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

**VIA ELECTRONIC MAIL**

January 5, 2021

G. Scott Shepherd
Site Development Specialist II
SBA Communications Corporation
134 Flanders Road, Suite 125
Westborough, MA 01581

RE: **EM-T-MOBILE-028-201112** – T-Mobile notice of intent to modify an existing telecommunications facility located at 29 Mahoney Road, Colchester, Connecticut.

Dear Mr. Shepherd:

The Connecticut Siting Council (Council) is in receipt of your correspondence of January 4, 2021 submitted in response to the Council's November 25, 2020 notification of an incomplete request for exempt modification with regard to the above-referenced matter.

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

Thank you for your attention and cooperation.

*s/ Melanie A. Bachman*

Melanie A. Bachman
Executive Director

MAB/IN/emr

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

January 4, 2021

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

**RE: Notice of Exempt Modification**
**29 Mahoney Road, Colchester, CT 06415**
**Latitude: 41.564533**
**Longitude: -72.251697**
**T-Mobile Site #: CT11472A_L600**

Dear Ms. Bachman:

T-Mobile currently maintains twelve (12) antennas at the 177-foot level of the existing 180-foot Monopole Tower at 29 Mahoney Rd., Colchester, CT. The 180-foot tower is owned by SBA Properties, LLC. The property is owned by the Colchester Fish & Game Club, Inc. T-Mobile now intends to remove three (3) L700/L600 MHz antennas and replace them three (3) new L600/L700, 1900/2100 MHz antennas.

The new antennas support 5G services and would be installed at the 177-foot level of the tower.

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

Planned Modifications:

TOWER

Remove:

- N/A

Remove and Replace:

- (3) Commscope LNX-6514DS antenna (remove) – (3) RFS APXVAARR18_43-u-NA20 antenna (replace)
- (3) Allen Tel FE15501P7775 TMA (remove) - (3) Ericsson KRY 112 489/2 TMA (replace)

Install New:

- (1) 1-5/8" Fiber
- (3)Ericsson KRY 112/144/2 TMA
- (3) Ericsson Radio 4449 RRU
- (3) Kathrein 782 10662 Bias T

Existing Equipment to Remain:

- (1) Low Profile Platform
- (9) EMS RR90-17-02DP antenna
- (12) 1-5/8" Coax

Entitlements:

- (3) Allen Tel FE15501P7775 TMA

GROUND

Install New:

- Equipment inside existing 6102 cabinet

This facility was approved by the Town of Colchester's Planning and Zoning Commission on March 15, 2000. Approval was given under SDP #2000-238. A bond was to be posted prior to commencement of work. No post construction stipulations were set. Please see attached.
Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. §16.50j-72(b)(2). In accordance with R.C.S.A. § 16.50j-73, a copy of this letter is being sent to the Town of Colchester's First Selectman, Art Shilosky and Town Planner, Randall Benson, as well as to the property owner. (Separate notice is not being sent to tower owner, as it belongs to SBA.)

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. §16.50j-72(b)(2).

1. The proposed modifications will not result in an increase in the height of the existing structure.
2. The proposed modification will not require the extension of the site boundary.
3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard.
5. The proposed modification will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The existing structure and its foundation can support the proposed loading.

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

Sincerely,

Site Development Specialist II
SBA COMMUNICATIONS CORPORATION
134 Flanders Rd., Suite 125
Westborough, MA 01581
508.251.0720 x3804 + T
508.366.2610 + F
508.868.6000 + C
GShepherd@sbasite.com

Attachments
cc: Art Shilosky, First Selectman / with attachments
*127 Norwich Avenue, Colchester, CT 06415*
*Randall Benson, Town Planner / with attachments*
*127 Norwich Avenue, Colchester, CT 06415*
Colchester Fish and Game Club / with attachments
PO Box 257 Colchester, CT 06415

Exhibit List

| | | |
|---|---|---|
| Exhibit 1 | Check Copy | To be invoiced at a later per Covid guidelines |
| Exhibit 2 | Notification Receipts | X |
| Exhibit 3 | Property Card | X |
| Exhibit 4 | Property Map | X |
| Exhibit 5 | Original Zoning Approval | Town of Colchester Z&P Commission 3/15/2000 |
| Exhibit 6 | Construction Drawings | Chappell Engineering 1/4/21 |
| Exhibit 7 | Structural Analysis | TES 7/16/19 |
| Exhibit 8 | Mount Analysis | TES 8/6/19 |
| Exhibit 10 | EME Report | Transcom Engineering 6/12/19 |

EXHIBIT 1

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

# EXHIBIT 2


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

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


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# EXHIBIT 3

# Town of Colchester, CT

Property Listing Report | Map Block Lot 03-03/002-000 | Account C0061900 | PID 924

## Property Information

| | |
|---|---|
| Property Location | 29 MAHONEY RD |
| Owner | COLCHESTER FISH + GAME CLUB IN |
| Co-Owner | |
| Mailing Address | PO BOX 257<br>COLCHESTER CT 06415 |
| Land Use | 1060 Vacant w Improvmts |
| Land Class | R |
| Zoning Code | R60 |
| Census Tract | 36 |
| Sub Lot | |

| | |
|---|---|
| Neighborhood | 0050 |
| Acreage | 90 |
| Utilities | Well,Septic |
| Lot Setting/Desc | Rural Below |
| Survey Map | |
| Additional Info | |

## Photo

## Sketch

## Primary Construction Details

| | | | | | |
|---|---|---|---|---|---|
| Year Built | | Bedrooms | | Exterior Walls | |
| Stories | | Full Bathrooms | | Interior Walls | |
| Building Style | | Half Bathrooms | | Heating Type | |
| Building Use | | Bath Style | | Heating Fuel | |
| Building Condition | | Kitchen Style | | AC Type | |
| Floors | | Roof Style | | Gross Bldg Area | |
| Total Rooms | | Roof Cover | | Total Living Area | |

Report Created On 5/16/2019

# Town of Colchester, CT

Property Listing Report | Map Block Lot 03-03/002-000 | Account C0061900

## Valuation Summary

(Assessed value = 70% of Appraised Value)

| Item | Appraised | Assessed |
|---|---|---|
| Buildings | 0 | 0 |
| Extras | 0 | 0 |
| Outbuildings | 6600 | 4600 |
| Land | 394000 | 203790 |
| Total | 400600 | 208390 |

## Outbuilding and Extra Items

| Type | Description |
|---|---|
| Canopy Ave | 377.00 S.F. |
| Canopy Ave | 720.00 S.F. |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |

## Sub Areas

| Subarea Type | Gross Area (sq ft) | Living Area (sq ft) |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| Total Area | | 0 |

## Sales History

| Owner of Record | Book/ Page | Sale Date | Sale Price |
|---|---|---|---|
| COLCHESTER FISH + GAME CLUB IN | 0086/0409 | 6/15/1965 | 0 |

