	8	554.373	2	.227	9	.31	1	3.024	8
114			min	-1651.732	4	251.412	3	-556.719	1	-.08	1	-.304	2	.657	3
115		3	max	1596.669	3	881.612	8	519.373	2	.227	9	.568	2	1.501	8
116			min	-1631.525	4	201.954	3	-521.719	1	-.08	1	-.566	1	.29	3
117		4	max	1576.462	3	796.491	8	484.373	2	.227	9	1.384	2	.179	9
118			min	-1611.318	4	162.561	3	-486.719	1	-.08	1	-1.385	1	-.005	3
119		5	max	0	11	.015	1	.006	2	0	11	0	11	0	11
120			min	0	1	-.031	4	-.01	3	0	1	0	1	0	1
121	M13	1	max	320.774	1	912.349	1	619.351	9	.122	6	-.058	3	.543	2
122			min	-167.019	2	-918.601	2	88.254	1	.039	1	-.395	9	-.648	1
123		2	max	334.879	1	920.493	1	624.332	9	.122	6	.042	2	1.014	2
124			min	-181.124	2	-926.744	2	93.236	1	.039	1	-.078	9	-1.115	1
125		3	max	348.984	1	1171.215	4	629.313	9	.122	6	.242	9	1.489	2
126			min	-123.239	3	-1148.032	3	-325.657	8	-.102	9	.047	3	-1.587	1
127		4	max	240.437	2	1146.784	4	-19.161	3	-.044	3	.029	4	.893	4
128			min	-88.239	1	-1123.602	3	-313.92	8	-.12	7	-.052	3	-.999	3
129		5	max	234.938	6	1122.354	4	-14.179	3	-.044	3	-.018	1	.314	4
130			min	-74.134	1	-1099.172	3	-302.183	8	-.12	7	-.186	6	-.432	3
131	M14A	1	max	1640.846	4	1063.199	7	582.465	1	.119	1	1.233	2	4.709	7
132			min	-1675.721	3	285.055	4	-589.145	2	-.092	2	-1.214	1	1.098	4
133		2	max	1620.639	4	997.294	7	547.465	1	.119	1	.304	2	3.024	7
134			min	-1655.514	3	251.98	4	-554.145	2	-.092	2	-.296	1	.658	4
135		3	max	1600.432	4	881.563	7	512.465	1	.119	1	.565	1	1.501	7
136			min	-1635.306	3	202.522	4	-519.145	2	-.092	2	-.568	2	.29	4
137		4	max	1580.225	4	796.442	7	477.465	1	.119	1	1.37	1	.142	7
138			min	-1615.099	3	163.128	4	-484.145	2	-.092	2	-1.383	2	-.006	4
139		5	max	0	11	.015	1	.01	3	0	11	0	11	0	11
140			min	0	1	-.031	3	-.006	1	0	1	0	1	0	1
141	M15	1	max	240.341	6	1121.239	4	362.625	7	.116	8	-.039	1	.306	3
142			min	-82.538	1	-1128.22	3	59.088	4	.041	1	-.221	6	-.417	4
143		2	max	253.394	2	1145.669	4	374.362	7	.116	8	.031	3	.888	3
144			min	-96.643	1	-1152.65	3	64.07	4	.041	1	-.058	4	-.996	4
145		3	max	331.349	1	1170.099	4	386.099	7	-.042	1	.178	7	1.496	2
146			min	-119.434	4	-1177.08	3	-353.569	6	-.127	6	.025	4	-1.587	4
147		4	max	317.244	1	925.407	2	-49.366	1	-.042	1	.039	2	1.022	2
148			min	-167.937	2	-902.929	1	-348.523	7	-.127	6	-.063	1	-1.122	1
149		5	max	303.14	1	917.263	2	-44.385	1	-.042	1	-.035	4	.551	2
150			min	-153.832	2	-894.786	1	-336.786	7	-.127	6	-.2	7	-.663	1
151	M16	1	max	86.857	2	22.904	1	502.161	3	.059	1	.128	1	.001	2
152			min	-99.998	1	-41.546	2	-384.932	4	-.063	2	-.11	2	0	1
153		2	max	86.857	2	22.904	1	502.161	3	.059	1	.122	1	.004	2
154			min	-99.998	1	-41.546	2	-384.932	4	-.063	2	-.098	2	-.002	1
155		3	max	86.857	2	22.904	1	502.161	3	.059	1	.116	1	.006	2
156			min	-99.998	1	-41.546	2	-384.932	4	-.063	2	-.085	2	-.004	1
157		4	max	86.857	2	22.904	1	502.161	3	.059	1	.132	3	.009	2
158			min	-99.998	1	-41.546	2	-384.932	4	-.063	2	-.091	4	-.005	1
159		5	max	86.857	2	22.904	1	502.161	3	.059	1	.163	3	.012	2
160			min	-99.998	1	-41.546	2	-384.932	4	-.063	2	-.115	4	-.006	1
161	M17	1	max	17.603	7	5.868	2	384.935	4	.086	1	.082	1	0	1
162			min	-3.29	4	-81.674	5	-502.154	3	-.028	2	-.055	2	-.001	2
163		2	max	17.603	7	5.868	2	384.935	4	.086	1	.087	1	.005	5
164			min	-3.29	4	-81.674	5	-502.154	3	-.028	2	-.068	2	-.002	2
165		3	max	17.603	7	5.868	2	384.935	4	.086	1	.093	1	.01	5

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-...	LC	y-y Mome...	LC	z-z Mom...	LC
166			min	-3.29	4	-81.674	5	-502.154	3	-.028	2	-.08	2	-.002	2
167		4	max	17.603	7	5.868	2	384.935	4	.086	1	.099	1	.015	5
168			min	-3.29	4	-81.674	5	-502.154	3	-.028	2	-.093	2	-.002	2
169		5	max	17.603	7	5.868	2	384.935	4	.086	1	.104	1	.02	5
170			min	-3.29	4	-81.674	5	-502.154	3	-.028	2	-.106	2	-.003	2
171	M18	1	max	17.824	8	5.453	2	504.92	4	.028	2	.055	2	0	1
172			min	-3.086	3	-82.045	5	-388.455	3	-.086	5	-.082	1	-.001	2
173		2	max	17.824	8	5.453	2	504.92	4	.028	2	.068	2	.005	5
174			min	-3.086	3	-82.045	5	-388.455	3	-.086	5	-.087	1	-.002	2
175		3	max	17.824	8	5.453	2	504.92	4	.028	2	.08	2	.01	5
176			min	-3.086	3	-82.045	5	-388.455	3	-.086	5	-.093	1	-.002	2
177		4	max	17.824	8	5.453	2	504.92	4	.028	2	.093	2	.015	5
178			min	-3.086	3	-82.045	5	-388.455	3	-.086	5	-.099	1	-.002	2
179		5	max	17.824	8	5.453	2	504.92	4	.028	2	.106	2	.02	5
180			min	-3.086	3	-82.045	5	-388.455	3	-.086	5	-.105	1	-.003	2
181	M19	1	max	86.603	2	23.033	1	388.453	3	.062	2	.11	2	.001	2
182			min	-100.075	1	-41.144	2	-504.928	4	-.059	1	-.128	1	0	1
183		2	max	86.603	2	23.033	1	388.453	3	.062	2	.097	2	.004	2
184			min	-100.075	1	-41.144	2	-504.928	4	-.059	1	-.122	1	-.002	1
185		3	max	86.603	2	23.033	1	388.453	3	.062	2	.084	2	.006	2
186			min	-100.075	1	-41.144	2	-504.928	4	-.059	1	-.116	1	-.004	1
187		4	max	86.603	2	23.033	1	388.453	3	.062	2	.091	3	.009	2
188			min	-100.075	1	-41.144	2	-504.928	4	-.059	1	-.132	4	-.005	1
189		5	max	86.603	2	23.033	1	388.453	3	.062	2	.115	3	.011	2
190			min	-100.075	1	-41.144	2	-504.928	4	-.059	1	-.164	4	-.006	1
191	M20	1	max	0	11	0	11	0	11	0	11	0	11	0	11
192			min	0	1	0	1	0	1	0	1	0	1	0	1
193		2	max	504.922	4	14.534	2	35.864	1	0	1	.016	2	.044	2
194			min	-388.456	3	-54.225	5	-23.557	2	-.001	2	-.013	1	-.07	1
195		3	max	504.922	4	25.616	2	57.136	1	0	1	.006	2	.013	4
196			min	-388.456	3	-38.313	1	-44.83	2	-.001	2	-.012	5	-.013	3
197		4	max	504.922	4	34.449	2	78.409	1	0	1	.013	1	.065	1
198			min	-388.456	3	-29.479	1	-66.102	2	-.001	2	-.012	2	-.055	2
199		5	max	0	11	0	11	0	11	0	11	0	11	0	11
200			min	0	1	0	1	0	1	0	1	0	1	0	1
201	M21	1	max	0	11	0	11	0	11	0	11	0	11	0	11
202			min	0	1	0	1	0	1	0	1	0	1	0	1
203		2	max	502.155	3	35.801	1	14.945	2	.001	2	.016	2	.07	1
204			min	-384.935	4	-23.808	2	-53.857	5	0	1	-.013	1	-.044	2
205		3	max	502.155	3	57.073	1	26.028	2	.001	2	.006	2	.017	9
206			min	-384.935	4	-45.08	2	-38.196	1	0	1	-.012	5	-.012	3
207		4	max	502.155	3	78.346	1	34.861	2	.001	2	.013	1	.056	2
208			min	-384.935	4	-66.353	2	-29.363	1	0	1	-.012	2	-.065	1
209		5	max	0	11	0	11	0	11	0	11	0	11	0	11
210			min	0	1	0	1	0	1	0	1	0	1	0	1
211	M22	1	max	62.654	3	18.857	4	402.787	1	.052	4	.101	4	.001	3
212			min	-78.308	4	-35.159	7	-288.291	2	-.052	3	-.081	3	0	4
213		2	max	62.654	3	18.857	4	402.787	1	.052	4	.087	4	.003	3
214			min	-78.308	4	-35.159	7	-288.291	2	-.052	3	-.06	3	-.002	4
215		3	max	62.654	3	18.857	4	402.787	1	.052	4	.073	4	.005	3
216			min	-78.308	4	-35.159	7	-288.291	2	-.052	3	-.039	3	-.003	4
217		4	max	62.654	3	18.857	4	402.787	1	.052	4	.072	1	.008	3
218			min	-78.308	4	-35.159	7	-288.291	2	-.052	3	-.03	2	-.004	4
219		5	max	62.654	3	18.857	4	402.787	1	.052	4	.097	1	.01	3
220			min	-78.308	4	-35.159	7	-288.291	2	-.052	3	-.048	2	-.005	4
221	M23	1	max	19.087	5	-.797	3	325.112	2	.092	8	.067	4	0	4
222			min	1.155	3	-84.235	8	-439.65	1	-.013	3	-.036	3	-.001	3

