NORTHEAST SITE SOLUTIONS
*Turnkey Wireless Development*

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

June 17, 2022

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

RE: Exempt Modification Application
29 Bogus Hill Road, New Fairfield, CT 06812
Latitude: 41.511836
Longitude: -73.467208
Site #: CT13061-A _CTFF750A_SBA/T-Mobile

Dear Ms. Bachman:

T-Mobile is requesting to file an exempt modification for an existing tower located at 29 Bogus Hill Road, New Fairfield, CT 06812. T-Mobile currently maintains six (6) antennas at the 150-foot level of the existing 149-foot monopole tower. The property is owned by Bogus Ranger LLC and the tower is owned by SBA. T-Mobile now intends to replace (3) antennas. The new antennas would be installed at the 150-foot level of the tower. This modification includes B2, B5 hardware that is both 4G (LTE), and 5G capable. Antenna mount modifications will be completed as per the attached TES mount analysis dated May 20, 2022.

**T-Mobile Planned Modifications:**
**Remove:**
(2) Coax – 1-5/8"

**Remove and Replace:**
(3) ANDREW LNX-6515DS-A1M Antennas (REMOVE) - (3) ) RFS APXVAALL24-43-U-NA20 Antennas (REPLACE)

**Install New:**
(3) ERICSSON 4480 B71+B85 RRU
(1) HCS Fiber Cable 1.9"

**Existing to Remain:**
(3) RFS APXV18-206517-C-A20 Antennas
(3) RFS APXV18-209014 Antennas *
(16) Coax – 1-5/8" *
(3) Ericsson TMAs *
(3) Kathrein 782 11056 Bias-Ts *

*Equipment listed for entitlement purposed only

NORTHEAST SITE SOLUTIONS

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The facility was approved by the Connecticut Siting Council, Docket No. 315 on September 28, 2006. Please see attached.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies§ 16- SOj-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.SA. § 16-SOj-73, a copy of this letter is being sent to Patricia Del Monaco, First Selectman and Evan White, Zoning Enforcement Officer for the Town of New Fairfield, as well as the property owner and the tower owner.

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2).

1. The proposed modifications will not result in an increase in the height of the existing structure.

2. The proposed modifications will not require the extension of the site boundary.

3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.

4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard.

5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

6. The existing structure and its foundation can support the proposed loading.

For the foregoing reasons, T-Mobile respectfully submits that the proposed modifications to the above referenced telecommunications facility constitute an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

Denise Sabo
Mobile: 203-435-3640
Fax: 413-521-0558
Office: 4 Angela's Way, Burlington CT 06013
Email: denise@northeastsitesolutions.com

NORTHEAST SITE SOLUTIONS
*Turnkey Wireless Development*

Attachments

Cc: Patricia Del Monaco, First Selectman
Town of New Fairfield
4 Brush Hill Road
New Fairfield, CT 06812

Evan White, Zoning Enforcement Officer
Town of New Fairfield
4 Brush Hill Road
New Fairfield, CT 06812

Bogus Ranger LLC – Property Owner
7 Masons Island Road
Mystic, CT 06355

SBA - Tower Owner

# Exhibit A

## Original Facility Approval

| | | |
|---|---|---|
| **DOCKET NO. 315 –** Optasite, Inc. and New Cingular Wireless PCS, LLC application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a telecommunications facility at 29 Bogus Hill Road in New Fairfield, Connecticut. | } | Connecticut<br>Siting<br>Council |

September 28, 2006

**Decision and Order**

Pursuant to the foregoing Findings of Fact and Opinion, the Connecticut Siting Council (Council) finds that the effects associated with the construction, operation, and maintenance of a telecommunications facility including effects on the natural environment; ecological integrity and balance; public health and safety; scenic, historic, and recreational values; forests and parks; air and water purity; and fish and wildlife are not disproportionate either alone or cumulatively with other effects when compared to need, are not in conflict with the policies of the State concerning such effects, and are not sufficient reason to deny the application and therefore directs that a Certificate of Environmental Compatibility and Pubic Need, as provided by General Statutes § 16-50k, be issued to Optasite, Inc. for the construction, maintenance and operation of a wireless telecommunications facility to be located at Site B at 29 Bogus Hill Road in New Fairfield, Connecticut. The Council denies certification of Site A located at 29 Bogus Hill Road in New Fairfield, 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 monopole and shall be constructed no taller than 130 feet above ground level to provide telecommunications services to both public and private entities. The tower's design shall incorporate a yield point in order to reduce the size of the setback radius.

2. The location of the tower shall be adjusted within the lease parcel to maximize the distance from the tower to the nearest property to the north of the site.

3. No on-site construction work shall take place between December 31 and March 1 to avoid disturbing bald eagles that may be in the vicinity.

4. During construction, large cover objects such as logs and moveable rocks shall be moved out of the way of heavy machinery to minimize any potential harm to hognose snakes that might be in the area.

5. 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 New Fairfield 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, antennas mountings, equipment building, access road, utility line, and landscaping; and

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

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

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

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

9. The Certificate Holder shall provide reasonable space on the tower for no compensation for any Town of New Fairfield municipal antennas, provided such antennas can be accommodated and are compatible with the structural integrity of the tower.

10. If the facility authorized herein is not fully constructed and providing wireless services within eighteen months from the date of the mailing of the Council's Findings of Fact, Opinion, and Decision and Order (collectively called "Final Decision"), this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made. The time between the filing and resolution of any appeals of the Council's Final Decision shall not be counted in calculating this deadline.

11. If the facility ceases to provide wireless services for a period of one year, this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made.

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

13. Any request for extension of the time periods referred to in Conditions 10, 11, and 12 shall be filed with the Council not later than sixty days prior to the expiration date of this Certificate and shall be served on all parties and intervenors and the Town of Hartland, as listed in the service list. Any proposed modifications to this Decision and Order shall likewise be so served.

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

Pursuant to General Statutes § 16-50p, we hereby direct that a copy of the Findings of Fact, Opinion, and Decision and Order be served on each person listed below, and notice of issuance shall be published in the Danbury News-Times and in The Fairfield Citizen-News.

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

The parties and intervenors in this proceeding are:

| **Status Granted** | **Status Holder (name, address & phone number)** | **Representative (name, address & phone number)** |
|---|---|---|
| **Applicant** | Optasite, Inc.<br>New Cingular Wireless PCS, LLC | Lucia Chiocchio, Esq.<br>Cuddy and Feder, LLP<br>90 Maple Avenue<br>White Plains, NY 10601<br><br>Ms. Jennifer Young Gaudet<br>345 Taylor Street<br>Talcottville, CT 06066 |
| **Party** *(approved on 5/17/06)* | Edward J. Hannafin<br>Malcolm McCluskey | Thomas W. Beecher, Esq.<br>Collins, Hannafin, Garamella, Jaber & Tuozzolo, P.C.<br>148 Deer Hill Avenue<br>Danbury, CT 06810<br>(203) 744-2150<br>(203) 791-1126 - fax<br>tbeecher@chgjtlaw.com |
| **Intervenor** *(approved on 7/12/06)* | Tax District of Bogus Hill | Allan Deutscher<br>P.O. Box 8240<br>New Fairfield, CT 06812 |

# Exhibit B

**Property Card**

# 29 BOGUS HILL RD

| | | | |
|---|---|---|---|
| **Location** | 29 BOGUS HILL RD | **Mblu** | 6/ 4/ 84A/ / |
| **Acct#** | 00071810 | **Owner** | BOGUS RANGER LLC |
| **Assessment** | $718,200 | **Appraisal** | $1,026,000 |
| **PID** | 100569 | **Building Count** | 1 |

## Current Value

| Appraisal | | | |
|---|---|---|---|
| **Valuation Year** | **Improvements** | **Land** | **Total** |
| 2019 | $810,000 | $216,000 | $1,026,000 |

| Assessment | | | |
|---|---|---|---|
| **Valuation Year** | **Improvements** | **Land** | **Total** |
| 2019 | $567,000 | $151,200 | $718,200 |

## Owner of Record

| | | | |
|---|---|---|---|
| **Owner** | BOGUS RANGER LLC | **Sale Price** | $9,000,000 |
| **Co-Owner** | | **Certificate** | |
| **Address** | 7 MASONS ISLAND RD<br>MYSTIC, CT 06355 | **Book & Page** | 562/39 |
| | | **Sale Date** | 09/08/2021 |
| | | **Instrument** | 00 |

## Ownership History

| Ownership History | | | | | |
|---|---|---|---|---|---|
| **Owner** | **Sale Price** | **Certificate** | **Book & Page** | **Instrument** | **Sale Date** |
| BOGUS RANGER LLC | $9,000,000 | | 562/39 | 00 | 09/08/2021 |
| GIRL SCOUTS OF CONNECTICUT INC | $0 | | 0053/0587 | | 01/01/1900 |

## Building Information

### Building 1 : Section 1

| | |
|---|---|
| **Year Built:** | |
| **Living Area:** | 0 |
| **Replacement Cost:** | $0 |
| **Building Percent Good:** | |

**Replacement Cost**
**Less Depreciation:** $0

| Building Attributes | |
|---|---|
| **Field** | **Description** |
| Style: | Outbuildings |
| Model | |
| Grade: | |
| Stories: | |
| Occupancy | |
| Exterior Wall 1 | |
| Exterior Wall 2 | |
| Roof Structure: | |
| Roof Cover | |
| Interior Wall 1 | |
| Interior Wall 2 | |
| Interior Flr 1 | |
| Interior Flr 2 | |
| Heat Fuel | |
| Heat Type: | |
| AC Type: | |
| Total Bedrooms: | |
| Full Bathrms: | |
| Half Baths: | |
| Num Xtra Fix | |
| Total Rooms: | |
| Bath Style | |
| Kitchen Style | |
| Fireplaces | |
| Bsmt Garage | |
| Fin Bsmt Area | |
| Fin Bsmt Qual | |
| Func Code | |
| Eco Code | |
| Num Park | |
| Fireplaces 1 | |
| Fndtn Cndtn | |
| Basement | |

## Building Photo

(http://images.vgsi.com/photos/NewFairfieldCTPhotos//\00\00\61\79.jpg)

## Building Layout

Building Layout
(http://images.vgsi.com/photos/NewFairfieldCTPhotos//Sketches/100569_8

| Building Sub-Areas (sq ft) | Legend |
|---|---|
| No Data for Building Sub-Areas | |

## Extra Features

| Extra Features | Legend |
|---|---|

No Data for Extra Features

## Land

### Land Use

| | |
|---|---|
| **Use Code** | 401 |
| **Description** | Cell TWR |
| **Zone** | 2 |
| **Neighborhood** | |
| **Alt Land Appr** | No |
| **Category** | |

### Land Line Valuation

| | |
|---|---|
| **Size (Acres)** | 0.00 |
| **Depth** | |
| **Assessed Value** | $151,200 |
| **Appraised Value** | $216,000 |

## Outbuildings

| Outbuildings | | | | | | Legend |
|---|---|---|---|---|---|---|
| **Code** | **Description** | **Sub Code** | **Sub Description** | **Size** | **Value** | **Bldg #** |
| CELL | Cell Tenant | | | 3.00 UNITS | $810,000 | 1 |

## Valuation History

| Appraisal | | | |
|---|---|---|---|
| **Valuation Year** | **Improvements** | **Land** | **Total** |
| 2018 | $441,000 | $216,000 | $657,000 |
| 2017 | $441,000 | $216,000 | $657,000 |
| 2016 | $441,000 | $216,000 | $657,000 |

| Assessment | | | |
|---|---|---|---|
| **Valuation Year** | **Improvements** | **Land** | **Total** |
| 2018 | $308,700 | $151,200 | $459,900 |
| 2017 | $308,700 | $151,200 | $459,900 |
| 2016 | $308,700 | $151,200 | $459,900 |


# 29 BOGUS HILL ROAD

6/17/2022 8:51:29 AM

Scale: 1"=1000'

Scale is approximate

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

# Exhibit C

**Construction Drawings**

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

# NEW FAIRFIELD

29 BOGUS HILL ROAD
NEW FAIRFIELD, CT 06812
FAIRFIELD COUNTY

# SITE NO.: CTFF750A

SITE TYPE: 150'± MONOPOLE

RF DESIGN GUIDELINE: 67E04E

## SCOPE OF WORK

REMOVE:
- 3 ANTENNAS
- 1 60A-2P BREAKER

INSTALL:
- 3 ANTENNAS
- 3 RRUs
- 1 ANTENNA HAND-RAIL KIT
- 1 HYBRID CABLES
- 1 125A-2P BREAKER

## SITE NOTES

1. THIS IS AN UNMANNED AND RESTRICTED ACCESS TELECOMMUNICATION FACILITY, AND IS NOT FOR HUMAN HABITATION. IT WILL BE USED FOR THE TRANSMISSION OF RADIO SIGNAL FOR THE PURPOSE OF PROVIDING PUBLIC CELLULAR SERVICE.
   - ADA COMPLIANCE NOT REQUIRED.
   - POTABLE WATER OR SANITARY SERVICE IS NOT REQUIRED.
   - NO OUTDOOR STORAGE OR ANY SOLID WASTE RECEPTACLES REQUIRED.
2. CONTRACTOR SHALL VERIFY ALL PLANS, EXISTING DIMENSIONS, AND CONDITIONS ON JOB SITE. CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ARCHITECT/ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK. FAILURE TO NOTIFY THE ARCHITECT/ENGINEER PLACE THE RESPONSIBILITY ON THE CONTRACTOR TO CORRECT THE DISCREPANCIES AT THE CONTRACTOR'S EXPENSE.
3. NEW CONSTRUCTION WILL CONFORM TO ALL APPLICABLE CODES AND ORDINANCES.
   - BUILDING CODE: 2018 CONNECTICUT STATE BUILDING CODE
   - ELECTRICAL CODE: 2017 NATIONAL ELECTRICAL CODE
   - STRUCTURAL CODE: TIA/EIA-222-G STRUCTURAL STANDARDS FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS.

## APPROVALS

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

## T-MOBILE TECHNICIAN SITE SAFETY NOTES

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

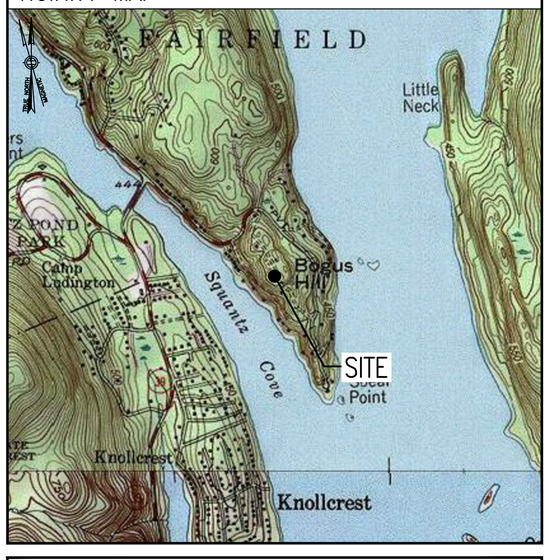
## GENERAL NOTES

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

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

## VICINITY MAP

SCALE: 1" = 1000'-0"




## DIRECTIONS

MERGE ONTO I-495 NORTH TOWARD MANSFIELD/MARLBORO. TAKE EXIT 58 FOR I-90 WEST TOWARD ALBANY. USE RIGHT 2 LANES FOR EXIT 78 FOR I-84 TOWARD HARTFORD CT/NEW YORK CITY. CONTINUE ONTO I-84. TAKE EXIT 6 FOR CT-37 NORTH. TURN RIGHT ONTO NORTH STREET. TURN RIGHT ONTO SAW MILL ROAD. TURN RIGHT ONTO CT-39 NORTH. TURN RIGHT ONTO BOGUS HILL ROAD. SITE IS LOCATED ON THE LEFT HAND SIDE.

## SHEET INDEX

| SHT. NO. | DESCRIPTION | VER. |
|---|---|---|
| T-1 | TITLE SHEET | 0 |
| | | |
| GN-1 | GENERAL NOTES | 0 |
| | | |
| A-1 | COMPOUND & EQUIPMENT PLAN | 0 |
| A-2 | TOWER ELEVATIONS & ANTENNA PLAN | 0 |
| A-3 | SITE DETAILS, ANTENNA & FEEDLINE CHARTS | 0 |
| | | |
| E-1 | ELECTRIC & GROUNDING DETAILS | 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.

## PROJECT SUMMARY

| | |
|---|---|
| SITE NUMBER: | CTFF750A |
| SITE NAME: | NEW FAIRFIELD |
| SBA SITE NUMBER: | CT13061-A |
| SBA SITE NAME: | NEW FAIRFIELD |
| SITE ADDRESS: | 29 BOGUS HILL ROAD<br>NEW FAIRFIELD, CT 06812 |
| PROPERTY OWNER: | GIRL SCOUTS OF CONNECTICUT INC.<br>340 WASHINGTON STREET<br>HARTFORD, CT 06106 |
| TOWER OWNER: | SBA TOWERS IV, LLC<br>8501 CONGRESS AVENUE<br>BOCA RATON, FL 33487<br>PHONE: 561-226-9523 |
| COUNTY: | FAIRFIELD |
| ZONING DISTRICT: | CAMP HOUSE |
| STRUCTURE TYPE: | MONOPOLE |
| STRUCTURE HEIGHT: | 150'± |
| APPLICANT: | T-MOBILE NORTHEAST LLC<br>15 COMMERCE WAY, SUITE B<br>NORTON, MA 02766 |
| ARCHITECT: | CHAPPELL ENGINEERING ASSOCIATES, LLC.<br>201 BOSTON POST ROAD WEST, SUITE 101<br>MARLBOROUGH, MA 01752 |
| STRUCTURAL ENGINEER: | CHAPPELL ENGINEERING ASSOCIATES, LLC.<br>201 BOSTON POST ROAD WEST, SUITE 101<br>MARLBOROUGH, MA 01752 |
| SITE CONTROL POINT: | LATITUDE: 41.511850° N41°30'42.66"<br>LONGITUDE: -73.46721.3° W73°28'01.97" |

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


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

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

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


STATE OF CONNECTICUT
JAMES M. FITZGERALD
No. 25997
LICENSED
PROFESSIONAL CIVIL ENGINEER
5/19/2022

CHECKED BY: JMT

APPROVED BY: JMT

## SUBMITTALS

| REV. | DATE | DESCRIPTION | BY |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| 0 | 04/21/22 | ISSUED FOR CONSTRUCTION | JRV |

SITE NUMBER:
CTFF750A

SITE ADDRESS:
29 BOGUS HILL ROAD
NEW FAIRFIELD, CT 06812

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1

1815.481

## GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

## SITE WORK GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

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

## CONCRETE AND REINFORCING STEEL NOTES:

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

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

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

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

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

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

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

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

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

## STRUCTURAL STEEL NOTES:

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

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

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

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

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

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

## SOIL COMPACTION NOTES FOR SLAB ON GRADE:

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

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

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

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

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

## COMPACTION EQUIPMENT:

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

## CONSTRUCTION NOTES:

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

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

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

## ELECTRICAL INSTALLATION NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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


T-MOBILE
NORTHEAST LLC

15 COMMERCE WAY, SUITE B
NORTON, MA 02766
(508) 286–2700

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

CHAPPELL ENGINEERING ASSOCIATES, LLC
Civil ·Structural ·Land Surveying

R.K. EXECUTIVE CENTRE
201 BOSTON POST ROAD WEST, SUITE 101
MARLBOROUGH, MA 01752
(508) 481–7400
www.chappellengineering.com


STATE OF CONNECTICUT
JAMES M. FITZGERALD
No. 25937
LICENSED
PROFESSIONAL CIVIL ENGINEER
5/13/2022

CHECKED BY: JMT

APPROVED BY: JMT

SUBMITTALS

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NEW FAIRFIELD, CT 06812

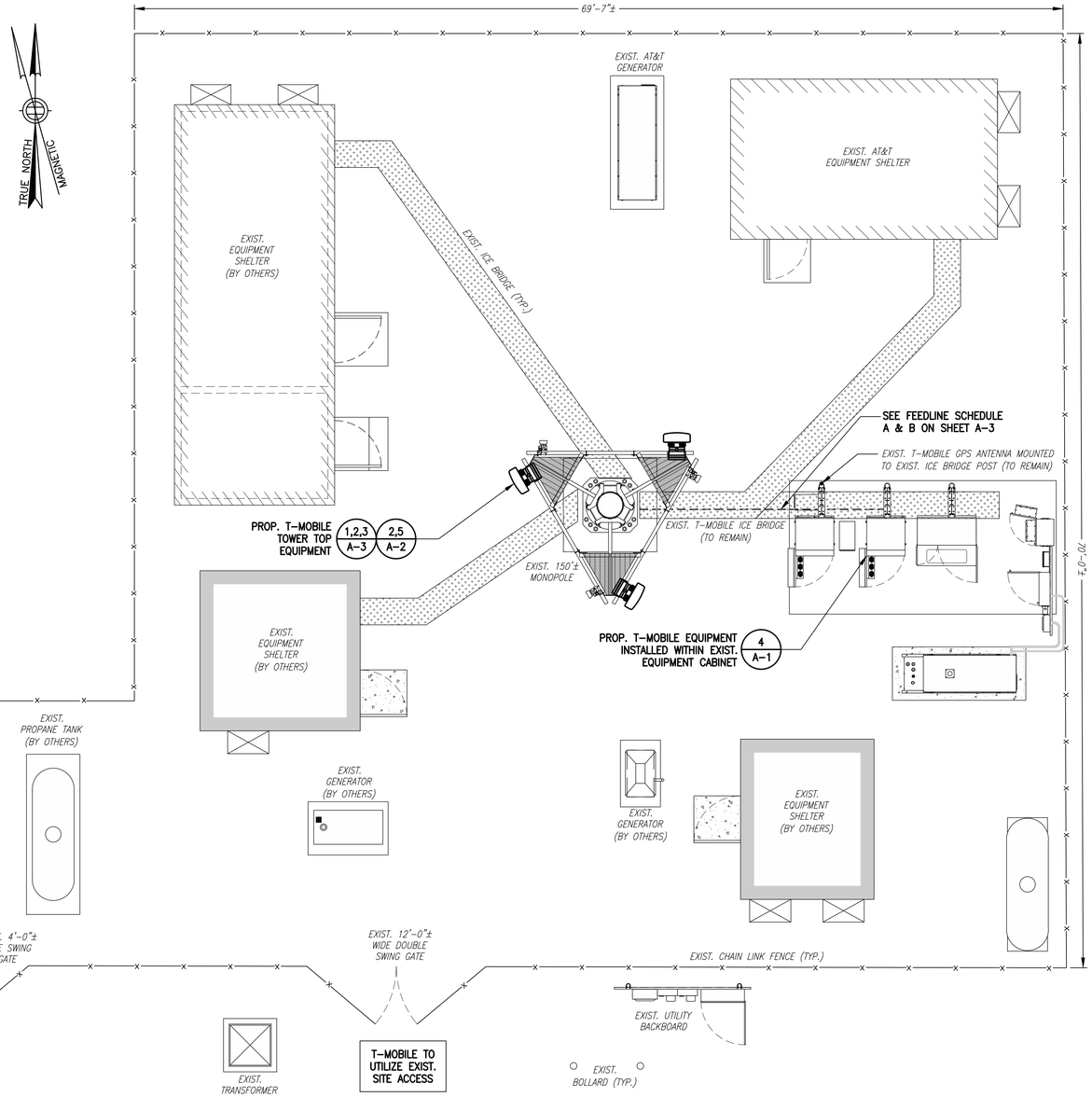
SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-1

1815.481

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

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




COMPOUND PLAN 1 A-1
SCALE: 1" = 5'-0"
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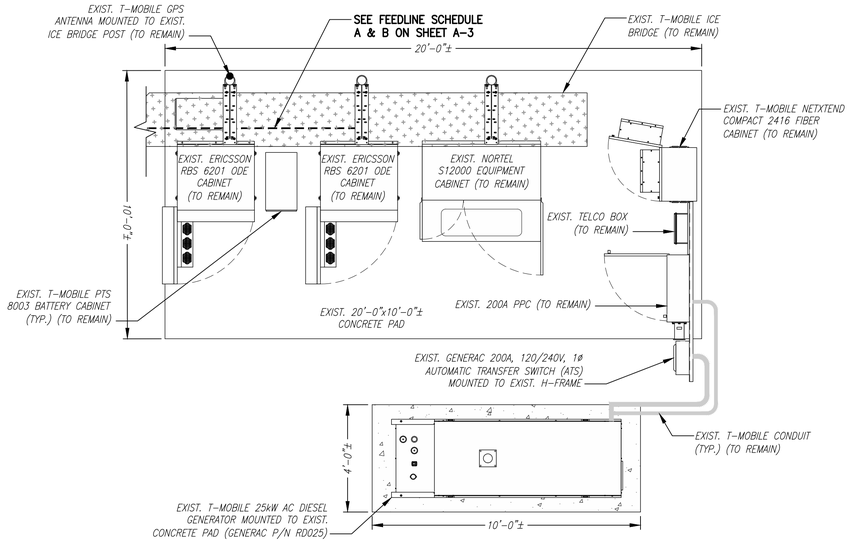
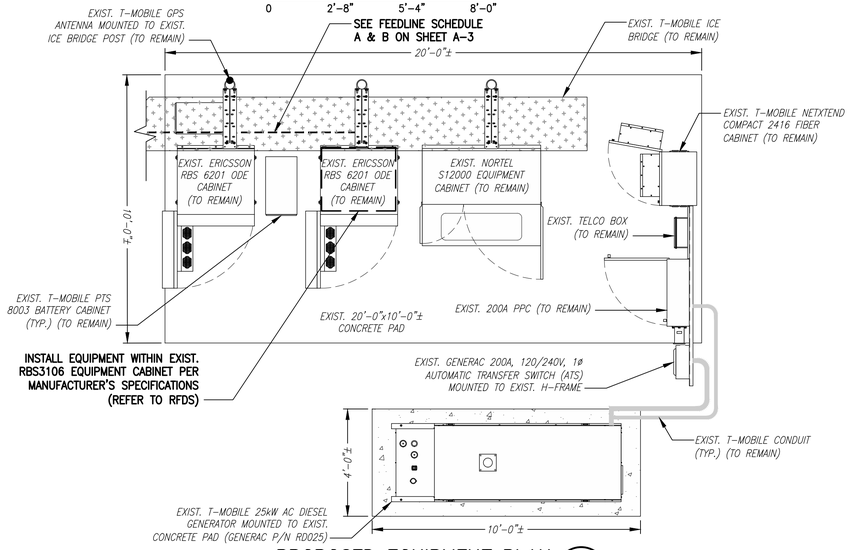
EXISTING EQUIPMENT PHOTO 2 A-1
SCALE: N.T.S.




EXISTING EQUIPMENT PLAN 3 A-1
SCALE: 3/8" = 1'-0"
0 2'-8" 5'-4" 8'-0"




PROPOSED EQUIPMENT PLAN 4 A-1
SCALE: 3/8" = 1'-0"
0 2'-8" 5'-4" 8'-0"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LICENSED PROFESSIONAL CIVIL ENGINEER
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CHECKED BY: JMT

APPROVED BY: JMT

SUBMITTALS

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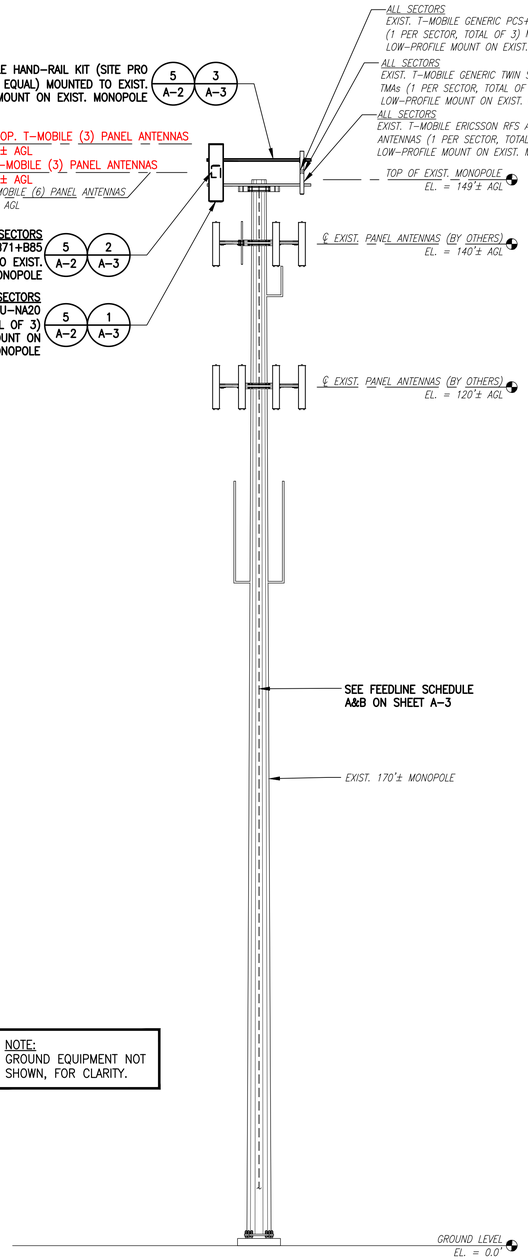
SPECIAL PRE-CONSTRUCTION WORK NOTE (SBA-PROVIDED TOWER STRUCTURAL ANALYSIS SPECIAL EQUIPMENT INSTALLATION REQUIREMENTS):
GENERAL CONTRACTOR SHALL FURNISH AND INSTALL ALL SPECIAL OR SUPPLEMENTAL ADDITIONAL TOWER-MOUNTED EQUIPMENT PER RECOMMENDATIONS FROM SBA-PROVIDED TOWER STRUCTURAL ANALYSIS FOR ANY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

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

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

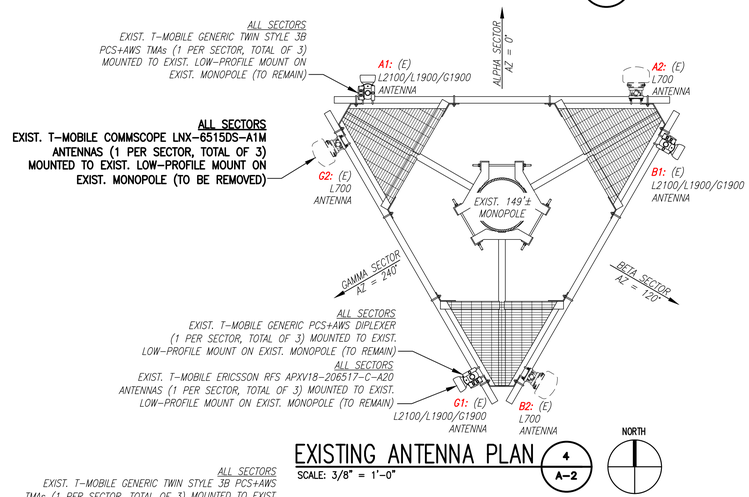
EXISTING TOWER PHOTO 1 A-2
N.T.S.



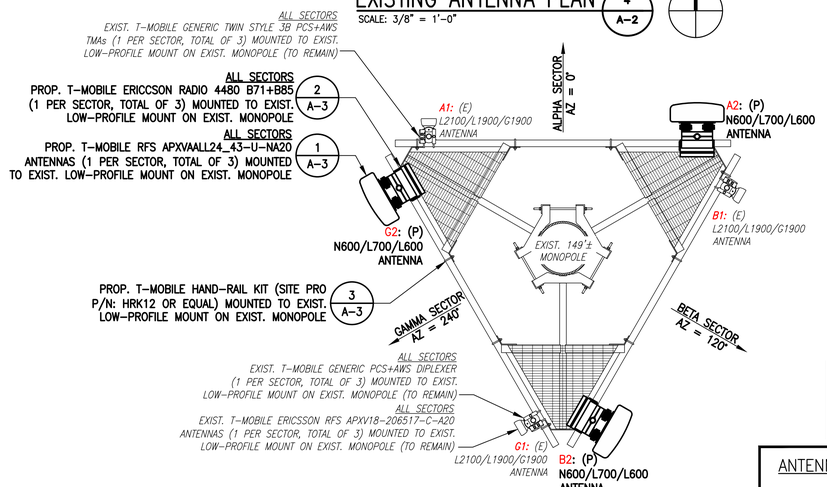

NOTE:
GROUND EQUIPMENT NOT SHOWN, FOR CLARITY.

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


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




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




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

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

ANTENNA STATUS LEGEND:

EMPTY – EMPTY PIPE

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


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

SBA
SBA COMMUNICATIONS CORP.
134 FLANDERS ROAD, SUITE 125
WESTBOROUGH, MA 01581
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CHAPPELL ENGINEERING ASSOCIATES, LLC
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201 BOSTON POST ROAD WEST, SUITE 101
MARLBOROUGH, MA 01752
(508) 481-7400
www.chappellengineering.com


STATE OF CONNECTICUT
JAMES M. FITZGERALD
No. 25937
LICENSED PROFESSIONAL CIVIL ENGINEER
5/17/2022

CHECKED BY: JMT

APPROVED BY: JMT

SUBMITTALS

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SITE NUMBER:
CTFF750A

SITE ADDRESS:
29 BOGUS HILL ROAD
NEW FAIRFIELD, CT 06812

SHEET TITLE
TOWER ELEVATIONS & ANTENNA PLANS

SHEET NUMBER
A-2

1815.481

## FINAL ANTENNA CONFIGURATION

| SECTOR | ANTENNA | RAD CENTER | AZIMUTH (TRUE NORTH) | MECHANICAL DOWNTILT | ELECTRICAL DOWNTILT | BAND | TMA/RADIOS | SIGNAL CABLES |
|---|---|---|---|---|---|---|---|---|
| ALPHA | A1 *RFS APXV18-206517S-C-A20* | 150'± AGL | *0°* | *0°* | *2°* | *L2100/1900/G1900* | *GENERIC TWIN STYLE 3B PCS+AWS TMA*<br>*GENERIC AWS/PCS DIPLEXER*<br>*FILTER* | *(3) 1-5/8"ø COAX CABLES*<br>**(1) 2" (6x24) HCS FIBER CABLE** |
| | A2 **RFS APXVAALL24_43-U-NA20** | 150'± AGL | **0°** | **0°** | **0°** | **L700/L600/N600** | **RADIO 4480 B71+B85** | |
| BETA | B1 *RFS APXV18-206517S-C-A20* | 150'± AGL | *120°* | *0°* | *2°* | *L2100/1900/G1900* | *GENERIC TWIN STYLE 3B PCS+AWS TMA*<br>*GENERIC AWS/PCS DIPLEXER*<br>*FILTER* | |
| | B2 **RFS APXVAALL24_43-U-NA20** | 150'± AGL | **120°** | **0°** | **0°** | **L700/L600/N600** | **RADIO 4480 B71+B85** | |
| GAMMA | G1 *RFS APXV18-206517S-C-A20* | 150'± AGL | *240°* | *0°* | *2°* | *L2100/1900/G1900* | *GENERIC TWIN STYLE 3B PCS+AWS TMA*<br>*GENERIC AWS/PCS DIPLEXER*<br>*FILTER* | |
| | G2 **RFS APXVAALL24_43-U-NA20** | 150'± AGL | **240°** | **0°** | **0°** | **L700/L600/N600** | **RADIO 4480 B71+B85** | |

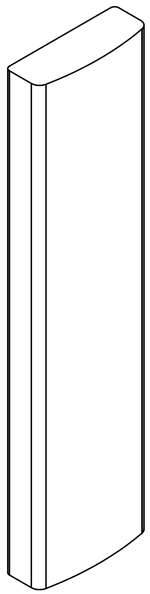
CABLE NOTE: EXISTING (3) 1-5/8"ø COAX CABLES TO BE REMOVED. SEE FEEDLINE SCHEDULE A & B BELOW.

NOTE: RFDS REV4 – 03/09/22

## FEEDLINE SCHEDULE

| SCHEDULE | FEEDLINES | LOCATION |
|---|---|---|
| A | *EXISTING TO REMAIN:* *(1) 1/2" COAX CABLE FOR GPS ANTENNA*<br>*(3) 1-5/8"ø COAX CABLES*<br>*EXISTING TO BE REMOVED:* *(3) 1-5/8"ø COAX CABLES* | ROUTED PER STRUCTURAL ANALYSIS |
| B | PROPOSED: (1) 2" (6x24) HCS FIBER CABLE | |

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

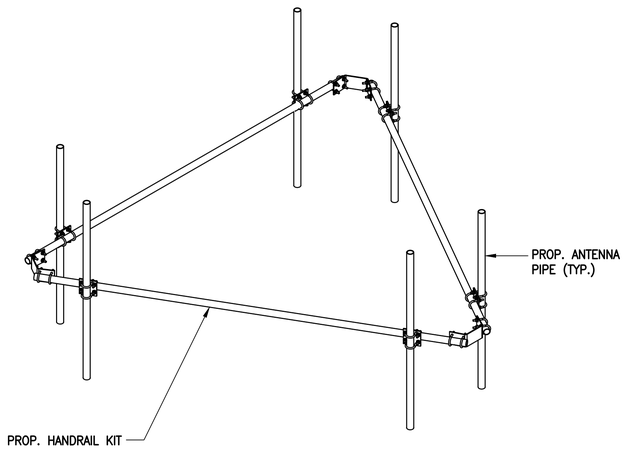


RFS APXVAALL24_43-U-NA20 ANTENNA
DIMENSIONS: 95.9"H x 24.0"W x 8.5"D
WEIGHT: 122.8 lbs
QUANTITY: 1 PER SECTOR, TOTAL OF 3

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

ERICSSON RADIO 4480 B71+B85
DIMENSIONS: 19.2"H x 15.1"W x 7.5"D
WEIGHT: 92.6 lbs
QUANTITY: 1 PER SECTOR, TOTAL OF 3

RADIO DETAILS (2 / A-3)
SCALE: N.T.S.




NOTE:
ANTENNAS & ANTENNA MOUNT NOT SHOWN, FOR CLARITY.

SITE-PRO HANDRAIL KIT
PART NUMBER: HRK12

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


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

SBA
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STATE OF CONNECTICUT
JAMES M. FITZGERALD
No. 25997
LICENSED PROFESSIONAL CIVIL ENGINEER
5/17/2022

CHECKED BY: JMT

APPROVED BY: JMT

SUBMITTALS

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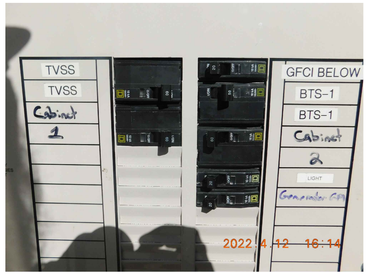
SITE NUMBER:
CTFF750A

SITE ADDRESS:
29 BOGUS HILL ROAD
NEW FAIRFIELD, CT 06812

SHEET TITLE
SITE DETAILS, ANTENNA & FEEDLINE CHARTS

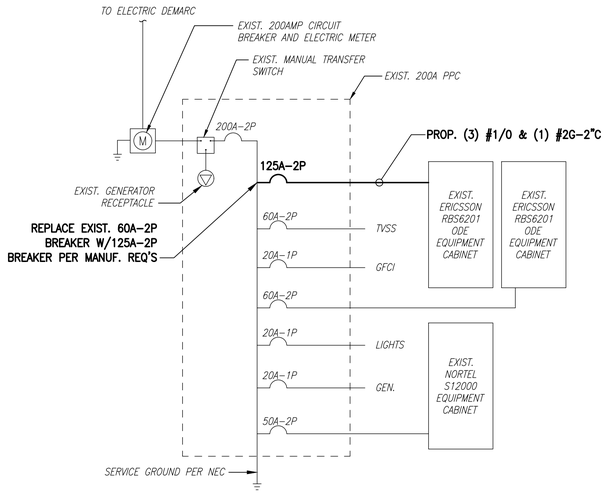
SHEET NUMBER
A-3

1815.481

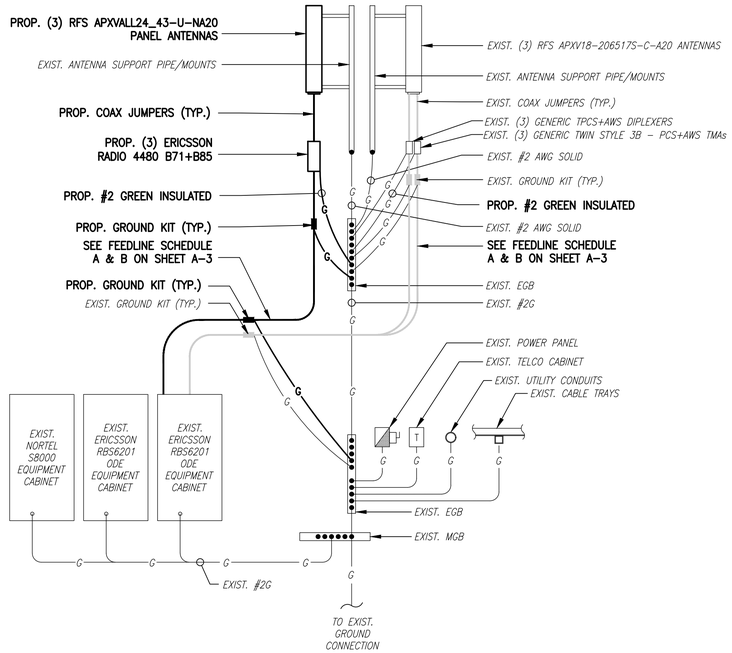

## EXISTING POWER PANEL PHOTOS

SCALE: NOT TO SCALE — 1 / E-1



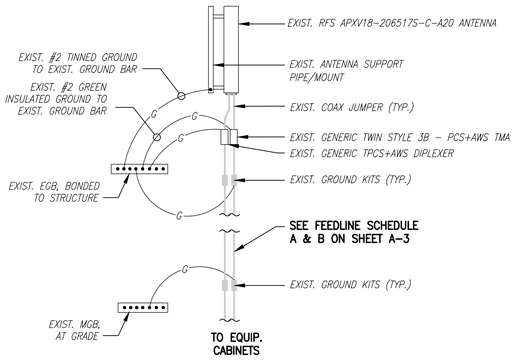

## ONE LINE DIAGRAM

SCALE: NOT TO SCALE — 2 / E-1

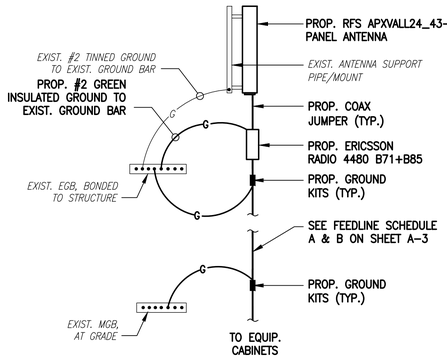



## GROUNDING RISER DIAGRAM

SCALE: NOT TO SCALE — 3 / E-1



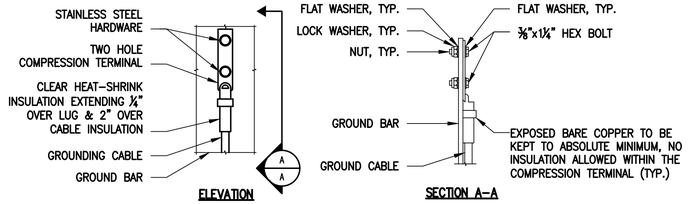

## L2100/L1900/G1900 ANTENNAS




## L700/L600/N600 ANTENNA

## COAX CABLE CONNECTION AND GROUNDING DETAIL

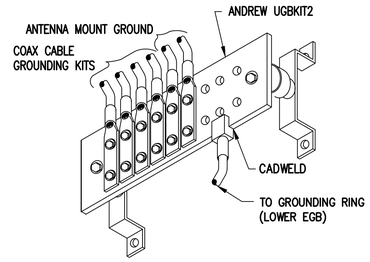
SCALE: NOT TO SCALE — 4 / E-1




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

## TYPICAL GROUND BAR CONNECTIONS DETAIL

SCALE: NOT TO SCALE — 5 / E-1




## GROUND BAR (EGB)

SCALE: NOT TO SCALE — 6 / E-1

## ELECTRICAL AND GROUNDING NOTES

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


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

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134 FLANDERS ROAD, SUITE 125
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STATE OF CONNECTICUT
JAMES M. FITZGERALD
No. 25937
LICENSED PROFESSIONAL CIVIL ENGINEER
5/17/2022

CHECKED BY: JMT

APPROVED BY: JMT

SUBMITTALS

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SITE NUMBER:
CTFF750A

SITE ADDRESS:
29 BOGUS HILL ROAD
NEW FAIRFIELD, CT 06812

SHEET TITLE
ELECTRIC & GROUNDING DETAILS

SHEET NUMBER
E-1

1815.481

# Exhibit D

## Structural Analysis Report

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

# Structural Analysis Report

**Existing 149 ft SABRE Monopole**

**Customer Name: SBA Communications Corp**

**Customer Site Number: CT13061-A**

**Customer Site Name: New Fairfield**

**Carrier Name: T-Mobile (App#: 194468-1)**

**Carrier Site ID / Name: CTFF750A / New Fairfield**

**Site Location: 29 Bogus Hill Road**

**New Fairfield, Connecticut**

**Fairfield County**

**Latitude: 41.511833**

**Longitude: -73.450528**


## Analysis Result:

**Max Structural Usage: 79.8% [Pass]**

**Max Foundation Usage: 83.0% [Pass]**

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

**Report Prepared By: Kevin Azisllari**

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

# Structural Analysis Report

**Existing 149 ft SABRE Monopole**

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## Analysis Result:

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**Max Foundation Usage: 83.0% [Pass]**

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

**Report Prepared By: Kevin Azisllari**

## Introduction

The purpose of this report is to summarize the analysis results on the 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** | Original structural design report & tower section data prepared by Sabre Communications Corporation. Dated 11-07-2006. Drawing No 07-11088-PE. Job No 07-11088.<br>Previous structural report prepared by FDH Engineering, Inc. Dated 03-12-2015. Project No 15BFZD1400. |
| **Foundation Drawing** | Original foundation design prepared by Sabre Communications Corporation. Dated 11-07-2006. Job No 07-11088. |
| **Geotechnical Report** | Geotechnical report prepared by JGI Eastern, Inc. Dated 10-12-2006. Project No 06645G. |
| **Modification Drawings** | N/A |
| **Mount Analysis** | TES 128769, dated 05/20/2022 |

## Analysis Criteria

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

| | |
|---|---|
| **Wind Speed Used in the Analysis:** | Ultimate Design Wind Speed $V_{ult}$ = 115.0 mph (3-Sec. Gust)/ Nominal Design Wind Speed $V_{asd}$ = 89.0 mph (3-Sec. Gust) |
| **Wind Speed with Ice:** | 50 mph (3-Sec. Gust) with 3/4" radial ice concurrent |
| **Operational Wind Speed:** | 60 mph + 0" Radial ice |
| **Standard/Codes:** | TIA-222-G-2 / 2015 IBC / 2018 Connecticut State Building Code |
| **Exposure Category:** | C |
| **Structure Class:** | II |
| **Topographic Category:** | 1 |
| **Crest Height:** | 0 ft |
| **Seismic Parameters:** | $S_S$ = 0.206, $S_1$ = 0.066 |

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 | 151.3 | 1 | RFS BA1010 - Whip | (1) Standoff Mount | (1) 7/8"[1] | Town Of New Fairfield |
| - | 150.0 | 3 | Commscope LNX-6515DS-VTM - Panel | Low Profile Platform | (18) 1 5/8" | T-Mobile |
| - | | 3 | RFS APXV18-209014 - Panel | | | |
| - | | 3 | RFS APXV18-206517S-A20 - Panel | | | |
| - | | 3 | Ericsson KRY 112 489/2 | | | |
| - | | 3 | Kathrein 782 11056 | | | |
| 8 | 142.0 | 3 | Ericsson RRUS 32 RRU | Low Profile Platform | (12) 1 5/8"<br>(2) 1/2" Fiber<br>(1) 3" Conduit<br>(4) 3/4" DC Power | AT&T |
| 9 | | 3 | Ericsson 4426 B66 RRU | | | |
| 10 | | 3 | Cci HPA-65R-BUU-H6 - Panel | | | |
| 11 | | 9 | Powerwave LGP-21401 TMA | | | |
| 12 | | 3 | Powerwave TT19-08BP111-001 TMA | | | |
| 13 | | 3 | Ericsson RRUS 11 RRU | | | |
| 14 | | 3 | Ericsson RRUS 12 RRU | | | |
| 15 | 141.0 | 3 | Ericsson RRUS-A2 RRU Modules | | | |
| 16 | | 2 | Raycap DC6-48-60-18-8F -SP | | | |
| 17 | | 3 | Powerwave 1001983 - Smart Bias Ts | | | |
| 18 | | 3 | Kathrein 80010798 - Panel | | | |
| 19 | | 6 | Kaelus DBCT108F1V92-1 Diplexer | | | |
| 20 | | 3 | Powerwave 7770 - Panel | | | |
| 21 | 134.8 | 1 | RFS BA40-01 - Whip | (1) Standoff Mount | (1) 7/8" | Town Of New Fairfield |
| 22 | 120.0 | 3 | Samsung MT6407-77A - Panel | Low Profile Platform + Modification [VZSMART-PLK1+PLK5+PLK7] | (10) 1 5/8"<br>(2) 1 5/8"<br>Hybrid | Verizon |
| 23 | | 3 | Samsung B2/B66A | | | |
| 24 | | 3 | Samsung B5/B13 | | | |
| 25 | | 1 | Raycap RC2DC-3315-PF-48 | | | |
| 26 | 119.5 | 6 | Antel LPA-80080-4CF-EDIN-0 - Panel | | | |
| 27 | | 6 | Andrew SBNHH-1D65B w/ Mount Pipe - Panel | | | |

## 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 |
|---|---|---|---|---|---|---|
| 2 | 150.0 | 3 | RFS APXV18-206517S-A20 - Panel | Low Profile Platform | (1) 1.9" Fiber<br>(16) 1 5/8" | T-Mobile |
| 3 | | 3 | RFS APXVAALL24_43-U-NA20 - Panel | | | |
| 4 | | 3 | RFS APXV18-209014 - Panel | | | |
| 5 | | 3 | Ericsson KRY 112 489/2 - TMA | | | |
| 6 | | 3 | Ericsson 4480 B71 + B85 - RRU | | | |
| 7 | | 3 | Kathrein 782 11056 - Bias Ts | | | |

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

## Analysis Results

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

| | Pole shafts | Anchor Bolts | Base Plate |
|---|---|---|---|
| Max. Usage: | **79.8%** | **76.6%** | **55.7%** |
| Pass/Fail | **Pass** | **Pass** | **Pass** |

## Foundations

| | Moment (Kip-Ft) | Shear (Kips) | Axial (Kips) |
|---|---|---|---|
| Analysis Reactions | 2947.2 | 26.5 | 65.7 |

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

## Operational Condition (Rigidity):

Operational characteristics of the tower are found to be within the limits prescribed by TIA-222 for the installed antennas. The maximum twist/sway at the elevation of the proposed equipment is 1.7794 degrees under the operational wind speed as specified in the Analysis Criteria.

## Conclusions

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

# Standard Conditions

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

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

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

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

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

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

# Usage Diagram - Max Ratio 79.81% at 0.0ft

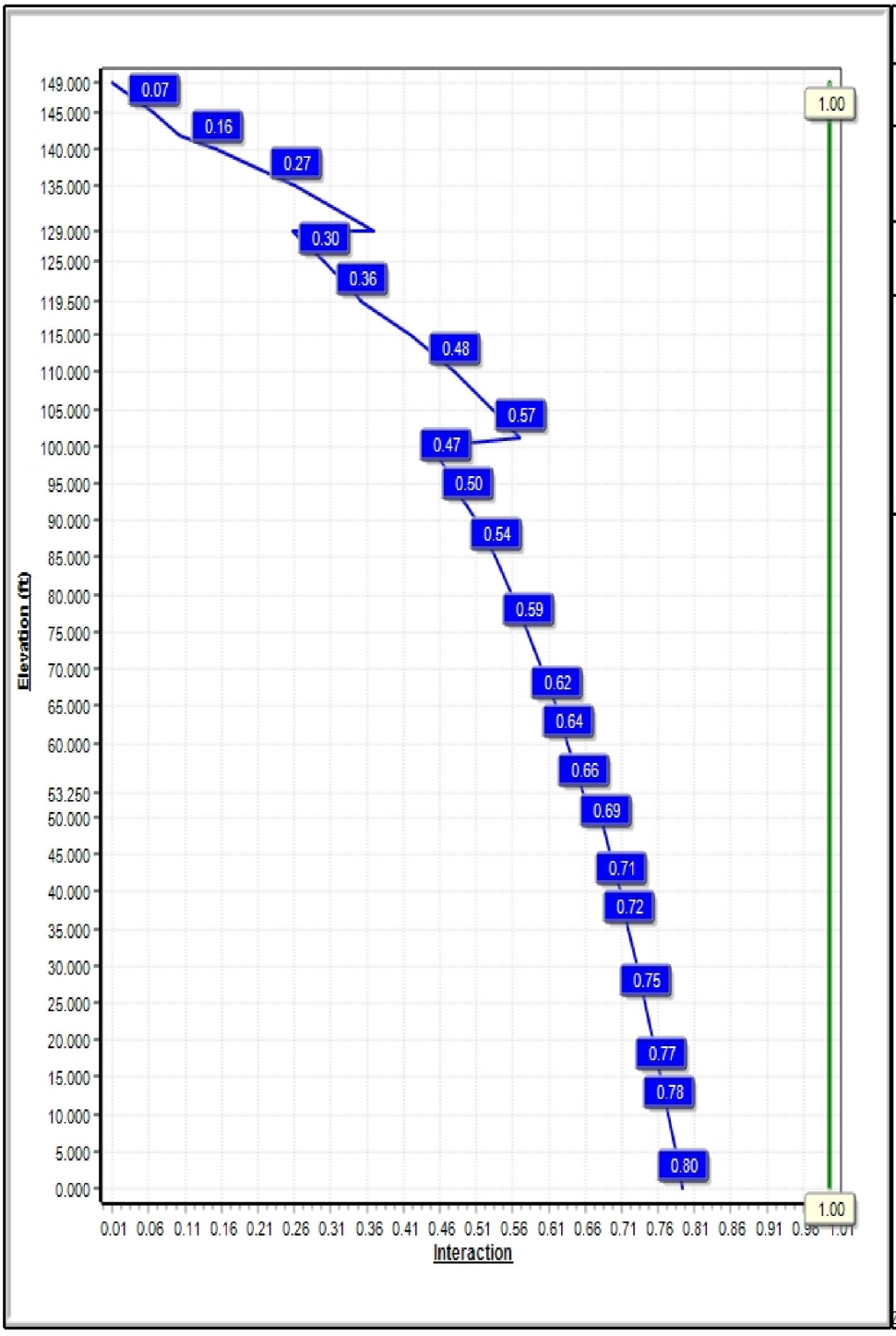
| | | | | |
|---|---|---|---|---|
| **Structure:** | CT13061-A-SBA | **Code:** | EIA/TIA-222-G | 5/31/2022 |
| **Site Name:** | New Fairfield | **Exposure:** | C | |
| **Height:** | 149.00 (ft) | **Gh:** | 1.1 | |
| **Base Elev:** | 1.000 (ft) | | | Page: 1 |

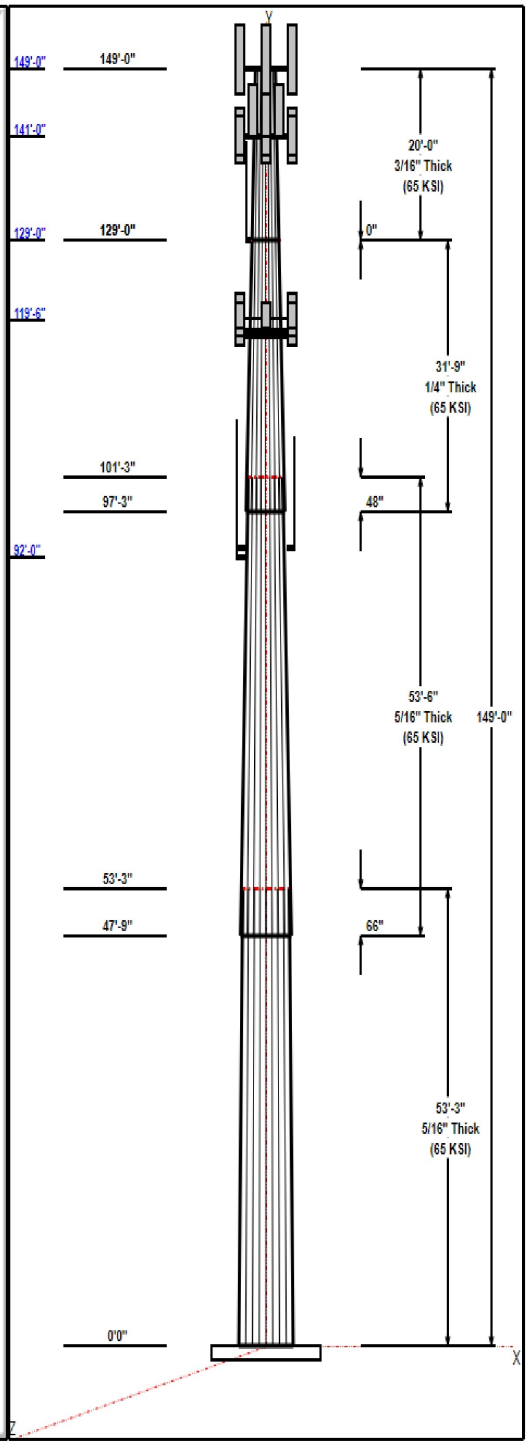
Tower Engineering Solutions

| | | | |
|---|---|---|---|
| Dead Load Factor: | 1.20 | **Iterations:** | 25 |
| Wind Load Factor: | 1.60 | | |

**Load Case : 1.2D + 1.6W 89 mph Wind**





# Structure: CT13061-A-SBA

**Type:** Tapered
**Site Name:** New Fairfield
**Height:** 149.00 (ft)
**Base Elev:** 1.00 (ft)

**Base Shape:** 18 Sided
**Taper:** 0.25534

5/31/2022



Tower Engineering Solutions

## Shaft Properties

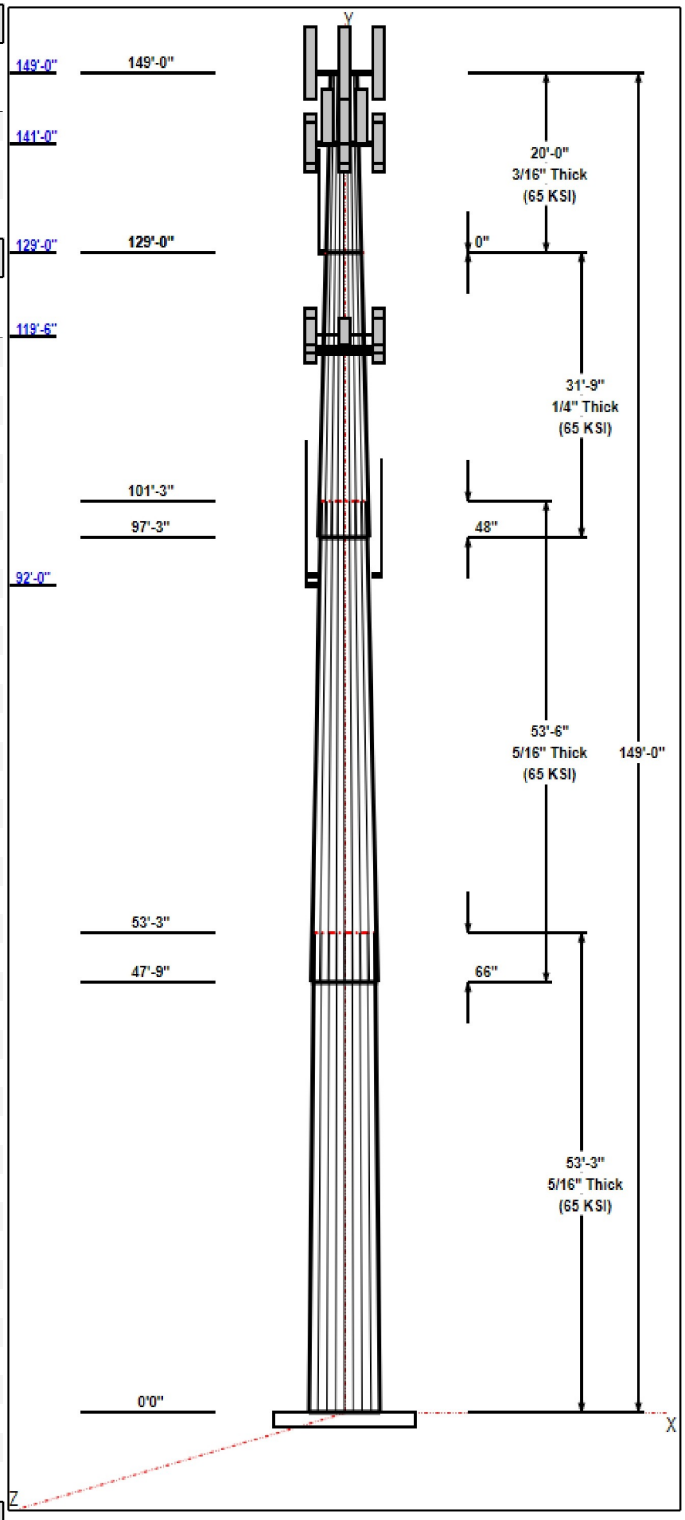
| Seq | Length (ft) | Top (in) | Bottom (in) | Thick (in) | Joint Type | Taper | Grade (ksi) |
|---|---|---|---|---|---|---|---|
| 1 | 53.25 | 42.32 | 55.92 | 0.313 | | 0.25534 | 65 |
| 2 | 53.50 | 30.69 | 44.35 | 0.313 | Slip | 0.25534 | 65 |
| 3 | 31.75 | 24.11 | 32.21 | 0.250 | Slip | 0.25534 | 65 |
| 4 | 20.00 | 19.00 | 24.11 | 0.188 | Butt | 0.25534 | 65 |

## Discrete Appurtenances

| Attach Elev (ft) | Force Elev (ft) | Qty | Description | Carrier |
|---|---|---|---|---|
| 149.00 | 152.50 | 1 | Lightning Rod | --- |
| 149.00 | 151.35 | 1 | RFS BA1010 | T. Of New Fairfield |
| 149.00 | 150.00 | 1 | Low Profile Platform | T-Mobile |
| 149.00 | 149.00 | 1 | Standoff Mount | T. Of New Fairfield |
| 149.00 | 150.00 | 3 | RFS | T-Mobile |
| 149.00 | 150.00 | 3 | RFS | T-Mobile |
| 149.00 | 150.00 | 3 | RFS APXV18-209014 | T-Mobile |
| 149.00 | 150.00 | 3 | Ericsson KRY 112 489/2 | T-Mobile |
| 149.00 | 150.00 | 3 | Ericsson 4480 B71 + B85 | T-Mobile |
| 149.00 | 150.00 | 3 | Kathrein 782 11056 | T-Mobile |
| 142.00 | 142.00 | 3 | Ericsson RRUS 32 RRU | AT&T |
| 142.00 | 142.00 | 3 | Ericsson 4426 B66 RRU | AT&T |
| 142.00 | 144.00 | 3 | Cci HPA-65R-BUU-H6 | AT&T |
| 142.00 | 144.00 | 9 | Powerwave LGP-21401 | AT&T |
| 142.00 | 144.00 | 3 | Powerwave | AT&T |
| 142.00 | 142.00 | 3 | Ericsson RRUS 11 RRU | AT&T |
| 142.00 | 144.00 | 3 | Ericsson RRUS 12 RRU | AT&T |
| 141.00 | 141.00 | 3 | Ericsson RRUS-A2 RRU | AT&T |
| 141.00 | 141.00 | 2 | Raycap DC6-48-60-18-8F | AT&T |
| 141.00 | 141.00 | 3 | Powerwave 1001983 | AT&T |
| 141.00 | 141.00 | 1 | Low Profile Platform | AT&T |
| 141.00 | 141.00 | 3 | Powerwave 7770 | AT&T |
| 141.00 | 141.00 | 3 | Kathrein 80010798 | AT&T |
| 141.00 | 141.00 | 6 | Kaelus DBCT108F1V92-1 | AT&T |
| 129.00 | 134.75 | 1 | RFS BA40-01 | T. Of New Fairfield |
| 129.00 | 129.00 | 1 | Standoff Mount | T. Of New Fairfield |
| 119.50 | 119.50 | 6 | Antel | Verizon |
| 119.50 | 120.00 | 3 | MT6407-77A | Verizon |
| 119.50 | 120.00 | 3 | B2/B66A RRH-BR049 | Verizon |
| 119.50 | 120.00 | 3 | B5/B13 RRH-BR04C | Verizon |
| 119.50 | 119.50 | 1 | MS-H1242 (Heavy Collar | Verizon |
| 119.50 | 119.50 | 1 | MS-KI22-5 (Kickers w/o | Verizon |
| 119.50 | 120.00 | 1 | HRK12 (Handrail Kit) | Verizon |
| 119.50 | 120.00 | 1 | Andrew | Verizon |
| 119.50 | 119.50 | 6 | Andrew SBNHH-1D65B | Verizon |
| 119.50 | 119.50 | 1 | Low Profile Platform | Verizon |
| 93.00 | 99.50 | 2 | RFS 1142 | CL&P |
| 93.00 | 93.00 | 2 | Single Arm Mount | CL&P |
| 92.00 | 100.00 | 1 | Sinclair SD210-SF3P2LDF | CL&P |
| 92.00 | 92.00 | 1 | Single Arm Mount | CL&P |

## Linear Appurtenances

| Elev From (ft) | Elev To (ft) | Placement | Description | Carrier |
|---|---|---|---|---|
| 3.00 | 149.00 | Inside | 1 5/8" Coax | T-Mobile |
| 3.00 | 149.00 | Inside | 1.68" Fiber | T-Mobile |



| | | | | |
|---|---|---|---|---|
| 3.00 | 149.00 | Inside | 7/8" Coax | T. Of New Fairfield |
| 94.00 | 149.00 | Outside | 7/8" Coax | T. Of New Fairfield |
| 3.00 | 141.00 | Inside | 1 5/8" Coax | AT&T |
| 3.00 | 141.00 | Inside | 1/2" Fiber | AT&T |
| 3.00 | 141.00 | Inside | 3" Conduit | AT&T |
| 3.00 | 141.00 | Inside | 3/4" DC | AT&T |
| 3.00 | 129.00 | Inside | 7/8" Coax | T. Of New Fairfield |
| 3.00 | 120.00 | Inside | 1 5/8" Coax | Verizon |
| 3.00 | 120.00 | Inside | 1 5/8" Hybrid | Verizon |
| 3.00 | 93.00 | Inside | 7/8" Coax | CL&P |
| 3.00 | 92.00 | Inside | 7/8" Coax | CL&P |

### Anchor Bolts

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

### Base Plate

| Thickness (in) | Specifications (in) | Grade (ksi) | Geometry |
|---|---|---|---|
| 2.7500 | 59.8 | 60.0 | Clipped |

### Reactions

| Load Case | Moment (FT-Kips) | Shear (Kips) | Axial (Kips) |
|---|---|---|---|
| 1.2D + 1.6W 89 mph Wind | 2947.2 | 26.5 | 41.5 |
| 0.9D + 1.6W 89 mph Wind | 2910.2 | 26.5 | 31.1 |
| 1.2D + 1.0Di + 1.0Wi 50 mph Wind | 1013.4 | 9.1 | 65.7 |
| 1.2D + 1.0E | 246.7 | 2.0 | 41.5 |
| 0.9D + 1.0E | 243.3 | 2.0 | 31.1 |
| 1.0D + 1.0W 60 mph Wind | 831.3 | 7.5 | 34.6 |

# Structure: CT13061-A-SBA - Coax Line Placement

**Type:** Monopole
**Site Name:** New Fairfield
**Height:** 149.00 (ft)

5/31/2022



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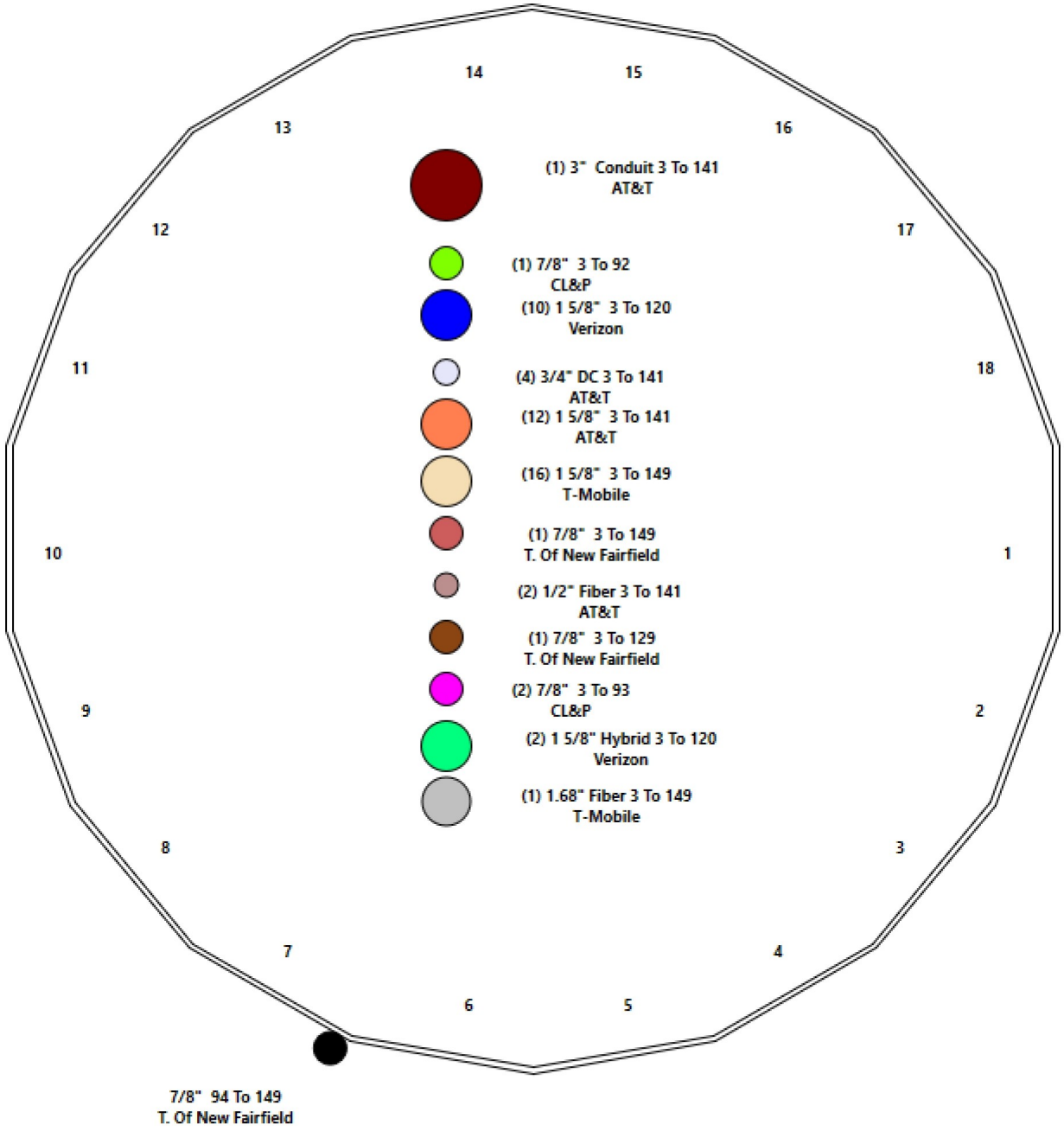


# Shaft Properties

| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT13061-A-SBA | | **Code:** | TIA-222-G | 5/31/2022 |
| **Site Name:** | New Fairfield | | **Exposure:** | C | |
| **Height:** | 149.00 (ft) | | **Crest Height:** | 0.00 | |
| **Base Elev:** | 1.000 (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 | 0.3125 | 65 | | 0.00 | 8,772 |
| 2 | 18 | 53.500 | 0.3125 | 65 | Slip | 66.00 | 6,719 |
| 3 | 18 | 31.750 | 0.2500 | 65 | Slip | 48.00 | 2,393 |
| 4 | 18 | 20.000 | 0.1875 | 65 | Flange | 0.00 | 865 |
| | | | | | **Total Shaft Weight:** | | **18,749** |

| | 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 | 55.92 | 0.00 | 55.15 | 21547.38 | 30.14 | 178.94 | 42.32 | 53.25 | 41.67 | 9291.37 | 22.47 | 135.4 | 0.255336 |
| 2 | 44.35 | 47.75 | 43.68 | 10703.92 | 23.62 | 141.93 | 30.69 | 101.25 | 30.13 | 3513.56 | 15.91 | 98.22 | 0.255336 |
| 3 | 32.21 | 97.25 | 25.36 | 3273.80 | 21.31 | 128.85 | 24.11 | 129.00 | 18.93 | 1361.18 | 15.59 | 96.43 | 0.255336 |
| 4 | 24.11 | 129.0 | 14.23 | 1028.93 | 21.26 | 128.57 | 19.00 | 149.00 | 11.20 | 500.59 | 16.46 | 101.3 | 0.255336 |