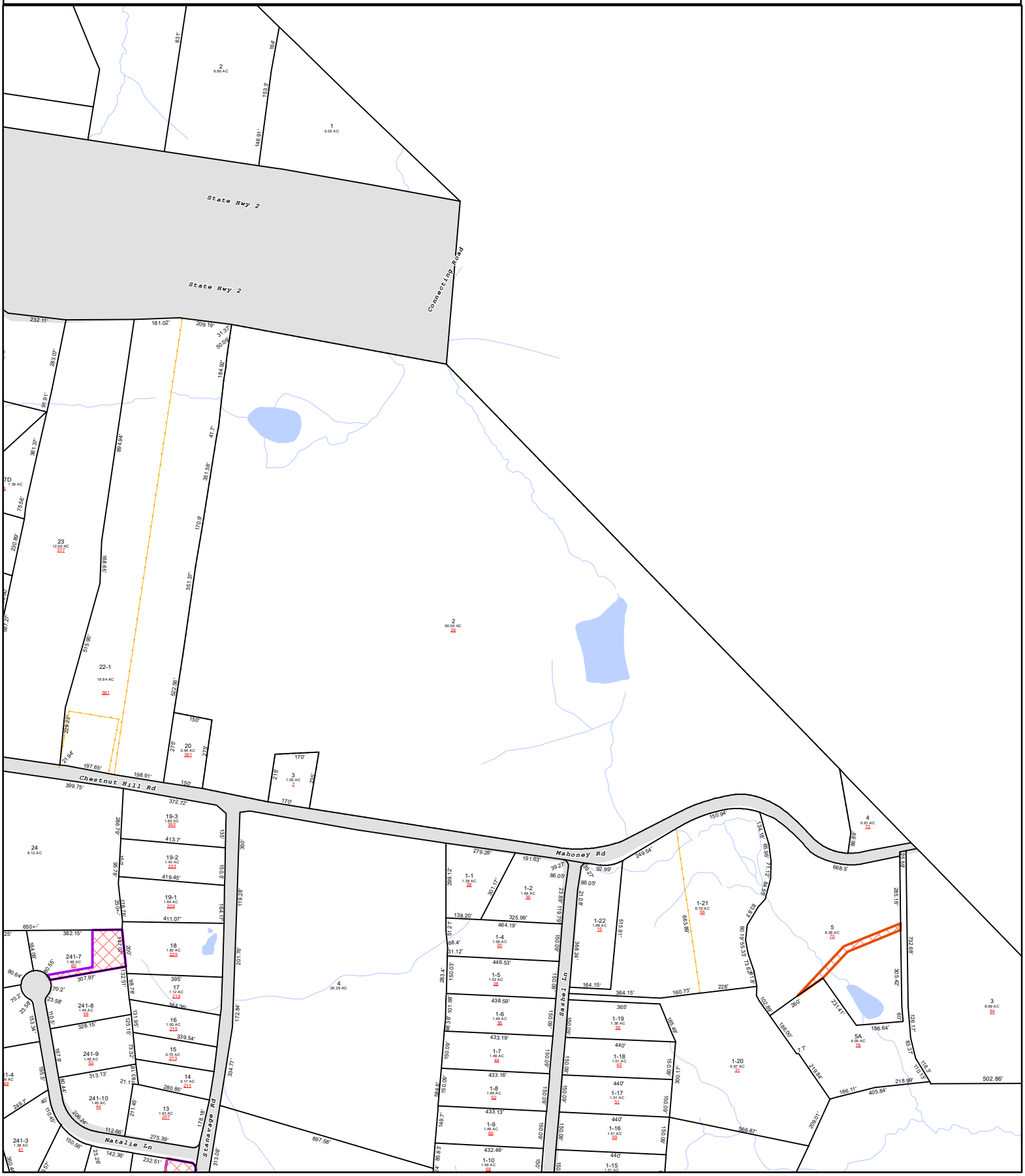
Report Created On 5/16/2019

# EXHIBIT 4

# Town of Colchester, Connecticut - Assessment Parcel Map

Parcel: 03-03-002-000

Address: 29 MAHONEY RD




**Approximate Scale:** **1 inch = 500 feet**

0 260 520 780 1,040 Feet

**Map Produced: September 2018 / Grand List: 2017**

# EXHIBIT 5

TOWN OF COLCHESTER
INCORPORATED
1698
CONNECTICUT

**Planning and Zoning**
Planning Director
Town Engineer
**Code Administration**
Health Director
Building Official
Fire Marshal
Registered Sanitarian
Zoning Enforcement
Wetlands Enforcement

***VIA CERTIFIED MAIL***
***RETURN RECEIPT REQUESTED***

March 16, 2000

Esther McNanny and Jim Smith
SBA, Inc.
80 Eastern Boulevard
Glastonbury, CT 06033

**RE: SDP#2000-238, Application of SBA, Inc. for Site Development Plan Review for Communications Tower at 29 Mahoney Road, Colchester, CT**

Dear Esther and Jim:

The Colchester Zoning & Planning Commission at its March 15, 2000 regular meeting *approved* your above-referenced application. Notice of this decision will be published in the Zone 4 Section of the Hartford Courant and in the Rivereast News Bulletin on Friday, March 17, 2000.

Per Section 12.10.1 of the Zoning Regulations, a bond in the amount of 25% of the total cost of site improvements must be posted prior to the endorsement of this plan and/or commencement of work. A bond estimate must be submitted to the Town Engineer for his review and approval.

Please feel free to contact me at (860) 537-7294 with any questions.

Very truly yours,

Liz Rasmussen
Zoning Enforcement Officer

/lbr
cc: File
(p:/liz/zpc/decisionletters/sdp#2000-23829mahoneyroadsba)

# EXHIBIT 6

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

# RT2/COLCHESTER-BOZRAH

## 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 |

29 MAHONEY ROAD
COLCHESTER, CT 06415
NEW LONDON COUNTY

## SITE NO.: CT11472A

SITE TYPE: 180'± MONOPOLE

RF DESIGN GUIDELINE: CUSTOM

## SITE NOTES

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

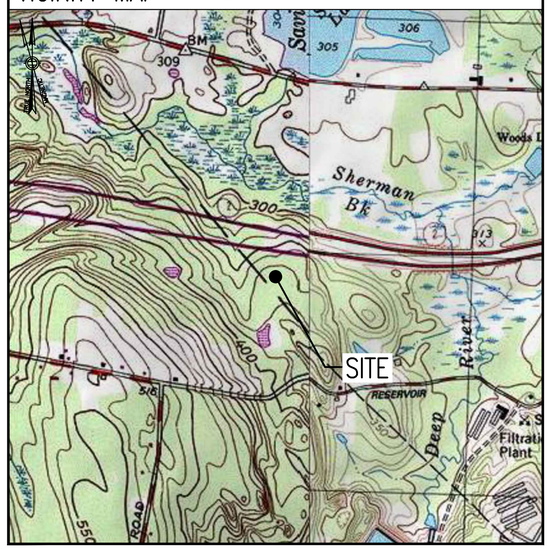
## GENERAL NOTES

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

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

## VICINITY MAP

SCALE: 1" = 1000'-0"




## DO NOT SCALE DRAWINGS

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

## SHEET INDEX

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

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

## PROJECT SUMMARY

| | |
|---|---|
| SITE NUMBER: | CT11472A |
| SBA SITE NUMBER: | CT02652-S |
| SBA SITE NAME: | COLCHESTER 3 |
| SITE ADDRESS: | 29 MAHONEY ROAD<br>COLCHESTER, CT 06415 |
| PROPERTY OWNER: | COLCHESTER FISH & GAME CLUB, INC.<br>COLCHESTER, CT 06415-0257 |
| TOWER OWNER: | SBA PROPERTIES, LLC<br>8501 CONGRESS AVENUE<br>BOCA RATON, FL 33487<br>PHONE: 561-226-9523 |
| COUNTY: | NEW LONDON COUNTY |
| ZONING DISTRICT: | RURAL |
| STRUCTURE TYPE: | MONOPOLE |
| STRUCTURE HEIGHT: | 180' |
| APPLICANT: | T-MOBILE NORTHEAST LLC<br>15 COMMERCE WAY, SUITE B<br>NORTON, MA 02766 |
| SBA RSM: | STEPHEN ROTH<br>PHONE: 860-539-4920<br>EMAIL: SRoth@sbasite.com |
| 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: 41.564499° 41°33'52.1964"<br>LONGITUDE: -72.251655° 72°15'05.958" |