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-...	LC	y-y Mome...	LC	z-z Mom...	LC
223		2	max	19.087	5	-.797	3	325.112	2	.092	8	.078	4	.005	8
224			min	1.155	3	-84.235	8	-439.65	1	-.013	3	-.055	3	-.001	3
225		3	max	19.087	5	-.797	3	325.112	2	.092	8	.09	4	.01	8
226			min	1.155	3	-84.235	8	-439.65	1	-.013	3	-.073	3	0	3
227		4	max	19.087	5	-.797	3	325.112	2	.092	8	.101	4	.015	8
228			min	1.155	3	-84.235	8	-439.65	1	-.013	3	-.092	3	0	3
229		5	max	19.087	5	-.797	3	325.112	2	.092	8	.113	4	.021	8
230			min	1.155	3	-84.235	8	-439.65	1	-.013	3	-.111	3	0	3
231	M24	1	max	18.388	7	-7.116	3	197.952	7	.006	3	.034	3	0	4
232			min	-2.519	1	-81.754	8	-47.681	4	-.086	8	-.063	4	0	3
233		2	max	18.388	7	-7.116	3	197.952	7	.006	3	.044	3	.005	8
234			min	-2.519	1	-81.754	8	-47.681	4	-.086	8	-.066	4	0	3
235		3	max	18.388	7	-7.116	3	197.952	7	.006	3	.055	3	.01	8
236			min	-2.519	1	-81.754	8	-47.681	4	-.086	8	-.069	4	0	3
237		4	max	18.388	7	-7.116	3	197.952	7	.006	3	.065	3	.015	8
238			min	-2.519	1	-81.754	8	-47.681	4	-.086	8	-.072	4	0	3
239		5	max	18.388	7	-7.116	3	197.952	7	.006	3	.075	3	.02	8
240			min	-2.519	1	-81.754	8	-47.681	4	-.086	8	-.075	4	0	3
241	M25	1	max	61.361	3	12.142	4	10.953	4	.037	3	.075	3	0	3
242			min	-75.141	4	-34.878	7	-187.315	7	-.038	4	-.095	4	0	4
243		2	max	61.361	3	12.142	4	10.953	4	.037	3	.067	3	.003	7
244			min	-75.141	4	-34.878	7	-187.315	7	-.038	4	-.095	4	-.001	4
245		3	max	61.361	3	12.142	4	10.953	4	.037	3	.059	3	.005	7
246			min	-75.141	4	-34.878	7	-187.315	7	-.038	4	-.094	4	-.002	4
247		4	max	61.361	3	12.142	4	10.953	4	.037	3	.051	3	.007	7
248			min	-75.141	4	-34.878	7	-187.315	7	-.038	4	-.093	4	-.003	4
249		5	max	61.361	3	12.142	4	10.953	4	.037	3	.043	3	.009	7
250			min	-75.141	4	-34.878	7	-187.315	7	-.038	4	-.093	4	-.004	4
251	M26	1	max	0	11	0	7	.002	4	0	11	0	11	0	11
252			min	0	1	-.001	1	-.001	2	0	1	0	1	0	1
253		2	max	195.296	7	2.046	3	27.203	4	0	4	.013	3	.026	3
254			min	-38.444	4	-54.034	8	-13.83	3	0	3	-.01	4	-.054	4
255		3	max	192.636	7	13.128	3	43.157	4	0	4	.003	3	.007	2
256			min	-29.233	4	-27.517	4	-29.785	3	0	3	-.011	8	-.008	1
257		4	max	189.975	7	21.961	3	59.112	4	0	4	.011	4	.047	4
258			min	-20.021	4	-18.684	4	-45.739	3	0	3	-.011	3	-.034	3
259		5	max	0	11	.002	1	0	2	0	11	0	11	0	11
260			min	0	1	0	3	-.001	4	0	1	0	1	0	1
261	M27	1	max	0	11	0	2	0	8	0	11	0	11	0	11
262			min	0	1	-.002	4	-.001	2	0	1	0	1	0	1
263		2	max	430.429	1	29.667	4	7.98	3	.001	3	.012	3	.059	4
264			min	-315.896	2	-15.855	3	-56.4	8	0	4	-.008	4	-.027	3
265		3	max	421.218	1	45.622	4	19.062	3	.001	3	.005	3	.011	2
266			min	-306.685	2	-31.81	3	-34.089	4	0	4	-.011	8	-.008	1
267		4	max	412.007	1	61.576	4	27.895	3	.001	3	.008	4	.044	3
268			min	-297.474	2	-47.764	3	-25.256	4	0	4	-.006	3	-.055	4
269		5	max	0	11	.002	4	.002	2	0	11	0	11	0	11
270			min	0	1	0	2	0	8	0	1	0	1	0	1
271	M28	1	max	61.497	4	11.874	3	187.509	8	.037	2	.095	3	0	4
272			min	-74.981	3	-35.281	8	-10.11	3	-.038	4	-.076	4	0	3
273		2	max	61.497	4	11.874	3	187.509	8	.037	2	.094	3	.003	8
274			min	-74.981	3	-35.281	8	-10.11	3	-.038	4	-.068	4	-.001	3
275		3	max	61.497	4	11.874	3	187.509	8	.037	2	.094	3	.005	8
276			min	-74.981	3	-35.281	8	-10.11	3	-.038	4	-.06	4	-.002	3
277		4	max	61.497	4	11.874	3	187.509	8	.037	2	.093	3	.007	8
278			min	-74.981	3	-35.281	8	-10.11	3	-.038	4	-.052	4	-.003	3
279		5	max	61.497	4	11.874	3	187.509	8	.037	2	.092	3	.01	8

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-...	LC	y-y Mome...	LC	z-z Mom...	LC
280			min	-74.981	3	-35.281	8	-10.11	3	-.038	4	-.044	4	-.003	3
281	M29	1	max	18.166	8	-6.845	4	46.829	3	.085	7	.063	3	0	3
282			min	-2.687	1	-81.357	7	-198.146	8	-.007	4	-.034	4	0	4
283		2	max	18.166	8	-6.845	4	46.829	3	.085	7	.066	3	.005	7
284			min	-2.687	1	-81.357	7	-198.146	8	-.007	4	-.044	4	0	4
285		3	max	18.166	8	-6.845	4	46.829	3	.085	7	.068	3	.01	7
286			min	-2.687	1	-81.357	7	-198.146	8	-.007	4	-.055	4	0	4
287		4	max	18.166	8	-6.845	4	46.829	3	.085	7	.071	3	.015	7
288			min	-2.687	1	-81.357	7	-198.146	8	-.007	4	-.065	4	0	4
289		5	max	18.166	8	-6.845	4	46.829	3	.085	7	.074	3	.02	7
290			min	-2.687	1	-81.357	7	-198.146	8	-.007	4	-.075	4	0	4
291	M30	1	max	19.296	5	-1.323	4	439.078	1	.013	4	.036	4	0	3
292			min	1.408	4	-84.582	7	-324.942	2	-.092	7	-.067	3	-.001	4
293		2	max	19.296	5	-1.323	4	439.078	1	.013	4	.054	4	.005	7
294			min	1.408	4	-84.582	7	-324.942	2	-.092	7	-.078	3	0	4
295		3	max	19.296	5	-1.323	4	439.078	1	.013	4	.073	4	.01	7
296			min	1.408	4	-84.582	7	-324.942	2	-.092	7	-.09	3	0	4
297		4	max	19.296	5	-1.323	4	439.078	1	.013	4	.091	4	.016	7
298			min	1.408	4	-84.582	7	-324.942	2	-.092	7	-.101	3	0	4
299		5	max	19.296	5	-1.323	4	439.078	1	.013	4	.11	4	.021	7
300			min	1.408	4	-84.582	7	-324.942	2	-.092	7	-.112	3	0	4
301	M31	1	max	62.405	4	18.869	3	288.122	2	.051	4	.08	4	.001	4
302			min	-78.345	3	-34.697	8	-402.217	1	-.052	3	-.101	3	0	3
303		2	max	62.405	4	18.869	3	288.122	2	.051	4	.059	4	.003	4
304			min	-78.345	3	-34.697	8	-402.217	1	-.052	3	-.087	3	-.002	3
305		3	max	62.405	4	18.869	3	288.122	2	.051	4	.038	4	.005	4
306			min	-78.345	3	-34.697	8	-402.217	1	-.052	3	-.073	3	-.003	3
307		4	max	62.405	4	18.869	3	288.122	2	.051	4	.03	2	.007	4
308			min	-78.345	3	-34.697	8	-402.217	1	-.052	3	-.072	1	-.004	3
309		5	max	62.405	4	18.869	3	288.122	2	.051	4	.048	2	.01	4
310			min	-78.345	3	-34.697	8	-402.217	1	-.052	3	-.098	1	-.005	3
311	M32	1	max	0	11	0	7	0	2	0	11	0	11	0	11
312			min	0	1	-.001	2	-.002	3	0	1	0	1	0	1
313		2	max	429.859	1	7.466	4	29.71	3	0	3	.012	4	.027	4
314			min	-315.729	2	-56.743	7	-15.592	4	-.001	4	-.008	3	-.059	3
315		3	max	420.648	1	18.548	4	45.664	3	0	3	.005	4	.008	1
316			min	-306.517	2	-34.1	3	-31.546	4	-.001	4	-.011	7	-.011	2
317		4	max	411.437	1	27.381	4	61.619	3	0	3	.008	3	.055	3
318			min	-297.306	2	-25.267	3	-47.501	4	-.001	4	-.007	4	-.043	4
319		5	max	0	11	.002	2	.002	3	0	11	0	11	0	11
320			min	0	1	0	7	0	2	0	1	0	1	0	1
321	M33	1	max	0	11	.002	3	0	8	0	11	0	11	0	11
322			min	0	1	-.001	2	-.001	1	0	1	0	1	0	1
323		2	max	195.489	8	27.043	3	2.312	4	0	4	.013	4	.054	3
324			min	-37.599	3	-13.974	4	-53.638	7	0	3	-.01	3	-.026	4
325		3	max	192.829	8	42.997	3	13.394	4	0	4	.003	4	.01	9
326			min	-28.388	3	-29.928	4	-27.259	3	0	3	-.011	7	-.007	2
327		4	max	190.169	8	58.952	3	22.227	4	0	4	.011	3	.035	4
328			min	-19.177	3	-45.883	4	-18.426	3	0	3	-.011	4	-.046	3
329		5	max	0	11	0	2	.002	1	0	11	0	11	0	11
330			min	0	1	-.001	3	0	4	0	1	0	1	0	1
331	MP3A	1	max	283.642	5	261.688	4	646.482	1	0	3	0	1	0	11
332			min	76.8	10	-261.686	3	-646.895	2	0	4	0	2	0	1
333		2	max	-331.708	2	68.14	3	452.994	2	.036	4	.616	1	.021	4
334			min	-1022.727	10	-70.498	4	-354.862	1	-.037	3	-.962	2	-.119	9
335		3	max	-239.378	2	34.003	4	343.706	2	.036	4	.055	1	.02	4
336			min	-930.397	10	-54.356	9	-245.574	1	-.037	3	-.222	6	-.021	3