# Load Summary

| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT13061-A-SBA | **Code:** | TIA-222-G | 5/31/2022 | |
| **Site Name:** | New Fairfield | **Exposure:** | C | | |
| **Height:** | 149.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 1.000 (ft) | **Site Class:** | D - Stiff Soil | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 6 | |

## 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 | Lightning Rod | 1 | 35.00 | 1.05 | 1.00 | 66.41 | 3.424 | 1.00 | 0.00 | 3.50 |
| 2 | 149.00 | RFS BA1010 | 1 | 8.80 | 1.24 | 1.00 | 73.68 | 2.274 | 1.00 | 0.00 | 2.35 |
| 3 | 149.00 | Low Profile Platform | 1 | 1500.00 | 22.00 | 1.00 | 2808.91 | 39.662 | 1.00 | 0.00 | 1.00 |
| 4 | 149.00 | Standoff Mount | 1 | 60.00 | 1.80 | 1.00 | 180.42 | 5.885 | 1.00 | 0.00 | 0.00 |
| 5 | 149.00 | RFS APXV18-206517S-A20 | 3 | 26.40 | 5.17 | 0.73 | 119.25 | 7.545 | 0.73 | 0.00 | 1.00 |
| 6 | 149.00 | RFS APXVAALL24_43-U-NA20 | 3 | 122.80 | 20.24 | 0.73 | 550.50 | 22.140 | 0.73 | 0.00 | 1.00 |
| 7 | 149.00 | RFS APXV18-209014 | 3 | 18.70 | 3.58 | 0.74 | 107.36 | 4.512 | 0.74 | 0.00 | 1.00 |
| 8 | 149.00 | Ericsson KRY 112 489/2 | 3 | 13.20 | 0.68 | 0.67 | 31.27 | 1.327 | 0.67 | 0.00 | 1.00 |
| 9 | 149.00 | Ericsson 4480 B71 + B85 | 3 | 93.00 | 2.85 | 0.67 | 164.93 | 3.525 | 0.67 | 0.00 | 1.00 |
| 10 | 149.00 | Kathrein 782 11056 | 3 | 2.60 | 0.28 | 0.67 | 9.13 | 0.681 | 0.67 | 0.00 | 1.00 |
| 11 | 142.00 | Ericsson RRUS 32 RRU | 3 | 77.00 | 1.65 | 0.70 | 125.18 | 2.227 | 0.70 | 0.00 | 0.00 |
| 12 | 142.00 | Ericsson 4426 B66 RRU | 3 | 48.50 | 1.15 | 0.73 | 87.38 | 1.622 | 0.73 | 0.00 | 0.00 |
| 13 | 142.00 | Cci HPA-65R-BUU-H6 | 3 | 50.70 | 9.66 | 0.85 | 297.43 | 11.019 | 0.85 | 0.00 | 2.00 |
| 14 | 142.00 | Powerwave LGP-21401 TMA | 9 | 14.10 | 1.05 | 1.00 | 38.98 | 1.727 | 1.00 | 0.00 | 2.00 |
| 15 | 142.00 | Powerwave TT19-08BP111-001 TMA | 3 | 16.00 | 0.55 | 0.90 | 36.14 | 1.057 | 0.90 | 0.00 | 2.00 |
| 16 | 142.00 | Ericsson RRUS 11 RRU | 3 | 55.00 | 2.52 | 0.78 | 121.11 | 3.150 | 0.78 | 0.00 | 0.00 |
| 17 | 142.00 | Ericsson RRUS 12 RRU | 3 | 50.00 | 3.15 | 0.70 | 111.63 | 4.400 | 0.70 | 0.00 | 2.00 |
| 18 | 141.00 | Ericsson RRUS-A2 RRU Modules | 3 | 15.00 | 1.57 | 0.67 | 40.41 | 2.388 | 0.67 | 0.00 | 0.00 |
| 19 | 141.00 | Raycap DC6-48-60-18-8F | 2 | 32.80 | 2.20 | 1.00 | 118.86 | 3.345 | 1.00 | 0.00 | 0.00 |
| 20 | 141.00 | Powerwave 1001983 Smart Bias Ts | 3 | 2.90 | 0.11 | 1.00 | 6.55 | 0.298 | 1.00 | 0.00 | 0.00 |
| 21 | 141.00 | Low Profile Platform | 1 | 1500.00 | 22.00 | 1.00 | 2801.76 | 39.565 | 1.00 | 0.00 | 0.00 |
| 22 | 141.00 | Powerwave 7770 | 3 | 35.00 | 5.51 | 0.73 | 216.16 | 6.559 | 0.73 | 0.00 | 0.00 |
| 23 | 141.00 | Kathrein 80010798 | 3 | 86.30 | 10.69 | 0.78 | 327.73 | 12.130 | 0.78 | 0.00 | 0.00 |
| 24 | 141.00 | Kaelus DBCT108F1V92-1 Diplexer | 6 | 16.70 | 0.71 | 0.70 | 34.98 | 1.063 | 0.70 | 0.00 | 0.00 |
| 25 | 129.00 | RFS BA40-01 | 1 | 32.00 | 3.45 | 1.00 | 96.87 | 10.079 | 1.00 | 0.00 | 5.75 |
| 26 | 129.00 | Standoff Mount | 1 | 60.00 | 1.80 | 1.00 | 178.71 | 5.827 | 1.00 | 0.00 | 0.00 |
| 27 | 119.50 | Antel LPA-80080-4CF-EDIN-0 | 6 | 12.00 | 5.40 | 0.74 | 125.12 | 7.218 | 0.74 | 0.00 | 0.00 |
| 28 | 119.50 | MT6407-77A | 3 | 79.40 | 4.69 | 0.70 | 195.82 | 5.616 | 0.72 | 0.00 | 0.50 |
| 29 | 119.50 | B2/B66A RRH-BR049 | 3 | 84.40 | 1.87 | 0.67 | 158.91 | 2.430 | 0.70 | 0.00 | 0.50 |
| 30 | 119.50 | B5/B13 RRH-BR04C (RFV01U-D2A) | 3 | 70.30 | 1.87 | 0.67 | 137.78 | 2.430 | 0.70 | 0.00 | 0.50 |
| 31 | 119.50 | MS-H1242 (Heavy Collar Mount) | 1 | 150.00 | 2.50 | 1.00 | 354.89 | 5.061 | 1.00 | 0.00 | 0.00 |
| 32 | 119.50 | MS-KI22-5 (Kickers w/o Collar) | 1 | 291.00 | 8.00 | 1.00 | 688.49 | 16.196 | 1.00 | 0.00 | 0.00 |
| 33 | 119.50 | HRK12 (Handrail Kit) | 1 | 504.00 | 8.20 | 1.00 | 1089.16 | 16.040 | 1.00 | 0.00 | 0.50 |
| 34 | 119.50 | Andrew RC2DC-3315-PF-48 | 1 | 32.00 | 3.79 | 1.00 | 144.22 | 4.724 | 1.00 | 0.00 | 0.50 |
| 35 | 119.50 | Andrew SBNHH-1D65B (119.5) | 6 | 40.00 | 8.16 | 0.83 | 237.91 | 9.430 | 0.83 | 0.00 | 0.00 |
| 36 | 119.50 | Low Profile Platform | 1 | 1500.00 | 22.00 | 1.00 | 2780.56 | 39.279 | 1.00 | 0.00 | 0.00 |
| 37 | 93.00 | RFS 1142 | 2 | 10.00 | 3.90 | 1.00 | 29.15 | 12.347 | 1.00 | 0.00 | 6.50 |
| 38 | 93.00 | Single Arm Mount | 2 | 60.00 | 1.80 | 1.00 | 174.92 | 5.699 | 1.00 | 0.00 | 0.00 |
| 39 | 92.00 | Sinclair SD210-SF3P2LDF | 1 | 18.50 | 4.80 | 1.00 | 75.64 | 11.543 | 1.00 | 0.00 | 8.00 |
| 40 | 92.00 | Single Arm Mount | 1 | 60.00 | 1.80 | 1.00 | 174.80 | 5.694 | 1.00 | 0.00 | 0.00 |
| | | **Totals:** | **104** | **9,337.60** | | | **23,433.30** | | | | |

## Linear Appurtenances

| Bottom Elev. (ft) | Top Elev. (ft) | Description | Exposed Width | Exposed |
|---|---|---|---|---|
| 3.00 | 149.00 | (16) 1 5/8" Coax | 0.00 | Inside |

## Discrete Appurtenances

| No. | Elev (ft) | Description | Qty | No Ice Weight (lb) | No Ice CaAa (sf) | No Ice CaAa Factor | Ice Weight (lb) | Ice CaAa (sf) | Ice CaAa Factor | Hor. Ecc. (ft) | Vert Ecc (ft) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 3.00 | 149.00 | (1) 1.68" Fiber | | | 0.00 | Inside | | | | | |
| 3.00 | 149.00 | (1) 7/8" Coax | | | 0.00 | Inside | | | | | |
| 94.00 | 149.00 | (1) 7/8" Coax | | | 1.11 | Outside | | | | | |
| 3.00 | 141.00 | (12) 1 5/8" Coax | | | 0.00 | Inside | | | | | |
| 3.00 | 141.00 | (2) 1/2" Fiber | | | 0.00 | Inside | | | | | |
| 3.00 | 141.00 | (1) 3" Conduit | | | 0.00 | Inside | | | | | |
| 3.00 | 141.00 | (4) 3/4" DC | | | 0.00 | Inside | | | | | |
| 3.00 | 129.00 | (1) 7/8" Coax | | | 0.00 | Inside | | | | | |
| 3.00 | 120.00 | (10) 1 5/8" Coax | | | 0.00 | Inside | | | | | |
| 3.00 | 120.00 | (2) 1 5/8" Hybrid | | | 0.00 | Inside | | | | | |
| 3.00 | 93.00 | (2) 7/8" Coax | | | 0.00 | Inside | | | | | |
| 3.00 | 92.00 | (1) 7/8" Coax | | | 0.00 | Inside | | | | | |

# Shaft Section Properties

| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT13061-A-SBA | **Code:** | TIA-222-G | 5/31/2022 | |
| **Site Name:** | New Fairfield | **Exposure:** | C | | |
| **Height:** | 149.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 1.000 (ft) | **Site Class:** | D - Stiff Soil | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 8 | |

Tower Engineering Solutions

**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 | | 0.3125 | 55.920 | 55.154 | 21547.4 | 30.14 | 178.94 | 65.9 | 758.9 | 0.0 |
| 5.00 | | 0.3125 | 54.643 | 53.887 | 20097.1 | 29.42 | 174.86 | 66.8 | 724.4 | 927.6 |
| 10.00 | | 0.3125 | 53.367 | 52.621 | 18713.4 | 28.70 | 170.77 | 67.6 | 690.7 | 906.1 |
| 15.00 | | 0.3125 | 52.090 | 51.355 | 17394.7 | 27.98 | 166.69 | 68.5 | 657.7 | 884.5 |
| 20.00 | | 0.3125 | 50.813 | 50.089 | 16139.5 | 27.26 | 162.60 | 69.3 | 625.6 | 863.0 |
| 25.00 | | 0.3125 | 49.537 | 48.822 | 14946.1 | 26.54 | 158.52 | 70.2 | 594.3 | 841.4 |
| 30.00 | | 0.3125 | 48.260 | 47.556 | 13813.1 | 25.82 | 154.43 | 71.0 | 563.7 | 819.9 |
| 35.00 | | 0.3125 | 46.983 | 46.290 | 12738.8 | 25.10 | 150.35 | 71.9 | 534.0 | 798.3 |
| 40.00 | | 0.3125 | 45.707 | 45.024 | 11721.7 | 24.38 | 146.26 | 72.7 | 505.1 | 776.8 |
| 45.00 | | 0.3125 | 44.430 | 43.757 | 10760.3 | 23.66 | 142.18 | 73.6 | 477.0 | 755.3 |
| 47.75 | Bot - Section 2 | 0.3125 | 43.728 | 43.061 | 10254.6 | 23.26 | 139.93 | 74.0 | 461.9 | 406.2 |
| 50.00 | | 0.3125 | 43.153 | 42.491 | 9852.9 | 22.94 | 138.09 | 74.4 | 449.7 | 659.8 |
| 53.25 | Top - Section 1 | 0.3125 | 42.948 | 42.288 | 9712.3 | 22.82 | 137.43 | 0.0 | 0.0 | 937.6 |
| 55.00 | | 0.3125 | 42.502 | 41.845 | 9410.1 | 22.57 | 136.00 | 74.9 | 436.1 | 250.5 |
| 60.00 | | 0.3125 | 41.225 | 40.578 | 8581.4 | 21.85 | 131.92 | 75.7 | 410.0 | 701.2 |
| 65.00 | | 0.3125 | 39.948 | 39.312 | 7802.9 | 21.13 | 127.83 | 76.5 | 384.7 | 679.6 |
| 70.00 | | 0.3125 | 38.672 | 38.046 | 7072.9 | 20.41 | 123.75 | 77.4 | 360.2 | 658.1 |
| 75.00 | | 0.3125 | 37.395 | 36.780 | 6389.9 | 19.69 | 119.66 | 78.2 | 336.6 | 636.5 |
| 80.00 | | 0.3125 | 36.118 | 35.513 | 5752.4 | 18.97 | 115.58 | 79.1 | 313.7 | 615.0 |
| 85.00 | | 0.3125 | 34.841 | 34.247 | 5158.8 | 18.25 | 111.49 | 79.9 | 291.6 | 593.4 |
| 90.00 | | 0.3125 | 33.565 | 32.981 | 4607.4 | 17.53 | 107.41 | 80.8 | 270.4 | 571.9 |
| 92.00 | | 0.3125 | 33.054 | 32.474 | 4398.4 | 17.24 | 105.77 | 81.1 | 262.1 | 222.7 |
| 93.00 | | 0.3125 | 32.799 | 32.221 | 4296.3 | 17.10 | 104.96 | 81.3 | 258.0 | 110.1 |
| 95.00 | | 0.3125 | 32.288 | 31.715 | 4096.9 | 16.81 | 103.32 | 81.6 | 249.9 | 217.6 |
| 97.25 | Bot - Section 3 | 0.3125 | 31.714 | 31.145 | 3880.0 | 16.48 | 101.48 | 82.0 | 241.0 | 240.6 |
| 100.00 | | 0.3125 | 31.011 | 30.448 | 3625.5 | 16.09 | 99.24 | 82.5 | 230.3 | 522.9 |
| 101.25 | Top - Section 2 | 0.2500 | 31.192 | 24.552 | 2969.9 | 20.59 | 124.77 | 0.0 | 0.0 | 233.8 |
| 105.00 | | 0.2500 | 30.235 | 23.792 | 2702.6 | 19.91 | 120.94 | 78.0 | 176.1 | 308.4 |
| 110.00 | | 0.2500 | 28.958 | 22.779 | 2371.9 | 19.01 | 115.83 | 79.0 | 161.3 | 396.2 |
| 115.00 | | 0.2500 | 27.681 | 21.766 | 2069.3 | 18.11 | 110.73 | 80.1 | 147.2 | 378.9 |
| 119.50 | | 0.2500 | 26.532 | 20.854 | 1820.0 | 17.30 | 106.13 | 81.0 | 135.1 | 326.3 |
| 120.00 | | 0.2500 | 26.405 | 20.753 | 1793.6 | 17.21 | 105.62 | 81.2 | 133.8 | 35.4 |
| 125.00 | | 0.2500 | 25.128 | 19.740 | 1543.6 | 16.31 | 100.51 | 82.2 | 121.0 | 344.5 |
| 129.00 | Top - Section 3 | 0.2500 | 24.107 | 18.930 | 1361.2 | 15.59 | 96.43 | 82.5 | 111.2 | 263.2 |
| 129.00 | Bot - Section 4 | 0.1875 | 24.107 | 14.234 | 1028.9 | 20.79 | 128.57 | 76.4 | 84.1 | |
| 130.00 | | 0.1875 | 23.851 | 14.082 | 996.3 | 21.02 | 127.21 | 76.7 | 82.3 | 48.2 |
| 135.00 | | 0.1875 | 22.575 | 13.323 | 843.6 | 19.82 | 120.40 | 78.1 | 73.6 | 233.1 |
| 140.00 | | 0.1875 | 21.298 | 12.563 | 707.4 | 18.62 | 113.59 | 79.5 | 65.4 | 220.2 |
| 141.00 | | 0.1875 | 21.043 | 12.411 | 682.0 | 18.38 | 112.23 | 79.8 | 63.8 | 42.5 |
| 142.00 | | 0.1875 | 20.787 | 12.259 | 657.3 | 18.14 | 110.87 | 80.1 | 62.3 | 42.0 |
| 145.00 | | 0.1875 | 20.021 | 11.803 | 586.6 | 17.42 | 106.78 | 80.9 | 57.7 | 122.8 |
| 149.00 | | 0.1875 | 19.000 | 11.195 | 500.6 | 16.46 | 101.33 | 82.0 | 51.9 | 156.5 |
| | | | | | | | | | | **18748.6** |

# Wind Loading - Shaft

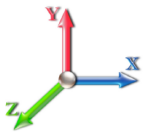
| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT13061-A-SBA | **Code:** | TIA-222-G | 5/31/2022 | |
| **Site Name:** | New Fairfield | **Exposure:** | C | | |
| **Height:** | 149.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 1.000 (ft) | **Site Class:** | D - Stiff Soil | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 9 | |

Tower Engineering Solutions

**Load Case:** 1.2D + 1.6W 89 mph Wind

**Dead Load Factor** 1.20

**Wind Load Factor** 1.60




**Iterations** 25

| 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 | 16.374 | 18.01 | 388.27 | 0.650 | 0.000 | 0.00 | 0.000 | 0.00 | 0.0 | 0.0 | 0.0 |
| 5.00 | | 1.00 | 0.85 | 16.374 | 18.01 | 379.41 | 0.650 | 0.000 | 5.00 | 23.389 | 15.20 | 438.1 | 0.0 | 1113.1 |
| 10.00 | | 1.00 | 0.85 | 16.374 | 18.01 | 370.54 | 0.650 | 0.000 | 5.00 | 22.849 | 14.85 | 428.0 | 0.0 | 1087.3 |
| 15.00 | | 1.00 | 0.86 | 16.576 | 18.23 | 363.90 | 0.650 | 0.000 | 5.00 | 22.309 | 14.50 | 423.1 | 0.0 | 1061.4 |
| 20.00 | | 1.00 | 0.91 | 17.553 | 19.31 | 365.29 | 0.650 | 0.000 | 5.00 | 21.769 | 14.15 | 437.1 | 0.0 | 1035.6 |
| 25.00 | | 1.00 | 0.95 | 18.360 | 20.20 | 364.21 | 0.650 | 0.000 | 5.00 | 21.229 | 13.80 | 445.9 | 0.0 | 1009.7 |
| 30.00 | | 1.00 | 0.99 | 19.053 | 20.96 | 361.46 | 0.650 | 0.000 | 5.00 | 20.689 | 13.45 | 450.9 | 0.0 | 983.9 |
| 35.00 | | 1.00 | 1.02 | 19.662 | 21.63 | 357.48 | 0.650 | 0.000 | 5.00 | 20.148 | 13.10 | 453.2 | 0.0 | 958.0 |
| 40.00 | | 1.00 | 1.05 | 20.208 | 22.23 | 352.56 | 0.650 | 0.000 | 5.00 | 19.608 | 12.75 | 453.3 | 0.0 | 932.2 |
| 45.00 | | 1.00 | 1.07 | 20.704 | 22.77 | 346.88 | 0.650 | 0.000 | 5.00 | 19.068 | 12.39 | 451.6 | 0.0 | 906.3 |
| 47.75 | Bot - Section 2 | 1.00 | 1.09 | 20.958 | 23.05 | 343.50 | 0.650 | 0.000 | 2.75 | 10.257 | 6.67 | 245.9 | 0.0 | 487.4 |
| 50.00 | | 1.00 | 1.10 | 21.158 | 23.27 | 340.60 | 0.650 | 0.000 | 2.25 | 8.390 | 5.45 | 203.1 | 0.0 | 791.7 |
| 53.25 | Top - Section 1 | 1.00 | 1.11 | 21.435 | 23.58 | 336.23 | 0.650 | 0.000 | 3.25 | 11.925 | 7.75 | 292.4 | 0.0 | 1125.1 |
| 55.00 | | 1.00 | 1.12 | 21.579 | 23.74 | 338.77 | 0.650 | 0.000 | 1.75 | 6.327 | 4.11 | 156.2 | 0.0 | 300.6 |
| 60.00 | | 1.00 | 1.14 | 21.971 | 24.17 | 331.57 | 0.650 | 0.000 | 5.00 | 17.712 | 11.51 | 445.2 | 0.0 | 841.4 |
| 65.00 | | 1.00 | 1.16 | 22.339 | 24.57 | 323.97 | 0.650 | 0.000 | 5.00 | 17.172 | 11.16 | 438.8 | 0.0 | 815.6 |
| 70.00 | | 1.00 | 1.18 | 22.685 | 24.95 | 316.04 | 0.650 | 0.000 | 5.00 | 16.632 | 10.81 | 431.6 | 0.0 | 789.7 |
| 75.00 | | 1.00 | 1.19 | 23.012 | 25.31 | 307.80 | 0.650 | 0.000 | 5.00 | 16.092 | 10.46 | 423.6 | 0.0 | 763.8 |
| 80.00 | | 1.00 | 1.21 | 23.323 | 25.66 | 299.30 | 0.650 | 0.000 | 5.00 | 15.551 | 10.11 | 414.9 | 0.0 | 738.0 |
| 85.00 | | 1.00 | 1.23 | 23.619 | 25.98 | 290.54 | 0.650 | 0.000 | 5.00 | 15.011 | 9.76 | 405.6 | 0.0 | 712.1 |
| 90.00 | | 1.00 | 1.24 | 23.901 | 26.29 | 281.57 | 0.650 | 0.000 | 5.00 | 14.471 | 9.41 | 395.7 | 0.0 | 686.3 |
| 92.00 | Appurtenance(s) | 1.00 | 1.25 | 24.011 | 26.41 | 277.92 | 0.650 | 0.000 | 2.00 | 5.637 | 3.66 | 154.8 | 0.0 | 267.3 |
| 93.00 | Appurtenance(s) | 1.00 | 1.25 | 24.065 | 26.47 | 276.08 | 0.650 | 0.000 | 1.00 | 2.786 | 1.81 | 76.7 | 0.0 | 132.1 |
| 95.00 | | 1.00 | 1.25 | 24.172 | 26.59 | 272.39 | 0.650 | 0.000 | 2.00 | 5.508 | 3.58 | 152.3 | 0.0 | 261.1 |
| 97.25 | Bot - Section 3 | 1.00 | 1.26 | 24.290 | 26.72 | 268.19 | 0.650 | 0.000 | 2.25 | 6.093 | 3.96 | 169.3 | 0.0 | 288.8 |
| 100.00 | | 1.00 | 1.27 | 24.432 | 26.88 | 263.02 | 0.650 | 0.000 | 2.75 | 7.414 | 4.82 | 207.2 | 0.0 | 627.5 |
| 101.25 | Top - Section 2 | 1.00 | 1.27 | 24.495 | 26.94 | 260.65 | 0.650 | 0.000 | 1.25 | 3.316 | 2.16 | 92.9 | 0.0 | 280.6 |
| 105.00 | | 1.00 | 1.28 | 24.682 | 27.15 | 257.74 | 0.650 | 0.000 | 3.75 | 9.746 | 6.33 | 275.2 | 0.0 | 370.1 |
| 110.00 | | 1.00 | 1.29 | 24.922 | 27.41 | 248.06 | 0.650 | 0.000 | 5.00 | 12.522 | 8.14 | 357.0 | 0.0 | 475.4 |
| 115.00 | | 1.00 | 1.31 | 25.155 | 27.67 | 238.22 | 0.650 | 0.000 | 5.00 | 11.982 | 7.79 | 344.8 | 0.0 | 454.7 |
| 119.50 | Appurtenance(s) | 1.00 | 1.32 | 25.357 | 27.89 | 229.25 | 0.650 | 0.000 | 4.50 | 10.322 | 6.71 | 299.4 | 0.0 | 391.6 |
| 120.00 | | 1.00 | 1.32 | 25.379 | 27.92 | 228.25 | 0.650 | 0.000 | 0.50 | 1.120 | 0.73 | 32.5 | 0.0 | 42.5 |
| 125.00 | | 1.00 | 1.33 | 25.596 | 28.16 | 218.14 | 0.650 | 0.000 | 5.00 | 10.902 | 7.09 | 319.2 | 0.0 | 413.4 |
| 129.00 | Top - Section 3 | 1.00 | 1.34 | 25.765 | 28.34 | 209.96 | 0.650 | 0.000 | 4.00 | 8.332 | 5.42 | 245.6 | 0.0 | 315.8 |
| 130.00 | | 1.00 | 1.34 | 25.807 | 28.39 | 207.91 | 0.650 | 0.000 | 1.00 | 2.029 | 1.32 | 59.9 | 0.0 | 57.8 |
| 135.00 | | 1.00 | 1.35 | 26.011 | 28.61 | 197.55 | 0.650 | 0.000 | 5.00 | 9.821 | 6.38 | 292.3 | 0.0 | 279.8 |
| 140.00 | | 1.00 | 1.36 | 26.210 | 28.83 | 187.09 | 0.650 | 0.000 | 5.00 | 9.281 | 6.03 | 278.3 | 0.0 | 264.2 |
| 141.00 | Appurtenance(s) | 1.00 | 1.36 | 26.249 | 28.87 | 184.99 | 0.650 | 0.000 | 1.00 | 1.791 | 1.16 | 53.8 | 0.0 | 51.0 |
| 142.00 | Appurtenance(s) | 1.00 | 1.36 | 26.287 | 28.92 | 182.88 | 0.650 | 0.000 | 1.00 | 1.770 | 1.15 | 53.2 | 0.0 | 50.4 |
| 145.00 | | 1.00 | 1.37 | 26.403 | 29.04 | 176.52 | 0.650 | 0.000 | 3.00 | 5.180 | 3.37 | 156.5 | 0.0 | 147.4 |
| 149.00 | Appurtenance(s) | 1.00 | 1.38 | 26.553 | 29.21 | 168.00 | 0.650 | 0.000 | 4.00 | 6.604 | 4.29 | 200.6 | 0.0 | 187.8 |
| | | | | | | | | **Totals:** | **149.00** | | | **11,656.1** | | **22,498.3** |

# Discrete Appurtenance Forces

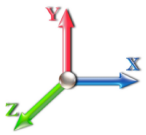
| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT13061-A-SBA | **Code:** | TIA-222-G | 5/31/2022 | |
| **Site Name:** | New Fairfield | **Exposure:** | C | | |
| **Height:** | 149.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 1.000 (ft) | **Site Class:** | D - Stiff Soil | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 10 | |

Tower Engineering Solutions

**Load Case:** 1.2D + 1.6W 89 mph Wind

**Dead Load Factor** 1.20

**Wind Load Factor** 1.60




**Iterations** 25

| 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 | 3 | 26.590 | 29.250 | 0.66 | 0.90 | 10.19 | 95.04 | 0.000 | 1.000 | 476.89 | 0.00 | 476.89 |
| 2 | 149.00 | Lightning Rod | 1 | 26.683 | 29.351 | 1.00 | 1.00 | 1.05 | 42.00 | 0.000 | 3.500 | 49.31 | 0.00 | 172.58 |
| 3 | 149.00 | RFS BA1010 | 1 | 26.640 | 29.304 | 1.00 | 1.00 | 1.24 | 10.56 | 0.000 | 2.350 | 58.14 | 0.00 | 136.63 |
| 4 | 149.00 | Low Profile Platform | 1 | 26.590 | 29.250 | 1.00 | 1.00 | 22.00 | 1800.00 | 0.000 | 1.000 | 1029.58 | 0.00 | 1029.58 |
| 5 | 149.00 | Standoff Mount | 1 | 26.553 | 29.209 | 1.00 | 1.00 | 1.80 | 72.00 | 0.000 | 0.000 | 84.12 | 0.00 | 0.00 |
| 6 | 149.00 | Kathrein 782 11056 | 3 | 26.590 | 29.250 | 0.60 | 0.90 | 0.51 | 9.36 | 0.000 | 1.000 | 23.70 | 0.00 | 23.70 |
| 7 | 149.00 | RFS APXV18-209014 | 3 | 26.590 | 29.250 | 0.67 | 0.90 | 7.15 | 67.32 | 0.000 | 1.000 | 334.75 | 0.00 | 334.75 |
| 8 | 149.00 | Ericsson KRY 112 489/2 | 3 | 26.590 | 29.250 | 0.60 | 0.90 | 1.23 | 47.52 | 0.000 | 1.000 | 57.57 | 0.00 | 57.57 |
| 9 | 149.00 | Ericsson 4480 B71 + B85 | 3 | 26.590 | 29.250 | 0.60 | 0.90 | 5.16 | 334.80 | 0.000 | 1.000 | 241.28 | 0.00 | 241.28 |
| 10 | 149.00 | RFS | 3 | 26.590 | 29.250 | 0.66 | 0.90 | 39.89 | 442.08 | 0.000 | 1.000 | 1866.96 | 0.00 | 1866.96 |
| 11 | 142.00 | Cci HPA-65R-BUU-H6 | 3 | 26.364 | 29.001 | 0.68 | 0.80 | 19.71 | 182.52 | 0.000 | 2.000 | 914.41 | 0.00 | 1828.81 |
| 12 | 142.00 | Ericsson 4426 B66 RRU | 3 | 26.287 | 28.916 | 0.58 | 0.80 | 2.01 | 174.60 | 0.000 | 0.000 | 93.22 | 0.00 | 0.00 |
| 13 | 142.00 | Ericsson RRUS 32 RRU | 3 | 26.287 | 28.916 | 0.56 | 0.80 | 2.77 | 277.20 | 0.000 | 0.000 | 128.25 | 0.00 | 0.00 |
| 14 | 142.00 | Powerwave | 3 | 26.364 | 29.001 | 0.72 | 0.80 | 1.19 | 57.60 | 0.000 | 2.000 | 55.12 | 0.00 | 110.25 |
| 15 | 142.00 | Powerwave LGP-21401 | 9 | 26.364 | 29.001 | 0.80 | 0.80 | 7.56 | 152.28 | 0.000 | 2.000 | 350.79 | 0.00 | 701.59 |
| 16 | 142.00 | Ericsson RRUS 11 RRU | 3 | 26.287 | 28.916 | 0.62 | 0.80 | 4.72 | 198.00 | 0.000 | 0.000 | 218.26 | 0.00 | 0.00 |
| 17 | 142.00 | Ericsson RRUS 12 RRU | 3 | 26.364 | 29.001 | 0.56 | 0.80 | 5.29 | 180.00 | 0.000 | 2.000 | 245.56 | 0.00 | 491.11 |
| 18 | 141.00 | Kaelus DBCT108F1V92-1 | 6 | 26.249 | 28.874 | 0.56 | 0.80 | 2.39 | 120.24 | 0.000 | 0.000 | 110.21 | 0.00 | 0.00 |
| 19 | 141.00 | Kathrein 80010798 | 3 | 26.249 | 28.874 | 0.62 | 0.80 | 20.01 | 310.68 | 0.000 | 0.000 | 924.49 | 0.00 | 0.00 |
| 20 | 141.00 | Powerwave 7770 | 3 | 26.249 | 28.874 | 0.58 | 0.80 | 9.65 | 126.00 | 0.000 | 0.000 | 445.97 | 0.00 | 0.00 |
| 21 | 141.00 | Low Profile Platform | 1 | 26.249 | 28.874 | 1.00 | 1.00 | 22.00 | 1800.00 | 0.000 | 0.000 | 1016.35 | 0.00 | 0.00 |
| 22 | 141.00 | Raycap DC6-48-60-18-8F | 2 | 26.249 | 28.874 | 0.80 | 0.80 | 3.52 | 78.72 | 0.000 | 0.000 | 162.62 | 0.00 | 0.00 |
| 23 | 141.00 | Ericsson RRUS-A2 RRU | 3 | 26.249 | 28.874 | 0.54 | 0.80 | 2.52 | 54.00 | 0.000 | 0.000 | 116.63 | 0.00 | 0.00 |
| 24 | 141.00 | Powerwave 1001983 | 3 | 26.249 | 28.874 | 0.80 | 0.80 | 0.26 | 10.44 | 0.000 | 0.000 | 12.20 | 0.00 | 0.00 |
| 25 | 129.00 | Standoff Mount | 1 | 25.765 | 28.342 | 1.00 | 1.00 | 1.80 | 72.00 | 0.000 | 0.000 | 81.62 | 0.00 | 0.00 |
| 26 | 129.00 | RFS BA40-01 | 1 | 26.001 | 28.601 | 1.00 | 1.00 | 3.45 | 38.40 | 0.000 | 5.750 | 157.88 | 0.00 | 907.80 |
| 27 | 119.50 | B5/B13 RRH-BR04C | 3 | 25.379 | 27.917 | 0.50 | 0.75 | 2.82 | 253.08 | 0.000 | 0.500 | 125.92 | 0.00 | 62.96 |
| 28 | 119.50 | Antel | 6 | 25.357 | 27.893 | 0.55 | 0.75 | 17.98 | 86.40 | 0.000 | 0.000 | 802.50 | 0.00 | 0.00 |
| 29 | 119.50 | Low Profile Platform | 1 | 25.357 | 27.893 | 1.00 | 1.00 | 22.00 | 1800.00 | 0.000 | 0.000 | 981.82 | 0.00 | 0.00 |
| 30 | 119.50 | MT6407-77A | 3 | 25.379 | 27.917 | 0.52 | 0.75 | 7.39 | 285.84 | 0.000 | 0.500 | 329.94 | 0.00 | 164.97 |
| 31 | 119.50 | B2/B66A RRH-BR049 | 3 | 25.379 | 27.917 | 0.50 | 0.75 | 2.82 | 303.84 | 0.000 | 0.500 | 125.92 | 0.00 | 62.96 |
| 32 | 119.50 | MS-H1242 (Heavy Collar | 1 | 25.357 | 27.893 | 1.00 | 1.00 | 2.50 | 180.00 | 0.000 | 0.000 | 111.57 | 0.00 | 0.00 |
| 33 | 119.50 | MS-KI22-5 (Kickers w/o | 1 | 25.357 | 27.893 | 1.00 | 1.00 | 8.00 | 349.20 | 0.000 | 0.000 | 357.03 | 0.00 | 0.00 |
| 34 | 119.50 | HRK12 (Handrail Kit) | 1 | 25.379 | 27.917 | 1.00 | 1.00 | 8.20 | 604.80 | 0.000 | 0.500 | 366.27 | 0.00 | 183.14 |
| 35 | 119.50 | Andrew | 1 | 25.379 | 27.917 | 1.00 | 1.00 | 3.79 | 38.40 | 0.000 | 0.500 | 169.29 | 0.00 | 84.64 |
| 36 | 119.50 | Andrew SBNHH-1D65B | 6 | 25.357 | 27.893 | 0.62 | 0.75 | 30.48 | 288.00 | 0.000 | 0.000 | 1360.16 | 0.00 | 0.00 |
| 37 | 93.00 | Single Arm Mount | 2 | 24.065 | 26.472 | 1.00 | 1.00 | 3.60 | 144.00 | 0.000 | 0.000 | 152.48 | 0.00 | 0.00 |
| 38 | 93.00 | RFS 1142 | 2 | 24.406 | 26.847 | 1.00 | 1.00 | 7.80 | 24.00 | 0.000 | 6.500 | 335.05 | 0.00 | 2177.83 |
| 39 | 92.00 | Single Arm Mount | 1 | 24.011 | 26.412 | 1.00 | 1.00 | 1.80 | 72.00 | 0.000 | 0.000 | 76.07 | 0.00 | 0.00 |
| 40 | 92.00 | Sinclair SD210-SF3P2LDF | 1 | 24.432 | 26.875 | 1.00 | 1.00 | 4.80 | 22.20 | 0.000 | 8.000 | 206.40 | 0.00 | 1651.20 |
| | | | | | | | **Totals:** | | **11,205.12** | | | **14,756.28** | | |

# Total Applied Force Summary

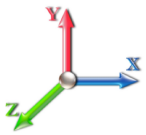
| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT13061-A-SBA | | **Code:** | TIA-222-G | 5/31/2022 |
| **Site Name:** | New Fairfield | | **Exposure:** | C | |
| **Height:** | 149.00 (ft) | | **Crest Height:** | 0.00 | |
| **Base Elev:** | 1.000 (ft) | | **Site Class:** | D - Stiff Soil | |
| **Gh:** | 1.1 | **Topography:** 1 | **Struct Class:** | II | Page: 11 |

Tower Engineering Solutions

**Load Case:** 1.2D + 1.6W 89 mph Wind

**Dead Load Factor** 1.20

**Wind Load Factor** 1.60




**Iterations** 25

| 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 | | 438.13 | 1229.94 | 0.00 | 0.00 |
| 10.00 | | 428.02 | 1379.30 | 0.00 | 0.00 |
| 15.00 | | 423.06 | 1353.44 | 0.00 | 0.00 |
| 20.00 | | 437.14 | 1327.59 | 0.00 | 0.00 |
| 25.00 | | 445.90 | 1301.74 | 0.00 | 0.00 |
| 30.00 | | 450.94 | 1275.88 | 0.00 | 0.00 |
| 35.00 | | 453.21 | 1250.03 | 0.00 | 0.00 |
| 40.00 | | 453.31 | 1224.18 | 0.00 | 0.00 |
| 45.00 | | 451.63 | 1198.33 | 0.00 | 0.00 |
| 47.75 | | 245.93 | 648.06 | 0.00 | 0.00 |
| 50.00 | | 203.08 | 923.11 | 0.00 | 0.00 |
| 53.25 | | 292.44 | 1314.90 | 0.00 | 0.00 |
| 55.00 | | 156.19 | 402.81 | 0.00 | 0.00 |
| 60.00 | | 445.19 | 1133.42 | 0.00 | 0.00 |
| 65.00 | | 438.83 | 1107.57 | 0.00 | 0.00 |
| 70.00 | | 431.62 | 1081.72 | 0.00 | 0.00 |
| 75.00 | | 423.62 | 1055.87 | 0.00 | 0.00 |
| 80.00 | | 414.93 | 1030.01 | 0.00 | 0.00 |
| 85.00 | | 405.60 | 1004.16 | 0.00 | 0.00 |
| 90.00 | | 395.69 | 978.31 | 0.00 | 0.00 |
| 92.00 | (2) attachments | 437.31 | 478.28 | 0.00 | 1651.20 |
| 93.00 | (4) attachments | 564.23 | 357.87 | 0.00 | 2177.83 |
| 95.00 | | 152.30 | 374.14 | 0.00 | 0.00 |
| 97.25 | | 169.31 | 415.96 | 0.00 | 0.00 |
| 100.00 | | 207.23 | 782.95 | 0.00 | 0.00 |
| 101.25 | | 92.93 | 351.23 | 0.00 | 0.00 |
| 105.00 | | 275.19 | 582.13 | 0.00 | 0.00 |
| 110.00 | | 357.02 | 758.07 | 0.00 | 0.00 |
| 115.00 | | 344.80 | 737.39 | 0.00 | 0.00 |
| 119.50 | (26) attachments | 5029.84 | 4835.53 | 0.00 | 558.67 |
| 120.00 | | 32.51 | 70.74 | 0.00 | 0.00 |
| 125.00 | | 319.22 | 620.43 | 0.00 | 0.00 |
| 129.00 | (2) attachments | 485.10 | 591.85 | 0.00 | 907.80 |
| 130.00 | | 59.90 | 98.60 | 0.00 | 0.00 |
| 135.00 | | 292.25 | 483.70 | 0.00 | 0.00 |
| 140.00 | | 278.28 | 468.19 | 0.00 | 0.00 |
| 141.00 | (21) attachments | 2842.25 | 2591.86 | 0.00 | 0.00 |
| 142.00 | (27) attachments | 2058.83 | 1293.94 | 0.00 | 3131.76 |
| 145.00 | | 156.45 | 211.50 | 0.00 | 0.00 |
| 149.00 | (22) attachments | 4422.91 | 3193.99 | 0.00 | 4339.94 |
| | **Totals:** | **26,412.34** | **41,518.71** | **0.00** | **12,767.21** |

# Linear Appurtenance Segment Forces (Factored)

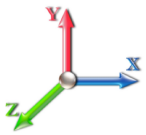
| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT13061-A-SBA | **Code:** | TIA-222-G | 5/31/2022 | |
| **Site Name:** | New Fairfield | **Exposure:** | C | | |
| **Height:** | 149.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 1.000 (ft) | **Site Class:** | D - Stiff Soil | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 12 | |

Tower Engineering Solutions

**Load Case:** 1.2D + 1.6W 89 mph Wind

**Dead Load Factor** 1.20

**Wind Load Factor** 1.60




**Iterations** 25

| Top Elev (ft) | Description | Wind Exposed | Length (ft) | Ca | Exposed Width (in) | Area (sqft) | CaAa (sqft) | Ra | Cf Adjust Factor | qz (psf) | F X (lb) | Dead Load (lb) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 95.00 | 7/8" Coax | Yes | 1.00 | 0.000 | 1.11 | 0.09 | 0.00 | 0.017 | 0.000 | 24.172 | 0.00 | 0.00 |
| 97.25 | 7/8" Coax | Yes | 2.25 | 0.000 | 1.11 | 0.21 | 0.00 | 0.034 | 0.000 | 24.290 | 0.00 | 0.00 |
| 100.00 | 7/8" Coax | Yes | 2.75 | 0.000 | 1.11 | 0.25 | 0.00 | 0.035 | 0.000 | 24.432 | 0.00 | 0.00 |
| 101.25 | 7/8" Coax | Yes | 1.25 | 0.000 | 1.11 | 0.12 | 0.00 | 0.035 | 0.000 | 24.495 | 0.00 | 0.00 |
| 105.00 | 7/8" Coax | Yes | 3.75 | 0.000 | 1.11 | 0.35 | 0.00 | 0.036 | 0.000 | 24.682 | 0.00 | 0.00 |
| 110.00 | 7/8" Coax | Yes | 5.00 | 0.000 | 1.11 | 0.46 | 0.00 | 0.037 | 0.000 | 24.922 | 0.00 | 0.00 |
| 115.00 | 7/8" Coax | Yes | 5.00 | 0.000 | 1.11 | 0.46 | 0.00 | 0.039 | 0.000 | 25.155 | 0.00 | 0.00 |
| 119.50 | 7/8" Coax | Yes | 4.50 | 0.000 | 1.11 | 0.42 | 0.00 | 0.040 | 0.000 | 25.357 | 0.00 | 0.00 |
| 120.00 | 7/8" Coax | Yes | 0.50 | 0.000 | 1.11 | 0.05 | 0.00 | 0.041 | 0.000 | 25.379 | 0.00 | 0.00 |
| 125.00 | 7/8" Coax | Yes | 5.00 | 0.000 | 1.11 | 0.46 | 0.00 | 0.042 | 0.000 | 25.596 | 0.00 | 0.00 |
| 129.00 | 7/8" Coax | Yes | 4.00 | 0.000 | 1.11 | 0.37 | 0.00 | 0.044 | 0.000 | 25.765 | 0.00 | 0.00 |
| 130.00 | 7/8" Coax | Yes | 1.00 | 0.000 | 1.11 | 0.09 | 0.00 | 0.046 | 0.000 | 25.807 | 0.00 | 0.00 |
| 135.00 | 7/8" Coax | Yes | 5.00 | 0.000 | 1.11 | 0.46 | 0.00 | 0.047 | 0.000 | 26.011 | 0.00 | 0.00 |
| 140.00 | 7/8" Coax | Yes | 5.00 | 0.000 | 1.11 | 0.46 | 0.00 | 0.050 | 0.000 | 26.210 | 0.00 | 0.00 |
| 141.00 | 7/8" Coax | Yes | 1.00 | 0.000 | 1.11 | 0.09 | 0.00 | 0.052 | 0.000 | 26.249 | 0.00 | 0.00 |
| 142.00 | 7/8" Coax | Yes | 1.00 | 0.000 | 1.11 | 0.09 | 0.00 | 0.052 | 0.000 | 26.287 | 0.00 | 0.00 |
| 145.00 | 7/8" Coax | Yes | 3.00 | 0.000 | 1.11 | 0.28 | 0.00 | 0.054 | 0.000 | 26.403 | 0.00 | 0.00 |
| 149.00 | 7/8" Coax | Yes | 4.00 | 0.000 | 1.11 | 0.37 | 0.00 | 0.056 | 0.000 | 26.553 | 0.00 | 0.00 |
| | | | | | | | | | | **Totals:** | **0.0** | **0.0** |

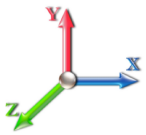
# Calculated Forces

| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT13061-A-SBA | **Code:** | TIA-222-G | 5/31/2022 | |
| **Site Name:** | New Fairfield | **Exposure:** | C | | |
| **Height:** | 149.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 1.000 (ft) | **Site Class:** | D - Stiff Soil | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 13 | |

**Load Case:** 1.2D + 1.6W 89 mph Wind

**Dead Load Factor** 1.20

**Wind Load Factor** 1.60




**Iterations** 25

| Seg Elev (ft) | Pu FY (-) (kips) | Vu FX (-) (kips) | Tu MY (-) (ft-kips) | Mu MZ (ft-kips) | Mu MX (ft-kips) | Resultant Moment (ft-kips) | phi Pn (kips) | phi Vn (kips) | phi Tn (ft-kips) | phi Mn (ft-kips) | Total Deflect (in) | Rotation Sway (deg) | Rotation Twist (deg) | Stress Ratio |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | -41.47 | -26.48 | 0.00 | -2947.2 | 0.00 | 2947.24 | 3273.57 | 1636.79 | 7496.53 | 3753.83 | 0.00 | 0.000 | 0.000 | 0.798 |
| 5.00 | -40.16 | -26.18 | 0.00 | -2814.8 | 0.00 | 2814.84 | 3239.51 | 1619.75 | 7247.24 | 3629.01 | 0.10 | -0.190 | 0.000 | 0.788 |
| 10.00 | -38.69 | -25.88 | 0.00 | -2683.9 | 0.00 | 2683.95 | 3203.51 | 1601.76 | 6997.34 | 3503.87 | 0.41 | -0.385 | 0.000 | 0.778 |
| 15.00 | -37.25 | -25.57 | 0.00 | -2554.5 | 0.00 | 2554.58 | 3165.58 | 1582.79 | 6747.13 | 3378.58 | 0.92 | -0.584 | 0.000 | 0.768 |
| 20.00 | -35.84 | -25.25 | 0.00 | -2426.7 | 0.00 | 2426.73 | 3125.72 | 1562.86 | 6496.92 | 3253.29 | 1.64 | -0.788 | 0.000 | 0.758 |
| 25.00 | -34.45 | -24.91 | 0.00 | -2300.4 | 0.00 | 2300.49 | 3083.93 | 1541.97 | 6247.01 | 3128.15 | 2.57 | -0.996 | 0.000 | 0.747 |
| 30.00 | -33.09 | -24.56 | 0.00 | -2175.9 | 0.00 | 2175.95 | 3040.21 | 1520.10 | 5997.71 | 3003.31 | 3.73 | -1.209 | 0.000 | 0.736 |
| 35.00 | -31.76 | -24.20 | 0.00 | -2053.1 | 0.00 | 2053.16 | 2994.56 | 1497.28 | 5749.33 | 2878.94 | 5.11 | -1.427 | 0.000 | 0.724 |
| 40.00 | -30.46 | -23.83 | 0.00 | -1932.1 | 0.00 | 1932.18 | 2946.97 | 1473.49 | 5502.17 | 2755.17 | 6.73 | -1.649 | 0.000 | 0.712 |
| 45.00 | -29.20 | -23.43 | 0.00 | -1813.0 | 0.00 | 1813.02 | 2897.46 | 1448.73 | 5256.53 | 2632.17 | 8.58 | -1.876 | 0.000 | 0.699 |
| 47.75 | -28.51 | -23.23 | 0.00 | -1748.5 | 0.00 | 1748.58 | 2869.40 | 1434.70 | 5122.20 | 2564.91 | 9.70 | -2.006 | 0.000 | 0.692 |
| 50.00 | -27.54 | -23.05 | 0.00 | -1696.3 | 0.00 | 1696.32 | 2846.01 | 1423.00 | 5012.74 | 2510.09 | 10.67 | -2.113 | 0.000 | 0.686 |
| 53.25 | -26.19 | -22.77 | 0.00 | -1621.4 | 0.00 | 1621.40 | 2837.57 | 1418.79 | 4973.81 | 2490.60 | 12.16 | -2.269 | 0.000 | 0.660 |
| 55.00 | -25.74 | -22.66 | 0.00 | -1581.5 | 0.00 | 1581.57 | 2819.00 | 1409.50 | 4889.10 | 2448.18 | 13.01 | -2.355 | 0.000 | 0.655 |
| 60.00 | -24.53 | -22.27 | 0.00 | -1468.2 | 0.00 | 1468.25 | 2764.64 | 1382.32 | 4648.65 | 2327.78 | 15.60 | -2.585 | 0.000 | 0.640 |
| 65.00 | -23.36 | -21.88 | 0.00 | -1356.9 | 0.00 | 1356.90 | 2708.35 | 1354.17 | 4410.81 | 2208.68 | 18.43 | -2.820 | 0.000 | 0.623 |
| 70.00 | -22.21 | -21.48 | 0.00 | -1247.5 | 0.00 | 1247.52 | 2650.12 | 1325.06 | 4175.87 | 2091.04 | 21.51 | -3.057 | 0.000 | 0.605 |
| 75.00 | -21.09 | -21.09 | 0.00 | -1140.1 | 0.00 | 1140.11 | 2589.96 | 1294.98 | 3944.16 | 1975.01 | 24.84 | -3.297 | 0.000 | 0.586 |
| 80.00 | -20.00 | -20.70 | 0.00 | -1034.6 | 0.00 | 1034.66 | 2527.88 | 1263.94 | 3715.96 | 1860.74 | 28.42 | -3.539 | 0.000 | 0.564 |
| 85.00 | -18.94 | -20.31 | 0.00 | -931.17 | 0.00 | 931.17 | 2463.86 | 1231.93 | 3491.60 | 1748.39 | 32.26 | -3.782 | 0.000 | 0.541 |
| 90.00 | -17.93 | -19.90 | 0.00 | -829.61 | 0.00 | 829.61 | 2397.91 | 1198.95 | 3271.37 | 1638.12 | 36.35 | -4.025 | 0.000 | 0.514 |
| 92.00 | -17.46 | -19.46 | 0.00 | -788.16 | 0.00 | 788.16 | 2370.99 | 1185.49 | 3184.51 | 1594.62 | 38.05 | -4.125 | 0.000 | 0.502 |
| 93.00 | -17.12 | -18.89 | 0.00 | -766.53 | 0.00 | 766.53 | 2357.41 | 1178.70 | 3141.35 | 1573.01 | 38.92 | -4.175 | 0.000 | 0.495 |
| 95.00 | -16.72 | -18.74 | 0.00 | -728.75 | 0.00 | 728.75 | 2330.03 | 1165.01 | 3055.58 | 1530.06 | 40.69 | -4.274 | 0.000 | 0.484 |
| 97.25 | -16.28 | -18.57 | 0.00 | -686.58 | 0.00 | 686.58 | 2298.85 | 1149.42 | 2960.01 | 1482.20 | 42.73 | -4.385 | 0.000 | 0.471 |
| 100.00 | -15.48 | -18.33 | 0.00 | -635.51 | 0.00 | 635.51 | 2260.21 | 1130.11 | 2844.54 | 1424.39 | 45.30 | -4.518 | 0.000 | 0.453 |
| 101.25 | -15.10 | -18.24 | 0.00 | -612.59 | 0.00 | 612.59 | 1705.50 | 852.75 | 2167.94 | 1085.58 | 46.49 | -4.580 | 0.000 | 0.574 |
| 105.00 | -14.47 | -17.98 | 0.00 | -544.17 | 0.00 | 544.17 | 1669.73 | 834.87 | 2056.27 | 1029.66 | 50.15 | -4.755 | 0.000 | 0.538 |
| 110.00 | -13.67 | -17.62 | 0.00 | -454.28 | 0.00 | 454.28 | 1620.35 | 810.17 | 1909.79 | 956.31 | 55.27 | -5.018 | 0.000 | 0.484 |
| 115.00 | -12.90 | -17.26 | 0.00 | -366.18 | 0.00 | 366.18 | 1569.04 | 784.52 | 1766.36 | 884.49 | 60.65 | -5.264 | 0.000 | 0.423 |
| 119.50 | -8.54 | -11.82 | 0.00 | -287.95 | 0.00 | 287.95 | 1521.21 | 760.60 | 1640.13 | 821.29 | 65.71 | -5.466 | 0.000 | 0.356 |
| 120.00 | -8.44 | -11.79 | 0.00 | -282.04 | 0.00 | 282.04 | 1515.79 | 757.90 | 1626.29 | 814.35 | 66.28 | -5.489 | 0.000 | 0.352 |
| 125.00 | -7.82 | -11.44 | 0.00 | -223.07 | 0.00 | 223.07 | 1460.62 | 730.31 | 1489.87 | 746.04 | 72.13 | -5.689 | 0.000 | 0.305 |
| 129.00 | -7.27 | -10.91 | 0.00 | -176.41 | 0.00 | 176.41 | 1406.38 | 703.19 | 1375.06 | 688.55 | 76.96 | -5.837 | 0.000 | 0.262 |
| 129.00 | -7.27 | -10.91 | 0.00 | -176.41 | 0.00 | 176.41 | 978.70 | 489.35 | 961.93 | 481.68 | 76.96 | -5.837 | 0.000 | 0.374 |
| 130.00 | -7.15 | -10.85 | 0.00 | -165.50 | 0.00 | 165.50 | 971.83 | 485.92 | 944.91 | 473.15 | 78.18 | -5.872 | 0.000 | 0.358 |
| 135.00 | -6.67 | -10.53 | 0.00 | -111.23 | 0.00 | 111.23 | 936.33 | 468.17 | 860.89 | 431.08 | 84.43 | -6.070 | 0.000 | 0.266 |
| 140.00 | -6.22 | -10.22 | 0.00 | -58.56 | 0.00 | 58.56 | 898.90 | 449.45 | 778.95 | 390.05 | 90.86 | -6.213 | 0.000 | 0.158 |
| 141.00 | -3.95 | -7.11 | 0.00 | -48.34 | 0.00 | 48.34 | 891.19 | 445.59 | 762.84 | 381.99 | 92.16 | -6.235 | 0.000 | 0.131 |
| 142.00 | -2.88 | -4.92 | 0.00 | -38.10 | 0.00 | 38.10 | 883.39 | 441.70 | 746.83 | 373.97 | 93.47 | -6.253 | 0.000 | 0.105 |
| 145.00 | -2.69 | -4.75 | 0.00 | -23.33 | 0.00 | 23.33 | 859.54 | 429.77 | 699.40 | 350.22 | 97.40 | -6.293 | 0.000 | 0.070 |
| 149.00 | 0.00 | -4.42 | 0.00 | -4.34 | 0.00 | 4.34 | 826.66 | 413.33 | 637.68 | 319.32 | 102.68 | -6.320 | 0.000 | 0.014 |

# Wind Loading - Shaft

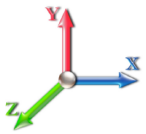
| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT13061-A-SBA | **Code:** | TIA-222-G | 5/31/2022 | |
| **Site Name:** | New Fairfield | **Exposure:** | C | | |
| **Height:** | 149.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 1.000 (ft) | **Site Class:** | D - Stiff Soil | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 14 | |

Tower Engineering Solutions

**Load Case:** 0.9D + 1.6W 89 mph Wind

**Dead Load Factor** 0.90

**Wind Load Factor** 1.60




**Iterations** 25

| 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 | 16.374 | 18.01 | 388.27 | 0.650 | 0.000 | 0.00 | 0.000 | 0.00 | 0.0 | 0.0 | 0.0 |
| 5.00 | | 1.00 | 0.85 | 16.374 | 18.01 | 379.41 | 0.650 | 0.000 | 5.00 | 23.389 | 15.20 | 438.1 | 0.0 | 834.8 |
| 10.00 | | 1.00 | 0.85 | 16.374 | 18.01 | 370.54 | 0.650 | 0.000 | 5.00 | 22.849 | 14.85 | 428.0 | 0.0 | 815.5 |
| 15.00 | | 1.00 | 0.86 | 16.576 | 18.23 | 363.90 | 0.650 | 0.000 | 5.00 | 22.309 | 14.50 | 423.1 | 0.0 | 796.1 |
| 20.00 | | 1.00 | 0.91 | 17.553 | 19.31 | 365.29 | 0.650 | 0.000 | 5.00 | 21.769 | 14.15 | 437.1 | 0.0 | 776.7 |
| 25.00 | | 1.00 | 0.95 | 18.360 | 20.20 | 364.21 | 0.650 | 0.000 | 5.00 | 21.229 | 13.80 | 445.9 | 0.0 | 757.3 |
| 30.00 | | 1.00 | 0.99 | 19.053 | 20.96 | 361.46 | 0.650 | 0.000 | 5.00 | 20.689 | 13.45 | 450.9 | 0.0 | 737.9 |
| 35.00 | | 1.00 | 1.02 | 19.662 | 21.63 | 357.48 | 0.650 | 0.000 | 5.00 | 20.148 | 13.10 | 453.2 | 0.0 | 718.5 |
| 40.00 | | 1.00 | 1.05 | 20.208 | 22.23 | 352.56 | 0.650 | 0.000 | 5.00 | 19.608 | 12.75 | 453.3 | 0.0 | 699.1 |
| 45.00 | | 1.00 | 1.07 | 20.704 | 22.77 | 346.88 | 0.650 | 0.000 | 5.00 | 19.068 | 12.39 | 451.6 | 0.0 | 679.7 |
| 47.75 | Bot - Section 2 | 1.00 | 1.09 | 20.958 | 23.05 | 343.50 | 0.650 | 0.000 | 2.75 | 10.257 | 6.67 | 245.9 | 0.0 | 365.6 |
| 50.00 | | 1.00 | 1.10 | 21.158 | 23.27 | 340.60 | 0.650 | 0.000 | 2.25 | 8.390 | 5.45 | 203.1 | 0.0 | 593.8 |
| 53.25 | Top - Section 1 | 1.00 | 1.11 | 21.435 | 23.58 | 336.23 | 0.650 | 0.000 | 3.25 | 11.925 | 7.75 | 292.4 | 0.0 | 843.8 |
| 55.00 | | 1.00 | 1.12 | 21.579 | 23.74 | 338.77 | 0.650 | 0.000 | 1.75 | 6.327 | 4.11 | 156.2 | 0.0 | 225.4 |
| 60.00 | | 1.00 | 1.14 | 21.971 | 24.17 | 331.57 | 0.650 | 0.000 | 5.00 | 17.712 | 11.51 | 445.2 | 0.0 | 631.1 |
| 65.00 | | 1.00 | 1.16 | 22.339 | 24.57 | 323.97 | 0.650 | 0.000 | 5.00 | 17.172 | 11.16 | 438.8 | 0.0 | 611.7 |
| 70.00 | | 1.00 | 1.18 | 22.685 | 24.95 | 316.04 | 0.650 | 0.000 | 5.00 | 16.632 | 10.81 | 431.6 | 0.0 | 592.3 |
| 75.00 | | 1.00 | 1.19 | 23.012 | 25.31 | 307.80 | 0.650 | 0.000 | 5.00 | 16.092 | 10.46 | 423.6 | 0.0 | 572.9 |
| 80.00 | | 1.00 | 1.21 | 23.323 | 25.66 | 299.30 | 0.650 | 0.000 | 5.00 | 15.551 | 10.11 | 414.9 | 0.0 | 553.5 |
| 85.00 | | 1.00 | 1.23 | 23.619 | 25.98 | 290.54 | 0.650 | 0.000 | 5.00 | 15.011 | 9.76 | 405.6 | 0.0 | 534.1 |
| 90.00 | | 1.00 | 1.24 | 23.901 | 26.29 | 281.57 | 0.650 | 0.000 | 5.00 | 14.471 | 9.41 | 395.7 | 0.0 | 514.7 |
| 92.00 | Appurtenance(s) | 1.00 | 1.25 | 24.011 | 26.41 | 277.92 | 0.650 | 0.000 | 2.00 | 5.637 | 3.66 | 154.8 | 0.0 | 200.5 |
| 93.00 | Appurtenance(s) | 1.00 | 1.25 | 24.065 | 26.47 | 276.08 | 0.650 | 0.000 | 1.00 | 2.786 | 1.81 | 76.7 | 0.0 | 99.1 |
| 95.00 | | 1.00 | 1.25 | 24.172 | 26.59 | 272.39 | 0.650 | 0.000 | 2.00 | 5.508 | 3.58 | 152.3 | 0.0 | 195.8 |
| 97.25 | Bot - Section 3 | 1.00 | 1.26 | 24.290 | 26.72 | 268.19 | 0.650 | 0.000 | 2.25 | 6.093 | 3.96 | 169.3 | 0.0 | 216.6 |
| 100.00 | | 1.00 | 1.27 | 24.432 | 26.88 | 263.02 | 0.650 | 0.000 | 2.75 | 7.414 | 4.82 | 207.2 | 0.0 | 470.6 |
| 101.25 | Top - Section 2 | 1.00 | 1.27 | 24.495 | 26.94 | 260.65 | 0.650 | 0.000 | 1.25 | 3.316 | 2.16 | 92.9 | 0.0 | 210.4 |
| 105.00 | | 1.00 | 1.28 | 24.682 | 27.15 | 257.74 | 0.650 | 0.000 | 3.75 | 9.746 | 6.33 | 275.2 | 0.0 | 277.6 |
| 110.00 | | 1.00 | 1.29 | 24.922 | 27.41 | 248.06 | 0.650 | 0.000 | 5.00 | 12.522 | 8.14 | 357.0 | 0.0 | 356.6 |
| 115.00 | | 1.00 | 1.31 | 25.155 | 27.67 | 238.22 | 0.650 | 0.000 | 5.00 | 11.982 | 7.79 | 344.8 | 0.0 | 341.0 |
| 119.50 | Appurtenance(s) | 1.00 | 1.32 | 25.357 | 27.89 | 229.25 | 0.650 | 0.000 | 4.50 | 10.322 | 6.71 | 299.4 | 0.0 | 293.7 |
| 120.00 | | 1.00 | 1.32 | 25.379 | 27.92 | 228.25 | 0.650 | 0.000 | 0.50 | 1.120 | 0.73 | 32.5 | 0.0 | 31.9 |
| 125.00 | | 1.00 | 1.33 | 25.596 | 28.16 | 218.14 | 0.650 | 0.000 | 5.00 | 10.902 | 7.09 | 319.2 | 0.0 | 310.0 |
| 129.00 | Top - Section 3 | 1.00 | 1.34 | 25.765 | 28.34 | 209.96 | 0.650 | 0.000 | 4.00 | 8.332 | 5.42 | 245.6 | 0.0 | 236.9 |
| 130.00 | | 1.00 | 1.34 | 25.807 | 28.39 | 207.91 | 0.650 | 0.000 | 1.00 | 2.029 | 1.32 | 59.9 | 0.0 | 43.4 |
| 135.00 | | 1.00 | 1.35 | 26.011 | 28.61 | 197.55 | 0.650 | 0.000 | 5.00 | 9.821 | 6.38 | 292.3 | 0.0 | 209.8 |
| 140.00 | | 1.00 | 1.36 | 26.210 | 28.83 | 187.09 | 0.650 | 0.000 | 5.00 | 9.281 | 6.03 | 278.3 | 0.0 | 198.2 |
| 141.00 | Appurtenance(s) | 1.00 | 1.36 | 26.249 | 28.87 | 184.99 | 0.650 | 0.000 | 1.00 | 1.791 | 1.16 | 53.8 | 0.0 | 38.2 |
| 142.00 | Appurtenance(s) | 1.00 | 1.36 | 26.287 | 28.92 | 182.88 | 0.650 | 0.000 | 1.00 | 1.770 | 1.15 | 53.2 | 0.0 | 37.8 |
| 145.00 | | 1.00 | 1.37 | 26.403 | 29.04 | 176.52 | 0.650 | 0.000 | 3.00 | 5.180 | 3.37 | 156.5 | 0.0 | 110.5 |
| 149.00 | Appurtenance(s) | 1.00 | 1.38 | 26.553 | 29.21 | 168.00 | 0.650 | 0.000 | 4.00 | 6.604 | 4.29 | 200.6 | 0.0 | 140.9 |
| | | | | | | | | **Totals:** | **149.00** | | | **11,656.1** | | **16,873.8** |

# Discrete Appurtenance Forces

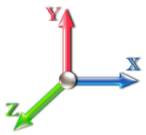
| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT13061-A-SBA | **Code:** | TIA-222-G | 5/31/2022 | |
| **Site Name:** | New Fairfield | **Exposure:** | C | | |
| **Height:** | 149.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 1.000 (ft) | **Site Class:** | D - Stiff Soil | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 15 | |

Tower Engineering Solutions

**Load Case:** 0.9D + 1.6W 89 mph Wind

**Dead Load Factor** 0.90

**Wind Load Factor** 1.60




**Iterations** 25

| 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 | 3 | 26.590 | 29.250 | 0.66 | 0.90 | 10.19 | 71.28 | 0.000 | 1.000 | 476.89 | 0.00 | 476.89 |
| 2 | 149.00 | Lightning Rod | 1 | 26.683 | 29.351 | 1.00 | 1.00 | 1.05 | 31.50 | 0.000 | 3.500 | 49.31 | 0.00 | 172.58 |
| 3 | 149.00 | RFS BA1010 | 1 | 26.640 | 29.304 | 1.00 | 1.00 | 1.24 | 7.92 | 0.000 | 2.350 | 58.14 | 0.00 | 136.63 |
| 4 | 149.00 | Low Profile Platform | 1 | 26.590 | 29.250 | 1.00 | 1.00 | 22.00 | 1350.00 | 0.000 | 1.000 | 1029.58 | 0.00 | 1029.58 |
| 5 | 149.00 | Standoff Mount | 1 | 26.553 | 29.209 | 1.00 | 1.00 | 1.80 | 54.00 | 0.000 | 0.000 | 84.12 | 0.00 | 0.00 |
| 6 | 149.00 | Kathrein 782 11056 | 3 | 26.590 | 29.250 | 0.60 | 0.90 | 0.51 | 7.02 | 0.000 | 1.000 | 23.70 | 0.00 | 23.70 |
| 7 | 149.00 | RFS APXV18-209014 | 3 | 26.590 | 29.250 | 0.67 | 0.90 | 7.15 | 50.49 | 0.000 | 1.000 | 334.75 | 0.00 | 334.75 |
| 8 | 149.00 | Ericsson KRY 112 489/2 | 3 | 26.590 | 29.250 | 0.60 | 0.90 | 1.23 | 35.64 | 0.000 | 1.000 | 57.57 | 0.00 | 57.57 |
| 9 | 149.00 | Ericsson 4480 B71 + B85 | 3 | 26.590 | 29.250 | 0.60 | 0.90 | 5.16 | 251.10 | 0.000 | 1.000 | 241.28 | 0.00 | 241.28 |
| 10 | 149.00 | RFS | 3 | 26.590 | 29.250 | 0.66 | 0.90 | 39.89 | 331.56 | 0.000 | 1.000 | 1866.96 | 0.00 | 1866.96 |
| 11 | 142.00 | Cci HPA-65R-BUU-H6 | 3 | 26.364 | 29.001 | 0.68 | 0.80 | 19.71 | 136.89 | 0.000 | 2.000 | 914.41 | 0.00 | 1828.81 |
| 12 | 142.00 | Ericsson 4426 B66 RRU | 3 | 26.287 | 28.916 | 0.58 | 0.80 | 2.01 | 130.95 | 0.000 | 0.000 | 93.22 | 0.00 | 0.00 |
| 13 | 142.00 | Ericsson RRUS 32 RRU | 3 | 26.287 | 28.916 | 0.56 | 0.80 | 2.77 | 207.90 | 0.000 | 0.000 | 128.25 | 0.00 | 0.00 |
| 14 | 142.00 | Powerwave | 3 | 26.364 | 29.001 | 0.72 | 0.80 | 1.19 | 43.20 | 0.000 | 2.000 | 55.12 | 0.00 | 110.25 |
| 15 | 142.00 | Powerwave LGP-21401 | 9 | 26.364 | 29.001 | 0.80 | 0.80 | 7.56 | 114.21 | 0.000 | 2.000 | 350.79 | 0.00 | 701.59 |
| 16 | 142.00 | Ericsson RRUS 11 RRU | 3 | 26.287 | 28.916 | 0.62 | 0.80 | 4.72 | 148.50 | 0.000 | 0.000 | 218.26 | 0.00 | 0.00 |
| 17 | 142.00 | Ericsson RRUS 12 RRU | 3 | 26.364 | 29.001 | 0.56 | 0.80 | 5.29 | 135.00 | 0.000 | 2.000 | 245.56 | 0.00 | 491.11 |
| 18 | 141.00 | Kaelus DBCT108F1V92-1 | 6 | 26.249 | 28.874 | 0.56 | 0.80 | 2.39 | 90.18 | 0.000 | 0.000 | 110.21 | 0.00 | 0.00 |
| 19 | 141.00 | Kathrein 80010798 | 3 | 26.249 | 28.874 | 0.62 | 0.80 | 20.01 | 233.01 | 0.000 | 0.000 | 924.49 | 0.00 | 0.00 |
| 20 | 141.00 | Powerwave 7770 | 3 | 26.249 | 28.874 | 0.58 | 0.80 | 9.65 | 94.50 | 0.000 | 0.000 | 445.97 | 0.00 | 0.00 |
| 21 | 141.00 | Low Profile Platform | 1 | 26.249 | 28.874 | 1.00 | 1.00 | 22.00 | 1350.00 | 0.000 | 0.000 | 1016.35 | 0.00 | 0.00 |
| 22 | 141.00 | Raycap DC6-48-60-18-8F | 2 | 26.249 | 28.874 | 0.80 | 0.80 | 3.52 | 59.04 | 0.000 | 0.000 | 162.62 | 0.00 | 0.00 |
| 23 | 141.00 | Ericsson RRUS-A2 RRU | 3 | 26.249 | 28.874 | 0.54 | 0.80 | 2.52 | 40.50 | 0.000 | 0.000 | 116.63 | 0.00 | 0.00 |
| 24 | 141.00 | Powerwave 1001983 | 3 | 26.249 | 28.874 | 0.80 | 0.80 | 0.26 | 7.83 | 0.000 | 0.000 | 12.20 | 0.00 | 0.00 |
| 25 | 129.00 | Standoff Mount | 1 | 25.765 | 28.342 | 1.00 | 1.00 | 1.80 | 54.00 | 0.000 | 0.000 | 81.62 | 0.00 | 0.00 |
| 26 | 129.00 | RFS BA40-01 | 1 | 26.001 | 28.601 | 1.00 | 1.00 | 3.45 | 28.80 | 0.000 | 5.750 | 157.88 | 0.00 | 907.80 |
| 27 | 119.50 | B5/B13 RRH-BR04C | 3 | 25.379 | 27.917 | 0.50 | 0.75 | 2.82 | 189.81 | 0.000 | 0.500 | 125.92 | 0.00 | 62.96 |
| 28 | 119.50 | Antel | 6 | 25.357 | 27.893 | 0.55 | 0.75 | 17.98 | 64.80 | 0.000 | 0.000 | 802.50 | 0.00 | 0.00 |
| 29 | 119.50 | Low Profile Platform | 1 | 25.357 | 27.893 | 1.00 | 1.00 | 22.00 | 1350.00 | 0.000 | 0.000 | 981.82 | 0.00 | 0.00 |
| 30 | 119.50 | MT6407-77A | 3 | 25.379 | 27.917 | 0.52 | 0.75 | 7.39 | 214.38 | 0.000 | 0.500 | 329.94 | 0.00 | 164.97 |
| 31 | 119.50 | B2/B66A RRH-BR049 | 3 | 25.379 | 27.917 | 0.50 | 0.75 | 2.82 | 227.88 | 0.000 | 0.500 | 125.92 | 0.00 | 62.96 |
| 32 | 119.50 | MS-H1242 (Heavy Collar | 1 | 25.357 | 27.893 | 1.00 | 1.00 | 2.50 | 135.00 | 0.000 | 0.000 | 111.57 | 0.00 | 0.00 |
| 33 | 119.50 | MS-KI22-5 (Kickers w/o | 1 | 25.357 | 27.893 | 1.00 | 1.00 | 8.00 | 261.90 | 0.000 | 0.000 | 357.03 | 0.00 | 0.00 |
| 34 | 119.50 | HRK12 (Handrail Kit) | 1 | 25.379 | 27.917 | 1.00 | 1.00 | 8.20 | 453.60 | 0.000 | 0.500 | 366.27 | 0.00 | 183.14 |
| 35 | 119.50 | Andrew | 1 | 25.379 | 27.917 | 1.00 | 1.00 | 3.79 | 28.80 | 0.000 | 0.500 | 169.29 | 0.00 | 84.64 |
| 36 | 119.50 | Andrew SBNHH-1D65B | 6 | 25.357 | 27.893 | 0.62 | 0.75 | 30.48 | 216.00 | 0.000 | 0.000 | 1360.16 | 0.00 | 0.00 |
| 37 | 93.00 | Single Arm Mount | 2 | 24.065 | 26.472 | 1.00 | 1.00 | 3.60 | 108.00 | 0.000 | 0.000 | 152.48 | 0.00 | 0.00 |
| 38 | 93.00 | RFS 1142 | 2 | 24.406 | 26.847 | 1.00 | 1.00 | 7.80 | 18.00 | 0.000 | 6.500 | 335.05 | 0.00 | 2177.83 |
| 39 | 92.00 | Single Arm Mount | 1 | 24.011 | 26.412 | 1.00 | 1.00 | 1.80 | 54.00 | 0.000 | 0.000 | 76.07 | 0.00 | 0.00 |
| 40 | 92.00 | Sinclair SD210-SF3P2LDF | 1 | 24.432 | 26.875 | 1.00 | 1.00 | 4.80 | 16.65 | 0.000 | 8.000 | 206.40 | 0.00 | 1651.20 |
| | | | | | | | **Totals:** | | **8,403.84** | | | **14,756.28** | | |