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
1/4/2021

CHECKED BY: JMT

APPROVED BY: JMT

### SUBMITTALS

| REV. | DATE | DESCRIPTION | BY |
|---|---|---|---|
| 2 | 01/04/21 | CONSTRUCTION REVISED | CMC |
| 1 | 09/23/19 | ISSUED FOR CONSTRUCTION | CMC |
| 0 | 05/07/19 | ISSUED FOR REVIEW | CMC |

SITE NUMBER:
CT11472A

SITE ADDRESS:
29 MAHONEY ROAD
COLCHESTER, CT 06415

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1

1815.087

## 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
1/4/2021

CHECKED BY: JMT

APPROVED BY: JMT

SUBMITTALS

| REV. | DATE | DESCRIPTION | BY |
|---|---|---|---|
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| 2 | 01/04/21 | CONSTRUCTION REVISED | CMC |
| 1 | 09/23/19 | ISSUED FOR CONSTRUCTION | CMC |
| 0 | 05/07/19 | ISSUED FOR REVIEW | CMC |

SITE NUMBER:
CT11472A

SITE ADDRESS:
29 MAHONEY ROAD
COLCHESTER, CT 06415

SHEET TITLE
GENERAL NOTES

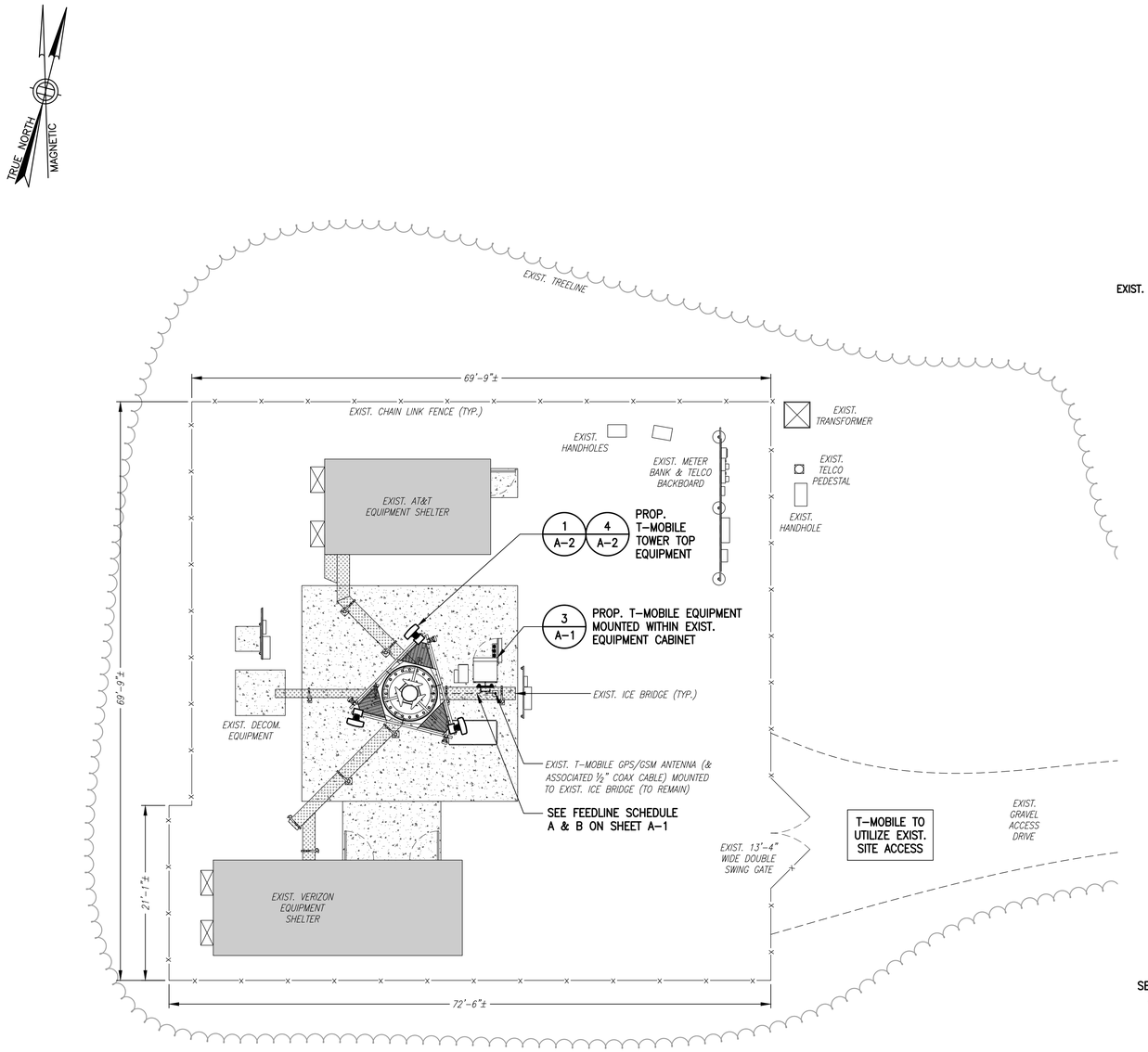
SHEET NUMBER
GN-1

1815.087

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.

| FEEDLINE SCHEDULE | FEEDLINES | LOCATION |
|---|---|---|
| A | *EXISTING TO REMAIN:* *(12) 1-¼" COAX CABLES* | ROUTED PER STRUCTURAL ANALYSIS |
| B | PROPOSED: (3) 1-⅝" HCS FIBER CABLE | |

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

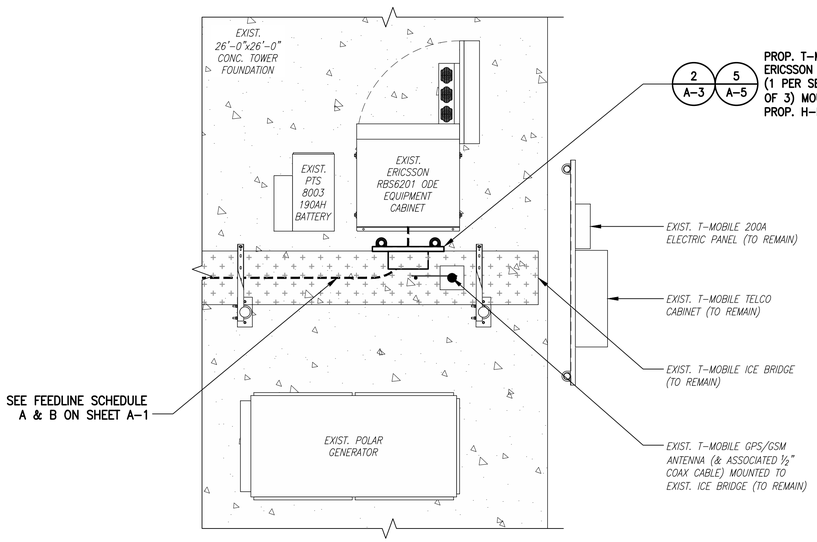



COMPOUND PLAN 1 A-1
SCALE: 1/8" = 1'-0"
0 4'-0" 8'-0" 16'-0" 24'-0"