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-...	LC	y-y Mome...	LC	z-z Mom...	LC
337		4	max	-222.516	2	93.349	4	241.638	2	.036	4	.449	2	.098	9
338			min	-913.534	10	-95.708	3	-143.506	1	-.037	3	-.403	1	-.079	4
339		5	max	0	1	.003	3	.007	1	0	9	0	11	0	11
340			min	0	6	-.004	9	-.017	6	0	3	0	1	0	1
341	MP3C	1	max	283.642	8	550.261	4	358.028	1	0	7	0	1	0	11
342			min	76.8	3	-550.605	3	-357.843	2	0	4	0	2	0	1
343		2	max	-354.18	3	373.145	3	105.609	2	.041	2	.337	3	.713	3
344			min	-954.827	8	-284.161	4	-151.422	1	-.042	1	-.183	4	-.416	4
345		3	max	-261.85	3	245.31	3	81.799	4	.041	2	.094	7	.172	7
346			min	-777.678	8	-156.326	4	-127.654	3	-.042	1	-.019	4	-.024	4
347		4	max	-244.987	3	153.922	3	81.799	4	.041	2	.145	4	.256	4
348			min	-720.49	8	-64.938	4	-127.654	3	-.042	1	-.173	3	-.314	3
349		5	max	0	4	.004	4	.006	7	0	7	0	11	0	11
350			min	0	7	-.009	7	-.004	4	0	4	0	1	0	1
351	MP3B	1	max	283.642	7	550.604	4	358.029	1	0	3	0	1	0	11
352			min	76.8	4	-550.261	3	-357.842	2	0	8	0	2	0	1
353		2	max	-355.813	4	285.454	3	103.34	2	.042	1	.341	4	.418	3
354			min	-954.48	7	-372.164	4	-153.175	1	-.042	2	-.177	3	-.711	4
355		3	max	-263.483	4	157.62	3	79.274	3	.042	1	.094	8	.024	3
356			min	-777.331	7	-244.33	4	-129.151	4	-.042	2	-.018	3	-.172	8
357		4	max	-246.621	4	66.232	3	79.274	3	.042	1	.14	3	.313	4
358			min	-720.143	7	-152.942	4	-129.151	4	-.042	2	-.176	4	-.258	3
359		5	max	0	3	.01	8	.006	8	0	3	0	11	0	11
360			min	0	8	-.004	3	-.004	3	0	8	0	1	0	1
361	M37	1	max	0	11	0	11	0	11	0	11	0	11	0	11
362			min	0	1	0	1	0	1	0	1	0	1	0	1
363		2	max	266.309	3	-13.518	4	152.227	2	-.081	9	.208	4	.053	8
364			min	-441.009	4	-187.589	9	-171.741	1	-.356	5	-.172	3	.001	3
365		3	max	171.404	2	232.708	8	254.27	1	.371	5	.687	2	.768	7
366			min	-446.135	3	-234.299	7	-114.082	3	-.163	3	-.721	1	.162	10
367		4	max	263.745	4	162.013	8	173.301	1	.371	5	.222	3	.081	9
368			min	-446.135	3	13.099	3	-151.329	2	.103	3	-.176	4	.002	4
369		5	max	0	11	0	11	0	11	0	11	0	11	0	11
370			min	0	1	0	1	0	1	0	1	0	1	0	1
371	M38	1	max	0	11	.009	2	0	1	0	11	0	11	0	11
372			min	0	1	-.003	8	-.01	3	0	1	0	1	0	1
373		2	max	413.441	1	-1.81	2	203.206	3	-.078	3	.227	2	.047	4
374			min	-593.726	2	-161.761	5	-223.776	4	-.334	8	-.191	1	-.016	3
375		3	max	448.501	1	240.054	7	263.933	3	.35	6	.957	3	.806	7
376			min	-628.786	2	-232.456	5	-284.502	4	-.155	4	-.996	4	.296	9
377		4	max	380.196	3	169.359	7	207.811	2	.35	6	.187	1	.064	7
378			min	-565.949	4	17.953	4	-185.654	1	.071	1	-.144	2	.009	4
379		5	max	0	11	.003	7	.01	1	0	11	0	11	0	11
380			min	0	1	-.009	1	-.008	3	0	1	0	1	0	1
381	M39	1	max	0	11	.009	1	.008	4	0	11	0	11	0	11
382			min	0	1	-.003	8	-.01	1	0	1	0	1	0	1
383		2	max	382.303	4	-19.3	3	191.085	1	-.059	1	.181	1	.072	9
384			min	-560.373	3	-170.911	8	-210.818	2	-.335	6	-.147	2	.009	3
385		3	max	448.05	1	230.848	5	283.082	3	.349	7	.946	4	.812	8
386			min	-635.998	2	-241.606	8	-260.121	4	-.176	2	-.985	3	.364	10
387		4	max	412.99	1	177.582	9	222.356	3	.349	7	.243	2	.046	3
388			min	-600.938	2	1.088	2	-199.395	4	.091	4	-.198	1	-.016	4
389		5	max	0	11	.003	7	.01	4	0	11	0	11	0	11
390			min	0	1	-.009	2	0	5	0	1	0	1	0	1
391	M40	1	max	-34.525	4	91.239	2	305.625	2	0	2	.379	1	.328	1
392			min	-148.252	7	-50.074	1	-315.686	1	-.001	1	-.433	2	-.231	2
393		2	max	-42.873	4	87.686	2	310.444	2	0	2	.221	1	.214	1

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-...	LC	y-y Mome...	LC	z-z Mom...	LC
394			min	-146.251	7	-53.627	1	-320.506	1	-.001	1	-.263	2	-.138	2
395		3	max	-37.432	1	84.134	2	315.264	2	0	2	.104	4	.178	4
396			min	-146.241	6	-57.179	1	-325.326	1	-.001	1	-.138	3	-.119	3
397		4	max	-29.084	1	80.581	2	320.084	2	0	2	.199	4	.235	4
398			min	-148.242	6	-60.732	1	-330.145	1	-.001	1	-.227	3	-.189	3
399		5	max	-20.736	1	77.029	2	324.903	2	0	2	.286	4	.287	4
400			min	-150.244	6	-64.284	1	-334.965	1	-.001	1	-.311	3	-.252	3
401	M41	1	max	6.52	1	97.722	3	376.032	3	.001	3	.37	4	.292	4
402			min	-152.561	6	-63.634	4	-385.911	4	-.001	4	-.416	3	-.209	3
403		2	max	6.52	1	94.17	3	376.032	3	.001	3	.177	4	.214	2
404			min	-152.561	6	-67.187	4	-385.911	4	-.001	4	-.214	3	-.147	1
405		3	max	6.52	1	90.617	3	376.032	3	.001	3	.121	2	.215	2
406			min	-152.561	6	-70.739	4	-385.911	4	-.001	4	-.152	1	-.162	1
407		4	max	6.52	1	87.065	3	376.032	3	.001	3	.184	3	.209	2
408			min	-152.561	6	-74.292	4	-385.911	4	-.001	4	-.213	4	-.167	1
409		5	max	6.52	1	83.512	3	376.032	3	.001	3	.381	3	.278	3
410			min	-152.561	6	-77.844	4	-385.911	4	-.001	4	-.41	4	-.246	4
411	M42	1	max	5.663	1	138.255	9	337.105	1	0	1	.265	3	.287	3
412			min	-155.285	6	-53.704	2	-346.775	2	-.001	2	-.307	4	-.202	4
413		2	max	-2.685	1	134.703	9	332.285	1	0	1	.187	3	.233	3
414			min	-153.283	6	-57.256	2	-341.955	2	-.001	2	-.224	4	-.162	4
415		3	max	-11.033	1	131.15	9	327.465	1	0	1	.102	3	.173	3
416			min	-151.282	6	-60.809	2	-337.136	2	-.001	2	-.136	4	-.114	4
417		4	max	-19.38	1	127.598	9	322.646	1	0	1	.231	1	.216	1
418			min	-149.28	6	-64.361	2	-332.316	2	-.001	2	-.266	2	-.165	2
419		5	max	-27.728	1	124.045	9	317.826	1	0	1	.397	1	.323	1
420			min	-147.279	6	-67.914	2	-327.497	2	-.001	2	-.435	2	-.278	2
421	M43	1	max	1540.716	1	1751.374	6	1157.054	3	.194	3	1.847	4	3.619	6
422			min	-1595.064	2	660.489	2	-1151.702	4	-.197	4	-1.86	3	.886	1
423		2	max	1540.716	1	1735.691	6	1135.704	3	.194	3	1.083	4	2.452	6
424			min	-1595.064	2	653.319	2	-1130.353	4	-.197	4	-1.093	3	.445	1
425		3	max	1540.716	1	1720.008	6	1114.355	3	.194	3	.334	4	1.296	6
426			min	-1595.064	2	646.15	2	-1109.003	4	-.197	4	-.34	3	.009	1
427		4	max	1540.716	1	1704.325	6	1093.005	3	.194	3	.399	3	.484	2
428			min	-1595.064	2	638.98	2	-1087.653	4	-.197	4	-.401	4	-.422	1
429		5	max	1540.716	1	1688.642	6	1071.655	3	.194	3	1.123	3	.059	2
430			min	-1595.064	2	631.81	2	-1066.303	4	-.197	4	-1.122	4	-1.109	5
431	M44	1	max	1258.208	4	1782.981	7	1237.606	1	.19	1	2.055	2	3.568	7
432			min	-1314.53	3	644.14	9	-1239.976	2	-.213	2	-2.056	1	.969	4
433		2	max	1248.963	4	1767.298	7	1221.594	1	.19	1	1.23	2	2.381	7
434			min	-1305.285	3	636.971	9	-1223.963	2	-.213	2	-1.234	1	.53	4
435		3	max	1239.718	4	1751.615	7	1205.581	1	.19	1	.417	2	1.204	7
436			min	-1296.04	3	629.801	9	-1207.951	2	-.213	2	-.422	1	.095	4
437		4	max	1230.473	4	1735.932	7	1189.569	1	.19	1	.379	1	.328	3
438			min	-1286.796	3	622.631	9	-1191.938	2	-.213	2	-.386	2	-.334	4
439		5	max	1221.229	4	1720.249	7	1173.557	1	.19	1	1.17	1	-.114	3
440			min	-1277.551	3	615.461	9	-1175.926	2	-.213	2	-1.178	2	-1.207	8
441	M45	1	max	1251.964	3	1783.135	8	1254.875	2	.211	2	2.062	1	3.569	8
442			min	-1308.331	4	658.043	2	-1241.768	1	-.194	1	-2.086	2	.967	3
443		2	max	1242.719	3	1767.452	8	1238.863	2	.211	2	1.236	1	2.381	8
444			min	-1299.086	4	650.874	2	-1225.756	1	-.194	1	-1.252	2	.529	3
445		3	max	1233.474	3	1751.769	8	1222.85	2	.211	2	.422	1	1.203	8
446			min	-1289.841	4	643.704	2	-1209.743	1	-.194	1	-.429	2	.095	3
447		4	max	1224.23	3	1736.086	8	1206.838	2	.211	2	.384	2	.327	4
448			min	-1280.596	4	636.534	2	-1193.731	1	-.194	1	-.382	1	-.333	3
449		5	max	1214.985	3	1720.403	8	1190.826	2	.211	2	1.186	2	-.116	4
450			min	-1271.352	4	629.365	2	-1177.719	1	-.194	1	-1.176	1	-1.206	7

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

	Member	Shape	Code Ch...	Loc[ft]	LC	Shear Ch..	Loc[ft]	Dir	LC	phi*Pnc ..	phi*Pnt ..	phi*Mn y-y [...	phi*Mn z-z ...	Cb	Eqn
1	MP3A	PIPE_2.0	.683	1.917	1	.070	1.917		2	3485.189	32130	1.872	1.872	1.544	H1-1b
2	MP3B	PIPE_2.0	.614	1.917	4	.079	1.917		4	3485.189	32130	1.872	1.872	2.132	H1-1b
3	MP3C	PIPE_2.0	.613	1.917	3	.080	1.917		4	3485.189	32130	1.872	1.872	2.127	H1-1b
4	M44	HSS3X3...	.466	0	5	.076	0	y	6	78890.5..	101016	8.556	8.556	2.143	H1-1b
5	M45	HSS3X3...	.464	0	5	.076	0	z	2	78890.5..	101016	8.556	8.556	2.143	H1-1b
6	M43	HSS3X3...	.462	0	7	.071	0	y	8	78890.5..	101016	8.556	8.556	2.092	H1-1b
7	M42	L3X3X4	.333	2.417	2	.029	0	z	2	40994.2..	46656	1.688	3.756	2.173	H2-1
8	M12	PIPE_4.0X	.326	0	8	.039	0		9	69916.7..	130410	14.516	14.516	2.158	H1-1b
9	M14A	PIPE_4.0X	.326	0	7	.029	0		7	69916.7..	130410	14.516	14.516	2.158	H1-1b
10	M6	PIPE_4.0X	.321	0	5	.033	0		4	69916.7..	130410	14.516	14.516	2.158	H1-1b
11	M40	L3X3X4	.320	0	2	.028	2.417	z	1	40994.2..	46656	1.688	3.756	2.166	H2-1
12	M13	C6X8.2	.312	0	5	.150	1.021	z	6	69374.5	77436	2.108	13.932	1.277	H1-1b
13	M41	L3X3X4	.310	2.417	4	.032	.151	z	4	40994.2..	46656	1.688	3.756	2.258	H2-1
14	MP2A	PIPE_2.0	.308	5.375	9	.070	5.375		1	6195.892	32130	1.872	1.872	1.905	H1-1b
15	M15	C6X8.2	.302	2.042	5	.153	1.021	z	8	69374.5	77436	2.108	13.932	1.268	H1-1b
16	M14	C6X8.2	.295	0	7	.146	1.021	z	7	69374.5	77436	2.108	13.932	1.351	H1-1b
17	M1	PIPE_2.5	.261	6.5	1	.134	.813		9	13460.4..	50715	3.596	3.596	1.851	H1-1b
18	MP2C	PIPE_2.0	.245	5.375	8	.074	5.375		4	6195.892	32130	1.872	1.872	1.821	H1-1b
19	MP2B	PIPE_2.0	.243	5.375	6	.056	5.375		2	6195.892	32130	1.872	1.872	1.804	H1-1b
20	MP1B	PIPE_2.0	.228	.938	5	.071	5.375		3	6195.892	32130	1.872	1.872	1.832	H1-1b
21	MP1C	PIPE_2.0	.226	.938	7	.054	5.375		2	6195.892	32130	1.872	1.872	1.812	H1-1b
22	MP1A	PIPE_2.0	.226	.938	6	.067	5.375		1	6195.892	32130	1.872	1.872	1.831	H1-1b
23	M2	PIPE_2.5	.217	6.5	4	.083	.812		8	13460.4..	50715	3.596	3.596	1.867	H1-1b
24	M3	PIPE_2.5	.217	6.5	3	.084	.812		7	13460.4..	50715	3.596	3.596	1.862	H1-1b
25	M38	PIPE_3.0	.200	7.25	3	.081	7.25		6	21266.02	65205	5.749	5.749	1.836	H1-1b
26	M39	PIPE_3.0	.199	7.25	4	.080	7.25		7	21266.02	65205	5.749	5.749	1.837	H1-1b
27	M20	L2x2x4	.152	3.792	1	.016	3.792	z	2	13608.0..	30585.6	.691	1.577	2.136	H2-1
28	M21	L2x2x4	.152	3.792	1	.016	3.792	y	2	13608.0..	30585.6	.691	1.577	2.132	H2-1
29	M37	PIPE_3.0	.139	7.25	7	.085	7.25		5	21266.02	65205	5.749	5.749	1.815	H1-1b
30	M32	L2x2x4	.122	3.792	3	.013	3.792	z	4	13608.0..	30585.6	.691	1.577	2.126	H2-1
31	M27	L2x2x4	.122	3.792	4	.013	3.792	y	3	13608.0..	30585.6	.691	1.577	2.123	H2-1
32	M26	L2x2x4	.115	3.792	4	.011	3.792	z	3	13608.0..	30585.6	.691	1.577	2.075	H2-1
33	M33	L2x2x4	.115	3.792	3	.012	3.792	y	4	13608.0..	30585.6	.691	1.577	2.066	H2-1