# Total Applied Force Summary

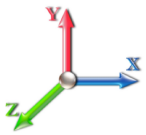
| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT13061-A-SBA | | **Code:** | TIA-222-G | 5/31/2022 |
| **Site Name:** | New Fairfield | | **Exposure:** | C | |
| **Height:** | 149.00 (ft) | | **Crest Height:** | 0.00 | |
| **Base Elev:** | 1.000 (ft) | | **Site Class:** | D - Stiff Soil | |
| **Gh:** | 1.1 | **Topography:** 1 | **Struct Class:** | II | Page: 16 |

Tower Engineering Solutions

**Load Case:** 0.9D + 1.6W 89 mph Wind

**Dead Load Factor** 0.90

**Wind Load Factor** 1.60




**Iterations** 25

| 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 | | 438.13 | 922.45 | 0.00 | 0.00 |
| 10.00 | | 428.02 | 1034.47 | 0.00 | 0.00 |
| 15.00 | | 423.06 | 1015.08 | 0.00 | 0.00 |
| 20.00 | | 437.14 | 995.69 | 0.00 | 0.00 |
| 25.00 | | 445.90 | 976.30 | 0.00 | 0.00 |
| 30.00 | | 450.94 | 956.91 | 0.00 | 0.00 |
| 35.00 | | 453.21 | 937.52 | 0.00 | 0.00 |
| 40.00 | | 453.31 | 918.13 | 0.00 | 0.00 |
| 45.00 | | 451.63 | 898.74 | 0.00 | 0.00 |
| 47.75 | | 245.93 | 486.04 | 0.00 | 0.00 |
| 50.00 | | 203.08 | 692.34 | 0.00 | 0.00 |
| 53.25 | | 292.44 | 986.18 | 0.00 | 0.00 |
| 55.00 | | 156.19 | 302.10 | 0.00 | 0.00 |
| 60.00 | | 445.19 | 850.07 | 0.00 | 0.00 |
| 65.00 | | 438.83 | 830.68 | 0.00 | 0.00 |
| 70.00 | | 431.62 | 811.29 | 0.00 | 0.00 |
| 75.00 | | 423.62 | 791.90 | 0.00 | 0.00 |
| 80.00 | | 414.93 | 772.51 | 0.00 | 0.00 |
| 85.00 | | 405.60 | 753.12 | 0.00 | 0.00 |
| 90.00 | | 395.69 | 733.73 | 0.00 | 0.00 |
| 92.00 | (2) attachments | 437.31 | 358.71 | 0.00 | 1651.20 |
| 93.00 | (4) attachments | 564.23 | 268.40 | 0.00 | 2177.83 |
| 95.00 | | 152.30 | 280.60 | 0.00 | 0.00 |
| 97.25 | | 169.31 | 311.97 | 0.00 | 0.00 |
| 100.00 | | 207.23 | 587.21 | 0.00 | 0.00 |
| 101.25 | | 92.93 | 263.43 | 0.00 | 0.00 |
| 105.00 | | 275.19 | 436.60 | 0.00 | 0.00 |
| 110.00 | | 357.02 | 568.55 | 0.00 | 0.00 |
| 115.00 | | 344.80 | 553.04 | 0.00 | 0.00 |
| 119.50 | (26) attachments | 5029.84 | 3626.65 | 0.00 | 558.67 |
| 120.00 | | 32.51 | 53.06 | 0.00 | 0.00 |
| 125.00 | | 319.22 | 465.32 | 0.00 | 0.00 |
| 129.00 | (2) attachments | 485.10 | 443.89 | 0.00 | 907.80 |
| 130.00 | | 59.90 | 73.95 | 0.00 | 0.00 |
| 135.00 | | 292.25 | 362.78 | 0.00 | 0.00 |
| 140.00 | | 278.28 | 351.14 | 0.00 | 0.00 |
| 141.00 | (21) attachments | 2842.25 | 1943.89 | 0.00 | 0.00 |
| 142.00 | (27) attachments | 2058.83 | 970.45 | 0.00 | 3131.76 |
| 145.00 | | 156.45 | 158.62 | 0.00 | 0.00 |
| 149.00 | (22) attachments | 4422.91 | 2395.49 | 0.00 | 4339.94 |
| | **Totals:** | **26,412.34** | **31,139.03** | **0.00** | **12,767.21** |

# Linear Appurtenance Segment Forces (Factored)

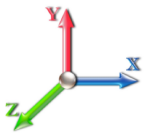
| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT13061-A-SBA | **Code:** | TIA-222-G | 5/31/2022 | |
| **Site Name:** | New Fairfield | **Exposure:** | C | | |
| **Height:** | 149.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 1.000 (ft) | **Site Class:** | D - Stiff Soil | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 17 | |

Tower Engineering Solutions

**Load Case:** 0.9D + 1.6W 89 mph Wind

**Dead Load Factor** 0.90

**Wind Load Factor** 1.60




**Iterations** 25

| Top Elev (ft) | Description | Wind Exposed | Length (ft) | Ca | Exposed Width (in) | Area (sqft) | CaAa (sqft) | Ra | Cf Adjust Factor | qz (psf) | F X (lb) | Dead Load (lb) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 95.00 | 7/8" Coax | Yes | 1.00 | 0.000 | 1.11 | 0.09 | 0.00 | 0.017 | 0.000 | 24.172 | 0.00 | 0.00 |
| 97.25 | 7/8" Coax | Yes | 2.25 | 0.000 | 1.11 | 0.21 | 0.00 | 0.034 | 0.000 | 24.290 | 0.00 | 0.00 |
| 100.00 | 7/8" Coax | Yes | 2.75 | 0.000 | 1.11 | 0.25 | 0.00 | 0.035 | 0.000 | 24.432 | 0.00 | 0.00 |
| 101.25 | 7/8" Coax | Yes | 1.25 | 0.000 | 1.11 | 0.12 | 0.00 | 0.035 | 0.000 | 24.495 | 0.00 | 0.00 |
| 105.00 | 7/8" Coax | Yes | 3.75 | 0.000 | 1.11 | 0.35 | 0.00 | 0.036 | 0.000 | 24.682 | 0.00 | 0.00 |
| 110.00 | 7/8" Coax | Yes | 5.00 | 0.000 | 1.11 | 0.46 | 0.00 | 0.037 | 0.000 | 24.922 | 0.00 | 0.00 |
| 115.00 | 7/8" Coax | Yes | 5.00 | 0.000 | 1.11 | 0.46 | 0.00 | 0.039 | 0.000 | 25.155 | 0.00 | 0.00 |
| 119.50 | 7/8" Coax | Yes | 4.50 | 0.000 | 1.11 | 0.42 | 0.00 | 0.040 | 0.000 | 25.357 | 0.00 | 0.00 |
| 120.00 | 7/8" Coax | Yes | 0.50 | 0.000 | 1.11 | 0.05 | 0.00 | 0.041 | 0.000 | 25.379 | 0.00 | 0.00 |
| 125.00 | 7/8" Coax | Yes | 5.00 | 0.000 | 1.11 | 0.46 | 0.00 | 0.042 | 0.000 | 25.596 | 0.00 | 0.00 |
| 129.00 | 7/8" Coax | Yes | 4.00 | 0.000 | 1.11 | 0.37 | 0.00 | 0.044 | 0.000 | 25.765 | 0.00 | 0.00 |
| 130.00 | 7/8" Coax | Yes | 1.00 | 0.000 | 1.11 | 0.09 | 0.00 | 0.046 | 0.000 | 25.807 | 0.00 | 0.00 |
| 135.00 | 7/8" Coax | Yes | 5.00 | 0.000 | 1.11 | 0.46 | 0.00 | 0.047 | 0.000 | 26.011 | 0.00 | 0.00 |
| 140.00 | 7/8" Coax | Yes | 5.00 | 0.000 | 1.11 | 0.46 | 0.00 | 0.050 | 0.000 | 26.210 | 0.00 | 0.00 |
| 141.00 | 7/8" Coax | Yes | 1.00 | 0.000 | 1.11 | 0.09 | 0.00 | 0.052 | 0.000 | 26.249 | 0.00 | 0.00 |
| 142.00 | 7/8" Coax | Yes | 1.00 | 0.000 | 1.11 | 0.09 | 0.00 | 0.052 | 0.000 | 26.287 | 0.00 | 0.00 |
| 145.00 | 7/8" Coax | Yes | 3.00 | 0.000 | 1.11 | 0.28 | 0.00 | 0.054 | 0.000 | 26.403 | 0.00 | 0.00 |
| 149.00 | 7/8" Coax | Yes | 4.00 | 0.000 | 1.11 | 0.37 | 0.00 | 0.056 | 0.000 | 26.553 | 0.00 | 0.00 |
| | | | | | | | | | | **Totals:** | **0.0** | **0.0** |

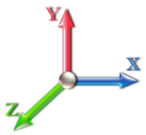
# Calculated Forces

| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT13061-A-SBA | **Code:** | TIA-222-G | 5/31/2022 | |
| **Site Name:** | New Fairfield | **Exposure:** | C | | |
| **Height:** | 149.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 1.000 (ft) | **Site Class:** | D - Stiff Soil | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 18 | |

**Load Case:** 0.9D + 1.6W 89 mph Wind

**Dead Load Factor** 0.90

**Wind Load Factor** 1.60




**Iterations** 25

| 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 | -31.09 | -26.46 | 0.00 | -2910.1 | 0.00 | 2910.19 | 3273.57 | 1636.79 | 7496.53 | 3753.83 | 0.00 | 0.000 | 0.000 | 0.785 |
| 5.00 | -30.09 | -26.12 | 0.00 | -2777.8 | 0.00 | 2777.87 | 3239.51 | 1619.75 | 7247.24 | 3629.01 | 0.10 | -0.188 | 0.000 | 0.775 |
| 10.00 | -28.97 | -25.79 | 0.00 | -2647.2 | 0.00 | 2647.25 | 3203.51 | 1601.76 | 6997.34 | 3503.87 | 0.40 | -0.380 | 0.000 | 0.765 |
| 15.00 | -27.87 | -25.45 | 0.00 | -2518.3 | 0.00 | 2518.31 | 3165.58 | 1582.79 | 6747.13 | 3378.58 | 0.90 | -0.576 | 0.000 | 0.754 |
| 20.00 | -26.79 | -25.10 | 0.00 | -2391.0 | 0.00 | 2391.04 | 3125.72 | 1562.86 | 6496.92 | 3253.29 | 1.62 | -0.777 | 0.000 | 0.744 |
| 25.00 | -25.73 | -24.73 | 0.00 | -2265.5 | 0.00 | 2265.54 | 3083.93 | 1541.97 | 6247.01 | 3128.15 | 2.54 | -0.982 | 0.000 | 0.733 |
| 30.00 | -24.69 | -24.36 | 0.00 | -2141.8 | 0.00 | 2141.87 | 3040.21 | 1520.10 | 5997.71 | 3003.31 | 3.68 | -1.192 | 0.000 | 0.722 |
| 35.00 | -23.67 | -23.97 | 0.00 | -2020.1 | 0.00 | 2020.10 | 2994.56 | 1497.28 | 5749.33 | 2878.94 | 5.04 | -1.406 | 0.000 | 0.710 |
| 40.00 | -22.68 | -23.58 | 0.00 | -1900.2 | 0.00 | 1900.24 | 2946.97 | 1473.49 | 5502.17 | 2755.17 | 6.63 | -1.625 | 0.000 | 0.698 |
| 45.00 | -21.72 | -23.17 | 0.00 | -1782.3 | 0.00 | 1782.34 | 2897.46 | 1448.73 | 5256.53 | 2632.17 | 8.46 | -1.848 | 0.000 | 0.685 |
| 47.75 | -21.20 | -22.95 | 0.00 | -1718.6 | 0.00 | 1718.63 | 2869.40 | 1434.70 | 5122.20 | 2564.91 | 9.56 | -1.976 | 0.000 | 0.678 |
| 50.00 | -20.46 | -22.77 | 0.00 | -1666.9 | 0.00 | 1666.99 | 2846.01 | 1423.00 | 5012.74 | 2510.09 | 10.52 | -2.081 | 0.000 | 0.672 |
| 53.25 | -19.44 | -22.48 | 0.00 | -1592.9 | 0.00 | 1592.99 | 2837.57 | 1418.79 | 4973.81 | 2490.60 | 11.99 | -2.234 | 0.000 | 0.647 |
| 55.00 | -19.08 | -22.36 | 0.00 | -1553.6 | 0.00 | 1553.65 | 2819.00 | 1409.50 | 4889.10 | 2448.18 | 12.82 | -2.319 | 0.000 | 0.642 |
| 60.00 | -18.17 | -21.96 | 0.00 | -1441.8 | 0.00 | 1441.84 | 2764.64 | 1382.32 | 4648.65 | 2327.78 | 15.37 | -2.545 | 0.000 | 0.626 |
| 65.00 | -17.27 | -21.55 | 0.00 | -1332.0 | 0.00 | 1332.06 | 2708.35 | 1354.17 | 4410.81 | 2208.68 | 18.16 | -2.775 | 0.000 | 0.610 |
| 70.00 | -16.40 | -21.14 | 0.00 | -1224.3 | 0.00 | 1224.32 | 2650.12 | 1325.06 | 4175.87 | 2091.04 | 21.19 | -3.008 | 0.000 | 0.592 |
| 75.00 | -15.54 | -20.74 | 0.00 | -1118.6 | 0.00 | 1118.60 | 2589.96 | 1294.98 | 3944.16 | 1975.01 | 24.46 | -3.244 | 0.000 | 0.573 |
| 80.00 | -14.71 | -20.34 | 0.00 | -1014.9 | 0.00 | 1014.90 | 2527.88 | 1263.94 | 3715.96 | 1860.74 | 27.99 | -3.481 | 0.000 | 0.552 |
| 85.00 | -13.90 | -19.95 | 0.00 | -913.18 | 0.00 | 913.18 | 2463.86 | 1231.93 | 3491.60 | 1748.39 | 31.76 | -3.719 | 0.000 | 0.528 |
| 90.00 | -13.14 | -19.54 | 0.00 | -813.43 | 0.00 | 813.43 | 2397.91 | 1198.95 | 3271.37 | 1638.12 | 35.78 | -3.958 | 0.000 | 0.502 |
| 92.00 | -12.79 | -19.10 | 0.00 | -772.70 | 0.00 | 772.70 | 2370.99 | 1185.49 | 3184.51 | 1594.62 | 37.46 | -4.056 | 0.000 | 0.490 |
| 93.00 | -12.54 | -18.53 | 0.00 | -751.42 | 0.00 | 751.42 | 2357.41 | 1178.70 | 3141.35 | 1573.01 | 38.31 | -4.105 | 0.000 | 0.483 |
| 95.00 | -12.23 | -18.38 | 0.00 | -714.35 | 0.00 | 714.35 | 2330.03 | 1165.01 | 3055.58 | 1530.06 | 40.05 | -4.202 | 0.000 | 0.472 |
| 97.25 | -11.90 | -18.22 | 0.00 | -672.99 | 0.00 | 672.99 | 2298.85 | 1149.42 | 2960.01 | 1482.20 | 42.06 | -4.310 | 0.000 | 0.459 |
| 100.00 | -11.30 | -17.98 | 0.00 | -622.90 | 0.00 | 622.90 | 2260.21 | 1130.11 | 2844.54 | 1424.39 | 44.58 | -4.441 | 0.000 | 0.443 |
| 101.25 | -11.01 | -17.89 | 0.00 | -600.42 | 0.00 | 600.42 | 1705.50 | 852.75 | 2167.94 | 1085.58 | 45.75 | -4.501 | 0.000 | 0.560 |
| 105.00 | -10.53 | -17.62 | 0.00 | -533.33 | 0.00 | 533.33 | 1669.73 | 834.87 | 2056.27 | 1029.66 | 49.35 | -4.673 | 0.000 | 0.525 |
| 110.00 | -9.91 | -17.26 | 0.00 | -445.21 | 0.00 | 445.21 | 1620.35 | 810.17 | 1909.79 | 956.31 | 54.38 | -4.931 | 0.000 | 0.472 |
| 115.00 | -9.33 | -16.91 | 0.00 | -358.89 | 0.00 | 358.89 | 1569.04 | 784.52 | 1766.36 | 884.49 | 59.67 | -5.172 | 0.000 | 0.412 |
| 119.50 | -6.16 | -11.58 | 0.00 | -282.26 | 0.00 | 282.26 | 1521.21 | 760.60 | 1640.13 | 821.29 | 64.64 | -5.370 | 0.000 | 0.348 |
| 120.00 | -6.09 | -11.55 | 0.00 | -276.47 | 0.00 | 276.47 | 1515.79 | 757.90 | 1626.29 | 814.35 | 65.20 | -5.392 | 0.000 | 0.344 |
| 125.00 | -5.62 | -11.21 | 0.00 | -218.71 | 0.00 | 218.71 | 1460.62 | 730.31 | 1489.87 | 746.04 | 70.95 | -5.589 | 0.000 | 0.297 |
| 129.00 | -5.21 | -10.69 | 0.00 | -172.98 | 0.00 | 172.98 | 1406.38 | 703.19 | 1375.06 | 688.55 | 75.69 | -5.733 | 0.000 | 0.255 |
| 129.00 | -5.21 | -10.69 | 0.00 | -172.98 | 0.00 | 172.98 | 978.70 | 489.35 | 961.93 | 481.68 | 75.69 | -5.733 | 0.000 | 0.365 |
| 130.00 | -5.12 | -10.63 | 0.00 | -162.30 | 0.00 | 162.30 | 971.83 | 485.92 | 944.91 | 473.15 | 76.89 | -5.768 | 0.000 | 0.349 |
| 135.00 | -4.76 | -10.32 | 0.00 | -109.14 | 0.00 | 109.14 | 936.33 | 468.17 | 860.89 | 431.08 | 83.03 | -5.962 | 0.000 | 0.259 |
| 140.00 | -4.43 | -10.01 | 0.00 | -57.56 | 0.00 | 57.56 | 898.90 | 449.45 | 778.95 | 390.05 | 89.35 | -6.103 | 0.000 | 0.153 |
| 141.00 | -2.79 | -6.98 | 0.00 | -47.55 | 0.00 | 47.55 | 891.19 | 445.59 | 762.84 | 381.99 | 90.63 | -6.124 | 0.000 | 0.128 |
| 142.00 | -2.05 | -4.83 | 0.00 | -37.44 | 0.00 | 37.44 | 883.39 | 441.70 | 746.83 | 373.97 | 91.91 | -6.142 | 0.000 | 0.103 |
| 145.00 | -1.90 | -4.66 | 0.00 | -22.96 | 0.00 | 22.96 | 859.54 | 429.77 | 699.40 | 350.22 | 95.77 | -6.181 | 0.000 | 0.068 |
| 149.00 | 0.00 | -4.42 | 0.00 | -4.34 | 0.00 | 4.34 | 826.66 | 413.33 | 637.68 | 319.32 | 100.96 | -6.208 | 0.000 | 0.014 |

# Wind Loading - Shaft

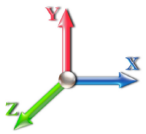
| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT13061-A-SBA | **Code:** | TIA-222-G | 5/31/2022 | |
| **Site Name:** | New Fairfield | **Exposure:** | C | | |
| **Height:** | 149.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 1.000 (ft) | **Site Class:** | D - Stiff Soil | | |
| **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** 25

| 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 | 1.057 | 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 | 1.265 | 5.00 | 24.443 | 29.33 | 166.7 | 443.0 | 1556.1 |
| 10.00 | | 1.00 | 0.85 | 5.168 | 5.68 | 0.00 | 1.200 | 1.344 | 5.00 | 23.969 | 28.76 | 163.5 | 460.6 | 1547.9 |
| 15.00 | | 1.00 | 0.86 | 5.232 | 5.76 | 0.00 | 1.200 | 1.395 | 5.00 | 23.472 | 28.17 | 162.1 | 467.5 | 1528.9 |
| 20.00 | | 1.00 | 0.91 | 5.540 | 6.09 | 0.00 | 1.200 | 1.434 | 5.00 | 22.964 | 27.56 | 167.9 | 469.2 | 1504.8 |
| 25.00 | | 1.00 | 0.95 | 5.795 | 6.37 | 0.00 | 1.200 | 1.465 | 5.00 | 22.449 | 26.94 | 171.7 | 467.9 | 1477.6 |
| 30.00 | | 1.00 | 0.99 | 6.013 | 6.61 | 0.00 | 1.200 | 1.491 | 5.00 | 21.931 | 26.32 | 174.1 | 464.5 | 1448.4 |
| 35.00 | | 1.00 | 1.02 | 6.206 | 6.83 | 0.00 | 1.200 | 1.513 | 5.00 | 21.409 | 25.69 | 175.4 | 459.6 | 1417.6 |
| 40.00 | | 1.00 | 1.05 | 6.378 | 7.02 | 0.00 | 1.200 | 1.533 | 5.00 | 20.886 | 25.06 | 175.8 | 453.6 | 1385.7 |
| 45.00 | | 1.00 | 1.07 | 6.534 | 7.19 | 0.00 | 1.200 | 1.551 | 5.00 | 20.360 | 24.43 | 175.6 | 446.6 | 1352.9 |
| 47.75 | Bot - Section 2 | 1.00 | 1.09 | 6.615 | 7.28 | 0.00 | 1.200 | 1.560 | 2.75 | 10.972 | 13.17 | 95.8 | 243.3 | 730.8 |
| 50.00 | | 1.00 | 1.10 | 6.678 | 7.35 | 0.00 | 1.200 | 1.567 | 2.25 | 8.977 | 10.77 | 79.1 | 200.2 | 991.9 |
| 53.25 | Top - Section 1 | 1.00 | 1.11 | 6.765 | 7.44 | 0.00 | 1.200 | 1.576 | 3.25 | 12.779 | 15.34 | 114.1 | 285.8 | 1410.8 |
| 55.00 | | 1.00 | 1.12 | 6.811 | 7.49 | 0.00 | 1.200 | 1.581 | 1.75 | 6.788 | 8.15 | 61.0 | 152.8 | 453.4 |
| 60.00 | | 1.00 | 1.14 | 6.934 | 7.63 | 0.00 | 1.200 | 1.595 | 5.00 | 19.041 | 22.85 | 174.3 | 427.8 | 1269.2 |
| 65.00 | | 1.00 | 1.16 | 7.050 | 7.76 | 0.00 | 1.200 | 1.608 | 5.00 | 18.512 | 22.21 | 172.3 | 418.4 | 1234.0 |
| 70.00 | | 1.00 | 1.18 | 7.160 | 7.88 | 0.00 | 1.200 | 1.619 | 5.00 | 17.981 | 21.58 | 169.9 | 408.6 | 1198.3 |
| 75.00 | | 1.00 | 1.19 | 7.263 | 7.99 | 0.00 | 1.200 | 1.631 | 5.00 | 17.450 | 20.94 | 167.3 | 398.5 | 1162.3 |
| 80.00 | | 1.00 | 1.21 | 7.361 | 8.10 | 0.00 | 1.200 | 1.641 | 5.00 | 16.919 | 20.30 | 164.4 | 388.0 | 1126.0 |
| 85.00 | | 1.00 | 1.23 | 7.454 | 8.20 | 0.00 | 1.200 | 1.651 | 5.00 | 16.387 | 19.66 | 161.2 | 377.2 | 1089.4 |
| 90.00 | | 1.00 | 1.24 | 7.544 | 8.30 | 0.00 | 1.200 | 1.660 | 5.00 | 15.855 | 19.03 | 157.9 | 366.2 | 1052.5 |
| 92.00 | Appurtenance(s) | 1.00 | 1.25 | 7.578 | 8.34 | 0.00 | 1.200 | 1.664 | 2.00 | 6.192 | 7.43 | 61.9 | 144.7 | 412.0 |
| 93.00 | Appurtenance(s) | 1.00 | 1.25 | 7.595 | 8.35 | 0.00 | 1.200 | 1.666 | 1.00 | 3.064 | 3.68 | 30.7 | 71.9 | 204.0 |
| 95.00 | | 1.00 | 1.25 | 7.629 | 8.39 | 0.00 | 1.200 | 1.669 | 2.00 | 6.064 | 7.28 | 61.1 | 142.0 | 403.0 |
| 97.25 | Bot - Section 3 | 1.00 | 1.26 | 7.666 | 8.43 | 0.00 | 1.200 | 1.673 | 2.25 | 6.720 | 8.06 | 68.0 | 157.4 | 446.1 |
| 100.00 | | 1.00 | 1.27 | 7.711 | 8.48 | 0.00 | 1.200 | 1.678 | 2.75 | 8.183 | 9.82 | 83.3 | 191.7 | 819.2 |
| 101.25 | Top - Section 2 | 1.00 | 1.27 | 7.731 | 8.50 | 0.00 | 1.200 | 1.680 | 1.25 | 3.666 | 4.40 | 37.4 | 86.4 | 367.0 |
| 105.00 | | 1.00 | 1.28 | 7.790 | 8.57 | 0.00 | 1.200 | 1.686 | 3.75 | 10.800 | 12.96 | 111.0 | 252.7 | 622.8 |
| 110.00 | | 1.00 | 1.29 | 7.866 | 8.65 | 0.00 | 1.200 | 1.693 | 5.00 | 13.933 | 16.72 | 144.7 | 325.0 | 800.4 |
| 115.00 | | 1.00 | 1.31 | 7.939 | 8.73 | 0.00 | 1.200 | 1.701 | 5.00 | 13.399 | 16.08 | 140.4 | 312.9 | 767.6 |
| 119.50 | Appurtenance(s) | 1.00 | 1.32 | 8.003 | 8.80 | 0.00 | 1.200 | 1.707 | 4.50 | 11.602 | 13.92 | 122.6 | 271.7 | 663.3 |
| 120.00 | | 1.00 | 1.32 | 8.010 | 8.81 | 0.00 | 1.200 | 1.708 | 0.50 | 1.262 | 1.51 | 13.3 | 30.1 | 72.5 |
| 125.00 | | 1.00 | 1.33 | 8.079 | 8.89 | 0.00 | 1.200 | 1.715 | 5.00 | 12.331 | 14.80 | 131.5 | 288.2 | 701.6 |
| 129.00 | Top - Section 3 | 1.00 | 1.34 | 8.132 | 8.95 | 0.00 | 1.200 | 1.720 | 4.00 | 9.479 | 11.38 | 101.8 | 222.5 | 538.3 |
| 130.00 | | 1.00 | 1.34 | 8.145 | 8.96 | 0.00 | 1.200 | 1.722 | 1.00 | 2.316 | 2.78 | 24.9 | 55.1 | 112.9 |
| 135.00 | | 1.00 | 1.35 | 8.210 | 9.03 | 0.00 | 1.200 | 1.728 | 5.00 | 11.261 | 13.51 | 122.0 | 262.9 | 542.7 |
| 140.00 | | 1.00 | 1.36 | 8.272 | 9.10 | 0.00 | 1.200 | 1.734 | 5.00 | 10.727 | 12.87 | 117.1 | 250.1 | 514.3 |
| 141.00 | Appurtenance(s) | 1.00 | 1.36 | 8.285 | 9.11 | 0.00 | 1.200 | 1.736 | 1.00 | 2.081 | 2.50 | 22.8 | 49.5 | 100.5 |
| 142.00 | Appurtenance(s) | 1.00 | 1.36 | 8.297 | 9.13 | 0.00 | 1.200 | 1.737 | 1.00 | 2.059 | 2.47 | 22.6 | 49.0 | 99.3 |
| 145.00 | | 1.00 | 1.37 | 8.333 | 9.17 | 0.00 | 1.200 | 1.741 | 3.00 | 6.050 | 7.26 | 66.5 | 142.2 | 289.6 |
| 149.00 | Appurtenance(s) | 1.00 | 1.38 | 8.381 | 9.22 | 0.00 | 1.200 | 1.745 | 4.00 | 7.767 | 9.32 | 85.9 | 181.3 | 369.1 |
| | | | | | | | | **Totals:** | **149.00** | | | **4,619.9** | | **33,785.1** |

# Discrete Appurtenance Forces

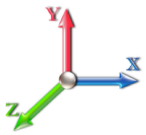
| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT13061-A-SBA | **Code:** | TIA-222-G | 5/31/2022 | |
| **Site Name:** | New Fairfield | **Exposure:** | C | | |
| **Height:** | 149.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 1.000 (ft) | **Site Class:** | D - Stiff Soil | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 20 | |

Tower Engineering Solutions

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

**Dead Load Factor** 1.20

**Wind Load Factor** 1.00




**Iterations** 25

| 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 | 3 | 8.392 | 9.232 | 0.66 | 0.90 | 14.87 | 293.78 | 0.000 | 1.000 | 137.28 | 0.00 | 137.28 |
| 2 | 149.00 | Lightning Rod | 1 | 8.421 | 9.264 | 1.00 | 1.00 | 3.42 | 64.41 | 0.000 | 3.500 | 31.71 | 0.00 | 111.00 |
| 3 | 149.00 | RFS BA1010 | 1 | 8.408 | 9.249 | 1.00 | 1.00 | 2.27 | 75.44 | 0.000 | 2.350 | 21.03 | 0.00 | 49.43 |
| 4 | 149.00 | Low Profile Platform | 1 | 8.392 | 9.232 | 1.00 | 1.00 | 39.66 | 2808.91 | 0.000 | 1.000 | 366.14 | 0.00 | 366.14 |
| 5 | 149.00 | Standoff Mount | 1 | 8.381 | 9.219 | 1.00 | 1.00 | 5.88 | 189.42 | 0.000 | 0.000 | 54.25 | 0.00 | 0.00 |
| 6 | 149.00 | Kathrein 782 11056 | 3 | 8.392 | 9.232 | 0.60 | 0.90 | 1.23 | 23.26 | 0.000 | 1.000 | 11.38 | 0.00 | 11.38 |
| 7 | 149.00 | RFS APXV18-209014 | 3 | 8.392 | 9.232 | 0.67 | 0.90 | 9.01 | 333.31 | 0.000 | 1.000 | 83.22 | 0.00 | 83.22 |
| 8 | 149.00 | Ericsson KRY 112 489/2 | 3 | 8.392 | 9.232 | 0.60 | 0.90 | 2.40 | 86.43 | 0.000 | 1.000 | 22.17 | 0.00 | 22.17 |
| 9 | 149.00 | Ericsson 4480 B71 + B85 | 3 | 8.392 | 9.232 | 0.60 | 0.90 | 6.38 | 499.60 | 0.000 | 1.000 | 58.86 | 0.00 | 58.86 |
| 10 | 149.00 | RFS | 3 | 8.392 | 9.232 | 0.66 | 0.90 | 43.64 | 1725.19 | 0.000 | 1.000 | 402.85 | 0.00 | 402.85 |
| 11 | 142.00 | Cci HPA-65R-BUU-H6 | 3 | 8.321 | 9.153 | 0.68 | 0.80 | 22.48 | 922.71 | 0.000 | 2.000 | 205.76 | 0.00 | 411.52 |
| 12 | 142.00 | Ericsson 4426 B66 RRU | 3 | 8.297 | 9.126 | 0.58 | 0.80 | 2.84 | 291.25 | 0.000 | 0.000 | 25.94 | 0.00 | 0.00 |
| 13 | 142.00 | Ericsson RRUS 32 RRU | 3 | 8.297 | 9.126 | 0.56 | 0.80 | 3.74 | 421.75 | 0.000 | 0.000 | 34.14 | 0.00 | 0.00 |
| 14 | 142.00 | Powerwave | 3 | 8.321 | 9.153 | 0.72 | 0.80 | 2.28 | 100.63 | 0.000 | 2.000 | 20.90 | 0.00 | 41.80 |
| 15 | 142.00 | Powerwave LGP-21401 | 9 | 8.321 | 9.153 | 0.80 | 0.80 | 12.43 | 312.32 | 0.000 | 2.000 | 113.81 | 0.00 | 227.62 |
| 16 | 142.00 | Ericsson RRUS 11 RRU | 3 | 8.297 | 9.126 | 0.62 | 0.80 | 5.90 | 352.52 | 0.000 | 0.000 | 53.82 | 0.00 | 0.00 |
| 17 | 142.00 | Ericsson RRUS 12 RRU | 3 | 8.321 | 9.153 | 0.56 | 0.80 | 7.39 | 271.28 | 0.000 | 2.000 | 67.65 | 0.00 | 135.31 |
| 18 | 141.00 | Kaelus DBCT108F1V92-1 | 6 | 8.285 | 9.113 | 0.56 | 0.80 | 3.57 | 205.35 | 0.000 | 0.000 | 32.55 | 0.00 | 0.00 |
| 19 | 141.00 | Kathrein 80010798 | 3 | 8.285 | 9.113 | 0.62 | 0.80 | 22.71 | 1034.97 | 0.000 | 0.000 | 206.93 | 0.00 | 0.00 |
| 20 | 141.00 | Powerwave 7770 | 3 | 8.285 | 9.113 | 0.58 | 0.80 | 11.49 | 669.48 | 0.000 | 0.000 | 104.72 | 0.00 | 0.00 |
| 21 | 141.00 | Low Profile Platform | 1 | 8.285 | 9.113 | 1.00 | 1.00 | 39.57 | 2801.76 | 0.000 | 0.000 | 360.55 | 0.00 | 0.00 |
| 22 | 141.00 | Raycap DC6-48-60-18-8F | 2 | 8.285 | 9.113 | 0.80 | 0.80 | 5.35 | 246.23 | 0.000 | 0.000 | 48.78 | 0.00 | 0.00 |
| 23 | 141.00 | Ericsson RRUS-A2 RRU | 3 | 8.285 | 9.113 | 0.54 | 0.80 | 3.84 | 81.03 | 0.000 | 0.000 | 34.99 | 0.00 | 0.00 |
| 24 | 141.00 | Powerwave 1001983 | 3 | 8.285 | 9.113 | 0.80 | 0.80 | 0.72 | 12.38 | 0.000 | 0.000 | 6.52 | 0.00 | 0.00 |
| 25 | 129.00 | Standoff Mount | 1 | 8.132 | 8.945 | 1.00 | 1.00 | 5.83 | 187.71 | 0.000 | 0.000 | 52.12 | 0.00 | 0.00 |
| 26 | 129.00 | RFS BA40-01 | 1 | 8.206 | 9.027 | 1.00 | 1.00 | 10.08 | 27.27 | 0.000 | 5.750 | 90.98 | 0.00 | 523.14 |
| 27 | 119.50 | B5/B13 RRH-BR04C | 3 | 8.010 | 8.811 | 0.52 | 0.75 | 3.83 | 455.52 | 0.000 | 0.500 | 33.72 | 0.00 | 16.86 |
| 28 | 119.50 | Antel | 6 | 8.003 | 8.803 | 0.55 | 0.75 | 24.04 | 566.49 | 0.000 | 0.000 | 211.60 | 0.00 | 0.00 |
| 29 | 119.50 | Low Profile Platform | 1 | 8.003 | 8.803 | 1.00 | 1.00 | 39.28 | 2780.56 | 0.000 | 0.000 | 345.79 | 0.00 | 0.00 |
| 30 | 119.50 | MT6407-77A | 3 | 8.010 | 8.811 | 0.54 | 0.75 | 9.10 | 635.10 | 0.000 | 0.500 | 80.16 | 0.00 | 40.08 |
| 31 | 119.50 | B2/B66A RRH-BR049 | 3 | 8.010 | 8.811 | 0.52 | 0.75 | 3.83 | 527.36 | 0.000 | 0.500 | 33.72 | 0.00 | 16.86 |
| 32 | 119.50 | MS-H1242 (Heavy Collar | 1 | 8.003 | 8.803 | 1.00 | 1.00 | 5.06 | 317.99 | 0.000 | 0.000 | 44.55 | 0.00 | 0.00 |
| 33 | 119.50 | MS-KI22-5 (Kickers w/o | 1 | 8.003 | 8.803 | 1.00 | 1.00 | 16.20 | 827.69 | 0.000 | 0.000 | 142.58 | 0.00 | 0.00 |
| 34 | 119.50 | HRK12 (Handrail Kit) | 1 | 8.010 | 8.811 | 1.00 | 1.00 | 16.04 | 1693.96 | 0.000 | 0.500 | 141.33 | 0.00 | 70.67 |
| 35 | 119.50 | Andrew | 1 | 8.010 | 8.811 | 1.00 | 1.00 | 4.72 | 125.62 | 0.000 | 0.500 | 41.63 | 0.00 | 20.81 |
| 36 | 119.50 | Andrew SBNHH-1D65B | 6 | 8.003 | 8.803 | 0.62 | 0.75 | 35.22 | 1475.45 | 0.000 | 0.000 | 310.06 | 0.00 | 0.00 |
| 37 | 93.00 | Single Arm Mount | 2 | 7.595 | 8.355 | 1.00 | 1.00 | 11.40 | 367.84 | 0.000 | 0.000 | 95.22 | 0.00 | 0.00 |
| 38 | 93.00 | RFS 1142 | 2 | 7.703 | 8.473 | 1.00 | 1.00 | 24.69 | -260.62 | 0.000 | 6.500 | 209.23 | 0.00 | 1360.02 |
| 39 | 92.00 | Single Arm Mount | 1 | 7.578 | 8.336 | 1.00 | 1.00 | 5.69 | 183.80 | 0.000 | 0.000 | 47.47 | 0.00 | 0.00 |
| 40 | 92.00 | Sinclair SD210-SF3P2LDF | 1 | 7.711 | 8.482 | 1.00 | 1.00 | 11.54 | 62.24 | 0.000 | 8.000 | 97.91 | 0.00 | 783.31 |
| | | | | | | | **Totals:** | | **23,797.39** | | | **4,484.04** | | |

# Total Applied Force Summary

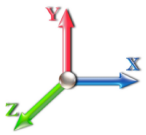
| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT13061-A-SBA | | **Code:** | TIA-222-G | 5/31/2022 |
| **Site Name:** | New Fairfield | | **Exposure:** | C | |
| **Height:** | 149.00 (ft) | | **Crest Height:** | 0.00 | |
| **Base Elev:** | 1.000 (ft) | | **Site Class:** | D - Stiff Soil | |
| **Gh:** | 1.1 | **Topography:** 1 | **Struct Class:** | II | Page: 21 |

Tower Engineering Solutions

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

**Dead Load Factor** 1.20

**Wind Load Factor** 1.00




**Iterations** 25

| 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 | | 166.75 | 1672.95 | 0.00 | 0.00 |
| 10.00 | | 163.51 | 1839.90 | 0.00 | 0.00 |
| 15.00 | | 162.10 | 1820.91 | 0.00 | 0.00 |
| 20.00 | | 167.93 | 1796.81 | 0.00 | 0.00 |
| 25.00 | | 171.72 | 1769.65 | 0.00 | 0.00 |
| 30.00 | | 174.08 | 1740.41 | 0.00 | 0.00 |
| 35.00 | | 175.38 | 1709.66 | 0.00 | 0.00 |
| 40.00 | | 175.84 | 1677.75 | 0.00 | 0.00 |
| 45.00 | | 175.62 | 1644.91 | 0.00 | 0.00 |
| 47.75 | | 95.80 | 891.38 | 0.00 | 0.00 |
| 50.00 | | 79.13 | 1123.35 | 0.00 | 0.00 |
| 53.25 | | 114.12 | 1600.66 | 0.00 | 0.00 |
| 55.00 | | 61.03 | 555.63 | 0.00 | 0.00 |
| 60.00 | | 174.29 | 1561.19 | 0.00 | 0.00 |
| 65.00 | | 172.28 | 1525.99 | 0.00 | 0.00 |
| 70.00 | | 169.94 | 1490.36 | 0.00 | 0.00 |
| 75.00 | | 167.30 | 1454.36 | 0.00 | 0.00 |
| 80.00 | | 164.39 | 1418.04 | 0.00 | 0.00 |
| 85.00 | | 161.25 | 1381.41 | 0.00 | 0.00 |
| 90.00 | | 157.87 | 1344.51 | 0.00 | 0.00 |
| 92.00 | (2) attachments | 207.32 | 774.81 | 0.00 | 783.31 |
| 93.00 | (4) attachments | 335.17 | 368.98 | 0.00 | 1360.02 |
| 95.00 | | 61.07 | 521.04 | 0.00 | 0.00 |
| 97.25 | | 68.00 | 584.52 | 0.00 | 0.00 |
| 100.00 | | 83.30 | 988.42 | 0.00 | 0.00 |
| 101.25 | | 37.41 | 443.91 | 0.00 | 0.00 |
| 105.00 | | 111.05 | 853.68 | 0.00 | 0.00 |
| 110.00 | | 144.67 | 1108.42 | 0.00 | 0.00 |
| 115.00 | | 140.42 | 1075.83 | 0.00 | 0.00 |
| 119.50 | (26) attachments | 1507.71 | 10346.53 | 0.00 | 165.28 |
| 120.00 | | 13.35 | 103.38 | 0.00 | 0.00 |
| 125.00 | | 131.49 | 934.53 | 0.00 | 0.00 |
| 129.00 | (2) attachments | 244.86 | 939.78 | 0.00 | 523.14 |
| 130.00 | | 24.90 | 158.94 | 0.00 | 0.00 |
| 135.00 | | 122.04 | 772.84 | 0.00 | 0.00 |
| 140.00 | | 117.13 | 744.63 | 0.00 | 0.00 |
| 141.00 | (21) attachments | 817.80 | 5197.75 | 0.00 | 0.00 |
| 142.00 | (27) attachments | 544.58 | 2798.45 | 0.00 | 816.25 |
| 145.00 | | 66.55 | 369.66 | 0.00 | 0.00 |
| 149.00 | (22) attachments | 1274.82 | 6575.67 | 0.00 | 1242.32 |
| | **Totals:** | **9,103.95** | **65,681.59** | **0.00** | **4,890.32** |

# Linear Appurtenance Segment Forces (Factored)

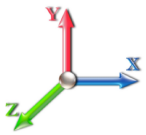
| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT13061-A-SBA | **Code:** | TIA-222-G | 5/31/2022 | |
| **Site Name:** | New Fairfield | **Exposure:** | C | | |
| **Height:** | 149.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 1.000 (ft) | **Site Class:** | D - Stiff Soil | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 22 | |

Tower Engineering Solutions

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

**Dead Load Factor** 1.20

**Wind Load Factor** 1.00




**Iterations** 25

| Top Elev (ft) | Description | Wind Exposed | Length (ft) | Ca | Exposed Width (in) | Area (sqft) | CaAa (sqft) | Ra | Cf Adjust Factor | qz (psf) | F X (lb) | Dead Load (lb) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 95.00 | 7/8" Coax | Yes | 1.00 | 0.000 | 1.11 | 0.37 | 0.00 | 0.017 | 0.000 | 7.629 | 0.00 | 4.95 |
| 97.25 | 7/8" Coax | Yes | 2.25 | 0.000 | 1.11 | 0.84 | 0.00 | 0.034 | 0.000 | 7.666 | 0.00 | 11.17 |
| 100.00 | 7/8" Coax | Yes | 2.75 | 0.000 | 1.11 | 1.02 | 0.00 | 0.035 | 0.000 | 7.711 | 0.00 | 13.72 |
| 101.25 | 7/8" Coax | Yes | 1.25 | 0.000 | 1.11 | 0.47 | 0.00 | 0.035 | 0.000 | 7.731 | 0.00 | 6.25 |
| 105.00 | 7/8" Coax | Yes | 3.75 | 0.000 | 1.11 | 1.40 | 0.00 | 0.036 | 0.000 | 7.790 | 0.00 | 18.86 |
| 110.00 | 7/8" Coax | Yes | 5.00 | 0.000 | 1.11 | 1.87 | 0.00 | 0.037 | 0.000 | 7.866 | 0.00 | 25.34 |
| 115.00 | 7/8" Coax | Yes | 5.00 | 0.000 | 1.11 | 1.88 | 0.00 | 0.039 | 0.000 | 7.939 | 0.00 | 25.53 |
| 119.50 | 7/8" Coax | Yes | 4.50 | 0.000 | 1.11 | 1.70 | 0.00 | 0.040 | 0.000 | 8.003 | 0.00 | 23.12 |
| 120.00 | 7/8" Coax | Yes | 0.50 | 0.000 | 1.11 | 0.19 | 0.00 | 0.041 | 0.000 | 8.010 | 0.00 | 2.57 |
| 125.00 | 7/8" Coax | Yes | 5.00 | 0.000 | 1.11 | 1.89 | 0.00 | 0.042 | 0.000 | 8.079 | 0.00 | 25.89 |
| 129.00 | 7/8" Coax | Yes | 4.00 | 0.000 | 1.11 | 1.52 | 0.00 | 0.044 | 0.000 | 8.132 | 0.00 | 20.82 |
| 130.00 | 7/8" Coax | Yes | 1.00 | 0.000 | 1.11 | 0.38 | 0.00 | 0.046 | 0.000 | 8.145 | 0.00 | 5.21 |
| 135.00 | 7/8" Coax | Yes | 5.00 | 0.000 | 1.11 | 1.90 | 0.00 | 0.047 | 0.000 | 8.210 | 0.00 | 26.22 |
| 140.00 | 7/8" Coax | Yes | 5.00 | 0.000 | 1.11 | 1.91 | 0.00 | 0.050 | 0.000 | 8.272 | 0.00 | 26.38 |
| 141.00 | 7/8" Coax | Yes | 1.00 | 0.000 | 1.11 | 0.38 | 0.00 | 0.052 | 0.000 | 8.285 | 0.00 | 5.28 |
| 142.00 | 7/8" Coax | Yes | 1.00 | 0.000 | 1.11 | 0.38 | 0.00 | 0.052 | 0.000 | 8.297 | 0.00 | 5.29 |
| 145.00 | 7/8" Coax | Yes | 3.00 | 0.000 | 1.11 | 1.15 | 0.00 | 0.054 | 0.000 | 8.333 | 0.00 | 15.92 |
| 149.00 | 7/8" Coax | Yes | 4.00 | 0.000 | 1.11 | 1.53 | 0.00 | 0.056 | 0.000 | 8.381 | 0.00 | 21.32 |
| | | | | | | | | | | **Totals:** | **0.0** | **283.8** |

# Calculated Forces

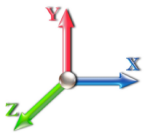
| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT13061-A-SBA | **Code:** | TIA-222-G | 5/31/2022 | |
| **Site Name:** | New Fairfield | **Exposure:** | C | | |
| **Height:** | 149.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 1.000 (ft) | **Site Class:** | D - Stiff Soil | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 23 | |

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** 25

| 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 | -65.68 | -9.14 | 0.00 | -1013.3 | 0.00 | 1013.39 | 3273.57 | 1636.79 | 7496.53 | 3753.83 | 0.00 | 0.000 | 0.000 | 0.290 |
| 5.00 | -63.99 | -9.05 | 0.00 | -967.68 | 0.00 | 967.68 | 3239.51 | 1619.75 | 7247.24 | 3629.01 | 0.04 | -0.065 | 0.000 | 0.286 |
| 10.00 | -62.14 | -8.95 | 0.00 | -922.44 | 0.00 | 922.44 | 3203.51 | 1601.76 | 6997.34 | 3503.87 | 0.14 | -0.132 | 0.000 | 0.283 |
| 15.00 | -60.31 | -8.86 | 0.00 | -877.67 | 0.00 | 877.67 | 3165.58 | 1582.79 | 6747.13 | 3378.58 | 0.32 | -0.201 | 0.000 | 0.279 |
| 20.00 | -58.50 | -8.76 | 0.00 | -833.37 | 0.00 | 833.37 | 3125.72 | 1562.86 | 6496.92 | 3253.29 | 0.56 | -0.271 | 0.000 | 0.275 |
| 25.00 | -56.73 | -8.65 | 0.00 | -789.58 | 0.00 | 789.58 | 3083.93 | 1541.97 | 6247.01 | 3128.15 | 0.88 | -0.342 | 0.000 | 0.271 |
| 30.00 | -54.98 | -8.53 | 0.00 | -746.35 | 0.00 | 746.35 | 3040.21 | 1520.10 | 5997.71 | 3003.31 | 1.28 | -0.415 | 0.000 | 0.267 |
| 35.00 | -53.26 | -8.41 | 0.00 | -703.68 | 0.00 | 703.68 | 2994.56 | 1497.28 | 5749.33 | 2878.94 | 1.76 | -0.490 | 0.000 | 0.262 |
| 40.00 | -51.57 | -8.29 | 0.00 | -661.61 | 0.00 | 661.61 | 2946.97 | 1473.49 | 5502.17 | 2755.17 | 2.31 | -0.566 | 0.000 | 0.258 |
| 45.00 | -49.92 | -8.15 | 0.00 | -620.15 | 0.00 | 620.15 | 2897.46 | 1448.73 | 5256.53 | 2632.17 | 2.95 | -0.644 | 0.000 | 0.253 |
| 47.75 | -49.02 | -8.08 | 0.00 | -597.73 | 0.00 | 597.73 | 2869.40 | 1434.70 | 5122.20 | 2564.91 | 3.33 | -0.688 | 0.000 | 0.250 |
| 50.00 | -47.89 | -8.03 | 0.00 | -579.55 | 0.00 | 579.55 | 2846.01 | 1423.00 | 5012.74 | 2510.09 | 3.66 | -0.725 | 0.000 | 0.248 |
| 53.25 | -46.29 | -7.92 | 0.00 | -553.47 | 0.00 | 553.47 | 2837.57 | 1418.79 | 4973.81 | 2490.60 | 4.18 | -0.778 | 0.000 | 0.239 |
| 55.00 | -45.73 | -7.90 | 0.00 | -539.61 | 0.00 | 539.61 | 2819.00 | 1409.50 | 4889.10 | 2448.18 | 4.47 | -0.807 | 0.000 | 0.237 |
| 60.00 | -44.16 | -7.76 | 0.00 | -500.12 | 0.00 | 500.12 | 2764.64 | 1382.32 | 4648.65 | 2327.78 | 5.35 | -0.886 | 0.000 | 0.231 |
| 65.00 | -42.62 | -7.62 | 0.00 | -461.31 | 0.00 | 461.31 | 2708.35 | 1354.17 | 4410.81 | 2208.68 | 6.33 | -0.966 | 0.000 | 0.225 |
| 70.00 | -41.13 | -7.49 | 0.00 | -423.19 | 0.00 | 423.19 | 2650.12 | 1325.06 | 4175.87 | 2091.04 | 7.38 | -1.046 | 0.000 | 0.218 |
| 75.00 | -39.66 | -7.35 | 0.00 | -385.76 | 0.00 | 385.76 | 2589.96 | 1294.98 | 3944.16 | 1975.01 | 8.52 | -1.128 | 0.000 | 0.211 |
| 80.00 | -38.24 | -7.21 | 0.00 | -349.02 | 0.00 | 349.02 | 2527.88 | 1263.94 | 3715.96 | 1860.74 | 9.75 | -1.209 | 0.000 | 0.203 |
| 85.00 | -36.85 | -7.07 | 0.00 | -312.97 | 0.00 | 312.97 | 2463.86 | 1231.93 | 3491.60 | 1748.39 | 11.06 | -1.291 | 0.000 | 0.194 |
| 90.00 | -35.50 | -6.92 | 0.00 | -277.62 | 0.00 | 277.62 | 2397.91 | 1198.95 | 3271.37 | 1638.12 | 12.45 | -1.373 | 0.000 | 0.184 |
| 92.00 | -34.73 | -6.71 | 0.00 | -263.00 | 0.00 | 263.00 | 2370.99 | 1185.49 | 3184.51 | 1594.62 | 13.03 | -1.406 | 0.000 | 0.180 |
| 93.00 | -34.37 | -6.38 | 0.00 | -254.93 | 0.00 | 254.93 | 2357.41 | 1178.70 | 3141.35 | 1573.01 | 13.33 | -1.423 | 0.000 | 0.177 |
| 95.00 | -33.85 | -6.32 | 0.00 | -242.18 | 0.00 | 242.18 | 2330.03 | 1165.01 | 3055.58 | 1530.06 | 13.93 | -1.456 | 0.000 | 0.173 |
| 97.25 | -33.26 | -6.26 | 0.00 | -227.95 | 0.00 | 227.95 | 2298.85 | 1149.42 | 2960.01 | 1482.20 | 14.63 | -1.493 | 0.000 | 0.168 |
| 100.00 | -32.27 | -6.17 | 0.00 | -210.73 | 0.00 | 210.73 | 2260.21 | 1130.11 | 2844.54 | 1424.39 | 15.50 | -1.537 | 0.000 | 0.162 |
| 101.25 | -31.82 | -6.15 | 0.00 | -203.01 | 0.00 | 203.01 | 1705.50 | 852.75 | 2167.94 | 1085.58 | 15.91 | -1.557 | 0.000 | 0.206 |
| 105.00 | -30.96 | -6.05 | 0.00 | -179.97 | 0.00 | 179.97 | 1669.73 | 834.87 | 2056.27 | 1029.66 | 17.15 | -1.615 | 0.000 | 0.193 |
| 110.00 | -29.85 | -5.92 | 0.00 | -149.72 | 0.00 | 149.72 | 1620.35 | 810.17 | 1909.79 | 956.31 | 18.89 | -1.702 | 0.000 | 0.175 |
| 115.00 | -28.77 | -5.78 | 0.00 | -120.14 | 0.00 | 120.14 | 1569.04 | 784.52 | 1766.36 | 884.49 | 20.72 | -1.783 | 0.000 | 0.154 |
| 119.50 | -18.48 | -3.96 | 0.00 | -93.96 | 0.00 | 93.96 | 1521.21 | 760.60 | 1640.13 | 821.29 | 22.43 | -1.849 | 0.000 | 0.127 |
| 120.00 | -18.37 | -3.95 | 0.00 | -91.98 | 0.00 | 91.98 | 1515.79 | 757.90 | 1626.29 | 814.35 | 22.63 | -1.857 | 0.000 | 0.125 |
| 125.00 | -17.44 | -3.81 | 0.00 | -72.22 | 0.00 | 72.22 | 1460.62 | 730.31 | 1489.87 | 746.04 | 24.61 | -1.922 | 0.000 | 0.109 |
| 129.00 | -16.51 | -3.54 | 0.00 | -56.47 | 0.00 | 56.47 | 1406.38 | 703.19 | 1375.06 | 688.55 | 26.24 | -1.969 | 0.000 | 0.094 |
| 129.00 | -16.51 | -3.54 | 0.00 | -56.47 | 0.00 | 56.47 | 978.70 | 489.35 | 961.93 | 481.68 | 26.24 | -1.969 | 0.000 | 0.134 |
| 130.00 | -16.35 | -3.52 | 0.00 | -52.93 | 0.00 | 52.93 | 971.83 | 485.92 | 944.91 | 473.15 | 26.65 | -1.981 | 0.000 | 0.129 |
| 135.00 | -15.57 | -3.39 | 0.00 | -35.33 | 0.00 | 35.33 | 936.33 | 468.17 | 860.89 | 431.08 | 28.76 | -2.044 | 0.000 | 0.099 |
| 140.00 | -14.83 | -3.25 | 0.00 | -18.40 | 0.00 | 18.40 | 898.90 | 449.45 | 778.95 | 390.05 | 30.93 | -2.089 | 0.000 | 0.064 |
| 141.00 | -9.67 | -2.24 | 0.00 | -15.16 | 0.00 | 15.16 | 891.19 | 445.59 | 762.84 | 381.99 | 31.37 | -2.096 | 0.000 | 0.051 |
| 142.00 | -6.89 | -1.60 | 0.00 | -12.10 | 0.00 | 12.10 | 883.39 | 441.70 | 746.83 | 373.97 | 31.81 | -2.102 | 0.000 | 0.040 |
| 145.00 | -6.52 | -1.52 | 0.00 | -7.31 | 0.00 | 7.31 | 859.54 | 429.77 | 699.40 | 350.22 | 33.13 | -2.114 | 0.000 | 0.028 |
| 149.00 | 0.00 | -1.27 | 0.00 | -1.24 | 0.00 | 1.24 | 826.66 | 413.33 | 637.68 | 319.32 | 34.91 | -2.123 | 0.000 | 0.004 |

# Seismic Segment Forces (Factored)

| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT13061-A-SBA | | **Code:** | TIA-222-G | 5/31/2022 |
| **Site Name:** | New Fairfield | | **Exposure:** | C | |
| **Height:** | 149.00 (ft) | | **Crest Height:** | 0.00 | |
| **Base Elev:** | 1.000 (ft) | | **Site Class:** | D - Stiff Soil | |
| **Gh:** | 1.1 | **Topography:** 1 | **Struct Class:** | II | Page: 24 |

IES Tower Engineering Solutions

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Load Case:** | 1.2D + 1.0E | | | | | | | **Iterations** | 23 |
| **Gust Response Factor** | 1.10 | | | | **Sds** | 0.22 | | **Ss** | 0.21 |
| **Dead Load Factor** | 1.20 | **Seismic Load Factor** | 1.00 | | **Sd1** | 0.11 | | **S1** | 0.07 |
| **Wind Load Factor** | 0.00 | **Structure Frequency (f1)** | 0.35 | | **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 | 0.01 | 0.00 | 0.00 | |
| 5.00 | | 927.61 | 0.00 | 0.04 | 0.02 | 23.11 | |
| 10.00 | | 906.06 | 0.01 | 0.06 | 0.03 | 30.11 | |
| 15.00 | | 884.52 | 0.02 | 0.06 | 0.04 | 32.99 | |
| 20.00 | | 862.97 | 0.04 | 0.07 | 0.04 | 34.00 | |
| 25.00 | | 841.43 | 0.06 | 0.07 | 0.04 | 34.22 | |
| 30.00 | | 819.89 | 0.08 | 0.07 | 0.04 | 34.18 | |
| 35.00 | | 798.34 | 0.11 | 0.07 | 0.04 | 34.10 | |
| 40.00 | | 776.80 | 0.14 | 0.07 | 0.03 | 33.93 | |
| 45.00 | | 755.26 | 0.18 | 0.07 | 0.03 | 33.47 | |
| 47.75 | Bot - Section 2 | 406.21 | 0.20 | 0.06 | 0.02 | 18.02 | |
| 50.00 | | 659.75 | 0.22 | 0.06 | 0.02 | 29.11 | |
| 53.25 | Top - Section 1 | 937.57 | 0.25 | 0.06 | 0.02 | 40.48 | |
| 55.00 | | 250.50 | 0.26 | 0.05 | 0.02 | 10.60 | |
| 60.00 | | 701.17 | 0.31 | 0.04 | 0.01 | 26.57 | |
| 65.00 | | 679.63 | 0.37 | 0.03 | 0.01 | 20.32 | |
| 70.00 | | 658.08 | 0.42 | 0.01 | 0.01 | 11.69 | |
| 75.00 | | 636.54 | 0.49 | -0.01 | 0.01 | 1.35 | |
| 80.00 | | 614.99 | 0.55 | -0.03 | 0.01 | -9.13 | |
| 85.00 | | 593.45 | 0.62 | -0.06 | 0.02 | -17.81 | |
| 90.00 | | 571.91 | 0.70 | -0.09 | 0.03 | -23.30 | |
| 92.00 | Appurtenance(s) | 301.23 | 0.73 | -0.09 | 0.04 | -13.09 | |
| 93.00 | Appurtenance(s) | 250.07 | 0.74 | -0.10 | 0.04 | -11.12 | |
| 95.00 | | 217.56 | 0.77 | -0.11 | 0.05 | -9.95 | |
| 97.25 | Bot - Section 3 | 240.63 | 0.81 | -0.11 | 0.06 | -11.07 | |
| 100.00 | | 522.91 | 0.86 | -0.12 | 0.07 | -23.33 | |
| 101.25 | Top - Section 2 | 233.81 | 0.88 | -0.12 | 0.08 | -10.15 | |
| 105.00 | | 308.44 | 0.94 | -0.12 | 0.11 | -11.58 | |
| 110.00 | | 396.18 | 1.03 | -0.10 | 0.15 | -9.76 | |
| 115.00 | | 378.94 | 1.13 | -0.05 | 0.21 | -2.29 | |
| 119.50 | Appurtenance(s) | 3817.6 | 1.22 | 0.02 | 0.27 | 59.37 | |
| 120.00 | | 35.40 | 1.23 | 0.03 | 0.28 | 0.65 | |
| 125.00 | | 344.47 | 1.33 | 0.17 | 0.37 | 16.61 | |
| 129.00 | Top - Section 3 | 355.17 | 1.42 | 0.32 | 0.45 | 27.13 | |
| 130.00 | | 48.18 | 1.44 | 0.37 | 0.48 | 4.05 | |
| 135.00 | | 233.13 | 1.55 | 0.64 | 0.61 | 29.32 | |
| 140.00 | | 220.21 | 1.67 | 1.01 | 0.77 | 38.23 | |
| 141.00 | Appurtenance(s) | 2125.8 | 1.69 | 1.10 | 0.81 | 391.00 | |
| 142.00 | Appurtenance(s) | 1060.4 | 1.72 | 1.19 | 0.84 | 206.24 | |
| 145.00 | | 122.82 | 1.79 | 1.50 | 0.96 | 27.96 | |
| 149.00 | Appurtenance(s) | 2590.4 | 1.89 | 1.98 | 1.14 | 713.70 | |
| | **Totals:** | **28,086.2** | | | | **1,809.9** | **Total Wind:** **26,412.3** |

# Calculated Forces

| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT13061-A-SBA | **Code:** | TIA-222-G | 5/31/2022 | |
| **Site Name:** | New Fairfield | **Exposure:** | C | | |
| **Height:** | 149.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 1.000 (ft) | **Site Class:** | D - Stiff Soil | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 25 | |

IES Tower Engineering Solutions

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Load Case:** | 1.2D + 1.0E | | | | | | | **Iterations** | 23 |
| **Gust Response Factor** | 1.10 | | | **Sds** | 0.22 | | | **Ss** | 0.21 |
| **Dead Load Factor** | 1.20 | **Seismic Load Factor** | 1.00 | **Sd1** | 0.11 | | | **S1** | 0.07 |
| **Wind Load Factor** | 0.00 | **Structure Frequency (f1)** | 0.35 | **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 | -41.52 | -1.97 | 0.00 | -246.71 | 0.00 | 246.71 | 3273.57 | 1636.79 | 7496.53 | 3753.83 | | 0.00 | 0.00 | 0.078 |
| 5.00 | -40.29 | -1.96 | 0.00 | -236.88 | 0.00 | 236.88 | 3239.51 | 1619.75 | 7247.24 | 3629.01 | | 0.01 | -0.02 | 0.078 |
| 10.00 | -38.91 | -1.94 | 0.00 | -227.10 | 0.00 | 227.10 | 3203.51 | 1601.76 | 6997.34 | 3503.87 | | 0.03 | -0.03 | 0.077 |
| 15.00 | -37.55 | -1.91 | 0.00 | -217.42 | 0.00 | 217.42 | 3165.58 | 1582.79 | 6747.13 | 3378.58 | | 0.08 | -0.05 | 0.076 |
| 20.00 | -36.23 | -1.89 | 0.00 | -207.85 | 0.00 | 207.85 | 3125.72 | 1562.86 | 6496.92 | 3253.29 | | 0.14 | -0.07 | 0.075 |
| 25.00 | -34.92 | -1.86 | 0.00 | -198.40 | 0.00 | 198.40 | 3083.93 | 1541.97 | 6247.01 | 3128.15 | | 0.22 | -0.08 | 0.075 |
| 30.00 | -33.65 | -1.84 | 0.00 | -189.08 | 0.00 | 189.08 | 3040.21 | 1520.10 | 5997.71 | 3003.31 | | 0.32 | -0.10 | 0.074 |
| 35.00 | -32.40 | -1.81 | 0.00 | -179.88 | 0.00 | 179.88 | 2994.56 | 1497.28 | 5749.33 | 2878.94 | | 0.43 | -0.12 | 0.073 |
| 40.00 | -31.17 | -1.79 | 0.00 | -170.81 | 0.00 | 170.81 | 2946.97 | 1473.49 | 5502.17 | 2755.17 | | 0.57 | -0.14 | 0.073 |
| 45.00 | -29.97 | -1.76 | 0.00 | -161.88 | 0.00 | 161.88 | 2897.46 | 1448.73 | 5256.53 | 2632.17 | | 0.73 | -0.16 | 0.072 |
| 47.75 | -29.32 | -1.74 | 0.00 | -157.04 | 0.00 | 157.04 | 2869.40 | 1434.70 | 5122.20 | 2564.91 | | 0.83 | -0.17 | 0.071 |
| 50.00 | -28.40 | -1.72 | 0.00 | -153.11 | 0.00 | 153.11 | 2846.01 | 1423.00 | 5012.74 | 2510.09 | | 0.91 | -0.18 | 0.071 |
| 53.25 | -27.09 | -1.68 | 0.00 | -147.53 | 0.00 | 147.53 | 2837.57 | 1418.79 | 4973.81 | 2490.60 | | 1.04 | -0.20 | 0.069 |
| 55.00 | -26.68 | -1.67 | 0.00 | -144.59 | 0.00 | 144.59 | 2819.00 | 1409.50 | 4889.10 | 2448.18 | | 1.12 | -0.20 | 0.069 |
| 60.00 | -25.55 | -1.65 | 0.00 | -136.22 | 0.00 | 136.22 | 2764.64 | 1382.32 | 4648.65 | 2327.78 | | 1.34 | -0.23 | 0.068 |
| 65.00 | -24.44 | -1.64 | 0.00 | -127.95 | 0.00 | 127.95 | 2708.35 | 1354.17 | 4410.81 | 2208.68 | | 1.59 | -0.25 | 0.067 |
| 70.00 | -23.36 | -1.63 | 0.00 | -119.77 | 0.00 | 119.77 | 2650.12 | 1325.06 | 4175.87 | 2091.04 | | 1.86 | -0.27 | 0.066 |
| 75.00 | -22.30 | -1.63 | 0.00 | -111.62 | 0.00 | 111.62 | 2589.96 | 1294.98 | 3944.16 | 1975.01 | | 2.16 | -0.29 | 0.065 |
| 80.00 | -21.27 | -1.64 | 0.00 | -103.45 | 0.00 | 103.45 | 2527.88 | 1263.94 | 3715.96 | 1860.74 | | 2.48 | -0.32 | 0.064 |
| 85.00 | -20.27 | -1.64 | 0.00 | -95.27 | 0.00 | 95.27 | 2463.86 | 1231.93 | 3491.60 | 1748.39 | | 2.82 | -0.34 | 0.063 |
| 90.00 | -19.29 | -1.64 | 0.00 | -87.08 | 0.00 | 87.08 | 2397.91 | 1198.95 | 3271.37 | 1638.12 | | 3.20 | -0.37 | 0.061 |
| 92.00 | -18.81 | -1.64 | 0.00 | -83.80 | 0.00 | 83.80 | 2370.99 | 1185.49 | 3184.51 | 1594.62 | | 3.35 | -0.38 | 0.060 |
| 93.00 | -18.45 | -1.64 | 0.00 | -82.16 | 0.00 | 82.16 | 2357.41 | 1178.70 | 3141.35 | 1573.01 | | 3.43 | -0.38 | 0.060 |
| 95.00 | -18.08 | -1.64 | 0.00 | -78.88 | 0.00 | 78.88 | 2330.03 | 1165.01 | 3055.58 | 1530.06 | | 3.60 | -0.39 | 0.059 |
| 97.25 | -17.66 | -1.64 | 0.00 | -75.19 | 0.00 | 75.19 | 2298.85 | 1149.42 | 2960.01 | 1482.20 | | 3.78 | -0.41 | 0.058 |
| 100.00 | -16.88 | -1.64 | 0.00 | -70.68 | 0.00 | 70.68 | 2260.21 | 1130.11 | 2844.54 | 1424.39 | | 4.02 | -0.42 | 0.057 |
| 101.25 | -16.53 | -1.64 | 0.00 | -68.63 | 0.00 | 68.63 | 1705.50 | 852.75 | 2167.94 | 1085.58 | | 4.13 | -0.43 | 0.073 |
| 105.00 | -15.94 | -1.64 | 0.00 | -62.48 | 0.00 | 62.48 | 1669.73 | 834.87 | 2056.27 | 1029.66 | | 4.48 | -0.45 | 0.070 |
| 110.00 | -15.18 | -1.64 | 0.00 | -54.26 | 0.00 | 54.26 | 1620.35 | 810.17 | 1909.79 | 956.31 | | 4.96 | -0.48 | 0.066 |
| 115.00 | -14.45 | -1.65 | 0.00 | -46.04 | 0.00 | 46.04 | 1569.04 | 784.52 | 1766.36 | 884.49 | | 5.48 | -0.51 | 0.061 |
| 119.50 | -9.61 | -1.54 | 0.00 | -38.64 | 0.00 | 38.64 | 1521.21 | 760.60 | 1640.13 | 821.29 | | 5.97 | -0.53 | 0.053 |
| 120.00 | -9.54 | -1.55 | 0.00 | -37.86 | 0.00 | 37.86 | 1515.79 | 757.90 | 1626.29 | 814.35 | | 6.03 | -0.54 | 0.053 |
| 125.00 | -8.92 | -1.53 | 0.00 | -30.13 | 0.00 | 30.13 | 1460.62 | 730.31 | 1489.87 | 746.04 | | 6.61 | -0.56 | 0.047 |
| 129.00 | -8.33 | -1.50 | 0.00 | -24.03 | 0.00 | 24.03 | 1406.38 | 703.19 | 1375.06 | 688.55 | | 7.09 | -0.58 | 0.041 |
| 129.00 | -8.33 | -1.50 | 0.00 | -24.03 | 0.00 | 24.03 | 978.70 | 489.35 | 961.93 | 481.68 | | 7.09 | -0.58 | 0.058 |
| 130.00 | -8.23 | -1.49 | 0.00 | -22.53 | 0.00 | 22.53 | 971.83 | 485.92 | 944.91 | 473.15 | | 7.21 | -0.59 | 0.056 |
| 135.00 | -7.74 | -1.46 | 0.00 | -15.07 | 0.00 | 15.07 | 936.33 | 468.17 | 860.89 | 431.08 | | 7.85 | -0.62 | 0.043 |
| 140.00 | -7.28 | -1.42 | 0.00 | -7.76 | 0.00 | 7.76 | 898.90 | 449.45 | 778.95 | 390.05 | | 8.50 | -0.64 | 0.028 |
| 141.00 | -4.69 | -1.00 | 0.00 | -6.34 | 0.00 | 6.34 | 891.19 | 445.59 | 762.84 | 381.99 | | 8.64 | -0.64 | 0.022 |
| 142.00 | -3.40 | -0.78 | 0.00 | -5.34 | 0.00 | 5.34 | 883.39 | 441.70 | 746.83 | 373.97 | | 8.77 | -0.64 | 0.018 |
| 145.00 | -3.19 | -0.75 | 0.00 | -3.00 | 0.00 | 3.00 | 859.54 | 429.77 | 699.40 | 350.22 | | 9.17 | -0.65 | 0.012 |
| 149.00 | 0.00 | -0.71 | 0.00 | 0.00 | 0.00 | 0.00 | 826.66 | 413.33 | 637.68 | 319.32 | | 9.72 | -0.65 | 0.000 |