EXIST. EQUIPMENT AREA 3 A-1

SOURCE: CEA SITE VISIT 04.23.19

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




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


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

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


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JAMES M. FITZGERALD
No. 25997
LICENSED PROFESSIONAL CIVIL ENGINEER
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CHECKED BY: JMT

APPROVED BY: JMT

SUBMITTALS

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COMPOUND & EQUIPMENT PLAN

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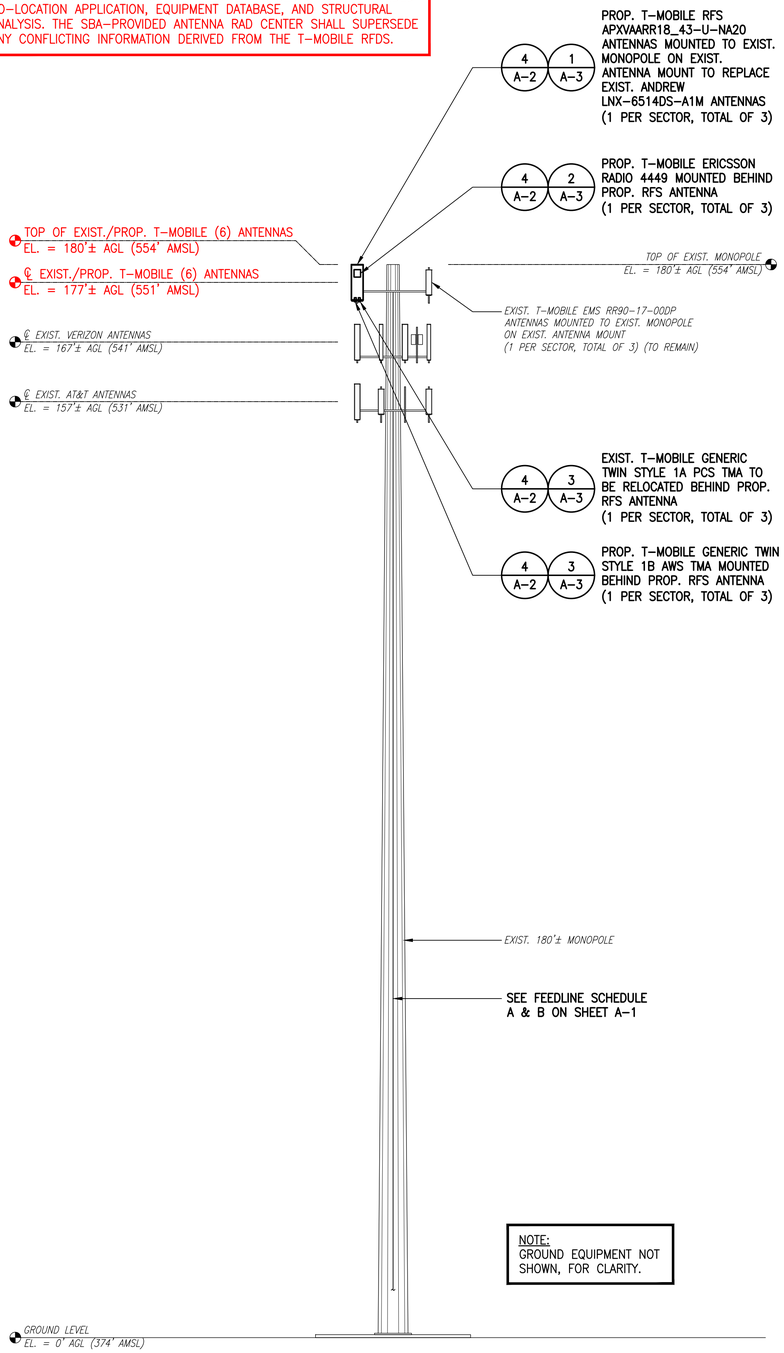
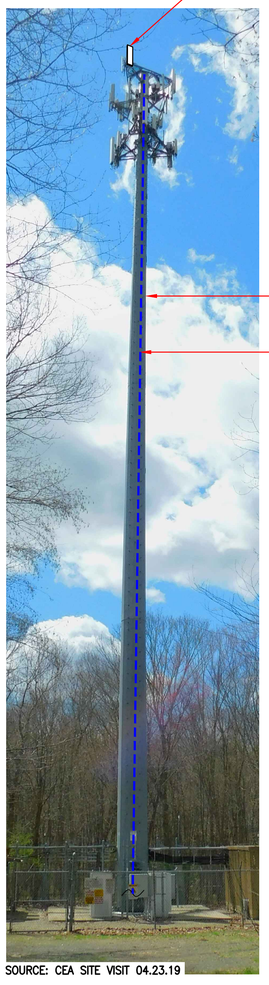
**SPECIAL CONSTRUCTION NOTE (SBA-PROVIDED ANTENNA MOUNT STRUCTURAL MOD SPECIAL EQUIPMENT INSTALLATION REQUIREMENTS):**
**GENERAL CONTRACTOR SHALL FURNISH AND INSTALL ALL ANTENNA MOUNT STRUCTURAL AUGMENTS (STRUCTURAL MODIFICATIONS) AT THE T-MOBILE RAD/VERTICAL EQUIPMENT SPACE PER RECOMMENDATIONS FROM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

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




NOTE:
GROUND EQUIPMENT NOT SHOWN, FOR CLARITY.