Envelope AISI S100-10: LRFD Cold Formed Steel Code Checks

Member	Shape	Code Check	Loc[ft]	LC	Shear C...	Loc[ft]	Dir	LC	phi*Pn...	phi*Tn...	phi*Mn..	phi*Mn...	Cb	Cmyy	Cmzz	Eqn
No Data to Print ...																

Envelope AA ADM1-10: ASD - Building Aluminum Code Checks

Member	Shape	Code C...	Loc[ft]	LC	Shear ...	Loc[ft]	Dir	LC	Pnc/O...	Pnt/Om...	Mny/O...	Mnz/O...	Vny/O...	Vnz/O...	Cb	Eqn
No Data to Print ...																

EXHIBIT 9

MODIFICATION AND DESIGN DRAWINGS FOR EXISTING ANTENNA MOUNTS EXISTING MONOPOLE TOWER

PROPOSED CARRIER: T-MOBILE

TOWER OWNER: SBA / TOWER OWNER SITE #: CT13075-A

CARRIER SITE #/NAME: CT11311G / CT311/OPTA PAWS PLACE

COORDINATES (LATITUDE: 41.399972°, LONGITUDE: -72.079222°)

PLEASE NOTE THIS SET OF DRAWINGS ARE FOR INSTALLATION AND ASSEMBLY ONLY. FABRICATION DETAIL DRAWINGS ARE NOT PROVIDED AND MUST BE COMPLETED BY THE STEEL FABRICATOR SELECTED. TES CAN PROVIDE THE FABRICATION DETAIL DRAWINGS FOR AN ADDITIONAL FEE.

SHEET	SHEET TITLE	REV
T-1	TITLE SHEET	0
BOM	BILL OF MATERIALS	0
GN-1	GENERAL NOTES	0
A-1	ANTENNA MOUNT MODIFICATION DETAILS	0
A-2	ANTENNA MOUNT PHOTOS	0
D-1	STANDARD DETAILS	0
MS-H1436	METROSITE HEAVY COLLAR MOUNT PLATE ASSEMBLY	
MPHW-1	METROSITE HEAVY COLLAR MOUNT PLATE WELDMENT DETAIL	
MS-P-TARM_6	METROSITE SUPPORT RAIL KIT	
TAW-6	TAW-6 WELDMENT	

NOTE:

1. THE MODIFICATION DRAWINGS ARE BASED ON THE **TES** PROJECT NO. **77624**, DATED **06/20/2019**.

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IRVING, TX 75038
PH: (972) 483-0607

SBA
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BOCA RATON, FL 33487
(800)-487-SITE

TES JOB NO:
81110

CUSTOMER SITE NO:
CT13075-A-SBA

CUSTOMER SITE NAME:
NEW LONDON
1294 PLEASANT VALLEY ROAD NORTH
GROTON, CT 06340

STATE OF CONNECTICUT
HANMING YOU
28931
LICENSED PROFESSIONAL ENGINEER
2/16/19

DRAWN BY: SP | CHECKED BY: KN/HMA

REV.	DESCRIPTION	BY	DATE
0	FIRST ISSUE	SP	07/16/19

SHEET TITLE:
TITLE SHEET

SHEET NUMBER: T-1
REV #: 0

BILL OF MATERIALS

QUANTITY COUNTED	QUANTITY PROVIDED	PART NUMBER	DESCRIPTIONS	SHEET LIST	PIECE WEIGHT (LBS)	WEIGHT (LB)	NOTES
			MATERIAL & HARDWARE				
1	1	MS-H1436	METROSITE HEAVY COLLAR MOUNT ASSEMBLY	A-1, MS-H1436	138.0	138.0	Galvanized
			FOLLOWING ITEMS ARE "CUSTOM" PARTS				
1	1	MS-P-TARM_6	METROSITE SUPPORT RAIL KIT	A-1, MS-P-TARM_6	711.00	711.0	GALVANIZED
3	3	PST2375-8	2" PST (2.375" O.D. X 0.154" THICKNESS) X 8'-0" A53 GR-B 35KSI	A-1	30.10	90.3	GALVANIZED
			ALL METROSITE PARTS ARE AVAILABLE FROM METROSITE, LLC. **180 IND PARK BLVD COMMERCE, GA 30529** **OFFICE: (706) 335-7045** **FAX: (706) 335-7056**				
			NOTE: ALL MATERIALS, WHICH WEREN'T LISTED IN THIS SHEET, ARE ASSUMED TO BE PROVIDED BY THE CONTRACTOR.				
				TOTAL WEIGHT (LBS) =		**939.3**	

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TES JOB NO:
81110

CUSTOMER SITE NO:
CT13075-A-SBA
CUSTOMER SITE NAME:
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1294 PLEASANT VALLEY ROAD NORTH
GROTON, CT 06340

DRAWN BY: SP | CHECKED BY: KN/HMA

REV.	DESCRIPTION	BY	DATE
0	FIRST ISSUE	SP	07/16/19

SHEET TITLE:
BILL OF MATERIALS

SHEET NUMBER: BOM
REV #: 0

GENERAL NOTES

1. ALL WORK SHALL COMPLY WITH THE ANSI/TIA-222-G, ANSI/ASSP A10.48, AND ANY OTHER GOVERNING BUILDING CODES AND OSHA SAFETY REGULATIONS.
2. ALL WORK INDICATED ON THE DRAWINGS SHALL BE PERFORMED BY QUALIFIED CONTRACTORS EXPERIENCED IN TELECOMMUNICATIONS TOWER, POLE AND FOUNDATION CONSTRUCTION.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN AND FABRICATION OF ALL MISCELLANEOUS PARTS (SUCH AS SHIMS), TEMPORARY SUPPORTS, AND GUYINGS, ETC., PER ANSI/ASSP A10.48, TO COMPLETE THE ASSEMBLY AS SHOWN IN THE DRAWINGS.
4. CONTRACTOR SHALL PROCEED WITH THE INSTALLATION WORK CAREFULLY SO THE WORK WILL NOT DAMAGE ANY EXISTING CABLE, EQUIPMENT OR THE STRUCTURE.
5. THE USE OF GAS TORCH OR WELDER, ARE NOT ALLOWED ON ANY TOWER STRUCTURE WITHOUT THE CONSENT OF THE TOWER OWNER.
6. GENERALLY THE CONTRACTOR IS RESPONSIBLE TO CONDUCT AN ONSITE VISIT SURVEY OF THE JOB SITE AFTER AWARD, AND REPORT ANY ISSUES WITH THE SITE TO **TES** BEFORE PROCEEDING CONSTRUCTION.
7. IT IS THE RESPONSIBILITY OF THE GC TO VERIFY THAT THERE IS NO INTERFERENCES (WITH SAFETY CLIMB BRACKETS, TRANSMISSION LINES, ETC.) PRIOR TO MOBILIZATION AND INSTALLATION OF THESE MODIFICATIONS.
8. PLEASE NOTIFY TES IMMEDIATELY IF ANY INSTALLATION ISSUES OCCUR RELATED TO THIS DRAWING @ 972-483-0607 OR EMAIL-TESCONSTRUCTION@TESTOWER.US

FABRICATION

1. ALL STEEL SHALL MEET OR EXCEED THE MINIMUM STRENGTH AS SPECIFIED IN THE DRAWINGS. IF YIELD STRENGTH WAS NOT NOTED IN THE DRAWINGS, CONTRACTORS SHALL CONTACT TES FOR DIRECTION.
2. ALL FIELD CUT EDGES SHALL BE GROUND SMOOTH. ALL FIELD CUT AND DRILLED SURFACES SHALL BE REPAIRED WITH A MINIMUM OF TWO COATS OF ZRC GALVILITE COLD GALVANIZING COMPOUND PER ASTM A780 AND MANUFACTURER'S RECOMMENDATIONS.

WELDING

1. ALL WELDING SHALL BE PERFORMED BY AWS CERTIFIED WELDERS AND IN ACCORDANCE WITH THE LATEST EDITION OF THE AWS WELDING CODE D1.1. ALL ELECTRODES TO BE LOW HYDROGEN, MATCHING FILLER METAL, PER AWS D1.1, UNO. (E70XX UNLESS NOTED OTHERWISE).
2. PRIOR TO FIELD WELDING GALVANIZED MATERIAL, CONTRACTOR SHALL GRIND OFF GALVANIZING APPROX. 0.5" BEYOND THE PROPOSED FIELD WELD SURFACES.
3. ALL WELDS SHALL BE INSPECTED VISUALLY. A MINIMUM OF 25% OF WELDS SHALL BE INSPECTED WITH DYE PENETRANT OR MAGNETIC PARTICLE TO MEET THE ACCEPTANCE CRITERIA OF AWS D1.1. 100% OF WELDS SHALL BE INSPECTED IF DEFECTS ARE FOUND.
4. WELD INSPECTIONS SHALL BE PERFORMED BY AN AWS CERTIFIED WELD INSPECTOR.
5. AFTER INSPECTION, ALL FIELD WELDED SURFACES SHALL BE REPAIRED WITH A MINIMUM OF TWO COATS OF ZRC GALVILITE COLD GALVANIZING COMPOUND PER ASTM A780 AND MANUFACTURER'S RECOMMENDATIONS.

BOLTED ASSEMBLIES AND TIGHTENING OF CONNECTIONS

1. ALL HIGH STRENGTH BOLTS SHALL CONFORM TO THE PROVISIONS OF THE SPECIFICATIONS FOR STRUCTURAL JOINTS USING A325 OR A490 BOLTS AS APPROVED BY THE RCSC.
2. FLANGE BOLTS SHALL BE TIGHTENED BY THE AISC "TURN-OF-THE-NUT" METHOD. THE FOLLOWING TABLE SHOULD BE USED FOR THE "TURN-OF-THE-NUT" TIGHTENING.
3. SPLICE BOLTS AND ALL OTHER BOLTS IN BEARING TYPE CONNECTIONS SHALL BE TIGHTENED TO A SNUG-TIGHT CONDITION.
4. THE SNUG-TIGHT CONDITION IS DEFINED AS THE TIGHTNESS ATTAINED BY EITHER A FEW IMPACTS OF AN IMPACT WRENCH OR THE FULL EFFORT OF AN IRONWORKER WITH AN ORDINARY SPUD WRENCH TO BRING THE CONNECTED PLIES INTO FIRM CONTACT.
5. HB HOLLO-BOLT SHALL BE INSTALLED PER ICC ESR-3330 INSTRUCTIONS.

VERIFICATION AND INSPECTION

1. IF APPLICABLE, VERIFICATION INSPECTION TO BE PERFORMED SHALL BE IN ACCORDANCE TO IBC-2015 SECTION 1705 FOR STEEL CONSTRUCTION AND TABLE 1705.3 FOR CONCRETE CONSTRUCTION.