# Seismic Segment Forces (Factored)

| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT13061-A-SBA | | **Code:** | TIA-222-G | 5/31/2022 |
| **Site Name:** | New Fairfield | | **Exposure:** | C | |
| **Height:** | 149.00 (ft) | | **Crest Height:** | 0.00 | |
| **Base Elev:** | 1.000 (ft) | | **Site Class:** | D - Stiff Soil | |
| **Gh:** | 1.1 | **Topography:** 1 | **Struct Class:** | II | Page: 26 |

Tower Engineering Solutions

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Load Case:** | 0.9D + 1.0E | | | | | | | **Iterations** | 23 |
| **Gust Response Factor** | 1.10 | | | | **Sds** | 0.22 | | **Ss** | 0.21 |
| **Dead Load Factor** | 0.90 | **Seismic Load Factor** | 1.00 | | **Sd1** | 0.11 | | **S1** | 0.07 |
| **Wind Load Factor** | 0.00 | **Structure Frequency (f1)** | 0.35 | | **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 | 0.01 | 0.00 | 0.00 | |
| 5.00 | | 927.61 | 0.00 | 0.04 | 0.02 | 23.11 | |
| 10.00 | | 906.06 | 0.01 | 0.06 | 0.03 | 30.11 | |
| 15.00 | | 884.52 | 0.02 | 0.06 | 0.04 | 32.99 | |
| 20.00 | | 862.97 | 0.04 | 0.07 | 0.04 | 34.00 | |
| 25.00 | | 841.43 | 0.06 | 0.07 | 0.04 | 34.22 | |
| 30.00 | | 819.89 | 0.08 | 0.07 | 0.04 | 34.18 | |
| 35.00 | | 798.34 | 0.11 | 0.07 | 0.04 | 34.10 | |
| 40.00 | | 776.80 | 0.14 | 0.07 | 0.03 | 33.93 | |
| 45.00 | | 755.26 | 0.18 | 0.07 | 0.03 | 33.47 | |
| 47.75 | Bot - Section 2 | 406.21 | 0.20 | 0.06 | 0.02 | 18.02 | |
| 50.00 | | 659.75 | 0.22 | 0.06 | 0.02 | 29.11 | |
| 53.25 | Top - Section 1 | 937.57 | 0.25 | 0.06 | 0.02 | 40.48 | |
| 55.00 | | 250.50 | 0.26 | 0.05 | 0.02 | 10.60 | |
| 60.00 | | 701.17 | 0.31 | 0.04 | 0.01 | 26.57 | |
| 65.00 | | 679.63 | 0.37 | 0.03 | 0.01 | 20.32 | |
| 70.00 | | 658.08 | 0.42 | 0.01 | 0.01 | 11.69 | |
| 75.00 | | 636.54 | 0.49 | -0.01 | 0.01 | 1.35 | |
| 80.00 | | 614.99 | 0.55 | -0.03 | 0.01 | -9.13 | |
| 85.00 | | 593.45 | 0.62 | -0.06 | 0.02 | -17.81 | |
| 90.00 | | 571.91 | 0.70 | -0.09 | 0.03 | -23.30 | |
| 92.00 | Appurtenance(s) | 301.23 | 0.73 | -0.09 | 0.04 | -13.09 | |
| 93.00 | Appurtenance(s) | 250.07 | 0.74 | -0.10 | 0.04 | -11.12 | |
| 95.00 | | 217.56 | 0.77 | -0.11 | 0.05 | -9.95 | |
| 97.25 | Bot - Section 3 | 240.63 | 0.81 | -0.11 | 0.06 | -11.07 | |
| 100.00 | | 522.91 | 0.86 | -0.12 | 0.07 | -23.33 | |
| 101.25 | Top - Section 2 | 233.81 | 0.88 | -0.12 | 0.08 | -10.15 | |
| 105.00 | | 308.44 | 0.94 | -0.12 | 0.11 | -11.58 | |
| 110.00 | | 396.18 | 1.03 | -0.10 | 0.15 | -9.76 | |
| 115.00 | | 378.94 | 1.13 | -0.05 | 0.21 | -2.29 | |
| 119.50 | Appurtenance(s) | 3817.6 | 1.22 | 0.02 | 0.27 | 59.37 | |
| 120.00 | | 35.40 | 1.23 | 0.03 | 0.28 | 0.65 | |
| 125.00 | | 344.47 | 1.33 | 0.17 | 0.37 | 16.61 | |
| 129.00 | Top - Section 3 | 355.17 | 1.42 | 0.32 | 0.45 | 27.13 | |
| 130.00 | | 48.18 | 1.44 | 0.37 | 0.48 | 4.05 | |
| 135.00 | | 233.13 | 1.55 | 0.64 | 0.61 | 29.32 | |
| 140.00 | | 220.21 | 1.67 | 1.01 | 0.77 | 38.23 | |
| 141.00 | Appurtenance(s) | 2125.8 | 1.69 | 1.10 | 0.81 | 391.00 | |
| 142.00 | Appurtenance(s) | 1060.4 | 1.72 | 1.19 | 0.84 | 206.24 | |
| 145.00 | | 122.82 | 1.79 | 1.50 | 0.96 | 27.96 | |
| 149.00 | Appurtenance(s) | 2590.4 | 1.89 | 1.98 | 1.14 | 713.70 | |
| | **Totals:** | **28,086.2** | | | | **1,809.9** | **Total Wind:** **26,412.3** |

# Calculated Forces

| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT13061-A-SBA | **Code:** | TIA-222-G | 5/31/2022 | |
| **Site Name:** | New Fairfield | **Exposure:** | C | | |
| **Height:** | 149.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 1.000 (ft) | **Site Class:** | D - Stiff Soil | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 27 | |

IES Tower Engineering Solutions

**Load Case:** 0.9D + 1.0E

**Iterations** 23

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Gust Response Factor** | 1.10 | | | **Sds** | 0.22 | | | **Ss** | 0.21 |
| **Dead Load Factor** | 0.90 | **Seismic Load Factor** | 1.00 | **Sd1** | 0.11 | | | **S1** | 0.07 |
| **Wind Load Factor** | 0.00 | **Structure Frequency (f1)** | 0.35 | **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 | -31.14 | -1.97 | 0.00 | -243.31 | 0.00 | 243.31 | 3273.57 | 1636.79 | 7496.53 | 3753.83 | | 0.00 | 0.00 | 0.074 |
| 5.00 | -30.22 | -1.95 | 0.00 | -233.48 | 0.00 | 233.48 | 3239.51 | 1619.75 | 7247.24 | 3629.01 | | 0.01 | -0.02 | 0.074 |
| 10.00 | -29.18 | -1.93 | 0.00 | -223.72 | 0.00 | 223.72 | 3203.51 | 1601.76 | 6997.34 | 3503.87 | | 0.03 | -0.03 | 0.073 |
| 15.00 | -28.17 | -1.90 | 0.00 | -214.08 | 0.00 | 214.08 | 3165.58 | 1582.79 | 6747.13 | 3378.58 | | 0.08 | -0.05 | 0.072 |
| 20.00 | -27.17 | -1.88 | 0.00 | -204.56 | 0.00 | 204.56 | 3125.72 | 1562.86 | 6496.92 | 3253.29 | | 0.14 | -0.07 | 0.072 |
| 25.00 | -26.19 | -1.85 | 0.00 | -195.17 | 0.00 | 195.17 | 3083.93 | 1541.97 | 6247.01 | 3128.15 | | 0.21 | -0.08 | 0.071 |
| 30.00 | -25.23 | -1.82 | 0.00 | -185.93 | 0.00 | 185.93 | 3040.21 | 1520.10 | 5997.71 | 3003.31 | | 0.31 | -0.10 | 0.070 |
| 35.00 | -24.30 | -1.79 | 0.00 | -176.82 | 0.00 | 176.82 | 2994.56 | 1497.28 | 5749.33 | 2878.94 | | 0.43 | -0.12 | 0.070 |
| 40.00 | -23.38 | -1.77 | 0.00 | -167.85 | 0.00 | 167.85 | 2946.97 | 1473.49 | 5502.17 | 2755.17 | | 0.56 | -0.14 | 0.069 |
| 45.00 | -22.48 | -1.74 | 0.00 | -159.01 | 0.00 | 159.01 | 2897.46 | 1448.73 | 5256.53 | 2632.17 | | 0.72 | -0.16 | 0.068 |
| 47.75 | -21.99 | -1.72 | 0.00 | -154.24 | 0.00 | 154.24 | 2869.40 | 1434.70 | 5122.20 | 2564.91 | | 0.82 | -0.17 | 0.068 |
| 50.00 | -21.30 | -1.69 | 0.00 | -150.37 | 0.00 | 150.37 | 2846.01 | 1423.00 | 5012.74 | 2510.09 | | 0.90 | -0.18 | 0.067 |
| 53.25 | -20.31 | -1.65 | 0.00 | -144.86 | 0.00 | 144.86 | 2837.57 | 1418.79 | 4973.81 | 2490.60 | | 1.03 | -0.19 | 0.065 |
| 55.00 | -20.01 | -1.65 | 0.00 | -141.97 | 0.00 | 141.97 | 2819.00 | 1409.50 | 4889.10 | 2448.18 | | 1.10 | -0.20 | 0.065 |
| 60.00 | -19.16 | -1.63 | 0.00 | -133.73 | 0.00 | 133.73 | 2764.64 | 1382.32 | 4648.65 | 2327.78 | | 1.32 | -0.22 | 0.064 |
| 65.00 | -18.33 | -1.61 | 0.00 | -125.60 | 0.00 | 125.60 | 2708.35 | 1354.17 | 4410.81 | 2208.68 | | 1.56 | -0.24 | 0.064 |
| 70.00 | -17.52 | -1.60 | 0.00 | -117.56 | 0.00 | 117.56 | 2650.12 | 1325.06 | 4175.87 | 2091.04 | | 1.83 | -0.27 | 0.063 |
| 75.00 | -16.72 | -1.60 | 0.00 | -109.56 | 0.00 | 109.56 | 2589.96 | 1294.98 | 3944.16 | 1975.01 | | 2.12 | -0.29 | 0.062 |
| 80.00 | -15.95 | -1.60 | 0.00 | -101.56 | 0.00 | 101.56 | 2527.88 | 1263.94 | 3715.96 | 1860.74 | | 2.44 | -0.31 | 0.061 |
| 85.00 | -15.20 | -1.61 | 0.00 | -93.54 | 0.00 | 93.54 | 2463.86 | 1231.93 | 3491.60 | 1748.39 | | 2.78 | -0.34 | 0.060 |
| 90.00 | -14.46 | -1.61 | 0.00 | -85.50 | 0.00 | 85.50 | 2397.91 | 1198.95 | 3271.37 | 1638.12 | | 3.14 | -0.36 | 0.058 |
| 92.00 | -14.10 | -1.61 | 0.00 | -82.29 | 0.00 | 82.29 | 2370.99 | 1185.49 | 3184.51 | 1594.62 | | 3.30 | -0.37 | 0.058 |
| 93.00 | -13.84 | -1.61 | 0.00 | -80.69 | 0.00 | 80.69 | 2357.41 | 1178.70 | 3141.35 | 1573.01 | | 3.38 | -0.38 | 0.057 |
| 95.00 | -13.56 | -1.61 | 0.00 | -77.47 | 0.00 | 77.47 | 2330.03 | 1165.01 | 3055.58 | 1530.06 | | 3.54 | -0.39 | 0.056 |
| 97.25 | -13.24 | -1.61 | 0.00 | -73.86 | 0.00 | 73.86 | 2298.85 | 1149.42 | 2960.01 | 1482.20 | | 3.72 | -0.40 | 0.056 |
| 100.00 | -12.66 | -1.61 | 0.00 | -69.44 | 0.00 | 69.44 | 2260.21 | 1130.11 | 2844.54 | 1424.39 | | 3.96 | -0.41 | 0.054 |
| 101.25 | -12.39 | -1.61 | 0.00 | -67.43 | 0.00 | 67.43 | 1705.50 | 852.75 | 2167.94 | 1085.58 | | 4.07 | -0.42 | 0.069 |
| 105.00 | -11.95 | -1.61 | 0.00 | -61.40 | 0.00 | 61.40 | 1669.73 | 834.87 | 2056.27 | 1029.66 | | 4.40 | -0.44 | 0.067 |
| 110.00 | -11.39 | -1.61 | 0.00 | -53.36 | 0.00 | 53.36 | 1620.35 | 810.17 | 1909.79 | 956.31 | | 4.88 | -0.47 | 0.063 |
| 115.00 | -10.83 | -1.61 | 0.00 | -45.31 | 0.00 | 45.31 | 1569.04 | 784.52 | 1766.36 | 884.49 | | 5.39 | -0.50 | 0.058 |
| 119.50 | -7.20 | -1.52 | 0.00 | -38.06 | 0.00 | 38.06 | 1521.21 | 760.60 | 1640.13 | 821.29 | | 5.87 | -0.53 | 0.051 |
| 120.00 | -7.15 | -1.52 | 0.00 | -37.30 | 0.00 | 37.30 | 1515.79 | 757.90 | 1626.29 | 814.35 | | 5.93 | -0.53 | 0.051 |
| 125.00 | -6.69 | -1.50 | 0.00 | -29.69 | 0.00 | 29.69 | 1460.62 | 730.31 | 1489.87 | 746.04 | | 6.50 | -0.55 | 0.044 |
| 129.00 | -6.24 | -1.47 | 0.00 | -23.68 | 0.00 | 23.68 | 1406.38 | 703.19 | 1375.06 | 688.55 | | 6.97 | -0.57 | 0.039 |
| 129.00 | -6.24 | -1.47 | 0.00 | -23.68 | 0.00 | 23.68 | 978.70 | 489.35 | 961.93 | 481.68 | | 6.97 | -0.57 | 0.056 |
| 130.00 | -6.17 | -1.47 | 0.00 | -22.20 | 0.00 | 22.20 | 971.83 | 485.92 | 944.91 | 473.15 | | 7.09 | -0.58 | 0.053 |
| 135.00 | -5.80 | -1.44 | 0.00 | -14.85 | 0.00 | 14.85 | 936.33 | 468.17 | 860.89 | 431.08 | | 7.71 | -0.61 | 0.041 |
| 140.00 | -5.45 | -1.40 | 0.00 | -7.66 | 0.00 | 7.66 | 898.90 | 449.45 | 778.95 | 390.05 | | 8.36 | -0.62 | 0.026 |
| 141.00 | -3.51 | -0.99 | 0.00 | -6.26 | 0.00 | 6.26 | 891.19 | 445.59 | 762.84 | 381.99 | | 8.49 | -0.63 | 0.020 |
| 142.00 | -2.55 | -0.77 | 0.00 | -5.27 | 0.00 | 5.27 | 883.39 | 441.70 | 746.83 | 373.97 | | 8.62 | -0.63 | 0.017 |
| 145.00 | -2.39 | -0.74 | 0.00 | -2.96 | 0.00 | 2.96 | 859.54 | 429.77 | 699.40 | 350.22 | | 9.02 | -0.64 | 0.011 |
| 149.00 | 0.00 | -0.71 | 0.00 | 0.00 | 0.00 | 0.00 | 826.66 | 413.33 | 637.68 | 319.32 | | 9.55 | -0.64 | 0.000 |

# Wind Loading - Shaft

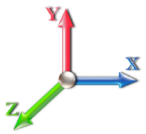
| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT13061-A-SBA | **Code:** | TIA-222-G | 5/31/2022 | |
| **Site Name:** | New Fairfield | **Exposure:** | C | | |
| **Height:** | 149.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 1.000 (ft) | **Site Class:** | D - Stiff Soil | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 28 | |

Tower Engineering Solutions

**Load Case:** 1.0D + 1.0W 60 mph Wind

**Dead Load Factor** 1.00

**Wind Load Factor** 1.00




**Iterations** 24

| 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 | 261.76 | 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 | 255.78 | 0.650 | 0.000 | 5.00 | 23.389 | 15.20 | 124.5 | 0.0 | 927.6 |
| 10.00 | | 1.00 | 0.85 | 7.442 | 8.19 | 249.80 | 0.650 | 0.000 | 5.00 | 22.849 | 14.85 | 121.6 | 0.0 | 906.1 |
| 15.00 | | 1.00 | 0.86 | 7.534 | 8.29 | 245.33 | 0.650 | 0.000 | 5.00 | 22.309 | 14.50 | 120.2 | 0.0 | 884.5 |
| 20.00 | | 1.00 | 0.91 | 7.978 | 8.78 | 246.26 | 0.650 | 0.000 | 5.00 | 21.769 | 14.15 | 124.2 | 0.0 | 863.0 |
| 25.00 | | 1.00 | 0.95 | 8.345 | 9.18 | 245.54 | 0.650 | 0.000 | 5.00 | 21.229 | 13.80 | 126.7 | 0.0 | 841.4 |
| 30.00 | | 1.00 | 0.99 | 8.659 | 9.53 | 243.68 | 0.650 | 0.000 | 5.00 | 20.689 | 13.45 | 128.1 | 0.0 | 819.9 |
| 35.00 | | 1.00 | 1.02 | 8.936 | 9.83 | 241.00 | 0.650 | 0.000 | 5.00 | 20.148 | 13.10 | 128.7 | 0.0 | 798.3 |
| 40.00 | | 1.00 | 1.05 | 9.184 | 10.10 | 237.68 | 0.650 | 0.000 | 5.00 | 19.608 | 12.75 | 128.8 | 0.0 | 776.8 |
| 45.00 | | 1.00 | 1.07 | 9.410 | 10.35 | 233.85 | 0.650 | 0.000 | 5.00 | 19.068 | 12.39 | 128.3 | 0.0 | 755.3 |
| 47.75 | Bot - Section 2 | 1.00 | 1.09 | 9.525 | 10.48 | 231.57 | 0.650 | 0.000 | 2.75 | 10.257 | 6.67 | 69.9 | 0.0 | 406.2 |
| 50.00 | | 1.00 | 1.10 | 9.616 | 10.58 | 229.62 | 0.650 | 0.000 | 2.25 | 8.390 | 5.45 | 57.7 | 0.0 | 659.8 |
| 53.25 | Top - Section 1 | 1.00 | 1.11 | 9.742 | 10.72 | 226.67 | 0.650 | 0.000 | 3.25 | 11.925 | 7.75 | 83.1 | 0.0 | 937.6 |
| 55.00 | | 1.00 | 1.12 | 9.807 | 10.79 | 228.39 | 0.650 | 0.000 | 1.75 | 6.327 | 4.11 | 44.4 | 0.0 | 250.5 |
| 60.00 | | 1.00 | 1.14 | 9.986 | 10.98 | 223.53 | 0.650 | 0.000 | 5.00 | 17.712 | 11.51 | 126.5 | 0.0 | 701.2 |
| 65.00 | | 1.00 | 1.16 | 10.153 | 11.17 | 218.41 | 0.650 | 0.000 | 5.00 | 17.172 | 11.16 | 124.7 | 0.0 | 679.6 |
| 70.00 | | 1.00 | 1.18 | 10.310 | 11.34 | 213.06 | 0.650 | 0.000 | 5.00 | 16.632 | 10.81 | 122.6 | 0.0 | 658.1 |
| 75.00 | | 1.00 | 1.19 | 10.459 | 11.50 | 207.51 | 0.650 | 0.000 | 5.00 | 16.092 | 10.46 | 120.3 | 0.0 | 636.5 |
| 80.00 | | 1.00 | 1.21 | 10.600 | 11.66 | 201.77 | 0.650 | 0.000 | 5.00 | 15.551 | 10.11 | 117.9 | 0.0 | 615.0 |
| 85.00 | | 1.00 | 1.23 | 10.734 | 11.81 | 195.87 | 0.650 | 0.000 | 5.00 | 15.011 | 9.76 | 115.2 | 0.0 | 593.4 |
| 90.00 | | 1.00 | 1.24 | 10.863 | 11.95 | 189.82 | 0.650 | 0.000 | 5.00 | 14.471 | 9.41 | 112.4 | 0.0 | 571.9 |
| 92.00 | Appurtenance(s) | 1.00 | 1.25 | 10.913 | 12.00 | 187.36 | 0.650 | 0.000 | 2.00 | 5.637 | 3.66 | 44.0 | 0.0 | 222.7 |
| 93.00 | Appurtenance(s) | 1.00 | 1.25 | 10.937 | 12.03 | 186.12 | 0.650 | 0.000 | 1.00 | 2.786 | 1.81 | 21.8 | 0.0 | 110.1 |
| 95.00 | | 1.00 | 1.25 | 10.986 | 12.08 | 183.63 | 0.650 | 0.000 | 2.00 | 5.508 | 3.58 | 43.3 | 0.0 | 217.6 |
| 97.25 | Bot - Section 3 | 1.00 | 1.26 | 11.040 | 12.14 | 180.80 | 0.650 | 0.000 | 2.25 | 6.093 | 3.96 | 48.1 | 0.0 | 240.6 |
| 100.00 | | 1.00 | 1.27 | 11.104 | 12.21 | 177.32 | 0.650 | 0.000 | 2.75 | 7.414 | 4.82 | 58.9 | 0.0 | 522.9 |
| 101.25 | Top - Section 2 | 1.00 | 1.27 | 11.133 | 12.25 | 175.72 | 0.650 | 0.000 | 1.25 | 3.316 | 2.16 | 26.4 | 0.0 | 233.8 |
| 105.00 | | 1.00 | 1.28 | 11.218 | 12.34 | 173.76 | 0.650 | 0.000 | 3.75 | 9.746 | 6.33 | 78.2 | 0.0 | 308.4 |
| 110.00 | | 1.00 | 1.29 | 11.327 | 12.46 | 167.23 | 0.650 | 0.000 | 5.00 | 12.522 | 8.14 | 101.4 | 0.0 | 396.2 |
| 115.00 | | 1.00 | 1.31 | 11.432 | 12.58 | 160.60 | 0.650 | 0.000 | 5.00 | 11.982 | 7.79 | 97.9 | 0.0 | 378.9 |
| 119.50 | Appurtenance(s) | 1.00 | 1.32 | 11.524 | 12.68 | 154.55 | 0.650 | 0.000 | 4.50 | 10.322 | 6.71 | 85.1 | 0.0 | 326.3 |
| 120.00 | | 1.00 | 1.32 | 11.534 | 12.69 | 153.87 | 0.650 | 0.000 | 0.50 | 1.120 | 0.73 | 9.2 | 0.0 | 35.4 |
| 125.00 | | 1.00 | 1.33 | 11.633 | 12.80 | 147.06 | 0.650 | 0.000 | 5.00 | 10.902 | 7.09 | 90.7 | 0.0 | 344.5 |
| 129.00 | Top - Section 3 | 1.00 | 1.34 | 11.710 | 12.88 | 141.55 | 0.650 | 0.000 | 4.00 | 8.332 | 5.42 | 69.8 | 0.0 | 263.2 |
| 130.00 | | 1.00 | 1.34 | 11.729 | 12.90 | 140.16 | 0.650 | 0.000 | 1.00 | 2.029 | 1.32 | 17.0 | 0.0 | 48.2 |
| 135.00 | | 1.00 | 1.35 | 11.822 | 13.00 | 133.18 | 0.650 | 0.000 | 5.00 | 9.821 | 6.38 | 83.0 | 0.0 | 233.1 |
| 140.00 | | 1.00 | 1.36 | 11.912 | 13.10 | 126.13 | 0.650 | 0.000 | 5.00 | 9.281 | 6.03 | 79.0 | 0.0 | 220.2 |
| 141.00 | Appurtenance(s) | 1.00 | 1.36 | 11.930 | 13.12 | 124.71 | 0.650 | 0.000 | 1.00 | 1.791 | 1.16 | 15.3 | 0.0 | 42.5 |
| 142.00 | Appurtenance(s) | 1.00 | 1.36 | 11.947 | 13.14 | 123.29 | 0.650 | 0.000 | 1.00 | 1.770 | 1.15 | 15.1 | 0.0 | 42.0 |
| 145.00 | | 1.00 | 1.37 | 12.000 | 13.20 | 119.00 | 0.650 | 0.000 | 3.00 | 5.180 | 3.37 | 44.4 | 0.0 | 122.8 |
| 149.00 | Appurtenance(s) | 1.00 | 1.38 | 12.068 | 13.27 | 113.26 | 0.650 | 0.000 | 4.00 | 6.604 | 4.29 | 57.0 | 0.0 | 156.5 |
| | | | | | | | | **Totals:** | **149.00** | | | **3,311.0** | | **18,748.6** |

# Discrete Appurtenance Forces

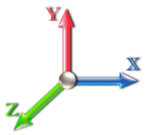
| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT13061-A-SBA | **Code:** | TIA-222-G | 5/31/2022 | |
| **Site Name:** | New Fairfield | **Exposure:** | C | | |
| **Height:** | 149.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 1.000 (ft) | **Site Class:** | D - Stiff Soil | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 29 | |

Tower Engineering Solutions

**Load Case:** 1.0D + 1.0W 60 mph Wind

**Dead Load Factor** 1.00

**Wind Load Factor** 1.00




**Iterations** 24

| 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 | 3 | 12.085 | 13.294 | 0.66 | 0.90 | 10.19 | 79.20 | 0.000 | 1.000 | 135.46 | 0.00 | 135.46 |
| 2 | 149.00 | Lightning Rod | 1 | 12.127 | 13.340 | 1.00 | 1.00 | 1.05 | 35.00 | 0.000 | 3.500 | 14.01 | 0.00 | 49.02 |
| 3 | 149.00 | RFS BA1010 | 1 | 12.108 | 13.318 | 1.00 | 1.00 | 1.24 | 8.80 | 0.000 | 2.350 | 16.51 | 0.00 | 38.81 |
| 4 | 149.00 | Low Profile Platform | 1 | 12.085 | 13.294 | 1.00 | 1.00 | 22.00 | 1500.00 | 0.000 | 1.000 | 292.46 | 0.00 | 292.46 |
| 5 | 149.00 | Standoff Mount | 1 | 12.068 | 13.275 | 1.00 | 1.00 | 1.80 | 60.00 | 0.000 | 0.000 | 23.89 | 0.00 | 0.00 |
| 6 | 149.00 | Kathrein 782 11056 | 3 | 12.085 | 13.294 | 0.60 | 0.90 | 0.51 | 7.80 | 0.000 | 1.000 | 6.73 | 0.00 | 6.73 |
| 7 | 149.00 | RFS APXV18-209014 | 3 | 12.085 | 13.294 | 0.67 | 0.90 | 7.15 | 56.10 | 0.000 | 1.000 | 95.09 | 0.00 | 95.09 |
| 8 | 149.00 | Ericsson KRY 112 489/2 | 3 | 12.085 | 13.294 | 0.60 | 0.90 | 1.23 | 39.60 | 0.000 | 1.000 | 16.35 | 0.00 | 16.35 |
| 9 | 149.00 | Ericsson 4480 B71 + B85 | 3 | 12.085 | 13.294 | 0.60 | 0.90 | 5.16 | 279.00 | 0.000 | 1.000 | 68.54 | 0.00 | 68.54 |
| 10 | 149.00 | RFS | 3 | 12.085 | 13.294 | 0.66 | 0.90 | 39.89 | 368.40 | 0.000 | 1.000 | 530.32 | 0.00 | 530.32 |
| 11 | 142.00 | Cci HPA-65R-BUU-H6 | 3 | 11.982 | 13.181 | 0.68 | 0.80 | 19.71 | 152.10 | 0.000 | 2.000 | 259.74 | 0.00 | 519.48 |
| 12 | 142.00 | Ericsson 4426 B66 RRU | 3 | 11.947 | 13.142 | 0.58 | 0.80 | 2.01 | 145.50 | 0.000 | 0.000 | 26.48 | 0.00 | 0.00 |
| 13 | 142.00 | Ericsson RRUS 32 RRU | 3 | 11.947 | 13.142 | 0.56 | 0.80 | 2.77 | 231.00 | 0.000 | 0.000 | 36.43 | 0.00 | 0.00 |
| 14 | 142.00 | Powerwave | 3 | 11.982 | 13.181 | 0.72 | 0.80 | 1.19 | 48.00 | 0.000 | 2.000 | 15.66 | 0.00 | 31.32 |
| 15 | 142.00 | Powerwave LGP-21401 | 9 | 11.982 | 13.181 | 0.80 | 0.80 | 7.56 | 126.90 | 0.000 | 2.000 | 99.65 | 0.00 | 199.29 |
| 16 | 142.00 | Ericsson RRUS 11 RRU | 3 | 11.947 | 13.142 | 0.62 | 0.80 | 4.72 | 165.00 | 0.000 | 0.000 | 62.00 | 0.00 | 0.00 |
| 17 | 142.00 | Ericsson RRUS 12 RRU | 3 | 11.982 | 13.181 | 0.56 | 0.80 | 5.29 | 150.00 | 0.000 | 2.000 | 69.75 | 0.00 | 139.50 |
| 18 | 141.00 | Kaelus DBCT108F1V92-1 | 6 | 11.930 | 13.123 | 0.56 | 0.80 | 2.39 | 100.20 | 0.000 | 0.000 | 31.31 | 0.00 | 0.00 |
| 19 | 141.00 | Kathrein 80010798 | 3 | 11.930 | 13.123 | 0.62 | 0.80 | 20.01 | 258.90 | 0.000 | 0.000 | 262.61 | 0.00 | 0.00 |
| 20 | 141.00 | Powerwave 7770 | 3 | 11.930 | 13.123 | 0.58 | 0.80 | 9.65 | 105.00 | 0.000 | 0.000 | 126.68 | 0.00 | 0.00 |
| 21 | 141.00 | Low Profile Platform | 1 | 11.930 | 13.123 | 1.00 | 1.00 | 22.00 | 1500.00 | 0.000 | 0.000 | 288.70 | 0.00 | 0.00 |
| 22 | 141.00 | Raycap DC6-48-60-18-8F | 2 | 11.930 | 13.123 | 0.80 | 0.80 | 3.52 | 65.60 | 0.000 | 0.000 | 46.19 | 0.00 | 0.00 |
| 23 | 141.00 | Ericsson RRUS-A2 RRU | 3 | 11.930 | 13.123 | 0.54 | 0.80 | 2.52 | 45.00 | 0.000 | 0.000 | 33.13 | 0.00 | 0.00 |
| 24 | 141.00 | Powerwave 1001983 | 3 | 11.930 | 13.123 | 0.80 | 0.80 | 0.26 | 8.70 | 0.000 | 0.000 | 3.46 | 0.00 | 0.00 |
| 25 | 129.00 | Standoff Mount | 1 | 11.710 | 12.881 | 1.00 | 1.00 | 1.80 | 60.00 | 0.000 | 0.000 | 23.19 | 0.00 | 0.00 |
| 26 | 129.00 | RFS BA40-01 | 1 | 11.817 | 12.999 | 1.00 | 1.00 | 3.45 | 32.00 | 0.000 | 5.750 | 44.85 | 0.00 | 257.87 |
| 27 | 119.50 | B5/B13 RRH-BR04C | 3 | 11.534 | 12.688 | 0.50 | 0.75 | 2.82 | 210.90 | 0.000 | 0.500 | 35.77 | 0.00 | 17.88 |
| 28 | 119.50 | Antel | 6 | 11.524 | 12.677 | 0.55 | 0.75 | 17.98 | 72.00 | 0.000 | 0.000 | 227.96 | 0.00 | 0.00 |
| 29 | 119.50 | Low Profile Platform | 1 | 11.524 | 12.677 | 1.00 | 1.00 | 22.00 | 1500.00 | 0.000 | 0.000 | 278.89 | 0.00 | 0.00 |
| 30 | 119.50 | MT6407-77A | 3 | 11.534 | 12.688 | 0.52 | 0.75 | 7.39 | 238.20 | 0.000 | 0.500 | 93.72 | 0.00 | 46.86 |
| 31 | 119.50 | B2/B66A RRH-BR049 | 3 | 11.534 | 12.688 | 0.50 | 0.75 | 2.82 | 253.20 | 0.000 | 0.500 | 35.77 | 0.00 | 17.88 |
| 32 | 119.50 | MS-H1242 (Heavy Collar | 1 | 11.524 | 12.677 | 1.00 | 1.00 | 2.50 | 150.00 | 0.000 | 0.000 | 31.69 | 0.00 | 0.00 |
| 33 | 119.50 | MS-KI22-5 (Kickers w/o | 1 | 11.524 | 12.677 | 1.00 | 1.00 | 8.00 | 291.00 | 0.000 | 0.000 | 101.41 | 0.00 | 0.00 |
| 34 | 119.50 | HRK12 (Handrail Kit) | 1 | 11.534 | 12.688 | 1.00 | 1.00 | 8.20 | 504.00 | 0.000 | 0.500 | 104.04 | 0.00 | 52.02 |
| 35 | 119.50 | Andrew | 1 | 11.534 | 12.688 | 1.00 | 1.00 | 3.79 | 32.00 | 0.000 | 0.500 | 48.09 | 0.00 | 24.04 |
| 36 | 119.50 | Andrew SBNHH-1D65B | 6 | 11.524 | 12.677 | 0.62 | 0.75 | 30.48 | 240.00 | 0.000 | 0.000 | 386.36 | 0.00 | 0.00 |
| 37 | 93.00 | Single Arm Mount | 2 | 10.937 | 12.031 | 1.00 | 1.00 | 3.60 | 120.00 | 0.000 | 0.000 | 43.31 | 0.00 | 0.00 |
| 38 | 93.00 | RFS 1142 | 2 | 11.092 | 12.202 | 1.00 | 1.00 | 7.80 | 20.00 | 0.000 | 6.500 | 95.17 | 0.00 | 618.62 |
| 39 | 92.00 | Single Arm Mount | 1 | 10.913 | 12.004 | 1.00 | 1.00 | 1.80 | 60.00 | 0.000 | 0.000 | 21.61 | 0.00 | 0.00 |
| 40 | 92.00 | Sinclair SD210-SF3P2LDF | 1 | 11.104 | 12.214 | 1.00 | 1.00 | 4.80 | 18.50 | 0.000 | 8.000 | 58.63 | 0.00 | 469.03 |
| | | | | | | | **Totals:** | | **9,337.60** | | | **4,191.60** | | |

# Total Applied Force Summary

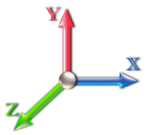
| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT13061-A-SBA | | **Code:** | TIA-222-G | 5/31/2022 |
| **Site Name:** | New Fairfield | | **Exposure:** | C | |
| **Height:** | 149.00 (ft) | | **Crest Height:** | 0.00 | |
| **Base Elev:** | 1.000 (ft) | | **Site Class:** | D - Stiff Soil | |
| **Gh:** | 1.1 | **Topography:** 1 | **Struct Class:** | II | Page: 30 |

Tower Engineering Solutions

**Load Case:** 1.0D + 1.0W 60 mph Wind

**Dead Load Factor** 1.00

**Wind Load Factor** 1.00




**Iterations** 24

| 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 | | 124.45 | 1024.95 | 0.00 | 0.00 |
| 10.00 | | 121.58 | 1149.41 | 0.00 | 0.00 |
| 15.00 | | 120.17 | 1127.87 | 0.00 | 0.00 |
| 20.00 | | 124.17 | 1106.32 | 0.00 | 0.00 |
| 25.00 | | 126.66 | 1084.78 | 0.00 | 0.00 |
| 30.00 | | 128.09 | 1063.24 | 0.00 | 0.00 |
| 35.00 | | 128.74 | 1041.69 | 0.00 | 0.00 |
| 40.00 | | 128.76 | 1020.15 | 0.00 | 0.00 |
| 45.00 | | 128.29 | 998.61 | 0.00 | 0.00 |
| 47.75 | | 69.86 | 540.05 | 0.00 | 0.00 |
| 50.00 | | 57.68 | 769.26 | 0.00 | 0.00 |
| 53.25 | | 83.07 | 1095.75 | 0.00 | 0.00 |
| 55.00 | | 44.37 | 335.67 | 0.00 | 0.00 |
| 60.00 | | 126.46 | 944.52 | 0.00 | 0.00 |
| 65.00 | | 124.65 | 922.98 | 0.00 | 0.00 |
| 70.00 | | 122.60 | 901.43 | 0.00 | 0.00 |
| 75.00 | | 120.33 | 879.89 | 0.00 | 0.00 |
| 80.00 | | 117.86 | 858.34 | 0.00 | 0.00 |
| 85.00 | | 115.21 | 836.80 | 0.00 | 0.00 |
| 90.00 | | 112.40 | 815.26 | 0.00 | 0.00 |
| 92.00 | (2) attachments | 124.22 | 398.57 | 0.00 | 469.03 |
| 93.00 | (4) attachments | 160.27 | 298.22 | 0.00 | 618.62 |
| 95.00 | | 43.26 | 311.78 | 0.00 | 0.00 |
| 97.25 | | 48.09 | 346.63 | 0.00 | 0.00 |
| 100.00 | | 58.87 | 652.46 | 0.00 | 0.00 |
| 101.25 | | 26.40 | 292.69 | 0.00 | 0.00 |
| 105.00 | | 78.17 | 485.11 | 0.00 | 0.00 |
| 110.00 | | 101.41 | 631.73 | 0.00 | 0.00 |
| 115.00 | | 97.94 | 614.49 | 0.00 | 0.00 |
| 119.50 | (26) attachments | 1428.75 | 4029.61 | 0.00 | 158.69 |
| 120.00 | | 9.24 | 58.95 | 0.00 | 0.00 |
| 125.00 | | 90.68 | 517.02 | 0.00 | 0.00 |
| 129.00 | (2) attachments | 137.80 | 493.21 | 0.00 | 257.87 |
| 130.00 | | 17.02 | 82.17 | 0.00 | 0.00 |
| 135.00 | | 83.02 | 403.08 | 0.00 | 0.00 |
| 140.00 | | 79.05 | 390.16 | 0.00 | 0.00 |
| 141.00 | (21) attachments | 807.36 | 2159.88 | 0.00 | 0.00 |
| 142.00 | (27) attachments | 584.82 | 1078.28 | 0.00 | 889.59 |
| 145.00 | | 44.44 | 176.25 | 0.00 | 0.00 |
| 149.00 | (22) attachments | 1256.35 | 2661.66 | 0.00 | 1232.78 |
| | **Totals:** | **7,502.56** | **34,598.92** | **0.00** | **3,626.59** |

# Linear Appurtenance Segment Forces (Factored)

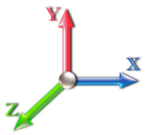
| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT13061-A-SBA | **Code:** | TIA-222-G | 5/31/2022 | |
| **Site Name:** | New Fairfield | **Exposure:** | C | | |
| **Height:** | 149.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 1.000 (ft) | **Site Class:** | D - Stiff Soil | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 31 | |

Tower Engineering Solutions

**Load Case:** 1.0D + 1.0W 60 mph Wind

**Dead Load Factor** 1.00

**Wind Load Factor** 1.00




**Iterations** 24

| Top Elev (ft) | Description | Wind Exposed | Length (ft) | Ca | Exposed Width (in) | Area (sqft) | CaAa (sqft) | Ra | Cf Adjust Factor | qz (psf) | F X (lb) | Dead Load (lb) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 95.00 | 7/8" Coax | Yes | 1.00 | 0.000 | 1.11 | 0.09 | 0.00 | 0.017 | 0.000 | 10.986 | 0.00 | 0.00 |
| 97.25 | 7/8" Coax | Yes | 2.25 | 0.000 | 1.11 | 0.21 | 0.00 | 0.034 | 0.000 | 11.040 | 0.00 | 0.00 |
| 100.00 | 7/8" Coax | Yes | 2.75 | 0.000 | 1.11 | 0.25 | 0.00 | 0.035 | 0.000 | 11.104 | 0.00 | 0.00 |
| 101.25 | 7/8" Coax | Yes | 1.25 | 0.000 | 1.11 | 0.12 | 0.00 | 0.035 | 0.000 | 11.133 | 0.00 | 0.00 |
| 105.00 | 7/8" Coax | Yes | 3.75 | 0.000 | 1.11 | 0.35 | 0.00 | 0.036 | 0.000 | 11.218 | 0.00 | 0.00 |
| 110.00 | 7/8" Coax | Yes | 5.00 | 0.000 | 1.11 | 0.46 | 0.00 | 0.037 | 0.000 | 11.327 | 0.00 | 0.00 |
| 115.00 | 7/8" Coax | Yes | 5.00 | 0.000 | 1.11 | 0.46 | 0.00 | 0.039 | 0.000 | 11.432 | 0.00 | 0.00 |
| 119.50 | 7/8" Coax | Yes | 4.50 | 0.000 | 1.11 | 0.42 | 0.00 | 0.040 | 0.000 | 11.524 | 0.00 | 0.00 |
| 120.00 | 7/8" Coax | Yes | 0.50 | 0.000 | 1.11 | 0.05 | 0.00 | 0.041 | 0.000 | 11.534 | 0.00 | 0.00 |
| 125.00 | 7/8" Coax | Yes | 5.00 | 0.000 | 1.11 | 0.46 | 0.00 | 0.042 | 0.000 | 11.633 | 0.00 | 0.00 |
| 129.00 | 7/8" Coax | Yes | 4.00 | 0.000 | 1.11 | 0.37 | 0.00 | 0.044 | 0.000 | 11.710 | 0.00 | 0.00 |
| 130.00 | 7/8" Coax | Yes | 1.00 | 0.000 | 1.11 | 0.09 | 0.00 | 0.046 | 0.000 | 11.729 | 0.00 | 0.00 |
| 135.00 | 7/8" Coax | Yes | 5.00 | 0.000 | 1.11 | 0.46 | 0.00 | 0.047 | 0.000 | 11.822 | 0.00 | 0.00 |
| 140.00 | 7/8" Coax | Yes | 5.00 | 0.000 | 1.11 | 0.46 | 0.00 | 0.050 | 0.000 | 11.912 | 0.00 | 0.00 |
| 141.00 | 7/8" Coax | Yes | 1.00 | 0.000 | 1.11 | 0.09 | 0.00 | 0.052 | 0.000 | 11.930 | 0.00 | 0.00 |
| 142.00 | 7/8" Coax | Yes | 1.00 | 0.000 | 1.11 | 0.09 | 0.00 | 0.052 | 0.000 | 11.947 | 0.00 | 0.00 |
| 145.00 | 7/8" Coax | Yes | 3.00 | 0.000 | 1.11 | 0.28 | 0.00 | 0.054 | 0.000 | 12.000 | 0.00 | 0.00 |
| 149.00 | 7/8" Coax | Yes | 4.00 | 0.000 | 1.11 | 0.37 | 0.00 | 0.056 | 0.000 | 12.068 | 0.00 | 0.00 |
| | | | | | | | | | | **Totals:** | **0.0** | **0.0** |

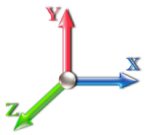
# Calculated Forces

| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT13061-A-SBA | **Code:** | TIA-222-G | 5/31/2022 | |
| **Site Name:** | New Fairfield | **Exposure:** | C | | |
| **Height:** | 149.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 1.000 (ft) | **Site Class:** | D - Stiff Soil | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 32 | |

**Load Case:** 1.0D + 1.0W 60 mph Wind

**Dead Load Factor** 1.00

**Wind Load Factor** 1.00




**Iterations** 24

| 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 | -34.60 | -7.52 | 0.00 | -831.33 | 0.00 | 831.33 | 3273.57 | 1636.79 | 7496.53 | 3753.83 | 0.00 | 0.000 | 0.000 | 0.232 |
| 5.00 | -33.56 | -7.43 | 0.00 | -793.74 | 0.00 | 793.74 | 3239.51 | 1619.75 | 7247.24 | 3629.01 | 0.03 | -0.054 | 0.000 | 0.229 |
| 10.00 | -32.41 | -7.33 | 0.00 | -756.61 | 0.00 | 756.61 | 3203.51 | 1601.76 | 6997.34 | 3503.87 | 0.11 | -0.109 | 0.000 | 0.226 |
| 15.00 | -31.27 | -7.24 | 0.00 | -719.95 | 0.00 | 719.95 | 3165.58 | 1582.79 | 6747.13 | 3378.58 | 0.26 | -0.165 | 0.000 | 0.223 |
| 20.00 | -30.16 | -7.14 | 0.00 | -683.74 | 0.00 | 683.74 | 3125.72 | 1562.86 | 6496.92 | 3253.29 | 0.46 | -0.222 | 0.000 | 0.220 |
| 25.00 | -29.07 | -7.04 | 0.00 | -648.02 | 0.00 | 648.02 | 3083.93 | 1541.97 | 6247.01 | 3128.15 | 0.73 | -0.281 | 0.000 | 0.217 |
| 30.00 | -28.00 | -6.94 | 0.00 | -612.80 | 0.00 | 612.80 | 3040.21 | 1520.10 | 5997.71 | 3003.31 | 1.05 | -0.341 | 0.000 | 0.213 |
| 35.00 | -26.95 | -6.83 | 0.00 | -578.11 | 0.00 | 578.11 | 2994.56 | 1497.28 | 5749.33 | 2878.94 | 1.44 | -0.402 | 0.000 | 0.210 |
| 40.00 | -25.92 | -6.72 | 0.00 | -543.95 | 0.00 | 543.95 | 2946.97 | 1473.49 | 5502.17 | 2755.17 | 1.90 | -0.465 | 0.000 | 0.206 |
| 45.00 | -24.92 | -6.61 | 0.00 | -510.33 | 0.00 | 510.33 | 2897.46 | 1448.73 | 5256.53 | 2632.17 | 2.42 | -0.529 | 0.000 | 0.203 |
| 47.75 | -24.38 | -6.55 | 0.00 | -492.15 | 0.00 | 492.15 | 2869.40 | 1434.70 | 5122.20 | 2564.91 | 2.73 | -0.565 | 0.000 | 0.200 |
| 50.00 | -23.60 | -6.50 | 0.00 | -477.42 | 0.00 | 477.42 | 2846.01 | 1423.00 | 5012.74 | 2510.09 | 3.01 | -0.595 | 0.000 | 0.199 |
| 53.25 | -22.51 | -6.42 | 0.00 | -456.30 | 0.00 | 456.30 | 2837.57 | 1418.79 | 4973.81 | 2490.60 | 3.43 | -0.639 | 0.000 | 0.191 |
| 55.00 | -22.17 | -6.39 | 0.00 | -445.07 | 0.00 | 445.07 | 2819.00 | 1409.50 | 4889.10 | 2448.18 | 3.67 | -0.663 | 0.000 | 0.190 |
| 60.00 | -21.22 | -6.27 | 0.00 | -413.14 | 0.00 | 413.14 | 2764.64 | 1382.32 | 4648.65 | 2327.78 | 4.40 | -0.728 | 0.000 | 0.185 |
| 65.00 | -20.29 | -6.16 | 0.00 | -381.78 | 0.00 | 381.78 | 2708.35 | 1354.17 | 4410.81 | 2208.68 | 5.19 | -0.794 | 0.000 | 0.180 |
| 70.00 | -19.38 | -6.05 | 0.00 | -350.98 | 0.00 | 350.98 | 2650.12 | 1325.06 | 4175.87 | 2091.04 | 6.06 | -0.861 | 0.000 | 0.175 |
| 75.00 | -18.50 | -5.93 | 0.00 | -320.75 | 0.00 | 320.75 | 2589.96 | 1294.98 | 3944.16 | 1975.01 | 7.00 | -0.928 | 0.000 | 0.170 |
| 80.00 | -17.63 | -5.82 | 0.00 | -291.09 | 0.00 | 291.09 | 2527.88 | 1263.94 | 3715.96 | 1860.74 | 8.01 | -0.997 | 0.000 | 0.163 |
| 85.00 | -16.79 | -5.71 | 0.00 | -261.97 | 0.00 | 261.97 | 2463.86 | 1231.93 | 3491.60 | 1748.39 | 9.09 | -1.065 | 0.000 | 0.157 |
| 90.00 | -15.97 | -5.60 | 0.00 | -233.41 | 0.00 | 233.41 | 2397.91 | 1198.95 | 3271.37 | 1638.12 | 10.24 | -1.133 | 0.000 | 0.149 |
| 92.00 | -15.57 | -5.47 | 0.00 | -221.75 | 0.00 | 221.75 | 2370.99 | 1185.49 | 3184.51 | 1594.62 | 10.72 | -1.161 | 0.000 | 0.146 |
| 93.00 | -15.28 | -5.31 | 0.00 | -215.66 | 0.00 | 215.66 | 2357.41 | 1178.70 | 3141.35 | 1573.01 | 10.97 | -1.176 | 0.000 | 0.144 |
| 95.00 | -14.96 | -5.27 | 0.00 | -205.04 | 0.00 | 205.04 | 2330.03 | 1165.01 | 3055.58 | 1530.06 | 11.47 | -1.203 | 0.000 | 0.140 |
| 97.25 | -14.62 | -5.22 | 0.00 | -193.18 | 0.00 | 193.18 | 2298.85 | 1149.42 | 2960.01 | 1482.20 | 12.04 | -1.234 | 0.000 | 0.137 |
| 100.00 | -13.96 | -5.16 | 0.00 | -178.82 | 0.00 | 178.82 | 2260.21 | 1130.11 | 2844.54 | 1424.39 | 12.76 | -1.272 | 0.000 | 0.132 |
| 101.25 | -13.67 | -5.13 | 0.00 | -172.38 | 0.00 | 172.38 | 1705.50 | 852.75 | 2167.94 | 1085.58 | 13.10 | -1.289 | 0.000 | 0.167 |
| 105.00 | -13.18 | -5.06 | 0.00 | -153.14 | 0.00 | 153.14 | 1669.73 | 834.87 | 2056.27 | 1029.66 | 14.13 | -1.339 | 0.000 | 0.157 |
| 110.00 | -12.54 | -4.95 | 0.00 | -127.86 | 0.00 | 127.86 | 1620.35 | 810.17 | 1909.79 | 956.31 | 15.57 | -1.413 | 0.000 | 0.141 |
| 115.00 | -11.93 | -4.85 | 0.00 | -103.09 | 0.00 | 103.09 | 1569.04 | 784.52 | 1766.36 | 884.49 | 17.09 | -1.482 | 0.000 | 0.124 |
| 119.50 | -7.93 | -3.32 | 0.00 | -81.08 | 0.00 | 81.08 | 1521.21 | 760.60 | 1640.13 | 821.29 | 18.52 | -1.539 | 0.000 | 0.104 |
| 120.00 | -7.87 | -3.32 | 0.00 | -79.42 | 0.00 | 79.42 | 1515.79 | 757.90 | 1626.29 | 814.35 | 18.68 | -1.545 | 0.000 | 0.103 |
| 125.00 | -7.36 | -3.22 | 0.00 | -62.83 | 0.00 | 62.83 | 1460.62 | 730.31 | 1489.87 | 746.04 | 20.33 | -1.602 | 0.000 | 0.089 |
| 129.00 | -6.87 | -3.07 | 0.00 | -49.70 | 0.00 | 49.70 | 1406.38 | 703.19 | 1375.06 | 688.55 | 21.69 | -1.643 | 0.000 | 0.077 |
| 129.00 | -6.87 | -3.07 | 0.00 | -49.70 | 0.00 | 49.70 | 978.70 | 489.35 | 961.93 | 481.68 | 21.69 | -1.643 | 0.000 | 0.110 |
| 130.00 | -6.78 | -3.06 | 0.00 | -46.63 | 0.00 | 46.63 | 971.83 | 485.92 | 944.91 | 473.15 | 22.03 | -1.653 | 0.000 | 0.106 |
| 135.00 | -6.38 | -2.97 | 0.00 | -31.35 | 0.00 | 31.35 | 936.33 | 468.17 | 860.89 | 431.08 | 23.80 | -1.709 | 0.000 | 0.080 |
| 140.00 | -5.99 | -2.88 | 0.00 | -16.52 | 0.00 | 16.52 | 898.90 | 449.45 | 778.95 | 390.05 | 25.61 | -1.749 | 0.000 | 0.049 |
| 141.00 | -3.86 | -2.00 | 0.00 | -13.64 | 0.00 | 13.64 | 891.19 | 445.59 | 762.84 | 381.99 | 25.98 | -1.755 | 0.000 | 0.040 |
| 142.00 | -2.80 | -1.39 | 0.00 | -10.75 | 0.00 | 10.75 | 883.39 | 441.70 | 746.83 | 373.97 | 26.34 | -1.761 | 0.000 | 0.032 |
| 145.00 | -2.62 | -1.34 | 0.00 | -6.59 | 0.00 | 6.59 | 859.54 | 429.77 | 699.40 | 350.22 | 27.45 | -1.772 | 0.000 | 0.022 |
| 149.00 | 0.00 | -1.26 | 0.00 | -1.23 | 0.00 | 1.23 | 826.66 | 413.33 | 637.68 | 319.32 | 28.94 | -1.779 | 0.000 | 0.004 |

# Final Analysis Summary

| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT13061-A-SBA | **Code:** | TIA-222-G | 5/31/2022 | |
| **Site Name:** | New Fairfield | **Exposure:** | C | | |
| **Height:** | 149.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 1.000 (ft) | **Site Class:** | D - Stiff Soil | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 33 | |

IES 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 89 mph Wind | 26.5 | 0.00 | 41.47 | 0.00 | 0.00 | 2947.24 |
| 0.9D + 1.6W 89 mph Wind | 26.5 | 0.00 | 31.09 | 0.00 | 0.00 | 2910.19 |
| 1.2D + 1.0Di + 1.0Wi 50 mph Wind | 9.1 | 0.00 | 65.68 | 0.00 | 0.00 | 1013.39 |
| 1.2D + 1.0E | 2.0 | 0.00 | 41.52 | 0.00 | 0.00 | 246.71 |
| 0.9D + 1.0E | 2.0 | 0.00 | 31.14 | 0.00 | 0.00 | 243.31 |
| 1.0D + 1.0W 60 mph Wind | 7.5 | 0.00 | 34.60 | 0.00 | 0.00 | 831.33 |

## 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 89 mph Wind | -41.47 | -26.48 | 0.00 | -2947.2 | 0.00 | -2947.2 | 3273.57 | 1636.7 | 7496.53 | 3753.83 | 0.00 | 0.798 |
| 0.9D + 1.6W 89 mph Wind | -31.09 | -26.46 | 0.00 | -2910.1 | 0.00 | -2910.1 | 3273.57 | 1636.7 | 7496.53 | 3753.83 | 0.00 | 0.785 |
| 1.2D + 1.0Di + 1.0Wi 50 mph Wind | -65.68 | -9.14 | 0.00 | -1013.3 | 0.00 | -1013.3 | 3273.57 | 1636.7 | 7496.53 | 3753.83 | 0.00 | 0.290 |
| 1.2D + 1.0E | -41.52 | -1.97 | 0.00 | -246.71 | 0.00 | -246.71 | 3273.57 | 1636.7 | 7496.53 | 3753.83 | 0.00 | 0.078 |
| 0.9D + 1.0E | -31.14 | -1.97 | 0.00 | -243.31 | 0.00 | -243.31 | 3273.57 | 1636.7 | 7496.53 | 3753.83 | 0.00 | 0.074 |
| 1.0D + 1.0W 60 mph Wind | -34.60 | -7.52 | 0.00 | -831.33 | 0.00 | -831.33 | 3273.57 | 1636.7 | 7496.53 | 3753.83 | 0.00 | 0.232 |

# Base Plate Summary

| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT13061-A-SB | | **Code:** | TIA-222-G | 5/31/2022 |
| **Site Name:** | New Fairfield | | **Exposure:** | C | |
| **Height:** | 149.00 (ft) | | **Crest Height:** | 0.00 | |
| **Base Elev:** | 1.000 (ft) | | **Site Class:** | D - Stiff Soil | |
| **Gh:** | 1.1 | **Topography:** 1 | **Struct Class:** | II | Page: 34 |

Tower Engineering Solutions

| Reactions | |
|---|---|
| Original Design | |
| **Moment (kip-ft):** | 3340.00 |
| **Axial (kip):** | 43.90 |
| **Shear (kip):** | 29.90 |
| Analysis (1.2D + 1.6W) | |
| **Moment (kip-ft):** | 2947.24 |
| **Axial (kip):** | 41.47 |
| **Shear (kip):** | 26.48 |

| Base Plate | |
|---|---|
| **Yield (ksi):** | 60.00 |
| **Width (in):** | 59.75 |
| **Style:** | Clipped |
| **Polygon Sides:** | 0.00 |
| **Clip Length (in):** | 11.00 |
| **Effective Len (in):** | 10.85 |
| **Moment (kip-in):** | 616.71 |
| **Allow Stress (ksi):** | 81.00 |
| **Applied Stress (ksi):** | 45.36 |
| **Stress Ratio:** | 0.56 |

| Anchor Bolts | |
|---|---|
| **Bolt Circle:** | 62.25 |
| **Number Bolts:** | 12.00 |
| **Bolt Type:** | 2.25" 18J |
| **Bolt Diameter (in):** | 2.25 |
| **Yield (ksi):** | 75.00 |
| **Ultimate (ksi):** | 100.00 |
| **Arrangement:** | Clustered |
| **Cluster Dist (in):** | 6.00 |
| **Start Angle (deg):** | 45.00 |
| Compression | |
| **Force (kip):** | 194.85 |
| **Allowable (kip):** | 260.00 |
| **Ratio:** | 0.77 |
| Tension | |
| **Force (kip):** | 183.91 |
| **Allowable (kip):** | 260.00 |
| **Ratio:** | 0.72 |

# Monopole Mat Foundation Design

| | | | | Date |
|---|---|---|---|---|
| | | | | 5/31/2022 |
| | **Customer Name:** | T-Mobile | **TIA Standard:** | TIA-222-G |
| | **Site Name:** | | **Structure Height (Ft.):** | 149 |
| | **Site Number:** | CT13061-A-SBA | **Engineer Name:** | K. Azisllari |
| | **Engr. Number:** | 129774 | **Engineer Login ID:** | |

**Foundation Info Obtained from:** Drawings/Calculations

**Structure Type:** Monopole

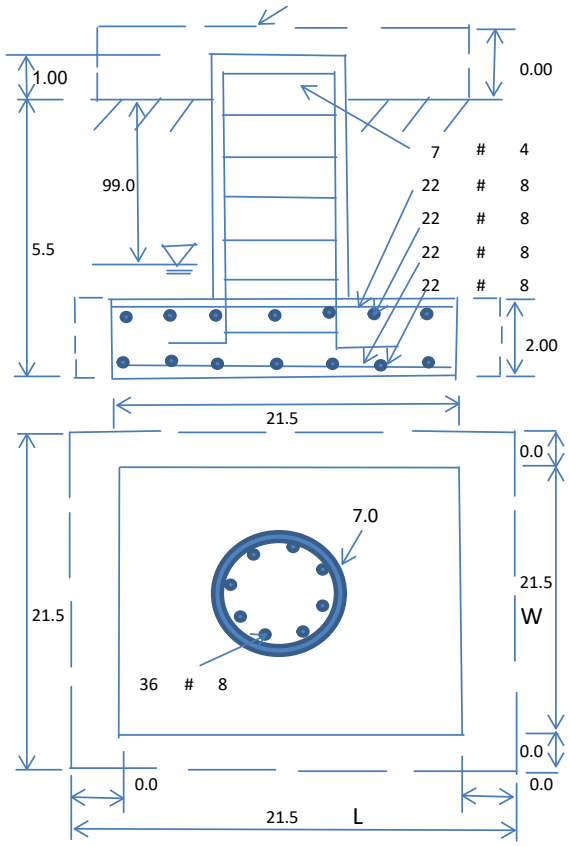
**Analysis or Design?** Analysis

**Base Reactions (Factored):**

| | | | |
|---|---|---|---|
| Axial Load (Kips): | 41.5 | Shear Force (Kips): | 26.5 |
| Uplift Force (Kips): | 0.0 | Moment (Kips-ft): | 2947.2 |
| Allowable overstress %: | 5.0% | | |

**Foundation Geometries:**

| | | | |
|---|---|---|---|
| | | Mods required -Yes/No ?: | No |
| Diameter of Pier (ft.): | 7.0 | Depth of Base BG (ft.): | 5.5 |
| Pier Height A. G. (ft.): | 1.00 | Thickness of Pad (ft): | 2.00 |
| Length of Pad (ft.): | 21.5 | Width of Pad (ft.): | 21.5 |
| Final Length of pad (ft) | 21.5 | Final width of pad (ft): | 21.5 |




**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 #: | 8 | Tie / Stirrup Size #: | 4 | |
| Qty. of Vertical Rebars: | 36 | Tie Spacing (in): | 12.0 | |
| Pad Rebar Yield (Ksi): | 60 | Pad Steel Rebar Size (#): | 8 | |
| Concrete Cover (in.): | 3 | Unit Weight of Concrete: | 150.0 | pcf |

Rebar at the bottom of the concrete pad:

| | | | |
|---|---|---|---|
| Qty. of Rebar in Pad (L): | 22 | Qty. of Rebar in Pad (W): | 22 |

Rebar at the top of the concrete pad:

| | | | |
|---|---|---|---|
| Qty. of Rebar in Pad (L): | 22 | Qty. of Rebar in Pad (W): | 22 |
| Apply 1.35 factor for e/w Per G: | 1.35 | | |

**Soil Design Parameters:**

| | | | | | | |
|---|---|---|---|---|---|---|
| Soil Unit Weight (pcf): | 120.0 | 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): | 12000 | Ultimate Skin Friction: | 0 | Psf | Angle from Bottm of Pad: | 25 |
| Consider Friction for O.T.M. (Y/N): | No | Consider Friction for bearing (Y/N): | Yes | | Angle from Bottm of Pad: | 25 |
| Consider soil hor. resist. for OTM.: | No | Reduction factor on the maximum soil bearing pressure: | 1.00 | | | |

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

| | | | |
|---|---|---|---|
| Total Dry Soil Volume (cu. Ft.): | 1483.18 | Total Dry Soil Weight (Kips): | 177.98 |
| Total Buoyant Soil Volume (cu. Ft.): | 0.00 | Total Buoyant Soil Weight (Kips): | 0.00 |
| Total Effective Soil Weight (Kips): | 177.98 | Weight from the Concrete Block at Top (K): | 0.00 |
| Total Dry Concrete Volume (cu. Ft.): | 1097.68 | Total Dry Concrete Weight (Kips): | 164.65 |
| Total Buoyant Concrete Volume (cu. Ft.): | 0.00 | Total Buoyant Concrete Weight (Kips): | 0.00 |
| Total Effective Concrete Weight (Kips): | 164.65 | Total Vertical Load on Base (Kips): | 384.13 |

**Check Soil Capacities:**

| | | | | | Load/ Capacity Ratio | |
|---|---|---|---|---|---|---|
| Calculated Maxium Net Soil Pressure under the base (psf): | 3822 | < | Allowable Factored Soil Bearing (psf): | 9000 | 0.42 | OK! |
| Allowable Foundation Overturning Resistance (kips-ft.): | 3761.1 | > | Design Factored Momont (kips-ft): | 3119 | 0.83 | OK! |
| Factor of Safety Against Overturning (O. R. Moment/Design Moment): | 1.21 | OK! | | | | |

**Check the capacities of Reinforceing Concrete:**

| | | | | | | |
|---|---|---|---|---|---|---|
| Strength reduction factor (Flexure and axial tension): | 0.90 | | Strength reduction factor (Shear): | 0.75 | | |
| Strength reduction factor (Axial compresion): | 0.65 | | Wind Load Factor on Concrete Design: | 1.00 | | |
| | | | | | Load/ Capacity Ratio | |
| (1) Concrete Pier: | | | | | | |
| Vertical Steel Rebar Area (sq. in./each): | 0.79 | | Tie / Stirrup Area (sq. in./each): | 0.20 | | |
| Calculated Moment Capacity (Mn,Kips-Ft): | 4845.7 | > | Design Factored Moment (Mu, Kips-F | 3066.5 | 0.63 | OK! |
| Calculated Shear Capacity (Kips): | 660.1 | > | Design Factored Shear (Kips): | 26.5 | 0.04 | OK! |
| Calculated Tension Capacity (Tn, Kips): | 1535.8 | > | Design Factored Tension (Tu Kips): | 0.0 | 0.00 | OK! |
| Calculated Compression Capacity (Pn, Kips): | 9747.6 | > | Design Factored Axial Load (Pu Kips): | 41.5 | 0.00 | OK! |
| Moment & Axial Strength Combination: | 0.63 | OK! | Check Tie Spacing (Design/Required): | | 1 | OK! |
| Pier Reinforcement Ratio: | 0.005 | | Reinforcement Ratio is satisfied per ACI | | | |
| (2).Concrete Pad: | | | | | | |
| One-Way Design Shear Capacity (L-Direction, Kips): | 501.8 | > | One-Way Factored Shear (L-D. Kips): | 215.3 | 0.43 | OK! |
| One-Way Design Shear Capacity (W-Direction, Kips): | 501.8 | > | One-Way Factored Shear (W-D., Kips) | 215.3 | 0.43 | OK! |
| One-Way Design Shear Capacity (Corner-Corner. Kips): | 466.5 | > | One-Way Factored Shear (C-C, Kips): | 222.5 | 0.48 | OK! |
| Lower Steel Pad Reinforcement Ratio (L-Direct. ): | 0.0033 | OK! | Lower Steel Pad Reinf. Ratio (W-Direc | 0.0033 | | |
| Lower Steel Pad Moment Capacity (L-Direction. Kips-ft): | 1556.8 | > | Moment at Bottom ( L-Dir. K-Ft): | 871.7 | 0.56 | OK! |
| Lower Steel Pad Moment Capacity (W-Direction. Kips-ft): | 1556.8 | > | Moment at Bottom ( W-Dir. K-Ft): | 871.7 | 0.56 | OK! |
| Lower Steel Pad Moment Capacity (Corner-Corner,K-ft): | 2182.0 | > | Moment at Bottom ( C-C Dir. K-Ft): | 1232.8 | 0.56 | OK! |
| Upper Steel Pad Reinforcement Ratio (L-Direct. ): | 0.0033 | OK! | Upper Steel Reinf. Ratio (W-Dir. ): | 0.0033 | | |
| Upper Steel Pad Moment Capacity (L-Direc. Kips-ft): | 1556.8 | > | Moment at the top (L-Dir K-Ft): | 404.9 | 0.26 | OK! |
| Upper Steel Pad Moment Capacity (W-Direc. Kips-ft): | 1556.8 | > | Moment at the top (W-Dir K-Ft): | 404.9 | 0.26 | OK! |
| Upper Steel Pad Moment Capacity (Corner-Corner. K-ft): | 2182.0 | > | Moment at the top (C-C Dir. K-Ft): | 382.8 | 0.18 | OK! |
| (3).Check Punching Shear Capacity due to Moment in the Pier: | | | | | | |
| Moment transferred by punching shear: | 1178.9 | k-ft. | Max. factored shear stress $v_{u\_CD}$: | | 2.9 | Psi |
| Max. factored shear stress $v_{u\_AB}$: | 13.2 | Psi | Factored shear Strength $\phi v_n$: | | 189.7 | Psi |
| Max. factored shear stress $v_u$: | 13.2 | Psi | Check Usage of Punching Shear Capacity: | | 0.07 | OK! |

# Exhibit E

## Mount Analysis

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

# Antenna Mount Analysis Report

**Existing Monopole Tower**

**Customer Name: SBA Communications Corp**

**Customer Site Number: CT13061-A-SBA**

**Customer Site Name: New Fairfield**

**Carrier Name: T-Mobile (App#: 194468-1, V1)**

**Carrier Site ID / Name: CTFF750A / New Fairfield**

**Site Location: 29 Bogus Hill Road**

**New Fairfield, Connecticut**

**Fairfield County**

**Latitude: 41.511833**

**Longitude: -73.450528**


## Analysis Result:

**Max Structural Usage: 99.2% [Pass]**

**Report Prepared By: Progesh Roka**

NOTE: The proposed support rail kit [(1) Site Pro HRK12] per CDs provided by SBA is not currently installed on the mount. The proposed mount reinforcement kit was assumed to be installed per the manufacturer's instructions, and it was assumed that the kit can be installed properly on the existing mount. TES cannot verify that the proposed mount reinforcement kit will fit properly and is not liable for any fit-up issues during installation.

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## Introduction

The purpose of this report is to summarize the analysis results on the (1) [Existing Low-Profile Platform + Proposed Site Pro HRK12] at 150.00' elevation to support the proposed antenna configuration. Any modification listed under Sources of Information was assumed completed and was included in this analysis.

## Sources of Information

| | |
|---|---|
| Mount Drawings | Mount mapping by SGS Towers; dated 5/13/2022 |
| Antenna Loading | Provided by SBA; Application #: 194468, v1; dated 5/19/2022 |
| Modification Drawings | N/A |
| Construction Drawings | Provided by SBA; dated 04/21/2022 |

## Analysis Criteria

Basic Wind Speed Used in the Analysis: $V_{ULT}$ = 115 mph (3-Sec. Gust) / Equivalent to
$V_{ASD}$ = 89 mph (3-Sec. Gust)
Basic Wind Speed with Ice: 40 mph (3-Sec. Gust) with 0.75" radial ice concurrent
Operational Wind Speed: 30 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 (Ft): 0

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

## Mount Information

[(1) Existing Low-Profile Platform + Proposed Site Pro HRK12] at 150.00' elevation

## Final Antenna Configuration

| | |
|---|---|
| 3 | RFS APXV18-206517S-A20 |
| 3 | RFS APXVAALL24_43-U-NA20 |
| 3 | RFS APXV18-209014 |
| 3 | Ericsson KRY 112 489/2 |
| 3 | Ericsson 4480 B71 + B85 |
| 3 | Kathrein Scala 782 11056 |

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

## Analysis Results

Our calculations have determined that under design wind load the existing mounts will be structurally adequate to support the proposed antenna configuration. The maximum structural usage is 99.2%, which occurs in the inner bracing member. The proposed equipment must be installed as stipulated in the Final Antenna Configuration section of this report. The analysis results are void if the proposed equipment is not installed in accordance with this report.

NOTE: The proposed support rail kit [(1) Site Pro HRK12] per CDs provided by SBA is not currently installed on the mount. The proposed mount reinforcement kit was assumed to be installed per the manufacturer's instructions, and it was assumed that the kit can be installed properly on the existing mount. TES cannot verify that the proposed mount reinforcement kit will fit properly and is not liable for any fit-up issues during installation.

## Attachments

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

# Standard Conditions

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

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

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

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

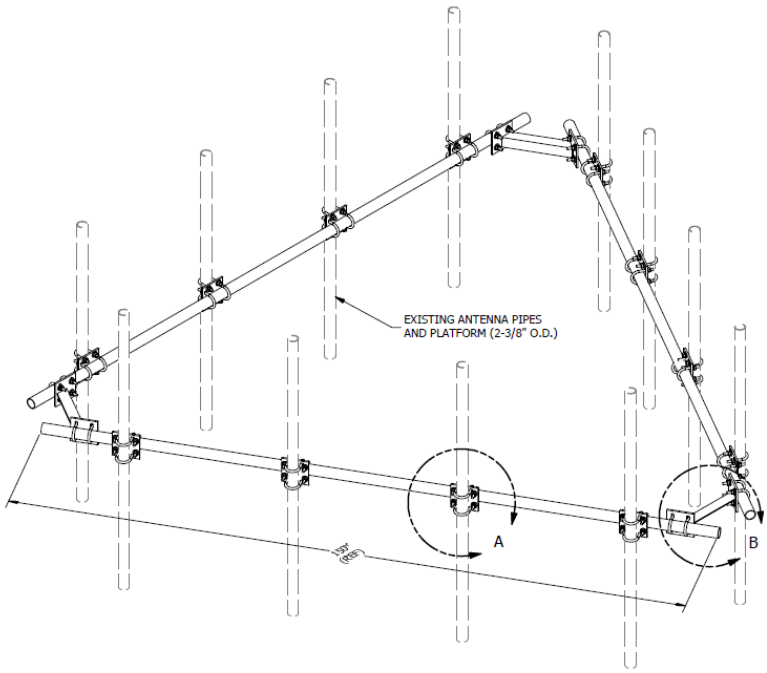
5. If the mount is modified, installation must adhere to the configuration communicated in the modification drawings.