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



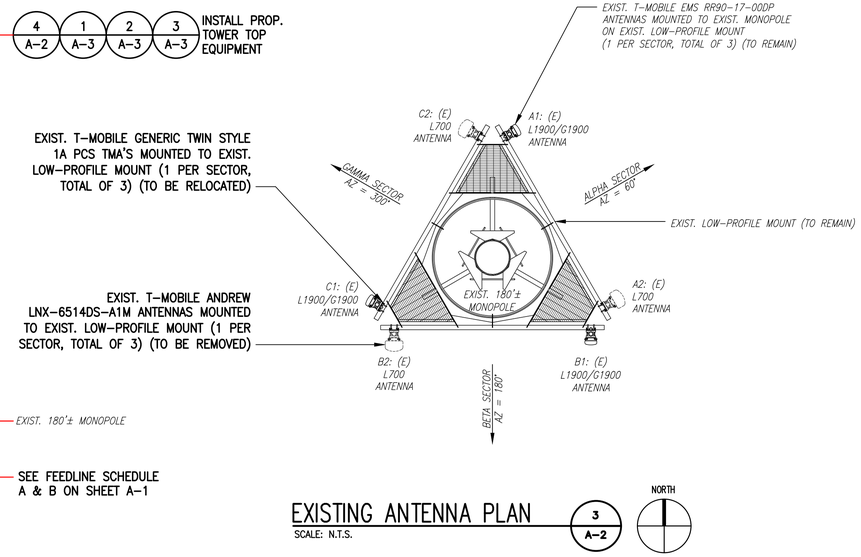

SOURCE: CEA SITE VISIT 04.23.19

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

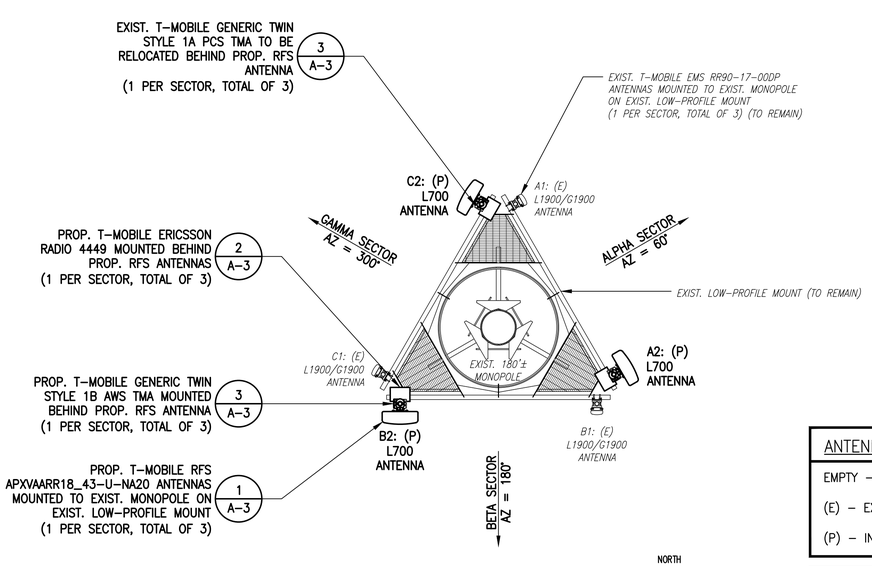
NOTE: ONE SECTOR SHOWN FOR CLARITY

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

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.




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




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

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

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


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
1/4/2021

CHECKED BY: JMT

APPROVED BY: JMT

SUBMITTALS

| REV. | DATE | DESCRIPTION | BY |
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| 2 | 01/04/21 | CONSTRUCTION REVISED | CMC |
| 1 | 09/23/19 | ISSUED FOR CONSTRUCTION | CMC |
| 0 | 05/07/19 | ISSUED FOR REVIEW | CMC |

SITE NUMBER:
CT11472A

SITE ADDRESS:
29 MAHONEY ROAD
COLCHESTER, CT 06415

SHEET TITLE
TOWER ELEVATIONS & ANTENNA PLAN

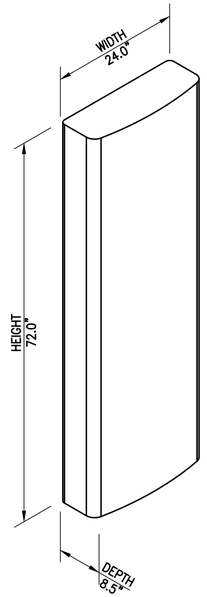
SHEET NUMBER
A-2

1815.087

## FINAL ANTENNA CONFIGURATION

| SECTOR | ANTENNA | RAD CENTER | AZIMUTH (TRUE NORTH) | MECHANICAL DOWNTILT | ELECTRICAL DOWNTILT | BAND | TMA/RADIOS | CABLES |
|---|---|---|---|---|---|---|---|---|
| ALPHA | *EMS RR90-17-00DP* | *177'± AGL* | *60°* | *0°* | – | – | – | – |
| | RFS APXVAARR18_43-U-NA20 | 177'± AGL | 60° | 0° | 2° | L600/L700 | RADIO 4449 B71+B12 | (1) (P) 6x12 (1-⅝") HCS FIBER CABLE |
| | | | | | | L1900/G1900 | *TWIN STYLE 1A PCS TMA* | *(4) (E) 1-¼" COAX CABLE* |
| | | | | | | L2100 | RADIO 4415 B66A (AT CABINET) TWIN STYLE 1B AWS TMA | |
| BETA | *EMS RR90-17-00DP* | *177'± AGL* | *180°* | *0°* | – | – | – | – |
| | RFS APXVAARR18_43-U-NA20 | 177'± AGL | 180° | 0° | 2° | L600/L700 | RADIO 4449 B71+B12 | (1) (P) 6x12 (1-⅝") HCS FIBER CABLE |
| | | | | | | L1900/G1900 | *TWIN STYLE 1A PCS TMA* | *(4) (E) 1-¼" COAX CABLE* |
| | | | | | | L2100 | RADIO 4415 B66A (AT CABINET) TWIN STYLE 1B AWS TMA | |
| GAMMA | *EMS RR90-17-00DP* | *177'± AGL* | *300°* | *0°* | – | – | – | – |
| | RFS APXVAARR18_43-U-NA20 | 177'± AGL | 300° | 0° | 2° | L600/L700 | RADIO 4449 B71+B12 | (1) (P) 6x12 (1-⅝") HCS FIBER CABLE |
| | | | | | | L1900/G1900 | *TWIN STYLE 1A PCS TMA* | *(4) (E) 1-¼" COAX CABLE* |
| | | | | | | L2100 | RADIO 4415 B66A (AT CABINET) TWIN STYLE 1B AWS TMA | |
| CABLE NOTE: SEE FEEDLINE SCHEDULE A&B ON SHEET A-1 | | | | | | | | |

NOTE: RFDS REV2.1 – 04/25/19



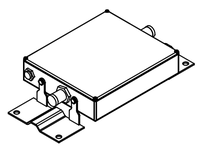

RFS APXVAARR18_43-U-NA20 PANEL ANTENNA
DIMENSIONS: 72.0"H x 24.0"W x 8.5"D
WEIGHT: 106.0 LBS
1 PER SECTOR, TOTAL OF 3

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

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

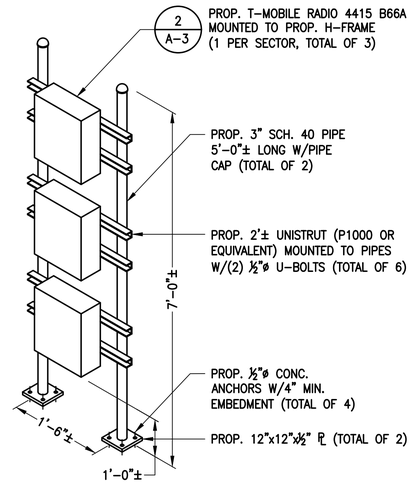
ERICSSON RRUS 4415 B66A
DIMENSIONS: 16.5"H x 13.4"W x 5.9"D
WEIGHT: 46 LBS
1 PER SECTOR, TOTAL OF 3

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



TMA 17/21
DIMENSIONS: 7.7"H x 7.5"W x 3.4"D
WEIGHT: 11.0 LBS
2 PER SECTOR, TOTAL OF 6

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




H-FRAME DETAIL (5 / A-3)
SCALE: N.T.S.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APPROVED BY: JMT

SUBMITTALS

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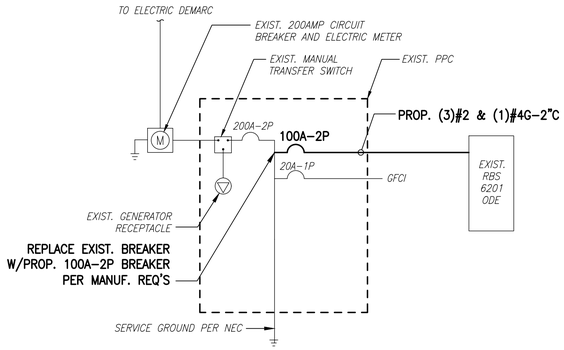
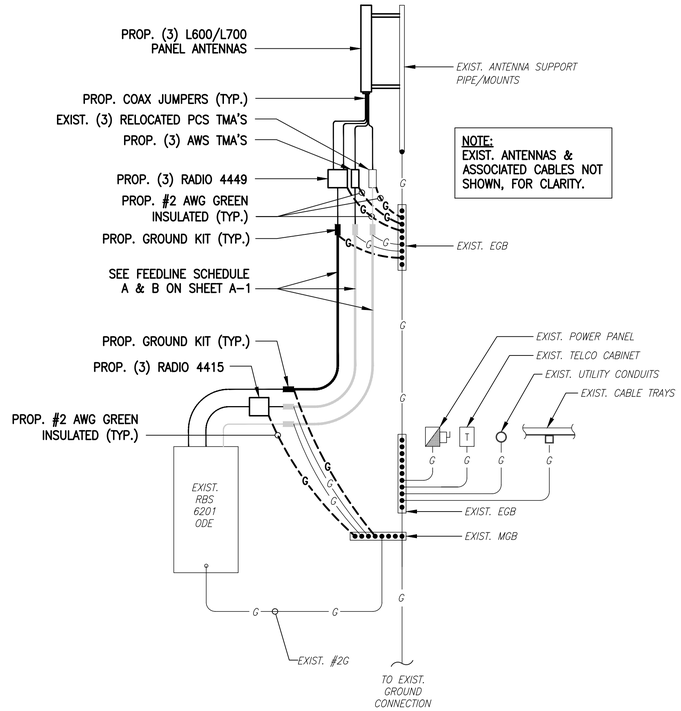
SHEET TITLE
SITE DETAILS