TABLE 8.2 NUT ROTATION FROM SNUG-TIGHT CONDITION FOR TURN-OF-NUT PRETENSIONING [a,b]

BOLT LENGTH [c]	DISPOSITION OF OUTER FACE OF BOLTED PARTS		
	BOTH FACES NORMAL TO BOLT AXIS	ONE FACE NORMAL TO BOLT AXIS, OTHER SLOPED NOT MORE THAN 1:20 [d]	BOTH FACES SLOPED NOT MORE THAN 1:20 FROM NORMAL TO BOLT AXIS [d]
NOT MORE THAN $4d_b$	1/3 TURN	1/2 TURN	2/3 TURN
MORE THAN $4d_b$ BUT NOT MORE THAN $8d_b$	1/2 TURN	2/3 TURN	5/6 TURN
MORE THAN $8d_b$ BUT NOT MORE THAN $12d_b$	2/3 TURN	5/6 TURN	1 TURN

[a] NUT ROTATION IS RELATIVE TO BOLT REGARDLESS OF THE ELEMENT (NUT OR BOLT) BEING TURNED. FOR REQUIRED NUT ROTATIONS OF 1/2 TURN AND LESS, THE TOLERANCE IS PLUS OR MINUS 30 DEGREES; FOR REQUIRED NUT ROTATIONS OF 2/3 TURN AND MORE, THE TOLERANCE IS PLUS OR MINUS 45 DEGREES.

[b] APPLICABLE ONLY TO JOINTS IN WHICH ALL MATERIAL WITHIN THE GRIP IS STEEL.

[c] WHEN THE BOLT LENGTH EXCEEDS $12d_b$, THE REQUIRED NUT ROTATION SHALL BE DETERMINED BY ACTUAL TESTING IN A SUITABLE TENSION CALIBRATOR THAT SIMULATES THE CONDITIONS OF SOLIDLY FITTING STEEL.

[d] BEVELED WASHER NOT USED.

SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS, JUNE 30, 2004 RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS

INSTALLATION TORQUE REQUIRED FOR HOLLO BOLTS AND AJAX BOLTS:

1. HB12 HOLLO BOLT: 59 FT-LBS
2. HB16 HOLLO BOLT: 140 FT-LBS
3. HB20 HOLLO BOLT: 221 FT-LBS
4. M20 AJAX BOLT: 280 FT-LBS.

FIELD HOT WORK PLAN NOTES:

FOLLOWING GUIDELINES SHALL BE COMPLIED WITH:

1. CONTRACTOR'S RESPONSIBILITY TO COMPLETE A HOT WORK PLAN IF AWARDED PER CUSTOMER SPECIFICATIONS GUIDELINES FOR WELDING, CUTTING & SPARK PRODUCING WORK.
2. HAVE A FIRE PLAN APPROVED BY THE CUSTOMER AND THEIR SAFETY MANAGEMENT DEPT.
3. CONTRACTOR MUST OBTAIN THE CONTACT INFO OF THE LOCAL FIRE DEPARTMENT AND THE 911 ADDRESS OF THE TOWER SITE BEFORE CONSTRUCTION.
4. CONTRACTOR SHALL MAKE SURE THAT CELL PHONE COVERAGE IS AVAILABLE IN THE TOWER SITE. IF CELL COVERAGE IS NOT AVAILABLE, AN IMMEDIATE AVAILABLE MEANS OF DIRECT COMMUNICATION WITH THE FIRE DEPARTMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION START.
5. ALL CONSTRUCTION SHALL BE PERFORMED UNDER WIND SPEED LESS THAN 10 MPH ON THE GROUND LEVEL. IF WIND SPEED INCREASE, CONTRACTOR MUST DETERMINE IF CONSTRUCTION SHALL BE DISCONTINUED.
6. FIRE SUPPRESSION EQUIPMENT MUST BE MADE AVAILABLE ON SITE AND READY TO USE.
7. CONTRACTOR SHALL ASSIGN A FIRE WATCHER TO PERFORM FIRE-FIGHTING DUTIES.
8. ALL WELDERS SHALL BE AWS OR STATE CERTIFIED. THEY MUST ALSO BE EXPERIENCED IN WELDING ON GALVANIZED MATERIALS.
9. IF IT IS POSSIBLE, ALL EXISTING COAX NEAR WELDING AREA SHALL BE TEMPORARILY MOVED AWAY FROM THE WELDING AREA BEFORE WELDING THE PLATES.
10. PLEASE REPORT ANY FIELD ISSUE TO TES @ 972-483-0607.

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TES JOB NO:
81110

CUSTOMER SITE NO:
CT13075-A-SBA
CUSTOMER SITE NAME:
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1294 PLEASANT VALLEY ROAD NORTH
GROTON, CT 06340

DRAWN BY: SP | CHECKED BY: KN/HMA

REV.	DESCRIPTION	BY	DATE
0	FIRST ISSUE	SP	07/16/19

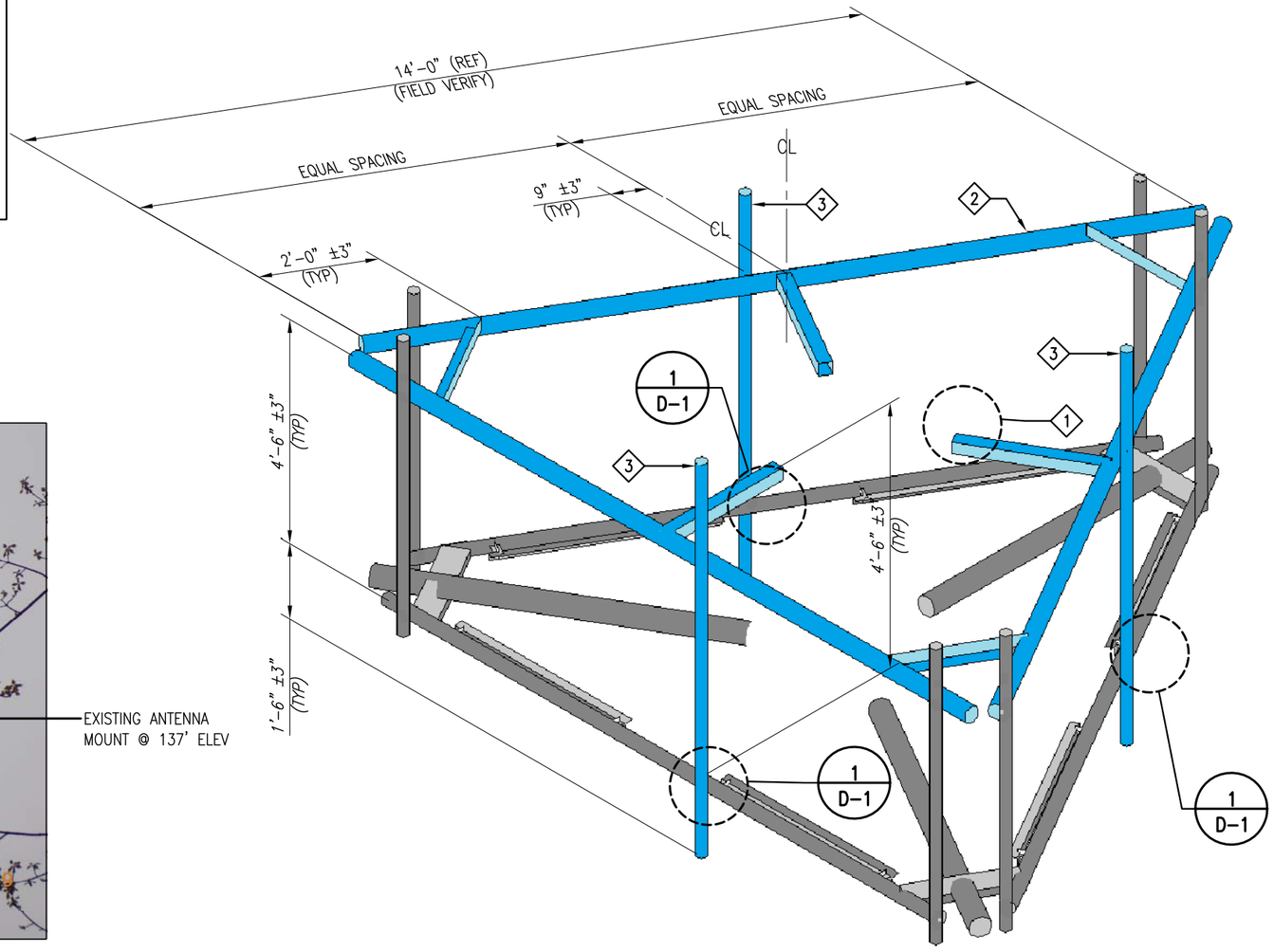
SHEET TITLE:
GENERAL NOTES

SHEET NUMBER: GN-1
REV #: 0

SCOPE OF WORK

1. INSTALL NEW HEAVY COLLAR MOUNT (NOT SHOWN FOR CLARITY). SEE SHEET MS-H1436 FOR DETAILS.
2. INSTALL NEW SUPPORT RAIL KIT. SEE SHEET MS-P-TARM_6 FOR DETAILS.
3. INSTALL NEW 2" PST ANTENNA MOUNT PIPE. (1) PER SECTOR AS SHOWN.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CLEAN-UP, REMOVAL AND DISPOSAL OF EXCESS MATERIALS USED AND REMOVED FROM THE STRUCTURE AT THE COMPLETION OF THE PROJECT.

PHOTO 1



ISOMETRIC VIEW
EXISTING ANTENNA MOUNT @ 137' ELEV.

GC NOTE:
1. **IT IS THE RESPONSIBILITY OF THE GC TO VERIFY THAT THERE IS NO INTERFERENCES WITH (PORT HOLES, SAFETY CLIMB BRACKETS, TRANSMISSION LINES, ETC.) PRIOR TO MOBILIZATION AND INSTALLATION OF THESE MODIFICATIONS.**
2. **PLEASE NOTIFY TES IMMEDIATELY IF ANY INSTALLATION ISSUES OCCUR RELATED TO THIS DRAWING @ 972-483-0607 OR EMAIL-TESCONSTRUCTION@TESTOWER.US**

NOTES:
1. TEMPORARILY RELOCATE ANY EXISTING COAX ATTACHED TO THE LEGS AND/OR ANY OTHER MEMBERS WHERE OBSTRUCTION WITH THE PROPOSED MODIFICATION MAY OCCUR.
2. WHEN FIELD CUTTING AND DRILLING ANGLES, USE SAME GAGE LINES AND EDGE DISTANCES AS INDICATED ON SHOP CUT AND DRILLED ENDS.
3. APPLY (2) COATS OF ZINC RICH GALVANIZING COMPOUND AS PER THE MANUFACTURER'S SPECIFICATIONS TO ALL FIELD CUT AND DRILLED AREAS.
4. **MEMBERS IN BLUE COLOR ARE NEW REINFORCEMENTS.**

ITEM NO.	QTY.	PART NO.	DESCRIPTIONS
1	1	MS-H1436	METROSITE HEAVY COLLAR MOUNT ASSEMBLY
2	1	MS-P-TARM_6	METROSITE SUPPORT RAIL KIT
3	3	PST2375-8	2" PST (2.375" O.D. X 0.154" THICKNESS) X 8'-0" A53 GR-

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TES JOB NO:
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CUSTOMER SITE NO:
CT13075-A-SBA
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1294 PLEASANT VALLEY ROAD NORTH
GROTON, CT 06340

DRAWN BY: SP | CHECKED BY: KN/HMA

REV.	DESCRIPTION	BY	DATE
0	FIRST ISSUE	SP	07/16/19

SHEET TITLE:
ANTENNA MOUNT MODIFICATION DETAILS

SHEET NUMBER: A-1
REV #: 0

PHOTO 1

PHOTO 2

EXISTING EQUIPMENT MUST BE RELOCATED UP OR DOWN ALONG THE MEMBER TO ACCOMMODATE INSTALLATION OF MOUNT MODIFICATION

PHOTO 3

TES
Tower Engineering Solutions
1320 GREENWAY DRIVE, SUITE 600
IRVING, TX 75038
PH: (972) 483-0607