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

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

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

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


**Proposed Site Pro HRK12**

# Structure: CT13061-A-SBA - New Fairfield

**Sector:** A

**Structure Type:** Monopole

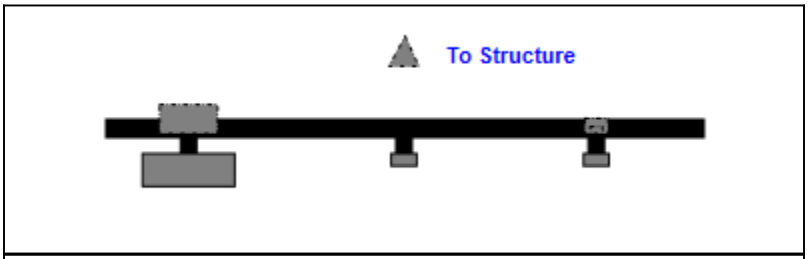
**Mount Elev:** 150.00

5/20/2022



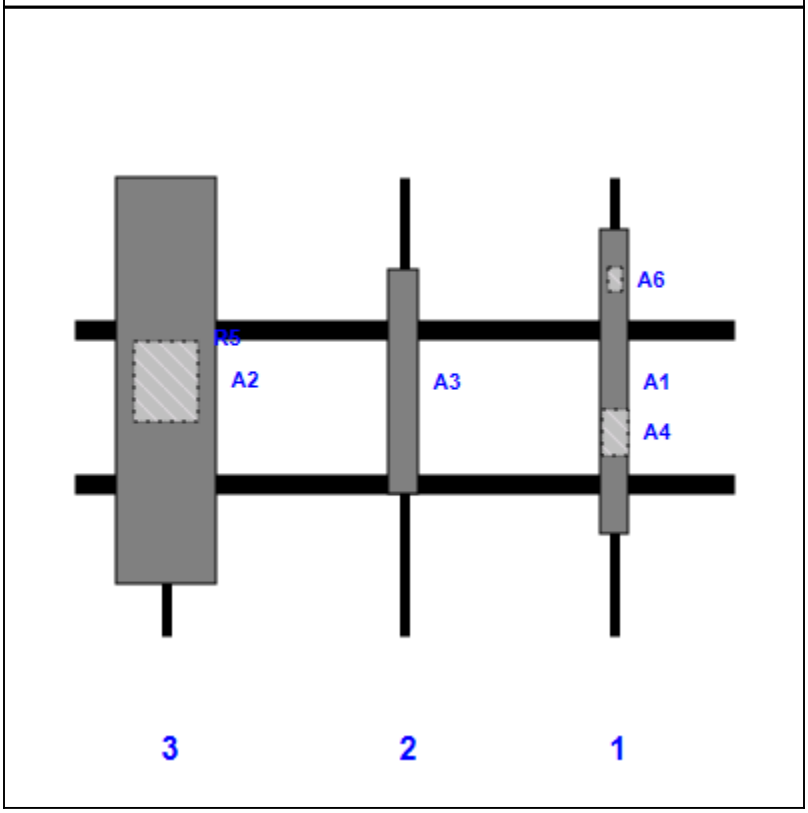
Tower Engineering Solutions

## Plan View



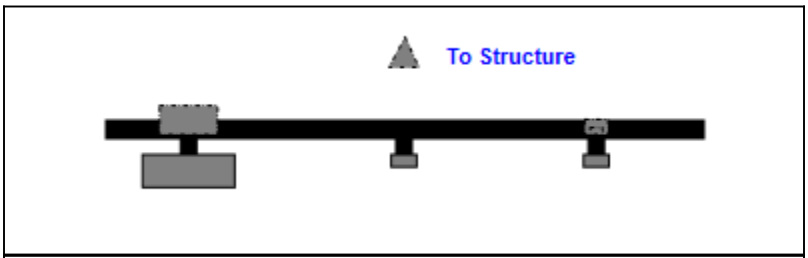

## Front View

**Looking Toward Structure**



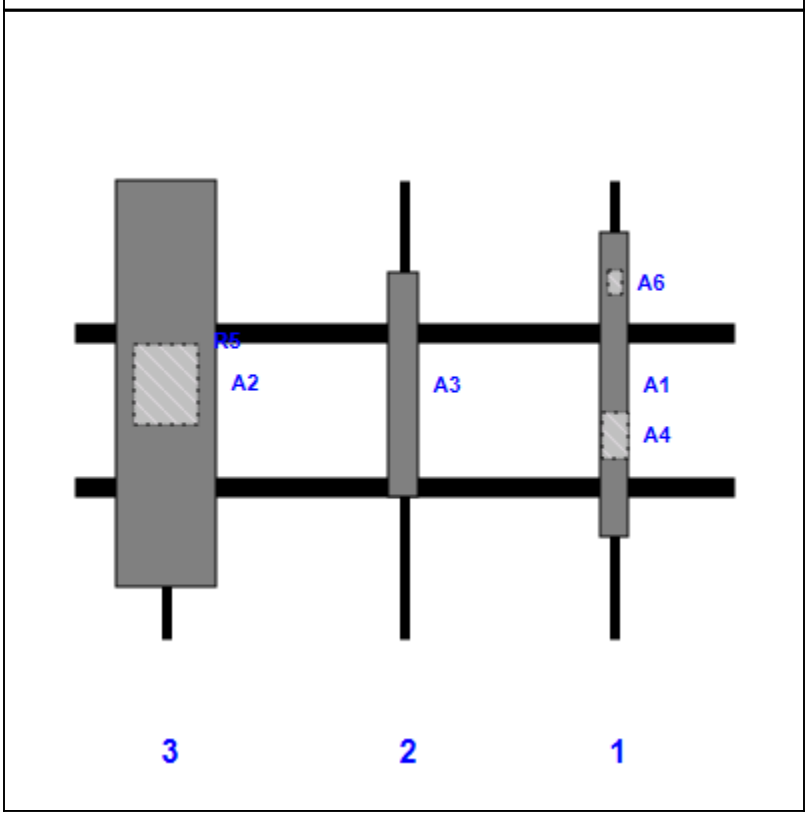

| Ref # | Model | Height (in) | Width (in) | H Dist Left | Pipe # | Pipe Pos V | Pos | From Top | H Offset | Status | Validation |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A1 | APXV18-206517S-A20 | 72.00 | 6.60 | 128.00 | 1 | a | Front | 48.00 | | | |
| A4 | KRY 112 489/2 | 11.00 | 6.10 | 128.00 | 1 | a | Behind | 60.00 | | | |
| A6 | 782 11056 | 5.50 | 3.20 | 128.00 | 1 | a | Behind | 24.00 | | | |
| A3 | APXV18-209014 | 53.10 | 6.65 | 78.00 | 2 | a | Front | 47.94 | | | |
| A2 | APXVAALL24_43-U-NA20 | 95.90 | 24.00 | 22.00 | 3 | a | Front | 48.00 | | | |
| R5 | 4480 B71 + B85 | 19.20 | 15.10 | 22.00 | 3 | a | Behind | 48.00 | | | |

## Plan View




## Front View

**Looking Toward Structure**

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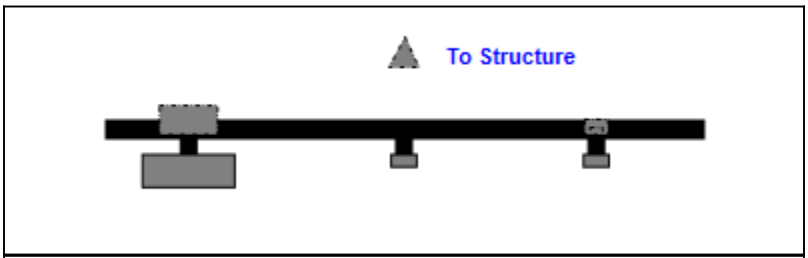
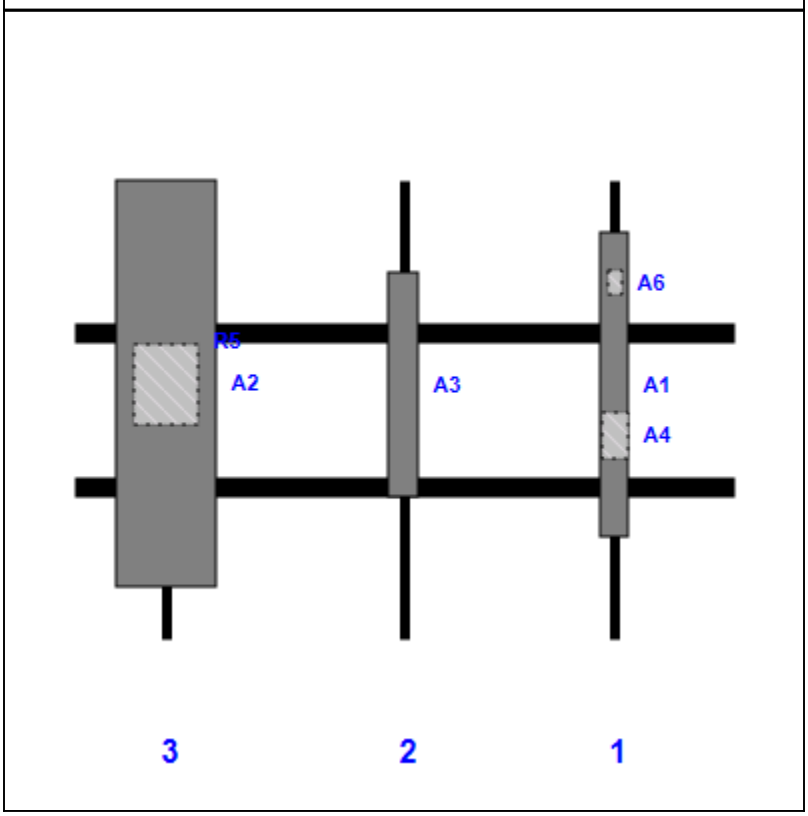
## Plan View




## Front View

**Looking Toward Structure**

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| A2 | APXVAALL24_43-U-NA20 | 95.90 | 24.00 | 22.00 | 3 | a | Front | 48.00 | | | |
| R5 | 4480 B71 + B85 | 19.20 | 15.10 | 22.00 | 3 | a | Behind | 48.00 | | | |

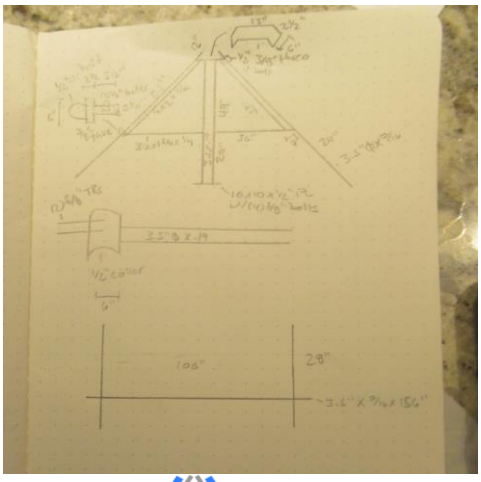
V4.1 Updated on 12-17-2021

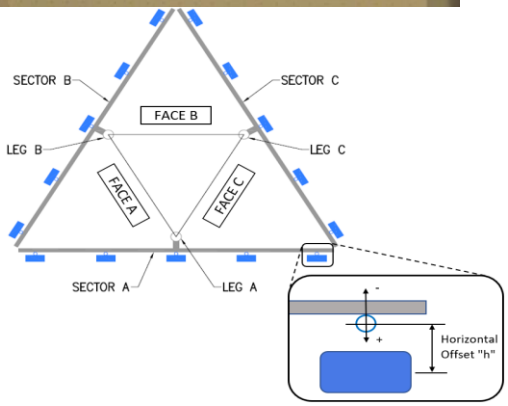
# Antenna Mount Mapping Form (PATENT PENDING)

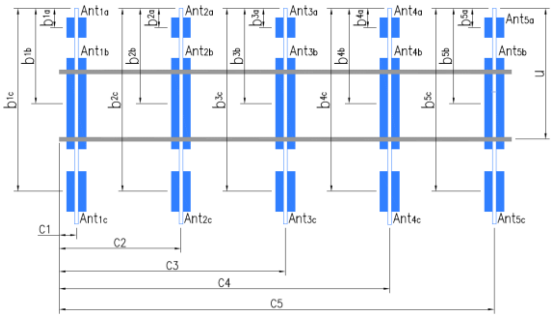
| FCC # |
|---|
| 1265077 |

| | | | |
|---|---|---|---|
| **Tower Owner:** | SBA | **Mapping Date:** | 5/13/2022 |
| **Site Name:** | New Fairfield | **Tower Type:** | Monopole |
| **Site Number or ID:** | CT13061 | **Tower Height (Ft.):** | 150 |
| **Mapping Contractor:** | SGS Towers | **Mount Elevation (Ft.):** | 147 |








**Antenna Layout (Looking Out From Tower)**

## Mount Pipe Configuration and Geometries [Unit = Inches]

| Sector / Position | Mount Pipe Size & Length | Vertical Offset Dimension "u" | Horizontal Offset "C1, C2, C3, etc." | Sector / Position | Mount Pipe Size & Length | Vertical Offset Dimension "u" | Horizontal Offset "C1, C2, C3, etc." |
|---|---|---|---|---|---|---|---|
| A1 | 2.4x1/8x72 | 54.50 | 28.00 | C1 | 2.4x1/8x72 | 54.50 | 28.00 |
| A2 | 2.9x3/16x108 | 72.00 | 134.00 | C2 | 2.4x1/8x72 | 72.00 | 134.00 |
| A3 | | | | C3 | | | |
| A4 | | | | C4 | | | |
| A5 | | | | C5 | | | |
| A6 | | | | C6 | | | |
| B1 | 2.4x1/8x72 | 54.50 | 28.00 | D1 | | | |
| B2 | 2.4x1/8x72 | 72.00 | 134.00 | D2 | | | |
| B3 | | | | D3 | | | |
| B4 | | | | D4 | | | |
| B5 | | | | D5 | | | |
| B6 | | | | D6 | | | |

| | |
|---|---|
| Distance from top of bottom support rail to lowest tip of ant./eqpt. of Carrier above. (N/A if > 10 ft.) : | |
| Distance from top of bottom support rail to highest tip of ant./eqpt. of Carrier below. (N/A if > 10 ft.) : | 8 |

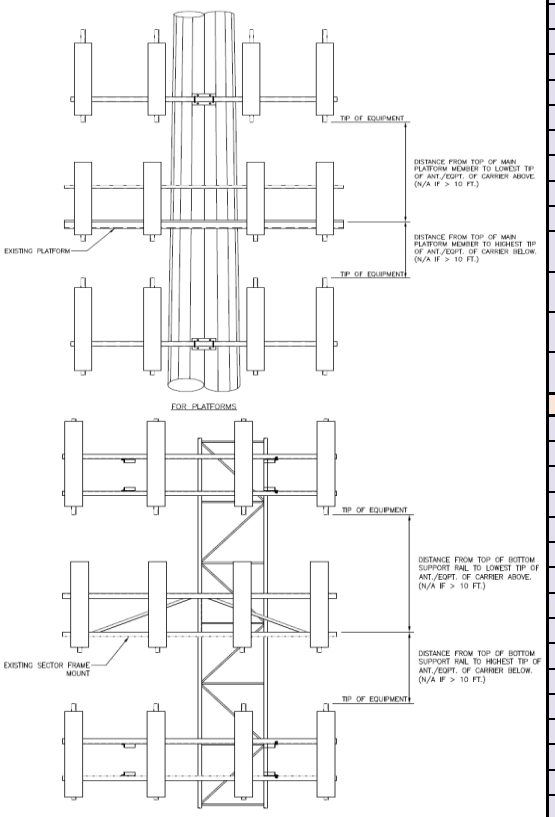
Please enter additional infomation or comments below.

| | | | |
|---|---|---|---|
| Tower Face Width at Mount Elev. (ft.): | | Tower Leg Size or Pole Shaft Diameter at Mount Elev. (in.): | 19.85 |

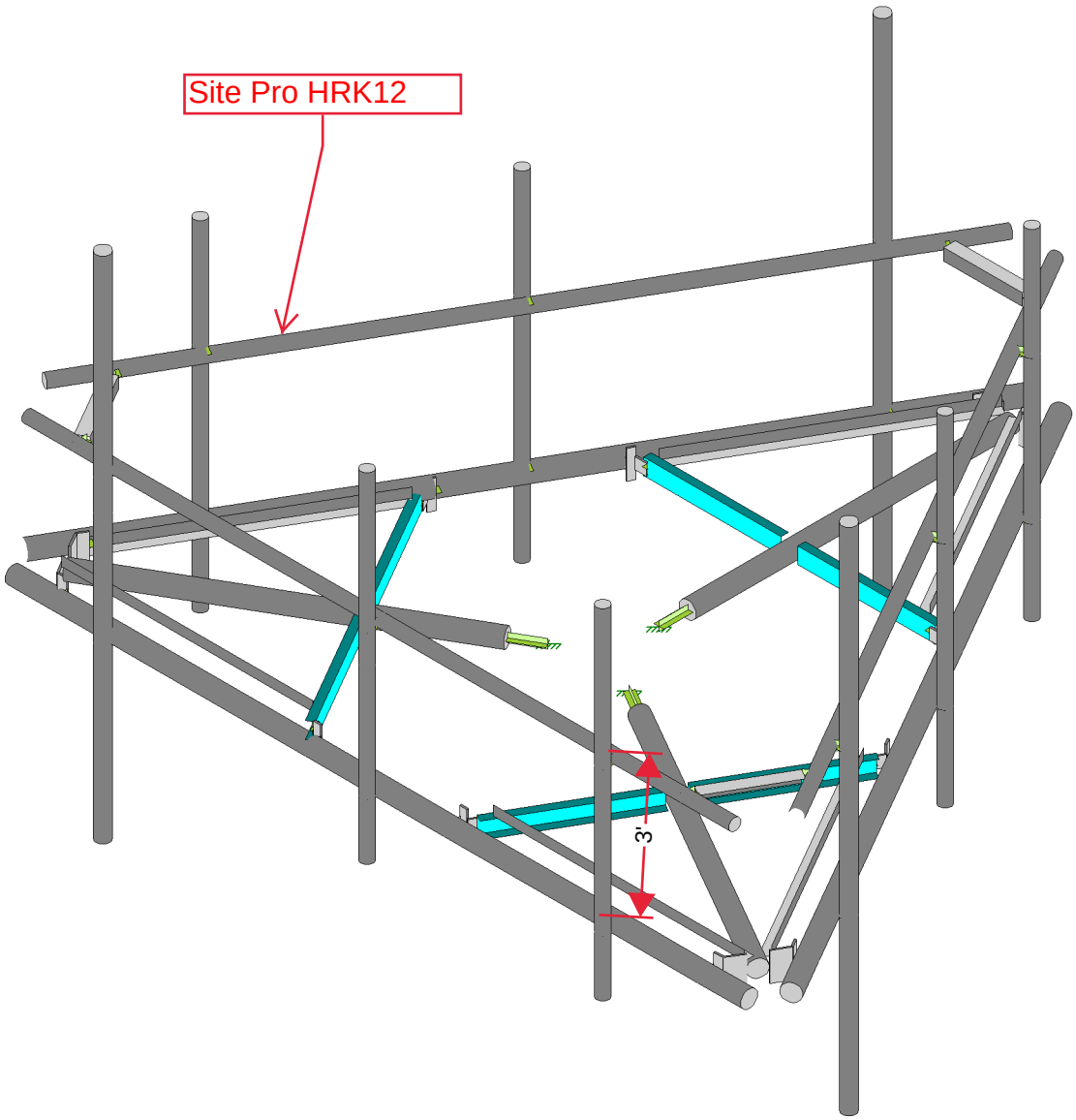
| | Enter antenna model. If not labeled, enter "Unknown". | | | | | | Mounting Locations [Units are inches and degrees] | | | Photos of antennas |
|---|---|---|---|---|---|---|---|---|---|---|
| Ants. Items | Antenna Models if Known | Width (in.) | Depth (in.) | Height (in.) | Coax Size and Qty | Antenna Center-line (Ft.) | Vertical Distances"$b_{1a}$, $b_{2a}$, $b_{3a}$, $b_{1b}$...." (Inches) | Horiz. Offset "h" (Use "-" if Ant. is behind) | Antenna Azimuth (Degrees) | Photo Numbers |
| **Sector A** | | | | | | | | | | |
| $Ant_{1a}$ | | | | (12) 1 7/8" FH | | | | | | |
| $Ant_{1b}$ | UNKN ANT | 7.00 | 3.25 | 73.00 | | 150 | 28.00 | 9.00 | 0.00 | 179-181 |
| $Ant_{1c}$ | (2) UNKN TME | 8.50 | 2.25 | 9.75 | | | 36.00 | 4.00 | | 183-185 |
| $Ant_{2a}$ | | | | | | | | | | |
| $Ant_{2b}$ | LNX-6515DS-A1M | 11.90 | 7.10 | 96.40 | | 150 | 36.00 | 9.00 | 0.00 | 212 |
| $Ant_{2c}$ | | | | | | | | | | |
| $Ant_{3a}$ | | | | | | | | | | |
| $Ant_{3b}$ | | | | | | | | | | |
| $Ant_{3c}$ | | | | | | | | | | |
| $Ant_{4a}$ | | | | | | | | | | |
| $Ant_{4b}$ | | | | | | | | | | |
| $Ant_{4c}$ | | | | | | | | | | |
| $Ant_{5a}$ | | | | | | | | | | |
| $Ant_{5b}$ | | | | | | | | | | |
| $Ant_{5c}$ | | | | | | | | | | |
| Ant on Standoff | | | | | | | | | | |
| Ant on Standoff | | | | | | | | | | |
| Ant on Tower | | | | | | | | | | |
| Ant on Tower | | | | | | | | | | |

| Mount Azimuth (Degree) for Each Sector | | | | Tower Leg Azimuth (Degree) for Each Sector | |
|---|---|---|---|---|---|
| Sector A: | 0.00 | Deg | Leg A: | | Deg |
| Sector B: | 120.00 | Deg | Leg B: | | Deg |
| Sector C: | 240.00 | Deg | Leg C: | | Deg |
| Sector D: | | Deg | Leg D: | | Deg |

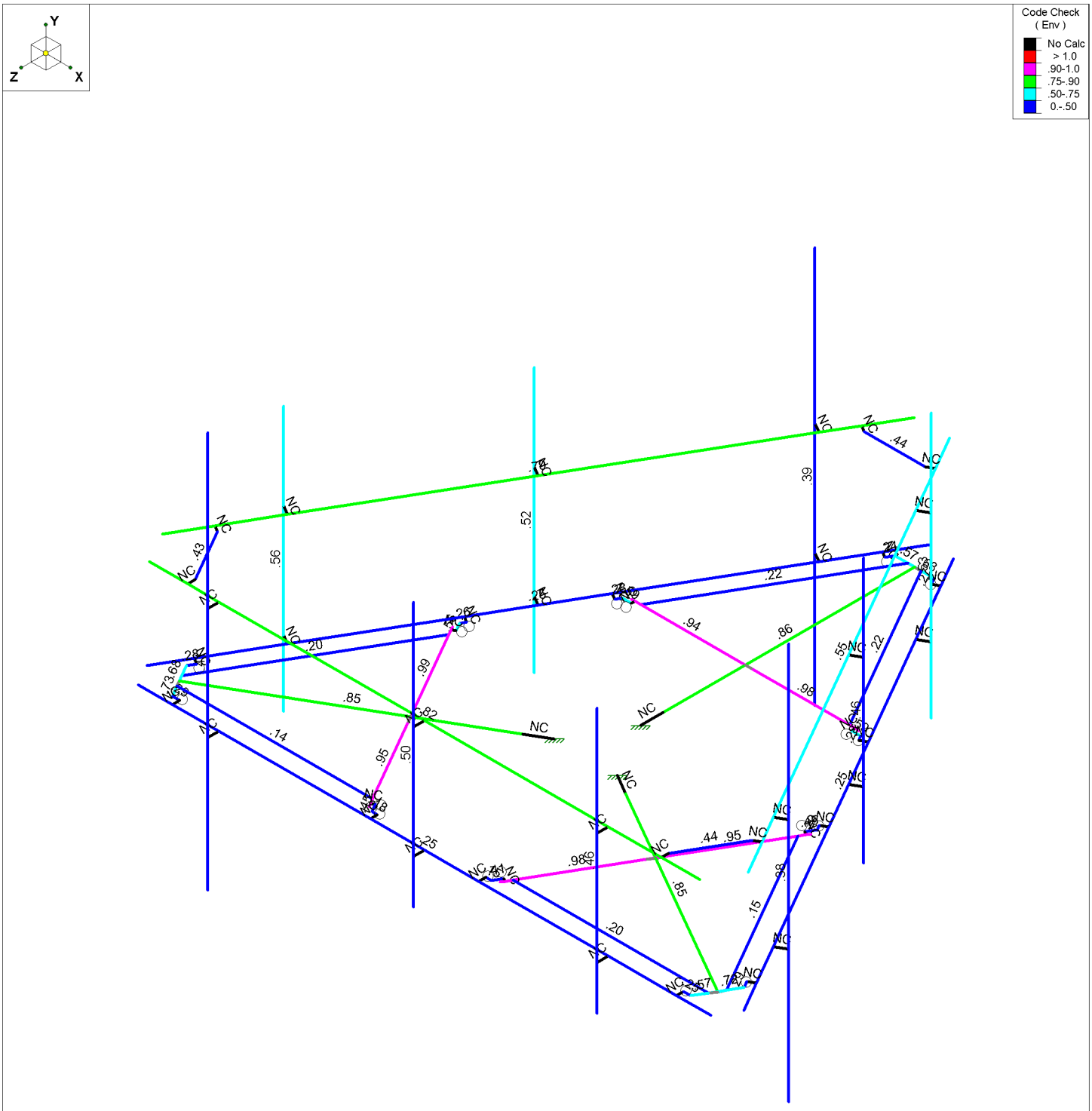
| Climbing Facility Information | | | |
|---|---|---|---|
| Location: | 180.00 | Deg | Sector B |
| Climbing Facility | Corrosion Type: | | Good condition. |
| | Access: | | Climbing path was unobstructed. |
| | Condition: | | Good condition. |


| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Sector B** | | | | | | | | | | |
| $Ant_{1a}$ | | | | | | | | | | |
| $Ant_{1b}$ | UNKN ANT | 7.00 | 3.25 | 73.00 | | 150 | 28.00 | 9.00 | 120.00 | 221 |
| $Ant_{1c}$ | (2) TMA-DB1921-DD-A | 8.50 | 2.25 | 9.75 | | | 36.00 | 4.00 | | 229 |
| $Ant_{2a}$ | | | | | | | | | | |
| $Ant_{2b}$ | LNX-6515DS-A1M | 11.90 | 7.10 | 96.40 | | 150 | 36.00 | 9.00 | 120.00 | 231 |
| $Ant_{2c}$ | | | | | | | | | | |
| $Ant_{3a}$ | | | | | | | | | | |
| $Ant_{3b}$ | | | | | | | | | | |
| $Ant_{3c}$ | | | | | | | | | | |
| $Ant_{4a}$ | | | | | | | | | | |
| $Ant_{4b}$ | | | | | | | | | | |
| $Ant_{4c}$ | | | | | | | | | | |
| $Ant_{5a}$ | | | | | | | | | | |
| $Ant_{5b}$ | | | | | | | | | | |
| $Ant_{5c}$ | | | | | | | | | | |
| Ant on Standoff | | | | | | | | | | |
| Ant on Standoff | | | | | | | | | | |
| Ant on Tower | | | | | | | | | | |
| Ant on Tower | | | | | | | | | | |
| **Sector C** | | | | | | | | | | |
| $Ant_{1a}$ | | | | | | | | | | |
| $Ant_{1b}$ | UNKN ANT | 7.00 | 3.25 | 73.00 | | 150 | 28.00 | 9.00 | 240.00 | 236 |
| $Ant_{1c}$ | (2) UNKN TME | 8.50 | 2.25 | 9.75 | | | 36.00 | 4.00 | | 240 |
| $Ant_{2a}$ | | | | | | | | | | |
| $Ant_{2b}$ | LNX-6515DS-A1M | 11.90 | 7.10 | 96.40 | | 150 | 36.00 | 9.00 | 240.00 | 250 |
| $Ant_{2c}$ | | | | | | | | | | |
| $Ant_{3a}$ | | | | | | | | | | |
| $Ant_{3b}$ | | | | | | | | | | |
| $Ant_{3c}$ | | | | | | | | | | |
| $Ant_{4a}$ | | | | | | | | | | |
| $Ant_{4b}$ | | | | | | | | | | |
| $Ant_{4c}$ | | | | | | | | | | |
| $Ant_{5a}$ | | | | | | | | | | |
| $Ant_{5b}$ | | | | | | | | | | |
| $Ant_{5c}$ | | | | | | | | | | |
| Ant on Standoff | | | | | | | | | | |
| Ant on Standoff | | | | | | | | | | |
| Ant on Tower | | | | | | | | | | |
| Ant on Tower | | | | | | | | | | |
| **Sector D** | | | | | | | | | | |
| $Ant_{1a}$ | | | | | | | | | | |
| $Ant_{1b}$ | | | | | | | | | | |
| $Ant_{1c}$ | | | | | | | | | | |
| $Ant_{2a}$ | | | | | | | | | | |
| $Ant_{2b}$ | | | | | | | | | | |
| $Ant_{2c}$ | | | | | | | | | | |
| $Ant_{3a}$ | | | | | | | | | | |
| $Ant_{3b}$ | | | | | | | | | | |
| $Ant_{3c}$ | | | | | | | | | | |
| $Ant_{4a}$ | | | | | | | | | | |
| $Ant_{4b}$ | | | | | | | | | | |
| $Ant_{4c}$ | | | | | | | | | | |
| $Ant_{5a}$ | | | | | | | | | | |
| $Ant_{5b}$ | | | | | | | | | | |
| $Ant_{5c}$ | | | | | | | | | | |
| Ant on Standoff | | | | | | | | | | |
| Ant on Standoff | | | | | | | | | | |
| Ant on Tower | | | | | | | | | | |
| Ant on Tower | | | | | | | | | | |

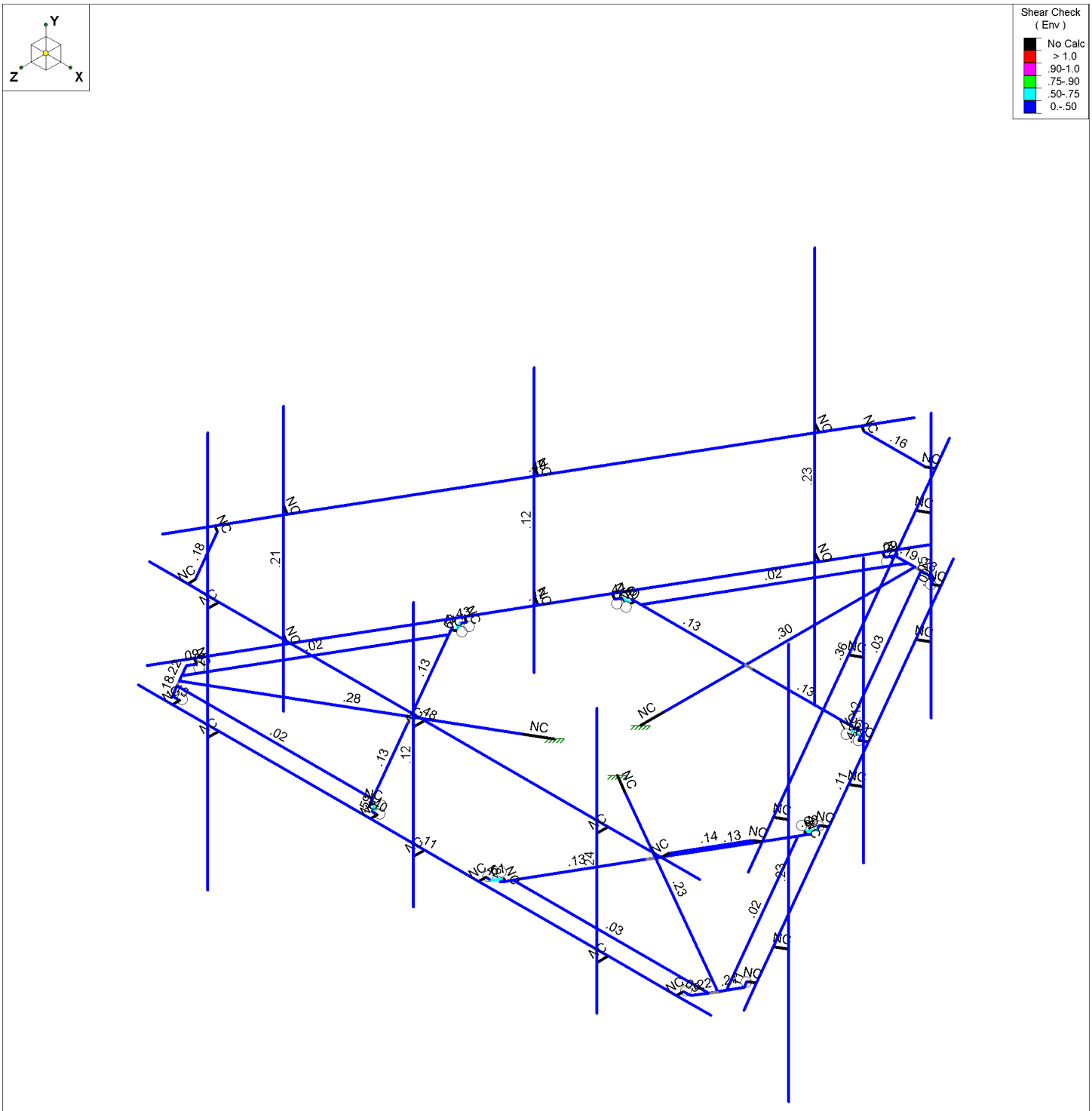



| | | |
|---|---|---|
| Tower Engineering Solutio... | | SK - 8 |
| Progesh Roka | CT13061-A-SBA_MT_LO_Loads Only_G | May 20, 2022 at 3:30 PM |
| TES Project No. 128769 | RENDER | CT13061-A-SBA_128769_G_RISA_... |




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

| | | |
|---|---|---|
| Tower Engineering Solutio... | | SK - 9 |
| Progesh Roka | CT13061-A-SBA_MT_LO_Loads Only_G | May 20, 2022 at 3:30 PM |
| TES Project No. 128769 | UNITY | CT13061-A-SBA_128769_G_RISA_... |




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

| | | |
|---|---|---|
| Tower Engineering Solutio... | | SK - 10 |
| Progesh Roka | CT13061-A-SBA_MT_LO_Loads Only_G | May 20, 2022 at 3:30 PM |
| TES Project No. 128769 | SHEAR | CT13061-A-SBA_128769_G_RISA_... |

## Basic Load Cases

| | BLC Description | Category | X Gravity | Y Gravity | Z Gravity | Joint | Point | Distribu... | Area(M... | Surface... |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Antenna D | None | | | | | 27 | | | |
| 2 | Antenna Di | None | | | | | 27 | | | |
| 3 | Antenna W Front | None | | | | | 27 | | | |
| 4 | Antenna Wi Front | None | | | | | 27 | | | |
| 5 | Antenna W Side | None | | | | | 27 | | | |
| 6 | Antenna Wi Side | None | | | | | 27 | | | |
| 7 | Service Lm1 | None | | | | | 1 | | | |
| 8 | Service Lm2 | None | | | | | 1 | | | |
| 9 | Structure D | None | | -1 | | | | | 3 | |
| 10 | Structure Di | None | | | | | | 54 | 3 | |
| 11 | Structure W Front | None | | | | | | 54 | | |
| 12 | Structure Wi Front | None | | | | | | 54 | | |
| 13 | Structure W Side | None | | | | | | 54 | | |
| 14 | Structure Wi Side | None | | | | | | 54 | | |
| 15 | BLC 9 Transient Area Loads | None | | | | | | 57 | | |
| 16 | BLC 10 Transient Area Loads | None | | | | | | 57 | | |

## Load Combinations

| | Description | So.. | P... | S... | BLC | Fac.. | BLC | Fac.. | BLC | Fac.. | BLC | Fac.. | BLC | Fac.. | BLC | Fac.. | BLC | Fac.. | BLC | Fac.. | BLC | Fac.. | BLC | Fac... |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 (Mai... | Yes | Y | | 1 | 1.2 | 9 | 1.2 | 7 | 1.5 | 3 | .16 | 11 | .16 | | | | | | | | | | |
| 10 | 1.2D+1.5L2+.16W (Mai... | Yes | Y | | 1 | 1.2 | 9 | 1.2 | 8 | 1.5 | 3 | .16 | 11 | .16 | | | | | | | | | | |
| 11 | 1.4D | Yes | Y | | 1 | 1.4 | 9 | 1.4 | | | | | | | | | | | | | | | | |

## Joint Coordinates and Temperatures

| | Label | X [in] | Y [in] | Z [in] | Temp [F] | Detach From Diap... |
|---|---|---|---|---|---|---|
| 1 | N1 | 0 | 0 | 0 | 0 | |
| 2 | N2 | 0 | 0 | -16.175 | 0 | |
| 3 | N3 | 0 | 0 | -9.925 | 0 | |
| 4 | N4 | 0 | 0 | -84.674995 | 0 | |
| 5 | N5 | -1.761558 | 0 | -84.654977 | 0 | |
| 6 | N6 | 0 | 0 | -38.5055 | 0 | |
| 7 | N7 | 28.40597 | 0 | -38.5055 | 0 | |
| 8 | N8 | 1.761558 | 0 | -84.654977 | 0 | |
| 9 | N9 | 31. | 0 | -38.5055 | 0 | |
| 10 | N10 | -31. | 0 | -38.5055 | 0 | |
| 11 | N11 | -30 | 0 | -38.5055 | 0 | |
| 12 | N12 | -30 | 0 | -37.528 | 0 | |

## Joint Coordinates and Temperatures (Continued)

| | Label | X [in] | Y [in] | Z [in] | Temp [F] | Detach From Diap... |
|---|---|---|---|---|---|---|
| 13 | N13 | -32.5 | 0 | -37.528 | 0 | |
| 14 | N14 | -33.25 | 0 | -36.228962 | 0 | |
| 15 | N15 | -34.928279 | 0 | -37.197917 | 0 | |
| 16 | N16 | 30 | 0 | -38.5055 | 0 | |
| 17 | N17 | 30 | 0 | -37.528 | 0 | |
| 18 | N18 | 32.5 | 0 | -37.528 | 0 | |
| 19 | N19 | 33.25 | 0 | -36.228962 | 0 | |
| 20 | N20 | 34.928279 | 0 | -37.197917 | 0 | |
| 21 | N21 | -28.40597 | 0 | -38.5055 | 0 | |
| 22 | N22 | -7.992941 | 0 | -83.85129 | 0 | |
| 23 | N23 | -6.315024 | 0 | -82.882544 | 0 | |
| 24 | N24 | -5.315024 | 0 | -84.614595 | 0 | |
| 25 | N25 | 7.992941 | 0 | -83.85129 | 0 | |
| 26 | N26 | 6.315024 | 0 | -82.882544 | 0 | |
| 27 | N27 | 5.315024 | 0 | -84.614595 | 0 | |
| 28 | N28 | -3.30338 | 0 | -91.973849 | 0 | |
| 29 | N29 | -81.30338 | 0 | 43.126114 | 0 | |
| 30 | N30 | -78. | 0 | 48.847735 | 0 | |
| 31 | N31 | 78 | 0 | 48.847735 | 0 | |
| 32 | N32 | 81.30338 | 0 | 43.126114 | 0 | |
| 33 | N33 | 3.30338 | 0 | -91.973849 | 0 | |
| 34 | N34 | -14.007961 | 0 | 8.0875 | 0 | |
| 35 | N35 | -8.595302 | 0 | 4.9625 | 0 | |
| 36 | N36 | -73.330697 | 0 | 42.337498 | 0 | |
| 37 | N37 | -72.432582 | 0 | 43.853042 | 0 | |
| 38 | N38 | -33.346741 | 0 | 19.25275 | 0 | |
| 39 | N39 | -47.549726 | 0 | -5.347542 | 0 | |
| 40 | N40 | -74.194139 | 0 | 40.801935 | 0 | |
| 41 | N41 | -48.846741 | 0 | -7.594038 | 0 | |
| 42 | N42 | -17.846741 | 0 | 46.099538 | 0 | |
| 43 | N43 | -18.346741 | 0 | 45.233512 | 0 | |
| 44 | N44 | -17.500201 | 0 | 44.744762 | 0 | |
| 45 | N45 | -16.250201 | 0 | 46.909826 | 0 | |
| 46 | N46 | -14.750201 | 0 | 46.909826 | 0 | |
| 47 | N47 | -14.750201 | 0 | 48.847735 | 0 | |
| 48 | N48 | -48.346741 | 0 | -6.728012 | 0 | |
| 49 | N49 | -47.500201 | 0 | -7.216762 | 0 | |
| 50 | N50 | -48.750201 | 0 | -9.381826 | 0 | |
| 51 | N51 | -48.000201 | 0 | -10.680864 | 0 | |
| 52 | N52 | -49.67848 | 0 | -11.649819 | 0 | |
| 53 | N53 | -19.143756 | 0 | 43.853042 | 0 | |
| 54 | N54 | -68.620877 | 0 | 48.847735 | 0 | |
| 55 | N55 | -68.620877 | 0 | 46.910244 | 0 | |
| 56 | N56 | -70.620877 | 0 | 46.910244 | 0 | |
| 57 | N57 | -76.613818 | 0 | 35.003555 | 0 | |
| 58 | N58 | -74.935901 | 0 | 35.972301 | 0 | |
| 59 | N59 | -75.935901 | 0 | 37.704351 | 0 | |
| 60 | N60 | 14.007961 | 0 | 8.0875 | 0 | |
| 61 | N61 | 8.595302 | 0 | 4.9625 | 0 | |
| 62 | N62 | 73.330697 | 0 | 42.337498 | 0 | |
| 63 | N63 | 74.194139 | 0 | 40.801935 | 0 | |
| 64 | N64 | 33.346741 | 0 | 19.25275 | 0 | |

## Joint Coordinates and Temperatures (Continued)

| | Label | X [in] | Y [in] | Z [in] | Temp [F] | Detach From Diap... |
|---|---|---|---|---|---|---|
| 65 | N65 | 19.143756 | 0 | 43.853042 | 0 | |
| 66 | N66 | 72.432582 | 0 | 43.853042 | 0 | |
| 67 | N67 | 17.846741 | 0 | 46.099538 | 0 | |
| 68 | N68 | 48.846741 | 0 | -7.594038 | 0 | |
| 69 | N69 | 48.346741 | 0 | -6.728012 | 0 | |
| 70 | N70 | 47.500201 | 0 | -7.216762 | 0 | |
| 71 | N71 | 48.750201 | 0 | -9.381826 | 0 | |
| 72 | N72 | 48.000201 | 0 | -10.680864 | 0 | |
| 73 | N73 | 49.67848 | 0 | -11.649819 | 0 | |
| 74 | N74 | 18.346741 | 0 | 45.233512 | 0 | |
| 75 | N75 | 17.500201 | 0 | 44.744762 | 0 | |
| 76 | N76 | 16.250201 | 0 | 46.909826 | 0 | |
| 77 | N77 | 14.750201 | 0 | 46.909826 | 0 | |
| 78 | N78 | 14.750201 | 0 | 48.847735 | 0 | |
| 79 | N79 | 47.549726 | 0 | -5.347542 | 0 | |
| 80 | N80 | 76.613818 | 0 | 35.003555 | 0 | |
| 81 | N81 | 74.935901 | 0 | 35.972301 | 0 | |
| 82 | N82 | 75.935901 | 0 | 37.704351 | 0 | |
| 83 | N83 | 68.620877 | 0 | 48.847735 | 0 | |
| 84 | N84 | 68.620877 | 0 | 46.910244 | 0 | |
| 85 | N85 | 70.620877 | 0 | 46.910244 | 0 | |
| 86 | N86 | 50. | 0 | 48.847735 | 0 | |
| 87 | N87 | -56. | 0 | 48.847735 | 0 | |
| 88 | N88 | 50. | 0 | 51.847735 | 0 | |
| 89 | N89 | -56. | 0 | 51.847735 | 0 | |
| 90 | N90 | 50. | 60 | 51.847735 | 0 | |
| 91 | N91 | 50. | -12 | 51.847735 | 0 | |
| 92 | N92 | -56. | 72 | 51.847735 | 0 | |
| 93 | N93 | -56. | -36 | 51.847735 | 0 | |
| 94 | N94 | 0. | 0 | 48.847735 | 0 | |
| 95 | N95 | 0. | 0 | 51.847735 | 0 | |
| 96 | N96 | 0. | 60 | 51.847735 | 0 | |
| 97 | N97 | 0. | -12 | 51.847735 | 0 | |
| 98 | N98 | 17.30338 | 0 | -67.725138 | 0 | |
| 99 | N99 | 70.30338 | 0 | 24.073555 | 0 | |
| 100 | N100 | 19.901456 | 0 | -69.225138 | 0 | |
| 101 | N101 | 72.901456 | 0 | 22.573555 | 0 | |
| 102 | N102 | 19.901456 | 54 | -69.225138 | 0 | |
| 103 | N103 | 19.901456 | -18 | -69.225138 | 0 | |
| 104 | N104 | 72.901456 | 72 | 22.573555 | 0 | |
| 105 | N105 | 72.901456 | -36 | 22.573555 | 0 | |
| 106 | N106 | 42.30338 | 0 | -24.423868 | 0 | |
| 107 | N107 | 44.901456 | 0 | -25.923868 | 0 | |
| 108 | N108 | 44.901456 | 54 | -25.923868 | 0 | |
| 109 | N109 | 44.901456 | -18 | -25.923868 | 0 | |
| 110 | N110 | -67.30338 | 0 | 18.877403 | 0 | |
| 111 | N111 | -14.30338 | 0 | -72.92129 | 0 | |
| 112 | N112 | -69.901456 | 0 | 17.377403 | 0 | |
| 113 | N113 | -16.901456 | 0 | -74.42129 | 0 | |
| 114 | N114 | -69.901456 | 54 | 17.377403 | 0 | |
| 115 | N115 | -69.901456 | -18 | 17.377403 | 0 | |
| 116 | N116 | -16.901456 | 72 | -74.42129 | 0 | |

## Joint Coordinates and Temperatures (Continued)

| | Label | X [in] | Y [in] | Z [in] | Temp [F] | Detach From Diap... |
|---|---|---|---|---|---|---|
| 117 | N117 | -16.901456 | -36 | -74.42129 | 0 | |
| 118 | N118 | -42.30338 | 0 | -24.423868 | 0 | |
| 119 | N119 | -44.901456 | 0 | -25.923868 | 0 | |
| 120 | N120 | -44.901456 | 54 | -25.923868 | 0 | |
| 121 | N121 | -44.901456 | -18 | -25.923868 | 0 | |
| 122 | N122 | -56. | 24 | 51.847735 | 0 | |
| 123 | N123 | 50. | 24 | 51.847735 | 0 | |
| 124 | N124 | 0. | 24 | 51.847735 | 0 | |
| 125 | N125 | -75. | 30.5 | 48.847735 | 0 | |
| 126 | N126 | 75 | 30.5 | 48.847735 | 0 | |
| 127 | N149 | 50. | 30.5 | 48.847735 | 0 | |
| 128 | N150 | -56. | 30.5 | 48.847735 | 0 | |
| 129 | N151 | 50. | 30.5 | 51.847735 | 0 | |
| 130 | N152 | -56. | 30.5 | 51.847735 | 0 | |
| 131 | N153 | 0. | 30.5 | 48.847735 | 0 | |
| 132 | N154 | 0. | 30.5 | 51.847735 | 0 | |
| 133 | N155 | 17.30338 | 30.5 | -67.725138 | 0 | |
| 134 | N156 | 70.30338 | 30.5 | 24.073555 | 0 | |
| 135 | N157 | 19.901456 | 30.5 | -69.225138 | 0 | |
| 136 | N158 | 72.901456 | 30.5 | 22.573555 | 0 | |
| 137 | N159 | 42.30338 | 30.5 | -24.423868 | 0 | |
| 138 | N160 | 44.901456 | 30.5 | -25.923868 | 0 | |
| 139 | N161 | -67.30338 | 30.5 | 18.877403 | 0 | |
| 140 | N162 | -14.30338 | 30.5 | -72.92129 | 0 | |
| 141 | N163 | -69.901456 | 30.5 | 17.377403 | 0 | |
| 142 | N164 | -16.901456 | 30.5 | -74.42129 | 0 | |
| 143 | N165 | -42.30338 | 30.5 | -24.423868 | 0 | |
| 144 | N166 | -44.901456 | 30.5 | -25.923868 | 0 | |
| 145 | N145 | 79.80338 | 30.5 | 40.528038 | 0 | |
| 146 | N146 | 4.80338 | 30.5 | -89.375773 | 0 | |
| 147 | N147 | -4.80338 | 30.5 | -89.375773 | 0 | |
| 148 | N148 | -79.80338 | 30.5 | 40.528038 | 0 | |
| 149 | N149A | -64.5 | 30.5 | 48.847735 | 0 | |
| 150 | N150A | -64.5 | 30.5 | 46.847735 | 0 | |
| 151 | N151A | 64.5 | 30.5 | 48.847735 | 0 | |
| 152 | N152A | 64.5 | 30.5 | 46.847735 | 0 | |
| 153 | N153A | 74.55338 | 30.5 | 31.434771 | 0 | |
| 154 | N154A | 72.821329 | 30.5 | 32.434771 | 0 | |
| 155 | N155A | 10.05338 | 30.5 | -80.282506 | 0 | |
| 156 | N156A | 8.321329 | 30.5 | -79.282506 | 0 | |
| 157 | N157A | -10.05338 | 30.5 | -80.282506 | 0 | |
| 158 | N158A | -8.321329 | 30.5 | -79.282506 | 0 | |
| 159 | N159A | -74.55338 | 30.5 | 31.434771 | 0 | |
| 160 | N160A | -72.821329 | 30.5 | 32.434771 | 0 | |

## Hot Rolled Steel Section Sets

| | Label | Shape | Type | Design List | Material | Design ... | A [in2] | Iyy [in4] | Izz [in4] | J [in4] |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Bottom End Connection | PL3/8x6 | Beam | RECT | A36 Gr.36 | Typical | 2.25 | .026 | 6.75 | .101 |
| 2 | Bracing Connection | PL3/8x6 | Beam | RECT | A36 Gr.36 | Typical | 2.25 | .026 | 6.75 | .101 |
| 3 | Support Rail Connector | L2.5x2.5x4 | Beam | Single Angle | A36 Gr.36 | Typical | 1.19 | .692 | .692 | .026 |

## Hot Rolled Steel Section Sets (Continued)

| | Label | Shape | Type | Design List | Material | Design ... | A [in2] | Iyy [in4] | Izz [in4] | J [in4] |
|---|---|---|---|---|---|---|---|---|---|---|
| 4 | Bracing Innner Connecti... | PL3/8x2.375 | Beam | RECT | A36 Gr.36 | Typical | .891 | .01 | .419 | .038 |
| 5 | Bracing C | HSS3X3X3 | Beam | Channel | A36 Gr.36 | Typical | 1.89 | 2.46 | 2.46 | 4.03 |
| 6 | Foot Rail | PIPE_3.0 | Beam | Pipe | A53 Gr.B | Typical | 2.07 | 2.85 | 2.85 | 5.69 |
| 7 | Mount Pipe | PIPE_2.0 | Beam | Pipe | A53 Gr.B | Typical | 1.02 | .627 | .627 | 1.25 |
| 8 | Mount Pipe 2 | PIPE_2.5 | Beam | Pipe | A53 Gr.B | Typical | 1.61 | 1.45 | 1.45 | 2.89 |
| 9 | Grating Angles | L2x2x3 | Beam | Single Angle | A36 Gr.36 | Typical | .722 | .271 | .271 | .009 |
| 10 | Braces | L2.5x2.5x3 | Beam | Single Angle | A36 Gr.36 | Typical | .901 | .535 | .535 | .011 |
| 11 | Mid Support Rail Conne... | L2.5x2.5x4 | Beam | Single Angle | A36 Gr.36 | Typical | 1.19 | .692 | .692 | .026 |
| 12 | Standoff | PIPE_3.0 | Beam | Pipe | A53 Gr.B | Typical | 2.07 | 2.85 | 2.85 | 5.69 |
| 13 | Support Rail | PIPE_2.0 | Beam | Pipe | A53 Gr.B | Typical | 1.02 | .627 | .627 | 1.25 |

## Cold Formed Steel Section Sets

| | Label | Shape | Type | Design List | Material | Design R... | A [in2] | Iyy [in4] | Izz [in4] | J [in4] |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Bracing | 3.5XCU1.6X250 | Beam | CU | A570 Gr.33 | Typical | 1.416 | .318 | 2.267 | .029 |

## Hot Rolled Steel Properties

| | Label | E [ksi] | G [ksi] | Nu | Therm (/1... | Density[k/ft^3] | 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 |

## Member Primary Data

| | Label | I Joint | J Joint | K Joint | Rotate(d... | Section/Shape | Type | Design List | Material | Design Rul... |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | M1 | N2 | N4 | | | Standoff | Beam | Pipe | A53 Gr.B | Typical |
| 2 | M2 | N2 | N3 | | | RIGID | Beam | None | RIGID | DR1 |
| 3 | M3 | N9 | N6 | | | Bracing | Beam | CU | A570 Gr.... | Typical |
| 4 | M4 | N6 | N10 | | | Bracing | Beam | CU | A570 Gr.... | Typical |
| 5 | M5 | N11 | N12 | | | RIGID | Beam | None | RIGID | DR1 |
| 6 | M6 | N12 | N13 | | | Bracing Innner Connecting Pla... | Beam | RECT | A36 Gr.36 | Typical |
| 7 | M7 | N13 | N14 | | | Bracing Connection | Beam | RECT | A36 Gr.36 | Typical |
| 8 | M8 | N15 | N14 | | | RIGID | Beam | None | RIGID | DR1 |
| 9 | M9 | N16 | N17 | | | RIGID | Beam | None | RIGID | DR1 |
| 10 | M10 | N17 | N18 | | | Bracing Innner Connecting Pla... | Beam | RECT | A36 Gr.36 | Typical |
| 11 | M11 | N18 | N19 | | | Bracing Connection | Beam | RECT | A36 Gr.36 | Typical |
| 12 | M12 | N20 | N19 | | | RIGID | Beam | None | RIGID | DR1 |
| 13 | M13 | N22 | N23 | | | RIGID | Beam | None | RIGID | DR1 |
| 14 | M14 | N24 | N23 | | | Bottom End Connection | Beam | RECT | A36 Gr.36 | Typical |

## Member Primary Data (Continued)

| | Label | I Joint | J Joint | K Joint | Rotate(d... | Section/Shape | Type | Design List | Material | Design Rul... |
|---|---|---|---|---|---|---|---|---|---|---|
| 15 | M15 | N25 | N26 | | | RIGID | Beam | None | RIGID | DR1 |
| 16 | M16 | N27 | N26 | | | Bottom End Connection | Beam | RECT | A36 Gr.36 | Typical |
| 17 | M17 | N27 | N4 | | | Bottom End Connection | Beam | RECT | A36 Gr.36 | Typical |
| 18 | M18 | N24 | N4 | | | Bottom End Connection | Beam | RECT | A36 Gr.36 | Typical |
| 19 | M19 | N28 | N29 | | | Foot Rail | Beam | Pipe | A53 Gr.B | Typical |
| 20 | M20 | N7 | N8 | | 270 | Grating Angles | Beam | Single Angle | A36 Gr.36 | Typical |
| 21 | M21 | N5 | N21 | | 270 | Grating Angles | Beam | Single Angle | A36 Gr.36 | Typical |
| 22 | M22 | N30 | N31 | | | Foot Rail | Beam | Pipe | A53 Gr.B | Typical |
| 23 | M23 | N32 | N33 | | | Foot Rail | Beam | Pipe | A53 Gr.B | Typical |
| 24 | M24 | N34 | N36 | | | Standoff | Beam | Pipe | A53 Gr.B | Typical |
| 25 | M25 | N34 | N35 | | | RIGID | Beam | None | RIGID | DR1 |
| 26 | M26 | N41 | N38 | | | Bracing | Beam | CU | A570 Gr.... | Typical |
| 27 | M27 | N38 | N42 | | | Bracing | Beam | CU | A570 Gr.... | Typical |
| 28 | M28 | N43 | N44 | | | RIGID | Beam | None | RIGID | DR1 |
| 29 | M29 | N44 | N45 | | | Bracing Innner Connecting Pla... | Beam | RECT | A36 Gr.36 | Typical |
| 30 | M30 | N45 | N46 | | | Bracing Connection | Beam | RECT | A36 Gr.36 | Typical |
| 31 | M31 | N47 | N46 | | | RIGID | Beam | None | RIGID | DR1 |
| 32 | M32 | N48 | N49 | | | RIGID | Beam | None | RIGID | DR1 |
| 33 | M33 | N49 | N50 | | | Bracing Innner Connecting Pla... | Beam | RECT | A36 Gr.36 | Typical |
| 34 | M34 | N50 | N51 | | | Bracing Connection | Beam | RECT | A36 Gr.36 | Typical |
| 35 | M35 | N52 | N51 | | | RIGID | Beam | None | RIGID | DR1 |
| 36 | M36 | N54 | N55 | | | RIGID | Beam | None | RIGID | DR1 |
| 37 | M37 | N56 | N55 | | | Bottom End Connection | Beam | RECT | A36 Gr.36 | Typical |
| 38 | M38 | N57 | N58 | | | RIGID | Beam | None | RIGID | DR1 |
| 39 | M39 | N59 | N58 | | | Bottom End Connection | Beam | RECT | A36 Gr.36 | Typical |
| 40 | M40 | N59 | N36 | | | Bottom End Connection | Beam | RECT | A36 Gr.36 | Typical |
| 41 | M41 | N56 | N36 | | | Bottom End Connection | Beam | RECT | A36 Gr.36 | Typical |
| 42 | M42 | N39 | N40 | | 270 | Grating Angles | Beam | Single Angle | A36 Gr.36 | Typical |
| 43 | M43 | N37 | N53 | | 270 | Grating Angles | Beam | Single Angle | A36 Gr.36 | Typical |
| 44 | M44 | N60 | N62 | | | Standoff | Beam | Pipe | A53 Gr.B | Typical |
| 45 | M45 | N60 | N61 | | | RIGID | Beam | None | RIGID | DR1 |
| 46 | M46 | N67 | N64 | | | Bracing | Beam | CU | A570 Gr.... | Typical |
| 47 | M47 | N64 | N68 | | | Bracing | Beam | CU | A570 Gr.... | Typical |
| 48 | M48 | N69 | N70 | | | RIGID | Beam | None | RIGID | DR1 |
| 49 | M49 | N70 | N71 | | | Bracing Innner Connecting Pla... | Beam | RECT | A36 Gr.36 | Typical |
| 50 | M50 | N71 | N72 | | | Bracing Connection | Beam | RECT | A36 Gr.36 | Typical |
| 51 | M51 | N73 | N72 | | | RIGID | Beam | None | RIGID | DR1 |
| 52 | M52 | N74 | N75 | | | RIGID | Beam | None | RIGID | DR1 |
| 53 | M53 | N75 | N76 | | | Bracing Innner Connecting Pla... | Beam | RECT | A36 Gr.36 | Typical |
| 54 | M54 | N76 | N77 | | | Bracing Connection | Beam | RECT | A36 Gr.36 | Typical |
| 55 | M55 | N78 | N77 | | | RIGID | Beam | None | RIGID | DR1 |
| 56 | M56 | N80 | N81 | | | RIGID | Beam | None | RIGID | DR1 |
| 57 | M57 | N82 | N81 | | | Bottom End Connection | Beam | RECT | A36 Gr.36 | Typical |
| 58 | M58 | N83 | N84 | | | RIGID | Beam | None | RIGID | DR1 |
| 59 | M59 | N85 | N84 | | | Bottom End Connection | Beam | RECT | A36 Gr.36 | Typical |
| 60 | M60 | N85 | N62 | | | Bottom End Connection | Beam | RECT | A36 Gr.36 | Typical |
| 61 | M61 | N82 | N62 | | | Bottom End Connection | Beam | RECT | A36 Gr.36 | Typical |
| 62 | M62 | N65 | N66 | | 270 | Grating Angles | Beam | Single Angle | A36 Gr.36 | Typical |
| 63 | M63 | N63 | N79 | | 270 | Grating Angles | Beam | Single Angle | A36 Gr.36 | Typical |
| 64 | M64 | N89 | N87 | | | RIGID | Beam | None | RIGID | DR1 |
| 65 | M65 | N88 | N86 | | | RIGID | Beam | None | RIGID | DR1 |
| 66 | MP1A | N90 | N91 | | | Mount Pipe | Beam | Pipe | A53 Gr.B | Typical |

## Member Primary Data (Continued)

| | Label | I Joint | J Joint | K Joint | Rotate(d... | Section/Shape | Type | Design List | Material | Design Rul... |
|---|---|---|---|---|---|---|---|---|---|---|
| 67 | MP3A | N92 | N93 | | | Mount Pipe 2 | Beam | Pipe | A53 Gr.B | Typical |
| 68 | M68 | N95 | N94 | | | RIGID | Beam | None | RIGID | DR1 |
| 69 | MP2A | N96 | N97 | | | Mount Pipe | Beam | Pipe | A53 Gr.B | Typical |
| 70 | M70 | N101 | N99 | | | RIGID | Beam | None | RIGID | DR1 |
| 71 | M71 | N100 | N98 | | | RIGID | Beam | None | RIGID | DR1 |
| 72 | MP1C | N102 | N103 | | 240 | Mount Pipe | Beam | Pipe | A53 Gr.B | Typical |
| 73 | MP3C | N104 | N105 | | 240 | Mount Pipe 2 | Beam | Pipe | A53 Gr.B | Typical |
| 74 | M74 | N107 | N106 | | | RIGID | Beam | None | RIGID | DR1 |
| 75 | MP2C | N108 | N109 | | 240 | Mount Pipe | Beam | Pipe | A53 Gr.B | Typical |
| 76 | M76 | N113 | N111 | | | RIGID | Beam | None | RIGID | DR1 |
| 77 | M77 | N112 | N110 | | | RIGID | Beam | None | RIGID | DR1 |
| 78 | MP1B | N114 | N115 | | 120 | Mount Pipe | Beam | Pipe | A53 Gr.B | Typical |
| 79 | MP3B | N116 | N117 | | 120 | Mount Pipe 2 | Beam | Pipe | A53 Gr.B | Typical |
| 80 | M80 | N119 | N118 | | | RIGID | Beam | None | RIGID | DR1 |
| 81 | MP2B | N120 | N121 | | 120 | Mount Pipe | Beam | Pipe | A53 Gr.B | Typical |
| 82 | M82 | N125 | N126 | | | Support Rail | Beam | Pipe | A53 Gr.B | Typical |
| 83 | M100 | N152 | N150 | | | RIGID | Beam | None | RIGID | DR1 |
| 84 | M101 | N151 | N149 | | | RIGID | Beam | None | RIGID | DR1 |
| 85 | M102 | N154 | N153 | | | RIGID | Beam | None | RIGID | DR1 |
| 86 | M103 | N158 | N156 | | | RIGID | Beam | None | RIGID | DR1 |
| 87 | M104A | N157 | N155 | | | RIGID | Beam | None | RIGID | DR1 |
| 88 | M105 | N160 | N159 | | | RIGID | Beam | None | RIGID | DR1 |
| 89 | M106 | N164 | N162 | | | RIGID | Beam | None | RIGID | DR1 |
| 90 | M107 | N163 | N161 | | | RIGID | Beam | None | RIGID | DR1 |
| 91 | M108 | N166 | N165 | | | RIGID | Beam | None | RIGID | DR1 |
| 92 | M92 | N145 | N146 | | | Support Rail | Beam | Pipe | A53 Gr.B | Typical |
| 93 | M93 | N147 | N148 | | | Support Rail | Beam | Pipe | A53 Gr.B | Typical |
| 94 | M94 | N149A | N150A | | | RIGID | Beam | None | RIGID | DR1 |
| 95 | M95 | N151A | N152A | | | RIGID | Beam | None | RIGID | DR1 |
| 96 | M96 | N153A | N154A | | | RIGID | Beam | None | RIGID | DR1 |
| 97 | M97 | N155A | N156A | | | RIGID | Beam | None | RIGID | DR1 |
| 98 | M98 | N157A | N158A | | | RIGID | Beam | None | RIGID | DR1 |
| 99 | M99 | N159A | N160A | | | RIGID | Beam | None | RIGID | DR1 |
| 100 | M100A | N160A | N150A | | 90 | Support Rail Connector | Beam | Single Angle | A36 Gr.36 | Typical |
| 101 | M101A | N152A | N154A | | 90 | Support Rail Connector | Beam | Single Angle | A36 Gr.36 | Typical |
| 102 | M102A | N156A | N158A | | 90 | Support Rail Connector | Beam | Single Angle | A36 Gr.36 | 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 | | | | 1.75 | | Yes | | | | None |
| 4 | M4 | | | 1.75 | | | Yes | | | | None |
| 5 | M5 | BenPIN | | | | | Yes | | | | None |
| 6 | M6 | | | | | | Yes | | | | None |
| 7 | M7 | | | | | | Yes | | | | None |
| 8 | M8 | BenPIN | | | | | Yes | | | | None |
| 9 | M9 | BenPIN | | | | | Yes | | | | None |
| 10 | M10 | | | | | | Yes | | | | None |
| 11 | M11 | | | | | | Yes | | | | 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... |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 12 | M12 | BenPIN | | | | | Yes | | | | None |
| 13 | M13 | BenPIN | | | | | Yes | | | | None |
| 14 | M14 | | | | | | Yes | | | | None |
| 15 | M15 | BenPIN | | | | | Yes | | | | None |
| 16 | M16 | | | | | | Yes | | | | None |
| 17 | M17 | | | | 1.75 | | Yes | | | | None |
| 18 | M18 | | | | 1.75 | | Yes | | | | None |
| 19 | M19 | | | | | | Yes | | | | None |
| 20 | M20 | | | | | | Yes | | +z+1.875 | | None |
| 21 | M21 | | | | | | Yes | | +z+1.875 | | None |
| 22 | M22 | | | | | | Yes | | | | None |
| 23 | M23 | | | | | | Yes | | | | None |
| 24 | M24 | | | | | | Yes | | | | None |
| 25 | M25 | | | | | | Yes | | | | None |
| 26 | M26 | | | | 1.75 | | Yes | | | | None |
| 27 | M27 | | | 1.75 | | | Yes | | | | None |
| 28 | M28 | BenPIN | | | | | Yes | | | | None |
| 29 | M29 | | | | | | Yes | | | | None |
| 30 | M30 | | | | | | Yes | | | | None |
| 31 | M31 | BenPIN | | | | | Yes | | | | None |
| 32 | M32 | BenPIN | | | | | Yes | | | | None |
| 33 | M33 | | | | | | Yes | | | | None |
| 34 | M34 | | | | | | Yes | | | | None |
| 35 | M35 | BenPIN | | | | | Yes | | | | None |
| 36 | M36 | BenPIN | | | | | Yes | | | | None |
| 37 | M37 | | | | | | Yes | | | | None |
| 38 | M38 | BenPIN | | | | | Yes | | | | None |
| 39 | M39 | | | | | | Yes | | | | None |
| 40 | M40 | | | | 1.75 | | Yes | | | | None |
| 41 | M41 | | | | 1.75 | | Yes | | | | None |
| 42 | M42 | | | | | | Yes | | +z+1.875 | | None |
| 43 | M43 | | | | | | Yes | | +z+1.875 | | None |
| 44 | M44 | | | | | | Yes | | | | None |
| 45 | M45 | | | | | | Yes | | | | None |
| 46 | M46 | | | | 1.75 | | Yes | | | | None |
| 47 | M47 | | | 1.75 | | | Yes | | | | None |
| 48 | M48 | BenPIN | | | | | Yes | | | | None |
| 49 | M49 | | | | | | Yes | | | | None |
| 50 | M50 | | | | | | Yes | | | | None |
| 51 | M51 | BenPIN | | | | | Yes | | | | None |
| 52 | M52 | BenPIN | | | | | Yes | | | | None |
| 53 | M53 | | | | | | Yes | | | | None |
| 54 | M54 | | | | | | Yes | | | | None |
| 55 | M55 | BenPIN | | | | | Yes | | | | None |
| 56 | M56 | BenPIN | | | | | Yes | | | | None |
| 57 | M57 | | | | | | Yes | | | | None |
| 58 | M58 | BenPIN | | | | | Yes | | | | None |
| 59 | M59 | | | | | | Yes | | | | None |
| 60 | M60 | | | | 1.75 | | Yes | | | | None |
| 61 | M61 | | | | 1.75 | | Yes | | | | None |
| 62 | M62 | | | | | | Yes | | +z+1.875 | | None |
| 63 | M63 | | | | | | Yes | | +z+1.875 | | 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... |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 64 | M64 | | | | | | Yes | | | | None |
| 65 | M65 | | | | | | Yes | | | | None |
| 66 | MP1A | | | | | | Yes | | | | None |
| 67 | MP3A | | | | | | Yes | | | | None |
| 68 | M68 | | | | | | Yes | | | | None |
| 69 | MP2A | | | | | | Yes | | | | None |
| 70 | M70 | | | | | | Yes | | | | None |
| 71 | M71 | | | | | | Yes | | | | None |
| 72 | MP1C | | | | | | Yes | | | | None |
| 73 | MP3C | | | | | | Yes | | | | None |
| 74 | M74 | | | | | | Yes | | | | None |
| 75 | MP2C | | | | | | Yes | | | | None |
| 76 | M76 | | | | | | Yes | | | | None |
| 77 | M77 | | | | | | Yes | | | | None |
| 78 | MP1B | | | | | | Yes | | | | None |
| 79 | MP3B | | | | | | Yes | | | | None |
| 80 | M80 | | | | | | Yes | | | | None |
| 81 | MP2B | | | | | | Yes | | | | None |
| 82 | M82 | | | | | | Yes | | | | None |
| 83 | M100 | | | | | | Yes | | | | None |
| 84 | M101 | | | | | | Yes | | | | None |
| 85 | M102 | | | | | | Yes | | | | None |
| 86 | M103 | | | | | | Yes | | | | None |
| 87 | M104A | | | | | | Yes | | | | None |
| 88 | M105 | | | | | | Yes | | | | None |
| 89 | M106 | | | | | | Yes | | | | None |
| 90 | M107 | | | | | | Yes | | | | None |
| 91 | M108 | | | | | | Yes | | | | None |
| 92 | M92 | | | | | | Yes | | | | None |
| 93 | M93 | | | | | | Yes | | | | None |
| 94 | M94 | | | | | | Yes | | | | None |
| 95 | M95 | | | | | | Yes | | | | None |
| 96 | M96 | | | | | | Yes | | | | None |
| 97 | M97 | | | | | | Yes | | | | None |
| 98 | M98 | | | | | | Yes | | | | None |
| 99 | M99 | | | | | | Yes | | | | None |
| 100 | M100A | | | | | | Yes | | | | None |
| 101 | M101A | | | | | | Yes | | | | None |
| 102 | M102A | | | | | | Yes | | | | None |

## Hot Rolled Steel Design Parameters

| | Label | Shape | Length[in] | Lbyy[in] | Lbzz[in] | Lcomp top[in] | Lcomp bot[in] | L-torqu... | Kyy | Kzz | Cb | Function |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | M1 | Standoff | 68.5 | | | Lbyy | | | | | | Lateral |
| 2 | M6 | Bracing Inn... | 2.5 | | | Lbyy | | | | | | Lateral |
| 3 | M7 | Bracing Con... | 1.5 | | | Lbyy | | | | | | Lateral |
| 4 | M10 | Bracing Inn... | 2.5 | | | Lbyy | | | | | | Lateral |
| 5 | M11 | Bracing Con... | 1.5 | | | Lbyy | | | | | | Lateral |
| 6 | M14 | Bottom End... | 2 | | | Lbyy | | | | | | Lateral |
| 7 | M16 | Bottom End... | 2 | | | Lbyy | | | | | | Lateral |
| 8 | M17 | Bottom End... | 5.315 | | | Lbyy | | | | | | Lateral |