SHEET NUMBER
A-3

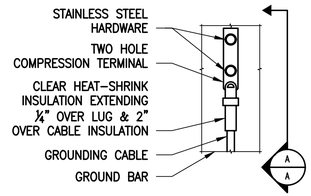
1815.087



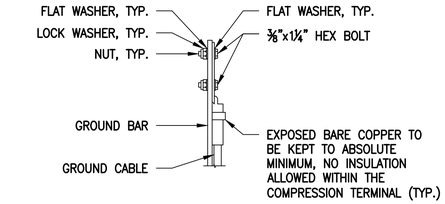

ONE LINE DIAGRAM (1 / E-1)
SCALE: NOT TO SCALE




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



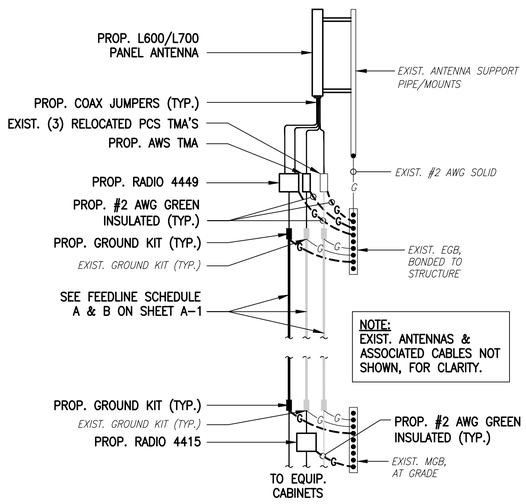

ELEVATION




SECTION A-A

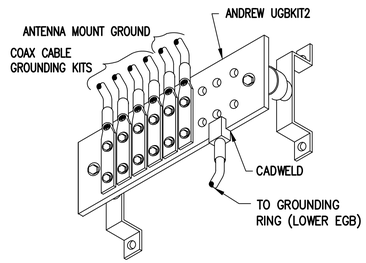
NOTES:
1. "DOUBLING UP" OR "STACKING" OF CONNECTION IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
3. CADWELL DOWNLEADS FROM UPPER EGB, LOWER EGB AND MGB.

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




L600/L700

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




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

## ELECTRICAL AND GROUNDING NOTES

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

SUBMITTALS

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SITE NUMBER:
CT11472A

SITE ADDRESS:
29 MAHONEY ROAD
COLCHESTER, CT 06415

SHEET TITLE
ELECTRICAL & GROUNDING DETAILS

SHEET NUMBER
E-1

1815.087

# EXHIBIT 7

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

# Structural Analysis Report

**Existing 180 ft. Valmont Monopole**

**Customer Name: SBA Communications Corp**

**Customer Site Number: CT02652-S**

**Customer Site Name: Colchester 3 CT**

**Carrier Name: T-Mobile (App#: 116752, V1)**

**Carrier Site ID / Name: CT11472A / Colchester**

**Site Location: 29 Mahoney Road**

**Colchester, Connecticut**

**New London County**

**Latitude: 41.564533**

**Longitude: -72.251697**


7/16/19

**Analysis Result:**

**Max Structural Usage: 63.7% [Pass]**

**Max Foundation Usage: 58.0% [Pass]**

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

**Report Prepared By : Delu Zhou**

## Introduction

The purpose of this report is to summarize the analysis results on the 180 ft. Valmont 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** | Valmont Microflect (Order # 11277-00) original design drawings, dated 011/03/1999 |
| **Foundation Drawing** | Valmont Microflect (Order # 11277-00) drawing # 3097-F, dated 04/03/2000 |
| **Geotechnical Report** | FDH Engineering, Inc. (Project # 1465721600) Geotechnical Report, dated 05/22/2014 |
| **Modification Drawings** | N/A |

## Analysis Criteria

The comprehensive analysis was performed in accordance with the requirements and stipulations of the ANSI/TIA/EIA 222-H**.** 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:** | 122.0 mph (3-Sec. Gust) (Ultimate wind speed) |
| **Wind Speed with Ice:** | 50 mph (3-Sec. Gust) with 1" radial ice concurrent |
| **Service Load Wind Speed:** | 60 mph + 0" Radial ice |
| **Standard/Codes:** | ANSI/TIA/EIA 222-H / 2018 Connecticut State Building Code |
| **Exposure Category:** | C |
| **Risk Category:** | II |
| **Topographic Category:** | 1 |
| **Crest Height:** | 0 ft. |
| **Seismic Parameters:** | $S_S$ = 0.202, $S_1$ = 0.055 |

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 |
|---|---|---|---|---|---|---|
| - | 177.0 | 9 | EMS RR90-17-02DP - Panel | (1) Low Profile Platform | (12) 1-1/4" | T-Mobile |
| - | | 3 | Commscope LNX-6514DS | | | |
| - | | 6 | Allen Tel FE15501P7775 | | | |
| 7 | 167.0 | 6 | BXA-171063-12CF - Panel | (1) Low Profile Platform | (12) 1 5/8" | Verizon |
| 8 | | 6 | BXA-70063-6CF - Panel | | | |
| 9 | | 3 | RRH2x40-07-U | | | |
| 10 | | 3 | RRH2x40-AWS | | | |
| 11 | 157.0 | 9 | 7770.00 - Panel | (1) Low Profile Platform | (12) 1 5/8" | AT&T |
| 12 | | 6 | LGP21401 TMA | | | |
| 13 | | 6 | LGP21903 Diplexers | | | |

## 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 |
|---|---|---|---|---|---|---|
| 1 | 177.0 | 9 | EMS RR90-17-02DP Panel | (1) Low Profile Platform | (12) 1 5/8"<br>(1) 1 5/8" Fiber | T-Mobile |
| 2 | | 3 | RFS APXVAARR18_43-U-NA20 Panel | | | |
| 3 | | 3 | Ericsson KRY 112 489/2 TMA | | | |
| 4 | | 3 | Ericsson KRY 112 144/2 TMA | | | |
| 5 | | 3 | Ericsson Radio 4449 RRU | | | |
| 6 | | 3 | Kathrein 782 10662 Bias-T | | | |

All transmission lines are considered running inside of the pole shafts.