SBA
5900 BROKEN SOUND PARKWAY, NW
BOCA RATON, FL 33487
(800)-487-SITE

TES JOB NO:
81110

CUSTOMER SITE NO:
CT13075-A-SBA

CUSTOMER SITE NAME:
NEW LONDON

1294 PLEASANT VALLEY ROAD NORTH
GROTON, CT 06340

DRAWN BY: SP | CHECKED BY: KN/HMA

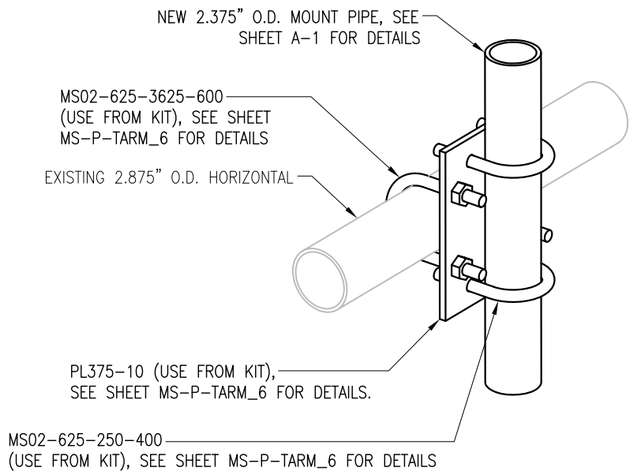
REV.	DESCRIPTION	BY	DATE
0	FIRST ISSUE	SP	07/16/19

SHEET TITLE:

ANTENNA MOUNT PHOTOS

SHEET NUMBER: A-2

REV #: 0



1 / D-1 DETAIL

NOTES:
1. HOT-DIPPED GALVANIZED PER ASTM A123.
2. ALL HOLES ARE 11/16" DIA. U.N.O

TES
Tower Engineering Solutions
1320 GREENWAY DRIVE, SUITE 600
IRVING, TX 75038
PH: (972) 483-0607

SBA
5900 BROKEN SOUND PARKWAY, NW
BOCA RATON, FL 33487
(800)-487-SITE

TES JOB NO: 81110

CUSTOMER SITE NO: CT13075-A-SBA

CUSTOMER SITE NAME: NEW LONDON

1294 PLEASANT VALLEY ROAD NORTH
GROTON, CT 06340

DRAWN BY: SP | CHECKED BY: KN/HMA

REV.	DESCRIPTION	BY	DATE
0	FIRST ISSUE	SP	07/16/19

SHEET TITLE: STANDARD DETAILS

SHEET NUMBER: D-1

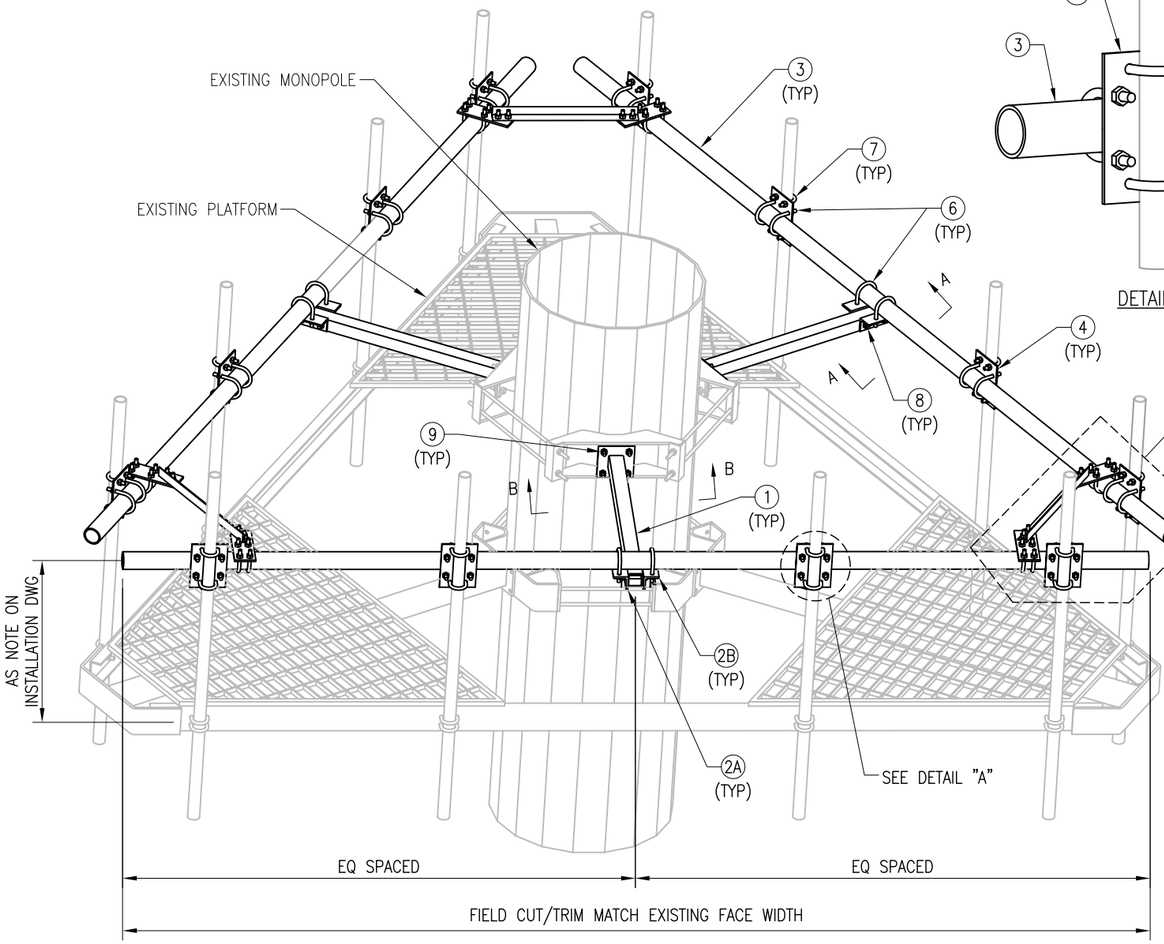
REV #: 0

THE FOLLOWING DRAWINGS ARE INCLUDED FOR REFERENCE ONLY
PLEASE REFER TO THE INSTALLATION DRAWINGS FOR ACTUAL INSTALLATION DETAILS

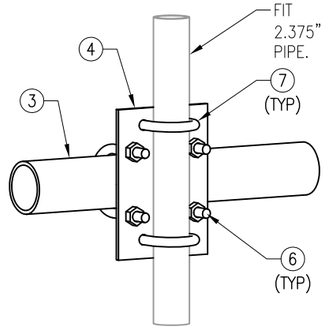
NOTES:
1) EXISTING ANTENNA MOUNT SHOWN ON THE DRAWING IS FOR REPRESENTATION PURPOSE ONLY.
2) FIELD ASSEMBLE ALL PARTS.

SUPPORT RAIL KIT (MS-P-TARM_6)

ITEM NO.	QTY.	PART NO.	DESCRIPTION	GRADE	SHEET #	WT
1	3	TAW-6	T-ARM WELDMENT	A500 GR-B	TAW-6	192
2A	3	AL-1A	L 3" X 3" X 1/4" X 0'-8"	A36	TAF-1	9.9
2B	3	AL-1B	L 3" X 3" X 1/4" X 0'-8"	A36	TAF-1	9.9
3	3	3PST-145	3" PST (3.50" O.D X .216" THICK) X 14'-6"	A53 GR-B	TAF-1	337.2
4	12	PL375-10	PL 3/8" X 7 1/8" X 10"	A36	TAF-1	92.4
5	6	PL375-11	PL 3/8" X 4 1/4" X 0'-11"	A36	TAF-1	15.1
5B	3	AL-33C	L 3" X 3" X 1/4" X 3'-6"	A36	ECP-1	54
5C	12	--	BOLT 5/8" X 2" A325 W/ HHN & LKW	A325	--	--
6	42	MS02-625-3625-600	RU-BOLT 5/8" X 3 5/8" I.W. X 6" I.L. A36 (OR EQUIV.)	A36	RBC-1	--
7	24	MS02-625-250-400	RU-BOLT 5/8" X 2 1/2" I.W. X 4" I.L. A36 (OR EQUIV.)	A36	RBC-1	--
8	6	--	ALL THREAD ROD 5/8" DIA. X 8" A36 HDG W/ (2) HHN & LKW EA.	A36	--	--
9	12	--	BOLT 5/8" X 2 1/4" A325 W/ HHN & LKW	A325	--	--
				GALVANIZED WT		711



ELEVATION VIEW



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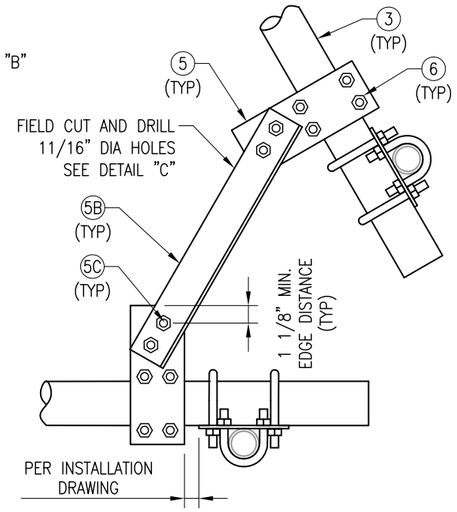

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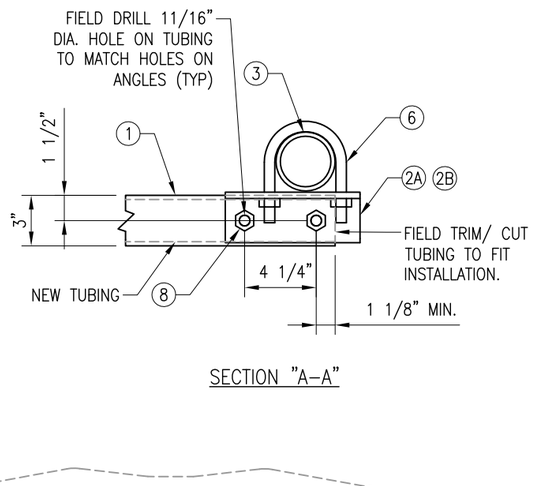

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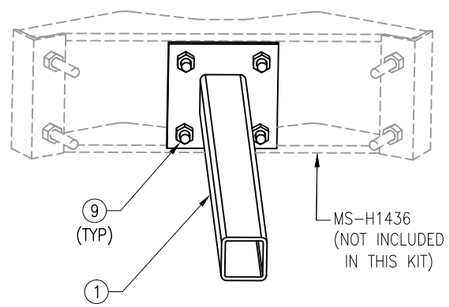

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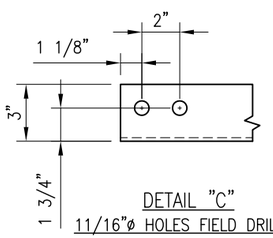
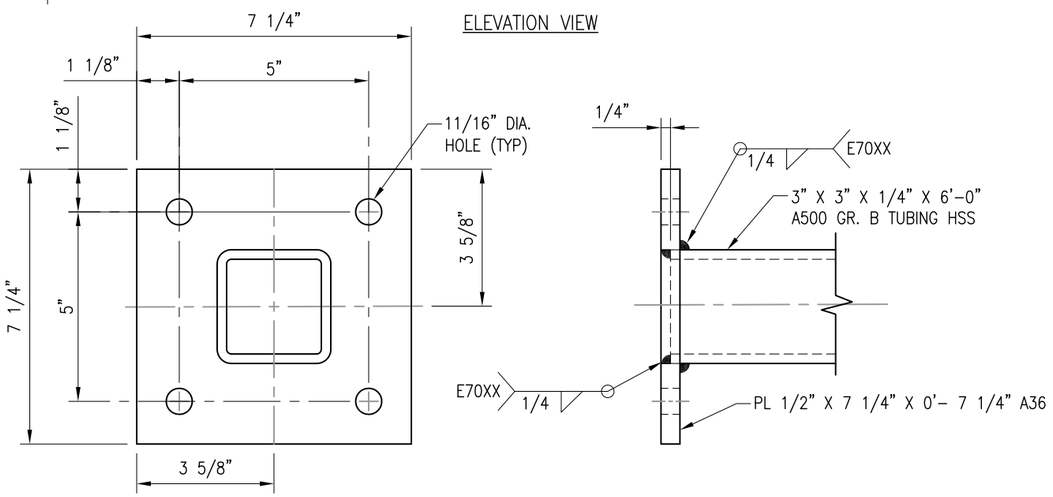