## Hot Rolled Steel Design Parameters (Continued)

| | Label | Shape | Length[in] | Lbyy[in] | Lbzz[in] | Lcomp top[in] | Lcomp bot[in] | L-torqu... | Kyy | Kzz | Cb | Function |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9 | M18 | Bottom End... | 5.315 | | | Lbyy | | | | | | Lateral |
| 10 | M19 | Foot Rail | 156 | | | Lbyy | | | | | | Gravity |
| 11 | M20 | Grating Ang... | 53.289 | | | Lbyy | | | | | | Lateral |
| 12 | M21 | Grating Ang... | 53.289 | | | Lbyy | | | | | | Lateral |
| 13 | M22 | Foot Rail | 156 | | | Lbyy | | | | | | Gravity |
| 14 | M23 | Foot Rail | 156 | | | Lbyy | | | | | | Gravity |
| 15 | M24 | Standoff | 68.5 | | | Lbyy | | | | | | Lateral |
| 16 | M29 | Bracing Inn... | 2.5 | | | Lbyy | | | | | | Lateral |
| 17 | M30 | Bracing Con... | 1.5 | | | Lbyy | | | | | | Lateral |
| 18 | M33 | Bracing Inn... | 2.5 | | | Lbyy | | | | | | Lateral |
| 19 | M34 | Bracing Con... | 1.5 | | | Lbyy | | | | | | Lateral |
| 20 | M37 | Bottom End... | 2 | | | Lbyy | | | | | | Lateral |
| 21 | M39 | Bottom End... | 2 | | | Lbyy | | | | | | Lateral |
| 22 | M40 | Bottom End... | 5.315 | | | Lbyy | | | | | | Lateral |
| 23 | M41 | Bottom End... | 5.315 | | | Lbyy | | | | | | Lateral |
| 24 | M42 | Grating Ang... | 53.289 | | | Lbyy | | | | | | Lateral |
| 25 | M43 | Grating Ang... | 53.289 | | | Lbyy | | | | | | Lateral |
| 26 | M44 | Standoff | 68.5 | | | Lbyy | | | | | | Lateral |
| 27 | M49 | Bracing Inn... | 2.5 | | | Lbyy | | | | | | Lateral |
| 28 | M50 | Bracing Con... | 1.5 | | | Lbyy | | | | | | Lateral |
| 29 | M53 | Bracing Inn... | 2.5 | | | Lbyy | | | | | | Lateral |
| 30 | M54 | Bracing Con... | 1.5 | | | Lbyy | | | | | | Lateral |
| 31 | M57 | Bottom End... | 2 | | | Lbyy | | | | | | Lateral |
| 32 | M59 | Bottom End... | 2 | | | Lbyy | | | | | | Lateral |
| 33 | M60 | Bottom End... | 5.315 | | | Lbyy | | | | | | Lateral |
| 34 | M61 | Bottom End... | 5.315 | | | Lbyy | | | | | | Lateral |
| 35 | M62 | Grating Ang... | 53.289 | | | Lbyy | | | | | | Lateral |
| 36 | M63 | Grating Ang... | 53.289 | | | Lbyy | | | | | | Lateral |
| 37 | MP1A | Mount Pipe | 72 | | | Lbyy | | | | | | Lateral |
| 38 | MP3A | Mount Pipe 2 | 108 | | | Lbyy | | | | | | Lateral |
| 39 | MP2A | Mount Pipe | 72 | | | Lbyy | | | | | | Lateral |
| 40 | MP1C | Mount Pipe | 72 | | | Lbyy | | | | | | Lateral |
| 41 | MP3C | Mount Pipe 2 | 108 | | | Lbyy | | | | | | Lateral |
| 42 | MP2C | Mount Pipe | 72 | | | Lbyy | | | | | | Lateral |
| 43 | MP1B | Mount Pipe | 72 | | | Lbyy | | | | | | Lateral |
| 44 | MP3B | Mount Pipe 2 | 108 | | | Lbyy | | | | | | Lateral |
| 45 | MP2B | Mount Pipe | 72 | | | Lbyy | | | | | | Lateral |
| 46 | M82 | Support Rail | 150 | | | Lbyy | | | | | | Lateral |
| 47 | M92 | Support Rail | 150 | | | Lbyy | | | | | | Lateral |
| 48 | M93 | Support Rail | 150 | | | Lbyy | | | | | | Lateral |
| 49 | M100A | Support Rail... | 16.643 | | | Lbyy | | | | | | Lateral |
| 50 | M101A | Support Rail... | 16.643 | | | Lbyy | | | | | | Lateral |
| 51 | M102A | Support Rail... | 16.643 | | | Lbyy | | | | | | Lateral |

## Cold Formed Steel Design Parameters

| | Label | Shape | Lengt... | Lbyy[in] | Lbzz[in] | Lcomp t... | Lcomp ... | L-torque... | Kyy | Kzz | Cm-... | Cm-... | Cb | R | a[in] | y sw... | z sw... |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | M3 | Bracing | 31 | | | Lbyy | | | | | | | | | | | |
| 2 | M4 | Bracing | 31 | | | Lbyy | | | | | | | | | | | |
| 3 | M26 | Bracing | 31 | | | Lbyy | | | | | | | | | | | |
| 4 | M27 | Bracing | 31 | | | Lbyy | | | | | | | | | | | |

## Cold Formed Steel Design Parameters (Continued)

| | Label | Shape | Lengt... | Lbyy[in] | Lbzz[in] | Lcomp t... | Lcomp ... | L-torque... | Kyy | Kzz | Cm-... | Cm-... | Cb | R | a[in] | y sw... | z sw... |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | M46 | Bracing | 31 | | | Lbyy | | | | | | | | | | | |
| 6 | M47 | Bracing | 31 | | | Lbyy | | | | | | | | | | | |

## 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 | N2 | | | | | | |
| 2 | N3 | Reaction | Reaction | Reaction | Reaction | Reaction | Reaction |
| 3 | N34 | | | | | | |
| 4 | N35 | Reaction | Reaction | Reaction | Reaction | Reaction | Reaction |
| 5 | N60 | | | | | | |
| 6 | N61 | 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 | N3 | max | 2226.237 | 4 | 2534.123 | 5 | 1859.427 | 1 | 6.246 | 5 | 4.47 | 3 | .858 | 3 |
| 2 | | min | -2213.832 | 3 | -356.727 | 2 | -1866.405 | 2 | -1.565 | 2 | -4.476 | 4 | -.93 | 4 |
| 3 | N35 | max | 1534.891 | 4 | 2505.886 | 8 | 1994.98 | 1 | .6 | 1 | 3.478 | 1 | 1.19 | 3 |
| 4 | | min | -1553.653 | 3 | -215.318 | 3 | -2007.373 | 2 | -3.175 | 6 | -3.428 | 2 | -5.324 | 8 |
| 5 | N61 | max | 1680.409 | 4 | 2506.052 | 7 | 1568.812 | 1 | .582 | 1 | 2.496 | 2 | 5.432 | 7 |
| 6 | | min | -1674.052 | 3 | -215.293 | 4 | -1549.442 | 2 | -2.998 | 6 | -2.563 | 1 | -1.235 | 4 |
| 7 | Totals: | max | 5441.538 | 4 | 6959.917 | 8 | 5423.219 | 1 | | | | | | |
| 8 | | min | -5441.537 | 3 | 2358.955 | 3 | -5423.219 | 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 Mome... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | M1 | 1 | max | 1866.405 | 2 | 2531.328 | 5 | 2225.783 | 4 | .93 | 4 | 3.317 | 3 | 4.926 | 5 |
| 2 | | | min | -1859.427 | 1 | -361.144 | 2 | -2213.987 | 3 | -.858 | 3 | -3.317 | 4 | -1.379 | 2 |
| 3 | | 2 | max | 1866.405 | 2 | 2503.305 | 5 | 2202.441 | 4 | .93 | 4 | .175 | 3 | 1.593 | 1 |
| 4 | | | min | -1859.427 | 1 | -373.206 | 2 | -2190.644 | 3 | -.858 | 3 | -.157 | 4 | -.855 | 2 |
| 5 | | 3 | max | 1795.068 | 2 | 263.363 | 1 | 19.444 | 4 | .357 | 4 | .411 | 4 | .496 | 1 |
| 6 | | | min | -1775.107 | 1 | -162.592 | 2 | -35.789 | 3 | -.235 | 3 | -.395 | 3 | -.539 | 2 |
| 7 | | 4 | max | 1795.068 | 2 | 239.693 | 1 | 7.835 | 2 | .357 | 4 | .422 | 4 | .137 | 1 |
| 8 | | | min | -1775.107 | 1 | -186.262 | 2 | -25.099 | 5 | -.235 | 3 | -.43 | 3 | -.29 | 2 |
| 9 | | 5 | max | 1795.068 | 2 | 223.361 | 1 | 10.897 | 3 | .357 | 4 | .4 | 4 | -.011 | 2 |
| 10 | | | min | -1775.107 | 1 | -202.594 | 2 | -27.845 | 8 | -.235 | 3 | -.431 | 3 | -.324 | 5 |
| 11 | M2 | 1 | max | 1866.405 | 2 | 356.727 | 2 | 2226.237 | 4 | .93 | 4 | 3.317 | 4 | 4.926 | 5 |
| 12 | | | min | -1859.427 | 1 | -2534.123 | 5 | -2213.832 | 3 | -.858 | 3 | -3.317 | 3 | -1.379 | 2 |
| 13 | | 2 | max | 1866.405 | 2 | 356.727 | 2 | 2226.237 | 4 | .93 | 4 | 3.607 | 4 | 5.256 | 5 |
| 14 | | | min | -1859.427 | 1 | -2534.123 | 5 | -2213.832 | 3 | -.858 | 3 | -3.606 | 3 | -1.426 | 2 |
| 15 | | 3 | max | 1866.405 | 2 | 356.727 | 2 | 2226.237 | 4 | .93 | 4 | 3.897 | 4 | 5.586 | 5 |
| 16 | | | min | -1859.427 | 1 | -2534.123 | 5 | -2213.832 | 3 | -.858 | 3 | -3.894 | 3 | -1.472 | 2 |
| 17 | | 4 | max | 1866.405 | 2 | 356.727 | 2 | 2226.237 | 4 | .93 | 4 | 4.186 | 4 | 5.916 | 5 |
| 18 | | | min | -1859.427 | 1 | -2534.123 | 5 | -2213.832 | 3 | -.858 | 3 | -4.182 | 3 | -1.519 | 2 |
| 19 | | 5 | max | 1866.405 | 2 | 356.727 | 2 | 2226.237 | 4 | .93 | 4 | 4.476 | 4 | 6.246 | 5 |
| 20 | | | min | -1859.427 | 1 | -2534.123 | 5 | -2213.832 | 3 | -.858 | 3 | -4.47 | 3 | -1.565 | 2 |
| 21 | M3 | 1 | max | 0 | 11 | 0 | 11 | 0 | 11 | 0 | 11 | 0 | 11 | 0 | 11 |
| 22 | | | min | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 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 Mome... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 23 | | 2 | max | 1075.714 | 4 | 134.387 | 2 | 147.165 | 3 | .004 | 3 | .083 | 4 | .936 | 5 |
| 24 | | | min | -1080.691 | 3 | -1089.148 | 5 | -143.073 | 4 | -.004 | 4 | -.074 | 3 | -.125 | 2 |
| 25 | | 3 | max | 1075.714 | 4 | 128.253 | 2 | 147.165 | 3 | .004 | 3 | .018 | 1 | 1.606 | 5 |
| 26 | | | min | -1080.691 | 3 | -1108.492 | 5 | -143.073 | 4 | -.004 | 4 | -.014 | 2 | -.205 | 2 |
| 27 | | 4 | max | 1075.714 | 4 | 122.119 | 2 | 147.165 | 3 | .004 | 3 | .105 | 3 | 2.287 | 5 |
| 28 | | | min | -1080.691 | 3 | -1127.837 | 5 | -143.073 | 4 | -.004 | 4 | -.091 | 4 | -.281 | 2 |
| 29 | | 5 | max | 1075.714 | 4 | 115.985 | 2 | 147.165 | 3 | .004 | 3 | .195 | 3 | 2.98 | 5 |
| 30 | | | min | -1080.691 | 3 | -1147.181 | 5 | -143.073 | 4 | -.004 | 4 | -.178 | 4 | -.354 | 2 |
| 31 | M4 | 1 | max | 1050.771 | 3 | 1124.262 | 5 | 146.512 | 3 | .004 | 3 | .192 | 4 | 2.911 | 5 |
| 32 | | | min | -1084.002 | 4 | -118.461 | 2 | -145.533 | 4 | -.005 | 4 | -.185 | 3 | -.36 | 2 |
| 33 | | 2 | max | 1050.771 | 3 | 1104.957 | 5 | 146.512 | 3 | .004 | 3 | .104 | 4 | 2.232 | 5 |
| 34 | | | min | -1084.002 | 4 | -124.582 | 2 | -145.533 | 4 | -.005 | 4 | -.095 | 3 | -.285 | 2 |
| 35 | | 3 | max | 1050.771 | 3 | 1085.652 | 5 | 146.512 | 3 | .004 | 3 | .02 | 1 | 1.564 | 5 |
| 36 | | | min | -1084.002 | 4 | -130.703 | 2 | -145.533 | 4 | -.005 | 4 | -.02 | 2 | -.208 | 2 |
| 37 | | 4 | max | 1050.771 | 3 | 1066.347 | 5 | 146.512 | 3 | .004 | 3 | .083 | 3 | .908 | 5 |
| 38 | | | min | -1084.002 | 4 | -136.824 | 2 | -145.533 | 4 | -.005 | 4 | -.074 | 4 | -.126 | 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 | M5 | 1 | max | 372.925 | 3 | 1025.312 | 5 | 1300.068 | 3 | .05 | 2 | 0 | 11 | 0 | 11 |
| 42 | | | min | -312.714 | 4 | -144.613 | 2 | -1268.684 | 4 | -.356 | 5 | 0 | 1 | 0 | 1 |
| 43 | | 2 | max | 372.925 | 3 | 1025.312 | 5 | 1300.068 | 3 | .05 | 2 | .026 | 3 | .003 | 2 |
| 44 | | | min | -312.714 | 4 | -144.613 | 2 | -1268.684 | 4 | -.356 | 5 | -.026 | 4 | -.021 | 5 |
| 45 | | 3 | max | 372.925 | 3 | 1025.312 | 5 | 1300.068 | 3 | .05 | 2 | .053 | 3 | .006 | 2 |
| 46 | | | min | -312.714 | 4 | -144.613 | 2 | -1268.684 | 4 | -.356 | 5 | -.052 | 4 | -.042 | 5 |
| 47 | | 4 | max | 372.925 | 3 | 1025.312 | 5 | 1300.068 | 3 | .05 | 2 | .079 | 3 | .009 | 2 |
| 48 | | | min | -312.714 | 4 | -144.613 | 2 | -1268.684 | 4 | -.356 | 5 | -.078 | 4 | -.063 | 5 |
| 49 | | 5 | max | 372.925 | 3 | 1025.312 | 5 | 1300.068 | 3 | .05 | 2 | .106 | 3 | .012 | 2 |
| 50 | | | min | -312.714 | 4 | -144.613 | 2 | -1268.684 | 4 | -.356 | 5 | -.103 | 4 | -.084 | 5 |
| 51 | M6 | 1 | max | 1288.924 | 3 | 1026.569 | 5 | 340.681 | 4 | .012 | 2 | .106 | 3 | .356 | 5 |
| 52 | | | min | -1277.155 | 4 | -143.308 | 2 | -341.3 | 3 | -.084 | 5 | -.103 | 4 | -.05 | 2 |
| 53 | | 2 | max | 1288.924 | 3 | 1025.938 | 5 | 340.681 | 4 | .012 | 2 | .088 | 3 | .302 | 5 |
| 54 | | | min | -1277.155 | 4 | -143.497 | 2 | -341.3 | 3 | -.084 | 5 | -.086 | 4 | -.043 | 2 |
| 55 | | 3 | max | 1288.924 | 3 | 1025.308 | 5 | 340.681 | 4 | .012 | 2 | .07 | 3 | .249 | 5 |
| 56 | | | min | -1277.155 | 4 | -143.687 | 2 | -341.3 | 3 | -.084 | 5 | -.068 | 4 | -.035 | 2 |
| 57 | | 4 | max | 1288.924 | 3 | 1024.677 | 5 | 340.681 | 4 | .012 | 2 | .053 | 3 | .196 | 5 |
| 58 | | | min | -1277.155 | 4 | -143.876 | 2 | -341.3 | 3 | -.084 | 5 | -.05 | 4 | -.028 | 2 |
| 59 | | 5 | max | 1288.924 | 3 | 1024.046 | 5 | 340.681 | 4 | .012 | 2 | .035 | 3 | .142 | 5 |
| 60 | | | min | -1277.155 | 4 | -144.066 | 2 | -341.3 | 3 | -.084 | 5 | -.032 | 4 | -.02 | 2 |
| 61 | M7 | 1 | max | 967.423 | 3 | 1022.581 | 5 | 948.854 | 3 | .023 | 2 | .035 | 3 | 0 | 2 |
| 62 | | | min | -909.4 | 4 | -146.297 | 2 | -933.971 | 4 | -.165 | 5 | -.032 | 4 | -.002 | 8 |
| 63 | | 2 | max | 966.79 | 3 | 1021.875 | 5 | 947.759 | 3 | .023 | 2 | .064 | 3 | .005 | 2 |
| 64 | | | min | -908.767 | 4 | -146.584 | 2 | -932.876 | 4 | -.165 | 5 | -.062 | 4 | -.033 | 5 |
| 65 | | 3 | max | 966.158 | 3 | 1021.169 | 5 | 946.664 | 3 | .023 | 2 | .094 | 3 | .009 | 2 |
| 66 | | | min | -908.135 | 4 | -146.871 | 2 | -931.781 | 4 | -.165 | 5 | -.091 | 4 | -.065 | 5 |
| 67 | | 4 | max | 965.526 | 3 | 1020.464 | 5 | 945.568 | 3 | .023 | 2 | .124 | 3 | .014 | 2 |
| 68 | | | min | -907.502 | 4 | -147.158 | 2 | -930.685 | 4 | -.165 | 5 | -.12 | 4 | -.097 | 5 |
| 69 | | 5 | max | 964.893 | 3 | 1019.758 | 5 | 944.473 | 3 | .023 | 2 | .153 | 3 | .019 | 2 |
| 70 | | | min | -906.87 | 4 | -147.445 | 2 | -929.59 | 4 | -.165 | 5 | -.149 | 4 | -.129 | 5 |
| 71 | M8 | 1 | max | 925.402 | 3 | 144.223 | 2 | 921.663 | 4 | .019 | 2 | 0 | 11 | 0 | 11 |
| 72 | | | min | -945.304 | 4 | -1021.513 | 5 | -948.217 | 3 | -.129 | 5 | 0 | 1 | 0 | 1 |
| 73 | | 2 | max | 925.402 | 3 | 144.223 | 2 | 921.663 | 4 | .019 | 2 | .037 | 4 | .041 | 5 |
| 74 | | | min | -945.304 | 4 | -1021.513 | 5 | -948.217 | 3 | -.129 | 5 | -.038 | 3 | -.006 | 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 Mome... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 75 | | 3 | max | 925.402 | 3 | 144.223 | 2 | 921.663 | 4 | .019 | 2 | .074 | 4 | .082 | 5 |
| 76 | | | min | -945.304 | 4 | -1021.513 | 5 | -948.217 | 3 | -.129 | 5 | -.077 | 3 | -.012 | 2 |
| 77 | | 4 | max | 925.402 | 3 | 144.223 | 2 | 921.663 | 4 | .019 | 2 | .112 | 4 | .124 | 5 |
| 78 | | | min | -945.304 | 4 | -1021.513 | 5 | -948.217 | 3 | -.129 | 5 | -.115 | 3 | -.017 | 2 |
| 79 | | 5 | max | 925.402 | 3 | 144.223 | 2 | 921.663 | 4 | .019 | 2 | .149 | 4 | .165 | 5 |
| 80 | | | min | -945.304 | 4 | -1021.513 | 5 | -948.217 | 3 | -.129 | 5 | -.153 | 3 | -.023 | 2 |
| 81 | M9 | 1 | max | 376.755 | 4 | 1059.571 | 5 | 1265.556 | 3 | .368 | 5 | 0 | 11 | 0 | 11 |
| 82 | | | min | -314.713 | 3 | -143.952 | 2 | -1327.888 | 4 | -.05 | 2 | 0 | 1 | 0 | 1 |
| 83 | | 2 | max | 376.755 | 4 | 1059.571 | 5 | 1265.556 | 3 | .368 | 5 | .026 | 3 | .003 | 2 |
| 84 | | | min | -314.713 | 3 | -143.952 | 2 | -1327.888 | 4 | -.05 | 2 | -.027 | 4 | -.022 | 5 |
| 85 | | 3 | max | 376.755 | 4 | 1059.571 | 5 | 1265.556 | 3 | .368 | 5 | .052 | 3 | .006 | 2 |
| 86 | | | min | -314.713 | 3 | -143.952 | 2 | -1327.888 | 4 | -.05 | 2 | -.054 | 4 | -.043 | 5 |
| 87 | | 4 | max | 376.755 | 4 | 1059.571 | 5 | 1265.556 | 3 | .368 | 5 | .077 | 3 | .009 | 2 |
| 88 | | | min | -314.713 | 3 | -143.952 | 2 | -1327.888 | 4 | -.05 | 2 | -.081 | 4 | -.065 | 5 |
| 89 | | 5 | max | 376.755 | 4 | 1059.571 | 5 | 1265.556 | 3 | .368 | 5 | .103 | 3 | .012 | 2 |
| 90 | | | min | -314.713 | 3 | -143.952 | 2 | -1327.888 | 4 | -.05 | 2 | -.108 | 4 | -.086 | 5 |
| 91 | M10 | 1 | max | 1317.764 | 4 | 1060.966 | 5 | 348.519 | 4 | .086 | 5 | .103 | 3 | .368 | 5 |
| 92 | | | min | -1273.392 | 3 | -142.875 | 2 | -339.829 | 3 | -.012 | 2 | -.108 | 4 | -.05 | 2 |
| 93 | | 2 | max | 1317.764 | 4 | 1060.336 | 5 | 348.519 | 4 | .086 | 5 | .085 | 3 | .313 | 5 |
| 94 | | | min | -1273.392 | 3 | -143.064 | 2 | -339.829 | 3 | -.012 | 2 | -.09 | 4 | -.042 | 2 |
| 95 | | 3 | max | 1317.764 | 4 | 1059.705 | 5 | 348.519 | 4 | .086 | 5 | .068 | 3 | .257 | 5 |
| 96 | | | min | -1273.392 | 3 | -143.254 | 2 | -339.829 | 3 | -.012 | 2 | -.072 | 4 | -.035 | 2 |
| 97 | | 4 | max | 1317.764 | 4 | 1059.074 | 5 | 348.519 | 4 | .086 | 5 | .05 | 3 | .202 | 5 |
| 98 | | | min | -1273.392 | 3 | -143.443 | 2 | -339.829 | 3 | -.012 | 2 | -.054 | 4 | -.028 | 2 |
| 99 | | 5 | max | 1317.764 | 4 | 1058.444 | 5 | 348.519 | 4 | .086 | 5 | .032 | 3 | .147 | 5 |
| 100 | | | min | -1273.392 | 3 | -143.633 | 2 | -339.829 | 3 | -.012 | 2 | -.036 | 4 | -.02 | 2 |
| 101 | M11 | 1 | max | 985.149 | 4 | 1056.875 | 5 | 931.679 | 3 | .171 | 5 | .032 | 3 | 0 | 2 |
| 102 | | | min | -909.248 | 3 | -145.478 | 2 | -969.103 | 4 | -.023 | 2 | -.036 | 4 | -.001 | 7 |
| 103 | | 2 | max | 984.516 | 4 | 1056.17 | 5 | 930.583 | 3 | .171 | 5 | .061 | 3 | .005 | 2 |
| 104 | | | min | -908.616 | 3 | -145.766 | 2 | -968.007 | 4 | -.023 | 2 | -.066 | 4 | -.034 | 5 |
| 105 | | 3 | max | 983.884 | 4 | 1055.464 | 5 | 929.488 | 3 | .171 | 5 | .09 | 3 | .009 | 2 |
| 106 | | | min | -907.983 | 3 | -146.053 | 2 | -966.912 | 4 | -.023 | 2 | -.096 | 4 | -.067 | 5 |
| 107 | | 4 | max | 983.251 | 4 | 1054.758 | 5 | 928.393 | 3 | .171 | 5 | .119 | 3 | .014 | 2 |
| 108 | | | min | -907.351 | 3 | -146.34 | 2 | -965.817 | 4 | -.023 | 2 | -.126 | 4 | -.1 | 5 |
| 109 | | 5 | max | 982.619 | 4 | 1054.053 | 5 | 927.297 | 3 | .171 | 5 | .148 | 3 | .018 | 2 |
| 110 | | | min | -906.719 | 3 | -146.627 | 2 | -964.721 | 4 | -.023 | 2 | -.156 | 4 | -.133 | 5 |
| 111 | M12 | 1 | max | 948.459 | 4 | 143.953 | 2 | 968.61 | 4 | .133 | 5 | 0 | 11 | 0 | 11 |
| 112 | | | min | -941.037 | 3 | -1055.917 | 5 | -919.411 | 3 | -.018 | 2 | 0 | 1 | 0 | 3 |
| 113 | | 2 | max | 948.459 | 4 | 143.953 | 2 | 968.61 | 4 | .133 | 5 | .039 | 4 | .043 | 5 |
| 114 | | | min | -941.037 | 3 | -1055.917 | 5 | -919.411 | 3 | -.018 | 2 | -.037 | 3 | -.006 | 2 |
| 115 | | 3 | max | 948.459 | 4 | 143.953 | 2 | 968.61 | 4 | .133 | 5 | .078 | 4 | .085 | 5 |
| 116 | | | min | -941.037 | 3 | -1055.917 | 5 | -919.411 | 3 | -.018 | 2 | -.074 | 3 | -.012 | 2 |
| 117 | | 4 | max | 948.459 | 4 | 143.953 | 2 | 968.61 | 4 | .133 | 5 | .117 | 4 | .128 | 5 |
| 118 | | | min | -941.037 | 3 | -1055.917 | 5 | -919.411 | 3 | -.018 | 2 | -.111 | 3 | -.017 | 2 |
| 119 | | 5 | max | 948.459 | 4 | 143.953 | 2 | 968.61 | 4 | .133 | 5 | .156 | 4 | .171 | 5 |
| 120 | | | min | -941.037 | 3 | -1055.917 | 5 | -919.411 | 3 | -.018 | 2 | -.148 | 3 | -.023 | 2 |
| 121 | M13 | 1 | max | 127.293 | 1 | 119.448 | 2 | 818.961 | 2 | .083 | 5 | 0 | 11 | 0 | 11 |
| 122 | | | min | -68.355 | 2 | -216.582 | 1 | -813.101 | 1 | -.019 | 2 | 0 | 1 | 0 | 1 |
| 123 | | 2 | max | 127.293 | 1 | 119.448 | 2 | 818.961 | 2 | .083 | 5 | .033 | 2 | .009 | 1 |
| 124 | | | min | -68.355 | 2 | -216.582 | 1 | -813.101 | 1 | -.019 | 2 | -.033 | 1 | -.005 | 2 |
| 125 | | 3 | max | 127.293 | 1 | 119.448 | 2 | 818.961 | 2 | .083 | 5 | .066 | 2 | .017 | 1 |
| 126 | | | min | -68.355 | 2 | -216.582 | 1 | -813.101 | 1 | -.019 | 2 | -.066 | 1 | -.01 | 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 Mome... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 127 | | 4 | max | 127.293 | 1 | 119.448 | 2 | 818.961 | 2 | .083 | 5 | .099 | 2 | .026 | 1 |
| 128 | | | min | -68.355 | 2 | -216.582 | 1 | -813.101 | 1 | -.019 | 2 | -.098 | 1 | -.014 | 2 |
| 129 | | 5 | max | 127.293 | 1 | 119.448 | 2 | 818.961 | 2 | .083 | 5 | .132 | 2 | .035 | 1 |
| 130 | | | min | -68.355 | 2 | -216.582 | 1 | -813.101 | 1 | -.019 | 2 | -.131 | 1 | -.019 | 2 |
| 131 | M14 | 1 | max | 813.944 | 1 | 210.794 | 1 | 123.363 | 3 | .019 | 2 | .113 | 1 | .106 | 5 |
| 132 | | | min | -823.745 | 2 | -122.755 | 2 | -81.352 | 2 | -.035 | 1 | -.119 | 3 | -.04 | 2 |
| 133 | | 2 | max | 813.1 | 1 | 210.411 | 1 | 121.903 | 3 | .019 | 2 | .117 | 1 | .1 | 5 |
| 134 | | | min | -822.902 | 2 | -123.138 | 2 | -81.839 | 2 | -.035 | 1 | -.122 | 2 | -.034 | 2 |
| 135 | | 3 | max | 812.257 | 1 | 210.028 | 1 | 120.442 | 3 | .019 | 2 | .122 | 1 | .094 | 5 |
| 136 | | | min | -822.059 | 2 | -123.521 | 2 | -82.326 | 2 | -.035 | 1 | -.125 | 2 | -.029 | 2 |
| 137 | | 4 | max | 811.414 | 1 | 209.645 | 1 | 118.982 | 3 | .019 | 2 | .127 | 1 | .088 | 5 |
| 138 | | | min | -821.215 | 2 | -123.904 | 2 | -82.813 | 2 | -.035 | 1 | -.129 | 2 | -.024 | 2 |
| 139 | | 5 | max | 810.571 | 1 | 209.263 | 1 | 117.522 | 3 | .019 | 2 | .131 | 1 | .083 | 5 |
| 140 | | | min | -820.372 | 2 | -124.287 | 2 | -83.299 | 2 | -.035 | 1 | -.132 | 2 | -.019 | 2 |
| 141 | M15 | 1 | max | 81.125 | 3 | 219.034 | 8 | 891.131 | 1 | .031 | 2 | 0 | 11 | 0 | 11 |
| 142 | | | min | -66.14 | 4 | -23.802 | 3 | -846.845 | 2 | -.125 | 5 | 0 | 1 | 0 | 1 |
| 143 | | 2 | max | 81.125 | 3 | 219.034 | 8 | 891.131 | 1 | .031 | 2 | .036 | 1 | 0 | 3 |
| 144 | | | min | -66.14 | 4 | -23.802 | 3 | -846.845 | 2 | -.125 | 5 | -.034 | 2 | -.009 | 8 |
| 145 | | 3 | max | 81.125 | 3 | 219.034 | 8 | 891.131 | 1 | .031 | 2 | .072 | 1 | .002 | 3 |
| 146 | | | min | -66.14 | 4 | -23.802 | 3 | -846.845 | 2 | -.125 | 5 | -.068 | 2 | -.018 | 8 |
| 147 | | 4 | max | 81.125 | 3 | 219.034 | 8 | 891.131 | 1 | .031 | 2 | .108 | 1 | .003 | 3 |
| 148 | | | min | -66.14 | 4 | -23.802 | 3 | -846.845 | 2 | -.125 | 5 | -.103 | 2 | -.027 | 8 |
| 149 | | 5 | max | 81.125 | 3 | 219.034 | 8 | 891.131 | 1 | .031 | 2 | .144 | 1 | .004 | 3 |
| 150 | | | min | -66.14 | 4 | -23.802 | 3 | -846.845 | 2 | -.125 | 5 | -.137 | 2 | -.035 | 8 |
| 151 | M16 | 1 | max | 893.063 | 1 | 25.647 | 3 | 78.635 | 2 | .004 | 3 | .123 | 2 | .104 | 1 |
| 152 | | | min | -851.551 | 2 | -214.999 | 8 | -68.243 | 3 | -.035 | 8 | -.136 | 1 | -.052 | 2 |
| 153 | | 2 | max | 892.219 | 1 | 25.264 | 3 | 79.122 | 2 | .004 | 3 | .127 | 2 | .105 | 1 |
| 154 | | | min | -850.708 | 2 | -215.94 | 8 | -69.703 | 3 | -.035 | 8 | -.138 | 1 | -.046 | 2 |
| 155 | | 3 | max | 891.376 | 1 | 24.881 | 3 | 79.608 | 2 | .004 | 3 | .13 | 2 | .109 | 5 |
| 156 | | | min | -849.865 | 2 | -216.881 | 8 | -71.163 | 3 | -.035 | 8 | -.14 | 1 | -.041 | 2 |
| 157 | | 4 | max | 890.533 | 1 | 24.498 | 3 | 80.095 | 2 | .004 | 3 | .133 | 2 | .117 | 5 |
| 158 | | | min | -849.022 | 2 | -217.821 | 8 | -72.624 | 3 | -.035 | 8 | -.142 | 1 | -.036 | 2 |
| 159 | | 5 | max | 889.69 | 1 | 24.116 | 3 | 80.582 | 2 | .004 | 3 | .137 | 2 | .125 | 5 |
| 160 | | | min | -848.179 | 2 | -218.762 | 8 | -74.084 | 3 | -.035 | 8 | -.144 | 1 | -.031 | 2 |
| 161 | M17 | 1 | max | 509.699 | 1 | 215.187 | 8 | 740.798 | 1 | .034 | 2 | .136 | 1 | .051 | 1 |
| 162 | | | min | -488.761 | 2 | -26.987 | 3 | -695.99 | 2 | -.096 | 5 | -.123 | 2 | -.043 | 2 |
| 163 | | 2 | max | 509.738 | 1 | 213.478 | 8 | 744.269 | 1 | .034 | 2 | .191 | 1 | .049 | 1 |
| 164 | | | min | -488.8 | 2 | -27.68 | 3 | -699.461 | 2 | -.096 | 5 | -.175 | 2 | -.052 | 2 |
| 165 | | 3 | max | 509.777 | 1 | 211.769 | 8 | 747.74 | 1 | .034 | 2 | .247 | 1 | .048 | 1 |
| 166 | | | min | -488.839 | 2 | -28.373 | 3 | -702.931 | 2 | -.096 | 5 | -.227 | 2 | -.061 | 2 |
| 167 | | 4 | max | 509.817 | 1 | 210.06 | 8 | 751.211 | 1 | .034 | 2 | .302 | 1 | .047 | 1 |
| 168 | | | min | -488.879 | 2 | -29.066 | 3 | -706.402 | 2 | -.096 | 5 | -.28 | 2 | -.07 | 2 |
| 169 | | 5 | max | 0 | 11 | 0 | 11 | 0 | 11 | 0 | 11 | 0 | 11 | 0 | 11 |
| 170 | | | min | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 171 | M18 | 1 | max | 522.786 | 1 | 118.247 | 2 | 670.34 | 2 | .08 | 5 | .119 | 3 | .082 | 1 |
| 172 | | | min | -477.081 | 2 | -217.852 | 1 | -641.029 | 1 | -.024 | 2 | -.113 | 1 | -.037 | 2 |
| 173 | | 2 | max | 522.826 | 1 | 117.554 | 2 | 673.811 | 2 | .08 | 5 | .168 | 2 | .098 | 1 |
| 174 | | | min | -477.121 | 2 | -218.545 | 1 | -644.5 | 1 | -.024 | 2 | -.16 | 1 | -.046 | 2 |
| 175 | | 3 | max | 522.865 | 1 | 116.861 | 2 | 677.282 | 2 | .08 | 5 | .219 | 2 | .114 | 1 |
| 176 | | | min | -477.16 | 2 | -219.238 | 1 | -647.971 | 1 | -.024 | 2 | -.208 | 1 | -.054 | 2 |
| 177 | | 4 | max | 522.905 | 1 | 116.168 | 2 | 680.753 | 2 | .08 | 5 | .269 | 2 | .131 | 1 |
| 178 | | | min | -477.2 | 2 | -219.931 | 1 | -651.441 | 1 | -.024 | 2 | -.257 | 1 | -.063 | 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 Mome... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 179 | | 5 | max | 0 | 11 | 0 | 11 | 0 | 11 | 0 | 11 | 0 | 11 | 0 | 11 |
| 180 | | | min | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 181 | M19 | 1 | max | 0 | 11 | .022 | 1 | .008 | 4 | 0 | 11 | 0 | 11 | 0 | 11 |
| 182 | | | min | 0 | 1 | -.002 | 8 | 0 | 9 | 0 | 1 | 0 | 1 | 0 | 1 |
| 183 | | 2 | max | 1545.85 | 4 | 111.805 | 3 | 351.554 | 4 | .388 | 2 | .305 | 2 | .216 | 1 |
| 184 | | | min | -1228.393 | 3 | -709.726 | 8 | -371.665 | 3 | -.398 | 1 | -.273 | 1 | -.294 | 2 |
| 185 | | 3 | max | 1123.623 | 4 | 326.353 | 1 | 609.446 | 1 | .388 | 2 | .345 | 4 | .983 | 4 |
| 186 | | | min | -704.908 | 3 | -568.471 | 2 | -594.09 | 2 | -.398 | 1 | -.357 | 3 | -.441 | 2 |
| 187 | | 4 | max | 1014.602 | 1 | 594.512 | 5 | 249.394 | 2 | .297 | 4 | .267 | 1 | .617 | 2 |
| 188 | | | min | -650.56 | 2 | -155.739 | 2 | -226.783 | 1 | -.244 | 3 | -.216 | 2 | -.445 | 1 |
| 189 | | 5 | max | 0 | 11 | .003 | 7 | 0 | 8 | 0 | 11 | 0 | 11 | 0 | 11 |
| 190 | | | min | 0 | 1 | -.022 | 2 | -.007 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 191 | M20 | 1 | max | 574.816 | 4 | 60.317 | 3 | 42.923 | 4 | .001 | 5 | .021 | 2 | .136 | 3 |
| 192 | | | min | -492.858 | 3 | -54.517 | 4 | -30.833 | 3 | 0 | 2 | -.025 | 1 | -.146 | 4 |
| 193 | | 2 | max | 582.304 | 4 | 47.346 | 3 | 38.65 | 4 | .001 | 5 | .025 | 3 | .068 | 3 |
| 194 | | | min | -500.347 | 3 | -41.546 | 4 | -35.106 | 3 | 0 | 2 | -.027 | 4 | -.077 | 4 |
| 195 | | 3 | max | 589.793 | 4 | 34.376 | 3 | 30.557 | 4 | .001 | 5 | .026 | 3 | .035 | 2 |
| 196 | | | min | -507.836 | 3 | -28.575 | 4 | -43.199 | 3 | 0 | 2 | -.027 | 4 | -.045 | 1 |
| 197 | | 4 | max | 597.282 | 4 | 21.405 | 3 | 23.677 | 4 | .001 | 5 | .011 | 3 | .026 | 2 |
| 198 | | | min | -515.324 | 3 | -15.604 | 4 | -56.19 | 7 | 0 | 2 | -.023 | 4 | -.061 | 1 |
| 199 | | 5 | max | 604.77 | 4 | 11.379 | 6 | 18.975 | 4 | .001 | 5 | -.004 | 2 | .041 | 4 |
| 200 | | | min | -522.813 | 3 | -2.634 | 4 | -72.484 | 7 | 0 | 2 | -.058 | 5 | -.119 | 7 |
| 201 | M21 | 1 | max | 602.412 | 3 | 6.103 | 1 | 62.095 | 8 | 0 | 2 | -.005 | 2 | .063 | 3 |
| 202 | | | min | -519.921 | 4 | -7.464 | 2 | -23.333 | 3 | -.001 | 5 | -.044 | 5 | -.089 | 4 |
| 203 | | 2 | max | 594.924 | 3 | 18.758 | 3 | 46.226 | 4 | 0 | 2 | .015 | 4 | .033 | 3 |
| 204 | | | min | -512.432 | 4 | -19.237 | 4 | -28.036 | 3 | -.001 | 5 | -.019 | 3 | -.04 | 4 |
| 205 | | 3 | max | 587.435 | 3 | 31.729 | 3 | 39.347 | 4 | 0 | 2 | .028 | 4 | .037 | 2 |
| 206 | | | min | -504.944 | 4 | -32.208 | 4 | -34.914 | 3 | -.001 | 5 | -.024 | 3 | -.029 | 1 |
| 207 | | 4 | max | 579.946 | 3 | 44.7 | 3 | 31.26 | 4 | 0 | 2 | .026 | 4 | .072 | 4 |
| 208 | | | min | -497.455 | 4 | -45.179 | 4 | -43.001 | 3 | -.001 | 5 | -.024 | 3 | -.072 | 3 |
| 209 | | 5 | max | 572.458 | 3 | 57.671 | 3 | 26.989 | 4 | 0 | 2 | .025 | 2 | .135 | 4 |
| 210 | | | min | -489.966 | 4 | -58.15 | 4 | -47.272 | 3 | -.001 | 5 | -.027 | 1 | -.148 | 3 |
| 211 | M22 | 1 | max | 0 | 11 | 0 | 11 | 0 | 11 | 0 | 11 | 0 | 11 | 0 | 11 |
| 212 | | | min | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 213 | | 2 | max | 1461.806 | 2 | 118.327 | 1 | 311.389 | 2 | .357 | 1 | .22 | 1 | .297 | 4 |
| 214 | | | min | -1148.884 | 1 | -708.41 | 6 | -340.626 | 1 | -.367 | 2 | -.171 | 2 | -.374 | 3 |
| 215 | | 3 | max | 951.381 | 2 | 491.517 | 4 | 303.791 | 4 | .357 | 1 | .268 | 2 | .939 | 6 |
| 216 | | | min | -528.279 | 1 | -604.701 | 3 | -356.06 | 3 | -.367 | 2 | -.287 | 1 | -.241 | 1 |
| 217 | | 4 | max | 1301.925 | 2 | 599.341 | 6 | 185.008 | 1 | .247 | 3 | .136 | 2 | .557 | 3 |
| 218 | | | min | -957.614 | 1 | -170.393 | 1 | -151.144 | 2 | -.193 | 4 | -.102 | 1 | -.384 | 4 |
| 219 | | 5 | max | 0 | 11 | 0 | 11 | 0 | 11 | 0 | 11 | 0 | 11 | 0 | 11 |
| 220 | | | min | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 221 | M23 | 1 | max | 0 | 11 | .019 | 2 | .004 | 4 | 0 | 11 | 0 | 11 | 0 | 11 |
| 222 | | | min | 0 | 1 | -.002 | 8 | 0 | 9 | 0 | 1 | 0 | 1 | 0 | 1 |
| 223 | | 2 | max | 958.844 | 1 | 15.629 | 4 | 206.635 | 1 | .391 | 4 | .405 | 4 | .272 | 2 |
| 224 | | | min | -617.378 | 2 | -692.087 | 5 | -230.071 | 2 | -.402 | 3 | -.376 | 3 | -.348 | 1 |
| 225 | | 3 | max | 1018.509 | 3 | 415.64 | 2 | 623.208 | 3 | .391 | 4 | .279 | 3 | 1.014 | 3 |
| 226 | | | min | -643.467 | 4 | -535.325 | 1 | -601.258 | 4 | -.402 | 3 | -.315 | 4 | -.48 | 4 |
| 227 | | 4 | max | 1476.91 | 3 | 609.289 | 7 | 304.579 | 4 | .287 | 1 | .336 | 3 | .487 | 4 |
| 228 | | | min | -1133.844 | 4 | -233.148 | 4 | -281.649 | 3 | -.233 | 2 | -.28 | 4 | -.315 | 3 |
| 229 | | 5 | max | 0 | 11 | .003 | 7 | .002 | 1 | 0 | 11 | 0 | 11 | 0 | 11 |
| 230 | | | min | 0 | 1 | -.024 | 1 | -.01 | 3 | 0 | 1 | 0 | 1 | 0 | 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 Mome... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 231 | M24 | 1 | max | 1557.849 | 3 | 2503.554 | 8 | 1732.903 | 2 | .839 | 2 | 2.567 | 1 | 4.855 | 8 |
| 232 | | | min | -1564.365 | 4 | -218.09 | 3 | -1751.544 | 1 | -.768 | 1 | -2.524 | 2 | -1.011 | 3 |
| 233 | | 2 | max | 1547.741 | 3 | 2475.531 | 8 | 1715.396 | 2 | .839 | 2 | .08 | 1 | 1.432 | 4 |
| 234 | | | min | -1554.257 | 4 | -230.153 | 3 | -1734.037 | 1 | -.768 | 1 | -.063 | 2 | -.691 | 3 |
| 235 | | 3 | max | 1476.785 | 3 | 236.792 | 4 | 23.421 | 3 | .356 | 2 | .354 | 2 | .423 | 4 |
| 236 | | | min | -1471.105 | 4 | -136.002 | 3 | -43.795 | 4 | -.236 | 1 | -.344 | 1 | -.463 | 3 |
| 237 | | 4 | max | 1466.677 | 3 | 213.122 | 4 | 17.585 | 3 | .356 | 2 | .359 | 2 | .103 | 4 |
| 238 | | | min | -1460.997 | 4 | -159.672 | 3 | -37.959 | 4 | -.236 | 1 | -.371 | 1 | -.255 | 7 |
| 239 | | 5 | max | 1456.57 | 3 | 196.791 | 4 | 11.749 | 3 | .356 | 2 | .339 | 2 | -.011 | 3 |
| 240 | | | min | -1450.889 | 4 | -176.004 | 3 | -32.123 | 4 | -.236 | 1 | -.374 | 1 | -.324 | 8 |
| 241 | M25 | 1 | max | 1557.849 | 3 | 215.318 | 3 | 1735.99 | 2 | .839 | 2 | 2.524 | 2 | 4.855 | 8 |
| 242 | | | min | -1564.365 | 4 | -2505.886 | 8 | -1748.538 | 1 | -.768 | 1 | -2.567 | 1 | -1.011 | 3 |
| 243 | | 2 | max | 1557.849 | 3 | 215.318 | 3 | 1735.99 | 2 | .839 | 2 | 2.75 | 2 | 5.182 | 8 |
| 244 | | | min | -1564.365 | 4 | -2505.886 | 8 | -1748.538 | 1 | -.768 | 1 | -2.795 | 1 | -1.039 | 3 |
| 245 | | 3 | max | 1557.849 | 3 | 215.318 | 3 | 1735.99 | 2 | .839 | 2 | 2.976 | 2 | 5.508 | 8 |
| 246 | | | min | -1564.365 | 4 | -2505.886 | 8 | -1748.538 | 1 | -.768 | 1 | -3.022 | 1 | -1.067 | 3 |
| 247 | | 4 | max | 1557.849 | 3 | 215.318 | 3 | 1735.99 | 2 | .839 | 2 | 3.202 | 2 | 5.834 | 8 |
| 248 | | | min | -1564.365 | 4 | -2505.886 | 8 | -1748.538 | 1 | -.768 | 1 | -3.25 | 1 | -1.095 | 3 |
| 249 | | 5 | max | 1557.849 | 3 | 215.318 | 3 | 1735.99 | 2 | .839 | 2 | 3.428 | 2 | 6.161 | 8 |
| 250 | | | min | -1564.365 | 4 | -2505.886 | 8 | -1748.538 | 1 | -.768 | 1 | -3.478 | 1 | -1.123 | 3 |
| 251 | M26 | 1 | max | 0 | 11 | .003 | 4 | .001 | 2 | 0 | 11 | 0 | 11 | 0 | 11 |
| 252 | | | min | 0 | 1 | 0 | 6 | 0 | 4 | 0 | 1 | 0 | 1 | 0 | 1 |
| 253 | | 2 | max | 964.302 | 2 | 131.38 | 3 | 118.631 | 1 | .003 | 1 | .065 | 2 | .937 | 8 |
| 254 | | | min | -961.473 | 1 | -1087.859 | 8 | -109.817 | 2 | -.003 | 2 | -.062 | 1 | -.133 | 3 |
| 255 | | 3 | max | 970.468 | 2 | 125.246 | 3 | 115.071 | 1 | .003 | 1 | .025 | 4 | 1.606 | 8 |
| 256 | | | min | -967.639 | 1 | -1107.203 | 8 | -106.257 | 2 | -.003 | 2 | -.02 | 3 | -.211 | 3 |
| 257 | | 4 | max | 976.634 | 2 | 119.112 | 3 | 111.512 | 1 | .003 | 1 | .078 | 1 | 2.286 | 8 |
| 258 | | | min | -973.805 | 1 | -1126.548 | 8 | -102.698 | 2 | -.003 | 2 | -.065 | 2 | -.285 | 3 |
| 259 | | 5 | max | 982.799 | 2 | 112.978 | 3 | 107.952 | 1 | .003 | 1 | .145 | 1 | 2.979 | 8 |
| 260 | | | min | -979.97 | 1 | -1145.892 | 8 | -99.138 | 2 | -.003 | 2 | -.126 | 2 | -.356 | 3 |
| 261 | M27 | 1 | max | 707.825 | 1 | 1102.784 | 8 | 138.729 | 1 | .003 | 1 | .184 | 2 | 2.851 | 8 |
| 262 | | | min | -703.536 | 2 | -3.791 | 3 | -136.771 | 2 | -.004 | 2 | -.18 | 1 | -.044 | 3 |
| 263 | | 2 | max | 701.659 | 1 | 1083.479 | 8 | 135.169 | 1 | .003 | 1 | .102 | 2 | 2.185 | 8 |
| 264 | | | min | -697.37 | 2 | -9.912 | 3 | -133.211 | 2 | -.004 | 2 | -.096 | 1 | -.039 | 3 |
| 265 | | 3 | max | 695.494 | 1 | 1064.174 | 8 | 131.61 | 1 | .003 | 1 | .022 | 2 | 1.531 | 8 |
| 266 | | | min | -691.205 | 2 | -16.033 | 3 | -129.651 | 2 | -.004 | 2 | -.015 | 1 | -.032 | 3 |
| 267 | | 4 | max | 689.328 | 1 | 1044.869 | 8 | 128.05 | 1 | .003 | 1 | .064 | 1 | .888 | 6 |
| 268 | | | min | -685.039 | 2 | -22.154 | 3 | -126.091 | 2 | -.004 | 2 | -.056 | 2 | -.02 | 3 |
| 269 | | 5 | max | 0 | 11 | .002 | 4 | 0 | 11 | 0 | 11 | 0 | 11 | 0 | 11 |
| 270 | | | min | 0 | 1 | -.004 | 2 | -.001 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 271 | M28 | 1 | max | 240.773 | 1 | 1004.472 | 6 | 831.873 | 1 | .009 | 3 | 0 | 11 | 0 | 10 |
| 272 | | | min | -185.64 | 2 | -24.207 | 3 | -777.494 | 2 | -.348 | 8 | 0 | 1 | 0 | 8 |
| 273 | | 2 | max | 240.773 | 1 | 1004.472 | 6 | 831.873 | 1 | .009 | 3 | .017 | 1 | 0 | 3 |
| 274 | | | min | -185.64 | 2 | -24.207 | 3 | -777.494 | 2 | -.348 | 8 | -.016 | 2 | -.02 | 6 |
| 275 | | 3 | max | 240.773 | 1 | 1004.472 | 6 | 831.873 | 1 | .009 | 3 | .034 | 1 | 0 | 3 |
| 276 | | | min | -185.64 | 2 | -24.207 | 3 | -777.494 | 2 | -.348 | 8 | -.032 | 2 | -.041 | 6 |
| 277 | | 4 | max | 240.773 | 1 | 1004.472 | 6 | 831.873 | 1 | .009 | 3 | .051 | 1 | .001 | 3 |
| 278 | | | min | -185.64 | 2 | -24.207 | 3 | -777.494 | 2 | -.348 | 8 | -.047 | 2 | -.061 | 6 |
| 279 | | 5 | max | 240.773 | 1 | 1004.472 | 6 | 831.873 | 1 | .009 | 3 | .068 | 1 | .002 | 3 |
| 280 | | | min | -185.64 | 2 | -24.207 | 3 | -777.494 | 2 | -.348 | 8 | -.063 | 2 | -.082 | 6 |
| 281 | M29 | 1 | max | 824.184 | 1 | 1003.961 | 8 | 206.028 | 2 | .002 | 3 | .068 | 1 | .348 | 8 |
| 282 | | | min | -782.925 | 2 | -24.5 | 3 | -217.32 | 1 | -.082 | 6 | -.063 | 2 | -.009 | 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 Mome... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 283 | | 2 | max | 823.767 | 1 | 1003.331 | 8 | 206.269 | 2 | .002 | 3 | .056 | 1 | .296 | 8 |
| 284 | | | min | -782.508 | 2 | -24.69 | 3 | -217.561 | 1 | -.082 | 6 | -.053 | 2 | -.007 | 3 |
| 285 | | 3 | max | 823.349 | 1 | 1002.7 | 8 | 206.509 | 2 | .002 | 3 | .045 | 1 | .243 | 8 |
| 286 | | | min | -782.09 | 2 | -24.879 | 3 | -217.801 | 1 | -.082 | 6 | -.042 | 2 | -.006 | 3 |
| 287 | | 4 | max | 822.932 | 1 | 1002.069 | 8 | 206.75 | 2 | .002 | 3 | .034 | 1 | .191 | 8 |
| 288 | | | min | -781.673 | 2 | -25.069 | 3 | -218.042 | 1 | -.082 | 6 | -.031 | 2 | -.005 | 3 |
| 289 | | 5 | max | 822.515 | 1 | 1001.439 | 8 | 206.991 | 2 | .002 | 3 | .022 | 1 | .139 | 8 |
| 290 | | | min | -781.256 | 2 | -25.258 | 3 | -218.283 | 1 | -.082 | 6 | -.02 | 2 | -.004 | 3 |
| 291 | M30 | 1 | max | 620.606 | 1 | 1002.127 | 6 | 607.22 | 1 | .004 | 3 | .022 | 1 | 0 | 3 |
| 292 | | | min | -552.241 | 2 | -26.095 | 3 | -570.459 | 2 | -.161 | 8 | -.02 | 2 | -.002 | 2 |
| 293 | | 2 | max | 620.606 | 1 | 1001.421 | 6 | 605.76 | 1 | .004 | 3 | .041 | 1 | 0 | 3 |
| 294 | | | min | -552.241 | 2 | -26.382 | 3 | -568.998 | 2 | -.161 | 8 | -.038 | 2 | -.033 | 6 |
| 295 | | 3 | max | 620.606 | 1 | 1000.716 | 6 | 604.299 | 1 | .004 | 3 | .06 | 1 | .002 | 3 |
| 296 | | | min | -552.241 | 2 | -26.669 | 3 | -567.538 | 2 | -.161 | 8 | -.056 | 2 | -.064 | 6 |
| 297 | | 4 | max | 620.606 | 1 | 1000.01 | 6 | 602.839 | 1 | .004 | 3 | .079 | 1 | .002 | 3 |
| 298 | | | min | -552.241 | 2 | -26.956 | 3 | -566.077 | 2 | -.161 | 8 | -.074 | 2 | -.095 | 6 |
| 299 | | 5 | max | 620.606 | 1 | 999.304 | 6 | 601.379 | 1 | .004 | 3 | .098 | 1 | .003 | 3 |
| 300 | | | min | -552.241 | 2 | -27.243 | 3 | -564.617 | 2 | -.161 | 8 | -.091 | 2 | -.127 | 6 |
| 301 | M31 | 1 | max | 585.609 | 1 | 25.256 | 3 | 565.056 | 2 | .003 | 3 | 0 | 11 | 0 | 11 |
| 302 | | | min | -577.438 | 2 | -998.919 | 8 | -606.368 | 1 | -.127 | 6 | 0 | 1 | 0 | 1 |
| 303 | | 2 | max | 585.609 | 1 | 25.256 | 3 | 565.056 | 2 | .003 | 3 | .023 | 2 | .04 | 8 |
| 304 | | | min | -577.438 | 2 | -998.919 | 8 | -606.368 | 1 | -.127 | 6 | -.024 | 1 | -.001 | 3 |
| 305 | | 3 | max | 585.609 | 1 | 25.256 | 3 | 565.056 | 2 | .003 | 3 | .046 | 2 | .081 | 8 |
| 306 | | | min | -577.438 | 2 | -998.919 | 8 | -606.368 | 1 | -.127 | 6 | -.049 | 1 | -.002 | 3 |
| 307 | | 4 | max | 585.609 | 1 | 25.256 | 3 | 565.056 | 2 | .003 | 3 | .068 | 2 | .121 | 8 |
| 308 | | | min | -577.438 | 2 | -998.919 | 8 | -606.368 | 1 | -.127 | 6 | -.073 | 1 | -.003 | 3 |
| 309 | | 5 | max | 585.609 | 1 | 25.256 | 3 | 565.056 | 2 | .003 | 3 | .091 | 2 | .161 | 8 |
| 310 | | | min | -577.438 | 2 | -998.919 | 8 | -606.368 | 1 | -.127 | 6 | -.098 | 1 | -.004 | 3 |
| 311 | M32 | 1 | max | 324.563 | 2 | 1060.223 | 8 | 1150.049 | 1 | .368 | 8 | 0 | 11 | 0 | 11 |
| 312 | | | min | -298.869 | 1 | -149.929 | 3 | -1185.541 | 2 | -.052 | 3 | 0 | 1 | 0 | 7 |
| 313 | | 2 | max | 324.563 | 2 | 1060.223 | 8 | 1150.049 | 1 | .368 | 8 | .023 | 1 | .003 | 3 |
| 314 | | | min | -298.869 | 1 | -149.929 | 3 | -1185.541 | 2 | -.052 | 3 | -.024 | 2 | -.022 | 8 |
| 315 | | 3 | max | 324.563 | 2 | 1060.223 | 8 | 1150.049 | 1 | .368 | 8 | .047 | 1 | .006 | 3 |
| 316 | | | min | -298.869 | 1 | -149.929 | 3 | -1185.541 | 2 | -.052 | 3 | -.048 | 2 | -.043 | 8 |
| 317 | | 4 | max | 324.563 | 2 | 1060.223 | 8 | 1150.049 | 1 | .368 | 8 | .07 | 1 | .009 | 3 |
| 318 | | | min | -298.869 | 1 | -149.929 | 3 | -1185.541 | 2 | -.052 | 3 | -.072 | 2 | -.065 | 8 |
| 319 | | 5 | max | 324.563 | 2 | 1060.223 | 8 | 1150.049 | 1 | .368 | 8 | .094 | 1 | .012 | 3 |
| 320 | | | min | -298.869 | 1 | -149.929 | 3 | -1185.541 | 2 | -.052 | 3 | -.097 | 2 | -.086 | 8 |
| 321 | M33 | 1 | max | 1180.677 | 2 | 1061.108 | 8 | 312.662 | 2 | .086 | 8 | .094 | 1 | .368 | 8 |
| 322 | | | min | -1154.229 | 1 | -149.285 | 3 | -309.563 | 1 | -.012 | 3 | -.097 | 2 | -.052 | 3 |
| 323 | | 2 | max | 1180.259 | 2 | 1060.477 | 8 | 312.422 | 2 | .086 | 8 | .078 | 1 | .313 | 8 |
| 324 | | | min | -1153.812 | 1 | -149.475 | 3 | -309.322 | 1 | -.012 | 3 | -.08 | 2 | -.045 | 3 |
| 325 | | 3 | max | 1179.842 | 2 | 1059.847 | 8 | 312.181 | 2 | .086 | 8 | .061 | 1 | .257 | 8 |
| 326 | | | min | -1153.395 | 1 | -149.664 | 3 | -309.081 | 1 | -.012 | 3 | -.064 | 2 | -.037 | 3 |
| 327 | | 4 | max | 1179.425 | 2 | 1059.216 | 8 | 311.94 | 2 | .086 | 8 | .045 | 1 | .202 | 8 |
| 328 | | | min | -1152.978 | 1 | -149.854 | 3 | -308.84 | 1 | -.012 | 3 | -.048 | 2 | -.029 | 3 |
| 329 | | 5 | max | 1179.008 | 2 | 1058.585 | 8 | 311.699 | 2 | .086 | 8 | .029 | 1 | .147 | 8 |
| 330 | | | min | -1152.56 | 1 | -150.043 | 3 | -308.6 | 1 | -.012 | 3 | -.032 | 2 | -.021 | 3 |
| 331 | M34 | 1 | max | 869.752 | 2 | 1057.569 | 8 | 844.929 | 1 | .171 | 8 | .029 | 1 | 0 | 3 |
| 332 | | | min | -834.272 | 1 | -150.812 | 3 | -864.229 | 2 | -.024 | 3 | -.032 | 2 | -.001 | 5 |
| 333 | | 2 | max | 869.12 | 2 | 1056.863 | 8 | 844.564 | 1 | .171 | 8 | .056 | 1 | .005 | 3 |
| 334 | | | min | -833.639 | 1 | -151.099 | 3 | -863.864 | 2 | -.024 | 3 | -.059 | 2 | -.034 | 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 Mome... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 335 | | 3 | max | 868.487 | 2 | 1056.157 | 8 | 844.199 | 1 | .171 | 8 | .082 | 1 | .009 | 3 |
| 336 | | | min | -833.007 | 1 | -151.386 | 3 | -863.499 | 2 | -.024 | 3 | -.086 | 2 | -.067 | 8 |
| 337 | | 4 | max | 867.855 | 2 | 1055.452 | 8 | 843.834 | 1 | .171 | 8 | .108 | 1 | .014 | 3 |
| 338 | | | min | -832.374 | 1 | -151.673 | 3 | -863.134 | 2 | -.024 | 3 | -.113 | 2 | -.1 | 8 |
| 339 | | 5 | max | 867.223 | 2 | 1054.746 | 8 | 843.469 | 1 | .171 | 8 | .135 | 1 | .019 | 3 |
| 340 | | | min | -831.742 | 1 | -151.96 | 3 | -862.768 | 2 | -.024 | 3 | -.139 | 2 | -.133 | 8 |
| 341 | M35 | 1 | max | 857.788 | 2 | 151.011 | 3 | 863.65 | 2 | .133 | 8 | 0 | 11 | 0 | 11 |
| 342 | | | min | -847.734 | 1 | -1055.944 | 8 | -834.814 | 1 | -.019 | 3 | 0 | 1 | 0 | 1 |
| 343 | | 2 | max | 857.788 | 2 | 151.011 | 3 | 863.65 | 2 | .133 | 8 | .035 | 2 | .043 | 8 |
| 344 | | | min | -847.734 | 1 | -1055.944 | 8 | -834.814 | 1 | -.019 | 3 | -.034 | 1 | -.006 | 3 |
| 345 | | 3 | max | 857.788 | 2 | 151.011 | 3 | 863.65 | 2 | .133 | 8 | .07 | 2 | .085 | 8 |
| 346 | | | min | -847.734 | 1 | -1055.944 | 8 | -834.814 | 1 | -.019 | 3 | -.067 | 1 | -.012 | 3 |
| 347 | | 4 | max | 857.788 | 2 | 151.011 | 3 | 863.65 | 2 | .133 | 8 | .105 | 2 | .128 | 8 |
| 348 | | | min | -847.734 | 1 | -1055.944 | 8 | -834.814 | 1 | -.019 | 3 | -.101 | 1 | -.018 | 3 |
| 349 | | 5 | max | 857.788 | 2 | 151.011 | 3 | 863.65 | 2 | .133 | 8 | .139 | 2 | .171 | 8 |
| 350 | | | min | -847.734 | 1 | -1055.944 | 8 | -834.814 | 1 | -.019 | 3 | -.135 | 1 | -.024 | 3 |
| 351 | M36 | 1 | max | 178.358 | 4 | 161.509 | 1 | 929.221 | 1 | .082 | 8 | 0 | 11 | 0 | 11 |
| 352 | | | min | -116.95 | 3 | -320.267 | 9 | -883.926 | 2 | -.012 | 3 | 0 | 1 | 0 | 1 |
| 353 | | 2 | max | 178.358 | 4 | 161.509 | 1 | 929.221 | 1 | .082 | 8 | .038 | 1 | .013 | 9 |
| 354 | | | min | -116.95 | 3 | -320.267 | 9 | -883.926 | 2 | -.012 | 3 | -.036 | 2 | -.007 | 1 |
| 355 | | 3 | max | 178.358 | 4 | 161.509 | 1 | 929.221 | 1 | .082 | 8 | .075 | 1 | .026 | 9 |
| 356 | | | min | -116.95 | 3 | -320.267 | 9 | -883.926 | 2 | -.012 | 3 | -.071 | 2 | -.013 | 1 |
| 357 | | 4 | max | 178.358 | 4 | 161.509 | 1 | 929.221 | 1 | .082 | 8 | .113 | 1 | .039 | 9 |
| 358 | | | min | -116.95 | 3 | -320.267 | 9 | -883.926 | 2 | -.012 | 3 | -.107 | 2 | -.02 | 1 |
| 359 | | 5 | max | 178.358 | 4 | 161.509 | 1 | 929.221 | 1 | .082 | 8 | .15 | 1 | .052 | 9 |
| 360 | | | min | -116.95 | 3 | -320.267 | 9 | -883.926 | 2 | -.012 | 3 | -.143 | 2 | -.026 | 1 |
| 361 | M37 | 1 | max | 884.258 | 2 | 321.929 | 9 | 173.701 | 4 | .026 | 1 | .149 | 2 | .103 | 8 |
| 362 | | | min | -927.152 | 1 | -159.327 | 1 | -122.137 | 3 | -.052 | 9 | -.161 | 1 | -.021 | 3 |
| 363 | | 2 | max | 884.258 | 2 | 321.547 | 9 | 173.701 | 4 | .026 | 1 | .147 | 2 | .097 | 8 |
| 364 | | | min | -927.152 | 1 | -159.71 | 1 | -122.137 | 3 | -.052 | 9 | -.158 | 1 | -.019 | 3 |
| 365 | | 3 | max | 884.258 | 2 | 321.164 | 9 | 173.701 | 4 | .026 | 1 | .146 | 2 | .092 | 8 |
| 366 | | | min | -927.152 | 1 | -160.093 | 1 | -122.137 | 3 | -.052 | 9 | -.155 | 1 | -.017 | 3 |
| 367 | | 4 | max | 884.258 | 2 | 320.781 | 9 | 173.701 | 4 | .026 | 1 | .144 | 2 | .087 | 8 |
| 368 | | | min | -927.152 | 1 | -160.476 | 1 | -122.137 | 3 | -.052 | 9 | -.153 | 1 | -.014 | 3 |
| 369 | | 5 | max | 884.258 | 2 | 320.398 | 9 | 173.701 | 4 | .026 | 1 | .143 | 2 | .082 | 8 |
| 370 | | | min | -927.152 | 1 | -160.859 | 1 | -122.137 | 3 | -.052 | 9 | -.15 | 1 | -.012 | 3 |
| 371 | M38 | 1 | max | 22.469 | 1 | 222.74 | 7 | 913.58 | 4 | .018 | 3 | 0 | 11 | 0 | 11 |
| 372 | | | min | -22.087 | 3 | -19.074 | 4 | -882.342 | 3 | -.123 | 8 | 0 | 1 | 0 | 3 |
| 373 | | 2 | max | 22.469 | 1 | 222.74 | 7 | 913.58 | 4 | .018 | 3 | .037 | 4 | 0 | 4 |
| 374 | | | min | -22.087 | 3 | -19.074 | 4 | -882.342 | 3 | -.123 | 8 | -.036 | 3 | -.009 | 7 |
| 375 | | 3 | max | 22.469 | 1 | 222.74 | 7 | 913.58 | 4 | .018 | 3 | .074 | 4 | .002 | 4 |
| 376 | | | min | -22.087 | 3 | -19.074 | 4 | -882.342 | 3 | -.123 | 8 | -.071 | 3 | -.018 | 7 |
| 377 | | 4 | max | 22.469 | 1 | 222.74 | 7 | 913.58 | 4 | .018 | 3 | .111 | 4 | .002 | 4 |
| 378 | | | min | -22.087 | 3 | -19.074 | 4 | -882.342 | 3 | -.123 | 8 | -.107 | 3 | -.027 | 7 |
| 379 | | 5 | max | 22.469 | 1 | 222.74 | 7 | 913.58 | 4 | .018 | 3 | .148 | 4 | .003 | 4 |
| 380 | | | min | -22.087 | 3 | -19.074 | 4 | -882.342 | 3 | -.123 | 8 | -.142 | 3 | -.036 | 7 |
| 381 | M39 | 1 | max | 916.423 | 4 | 14.705 | 4 | 34.486 | 3 | .003 | 4 | .136 | 3 | .098 | 4 |
| 382 | | | min | -886.234 | 3 | -218.55 | 7 | -20.431 | 1 | -.036 | 7 | -.148 | 4 | -.046 | 3 |
| 383 | | 2 | max | 915.58 | 4 | 14.323 | 4 | 35.947 | 3 | .003 | 4 | .138 | 3 | .099 | 8 |
| 384 | | | min | -885.391 | 3 | -219.491 | 7 | -20.918 | 1 | -.036 | 7 | -.148 | 4 | -.039 | 3 |
| 385 | | 3 | max | 914.737 | 4 | 13.94 | 4 | 37.407 | 3 | .003 | 4 | .139 | 3 | .107 | 8 |
| 386 | | | min | -884.548 | 3 | -220.432 | 7 | -21.405 | 1 | -.036 | 7 | -.148 | 4 | -.032 | 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 Mome... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 387 | | 4 | max | 913.893 | 4 | 13.557 | 4 | 38.867 | 3 | .003 | 4 | .141 | 3 | .115 | 8 |
| 388 | | | min | -883.705 | 3 | -221.373 | 7 | -21.892 | 1 | -.036 | 7 | -.147 | 4 | -.025 | 3 |
| 389 | | 5 | max | 913.05 | 4 | 13.174 | 4 | 40.328 | 3 | .003 | 4 | .142 | 3 | .123 | 8 |
| 390 | | | min | -882.862 | 3 | -222.314 | 7 | -22.379 | 1 | -.036 | 7 | -.148 | 4 | -.018 | 3 |
| 391 | M40 | 1 | max | 480.536 | 4 | 218.879 | 7 | 785.841 | 4 | .026 | 3 | .148 | 4 | .053 | 4 |
| 392 | | | min | -465.788 | 3 | -21.075 | 4 | -749.223 | 3 | -.094 | 8 | -.136 | 3 | -.046 | 3 |
| 393 | | 2 | max | 479.053 | 4 | 217.17 | 7 | 788.479 | 4 | .026 | 3 | .206 | 4 | .054 | 4 |
| 394 | | | min | -464.305 | 3 | -21.768 | 4 | -751.86 | 3 | -.094 | 8 | -.192 | 3 | -.057 | 3 |
| 395 | | 3 | max | 477.57 | 4 | 215.461 | 7 | 791.116 | 4 | .026 | 3 | .265 | 4 | .056 | 4 |
| 396 | | | min | -462.822 | 3 | -22.461 | 4 | -754.498 | 3 | -.094 | 8 | -.248 | 3 | -.069 | 3 |
| 397 | | 4 | max | 476.087 | 4 | 213.752 | 7 | 793.753 | 4 | .026 | 3 | .324 | 4 | .058 | 4 |
| 398 | | | min | -461.339 | 3 | -23.154 | 4 | -757.135 | 3 | -.094 | 8 | -.304 | 3 | -.081 | 3 |
| 399 | | 5 | max | 0 | 11 | 0 | 11 | 0 | 11 | 0 | 11 | 0 | 11 | 0 | 11 |
| 400 | | | min | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 401 | M41 | 1 | max | 431.926 | 2 | 157.356 | 1 | 839.376 | 1 | .078 | 8 | .161 | 1 | .091 | 9 |
| 402 | | | min | -395.191 | 1 | -321.374 | 9 | -776.106 | 2 | -.014 | 3 | -.149 | 2 | -.024 | 1 |
| 403 | | 2 | max | 430.403 | 2 | 156.663 | 1 | 840.278 | 1 | .078 | 8 | .223 | 1 | .115 | 9 |
| 404 | | | min | -393.668 | 1 | -322.067 | 9 | -777.009 | 2 | -.014 | 3 | -.206 | 2 | -.035 | 1 |
| 405 | | 3 | max | 430.447 | 4 | 155.97 | 1 | 841.18 | 1 | .078 | 8 | .286 | 1 | .139 | 9 |
| 406 | | | min | -392.146 | 1 | -322.76 | 9 | -777.911 | 2 | -.014 | 3 | -.264 | 2 | -.047 | 1 |
| 407 | | 4 | max | 431.97 | 4 | 155.277 | 1 | 842.082 | 1 | .078 | 8 | .348 | 1 | .163 | 9 |
| 408 | | | min | -390.623 | 1 | -323.453 | 9 | -778.813 | 2 | -.014 | 3 | -.322 | 2 | -.059 | 1 |
| 409 | | 5 | max | 0 | 11 | 0 | 11 | 0 | 11 | 0 | 11 | 0 | 11 | 0 | 11 |
| 410 | | | min | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 411 | M42 | 1 | max | 492.973 | 2 | 42.722 | 4 | 30.493 | 2 | .001 | 8 | .025 | 3 | .116 | 1 |
| 412 | | | min | -461.758 | 1 | -36.602 | 3 | -21.528 | 1 | 0 | 3 | -.03 | 4 | -.117 | 2 |
| 413 | | 2 | max | 500.462 | 2 | 31.432 | 1 | 26.22 | 2 | .001 | 8 | .025 | 1 | .071 | 1 |
| 414 | | | min | -469.247 | 1 | -24.652 | 2 | -25.801 | 1 | 0 | 3 | -.024 | 2 | -.073 | 2 |
| 415 | | 3 | max | 507.95 | 2 | 27.108 | 1 | 18.127 | 2 | .001 | 8 | .025 | 1 | .032 | 3 |
| 416 | | | min | -476.736 | 1 | -20.329 | 2 | -33.894 | 1 | 0 | 3 | -.024 | 2 | -.044 | 4 |
| 417 | | 4 | max | 515.439 | 2 | 22.784 | 1 | 11.247 | 2 | .001 | 8 | .015 | 1 | .034 | 3 |
| 418 | | | min | -484.224 | 1 | -16.005 | 2 | -54.045 | 5 | 0 | 3 | -.027 | 2 | -.069 | 4 |
| 419 | | 5 | max | 522.928 | 2 | 18.461 | 1 | 6.545 | 2 | .001 | 8 | -.002 | 3 | .021 | 3 |
| 420 | | | min | -491.713 | 1 | -11.682 | 2 | -70.339 | 5 | 0 | 3 | -.059 | 8 | -.114 | 8 |
| 421 | M43 | 1 | max | 388.35 | 1 | 6.92 | 4 | 60.462 | 6 | 0 | 3 | 0 | 3 | .057 | 1 |
| 422 | | | min | -317.515 | 2 | -8.747 | 3 | -15.308 | 1 | -.001 | 8 | -.046 | 6 | -.082 | 2 |
| 423 | | 2 | max | 388.35 | 1 | 10.462 | 1 | 44.168 | 6 | 0 | 3 | .011 | 3 | .042 | 1 |
| 424 | | | min | -317.515 | 2 | -10.603 | 2 | -20.01 | 1 | -.001 | 8 | -.016 | 4 | -.048 | 2 |
| 425 | | 3 | max | 388.35 | 1 | 27.756 | 1 | 31.811 | 2 | 0 | 3 | .022 | 2 | .029 | 3 |
| 426 | | | min | -317.515 | 2 | -27.897 | 2 | -26.888 | 1 | -.001 | 8 | -.017 | 1 | -.021 | 4 |
| 427 | | 4 | max | 388.35 | 1 | 45.05 | 1 | 23.724 | 2 | 0 | 3 | .018 | 3 | .045 | 2 |
| 428 | | | min | -317.515 | 2 | -45.191 | 2 | -34.975 | 1 | -.001 | 8 | -.013 | 1 | -.044 | 1 |
| 429 | | 5 | max | 388.35 | 1 | 62.345 | 1 | 19.453 | 2 | 0 | 3 | .013 | 3 | .104 | 2 |
| 430 | | | min | -317.515 | 2 | -62.486 | 2 | -39.247 | 1 | -.001 | 8 | -.016 | 4 | -.116 | 1 |
| 431 | M44 | 1 | max | 1635.145 | 4 | 2503.639 | 7 | 1328.458 | 1 | .784 | 1 | 1.827 | 2 | 4.862 | 7 |
| 432 | | | min | -1643.356 | 3 | -218.351 | 4 | -1283.119 | 2 | -.712 | 2 | -1.872 | 1 | -1.056 | 4 |
| 433 | | 2 | max | 1625.038 | 4 | 2475.617 | 7 | 1310.951 | 1 | .784 | 1 | .114 | 3 | 1.474 | 3 |
| 434 | | | min | -1633.248 | 3 | -230.414 | 4 | -1265.612 | 2 | -.712 | 2 | -.103 | 4 | -.735 | 4 |
| 435 | | 3 | max | 1553.287 | 4 | 249.292 | 3 | 10.065 | 1 | .258 | 1 | .297 | 1 | .452 | 3 |
| 436 | | | min | -1549.391 | 3 | -149.304 | 4 | -28.369 | 2 | -.132 | 2 | -.274 | 2 | -.494 | 4 |
| 437 | | 4 | max | 1543.179 | 4 | 225.622 | 3 | 1.083 | 3 | .258 | 1 | .299 | 1 | .114 | 3 |
| 438 | | | min | -1539.284 | 3 | -172.974 | 4 | -22.488 | 8 | -.132 | 2 | -.302 | 2 | -.263 | 4 |