## 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: | **63.7%** | **61.9%** | **47.7%** |
| Pass/Fail | **Pass** | **Pass** | **Pass** |

## Foundations

| | Moment (Kip-Ft) | Shear (Kips) | Axial (Kips) |
|---|---|---|---|
| Analysis Reactions | 4207.2 | 34.7 | 73.5 |

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

## Operational Condition (Rigidity):

Operational characteristics of the tower are found to be within the limits prescribed by ANSI/TIA/EIA 222-G for the installed antennas. The maximum twist/sway at the elevation of the proposed equipment is 1.3915 degrees under the operational wind speed as specified in the Analysis Criteria.

## Conclusions

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

# Standard Conditions

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

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

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

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

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

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

# Usage Diagram - Max Ratio 63.65% at 0.0ft

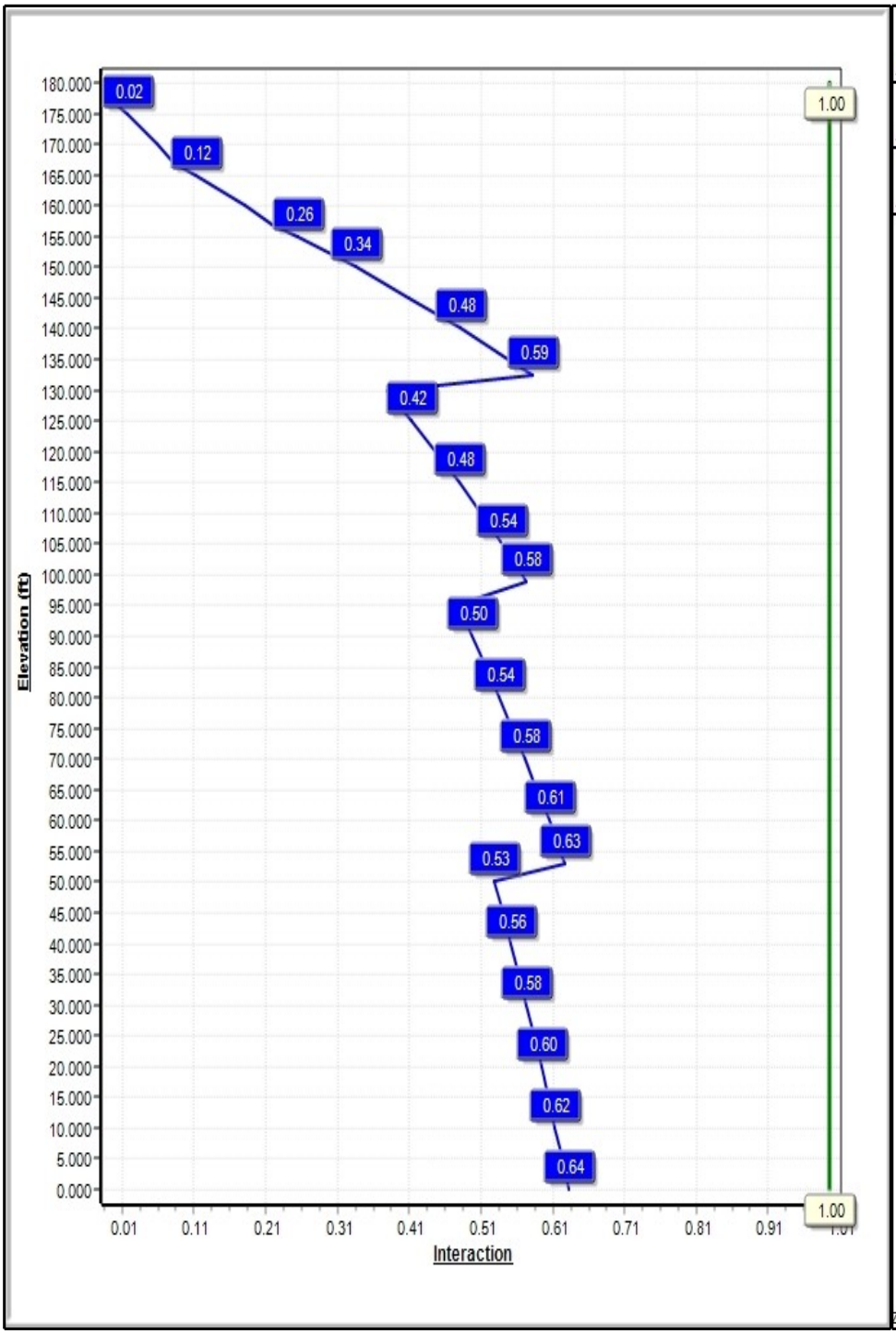
| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT02652-S-SBA | **Code:** | EIA/TIA-222-H | 7/16/2019 | |
| **Site Name:** | Colchester 3 CT | **Exposure:** | C | | |
| **Height:** | 180.00 (ft) | **Gh:** | 1.1 | | |
| **Base Elev:** | 0.000 (ft) | | | Page: 1 | |

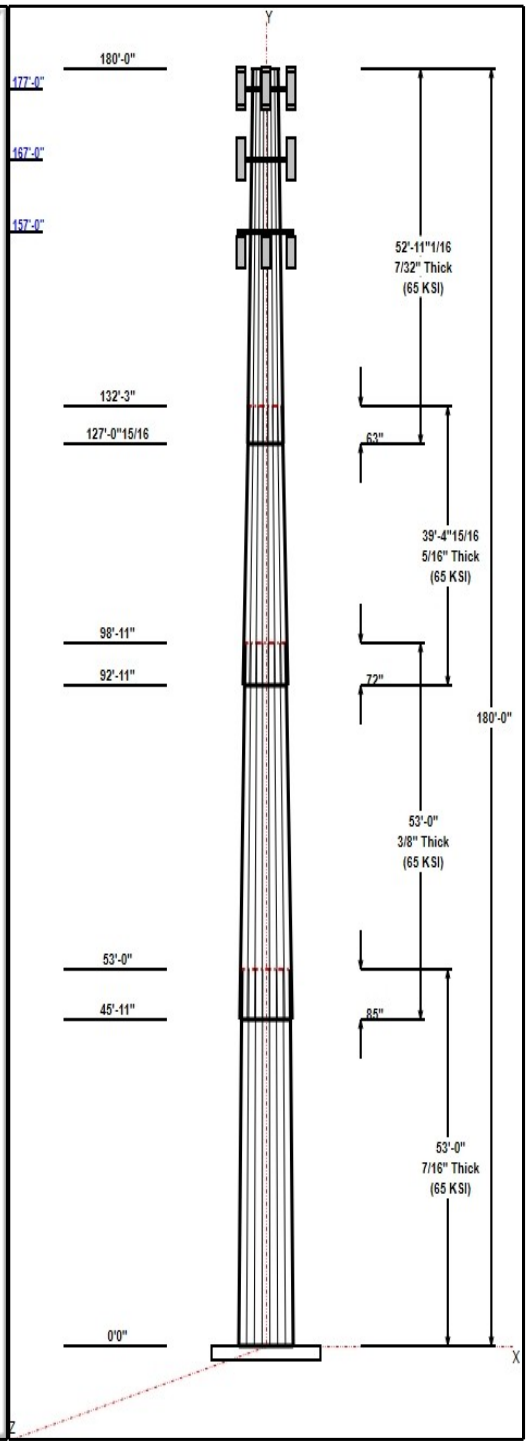
Tower Engineering Solutions

| | | | |
|---|---|---|---|
| Dead Load Factor: | 1.20 | **Iterations:** | 26 |
| Wind Load Factor: | 1.00 | | |