DETAIL "C"
11/16"ø HOLES FIELD DRILLED



FRONT VIEW

SIDE VIEW

TAW-6 WELDMENT

THIRD ANGLE PROJECTION

METROSITE FABRICATORS LLC
180 INDUSTRIAL PARK BLVD.
COMMERCE GA 30529

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE FINISH
STANDARD SHEET TOLERANCES
DECIMALS .X ± 0.1, .XX ± 0.02, .XXX ± 0.005
ANGLES ± 1°
FRACTIONS ± 1/32

CONFIDENTIAL
ALL INFORMATION ON THIS DOCUMENT IS PROPERTY OF METROSITE FABRICATORS LLC

APPROVAL / SIGNATURES	DATE
DRAWN BY XXX	04/16/18
REVIEWED XXX	-
APPROVED XXX	-

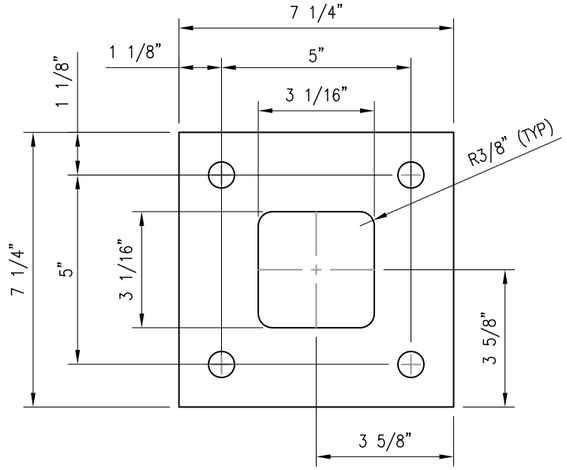
TITLE
SUPPORT RAIL KIT (MS-P-TARM_6) ASSEMBLY DETAIL

SIZE	DWG NO	REV
B	MS-P-TARM_6	0

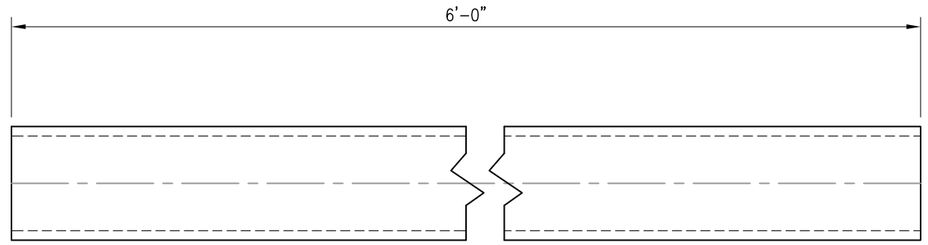
SCALE -
SHEET 1 OF 1

NOTES:
1. ALL HOLES ARE 11/16" DIA. U.N.O
2. HOT-DIPPED GALVANIZED PER ASTM A123.
3. WELD TYPE: E70XX.

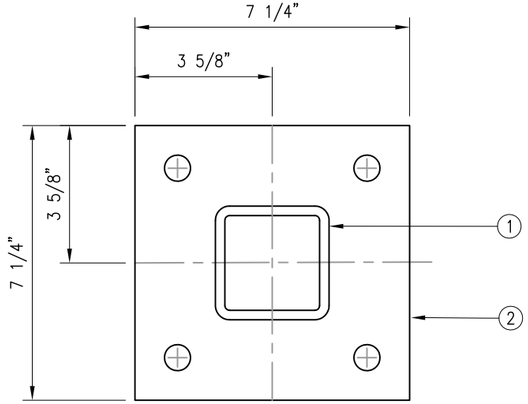
TAW-6 WELDMENT						
ITEM NO.	QTY.	PART NO.	DESCRIPTION	GRADE	SHEET #	WT
1	1	TB-6	3" X 3" X 1/4" X 6'-0" TUBING HSS	A500 GR-B	TAW-6	52.7
2	1	PL-6	PL 1/2" X 7 1/4" X 0'-7 1/4"	A36	TAW-6	7.5
					BLACK WT	60.2
					GALVANIZED WT	64



PL-6



TB-6



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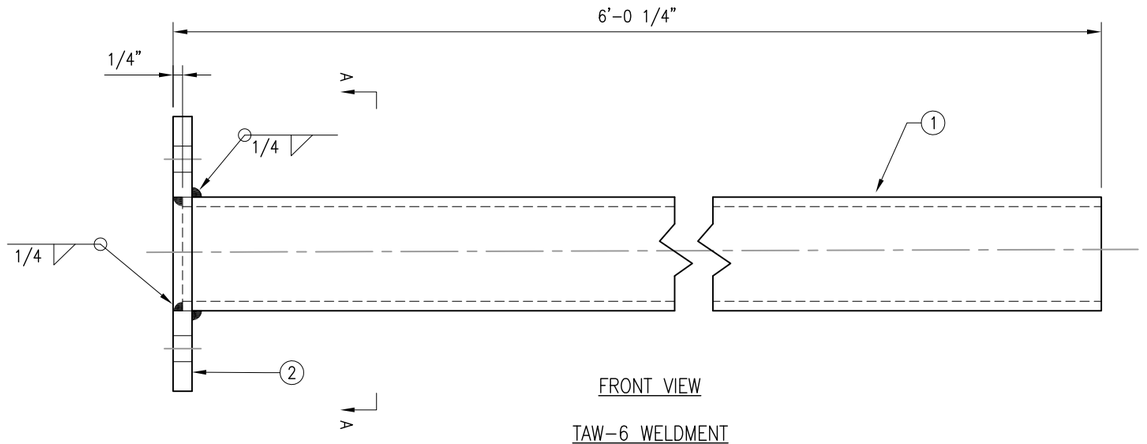


FRONT VIEW

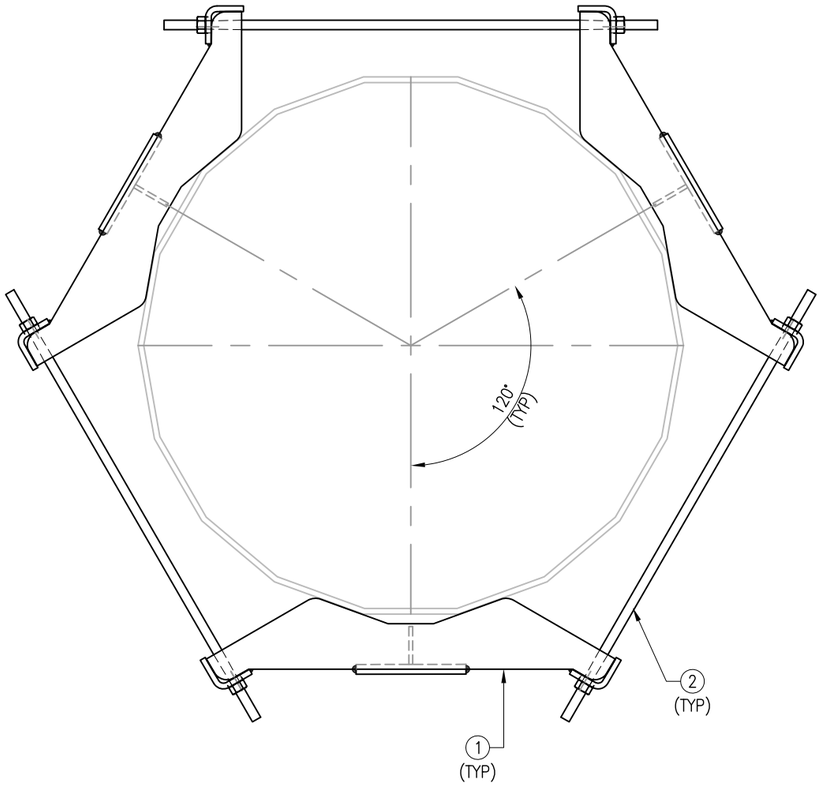
TAW-6 WELDMENT

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE FINISH	THIRD ANGLE PROJECTION	METROSITE FABRICATORS LLC 180 INDUSTRIAL PARK BLVD. COMMERCE GA 30529	
STANDARD SHEET TOLERANCES DECIMALS: .X ± 0.1, .XX ± 0.02, .XXX ± 0.005 ANGLES: ± 1° FRACTIONS: ± 1/32	CONFIDENTIAL ALL INFORMATION ON THIS DOCUMENT IS PROPERTY OF METROSITE FABRICATORS LLC	TITLE: TAW-6 WELDMENT	
	APPROVAL / SIGNATURES	DATE	SIZE B · DWG NO TAW-6 · REV 0
	DRAWN BY XXX	04/16/18	
	REVIEWED XXX	-	
	APPROVED XXX	-	SCALE - · SHEET 1 OF 1

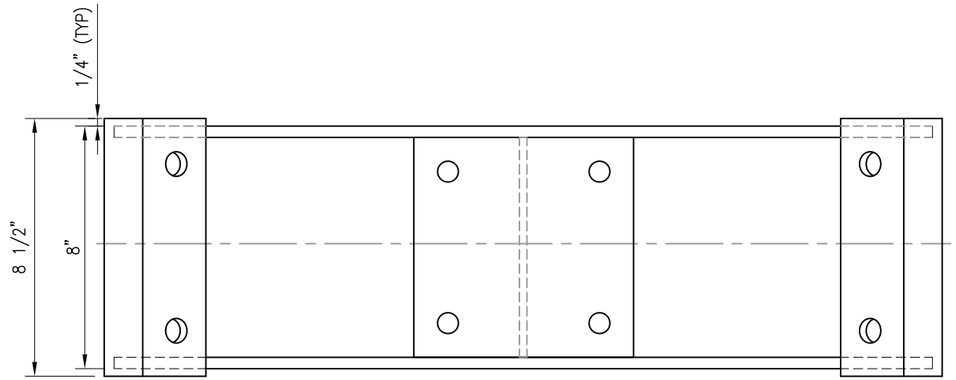
NOTE:
1) FITS 12" DIA TO 32" DIA.

ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	3	MPHW-1	MOUNT PLATE WELDMENT A36
2	6	---	THREADED ROD 3/4" X 2'-4 3/4" W/ 2 HHN & LW EA A36