## *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 Mome... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 439 | | 5 | max | 1533.072 | 4 | 209.29 | 3 | 6.645 | 2 | .258 | 1 | .276 | 1 | -.004 | 4 |
| 440 | | | min | -1529.176 | 3 | -189.306 | 4 | -26.427 | 5 | -.132 | 2 | -.305 | 2 | -.326 | 7 |
| 441 | M45 | 1 | max | 1635.145 | 4 | 215.293 | 4 | 1326.593 | 1 | .784 | 1 | 1.872 | 1 | 4.862 | 7 |
| 442 | | | min | -1643.356 | 3 | -2506.052 | 7 | -1285.025 | 2 | -.712 | 2 | -1.827 | 2 | -1.056 | 4 |
| 443 | | 2 | max | 1635.145 | 4 | 215.293 | 4 | 1326.593 | 1 | .784 | 1 | 2.045 | 1 | 5.188 | 7 |
| 444 | | | min | -1643.356 | 3 | -2506.052 | 7 | -1285.025 | 2 | -.712 | 2 | -1.994 | 2 | -1.084 | 4 |
| 445 | | 3 | max | 1635.145 | 4 | 215.293 | 4 | 1326.593 | 1 | .784 | 1 | 2.217 | 1 | 5.514 | 7 |
| 446 | | | min | -1643.356 | 3 | -2506.052 | 7 | -1285.025 | 2 | -.712 | 2 | -2.161 | 2 | -1.112 | 4 |
| 447 | | 4 | max | 1635.145 | 4 | 215.293 | 4 | 1326.593 | 1 | .784 | 1 | 2.39 | 1 | 5.84 | 7 |
| 448 | | | min | -1643.356 | 3 | -2506.052 | 7 | -1285.025 | 2 | -.712 | 2 | -2.329 | 2 | -1.14 | 4 |
| 449 | | 5 | max | 1635.145 | 4 | 215.293 | 4 | 1326.593 | 1 | .784 | 1 | 2.563 | 1 | 6.167 | 7 |
| 450 | | | min | -1643.356 | 3 | -2506.052 | 7 | -1285.025 | 2 | -.712 | 2 | -2.496 | 2 | -1.168 | 4 |
| 451 | M46 | 1 | max | 0 | 11 | .003 | 2 | 0 | 1 | 0 | 11 | 0 | 11 | 0 | 11 |
| 452 | | | min | 0 | 1 | -.001 | 3 | 0 | 6 | 0 | 1 | 0 | 1 | 0 | 1 |
| 453 | | 2 | max | 529.399 | 3 | 15.882 | 4 | 107.863 | 2 | .003 | 2 | .049 | 1 | .916 | 6 |
| 454 | | | min | -492.037 | 4 | -1066.772 | 7 | -103.788 | 1 | -.003 | 1 | -.044 | 2 | -.021 | 1 |
| 455 | | 3 | max | 535.565 | 3 | 9.748 | 4 | 111.422 | 2 | .003 | 2 | .023 | 2 | 1.571 | 7 |
| 456 | | | min | -498.203 | 4 | -1086.117 | 7 | -107.348 | 1 | -.003 | 1 | -.015 | 1 | -.02 | 4 |
| 457 | | 4 | max | 541.73 | 3 | 3.614 | 4 | 114.982 | 2 | .003 | 2 | .092 | 2 | 2.238 | 7 |
| 458 | | | min | -504.369 | 4 | -1105.461 | 7 | -110.908 | 1 | -.003 | 1 | -.082 | 1 | -.024 | 4 |
| 459 | | 5 | max | 547.896 | 3 | -2.52 | 4 | 118.542 | 2 | .003 | 2 | .163 | 2 | 2.918 | 7 |
| 460 | | | min | -510.534 | 4 | -1124.805 | 7 | -114.468 | 1 | -.003 | 1 | -.15 | 1 | -.024 | 4 |
| 461 | M47 | 1 | max | 759.624 | 2 | 1121.926 | 7 | 88.188 | 4 | .002 | 2 | .121 | 3 | 2.907 | 7 |
| 462 | | | min | -770.744 | 1 | -107.103 | 4 | -89.156 | 3 | -.003 | 1 | -.119 | 4 | -.342 | 4 |
| 463 | | 2 | max | 753.458 | 2 | 1102.621 | 7 | 85.122 | 2 | .002 | 2 | .07 | 3 | 2.229 | 7 |
| 464 | | | min | -764.578 | 1 | -113.224 | 4 | -90.147 | 1 | -.003 | 1 | -.068 | 4 | -.275 | 4 |
| 465 | | 3 | max | 747.292 | 2 | 1083.316 | 7 | 88.681 | 2 | .002 | 2 | .025 | 3 | 1.563 | 7 |
| 466 | | | min | -758.412 | 1 | -119.345 | 4 | -93.707 | 1 | -.003 | 1 | -.024 | 4 | -.204 | 4 |
| 467 | | 4 | max | 741.126 | 2 | 1064.012 | 7 | 92.241 | 2 | .002 | 2 | .051 | 2 | .909 | 7 |
| 468 | | | min | -752.247 | 1 | -125.466 | 4 | -97.266 | 1 | -.003 | 1 | -.05 | 1 | -.13 | 4 |
| 469 | | 5 | max | 0 | 11 | 0 | 6 | 0 | 3 | 0 | 11 | 0 | 11 | 0 | 11 |
| 470 | | | min | 0 | 1 | -.003 | 3 | 0 | 2 | 0 | 1 | 0 | 1 | 0 | 1 |
| 471 | M48 | 1 | max | 248.177 | 2 | 1025.733 | 7 | 906.3 | 2 | .051 | 4 | 0 | 11 | 0 | 6 |
| 472 | | | min | -235.763 | 1 | -147.118 | 4 | -902.396 | 1 | -.356 | 7 | 0 | 1 | 0 | 1 |
| 473 | | 2 | max | 248.177 | 2 | 1025.733 | 7 | 906.3 | 2 | .051 | 4 | .018 | 2 | .003 | 4 |
| 474 | | | min | -235.763 | 1 | -147.118 | 4 | -902.396 | 1 | -.356 | 7 | -.018 | 1 | -.021 | 7 |
| 475 | | 3 | max | 248.177 | 2 | 1025.733 | 7 | 906.3 | 2 | .051 | 4 | .037 | 2 | .006 | 4 |
| 476 | | | min | -235.763 | 1 | -147.118 | 4 | -902.396 | 1 | -.356 | 7 | -.037 | 1 | -.042 | 7 |
| 477 | | 4 | max | 248.177 | 2 | 1025.733 | 7 | 906.3 | 2 | .051 | 4 | .055 | 2 | .009 | 4 |
| 478 | | | min | -235.763 | 1 | -147.118 | 4 | -902.396 | 1 | -.356 | 7 | -.055 | 1 | -.063 | 7 |
| 479 | | 5 | max | 248.177 | 2 | 1025.733 | 7 | 906.3 | 2 | .051 | 4 | .074 | 2 | .012 | 4 |
| 480 | | | min | -235.763 | 1 | -147.118 | 4 | -902.396 | 1 | -.356 | 7 | -.074 | 1 | -.084 | 7 |
| 481 | M49 | 1 | max | 903.104 | 2 | 1026.158 | 7 | 242.684 | 1 | .012 | 4 | .074 | 2 | .356 | 7 |
| 482 | | | min | -905.072 | 1 | -146.796 | 4 | -239.933 | 2 | -.084 | 7 | -.074 | 1 | -.051 | 4 |
| 483 | | 2 | max | 902.687 | 2 | 1025.527 | 7 | 242.443 | 1 | .012 | 4 | .061 | 2 | .302 | 7 |
| 484 | | | min | -904.655 | 1 | -146.986 | 4 | -239.692 | 2 | -.084 | 7 | -.061 | 1 | -.044 | 4 |
| 485 | | 3 | max | 902.269 | 2 | 1024.897 | 7 | 242.203 | 1 | .012 | 4 | .049 | 2 | .249 | 7 |
| 486 | | | min | -904.237 | 1 | -147.175 | 4 | -239.452 | 2 | -.084 | 7 | -.048 | 1 | -.036 | 4 |
| 487 | | 4 | max | 901.852 | 2 | 1024.266 | 7 | 241.962 | 1 | .012 | 4 | .036 | 2 | .195 | 7 |
| 488 | | | min | -903.82 | 1 | -147.365 | 4 | -239.211 | 2 | -.084 | 7 | -.036 | 1 | -.028 | 4 |
| 489 | | 5 | max | 901.435 | 2 | 1023.635 | 7 | 241.721 | 1 | .012 | 4 | .024 | 2 | .142 | 7 |
| 490 | | | min | -903.403 | 1 | -147.554 | 4 | -238.97 | 2 | -.084 | 7 | -.023 | 1 | -.021 | 4 |

## 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 Mome... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 491 | M50 | 1 | max | 664.811 | 2 | 1023.147 | 7 | 660.919 | 2 | .024 | 4 | .024 | 2 | 0 | 4 |
| 492 | | | min | -655.036 | 1 | -147.933 | 4 | -662.096 | 1 | -.165 | 7 | -.023 | 1 | -.001 | 5 |
| 493 | | 2 | max | 664.179 | 2 | 1022.441 | 7 | 660.554 | 2 | .024 | 4 | .045 | 2 | .005 | 4 |
| 494 | | | min | -654.403 | 1 | -148.221 | 4 | -661.731 | 1 | -.165 | 7 | -.044 | 1 | -.033 | 7 |
| 495 | | 3 | max | 663.547 | 2 | 1021.736 | 7 | 660.188 | 2 | .024 | 4 | .065 | 2 | .009 | 4 |
| 496 | | | min | -653.771 | 1 | -148.508 | 4 | -661.366 | 1 | -.165 | 7 | -.064 | 1 | -.065 | 7 |
| 497 | | 4 | max | 662.914 | 2 | 1021.03 | 7 | 659.823 | 2 | .024 | 4 | .086 | 2 | .014 | 4 |
| 498 | | | min | -653.139 | 1 | -148.795 | 4 | -661.001 | 1 | -.165 | 7 | -.085 | 1 | -.097 | 7 |
| 499 | | 5 | max | 662.282 | 2 | 1020.324 | 7 | 659.458 | 2 | .024 | 4 | .106 | 2 | .019 | 4 |
| 500 | | | min | -652.506 | 1 | -149.082 | 4 | -660.636 | 1 | -.165 | 7 | -.106 | 1 | -.129 | 7 |
| 501 | M51 | 1 | max | 655.596 | 2 | 148.601 | 4 | 654.643 | 1 | .019 | 4 | 0 | 11 | 0 | 11 |
| 502 | | | min | -663.509 | 1 | -1020.915 | 7 | -659.252 | 2 | -.129 | 7 | 0 | 1 | 0 | 1 |
| 503 | | 2 | max | 655.596 | 2 | 148.601 | 4 | 654.643 | 1 | .019 | 4 | .026 | 1 | .041 | 7 |
| 504 | | | min | -663.509 | 1 | -1020.915 | 7 | -659.252 | 2 | -.129 | 7 | -.027 | 2 | -.006 | 4 |
| 505 | | 3 | max | 655.596 | 2 | 148.601 | 4 | 654.643 | 1 | .019 | 4 | .053 | 1 | .082 | 7 |
| 506 | | | min | -663.509 | 1 | -1020.915 | 7 | -659.252 | 2 | -.129 | 7 | -.053 | 2 | -.012 | 4 |
| 507 | | 4 | max | 655.596 | 2 | 148.601 | 4 | 654.643 | 1 | .019 | 4 | .079 | 1 | .124 | 7 |
| 508 | | | min | -663.509 | 1 | -1020.915 | 7 | -659.252 | 2 | -.129 | 7 | -.08 | 2 | -.018 | 4 |
| 509 | | 5 | max | 655.596 | 2 | 148.601 | 4 | 654.643 | 1 | .019 | 4 | .106 | 1 | .165 | 7 |
| 510 | | | min | -663.509 | 1 | -1020.915 | 7 | -659.252 | 2 | -.129 | 7 | -.106 | 2 | -.024 | 4 |
| 511 | M52 | 1 | max | 170.5 | 3 | 1038.085 | 6 | 609.292 | 4 | .36 | 6 | 0 | 11 | 0 | 6 |
| 512 | | | min | -167.343 | 4 | -22.347 | 1 | -649.666 | 3 | -.009 | 1 | 0 | 1 | 0 | 1 |
| 513 | | 2 | max | 170.5 | 3 | 1038.085 | 6 | 609.292 | 4 | .36 | 6 | .012 | 4 | 0 | 1 |
| 514 | | | min | -167.343 | 4 | -22.347 | 1 | -649.666 | 3 | -.009 | 1 | -.013 | 3 | -.021 | 6 |
| 515 | | 3 | max | 170.5 | 3 | 1038.085 | 6 | 609.292 | 4 | .36 | 6 | .025 | 4 | 0 | 1 |
| 516 | | | min | -167.343 | 4 | -22.347 | 1 | -649.666 | 3 | -.009 | 1 | -.026 | 3 | -.042 | 6 |
| 517 | | 4 | max | 170.5 | 3 | 1038.085 | 6 | 609.292 | 4 | .36 | 6 | .037 | 4 | .001 | 1 |
| 518 | | | min | -167.343 | 4 | -22.347 | 1 | -649.666 | 3 | -.009 | 1 | -.04 | 3 | -.063 | 6 |
| 519 | | 5 | max | 170.5 | 3 | 1038.085 | 6 | 609.292 | 4 | .36 | 6 | .05 | 4 | .002 | 1 |
| 520 | | | min | -167.343 | 4 | -22.347 | 1 | -649.666 | 3 | -.009 | 1 | -.053 | 3 | -.085 | 6 |
| 521 | M53 | 1 | max | 649.983 | 3 | 1037.673 | 6 | 173.444 | 3 | .085 | 6 | .05 | 4 | .36 | 6 |
| 522 | | | min | -608.941 | 4 | -24.663 | 1 | -164.554 | 4 | -.002 | 1 | -.053 | 3 | -.009 | 1 |
| 523 | | 2 | max | 649.566 | 3 | 1037.042 | 6 | 172.721 | 3 | .085 | 6 | .041 | 4 | .306 | 6 |
| 524 | | | min | -608.524 | 4 | -24.852 | 1 | -163.831 | 4 | -.002 | 1 | -.044 | 3 | -.008 | 1 |
| 525 | | 3 | max | 649.149 | 3 | 1036.412 | 6 | 171.998 | 3 | .085 | 6 | .033 | 4 | .252 | 7 |
| 526 | | | min | -608.107 | 4 | -25.042 | 1 | -163.108 | 4 | -.002 | 1 | -.035 | 3 | -.006 | 1 |
| 527 | | 4 | max | 648.732 | 3 | 1035.781 | 6 | 171.276 | 3 | .085 | 6 | .024 | 4 | .198 | 7 |
| 528 | | | min | -607.689 | 4 | -25.231 | 1 | -162.386 | 4 | -.002 | 1 | -.026 | 3 | -.005 | 1 |
| 529 | | 5 | max | 648.314 | 3 | 1035.15 | 6 | 170.553 | 3 | .085 | 6 | .016 | 4 | .144 | 7 |
| 530 | | | min | -607.272 | 4 | -25.421 | 1 | -161.663 | 4 | -.002 | 1 | -.017 | 3 | -.004 | 1 |
| 531 | M54 | 1 | max | 469.312 | 3 | 1035.602 | 6 | 446.717 | 4 | .167 | 6 | .016 | 4 | 0 | 4 |
| 532 | | | min | -446.057 | 4 | -23.309 | 1 | -474.41 | 3 | -.004 | 1 | -.017 | 3 | -.001 | 6 |
| 533 | | 2 | max | 469.312 | 3 | 1034.896 | 6 | 446.717 | 4 | .167 | 6 | .03 | 4 | 0 | 4 |
| 534 | | | min | -446.057 | 4 | -23.596 | 1 | -474.41 | 3 | -.004 | 1 | -.032 | 3 | -.034 | 6 |
| 535 | | 3 | max | 469.312 | 3 | 1034.191 | 6 | 446.717 | 4 | .167 | 6 | .044 | 4 | .001 | 1 |
| 536 | | | min | -446.057 | 4 | -23.883 | 1 | -474.41 | 3 | -.004 | 1 | -.047 | 3 | -.066 | 6 |
| 537 | | 4 | max | 469.312 | 3 | 1033.485 | 6 | 446.717 | 4 | .167 | 6 | .058 | 4 | .002 | 1 |
| 538 | | | min | -446.057 | 4 | -24.17 | 1 | -474.41 | 3 | -.004 | 1 | -.062 | 3 | -.098 | 6 |
| 539 | | 5 | max | 469.312 | 3 | 1032.78 | 6 | 446.717 | 4 | .167 | 6 | .071 | 4 | .003 | 1 |
| 540 | | | min | -446.057 | 4 | -24.458 | 1 | -474.41 | 3 | -.004 | 1 | -.076 | 3 | -.131 | 6 |
| 541 | M55 | 1 | max | 477.652 | 3 | 26.345 | 1 | 473.019 | 3 | .131 | 6 | 0 | 11 | 0 | 11 |
| 542 | | | min | -443.686 | 4 | -1032.28 | 6 | -442.688 | 4 | -.003 | 1 | 0 | 1 | 0 | 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 Mome... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 543 | | 2 | max | 477.652 | 3 | 26.345 | 1 | 473.019 | 3 | .131 | 6 | .019 | 3 | .042 | 6 |
| 544 | | | min | -443.686 | 4 | -1032.28 | 6 | -442.688 | 4 | -.003 | 1 | -.018 | 4 | -.001 | 1 |
| 545 | | 3 | max | 477.652 | 3 | 26.345 | 1 | 473.019 | 3 | .131 | 6 | .038 | 3 | .083 | 6 |
| 546 | | | min | -443.686 | 4 | -1032.28 | 6 | -442.688 | 4 | -.003 | 1 | -.036 | 4 | -.002 | 1 |
| 547 | | 4 | max | 477.652 | 3 | 26.345 | 1 | 473.019 | 3 | .131 | 6 | .057 | 3 | .125 | 6 |
| 548 | | | min | -443.686 | 4 | -1032.28 | 6 | -442.688 | 4 | -.003 | 1 | -.054 | 4 | -.003 | 1 |
| 549 | | 5 | max | 477.652 | 3 | 26.345 | 1 | 473.019 | 3 | .131 | 6 | .076 | 3 | .167 | 6 |
| 550 | | | min | -443.686 | 4 | -1032.28 | 6 | -442.688 | 4 | -.003 | 1 | -.071 | 4 | -.004 | 1 |
| 551 | M56 | 1 | max | 153.945 | 2 | 173.3 | 4 | 937.559 | 4 | .111 | 10 | 0 | 11 | 0 | 11 |
| 552 | | | min | -86.249 | 1 | -265.916 | 3 | -914.933 | 3 | -.011 | 1 | 0 | 1 | 0 | 1 |
| 553 | | 2 | max | 153.945 | 2 | 173.3 | 4 | 937.559 | 4 | .111 | 10 | .038 | 4 | .011 | 3 |
| 554 | | | min | -86.249 | 1 | -265.916 | 3 | -914.933 | 3 | -.011 | 1 | -.037 | 3 | -.007 | 4 |
| 555 | | 3 | max | 153.945 | 2 | 173.3 | 4 | 937.559 | 4 | .111 | 10 | .076 | 4 | .021 | 3 |
| 556 | | | min | -86.249 | 1 | -265.916 | 3 | -914.933 | 3 | -.011 | 1 | -.074 | 3 | -.014 | 4 |
| 557 | | 4 | max | 153.945 | 2 | 173.3 | 4 | 937.559 | 4 | .111 | 10 | .114 | 4 | .032 | 3 |
| 558 | | | min | -86.249 | 1 | -265.916 | 3 | -914.933 | 3 | -.011 | 1 | -.111 | 3 | -.021 | 4 |
| 559 | | 5 | max | 153.945 | 2 | 173.3 | 4 | 937.559 | 4 | .111 | 10 | .151 | 4 | .043 | 3 |
| 560 | | | min | -86.249 | 1 | -265.916 | 3 | -914.933 | 3 | -.011 | 1 | -.148 | 3 | -.028 | 4 |
| 561 | M57 | 1 | max | 918.052 | 3 | 262.066 | 3 | 155.955 | 2 | .028 | 4 | .15 | 3 | .105 | 7 |
| 562 | | | min | -939.566 | 4 | -174.649 | 4 | -88.166 | 1 | -.043 | 3 | -.157 | 4 | -.036 | 4 |
| 563 | | 2 | max | 917.208 | 3 | 261.683 | 3 | 155.468 | 2 | .028 | 4 | .149 | 3 | .1 | 10 |
| 564 | | | min | -938.723 | 4 | -175.032 | 4 | -87.679 | 1 | -.043 | 3 | -.155 | 4 | -.029 | 4 |
| 565 | | 3 | max | 916.365 | 3 | 261.3 | 3 | 154.981 | 2 | .028 | 4 | .149 | 3 | .104 | 10 |
| 566 | | | min | -937.88 | 4 | -175.414 | 4 | -87.192 | 1 | -.043 | 3 | -.154 | 4 | -.022 | 4 |
| 567 | | 4 | max | 915.522 | 3 | 260.917 | 3 | 154.494 | 2 | .028 | 4 | .148 | 3 | .107 | 10 |
| 568 | | | min | -937.037 | 4 | -175.797 | 4 | -86.705 | 1 | -.043 | 3 | -.153 | 4 | -.014 | 4 |
| 569 | | 5 | max | 914.679 | 3 | 260.534 | 3 | 154.007 | 2 | .028 | 4 | .148 | 3 | .111 | 10 |
| 570 | | | min | -936.193 | 4 | -176.18 | 4 | -86.218 | 1 | -.043 | 3 | -.151 | 4 | -.011 | 1 |
| 571 | M58 | 1 | max | 92.148 | 2 | 226.129 | 5 | 822.893 | 2 | .029 | 4 | 0 | 11 | 0 | 11 |
| 572 | | | min | -85.709 | 1 | -192.908 | 10 | -801.907 | 1 | -.124 | 7 | 0 | 1 | 0 | 1 |
| 573 | | 2 | max | 92.148 | 2 | 226.129 | 5 | 822.893 | 2 | .029 | 4 | .033 | 2 | .008 | 10 |
| 574 | | | min | -85.709 | 1 | -192.908 | 10 | -801.907 | 1 | -.124 | 7 | -.032 | 1 | -.009 | 5 |
| 575 | | 3 | max | 92.148 | 2 | 226.129 | 5 | 822.893 | 2 | .029 | 4 | .066 | 2 | .016 | 10 |
| 576 | | | min | -85.709 | 1 | -192.908 | 10 | -801.907 | 1 | -.124 | 7 | -.065 | 1 | -.018 | 5 |
| 577 | | 4 | max | 92.148 | 2 | 226.129 | 5 | 822.893 | 2 | .029 | 4 | .1 | 2 | .023 | 10 |
| 578 | | | min | -85.709 | 1 | -192.908 | 10 | -801.907 | 1 | -.124 | 7 | -.097 | 1 | -.027 | 5 |
| 579 | | 5 | max | 92.148 | 2 | 226.129 | 5 | 822.893 | 2 | .029 | 4 | .133 | 2 | .031 | 10 |
| 580 | | | min | -85.709 | 1 | -192.908 | 10 | -801.907 | 1 | -.124 | 7 | -.129 | 1 | -.037 | 5 |
| 581 | M59 | 1 | max | 821.042 | 2 | 194.817 | 10 | 91.424 | 1 | .031 | 10 | .114 | 1 | .091 | 7 |
| 582 | | | min | -803.555 | 1 | -221.93 | 5 | -69.965 | 2 | -.037 | 5 | -.121 | 2 | -.038 | 4 |
| 583 | | 2 | max | 821.042 | 2 | 194.435 | 10 | 93.372 | 1 | .031 | 10 | .117 | 1 | .099 | 7 |
| 584 | | | min | -803.555 | 1 | -222.871 | 5 | -71.912 | 2 | -.037 | 5 | -.124 | 2 | -.036 | 4 |
| 585 | | 3 | max | 821.042 | 2 | 194.052 | 10 | 95.319 | 1 | .031 | 10 | .121 | 1 | .107 | 7 |
| 586 | | | min | -803.555 | 1 | -223.811 | 5 | -73.859 | 2 | -.037 | 5 | -.127 | 2 | -.034 | 4 |
| 587 | | 4 | max | 821.042 | 2 | 193.669 | 10 | 97.266 | 1 | .031 | 10 | .125 | 1 | .116 | 7 |
| 588 | | | min | -803.555 | 1 | -224.752 | 5 | -75.806 | 2 | -.037 | 5 | -.13 | 2 | -.032 | 4 |
| 589 | | 5 | max | 821.042 | 2 | 193.286 | 10 | 99.213 | 1 | .031 | 10 | .129 | 1 | .124 | 7 |
| 590 | | | min | -803.555 | 1 | -225.693 | 5 | -77.754 | 2 | -.037 | 5 | -.133 | 2 | -.029 | 4 |
| 591 | M60 | 1 | max | 491.168 | 2 | 222.234 | 5 | 667.536 | 2 | .029 | 4 | .121 | 2 | .071 | 10 |
| 592 | | | min | -476.698 | 1 | -194.378 | 10 | -647.623 | 1 | -.095 | 7 | -.114 | 1 | -.033 | 1 |
| 593 | | 2 | max | 489.646 | 2 | 220.525 | 5 | 668.438 | 2 | .029 | 4 | .17 | 2 | .085 | 10 |
| 594 | | | min | -475.175 | 1 | -195.071 | 10 | -648.525 | 1 | -.095 | 7 | -.162 | 1 | -.047 | 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 Mome... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 595 | | 3 | max | 488.123 | 2 | 218.816 | 5 | 669.34 | 2 | .029 | 4 | .22 | 2 | .1 | 10 |
| 596 | | | min | -473.653 | 1 | -195.764 | 10 | -649.428 | 1 | -.095 | 7 | -.21 | 1 | -.061 | 1 |
| 597 | | 4 | max | 486.601 | 2 | 217.106 | 5 | 670.242 | 2 | .029 | 4 | .27 | 2 | .114 | 10 |
| 598 | | | min | -472.13 | 1 | -196.457 | 10 | -650.33 | 1 | -.095 | 7 | -.258 | 1 | -.075 | 1 |
| 599 | | 5 | max | 0 | 11 | 0 | 11 | 0 | 11 | 0 | 11 | 0 | 11 | 0 | 11 |
| 600 | | | min | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 601 | M61 | 1 | max | 471.753 | 3 | 170.243 | 4 | 832.499 | 4 | .09 | 10 | .157 | 4 | .087 | 3 |
| 602 | | | min | -429.415 | 4 | -269.3 | 3 | -793.063 | 3 | -.017 | 4 | -.15 | 3 | -.043 | 4 |
| 603 | | 2 | max | 470.27 | 3 | 169.55 | 4 | 835.136 | 4 | .09 | 10 | .219 | 4 | .107 | 3 |
| 604 | | | min | -427.932 | 4 | -269.993 | 3 | -795.701 | 3 | -.017 | 4 | -.209 | 3 | -.055 | 4 |
| 605 | | 3 | max | 468.787 | 3 | 168.857 | 4 | 837.774 | 4 | .09 | 10 | .281 | 4 | .127 | 3 |
| 606 | | | min | -426.449 | 4 | -270.685 | 3 | -798.338 | 3 | -.017 | 4 | -.268 | 3 | -.068 | 4 |
| 607 | | 4 | max | 467.304 | 3 | 168.164 | 4 | 840.411 | 4 | .09 | 10 | .343 | 4 | .148 | 3 |
| 608 | | | min | -424.966 | 4 | -271.378 | 3 | -800.975 | 3 | -.017 | 4 | -.328 | 3 | -.08 | 4 |
| 609 | | 5 | max | 0 | 11 | 0 | 11 | 0 | 11 | 0 | 11 | 0 | 11 | 0 | 11 |
| 610 | | | min | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 611 | M62 | 1 | max | 274.607 | 1 | 60.698 | 2 | 29.381 | 1 | .001 | 7 | .014 | 4 | .084 | 2 |
| 612 | | | min | -266.447 | 4 | -55.014 | 1 | -18.88 | 2 | 0 | 4 | -.019 | 3 | -.09 | 1 |
| 613 | | 2 | max | 274.607 | 1 | 43.403 | 2 | 25.108 | 1 | .001 | 7 | .019 | 4 | .049 | 4 |
| 614 | | | min | -266.447 | 4 | -37.72 | 1 | -23.153 | 2 | 0 | 4 | -.015 | 3 | -.047 | 3 |
| 615 | | 3 | max | 274.607 | 1 | 26.109 | 2 | 17.015 | 1 | .001 | 7 | .019 | 4 | .03 | 4 |
| 616 | | | min | -266.447 | 4 | -20.426 | 1 | -31.246 | 2 | 0 | 4 | -.017 | 3 | -.041 | 3 |
| 617 | | 4 | max | 274.607 | 1 | 11.732 | 4 | 10.136 | 1 | .001 | 7 | .012 | 4 | .027 | 1 |
| 618 | | | min | -266.447 | 4 | -4.576 | 3 | -53.931 | 6 | 0 | 4 | -.024 | 3 | -.063 | 2 |
| 619 | | 5 | max | 274.607 | 1 | 14.163 | 1 | 5.433 | 1 | .001 | 7 | .001 | 4 | .029 | 1 |
| 620 | | | min | -266.447 | 4 | -8.48 | 2 | -70.225 | 6 | 0 | 4 | -.059 | 6 | -.116 | 6 |
| 621 | M63 | 1 | max | 413.12 | 2 | 11.182 | 3 | 59.343 | 5 | 0 | 4 | -.002 | 1 | .031 | 4 |
| 622 | | | min | -399.777 | 1 | -12.092 | 1 | -5.638 | 2 | -.001 | 7 | -.045 | 7 | -.079 | 10 |
| 623 | | 2 | max | 405.632 | 2 | 14.767 | 2 | 43.049 | 5 | 0 | 4 | .014 | 1 | .039 | 4 |
| 624 | | | min | -392.288 | 1 | -16.416 | 1 | -10.341 | 2 | -.001 | 7 | -.019 | 2 | -.048 | 10 |
| 625 | | 3 | max | 398.143 | 2 | 19.091 | 2 | 25.818 | 1 | 0 | 4 | .023 | 1 | .032 | 4 |
| 626 | | | min | -384.8 | 1 | -20.739 | 1 | -17.219 | 2 | -.001 | 7 | -.016 | 2 | -.025 | 3 |
| 627 | | 4 | max | 390.654 | 2 | 26.985 | 4 | 17.731 | 1 | 0 | 4 | .022 | 1 | .061 | 1 |
| 628 | | | min | -377.311 | 1 | -27.73 | 3 | -25.306 | 2 | -.001 | 7 | -.016 | 2 | -.053 | 2 |
| 629 | | 5 | max | 383.166 | 2 | 39.956 | 4 | 13.46 | 1 | 0 | 4 | .024 | 4 | .094 | 1 |
| 630 | | | min | -369.822 | 1 | -40.701 | 3 | -30.743 | 6 | -.001 | 7 | -.028 | 3 | -.095 | 2 |
| 631 | M64 | 1 | max | 372.04 | 1 | 312.706 | 1 | 846.149 | 3 | 1.09 | 7 | .682 | 1 | .436 | 1 |
| 632 | | | min | -269.669 | 2 | -780.777 | 6 | -499.386 | 4 | -.197 | 4 | -.754 | 2 | -.561 | 2 |
| 633 | | 2 | max | 372.04 | 1 | 312.706 | 1 | 846.149 | 3 | 1.09 | 7 | .668 | 1 | .416 | 1 |
| 634 | | | min | -269.669 | 2 | -780.777 | 6 | -499.386 | 4 | -.197 | 4 | -.718 | 2 | -.512 | 2 |
| 635 | | 3 | max | 372.04 | 1 | 312.706 | 1 | 846.149 | 3 | 1.09 | 7 | .654 | 1 | .397 | 1 |
| 636 | | | min | -269.669 | 2 | -780.777 | 6 | -499.386 | 4 | -.197 | 4 | -.682 | 2 | -.464 | 2 |
| 637 | | 4 | max | 372.04 | 1 | 312.706 | 1 | 846.149 | 3 | 1.09 | 7 | .64 | 1 | .377 | 1 |
| 638 | | | min | -269.669 | 2 | -780.777 | 6 | -499.386 | 4 | -.197 | 4 | -.646 | 2 | -.416 | 2 |
| 639 | | 5 | max | 372.04 | 1 | 312.706 | 1 | 846.149 | 3 | 1.09 | 7 | .627 | 1 | .357 | 1 |
| 640 | | | min | -269.669 | 2 | -780.777 | 6 | -499.386 | 4 | -.197 | 4 | -.61 | 2 | -.367 | 2 |
| 641 | M65 | 1 | max | 184.459 | 3 | 393.946 | 1 | 397.945 | 3 | .259 | 3 | .305 | 2 | .26 | 1 |
| 642 | | | min | -150.886 | 4 | -544.656 | 2 | -709.881 | 4 | -.83 | 8 | -.275 | 1 | -.346 | 2 |
| 643 | | 2 | max | 184.459 | 3 | 393.946 | 1 | 397.945 | 3 | .259 | 3 | .275 | 2 | .235 | 1 |
| 644 | | | min | -150.886 | 4 | -544.656 | 2 | -709.881 | 4 | -.83 | 8 | -.266 | 1 | -.312 | 2 |
| 645 | | 3 | max | 184.459 | 3 | 393.946 | 1 | 397.945 | 3 | .259 | 3 | .245 | 2 | .21 | 1 |
| 646 | | | min | -150.886 | 4 | -544.656 | 2 | -709.881 | 4 | -.83 | 8 | -.256 | 1 | -.278 | 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 Mome... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 647 | | 4 | max | 184.459 | 3 | 393.946 | 1 | 397.945 | 3 | .259 | 3 | .215 | 2 | .186 | 1 |
| 648 | | | min | -150.886 | 4 | -544.656 | 2 | -709.881 | 4 | -.83 | 8 | -.247 | 1 | -.244 | 2 |
| 649 | | 5 | max | 184.459 | 3 | 393.946 | 1 | 397.945 | 3 | .259 | 3 | .185 | 2 | .193 | 4 |
| 650 | | | min | -150.886 | 4 | -544.656 | 2 | -709.881 | 4 | -.83 | 8 | -.237 | 1 | -.247 | 3 |
| 651 | MP1A | 1 | max | 73.539 | 8 | 71.86 | 4 | 118.432 | 1 | 0 | 11 | 0 | 11 | 0 | 11 |
| 652 | | | min | 15.6 | 1 | -71.871 | 3 | -118.419 | 2 | 0 | 1 | 0 | 1 | 0 | 1 |
| 653 | | 2 | max | 92.964 | 8 | 88.509 | 4 | 135.08 | 1 | 0 | 11 | .19 | 1 | .12 | 3 |
| 654 | | | min | 21.848 | 1 | -88.52 | 3 | -135.068 | 2 | 0 | 1 | -.19 | 2 | -.12 | 4 |
| 655 | | 3 | max | 498.166 | 2 | 589.895 | 4 | 183.716 | 3 | .275 | 1 | .17 | 4 | .404 | 2 |
| 656 | | | min | -439.732 | 1 | -274.743 | 3 | -152.064 | 4 | -.305 | 2 | -.142 | 3 | -.259 | 1 |
| 657 | | 4 | max | 504.413 | 2 | 606.544 | 4 | 183.659 | 3 | .275 | 1 | .155 | 2 | .189 | 3 |
| 658 | | | min | -433.485 | 1 | -291.28 | 3 | -152.064 | 4 | -.305 | 2 | -.082 | 1 | -.567 | 8 |
| 659 | | 5 | max | -15.6 | 10 | 71.81 | 3 | 118.306 | 2 | 0 | 11 | 0 | 11 | 0 | 11 |
| 660 | | | min | -73.539 | 5 | -71.76 | 4 | -118.293 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 661 | MP3A | 1 | max | 0 | 11 | .689 | 4 | 1.31 | 1 | 0 | 11 | 0 | 11 | 0 | 11 |
| 662 | | | min | 0 | 1 | -.694 | 3 | -1.354 | 2 | 0 | 1 | 0 | 1 | 0 | 1 |
| 663 | | 2 | max | 324.488 | 8 | 234.986 | 4 | 504.487 | 1 | 0 | 11 | .865 | 1 | .393 | 3 |
| 664 | | | min | 88.472 | 1 | -234.991 | 3 | -504.531 | 2 | 0 | 1 | -.865 | 2 | -.393 | 4 |
| 665 | | 3 | max | 675.062 | 2 | 236.276 | 4 | 267.865 | 4 | .754 | 2 | .573 | 1 | .34 | 3 |
| 666 | | | min | -410.542 | 1 | -594.888 | 7 | -178.749 | 3 | -.682 | 1 | -.574 | 2 | -.195 | 4 |
| 667 | | 4 | max | -88.472 | 10 | 234.533 | 3 | 503.81 | 2 | 0 | 11 | .39 | 1 | .188 | 3 |
| 668 | | | min | -324.488 | 5 | -234.643 | 4 | -503.759 | 1 | 0 | 1 | -.39 | 2 | -.188 | 4 |
| 669 | | 5 | max | 0 | 11 | .237 | 3 | .697 | 6 | 0 | 11 | 0 | 11 | 0 | 11 |
| 670 | | | min | 0 | 1 | -.787 | 8 | -.582 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 671 | M68 | 1 | max | 360.68 | 1 | -131.124 | 4 | 701.772 | 3 | .905 | 3 | .088 | 3 | .532 | 2 |
| 672 | | | min | -373.28 | 2 | -609.125 | 7 | -657.167 | 4 | -.837 | 4 | -.076 | 4 | -.564 | 1 |
| 673 | | 2 | max | 360.68 | 1 | -131.124 | 4 | 701.772 | 3 | .905 | 3 | .132 | 3 | .544 | 2 |
| 674 | | | min | -373.28 | 2 | -609.125 | 7 | -657.167 | 4 | -.837 | 4 | -.118 | 4 | -.553 | 1 |
| 675 | | 3 | max | 360.68 | 1 | -131.124 | 4 | 701.772 | 3 | .905 | 3 | .176 | 3 | .555 | 2 |
| 676 | | | min | -373.28 | 2 | -609.125 | 7 | -657.167 | 4 | -.837 | 4 | -.159 | 4 | -.541 | 1 |
| 677 | | 4 | max | 360.68 | 1 | -131.124 | 4 | 701.772 | 3 | .905 | 3 | .219 | 3 | .566 | 2 |
| 678 | | | min | -373.28 | 2 | -609.125 | 7 | -657.167 | 4 | -.837 | 4 | -.2 | 4 | -.53 | 1 |
| 679 | | 5 | max | 360.68 | 1 | -131.124 | 4 | 701.772 | 3 | .905 | 3 | .263 | 3 | .577 | 2 |
| 680 | | | min | -373.28 | 2 | -609.125 | 7 | -657.167 | 4 | -.837 | 4 | -.241 | 4 | -.518 | 1 |
| 681 | MP2A | 1 | max | 0 | 11 | .1 | 4 | .279 | 1 | 0 | 11 | 0 | 11 | 0 | 11 |
| 682 | | | min | 0 | 1 | -.097 | 3 | -.279 | 2 | 0 | 1 | 0 | 1 | 0 | 1 |
| 683 | | 2 | max | 74.546 | 8 | 64.169 | 4 | 101.282 | 1 | 0 | 11 | .074 | 1 | .047 | 3 |
| 684 | | | min | 17.468 | 1 | -64.166 | 3 | -101.282 | 2 | 0 | 1 | -.074 | 2 | -.047 | 4 |
| 685 | | 3 | max | 515.163 | 7 | 577.601 | 4 | 247.11 | 1 | .076 | 4 | .088 | 8 | .324 | 4 |
| 686 | | | min | 107.583 | 4 | -623.455 | 3 | -259.705 | 2 | -.088 | 3 | -.015 | 2 | -.348 | 3 |
| 687 | | 4 | max | 534.588 | 7 | 594.25 | 4 | 263.478 | 1 | .076 | 4 | .454 | 1 | .6 | 3 |
| 688 | | | min | 113.83 | 4 | -640.104 | 3 | -276.185 | 2 | -.088 | 3 | -.416 | 2 | -.554 | 4 |
| 689 | | 5 | max | 0 | 11 | .042 | 3 | .186 | 6 | 0 | 11 | 0 | 11 | 0 | 11 |
| 690 | | | min | 0 | 1 | -.06 | 8 | -.141 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 691 | M70 | 1 | max | 371.429 | 2 | 220.486 | 4 | 964.137 | 1 | 1.106 | 5 | .541 | 4 | .446 | 4 |
| 692 | | | min | -278.615 | 1 | -764.66 | 7 | -621.016 | 2 | -.243 | 2 | -.611 | 3 | -.574 | 3 |
| 693 | | 2 | max | 371.429 | 2 | 220.486 | 4 | 964.137 | 1 | 1.106 | 5 | .559 | 4 | .432 | 4 |
| 694 | | | min | -278.615 | 1 | -764.66 | 7 | -621.016 | 2 | -.243 | 2 | -.607 | 3 | -.531 | 3 |
| 695 | | 3 | max | 371.429 | 2 | 220.486 | 4 | 964.137 | 1 | 1.106 | 5 | .578 | 4 | .418 | 4 |
| 696 | | | min | -278.615 | 1 | -764.66 | 7 | -621.016 | 2 | -.243 | 2 | -.604 | 3 | -.488 | 3 |
| 697 | | 4 | max | 371.429 | 2 | 220.486 | 4 | 964.137 | 1 | 1.106 | 5 | .597 | 4 | .405 | 4 |
| 698 | | | min | -278.615 | 1 | -764.66 | 7 | -621.016 | 2 | -.243 | 2 | -.6 | 3 | -.445 | 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 Mome... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 699 | | 5 | max | 371.429 | 2 | 220.486 | 4 | 964.137 | 1 | 1.106 | 5 | .616 | 4 | .391 | 4 |
| 700 | | | min | -278.615 | 1 | -764.66 | 7 | -621.016 | 2 | -.243 | 2 | -.596 | 3 | -.402 | 3 |
| 701 | M71 | 1 | max | 201.342 | 4 | 436.287 | 4 | 515.739 | 4 | .35 | 4 | .289 | 3 | .24 | 2 |
| 702 | | | min | -156.903 | 3 | -585.275 | 3 | -833.8 | 3 | -.855 | 3 | -.256 | 4 | -.332 | 1 |
| 703 | | 2 | max | 201.342 | 4 | 436.287 | 4 | 515.739 | 4 | .35 | 4 | .236 | 3 | .239 | 2 |
| 704 | | | min | -156.903 | 3 | -585.275 | 3 | -833.8 | 3 | -.855 | 3 | -.224 | 4 | -.321 | 1 |
| 705 | | 3 | max | 201.342 | 4 | 436.287 | 4 | 515.739 | 4 | .35 | 4 | .184 | 3 | .237 | 2 |
| 706 | | | min | -156.903 | 3 | -585.275 | 3 | -833.8 | 3 | -.855 | 3 | -.192 | 4 | -.31 | 1 |
| 707 | | 4 | max | 201.342 | 4 | 436.287 | 4 | 515.739 | 4 | .35 | 4 | .132 | 3 | .235 | 2 |
| 708 | | | min | -156.903 | 3 | -585.275 | 3 | -833.8 | 3 | -.855 | 3 | -.159 | 4 | -.298 | 1 |
| 709 | | 5 | max | 201.342 | 4 | 436.287 | 4 | 515.739 | 4 | .35 | 4 | .116 | 1 | .233 | 2 |
| 710 | | | min | -156.903 | 3 | -585.275 | 3 | -833.8 | 3 | -.855 | 3 | -.17 | 2 | -.287 | 1 |
| 711 | MP1C | 1 | max | 73.539 | 8 | 72.275 | 2 | 92.5 | 4 | 0 | 11 | 0 | 11 | 0 | 11 |
| 712 | | | min | 15.6 | 1 | -72.284 | 1 | -92.489 | 3 | 0 | 1 | 0 | 1 | 0 | 1 |
| 713 | | 2 | max | 92.964 | 8 | 86.694 | 2 | 106.918 | 4 | 0 | 11 | .15 | 4 | .119 | 1 |
| 714 | | | min | 21.847 | 1 | -86.703 | 1 | -106.908 | 3 | 0 | 1 | -.15 | 3 | -.119 | 2 |
| 715 | | 3 | max | 541.414 | 3 | 753.814 | 3 | 184.133 | 1 | .256 | 4 | .081 | 3 | .189 | 3 |
| 716 | | | min | -479.527 | 4 | -429.188 | 4 | -152.891 | 2 | -.289 | 3 | -.036 | 4 | -.207 | 4 |
| 717 | | 4 | max | 547.661 | 3 | 762.139 | 3 | 175.809 | 1 | .256 | 4 | .261 | 1 | .443 | 4 |
| 718 | | | min | -473.28 | 4 | -437.512 | 4 | -144.567 | 2 | -.289 | 3 | -.169 | 2 | -.948 | 3 |
| 719 | | 5 | max | -15.6 | 10 | 72.304 | 1 | 92.622 | 3 | 0 | 11 | 0 | 11 | 0 | 11 |
| 720 | | | min | -73.539 | 5 | -72.225 | 2 | -92.601 | 4 | 0 | 1 | 0 | 1 | 0 | 1 |
| 721 | MP3C | 1 | max | 0 | 11 | .602 | 2 | 1.056 | 4 | 0 | 11 | 0 | 11 | 0 | 11 |
| 722 | | | min | 0 | 1 | -.605 | 1 | -1.099 | 3 | 0 | 1 | 0 | 1 | 0 | 1 |
| 723 | | 2 | max | 324.488 | 8 | 261.724 | 2 | 378.605 | 4 | 0 | 11 | .647 | 4 | .442 | 1 |
| 724 | | | min | 88.472 | 1 | -261.727 | 1 | -378.649 | 3 | 0 | 1 | -.647 | 3 | -.442 | 2 |
| 725 | | 3 | max | 585.76 | 3 | 331.815 | 2 | 302.804 | 3 | .611 | 3 | .447 | 4 | .502 | 4 |
| 726 | | | min | -321.354 | 4 | -679.93 | 1 | -216.927 | 4 | -.541 | 4 | -.449 | 3 | -.358 | 3 |
| 727 | | 4 | max | -88.472 | 10 | 261.268 | 1 | 378.108 | 3 | 0 | 11 | .294 | 4 | .206 | 1 |
| 728 | | | min | -324.488 | 5 | -261.38 | 2 | -378.057 | 4 | 0 | 1 | -.294 | 3 | -.206 | 2 |
| 729 | | 5 | max | 0 | 11 | .147 | 1 | .625 | 7 | 0 | 11 | 0 | 11 | 0 | 11 |
| 730 | | | min | 0 | 1 | -.733 | 6 | -.507 | 4 | 0 | 1 | 0 | 1 | 0 | 1 |
| 731 | M74 | 1 | max | 324.113 | 4 | -122.665 | 2 | 656.011 | 1 | .791 | 1 | .09 | 1 | .421 | 3 |
| 732 | | | min | -338.394 | 3 | -611.04 | 5 | -611.764 | 2 | -.724 | 2 | -.076 | 2 | -.452 | 4 |
| 733 | | 2 | max | 324.113 | 4 | -122.665 | 2 | 656.011 | 1 | .791 | 1 | .131 | 1 | .429 | 3 |
| 734 | | | min | -338.394 | 3 | -611.04 | 5 | -611.764 | 2 | -.724 | 2 | -.115 | 2 | -.438 | 4 |
| 735 | | 3 | max | 324.113 | 4 | -122.665 | 2 | 656.011 | 1 | .791 | 1 | .172 | 1 | .438 | 3 |
| 736 | | | min | -338.394 | 3 | -611.04 | 5 | -611.764 | 2 | -.724 | 2 | -.153 | 2 | -.424 | 4 |
| 737 | | 4 | max | 324.113 | 4 | -122.665 | 2 | 656.011 | 1 | .791 | 1 | .213 | 1 | .446 | 3 |
| 738 | | | min | -338.394 | 3 | -611.04 | 5 | -611.764 | 2 | -.724 | 2 | -.191 | 2 | -.41 | 4 |
| 739 | | 5 | max | 324.113 | 4 | -122.665 | 2 | 656.011 | 1 | .791 | 1 | .254 | 1 | .455 | 3 |
| 740 | | | min | -338.394 | 3 | -611.04 | 5 | -611.764 | 2 | -.724 | 2 | -.229 | 2 | -.395 | 4 |
| 741 | MP2C | 1 | max | 0 | 11 | .073 | 2 | .215 | 4 | 0 | 11 | 0 | 11 | 0 | 11 |
| 742 | | | min | 0 | 1 | -.07 | 1 | -.215 | 3 | 0 | 1 | 0 | 1 | 0 | 1 |
| 743 | | 2 | max | 74.546 | 8 | 63.555 | 2 | 79.69 | 4 | 0 | 11 | .058 | 4 | .046 | 1 |
| 744 | | | min | 17.467 | 1 | -63.552 | 1 | -79.69 | 3 | 0 | 1 | -.058 | 3 | -.046 | 2 |
| 745 | | 3 | max | 517.198 | 5 | 534.826 | 2 | 234.53 | 4 | .076 | 2 | .147 | 4 | .044 | 2 |
| 746 | | | min | 99.648 | 2 | -580.099 | 1 | -247.016 | 3 | -.09 | 1 | -.097 | 3 | -.044 | 1 |
| 747 | | 4 | max | 536.623 | 5 | 549.244 | 2 | 248.948 | 4 | .076 | 2 | .51 | 4 | .837 | 1 |
| 748 | | | min | 105.895 | 2 | -594.518 | 1 | -261.435 | 3 | -.09 | 1 | -.478 | 3 | -.769 | 2 |
| 749 | | 5 | max | 0 | 11 | .039 | 1 | .185 | 7 | 0 | 11 | 0 | 11 | 0 | 11 |
| 750 | | | min | 0 | 1 | -.059 | 6 | -.143 | 4 | 0 | 1 | 0 | 1 | 0 | 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 Mome... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 751 | M76 | 1 | max | 461.927 | 3 | 213.925 | 3 | 943.189 | 4 | 1.099 | 8 | .51 | 3 | .389 | 2 |
| 752 | | | min | -363.762 | 4 | -765.394 | 8 | -596.465 | 3 | -.221 | 3 | -.583 | 4 | -.517 | 1 |
| 753 | | 2 | max | 461.927 | 3 | 213.925 | 3 | 943.189 | 4 | 1.099 | 8 | .473 | 3 | .388 | 2 |
| 754 | | | min | -363.762 | 4 | -765.394 | 8 | -596.465 | 3 | -.221 | 3 | -.524 | 4 | -.487 | 1 |
| 755 | | 3 | max | 461.927 | 3 | 213.925 | 3 | 943.189 | 4 | 1.099 | 8 | .435 | 3 | .388 | 2 |
| 756 | | | min | -363.762 | 4 | -765.394 | 8 | -596.465 | 3 | -.221 | 3 | -.465 | 4 | -.457 | 1 |
| 757 | | 4 | max | 461.927 | 3 | 213.925 | 3 | 943.189 | 4 | 1.099 | 8 | .398 | 3 | .388 | 2 |
| 758 | | | min | -363.762 | 4 | -765.394 | 8 | -596.465 | 3 | -.221 | 3 | -.406 | 4 | -.428 | 1 |
| 759 | | 5 | max | 461.927 | 3 | 213.925 | 3 | 943.189 | 4 | 1.099 | 8 | .411 | 2 | .388 | 2 |
| 760 | | | min | -363.762 | 4 | -765.394 | 8 | -596.465 | 3 | -.221 | 3 | -.392 | 1 | -.398 | 1 |
| 761 | M77 | 1 | max | 230.707 | 2 | 341.045 | 2 | 581.12 | 2 | .4 | 2 | .209 | 1 | .3 | 3 |
| 762 | | | min | -189.262 | 1 | -491.713 | 1 | -892.333 | 1 | -.899 | 1 | -.177 | 2 | -.391 | 4 |
| 763 | | 2 | max | 230.707 | 2 | 341.045 | 2 | 581.12 | 2 | .4 | 2 | .186 | 4 | .286 | 3 |
| 764 | | | min | -189.262 | 1 | -491.713 | 1 | -892.333 | 1 | -.899 | 1 | -.179 | 3 | -.367 | 4 |
| 765 | | 3 | max | 230.707 | 2 | 341.045 | 2 | 581.12 | 2 | .4 | 2 | .181 | 4 | .272 | 3 |
| 766 | | | min | -189.262 | 1 | -491.713 | 1 | -892.333 | 1 | -.899 | 1 | -.194 | 3 | -.344 | 4 |
| 767 | | 4 | max | 230.707 | 2 | 341.045 | 2 | 581.12 | 2 | .4 | 2 | .175 | 4 | .258 | 3 |
| 768 | | | min | -189.262 | 1 | -491.713 | 1 | -892.333 | 1 | -.899 | 1 | -.209 | 3 | -.32 | 4 |
| 769 | | 5 | max | 230.707 | 2 | 341.045 | 2 | 581.12 | 2 | .4 | 2 | .17 | 4 | .244 | 3 |
| 770 | | | min | -189.262 | 1 | -491.713 | 1 | -892.333 | 1 | -.899 | 1 | -.224 | 3 | -.297 | 4 |
| 771 | MP1B | 1 | max | 73.539 | 8 | 72.205 | 1 | 92.412 | 3 | 0 | 11 | 0 | 11 | 0 | 11 |
| 772 | | | min | 15.6 | 1 | -72.216 | 2 | -92.398 | 4 | 0 | 1 | 0 | 1 | 0 | 1 |
| 773 | | 2 | max | 92.964 | 8 | 86.623 | 1 | 106.831 | 3 | 0 | 11 | .149 | 3 | .119 | 2 |
| 774 | | | min | 21.848 | 1 | -86.635 | 2 | -106.817 | 4 | 0 | 1 | -.149 | 4 | -.119 | 1 |
| 775 | | 3 | max | 447.726 | 1 | 787.006 | 1 | 163.198 | 4 | .177 | 2 | .116 | 1 | .169 | 1 |
| 776 | | | min | -384.618 | 2 | -467.447 | 2 | -133.454 | 3 | -.209 | 1 | -.073 | 2 | -.188 | 2 |
| 777 | | 4 | max | 453.974 | 1 | 801.425 | 1 | 170.476 | 2 | .177 | 2 | .23 | 4 | .524 | 2 |
| 778 | | | min | -378.37 | 2 | -481.866 | 2 | -140.197 | 1 | -.209 | 1 | -.088 | 1 | -1.022 | 1 |
| 779 | | 5 | max | -15.6 | 10 | 72.278 | 2 | 92.463 | 4 | 0 | 11 | 0 | 11 | 0 | 11 |
| 780 | | | min | -73.539 | 5 | -72.197 | 1 | -92.445 | 3 | 0 | 1 | 0 | 1 | 0 | 1 |
| 781 | MP3B | 1 | max | 0 | 11 | .725 | 1 | 1.021 | 3 | 0 | 11 | 0 | 11 | 0 | 11 |
| 782 | | | min | 0 | 1 | -.731 | 2 | -1.063 | 4 | 0 | 1 | 0 | 1 | 0 | 1 |
| 783 | | 2 | max | 324.488 | 8 | 261.846 | 1 | 378.57 | 3 | 0 | 11 | .647 | 3 | .442 | 2 |
| 784 | | | min | 88.472 | 1 | -261.852 | 2 | -378.613 | 4 | 0 | 1 | -.647 | 4 | -.442 | 1 |
| 785 | | 3 | max | 578.998 | 4 | 360.354 | 3 | 315.552 | 1 | .583 | 4 | .337 | 3 | .466 | 2 |
| 786 | | | min | -311.525 | 3 | -713.471 | 4 | -227.017 | 2 | -.51 | 3 | -.342 | 4 | -.322 | 1 |
| 787 | | 4 | max | -88.472 | 10 | 261.335 | 2 | 378.096 | 4 | 0 | 11 | .294 | 3 | .206 | 2 |
| 788 | | | min | -324.488 | 5 | -261.442 | 1 | -378.047 | 3 | 0 | 1 | -.294 | 4 | -.206 | 1 |
| 789 | | 5 | max | 0 | 11 | .213 | 2 | .635 | 8 | 0 | 11 | 0 | 11 | 0 | 11 |
| 790 | | | min | 0 | 1 | -.774 | 5 | -.498 | 3 | 0 | 1 | 0 | 1 | 0 | 1 |
| 791 | M80 | 1 | max | 283.638 | 3 | -122.94 | 1 | 703.39 | 2 | .866 | 2 | .087 | 4 | .341 | 4 |
| 792 | | | min | -294.58 | 4 | -610.388 | 8 | -659.38 | 1 | -.799 | 1 | -.076 | 1 | -.373 | 3 |
| 793 | | 2 | max | 283.638 | 3 | -122.94 | 1 | 703.39 | 2 | .866 | 2 | .129 | 2 | .356 | 4 |
| 794 | | | min | -294.58 | 4 | -610.388 | 8 | -659.38 | 1 | -.799 | 1 | -.117 | 1 | -.365 | 3 |
| 795 | | 3 | max | 283.638 | 3 | -122.94 | 1 | 703.39 | 2 | .866 | 2 | .173 | 2 | .372 | 4 |
| 796 | | | min | -294.58 | 4 | -610.388 | 8 | -659.38 | 1 | -.799 | 1 | -.159 | 1 | -.357 | 3 |
| 797 | | 4 | max | 283.638 | 3 | -122.94 | 1 | 703.39 | 2 | .866 | 2 | .217 | 2 | .387 | 4 |
| 798 | | | min | -294.58 | 4 | -610.388 | 8 | -659.38 | 1 | -.799 | 1 | -.2 | 1 | -.349 | 3 |
| 799 | | 5 | max | 283.638 | 3 | -122.94 | 1 | 703.39 | 2 | .866 | 2 | .261 | 2 | .402 | 4 |
| 800 | | | min | -294.58 | 4 | -610.388 | 8 | -659.38 | 1 | -.799 | 1 | -.241 | 1 | -.341 | 3 |
| 801 | MP2B | 1 | max | 0 | 11 | .077 | 1 | .177 | 3 | 0 | 11 | 0 | 11 | 0 | 11 |
| 802 | | | min | 0 | 1 | -.075 | 2 | -.176 | 4 | 0 | 1 | 0 | 1 | 0 | 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 Mome... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 803 | | 2 | max | 74.546 | 8 | 63.559 | 1 | 79.652 | 3 | 0 | 11 | .058 | 3 | .046 | 2 |
| 804 | | | min | 17.468 | 1 | -63.557 | 2 | -79.651 | 4 | 0 | 1 | -.058 | 4 | -.046 | 1 |
| 805 | | 3 | max | 516.755 | 8 | 582.399 | 1 | 191.537 | 3 | .076 | 1 | .132 | 3 | .04 | 1 |
| 806 | | | min | 101.596 | 1 | -627.733 | 2 | -204.525 | 4 | -.087 | 4 | -.081 | 4 | -.04 | 2 |
| 807 | | 4 | max | 536.18 | 8 | 596.817 | 1 | 205.956 | 3 | .076 | 1 | .43 | 3 | .912 | 2 |
| 808 | | | min | 107.843 | 1 | -642.151 | 2 | -218.943 | 4 | -.087 | 4 | -.399 | 4 | -.845 | 1 |
| 809 | | 5 | max | 0 | 11 | .04 | 2 | .166 | 8 | 0 | 11 | 0 | 11 | 0 | 11 |
| 810 | | | min | 0 | 1 | -.059 | 5 | -.114 | 3 | 0 | 1 | 0 | 1 | 0 | 1 |
| 811 | M82 | 1 | max | 0 | 11 | 0 | 11 | 0 | 11 | 0 | 11 | 0 | 11 | 0 | 11 |
| 812 | | | min | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 813 | | 2 | max | -20.32 | 1 | 151.358 | 4 | 63.709 | 2 | .091 | 1 | .236 | 1 | .172 | 4 |
| 814 | | | min | -538.62 | 6 | -273.63 | 3 | -50.292 | 1 | -.072 | 2 | -.266 | 2 | -.287 | 3 |
| 815 | | 3 | max | -21.74 | 1 | 223.16 | 8 | 98.394 | 2 | .194 | 2 | .102 | 4 | .588 | 3 |
| 816 | | | min | -632.116 | 7 | -286.645 | 3 | -92.635 | 4 | -.181 | 1 | -.112 | 3 | .072 | 1 |
| 817 | | 4 | max | 187.838 | 4 | 206.02 | 4 | 93.139 | 3 | .194 | 2 | .179 | 3 | .099 | 3 |
| 818 | | | min | -632.116 | 7 | -105.027 | 3 | -92.635 | 4 | -.181 | 1 | -.188 | 4 | -.196 | 4 |
| 819 | | 5 | max | 0 | 11 | 0 | 11 | 0 | 11 | 0 | 11 | 0 | 11 | 0 | 11 |
| 820 | | | min | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 821 | M100 | 1 | max | 751.099 | 1 | 478.441 | 2 | 226.759 | 1 | .915 | 3 | .754 | 2 | .61 | 2 |
| 822 | | | min | -853.455 | 2 | -610.021 | 1 | -585.477 | 6 | -.699 | 4 | -.682 | 1 | -.696 | 1 |
| 823 | | 2 | max | 751.099 | 1 | 478.441 | 2 | 226.759 | 1 | .915 | 3 | .718 | 2 | .58 | 2 |
| 824 | | | min | -853.455 | 2 | -610.021 | 1 | -585.477 | 6 | -.699 | 4 | -.668 | 1 | -.658 | 1 |
| 825 | | 3 | max | 751.099 | 1 | 478.441 | 2 | 226.759 | 1 | .915 | 3 | .682 | 2 | .55 | 2 |
| 826 | | | min | -853.455 | 2 | -610.021 | 1 | -585.477 | 6 | -.699 | 4 | -.654 | 1 | -.62 | 1 |
| 827 | | 4 | max | 751.099 | 1 | 478.441 | 2 | 226.759 | 1 | .915 | 3 | .647 | 2 | .52 | 2 |
| 828 | | | min | -853.455 | 2 | -610.021 | 1 | -585.477 | 6 | -.699 | 4 | -.64 | 1 | -.582 | 1 |
| 829 | | 5 | max | 751.099 | 1 | 478.441 | 2 | 226.759 | 1 | .915 | 3 | .611 | 2 | .49 | 2 |
| 830 | | | min | -853.455 | 2 | -610.021 | 1 | -585.477 | 6 | -.699 | 4 | -.625 | 1 | -.544 | 1 |
| 831 | M101 | 1 | max | 275.116 | 1 | 473.141 | 2 | 526.657 | 6 | .594 | 3 | .275 | 1 | .253 | 4 |
| 832 | | | min | -317.23 | 2 | -465.291 | 1 | -166.713 | 3 | -.902 | 4 | -.305 | 2 | -.242 | 3 |
| 833 | | 2 | max | 275.116 | 1 | 473.141 | 2 | 526.657 | 6 | .594 | 3 | .266 | 1 | .243 | 4 |
| 834 | | | min | -317.23 | 2 | -465.291 | 1 | -166.713 | 3 | -.902 | 4 | -.275 | 2 | -.232 | 3 |
| 835 | | 3 | max | 275.116 | 1 | 473.141 | 2 | 526.657 | 6 | .594 | 3 | .256 | 1 | .233 | 4 |
| 836 | | | min | -317.23 | 2 | -465.291 | 1 | -166.713 | 3 | -.902 | 4 | -.246 | 2 | -.222 | 3 |
| 837 | | 4 | max | 275.116 | 1 | 473.141 | 2 | 526.657 | 6 | .594 | 3 | .246 | 1 | .223 | 4 |
| 838 | | | min | -317.23 | 2 | -465.291 | 1 | -166.713 | 3 | -.902 | 4 | -.216 | 2 | -.211 | 3 |
| 839 | | 5 | max | 275.116 | 1 | 473.141 | 2 | 526.657 | 6 | .594 | 3 | .236 | 1 | .212 | 4 |
| 840 | | | min | -317.23 | 2 | -465.291 | 1 | -166.713 | 3 | -.902 | 4 | -.186 | 2 | -.201 | 3 |
| 841 | M102 | 1 | max | 138.031 | 2 | 421.194 | 7 | 495.638 | 4 | .797 | 3 | .076 | 4 | .3 | 2 |
| 842 | | | min | -125.397 | 1 | 83.702 | 4 | -540.416 | 3 | -.749 | 4 | -.088 | 3 | -.237 | 1 |
| 843 | | 2 | max | 138.031 | 2 | 421.194 | 7 | 495.638 | 4 | .797 | 3 | .107 | 4 | .292 | 2 |
| 844 | | | min | -125.397 | 1 | 83.702 | 4 | -540.416 | 3 | -.749 | 4 | -.122 | 3 | -.245 | 1 |
| 845 | | 3 | max | 138.031 | 2 | 421.194 | 7 | 495.638 | 4 | .797 | 3 | .138 | 4 | .283 | 2 |
| 846 | | | min | -125.397 | 1 | 83.702 | 4 | -540.416 | 3 | -.749 | 4 | -.155 | 3 | -.254 | 1 |
| 847 | | 4 | max | 138.031 | 2 | 421.194 | 7 | 495.638 | 4 | .797 | 3 | .169 | 4 | .275 | 2 |
| 848 | | | min | -125.397 | 1 | 83.702 | 4 | -540.416 | 3 | -.749 | 4 | -.189 | 3 | -.262 | 1 |
| 849 | | 5 | max | 138.031 | 2 | 421.194 | 7 | 495.638 | 4 | .797 | 3 | .2 | 4 | .266 | 2 |
| 850 | | | min | -125.397 | 1 | 83.702 | 4 | -540.416 | 3 | -.749 | 4 | -.223 | 3 | -.271 | 1 |
| 851 | M103 | 1 | max | 700.708 | 4 | 385.103 | 3 | 220.817 | 4 | 1.168 | 1 | .611 | 3 | .503 | 1 |
| 852 | | | min | -799.762 | 3 | -524.391 | 4 | -573.15 | 7 | -.951 | 2 | -.541 | 4 | -.604 | 2 |
| 853 | | 2 | max | 700.708 | 4 | 385.103 | 3 | 220.817 | 4 | 1.168 | 1 | .576 | 3 | .493 | 1 |
| 854 | | | min | -799.762 | 3 | -524.391 | 4 | -573.15 | 7 | -.951 | 2 | -.527 | 4 | -.583 | 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 Mome... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 855 | | 3 | max | 700.708 | 4 | 385.103 | 3 | 220.817 | 4 | 1.168 | 1 | .54 | 3 | .482 | 1 |
| 856 | | | min | -799.762 | 3 | -524.391 | 4 | -573.15 | 7 | -.951 | 2 | -.513 | 4 | -.563 | 2 |
| 857 | | 4 | max | 700.708 | 4 | 385.103 | 3 | 220.817 | 4 | 1.168 | 1 | .505 | 3 | .472 | 1 |
| 858 | | | min | -799.762 | 3 | -524.391 | 4 | -573.15 | 7 | -.951 | 2 | -.499 | 4 | -.542 | 2 |
| 859 | | 5 | max | 700.708 | 4 | 385.103 | 3 | 220.817 | 4 | 1.168 | 1 | .469 | 3 | .461 | 1 |
| 860 | | | min | -799.762 | 3 | -524.391 | 4 | -573.15 | 7 | -.951 | 2 | -.485 | 4 | -.522 | 2 |
| 861 | M104A | 1 | max | 212.173 | 2 | 512.933 | 3 | 676.981 | 3 | .766 | 4 | .256 | 4 | .297 | 3 |
| 862 | | | min | -244.065 | 1 | -508.655 | 4 | -358.49 | 4 | -1.086 | 3 | -.289 | 3 | -.281 | 4 |
| 863 | | 2 | max | 212.173 | 2 | 512.933 | 3 | 676.981 | 3 | .766 | 4 | .234 | 4 | .265 | 3 |
| 864 | | | min | -244.065 | 1 | -508.655 | 4 | -358.49 | 4 | -1.086 | 3 | -.246 | 3 | -.25 | 4 |
| 865 | | 3 | max | 212.173 | 2 | 512.933 | 3 | 676.981 | 3 | .766 | 4 | .211 | 4 | .233 | 3 |
| 866 | | | min | -244.065 | 1 | -508.655 | 4 | -358.49 | 4 | -1.086 | 3 | -.204 | 3 | -.218 | 4 |
| 867 | | 4 | max | 212.173 | 2 | 512.933 | 3 | 676.981 | 3 | .766 | 4 | .189 | 4 | .201 | 3 |
| 868 | | | min | -244.065 | 1 | -508.655 | 4 | -358.49 | 4 | -1.086 | 3 | -.162 | 3 | -.186 | 4 |
| 869 | | 5 | max | 212.173 | 2 | 512.933 | 3 | 676.981 | 3 | .766 | 4 | .166 | 4 | .169 | 3 |
| 870 | | | min | -244.065 | 1 | -508.655 | 4 | -358.49 | 4 | -1.086 | 3 | -.119 | 3 | -.154 | 4 |
| 871 | M105 | 1 | max | 150.519 | 3 | 423.186 | 5 | 456.048 | 2 | .72 | 1 | .076 | 2 | .251 | 3 |
| 872 | | | min | -136.284 | 4 | 75.737 | 2 | -500.084 | 1 | -.672 | 2 | -.09 | 1 | -.188 | 4 |
| 873 | | 2 | max | 150.519 | 3 | 423.186 | 5 | 456.048 | 2 | .72 | 1 | .105 | 2 | .245 | 3 |
| 874 | | | min | -136.284 | 4 | 75.737 | 2 | -500.084 | 1 | -.672 | 2 | -.121 | 1 | -.199 | 4 |
| 875 | | 3 | max | 150.519 | 3 | 423.186 | 5 | 456.048 | 2 | .72 | 1 | .133 | 2 | .239 | 3 |
| 876 | | | min | -136.284 | 4 | 75.737 | 2 | -500.084 | 1 | -.672 | 2 | -.152 | 1 | -.211 | 4 |
| 877 | | 4 | max | 150.519 | 3 | 423.186 | 5 | 456.048 | 2 | .72 | 1 | .162 | 2 | .234 | 3 |
| 878 | | | min | -136.284 | 4 | 75.737 | 2 | -500.084 | 1 | -.672 | 2 | -.183 | 1 | -.222 | 4 |
| 879 | | 5 | max | 150.519 | 3 | 423.186 | 5 | 456.048 | 2 | .72 | 1 | .19 | 2 | .228 | 3 |
| 880 | | | min | -136.284 | 4 | 75.737 | 2 | -500.084 | 1 | -.672 | 2 | -.215 | 1 | -.233 | 4 |
| 881 | M106 | 1 | max | 430.866 | 3 | 373.151 | 4 | 81.154 | 3 | 1.201 | 4 | .583 | 4 | .685 | 4 |
| 882 | | | min | -529.008 | 4 | -519.429 | 3 | -572.314 | 8 | -.979 | 3 | -.51 | 3 | -.778 | 3 |
| 883 | | 2 | max | 430.866 | 3 | 373.151 | 4 | 81.154 | 3 | 1.201 | 4 | .556 | 4 | .662 | 4 |
| 884 | | | min | -529.008 | 4 | -519.429 | 3 | -572.314 | 8 | -.979 | 3 | -.505 | 3 | -.745 | 3 |
| 885 | | 3 | max | 430.866 | 3 | 373.151 | 4 | 81.154 | 3 | 1.201 | 4 | .53 | 4 | .639 | 4 |
| 886 | | | min | -529.008 | 4 | -519.429 | 3 | -572.314 | 8 | -.979 | 3 | -.5 | 3 | -.713 | 3 |
| 887 | | 4 | max | 430.866 | 3 | 373.151 | 4 | 81.154 | 3 | 1.201 | 4 | .503 | 4 | .615 | 4 |
| 888 | | | min | -529.008 | 4 | -519.429 | 3 | -572.314 | 8 | -.979 | 3 | -.495 | 3 | -.68 | 3 |
| 889 | | 5 | max | 430.866 | 3 | 373.151 | 4 | 81.154 | 3 | 1.201 | 4 | .476 | 4 | .592 | 4 |
| 890 | | | min | -529.008 | 4 | -519.429 | 3 | -572.314 | 8 | -.979 | 3 | -.49 | 3 | -.648 | 3 |
| 891 | M107 | 1 | max | 257.875 | 3 | 416.703 | 1 | 680.122 | 1 | .829 | 2 | .177 | 2 | .343 | 1 |
| 892 | | | min | -293.924 | 4 | -416.186 | 2 | -367.455 | 2 | -1.143 | 1 | -.209 | 1 | -.331 | 2 |
| 893 | | 2 | max | 257.875 | 3 | 416.703 | 1 | 680.122 | 1 | .829 | 2 | .169 | 3 | .317 | 1 |
| 894 | | | min | -293.924 | 4 | -416.186 | 2 | -367.455 | 2 | -1.143 | 1 | -.176 | 4 | -.305 | 2 |
| 895 | | 3 | max | 257.875 | 3 | 416.703 | 1 | 680.122 | 1 | .829 | 2 | .174 | 3 | .291 | 1 |
| 896 | | | min | -293.924 | 4 | -416.186 | 2 | -367.455 | 2 | -1.143 | 1 | -.161 | 4 | -.279 | 2 |
| 897 | | 4 | max | 257.875 | 3 | 416.703 | 1 | 680.122 | 1 | .829 | 2 | .18 | 3 | .265 | 1 |
| 898 | | | min | -293.924 | 4 | -416.186 | 2 | -367.455 | 2 | -1.143 | 1 | -.146 | 4 | -.253 | 2 |
| 899 | | 5 | max | 257.875 | 3 | 416.703 | 1 | 680.122 | 1 | .829 | 2 | .185 | 3 | .239 | 1 |
| 900 | | | min | -293.924 | 4 | -416.186 | 2 | -367.455 | 2 | -1.143 | 1 | -.131 | 4 | -.227 | 2 |
| 901 | M108 | 1 | max | 106.828 | 4 | 422.658 | 8 | 503.336 | 1 | .765 | 2 | .076 | 1 | .222 | 4 |
| 902 | | | min | -95.842 | 3 | 76.463 | 1 | -547.825 | 2 | -.717 | 1 | -.087 | 4 | -.158 | 3 |
| 903 | | 2 | max | 106.828 | 4 | 422.658 | 8 | 503.336 | 1 | .765 | 2 | .108 | 1 | .21 | 4 |
| 904 | | | min | -95.842 | 3 | 76.463 | 1 | -547.825 | 2 | -.717 | 1 | -.119 | 2 | -.163 | 3 |
| 905 | | 3 | max | 106.828 | 4 | 422.658 | 8 | 503.336 | 1 | .765 | 2 | .139 | 1 | .198 | 4 |
| 906 | | | min | -95.842 | 3 | 76.463 | 1 | -547.825 | 2 | -.717 | 1 | -.153 | 2 | -.168 | 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 Mome... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 907 | | 4 | max | 106.828 | 4 | 422.658 | 8 | 503.336 | 1 | .765 | 2 | .171 | 1 | .185 | 4 |
| 908 | | | min | -95.842 | 3 | 76.463 | 1 | -547.825 | 2 | -.717 | 1 | -.188 | 2 | -.173 | 3 |
| 909 | | 5 | max | 106.828 | 4 | 422.658 | 8 | 503.336 | 1 | .765 | 2 | .202 | 1 | .173 | 4 |
| 910 | | | min | -95.842 | 3 | 76.463 | 1 | -547.825 | 2 | -.717 | 1 | -.222 | 2 | -.178 | 3 |
| 911 | M92 | 1 | max | 0 | 11 | .023 | 4 | .025 | 3 | 0 | 11 | 0 | 11 | 0 | 11 |
| 912 | | | min | 0 | 1 | 0 | 10 | -.012 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 913 | | 2 | max | 107.933 | 4 | 145.036 | 2 | 79.11 | 1 | .1 | 4 | .188 | 4 | .15 | 2 |
| 914 | | | min | -555.796 | 7 | -267.833 | 1 | -65.419 | 2 | -.082 | 3 | -.22 | 3 | -.266 | 4 |
| 915 | | 3 | max | -107.484 | 9 | 220.092 | 6 | 87.781 | 1 | .146 | 3 | .109 | 1 | .592 | 1 |
| 916 | | | min | -618.74 | 5 | -280.849 | 1 | -84.774 | 3 | -.133 | 4 | -.096 | 2 | .16 | 9 |
| 917 | | 4 | max | 72.275 | 2 | 192.574 | 2 | 60.159 | 1 | .146 | 3 | .164 | 4 | .134 | 1 |
| 918 | | | min | -614.057 | 5 | -90.487 | 1 | -58.899 | 2 | -.133 | 4 | -.177 | 3 | -.233 | 2 |
| 919 | | 5 | max | 0 | 11 | .01 | 3 | .017 | 4 | 0 | 11 | 0 | 11 | 0 | 11 |
| 920 | | | min | 0 | 1 | -.018 | 1 | 0 | 6 | 0 | 1 | 0 | 1 | 0 | 1 |
| 921 | M93 | 1 | max | 0 | 11 | .025 | 2 | .012 | 1 | 0 | 11 | 0 | 11 | 0 | 11 |
| 922 | | | min | 0 | 1 | 0 | 9 | -.018 | 4 | 0 | 1 | 0 | 1 | 0 | 1 |
| 923 | | 2 | max | 32.522 | 2 | 142.886 | 1 | 84.386 | 4 | .113 | 2 | .19 | 3 | .194 | 1 |
| 924 | | | min | -545.437 | 5 | -265.33 | 2 | -70.977 | 3 | -.094 | 1 | -.219 | 4 | -.309 | 2 |
| 925 | | 3 | max | -91.903 | 10 | 220.181 | 5 | 110.4 | 4 | .159 | 4 | .105 | 1 | .541 | 2 |
| 926 | | | min | -618.709 | 6 | -278.345 | 2 | -109.182 | 1 | -.145 | 3 | -.112 | 2 | .129 | 10 |
| 927 | | 4 | max | 93.056 | 1 | 191.688 | 1 | 98.923 | 2 | .159 | 4 | .21 | 2 | .127 | 4 |
| 928 | | | min | -614.026 | 6 | -90.855 | 2 | -100.51 | 1 | -.145 | 3 | -.222 | 1 | -.225 | 3 |
| 929 | | 5 | max | 0 | 11 | .001 | 1 | .018 | 2 | 0 | 11 | 0 | 11 | 0 | 11 |
| 930 | | | min | 0 | 1 | -.02 | 4 | -.01 | 3 | 0 | 1 | 0 | 1 | 0 | 1 |
| 931 | M94 | 1 | max | 735.474 | 1 | 537.222 | 2 | 250.435 | 1 | .244 | 2 | .39 | 2 | .562 | 2 |
| 932 | | | min | -824.89 | 2 | -578.083 | 1 | -236.858 | 2 | -.281 | 1 | -.42 | 1 | -.634 | 1 |
| 933 | | 2 | max | 735.474 | 1 | 537.222 | 2 | 250.435 | 1 | .244 | 2 | .38 | 2 | .54 | 2 |
| 934 | | | min | -824.89 | 2 | -578.083 | 1 | -236.858 | 2 | -.281 | 1 | -.41 | 1 | -.61 | 1 |
| 935 | | 3 | max | 735.474 | 1 | 537.222 | 2 | 250.435 | 1 | .244 | 2 | .37 | 2 | .517 | 2 |
| 936 | | | min | -824.89 | 2 | -578.083 | 1 | -236.858 | 2 | -.281 | 1 | -.399 | 1 | -.586 | 1 |
| 937 | | 4 | max | 735.474 | 1 | 537.222 | 2 | 250.435 | 1 | .244 | 2 | .36 | 2 | .495 | 2 |
| 938 | | | min | -824.89 | 2 | -578.083 | 1 | -236.858 | 2 | -.281 | 1 | -.389 | 1 | -.562 | 1 |
| 939 | | 5 | max | 735.474 | 1 | 537.222 | 2 | 250.435 | 1 | .244 | 2 | .35 | 2 | .473 | 2 |
| 940 | | | min | -824.89 | 2 | -578.083 | 1 | -236.858 | 2 | -.281 | 1 | -.378 | 1 | -.538 | 1 |
| 941 | M95 | 1 | max | 303.986 | 1 | 497.185 | 2 | 668.611 | 4 | .072 | 1 | .643 | 3 | .255 | 2 |
| 942 | | | min | -346.436 | 2 | -412.393 | 1 | -744.726 | 3 | -.081 | 2 | -.552 | 4 | -.225 | 1 |
| 943 | | 2 | max | 303.986 | 1 | 497.185 | 2 | 668.611 | 4 | .072 | 1 | .612 | 3 | .234 | 2 |
| 944 | | | min | -346.436 | 2 | -412.393 | 1 | -744.726 | 3 | -.081 | 2 | -.524 | 4 | -.208 | 1 |
| 945 | | 3 | max | 303.986 | 1 | 497.185 | 2 | 668.611 | 4 | .072 | 1 | .581 | 3 | .214 | 2 |
| 946 | | | min | -346.436 | 2 | -412.393 | 1 | -744.726 | 3 | -.081 | 2 | -.496 | 4 | -.191 | 1 |
| 947 | | 4 | max | 303.986 | 1 | 497.185 | 2 | 668.611 | 4 | .072 | 1 | .55 | 3 | .193 | 2 |
| 948 | | | min | -346.436 | 2 | -412.393 | 1 | -744.726 | 3 | -.081 | 2 | -.468 | 4 | -.173 | 1 |
| 949 | | 5 | max | 303.986 | 1 | 497.185 | 2 | 668.611 | 4 | .072 | 1 | .519 | 3 | .172 | 2 |
| 950 | | | min | -346.436 | 2 | -412.393 | 1 | -744.726 | 3 | -.081 | 2 | -.44 | 4 | -.156 | 1 |
| 951 | M96 | 1 | max | 699.29 | 4 | 423.475 | 1 | 353.827 | 2 | .191 | 1 | .489 | 1 | .433 | 1 |
| 952 | | | min | -785.951 | 3 | -486.227 | 2 | -351.126 | 1 | -.232 | 2 | -.512 | 2 | -.514 | 2 |
| 953 | | 2 | max | 699.29 | 4 | 423.475 | 1 | 353.827 | 2 | .191 | 1 | .474 | 1 | .415 | 1 |
| 954 | | | min | -785.951 | 3 | -486.227 | 2 | -351.126 | 1 | -.232 | 2 | -.498 | 2 | -.494 | 2 |
| 955 | | 3 | max | 699.29 | 4 | 423.475 | 1 | 353.827 | 2 | .191 | 1 | .459 | 1 | .397 | 1 |
| 956 | | | min | -785.951 | 3 | -486.227 | 2 | -351.126 | 1 | -.232 | 2 | -.483 | 2 | -.474 | 2 |
| 957 | | 4 | max | 699.29 | 4 | 423.475 | 1 | 353.827 | 2 | .191 | 1 | .445 | 1 | .38 | 1 |
| 958 | | | min | -785.951 | 3 | -486.227 | 2 | -351.126 | 1 | -.232 | 2 | -.468 | 2 | -.453 | 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 Mome... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 959 | | 5 | max | 699.29 | 4 | 423.475 | 1 | 353.827 | 2 | .191 | 1 | .43 | 1 | .362 | 1 |
| 960 | | | min | -785.951 | 3 | -486.227 | 2 | -351.126 | 1 | -.232 | 2 | -.453 | 2 | -.433 | 2 |
| 961 | M97 | 1 | max | 279.587 | 2 | 641.097 | 3 | 491.964 | 3 | .087 | 4 | .443 | 1 | .315 | 3 |
| 962 | | | min | -314.022 | 1 | -562.033 | 4 | -566.43 | 4 | -.095 | 3 | -.354 | 2 | -.287 | 4 |
| 963 | | 2 | max | 279.587 | 2 | 641.097 | 3 | 491.964 | 3 | .087 | 4 | .426 | 1 | .288 | 3 |
| 964 | | | min | -314.022 | 1 | -562.033 | 4 | -566.43 | 4 | -.095 | 3 | -.34 | 2 | -.264 | 4 |
| 965 | | 3 | max | 279.587 | 2 | 641.097 | 3 | 491.964 | 3 | .087 | 4 | .408 | 1 | .261 | 3 |
| 966 | | | min | -314.022 | 1 | -562.033 | 4 | -566.43 | 4 | -.095 | 3 | -.325 | 2 | -.24 | 4 |
| 967 | | 4 | max | 279.587 | 2 | 641.097 | 3 | 491.964 | 3 | .087 | 4 | .39 | 1 | .235 | 3 |
| 968 | | | min | -314.022 | 1 | -562.033 | 4 | -566.43 | 4 | -.095 | 3 | -.31 | 2 | -.217 | 4 |
| 969 | | 5 | max | 279.587 | 2 | 641.097 | 3 | 491.964 | 3 | .087 | 4 | .372 | 1 | .208 | 3 |
| 970 | | | min | -314.022 | 1 | -562.033 | 4 | -566.43 | 4 | -.095 | 3 | -.295 | 2 | -.194 | 4 |
| 971 | M98 | 1 | max | 447.215 | 2 | 575.179 | 4 | 320.34 | 3 | .27 | 4 | .491 | 4 | .606 | 4 |
| 972 | | | min | -526.567 | 1 | -629.11 | 3 | -313.355 | 4 | -.308 | 3 | -.518 | 3 | -.682 | 3 |
| 973 | | 2 | max | 447.215 | 2 | 575.179 | 4 | 320.34 | 3 | .27 | 4 | .478 | 4 | .582 | 4 |
| 974 | | | min | -526.567 | 1 | -629.11 | 3 | -313.355 | 4 | -.308 | 3 | -.504 | 3 | -.655 | 3 |
| 975 | | 3 | max | 447.215 | 2 | 575.179 | 4 | 320.34 | 3 | .27 | 4 | .465 | 4 | .558 | 4 |
| 976 | | | min | -526.567 | 1 | -629.11 | 3 | -313.355 | 4 | -.308 | 3 | -.491 | 3 | -.629 | 3 |
| 977 | | 4 | max | 447.215 | 2 | 575.179 | 4 | 320.34 | 3 | .27 | 4 | .452 | 4 | .534 | 4 |
| 978 | | | min | -526.567 | 1 | -629.11 | 3 | -313.355 | 4 | -.308 | 3 | -.478 | 3 | -.603 | 3 |
| 979 | | 5 | max | 447.215 | 2 | 575.179 | 4 | 320.34 | 3 | .27 | 4 | .439 | 4 | .51 | 4 |
| 980 | | | min | -526.567 | 1 | -629.11 | 3 | -313.355 | 4 | -.308 | 3 | -.464 | 3 | -.577 | 3 |
| 981 | M99 | 1 | max | 311.343 | 3 | 595.224 | 1 | 759.298 | 1 | .077 | 2 | .648 | 2 | .295 | 1 |
| 982 | | | min | -349.656 | 4 | -517.999 | 2 | -836.069 | 2 | -.083 | 1 | -.557 | 1 | -.27 | 2 |
| 983 | | 2 | max | 311.343 | 3 | 595.224 | 1 | 759.298 | 1 | .077 | 2 | .614 | 2 | .27 | 1 |
| 984 | | | min | -349.656 | 4 | -517.999 | 2 | -836.069 | 2 | -.083 | 1 | -.525 | 1 | -.248 | 2 |
| 985 | | 3 | max | 311.343 | 3 | 595.224 | 1 | 759.298 | 1 | .077 | 2 | .579 | 2 | .245 | 1 |
| 986 | | | min | -349.656 | 4 | -517.999 | 2 | -836.069 | 2 | -.083 | 1 | -.493 | 1 | -.227 | 2 |
| 987 | | 4 | max | 311.343 | 3 | 595.224 | 1 | 759.298 | 1 | .077 | 2 | .544 | 2 | .22 | 1 |
| 988 | | | min | -349.656 | 4 | -517.999 | 2 | -836.069 | 2 | -.083 | 1 | -.462 | 1 | -.205 | 2 |
| 989 | | 5 | max | 311.343 | 3 | 595.224 | 1 | 759.298 | 1 | .077 | 2 | .509 | 2 | .195 | 1 |
| 990 | | | min | -349.656 | 4 | -517.999 | 2 | -836.069 | 2 | -.083 | 1 | -.43 | 1 | -.184 | 2 |
| 991 | M100A | 1 | max | 515.938 | 1 | 582.844 | 1 | 521.922 | 2 | .026 | 1 | .22 | 2 | .453 | 1 |
| 992 | | | min | -590.949 | 2 | -619.657 | 2 | -592.373 | 1 | -.025 | 2 | -.155 | 1 | -.5 | 2 |
| 993 | | 2 | max | 515.938 | 1 | 582.844 | 1 | 523.607 | 2 | .026 | 1 | .197 | 2 | .165 | 1 |
| 994 | | | min | -590.949 | 2 | -619.657 | 2 | -590.688 | 1 | -.025 | 2 | -.157 | 1 | -.22 | 2 |
| 995 | | 3 | max | 515.938 | 1 | 582.844 | 1 | 525.292 | 2 | .026 | 1 | .173 | 2 | .192 | 3 |
| 996 | | | min | -590.949 | 2 | -619.657 | 2 | -589.003 | 1 | -.025 | 2 | -.159 | 1 | -.251 | 4 |
| 997 | | 4 | max | 515.938 | 1 | 582.844 | 1 | 526.977 | 2 | .026 | 1 | .15 | 2 | .342 | 2 |
| 998 | | | min | -590.949 | 2 | -619.657 | 2 | -587.318 | 1 | -.025 | 2 | -.16 | 1 | -.409 | 1 |
| 999 | | 5 | max | 515.938 | 1 | 582.844 | 1 | 528.661 | 2 | .026 | 1 | .128 | 2 | .623 | 2 |
| 1000 | | | min | -590.949 | 2 | -619.657 | 2 | -585.634 | 1 | -.025 | 2 | -.161 | 1 | -.696 | 1 |
| 1001 | M101A | 1 | max | 544.217 | 4 | 461.079 | 4 | 415.319 | 1 | .02 | 4 | .27 | 3 | .418 | 4 |
| 1002 | | | min | -614.399 | 3 | -501.238 | 3 | -494.145 | 2 | -.02 | 3 | -.204 | 4 | -.465 | 3 |
| 1003 | | 2 | max | 544.217 | 4 | 461.079 | 4 | 417.004 | 1 | .02 | 4 | .216 | 3 | .219 | 4 |
| 1004 | | | min | -614.399 | 3 | -501.238 | 3 | -492.46 | 2 | -.02 | 3 | -.178 | 4 | -.273 | 3 |
| 1005 | | 3 | max | 544.217 | 4 | 461.079 | 4 | 418.688 | 1 | .02 | 4 | .163 | 3 | .238 | 1 |
| 1006 | | | min | -614.399 | 3 | -501.238 | 3 | -490.775 | 2 | -.02 | 3 | -.151 | 4 | -.298 | 2 |
| 1007 | | 4 | max | 544.217 | 4 | 461.079 | 4 | 420.373 | 1 | .02 | 4 | .11 | 3 | .415 | 1 |
| 1008 | | | min | -614.399 | 3 | -501.238 | 3 | -489.091 | 2 | -.02 | 3 | -.123 | 4 | -.483 | 2 |
| 1009 | | 5 | max | 544.217 | 4 | 461.079 | 4 | 422.058 | 1 | .02 | 4 | .058 | 3 | .594 | 1 |
| 1010 | | | min | -614.399 | 3 | -501.238 | 3 | -487.406 | 2 | -.02 | 3 | -.096 | 4 | -.668 | 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 Mome... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1011 | M102A | 1 | max | 419.64 | 2 | 469.092 | 3 | 564.908 | 4 | .022 | 3 | .233 | 1 | .293 | 3 |
| 1012 | | | min | -485.319 | 1 | -507.941 | 4 | -638.763 | 3 | -.021 | 4 | -.167 | 2 | -.337 | 4 |
| 1013 | | 2 | max | 419.64 | 2 | 469.092 | 3 | 566.593 | 4 | .022 | 3 | .181 | 1 | .191 | 2 |
| 1014 | | | min | -485.319 | 1 | -507.941 | 4 | -637.078 | 3 | -.021 | 4 | -.144 | 2 | -.242 | 1 |
| 1015 | | 3 | max | 419.64 | 2 | 469.092 | 3 | 568.278 | 4 | .022 | 3 | .13 | 1 | .19 | 4 |
| 1016 | | | min | -485.319 | 1 | -507.941 | 4 | -635.394 | 3 | -.021 | 4 | -.12 | 2 | -.25 | 3 |
| 1017 | | 4 | max | 419.64 | 2 | 469.092 | 3 | 569.962 | 4 | .022 | 3 | .082 | 4 | .454 | 4 |
| 1018 | | | min | -485.319 | 1 | -507.941 | 4 | -633.709 | 3 | -.021 | 4 | -.096 | 2 | -.52 | 3 |
| 1019 | | 5 | max | 419.64 | 2 | 469.092 | 3 | 571.647 | 4 | .022 | 3 | .097 | 4 | .718 | 4 |
| 1020 | | | min | -485.319 | 1 | -507.941 | 4 | -632.024 | 3 | -.021 | 4 | -.134 | 3 | -.791 | 3 |