GALVANIZED WEIGHT: 136.7 LBS



TOP VIEW



FRONT VIEW

THIRD ANGLE PROJECTION

METROSITE FABRICATORS LLC
180 INDUSTRIAL PARK BLVD.
COMMERCE GA 30529

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE FINISH

STANDARD SHEET TOLERANCES

DECIMALS	ANGLES
.X ± 0.1	± 1°
.XX ± 0.02	FRACTIONS
.XXX ± 0.005	± 1/32

APPROVAL / SIGNATURES		DATE
DRAWN BY	XXX	05/12/17
REVIEWED	XXX	-
APPROVED	XXX	-

TITLE
HEAVY COLLAR MOUNT PLATE
ASSEMBLY DETAIL MS-H1436

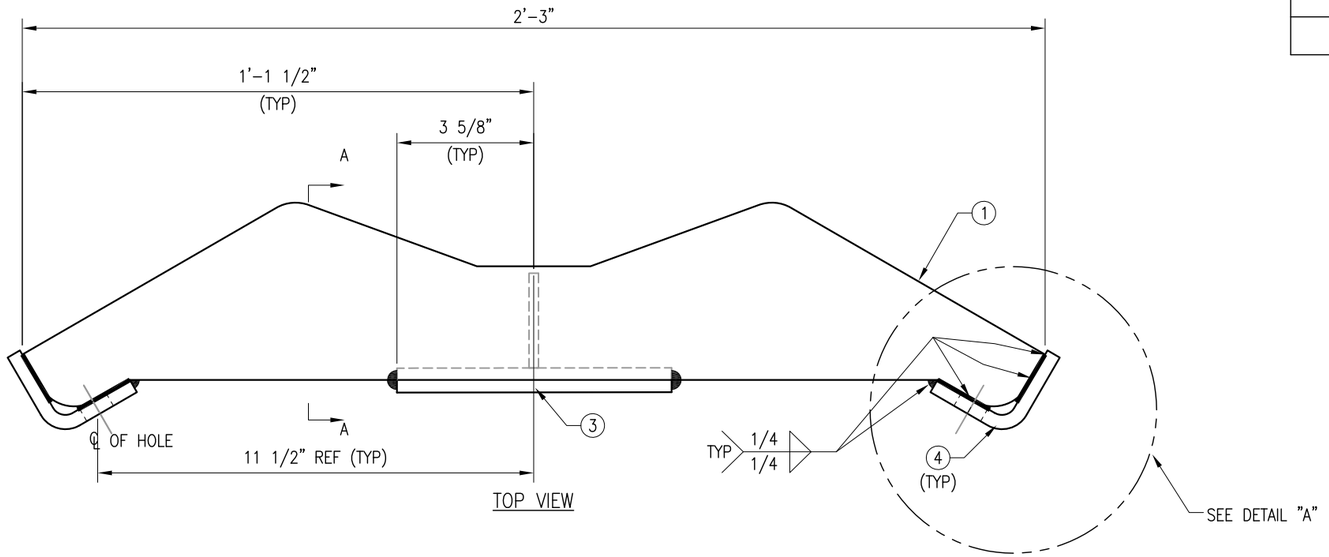
SIZE	DWG NO	REV
B	MS-H1436	1

SCALE -

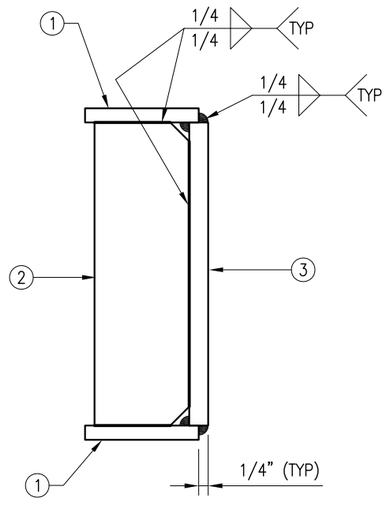
SHEET 1 OF 1

NOTES:
1. HOT-DIPPED GALVANIZED PER ASTM A123.
2. WELD TYPE: E70XX.

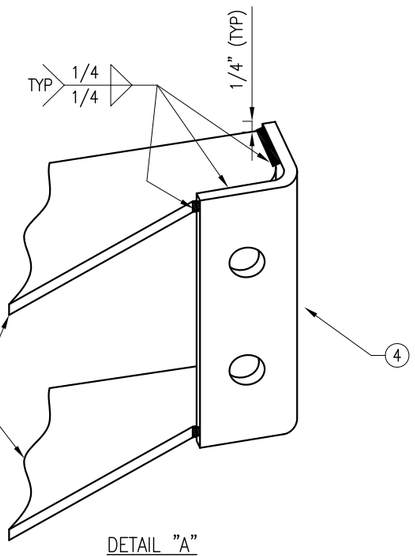
MPHW-1 WELDMENT						
ITEM NO.	QTY.	PART NO.	DESCRIPTION	GRADE	SHEET #	WT
1	2	PL-4	PL 3/8" X 5 3/8" X 2'-3"	A36	F-2	18.8
2	1	PL-5	PL 3/8" X 2 1/2" X 0'-7 1/4"	A36	F-2	1.9
3	1	PL-6	PL 1/2" X 7 1/4" X 0'-7 1/4"	A36	F-2	7.5
4	2	PL-7	PL 3/8" x 4 3/8" x 8 1/2"	A36	F-2	7.8
					BLACK WT	36
					GALVANIZED WT	38



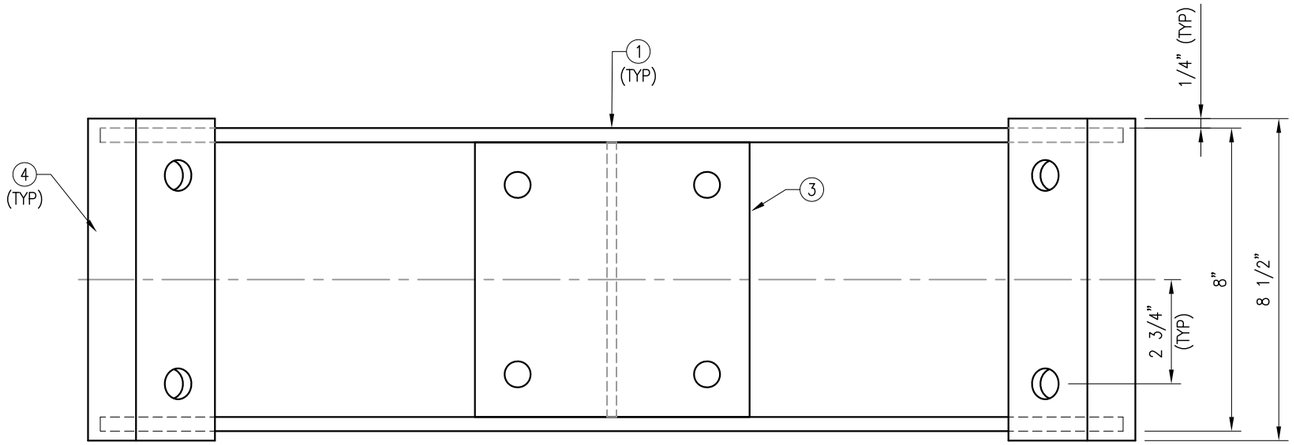
TOP VIEW



SECTION "A-A"



DETAIL "A"



FRONT VIEW

MPW-1 WELDMENT

THIRD ANGLE PROJECTION

METROSITE FABRICATORS LLC
180 INDUSTRIAL PARK BLVD.
COMMERCE GA 30529

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE FINISH

STANDARD SHEET TOLERANCES

DECIMALS	ANGLES
.X ± 0.1	± 1°
.XX ± 0.02	FRACTIONS
.XXX ± 0.005	± 1/32

APPROVAL / SIGNATURES		DATE
DRAWN BY	XXX	05/12/17
REVIEWED	XXX	-
APPROVED	XXX	-

TITLE
HEAVY COLLAR MOUNT PLATE WELDMENT DETAIL

SIZE	DWG NO	REV
B	MPHW-1	0

SCALE - SHEET 1 OF 1

EXHIBIT 10

Radio Frequency Emissions Analysis Report

T-MOBILE Existing Facility

Site ID: CT11311G

CT311Opta Paws Place
1294 Pleasant Valley Road North
Groton, CT 06340

May 21, 2019

Transcom Engineering Project Number: 737001-0052

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**16.67 %**

May 21, 2019

T-MOBILE
Attn: Jason Overbey, RF Manager
35 Griffin Road South
Bloomfield, CT 6009

Emissions Analysis for Site: **CT11311G – CT311Opta Paws Place**

Transcom Engineering, Inc ("Transcom") was directed to analyze the proposed upgrades to the T-MOBILE facility located at **1294 Pleasant Valley Road North, Groton, CT**, for the purpose of determining whether the emissions from the Proposed T-MOBILE Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

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

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

Population exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 600 & 700 MHz bands are approximately 400 $\mu W/cm^2$ and 467 $\mu W/cm^2$ respectively. The general population exposure limit for the 1900 MHz (PCS) and 2100 MHz (AWS) bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were performed for the proposed upgrades to the T-MOBILE antenna facility located at **1294 Pleasant Valley Road North, Groton, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-MOBILE is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. All power values expressed and analyzed are maximum power levels expected to be used on all radios.

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

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

Technology	Frequency Band	Channel Count	Transmit Power per Channel (W)
LTE	1900 MHz (PCS)	4	40
LTE	2100 MHz (AWS)	2	60
UMTS	1900 MHz (PCS)	1	40
GSM	1900 MHz (PCS)	1	15
LTE / 5G NR	600 MHz	2	40
LTE	700 MHz	2	20

Table 1: Channel Data Table

The following antennas listed in *Table 2* were used in the modeling for transmission in the 600, 700 MHz, 1900 MHz (PCS) and 2100 MHz (AWS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

Sector	Antenna Number	Antenna Make / Model	Antenna Centerline (ft)
A	1	Ericsson AIR32 B66A / B2A	137
A	2	Ericsson AIR21 B2A/B4P	137
A	3	RFS APXVAARR24_43-U-NA20	137
B	1	Ericsson AIR32 B66A / B2A	137
B	2	Ericsson AIR21 B2A/B4P	137
B	3	RFS APXVAARR24_43-U-NA20	137
C	1	Ericsson AIR32 B66A / B2A	137
C	2	Ericsson AIR21 B2A/B4P	137
C	3	RFS APXVAARR24_43-U-NA20	137

Table 2: Antenna Data

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

RESULTS

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

Antenna ID	Antenna Make / Model	Frequency Bands	Antenna Gain (dBd)	Channel Count	Total TX Power (W)	ERP (W)	MPE %
Antenna A1	Ericsson AIR32 B66A / B2A	1900 MHz (PCS) / 2100 MHz (AWS)	15.85	6	280	10,768.57	2.26
Antenna A2	Ericsson AIR21 B2A/B4P	1900 MHz (PCS)	15.9	2	55	2,139.75	0.45
Antenna A3	RFS APXVAARR24_43-U-NA20	600 MHz / 700 MHz	12.95 / 13.35	4	120	2,443.03	1.22
						Sector A Composite MPE%	**3.93**
Antenna B1	Ericsson AIR32 B66A / B2A	1900 MHz (PCS) / 2100 MHz (AWS)	15.85	6	280	10,768.57	2.26
Antenna B2	Ericsson AIR21 B2A/B4P	1900 MHz (PCS)	15.9	2	55	2,139.75	0.45
Antenna B3	RFS APXVAARR24_43-U-NA20	600 MHz / 700 MHz	12.95 / 13.35	4	120	2,443.03	1.22
						Sector B Composite MPE%	**3.93**
Antenna C1	Ericsson AIR32 B66A / B2A	1900 MHz (PCS) / 2100 MHz (AWS)	15.85	6	280	10,768.57	2.26
Antenna C2	Ericsson AIR21 B2A/B4P	1900 MHz (PCS)	15.9	2	55	2,139.75	0.45
Antenna C3	RFS APXVAARR24_43-U-NA20	600 MHz / 700 MHz	12.95 / 13.35	4	120	2,443.03	1.22
						Sector C Composite MPE%	**3.93**

Table 3: T-MOBILE Emissions Levels

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

Site Composite MPE%	
Carrier	**MPE%**
T-MOBILE – Max Per Sector Value	**3.93 %**
Verizon Wireless	3.15 %
AT&T	9.59 %
Site Total MPE %:	**16.67 %**

Table 4: All Carrier MPE Contributions

T-MOBILE Sector A Total:	3.93 %
T-MOBILE Sector B Total:	3.93 %
T-MOBILE Sector C Total:	3.93 %
Site Total:	16.67 %

Table 5: Site MPE Summary

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

T-MOBILE _ Frequency Band / Technology Max Power Values (Per Sector)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
T-Mobile 1900 MHz (PCS) LTE	4	1,538.37	137	12.89	1900 MHz (PCS)	1000	1.29%
T-Mobile 2100 MHz (AWS) LTE	2	2,307.55	137	9.67	2100 MHz (AWS)	1000	0.97%
T-Mobile 1900 MHz (PCS) UMTS	1	1,556.18	137	3.26	1900 MHz (PCS)	1000	0.33%
T-Mobile 1900 MHz (PCS) GSM	1	583.57	137	1.22	1900 MHz (PCS)	1000	0.12%
T-Mobile 600 MHz LTE / 5G NR	2	788.97	137	3.31	600 MHz	400	0.83%
T-Mobile 700 MHz LTE	2	432.54	137	1.81	700 MHz	467	0.39%
						Total:	**3.93%**

Table 6: T-MOBILE Maximum Sector MPE Power Values

Summary

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

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

T-MOBILE Sector	Power Density Value (%)
Sector A:	3.93 %
Sector B:	3.93 %
Sector C:	3.93 %
T-MOBILE Maximum Total (per sector):	3.93 %
Site Total:	16.67 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **16.67 %** 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.

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