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

| | Member | Shape | Code Check | Loc[in] | LC | Shear C... | Lo..... | | LC | phi*... | phi*... | phi*... | phi*... | Cb | Eqn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | M1 | PIPE_3.0 | .860 | 0 | 5 | .302 | 0 | | 4 | 547... | 65205 | 5.749 | 5.749 | 3.619 | H1-... |
| 2 | M6 | PL3/8x2.375 | .589 | 0 | 4 | .604 | 0 | y | 5 | 280... | 288... | .224 | 1.428 | 1.317 | H1-... |
| 3 | M7 | PL3/8x6 | .278 | 1.5 | 3 | .412 | 0 | y | 5 | 720... | 72900 | .57 | 9.113 | 1.651 | H1-... |
| 4 | M10 | PL3/8x2.375 | .594 | 0 | 3 | .624 | 0 | y | 5 | 280... | 288... | .224 | 1.428 | 1.317 | H1-... |
| 5 | M11 | PL3/8x6 | .284 | 1.5 | 4 | .426 | 0 | y | 5 | 720... | 72900 | .57 | 9.113 | 1.648 | H1-... |
| 6 | M14 | PL3/8x6 | .243 | 2 | 1 | .087 | 0 | y | 1 | 714... | 72900 | .57 | 9.113 | 1.16 | H1-... |
| 7 | M16 | PL3/8x6 | .271 | 2 | 1 | .088 | 2 | y | 8 | 714... | 72900 | .57 | 9.113 | 1.016 | H1-... |
| 8 | M17 | PL3/8x6 | .634 | 3.528 | 1 | .226 | 0 | y | 5 | 687... | 72900 | .57 | 9.113 | 1.039 | H1-... |
| 9 | M18 | PL3/8x6 | .569 | 3.528 | 2 | .187 | 3.... | y | 5 | 687... | 72900 | .57 | 9.113 | 1.235 | H1-... |
| 10 | M19 | PIPE_3.0 | .253 | 94.25 | 8 | .118 | 78 | | 2 | 263... | 65205 | 5.749 | 5.749 | 2.028 | H1-... |
| 11 | M20 | L2x2x3 | .222 | 0 | 4 | .025 | 53... | z | 7 | 869... | 233... | .558 | 1.239 | 2.499 | H2-1 |
| 12 | M21 | L2x2x3 | .221 | 53.289 | 3 | .020 | 0 | z | 8 | 869... | 233... | .558 | 1.239 | 2.532 | H2-1 |
| 13 | M22 | PIPE_3.0 | .254 | 94.25 | 6 | .106 | 61... | | 2 | 263... | 65205 | 5.749 | 5.749 | 2.114 | H1-... |
| 14 | M23 | PIPE_3.0 | .251 | 94.25 | 7 | .113 | 78 | | 4 | 263... | 65205 | 5.749 | 5.749 | 2.206 | H1-... |
| 15 | M24 | PIPE_3.0 | .847 | 0 | 8 | .276 | 0 | | 2 | 547... | 65205 | 5.749 | 5.749 | 3.632 | H1-... |
| 16 | M29 | PL3/8x2.375 | .453 | 0 | 2 | .591 | 0 | y | 6 | 280... | 288... | .224 | 1.428 | 1.317 | H1-... |
| 17 | M30 | PL3/8x6 | .176 | 1.5 | 1 | .403 | 0 | y | 8 | 720... | 72900 | .57 | 9.113 | 1.944 | H1-... |
| 18 | M33 | PL3/8x2.375 | .561 | 0 | 2 | .624 | 0 | y | 8 | 280... | 288... | .224 | 1.428 | 1.314 | H1-... |
| 19 | M34 | PL3/8x6 | .257 | 1.5 | 2 | .426 | 0 | y | 8 | 720... | 72900 | .57 | 9.113 | 1.664 | H1-... |
| 20 | M37 | PL3/8x6 | .289 | 0 | 1 | .129 | 0 | y | 9 | 714... | 72900 | .57 | 9.113 | 1.8 | H1-... |
| 21 | M39 | PL3/8x6 | .277 | 0 | 4 | .090 | 2 | y | 7 | 714... | 72900 | .57 | 9.113 | 1.01 | H1-... |
| 22 | M40 | PL3/8x6 | .678 | 3.528 | 4 | .222 | 0 | y | 8 | 687... | 72900 | .57 | 9.113 | 1.047 | H1-... |
| 23 | M41 | PL3/8x6 | .727 | 3.528 | 1 | .183 | 3.... | y | 8 | 687... | 72900 | .57 | 9.113 | 1.351 | H1-... |
| 24 | M42 | L2x2x3 | .200 | 53.289 | 8 | .025 | 53... | z | 8 | 869... | 233... | .558 | 1.239 | 2.558 | H2-1 |
| 25 | M43 | L2x2x3 | .139 | 53.289 | 1 | .020 | 0 | z | 6 | 869... | 233... | .558 | 1.239 | 2.488 | H2-1 |
| 26 | M44 | PIPE_3.0 | .849 | 0 | 7 | .234 | 0 | | 2 | 547... | 65205 | 5.749 | 5.749 | 3.627 | H1-... |
| 27 | M49 | PL3/8x2.375 | .453 | 0 | 2 | .604 | 0 | y | 7 | 280... | 288... | .224 | 1.428 | 1.315 | H1-... |
| 28 | M50 | PL3/8x6 | .198 | 1.5 | 2 | .412 | 0 | y | 7 | 720... | 72900 | .57 | 9.113 | 1.663 | H1-... |
| 29 | M53 | PL3/8x2.375 | .411 | 0 | 3 | .611 | 0 | y | 6 | 280... | 288... | .224 | 1.428 | 1.315 | H1-... |
| 30 | M54 | PL3/8x6 | .146 | 1.5 | 3 | .416 | 0 | y | 6 | 720... | 72900 | .57 | 9.113 | 1.663 | H1-... |
| 31 | M57 | PL3/8x6 | .286 | 0 | 4 | .107 | 0 | y | 3 | 714... | 72900 | .57 | 9.113 | 1.473 | H1-... |
| 32 | M59 | PL3/8x6 | .245 | 2 | 2 | .091 | 2 | y | 5 | 714... | 72900 | .57 | 9.113 | 1.049 | H1-... |
| 33 | M60 | PL3/8x6 | .567 | 3.528 | 2 | .223 | 0 | y | 7 | 687... | 72900 | .57 | 9.113 | 1.125 | H1-... |
| 34 | M61 | PL3/8x6 | .721 | 3.528 | 4 | .209 | 0 | y | 10 | 687... | 72900 | .57 | 9.113 | 1.269 | H1-... |
| 35 | M62 | L2x2x3 | .201 | 53.289 | 6 | .025 | 53... | z | 6 | 869... | 233... | .558 | 1.239 | 2.548 | H2-1 |
| 36 | M63 | L2x2x3 | .152 | 53.289 | 2 | .020 | 0 | z | 7 | 869... | 233... | .558 | 1.239 | 2.434 | H2-1 |
| 37 | MP1A | PIPE_2.0 | .458 | 60 | 8 | .236 | 30 | | 2 | 208... | 32130 | 1.872 | 1.872 | 2.147 | H1-... |

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

| | Member | Shape | Code Check | Loc[in] | LC | Shear C... | Lo..... | | LC | phi*... | phi*... | phi*... | phi*... | Cb | Eqn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 38 | MP3A | PIPE_2.5 | .410 | 41.625 | 2 | .281 | 41... | | 2 | 261... | 50715 | 3.596 | 3.596 | 3.807 | H3-6 |
| 39 | MP2A | PIPE_2.0 | .500 | 60 | 3 | .120 | 60 | | 3 | 208... | 32130 | 1.872 | 1.872 | 2.043 | H1-... |
| 40 | MP1C | PIPE_2.0 | .527 | 54 | 3 | .253 | 54 | | 3 | 208... | 32130 | 1.872 | 1.872 | 1.902 | H1-... |
| 41 | MP3C | PIPE_2.5 | .380 | 72 | 1 | .228 | 41... | | 3 | 261... | 50715 | 3.596 | 3.596 | 2.583 | H1-... |
| 42 | MP2C | PIPE_2.0 | .459 | 54 | 1 | .116 | 54 | | 1 | 208... | 32130 | 1.872 | 1.872 | 2.127 | H1-... |
| 43 | MP1B | PIPE_2.0 | .559 | 54 | 1 | .210 | 54 | | 1 | 208... | 32130 | 1.872 | 1.872 | 1.92 | H1-... |
| 44 | MP3B | PIPE_2.5 | .390 | 72 | 4 | .232 | 72 | | 4 | 261... | 50715 | 3.596 | 3.596 | 2.894 | H1-... |
| 45 | MP2B | PIPE_2.0 | .516 | 54 | 2 | .119 | 54 | | 2 | 208... | 32130 | 1.872 | 1.872 | 2.144 | H1-... |
| 46 | M82 | PIPE_2.0 | .822 | 18.75 | 1 | .478 | 10... | | 1 | 629... | 32130 | 1.872 | 1.872 | 3.081 | H3-6 |
| 47 | M92 | PIPE_2.0 | .546 | 125 | 3 | .360 | 10... | | 2 | 629... | 32130 | 1.872 | 1.872 | 2.473 | H1-... |
| 48 | M93 | PIPE_2.0 | .795 | 18.75 | 3 | .486 | 10... | | 3 | 629... | 32130 | 1.872 | 1.872 | 2.42 | H3-6 |
| 49 | M100A | L2.5x2.5x4 | .433 | 16.643 | 1 | .176 | 0 | z | 1 | 362... | 38556 | 1.114 | 2.537 | 2.201 | H2-1 |
| 50 | M101A | L2.5x2.5x4 | .441 | 0 | 3 | .140 | 0 | y | 3 | 362... | 38556 | 1.114 | 2.537 | 2.202 | H2-1 |
| 51 | M102A | L2.5x2.5x4 | .437 | 16.643 | 3 | .159 | 0 | z | 3 | 362... | 38556 | 1.114 | 2.537 | 2.148 | H2-1 |

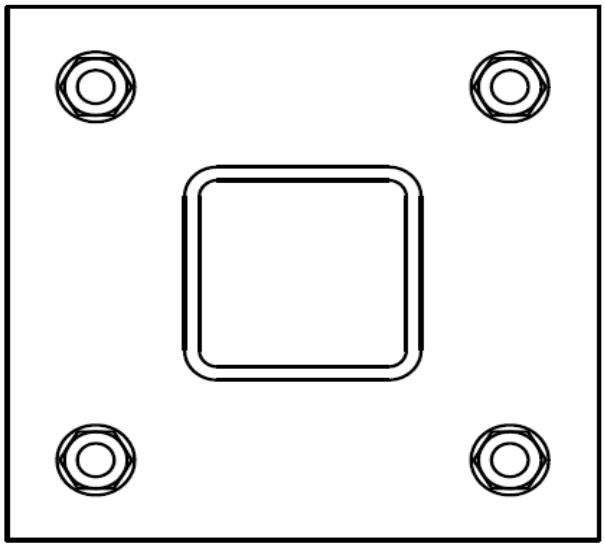
## Envelope AISI S100-10: LRFD Cold Formed Steel Code Checks

| | Member | Shape | Code ... | Loc[in] | LC | Shear ... | Loc[in] | Dir | LC | phi*Pn[lb] | phi*Tn[lb] | phi*Mny... | phi*Mnz... | Cb | Cmyy | Cmzz | Eqn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | M26 | 3.5XCU1... | .992 | 29.25 | 8 | .127 | 29.25 | y | 8 | 33149.1... | 42051.4... | .728 | 3.205 | 1.582 | .85 | .85 | C5.2.2-3 |
| 2 | M46 | 3.5XCU1... | .983 | 29.25 | 6 | .126 | 29.25 | y | 6 | 33149.1... | 42051.4... | .728 | 3.205 | 1.582 | .85 | .85 | C5.1.2-2 |
| 3 | M3 | 3.5XCU1... | .977 | 29.25 | 5 | .126 | 29.25 | y | 5 | 33149.1... | 42051.4... | .728 | 3.205 | 1.582 | .85 | .85 | C5.2.2-3 |
| 4 | M47 | 3.5XCU1... | .953 | 0 | 7 | .130 | 0 | y | 7 | 33149.1... | 42051.4... | .728 | 3.205 | 1.584 | .85 | .85 | C5.2.2-3 |
| 5 | M27 | 3.5XCU1... | .946 | 0 | 6 | .129 | 0 | y | 6 | 33149.1... | 42051.4... | .728 | 3.205 | 1.584 | .85 | .85 | C5.1.2-2 |
| 6 | M4 | 3.5XCU1... | .938 | 0 | 5 | .129 | 0 | y | 5 | 33149.1... | 42051.4... | .728 | 3.205 | 1.585 | .85 | .85 | C5.2.2-3 |

| | | | | |
|---|---|---|---|---|
| TES Tower Engineering Solutions | Standoff Arm Flange Connection Check | | | Date: 5/20/2022 |
| | Customer: | SBA | TIA Standard: | ANSI/TIA-222-g |
| | Carrier: | T-Mobile | Mount Elev. [ft]: | 150 |
| | Site Name: | New Fairfield | Engineer Name: | Progesh Roka |
| | Site Number: | CT13061-A-SBA | Project #: | 128769 |

*NOTE: The calculations shown below are for a single representative load combination for example purposes. The results for all load combinations are presented in the Results Summary Table.*

| | | |
|---|---|---|
| RISA Member Label = | M24 | |
| I or J End? | I | |
| Load Combination # = | 2 | |
| Plate Width, Wp = | 10 | [In] |
| Plate Height, Hp = | 10 | [In] |
| Plate Thickness, tp = | 0.5 | [In] |
| Plate Fy = | 36 | [KSI] |
| Bolt Diameter, db = | 0.625 | [In] |
| Bolt Fu = | 120 | [KSI] |
| Bolt Horizontal Spacing, Sbh = | 7 | [In] |
| Bolt Vertical Spacing, Sbv = | 7 | [In] |
| Standoff Member Shape = | Pipe | |
| Member Width, Wm = | 3.5 | [In] |
| Member Depth, Dm = | 5 | [In] |
| Member Thickness, tm = | 0.19 | [In] |
| Standoff Weld Size = | 0.375 | [In] |
| # Standoff Welds = | 1 | |
| Length of Stiffener, Ls = | | [In] |
| Width of Stiffener, Ws = | | [In] |
| Width of Notch, Wn = | | [In] |
| Stiffener Dim 1, ds1 = | | [In] |
| Stiffener Dim 2, ds2 = | | [In] |
| Stiffener Fy = | | [KSI] |
| Stiffener Weld Size = | | [In] |
| # Stiffener Welds = | | |



Typical Connection Detail

NOTES

Standoff and Stiffener welds are assumed 0.1875 in.

**Capacity Checks:**

| | | |
|---|---|---|
| Max Bolt Shear = | 1.055 | [Kips] |
| Bolt Shear Capacity = | 13.81 | [Kips] |
| Max Bolt Shear Usage = | 7.6% | PASS |
| Max Bolt Tension = | 4.94 | [Kips] |
| Bolt Tension Capacity = | 20.34 | [Kips] |
| Max Bolt Tension Usage = | 24.3% | PASS |
| Max Bolt Interaction = | 24.9% | PASS |
| Max Plate Bending Moment = | 15.80 | [Kip-In] |
| Length of Yield Line = | 8.45 | [In] |
| Plate Moment Capacity = | 17.11 | [Kip-In] |
| Max Plate Usage = | 92.3% | PASS |
| Max Weld Usage = | 11.5% | PASS |

| | Standoff Arm Flange Connection Check | | Date |
|---|---|---|---|
| | | | 5/20/2022 |
| Customer: | SBA | TIA Standard: | ANSI/TIA-222-g |
| Carrier: | T-Mobile | Mount Elev. [ft]: | 150 |
| Site Name: | New Fairfield | Engineer Name: | Progesh Roka |
| Site Number: | CT13061-A-SBA | Project #: | 128769 |

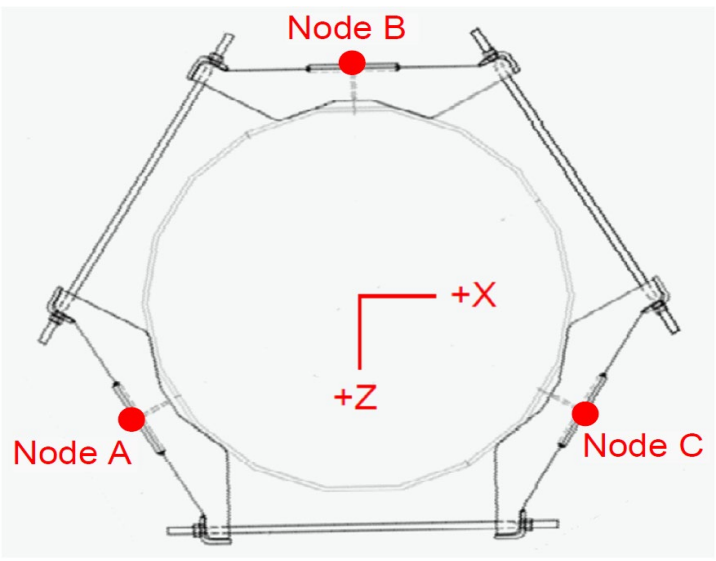
**Results Summary Table**

| Member Label | Member End | Load Combo # | Max Bolt Shear [K] | Max Bolt Tension [K] | Bolt Shear Check | Bolt Tension Check | Bolt Interaction Check | Plate Bending Check | Weld Check |
|---|---|---|---|---|---|---|---|---|---|
| M1 | I | 1 | 0.5133 | 4.3699 | 3.7% | 21.5% | 21.8% | 81.7% | 70.2% |
| M1 | I | 2 | 0.0970 | 0.9089 | 0.7% | 4.5% | 4.5% | 17.0% | 26.1% |
| M1 | I | 3 | 1.0793 | 4.0599 | 7.8% | 20.0% | 21.1% | 75.9% | 71.6% |
| M1 | I | 4 | 1.1243 | 4.1833 | 8.1% | 20.6% | 21.7% | 78.2% | 28.3% |
| M1 | I | 5 | 0.6770 | 4.3511 | 4.9% | 21.4% | 21.9% | 81.4% | 74.7% |
| M1 | I | 6 | 0.5685 | 3.2333 | 4.1% | 15.9% | 16.3% | 60.5% | 57.8% |
| M1 | I | 7 | 0.6234 | 4.3212 | 4.5% | 21.2% | 21.6% | 80.8% | 75.4% |
| M1 | I | 8 | 0.7259 | 4.3144 | 5.3% | 21.2% | 21.5% | 80.7% | 56.5% |
| M1 | I | 9 | 0.3343 | 1.0876 | 2.4% | 5.3% | 5.9% | 20.3% | 18.6% |
| M1 | I | 10 | 0.2705 | 1.1310 | 2.0% | 5.6% | 5.6% | 21.2% | 19.2% |
| M1 | I | 11 | 0.2485 | 1.4957 | 1.8% | 7.4% | 7.6% | 28.0% | 26.1% |
| M24 | I | 1 | 0.8564 | 1.9710 | 6.2% | 9.7% | 11.3% | 36.9% | 40.4% |
| M24 | I | 2 | 1.0555 | 4.9381 | 7.6% | 24.3% | 24.9% | 92.3% | 11.5% |
| M24 | I | 3 | 0.3757 | 0.9176 | 2.7% | 4.5% | 4.9% | 17.2% | 24.8% |
| M24 | I | 4 | 0.6490 | 4.1798 | 4.7% | 20.5% | 20.7% | 78.2% | 68.0% |
| M24 | I | 5 | 0.5834 | 3.9072 | 4.2% | 19.2% | 19.6% | 73.1% | 69.2% |
| M24 | I | 6 | 0.7351 | 4.4459 | 5.3% | 21.9% | 22.2% | 83.1% | 63.1% |
| M24 | I | 7 | 0.6151 | 3.3765 | 4.5% | 16.6% | 16.9% | 63.1% | 57.7% |
| M24 | I | 8 | 0.6359 | 4.3407 | 4.6% | 21.3% | 21.8% | 81.2% | 74.7% |
| M24 | I | 9 | 0.5177 | 3.3001 | 3.7% | 16.2% | 16.6% | 61.7% | 58.2% |
| M24 | I | 10 | 0.4006 | 1.2879 | 2.9% | 6.3% | 6.9% | 24.1% | 23.2% |
| M24 | I | 11 | 0.2485 | 1.4957 | 1.8% | 7.4% | 7.6% | 28.0% | 26.1% |
| M44 | I | 1 | 0.7721 | 1.4624 | 5.6% | 7.2% | 8.9% | 27.3% | 28.6% |
| M44 | I | 2 | 0.8967 | 4.2440 | 6.5% | 20.9% | 21.4% | 79.4% | 71.6% |
| M44 | I | 3 | 0.7532 | 4.3459 | 5.5% | 21.4% | 21.6% | 81.3% | 53.0% |
| M44 | I | 4 | 0.4064 | 1.0497 | 2.9% | 5.2% | 5.5% | 19.6% | 8.8% |
| M44 | I | 5 | 0.6766 | 3.8193 | 4.9% | 18.8% | 19.1% | 71.4% | 56.3% |
| M44 | I | 6 | 0.6305 | 4.3797 | 4.6% | 21.5% | 22.0% | 81.9% | 75.8% |
| M44 | I | 7 | 0.7121 | 4.3409 | 5.2% | 21.3% | 21.7% | 81.2% | 71.4% |
| M44 | I | 8 | 0.5393 | 3.4028 | 3.9% | 16.7% | 17.2% | 63.6% | 61.0% |
| M44 | I | 9 | 0.3483 | 1.1425 | 2.5% | 5.6% | 6.1% | 21.4% | 15.3% |
| M44 | I | 10 | 0.4846 | 3.0901 | 3.5% | 15.2% | 15.6% | 57.8% | 48.7% |
| M44 | I | 11 | 0.2485 | 1.4957 | 1.8% | 7.4% | 7.6% | 28.0% | 26.1% |

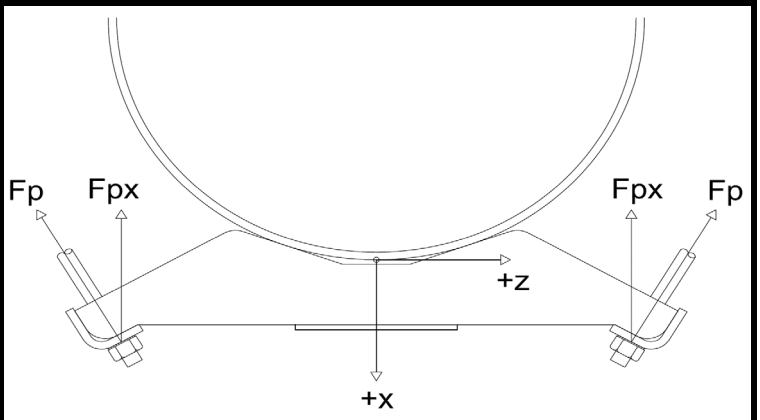
| | Collar Mount Calculations | | Date |
|---|---|---|---|
| | | | 5/20/2022 |
| Customer: | SBA | TIA Standard: | ANSI/TIA-222-G |
| Carrier: | T-Mobile | Mount Elev. [ft]: | 150 |
| Site Name: | New Fairfield | Engineer Name: | Progesh Roka |
| Site Number: | CT13061-A-SBA | TES Project #: | 128769 |

*NOTE: The results for all load combinations are presented in the Results Summary Table.*

| | | |
|---|---|---|
| Collar # = | 1 | |
| RISA Joint Label = | N3 | |
| Load Combination # = | 5 | |
| Collar Configuration # = | 1 | |
| Applied Axial Force, Fx = | -0.398 | [Kips] |
| Applied Moment, $M_{UY}$ = | 0.048 | [Kip-Ft] |
| Applied Moment, $M_{UZ}$ = | 7.460 | [Kip-Ft] |
| Collar Height, H= | 10 | [Inches] |
| # of Rows of Thread Rod, nrows = | 2 | |
| Diameter of Thread Rod, db = | 0.625 | [Inches] |
| Thread Rod Vert. Spacing, Sv = | 6 | [Inches] |
| Thread Rod Horiz. Spacing, Sh = | 16 | [Inches] |
| Thread Rod Fy = | 36 | [KSI] |
| Thread Rod Fu = | 58 | [KSI] |
| Thread Rod Pretension, Fp = | 6.136 | [K/bolt] |
| Fpx = | 5.314 | [K/bolt] |
| ϕ = | 1.0 | |




Typical Collar Mount Configuration




Local Coordinates

**Check Sliding:**

$$\varphi Rns = (2 \cdot nrows \cdot Fpx - T) \cdot \mu$$

| | | |
|---|---|---|
| Applied Tension, T = | 0.398 | |
| Coefficient of Friction, μ = | 0.30 | |
| Applied Vertical Shear, Vy = | 2.534 | [Kips] |
| ϕRns = | 6.257 | |
| Max Usage (Vy/ϕRns): | 40.5% | PASS |

**Check Rotation:**

$$\varphi Mny = (2 \cdot nrows \cdot Fpx + Fx) \cdot (Sh/4)$$

| | | |
|---|---|---|
| Applied Moment, $M_{UY}$ = | 0.048 | [Kip-Ft] |
| ϕMny = | 6.952 | [Kip-Ft] |
| Max Usage (Muy/ϕMny): | 0.7% | PASS |

**Check Tilting:**

$$\varphi Mnz = \sum_{i=1}^{nrows} (2 \cdot Fpx \cdot y_i) - \left(\frac{T \cdot H}{2}\right)$$

| | | |
|---|---|---|
| Applied Moment, $M_{UZ}$ = | 7.460 | |
| ϕMnz = | 8.690 | |
| Max Usage (Muz/ϕMnz): | 85.8% | PASS |

**Check Interaction:**

$$\sqrt{\left(\frac{Vy}{\varphi Rns}\right)^2 + \left(\frac{Muy}{\varphi Mny}\right)^2 + \left(\frac{Muz}{\varphi Mnz}\right)^2} \leq 1$$

| | | |
|---|---|---|
| Interaction Check: | 94.9% | PASS |

| TES Tower Engineering Solutions | Collar Mount Calculations | | Date |
|---|---|---|---|
| | | | 5/20/2022 |
| | Customer: SBA | TIA Standard: | ANSI/TIA-222-G |
| | Carrier: T-Mobile | Mount Elev. [ft]: | 150 |
| | Site Name: New Fairfield | Engineer Name: | Progesh Roka |
| | Site Number: CT13061-A-SBA | TES Project #: | 128769 |

**Results Summary Table**

| Collar # | Joint Label | Load Combo # | Tension [K] | Muy [K-Ft] | Muz [K-Ft] | Sliding Check | Rotation Check | Tilting Check | Interaction Check |
|---|---|---|---|---|---|---|---|---|---|
| 1 | N3 | 1 | 1.8594 | 0.3447 | 6.2593 | 33.2% | 5.3% | 77.5% | 84.4% |
| 1 | N3 | 2 | 0.0000 | 0.3381 | 1.7359 | 5.6% | 4.4% | 19.6% | 20.9% |
| 1 | N3 | 3 | 0.0000 | 5.5308 | 2.2269 | 12.3% | 77.9% | 25.1% | 82.8% |
| 1 | N3 | 4 | 0.1105 | 5.5427 | 2.3292 | 12.4% | 78.6% | 26.4% | 83.9% |
| 1 | N3 | 5 | 0.3983 | 0.0483 | 7.4603 | 40.5% | 0.7% | 85.8% | 94.9% |
| 1 | N3 | 6 | 0.0000 | 0.0392 | 5.9661 | 33.0% | 0.5% | 67.4% | 75.0% |
| 1 | N3 | 7 | 0.0220 | 1.0832 | 6.7076 | 36.4% | 15.3% | 75.8% | 85.5% |
| 1 | N3 | 8 | 0.0428 | 1.0752 | 6.7197 | 36.5% | 15.2% | 76.0% | 85.7% |
| 1 | N3 | 9 | 0.1860 | 0.0093 | 1.9222 | 11.2% | 0.1% | 21.9% | 24.6% |
| 1 | N3 | 10 | 0.1888 | 0.0586 | 1.9193 | 11.1% | 0.8% | 21.9% | 24.5% |
| 1 | N3 | 11 | 0.0117 | 0.0014 | 2.6576 | 14.4% | 0.0% | 30.0% | 33.3% |
| 1 | N35 | 1 | 0.0000 | 4.3158 | 0.2325 | 3.4% | 58.3% | 2.6% | 58.4% |
| 1 | N35 | 2 | 1.0079 | 4.2598 | 4.3136 | 22.4% | 63.1% | 51.1% | 84.3% |
| 1 | N35 | 3 | 0.0000 | 0.9260 | 1.2262 | 3.4% | 12.2% | 13.8% | 18.7% |
| 1 | N35 | 4 | 1.5644 | 0.8276 | 5.7474 | 30.3% | 12.6% | 70.1% | 77.3% |
| 1 | N35 | 5 | 0.0000 | 0.8177 | 6.3346 | 34.7% | 11.5% | 71.5% | 80.3% |
| 1 | N35 | 6 | 0.2266 | 0.8072 | 7.0927 | 38.5% | 11.5% | 80.9% | 90.4% |
| 1 | N35 | 7 | 0.0000 | 0.1898 | 6.0650 | 33.5% | 2.6% | 68.5% | 76.3% |
| 1 | N35 | 8 | 0.3394 | 0.1952 | 7.3610 | 39.9% | 2.8% | 84.5% | 93.5% |
| 1 | N35 | 9 | 0.0000 | 0.4589 | 5.2633 | 26.0% | 6.5% | 59.4% | 65.2% |
| 1 | N35 | 10 | 0.0000 | 0.4276 | 2.0672 | 12.4% | 6.0% | 23.3% | 27.1% |
| 1 | N35 | 11 | 0.0117 | 0.0014 | 2.6580 | 14.4% | 0.0% | 30.0% | 33.3% |
| 1 | N61 | 1 | 0.0000 | 3.1987 | 0.2942 | 3.3% | 43.4% | 3.3% | 43.7% |
| 1 | N61 | 2 | 0.8732 | 3.1117 | 4.2356 | 22.2% | 45.8% | 49.9% | 71.3% |
| 1 | N61 | 3 | 1.6434 | 1.0984 | 5.7907 | 30.4% | 16.8% | 70.9% | 78.9% |
| 1 | N61 | 4 | 0.0000 | 1.1783 | 1.2712 | 3.4% | 15.4% | 14.4% | 21.4% |
| 1 | N61 | 5 | 0.0000 | 0.6621 | 6.3426 | 34.7% | 9.3% | 71.6% | 80.1% |
| 1 | N61 | 6 | 0.2081 | 0.6686 | 7.0847 | 38.4% | 9.5% | 80.8% | 90.0% |
| 1 | N61 | 7 | 0.3505 | 0.2209 | 7.3676 | 40.0% | 3.2% | 84.6% | 93.6% |
| 1 | N61 | 8 | 0.0000 | 0.2326 | 6.0589 | 33.5% | 3.2% | 68.4% | 76.2% |
| 1 | N61 | 9 | 0.0000 | 0.3181 | 1.9205 | 11.7% | 4.5% | 21.7% | 25.0% |
| 1 | N61 | 10 | 0.0000 | 0.3334 | 5.0589 | 25.3% | 4.7% | 57.1% | 62.7% |
| 1 | N61 | 11 | 0.0117 | 0.0014 | 2.6574 | 14.4% | 0.0% | 30.0% | 33.3% |

# Exhibit F

## Power Density/RF Emissions Report

Fox Hill Telecom

# Radio Frequency Emissions Analysis Report

T-Mobile

## Site ID: CTFF750A

New Fairfield
29 Bogus Hill Road
New Fairfield, CT 06812

**June 3, 2022**

**Fox Hill Telecom Project Number: 221289**

| Site Compliance Summary | |
|---|---|
| Compliance Status: | **COMPLIANT** |
| Site total MPE% of FCC general population allowable limit: | **10.95 %** |

Fox Hill Telecom

June 3, 2022

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

Emissions Analysis for Site: **CTFF750A – New Fairfield**

Fox Hill Telecom, Inc ("Fox Hill") was directed to analyze the proposed upgrades to the T-MOBILE facility located at **29 Bogus Hill Road, New Fairfield, CT**, for the purpose of determining whether the emissions from the Proposed T-MOBILE Antenna Installation located on this property are within specified federal limits.

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

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

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

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

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

Additional details can be found in FCC OET 65.

# CALCULATIONS

Calculations were performed for the proposed upgrades to the T-MOBILE antenna facility located at **29 Bogus Hill Road, New Fairfield, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-MOBILE is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

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

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

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

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

*Table 1: Channel Data Table*

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

| Sector | Antenna Number | Antenna Make / Model | Antenna Centerline (ft) |
|---|---|---|---|
| A | 1 | RFS APXVAALL24_43-U-NA20 | 150 |
| A | 2 | RFS APXV18-206517S-C-A20 | 150 |
| A | 3 (Dormant) | RFS APXV18-209014 | 150 |
| B | 1 | RFS APXVAALL24_43-U-NA20 | 150 |
| B | 2 | RFS APXV18-206517S-C-A20 | 150 |
| B | 3 (Dormant) | RFS APXV18-209014 | 150 |
| C | 1 | RFS APXVAALL24_43-U-NA20 | 150 |
| C | 2 | RFS APXV18-206517S-C-A20 | 150 |
| C | 3 (Dormant) | RFS APXV18-209014 | 150 |

*Table 2: Antenna Data*

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

## RESULTS

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

| Antenna ID | Antenna Make / Model | Frequency Bands | Antenna Gain (dBd) | Channel Count | Total TX Power (W) | ERP (W) | MPE % |
|---|---|---|---|---|---|---|---|
| Antenna A1 | RFS APXVAALL24_43-U-NA20 | 600 MHz / 700 MHz | 13.65 / 13.85 | 4 | 120 | 2,824.56 | 1.16 |
| Antenna A2 | RFS APXV18-206517S-C-A20 | 1900 MHz (PCS) / 2100 MHz (AWS) | 16.65 / 16.65 | 9 | 335 | 15,489.76 | 2.68 |
| Antenna A3 | RFS APXV18-209014 | Dormant Antenna | NA | 0 | NA | NA | NA |
| | | | | | | Sector A Composite MPE% | **3.84** |
| Antenna B1 | RFS APXVAALL24_43-U-NA20 | 600 MHz / 700 MHz | 13.65 / 13.85 | 4 | 120 | 2,824.56 | 1.16 |
| Antenna B2 | RFS APXV18-206517S-C-A20 | 1900 MHz (PCS) / 2100 MHz (AWS) | 16.65 / 16.65 | 9 | 335 | 15,489.76 | 2.68 |
| Antenna B3 | RFS APXV18-209014 | Dormant Antenna | NA | 0 | NA | NA | NA |
| | | | | | | Sector B Composite MPE% | **3.84** |
| Antenna C1 | RFS APXVAALL24_43-U-NA20 | 600 MHz / 700 MHz | 13.65 / 13.85 | 4 | 120 | 2,824.56 | 1.16 |
| Antenna C2 | RFS APXV18-206517S-C-A20 | 1900 MHz (PCS) / 2100 MHz (AWS) | 16.65 / 16.65 | 9 | 335 | 15,489.76 | 2.68 |
| Antenna C3 | RFS APXV18-209014 | Dormant Antenna | NA | 0 | NA | NA | NA |
| | | | | | | Sector C Composite MPE% | **3.84** |

*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 | **3.84 %** |
| AT&T | 4.17 % |
| CL&P | 0.51 % |
| Verizon Wireless | 2.43 % |
| **Site Total MPE %:** | **10.95 %** |

*Table 4: All Carrier MPE Contributions*

| | |
|---|---|
| T-MOBILE Sector A Total: | 3.84 % |
| T-MOBILE Sector B Total: | 3.84 % |
| T-MOBILE Sector C Total: | 3.84 % |
| | |
| Site Total: | 10.95 % |

*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 600 MHz LTE / 5G NR | 2 | 926.96 | 150 | 3.21 | 600 MHz | 400 | 0.80% |
| T-Mobile 700 MHz LTE | 2 | 485.32 | 150 | 1.68 | 700 MHz | 467 | 0.36% |
| T-Mobile 1900 MHz (PCS) LTE | 4 | 1,849.52 | 150 | 12.83 | 1900 MHz (PCS) | 1000 | 1.28% |
| T-Mobile 1900 MHz (PCS) GSM | 1 | 693.57 | 150 | 1.20 | 1900 MHz (PCS) | 1000 | 0.12% |
| T-Mobile 2100 MHz (AWS) LTE | 4 | 1,849.52 | 150 | 12.83 | 2100 MHz (AWS) | 1000 | 1.28% |
| | | | | | | **Total:** | **3.84%** |

*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: | 3.84 % |
| Sector B: | 3.84 % |
| Sector C: | 3.84 % |
| T-MOBILE Maximum Total (per sector): | 3.84 % |
| | |
| Site Total: | 10.95 % |
| | |
| Site Compliance Status: | **COMPLIANT** |

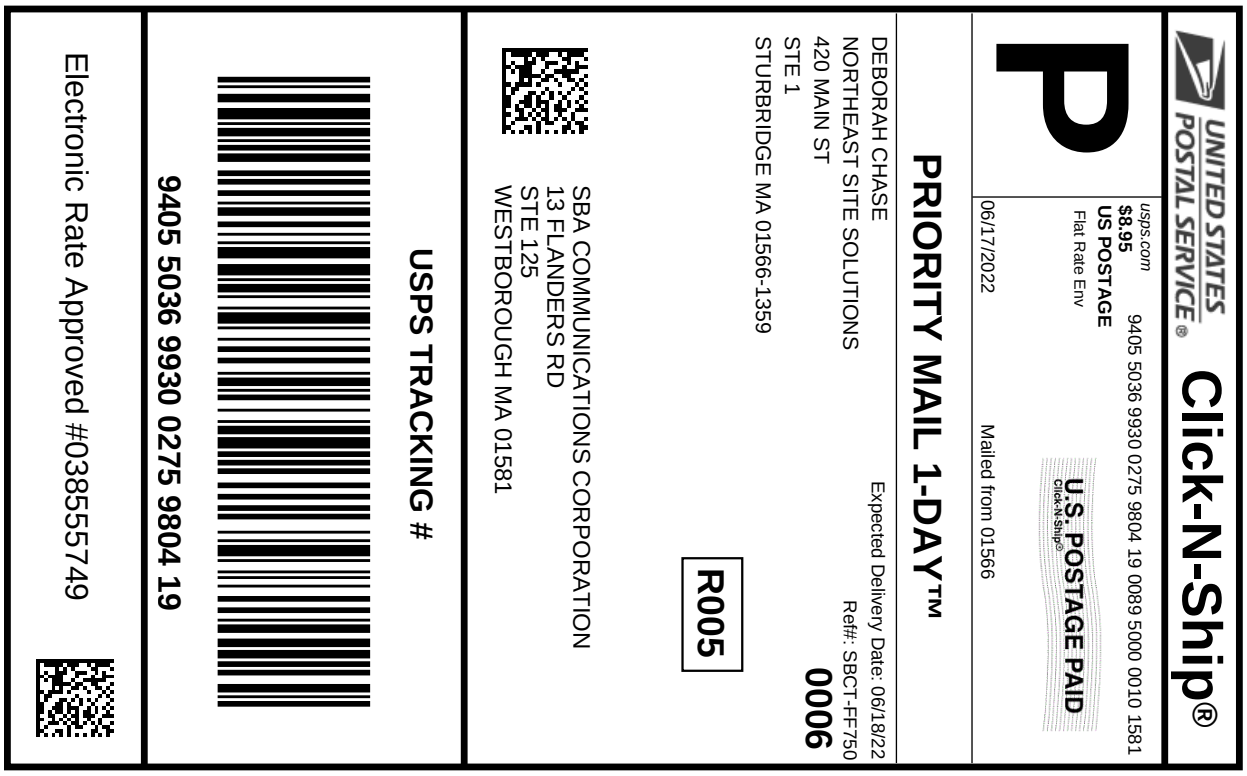
The anticipated composite MPE value for this site assuming all carriers present is **10.95 %** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

Scott Heffernan
Principal RF Engineer
**Fox Hill Telecom, Inc**
Holden, MA 01520
(978)660-3998

# Exhibit G

## Recipient Mailings

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**USPS TRACKING # :**
**9405 5036 9930 0275 9804 19**

| | |
|---|---|
| Trans. #: | 565830887 |
| Print Date: | 06/17/2022 |
| Ship Date: | 06/17/2022 |
| Expected Delivery Date: | 06/18/2022 |

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

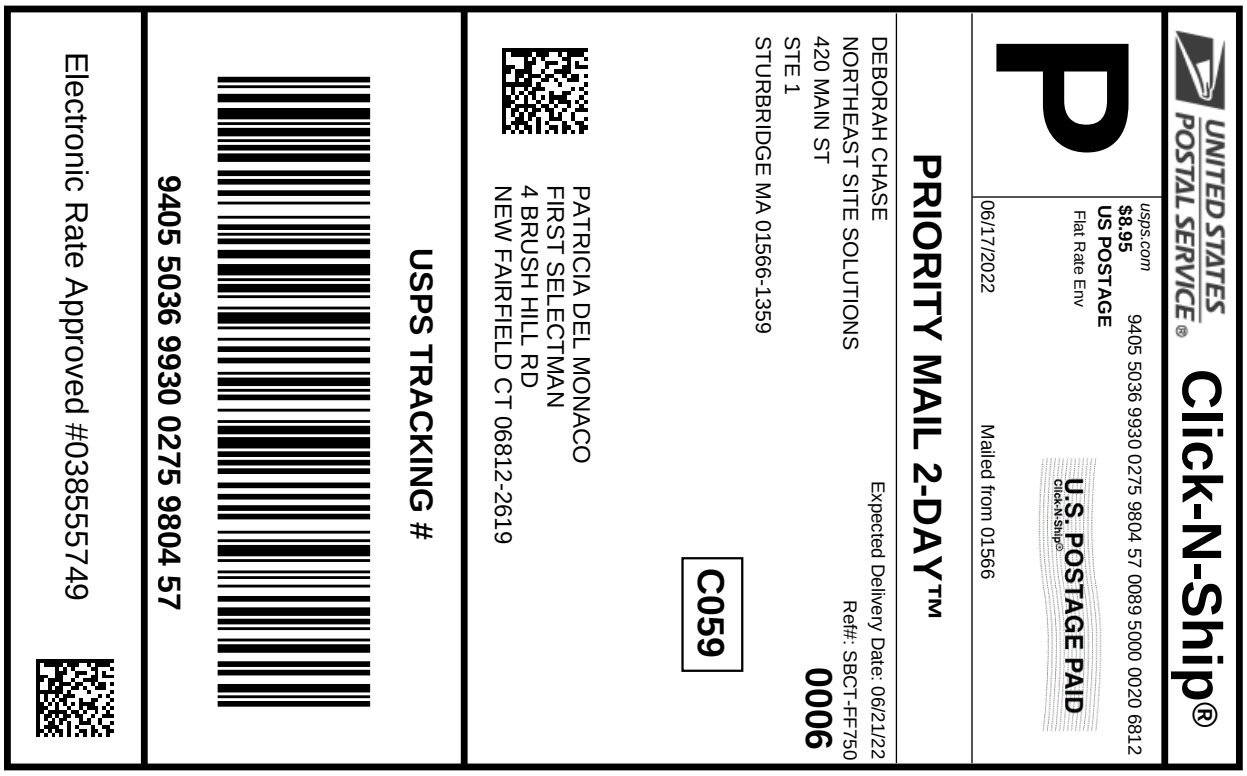
**From:** DEBORAH CHASE
NORTHEAST SITE SOLUTIONS
420 MAIN ST
STE 1
STURBRIDGE MA 01566-1359

Ref#: SBCT-FF750

**To:** SBA COMMUNICATIONS CORPORATION
13 FLANDERS RD
STE 125
WESTBOROUGH MA 01581

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

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

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|---|---|
| Trans. #: | 565830887 |
| Print Date: | 06/17/2022 |
| Ship Date: | 06/17/2022 |
| Expected Delivery Date: | 06/21/2022 |

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

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

Ref#: SBCT-FF750

**To:** PATRICIA DEL MONACO
FIRST SELECTMAN
4 BRUSH HILL RD
NEW FAIRFIELD CT 06812-2619

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06/17/2022 Mailed from 01566

**U.S. POSTAGE PAID**
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**PRIORITY MAIL 2-DAY™**

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

Expected Delivery Date: 06/21/22
Ref#: SBCT-FF750

**0006**

**C059**

EVAN WHITE
ZONING ENFORCEMENT OFFICER
4 BRUSH HILL RD
NEW FAIRFIELD CT 06812-2619

**USPS TRACKING #**

**9405 5036 9930 0275 9804 71**

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## Click-N-Ship® Label Record

**USPS TRACKING # :**
**9405 5036 9930 0275 9804 71**

| | |
|---|---|
| Trans. #: | 565830887 |
| Print Date: | 06/17/2022 |
| Ship Date: | 06/17/2022 |
| Expected Delivery Date: | 06/21/2022 |

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

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

Ref#: SBCT-FF750

**To:** EVAN WHITE
ZONING ENFORCEMENT OFFICER
4 BRUSH HILL RD
NEW FAIRFIELD CT 06812-2619

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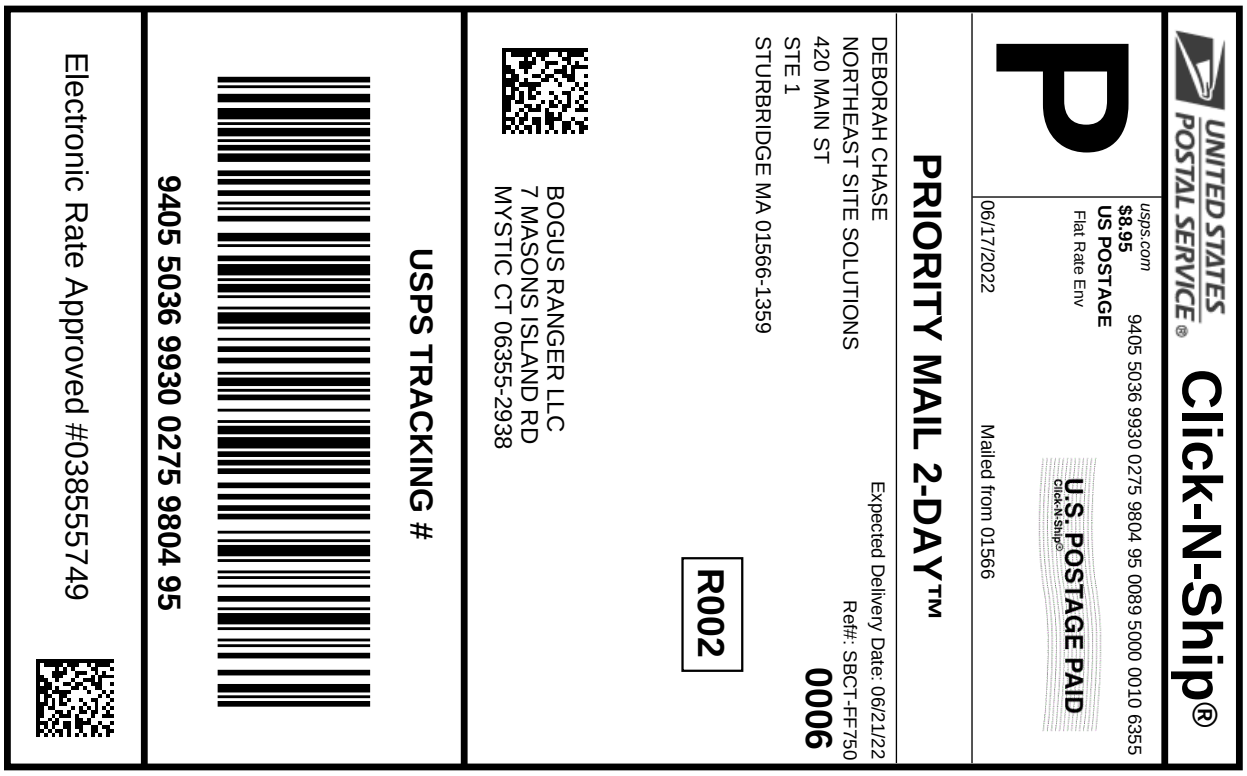


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## Click-N-Ship® Label Record

**USPS TRACKING # :**
**9405 5036 9930 0275 9804 95**

| | |
|---|---|
| Trans. #: | 565830887 |
| Print Date: | 06/17/2022 |
| Ship Date: | 06/17/2022 |
| Expected Delivery Date: | 06/21/2022 |

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

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

Ref#: SBCT-FF750

**To:** BOGUS RANGER LLC
7 MASONS ISLAND RD
MYSTIC CT 06355-2938

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

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UNITED STATES POSTAL SERVICE.

FARMINGTON
210 MAIN ST
FARMINGTON, CT 06032-9998
(800)275-8777

06/22/2022 10:40 AM

| Product | Qty | Unit Price | Price |
|---|---|---|---|
| Prepaid Mail<br>Westborough, MA 01581<br>Weight: 0 lb 2.00 oz<br>Acceptance Date:<br>Wed 06/22/2022<br>Tracking #:<br>9405 5036 9930 0275 9804 19 | 1 | | $0.00 |
| Prepaid Mail<br>New Fairfield, CT 06812<br>Weight: 0 lb 9.50 oz<br>Acceptance Date:<br>Wed 06/22/2022<br>Tracking #:<br>9405 5036 9930 0275 9804 71 | 1 | | $0.00 |
| Prepaid Mail<br>New Fairfield, CT 06812<br>Weight: 0 lb 9.40 oz<br>Acceptance Date:<br>Wed 06/22/2022<br>Tracking #:<br>9405 5036 9930 0275 9804 57 | 1 | | $0.00 |
| Prepaid Mail<br>Mystic, CT 06355<br>Weight: 0 lb 9.50 oz<br>Acceptance Date:<br>Wed 06/22/2022<br>Tracking #:<br>9405 5036 9930 0275 9804 95 | 1 | | $0.00 |
| Grand Total: | | | $0.00 |

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