**Load Case : 1.2D + 1.0W 122 mph Wind**





# Structure: CT02652-S-SBA

**Type:** Tapered
**Site Name:** Colchester 3 CT
**Height:** 180.00 (ft)
**Base Elev:** 0.00 (ft)

**Base Shape:** 16 Sided
**Taper:** 0.20502

7/16/2019



Tower Engineering Solutions

## Shaft Properties

| Seq | Length (ft) | Top (in) | Bottom (in) | Thick (in) | Joint Type | Taper | Grade (ksi) |
|---|---|---|---|---|---|---|---|
| 1 | 53.00 | 49.13 | 60.00 | 0.438 | | 0.20502 | 65 |
| 2 | 53.00 | 40.47 | 51.34 | 0.375 | Slip | 0.20502 | 65 |
| 3 | 39.41 | 34.25 | 42.33 | 0.313 | Slip | 0.20502 | 65 |
| 4 | 52.92 | 24.91 | 35.76 | 0.219 | Slip | 0.20502 | 65 |

## Discrete Appurtenances

| Attach Elev (ft) | Force Elev (ft) | Qty | Description | Carrier |
|---|---|---|---|---|
| 180.00 | 183.50 | 1 | Lightning Rod | |
| 177.00 | 177.00 | 9 | EMS RR90-17-02DP | T-Mobile |
| 177.00 | 177.00 | 1 | Low Profile Platform | T-Mobile |
| 177.00 | 177.46 | 3 | KRY 112 489/2 | T-Mobile |
| 177.00 | 177.29 | 3 | KRY 112 144/2 | T-Mobile |
| 177.00 | 177.63 | 3 | Ericsson Radio 4449 | T-Mobile |
| 177.00 | 177.24 | 3 | Kathrein 782 10662 Bias-T | T-Mobile |
| 177.00 | 177.00 | 3 | APXVAARR18_43-U-NA20 | T-Mobile |
| 167.00 | 167.00 | 6 | BXA-70063-6CF | Verizon |
| 167.00 | 167.00 | 6 | BXA-171063-12CF | Verizon |
| 167.00 | 167.00 | 3 | RRH2x40-AWS | Verizon |
| 167.00 | 167.00 | 3 | RRH2x40-07-U | Verizon |
| 167.00 | 167.00 | 1 | Low Profile Platform | Verizon |
| 157.00 | 154.00 | 9 | 7770.00 | AT&T |
| 157.00 | 157.00 | 1 | Low Profile Platform | AT&T |
| 157.00 | 157.00 | 6 | LGP21903 Diplexers | AT&T |
| 157.00 | 157.00 | 6 | LGP21401 TMA | AT&T |

## Linear Appurtenances

| Elev From (ft) | Elev To (ft) | Placement | Description | Carrier |
|---|---|---|---|---|
| 0.00 | 180.00 | Outside | Climbing Ladder | |
| 0.00 | 177.00 | Inside | 1 5/8" Coax | T-Mobile |
| 0.00 | 177.00 | Inside | 1 5/8" Fiber | T-Mobile |
| 0.00 | 167.00 | Inside | 1 5/8" Coax | Verizon |
| 0.00 | 157.00 | Inside | 1 5/8" Coax | AT&T |

## Anchor Bolts

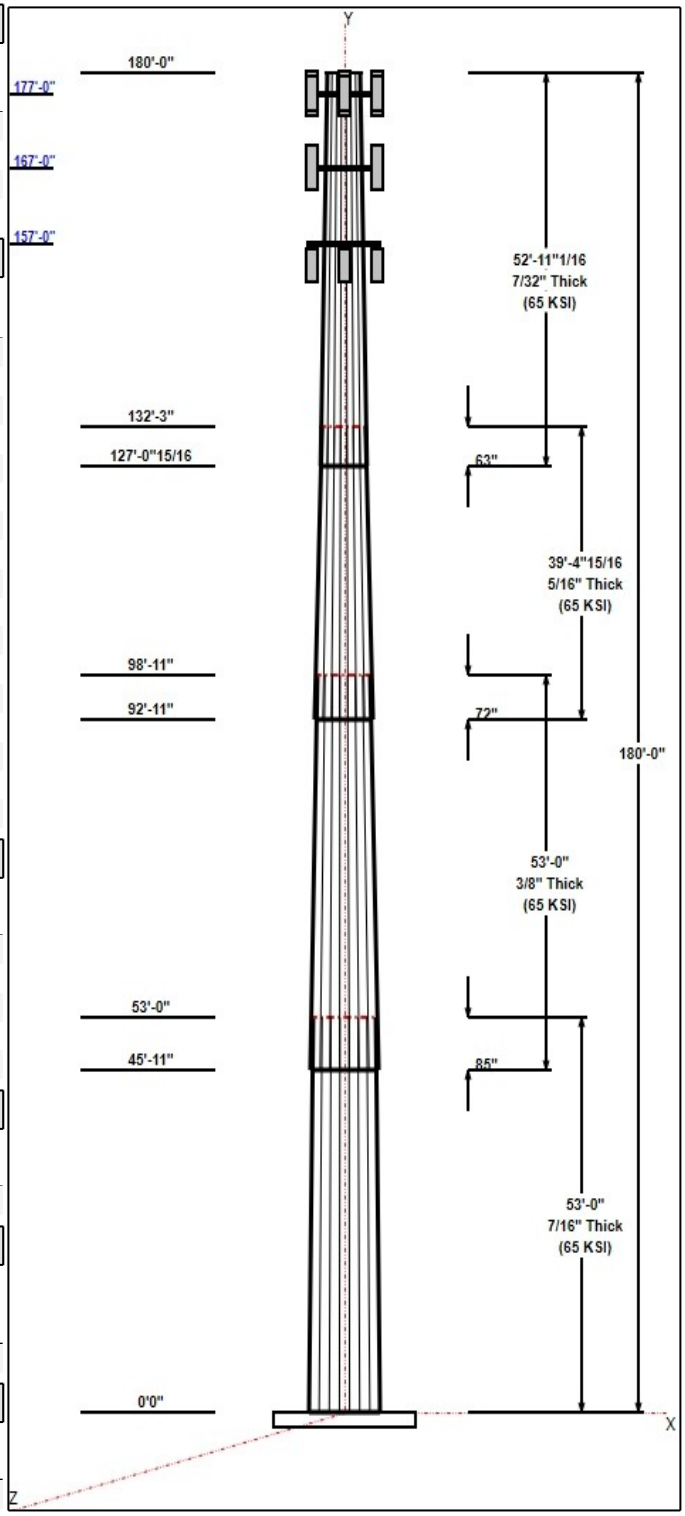
| Qty | Specifications | Grade (ksi) | Arrangement |
|---|---|---|---|
| 20 | 2.25" 18J | 75.0 | Radial |

## Base Plate

| Thickness (in) | Specifications (in) | Grade (ksi) | Geometry |
|---|---|---|---|
| 2.7500 | 74.6 | 60.0 | Polygon |

## Reactions

| Load Case | Moment (FT-Kips) | Shear (Kips) | Axial (Kips) |
|---|---|---|---|
| 1.2D + 1.0W 122 mph Wind | 4207.2 | 34.7 | 57.3 |
| 0.9D + 1.0W 122 mph Wind | 4158.1 | 34.7 | 42.9 |
| 1.2D + 1.0Di + 1.0Wi 50 mph Wind | 1085.0 | 9.1 | 73.5 |
| 1.2D + 1.0Ev + 1.0Eh | 249.4 | 2.2 | 57.3 |
| 0.9D + 1.0Ev + 1.0Eh | 246.5 | 2.2 | 43.0 |
| 1.0D + 1.0W 60 mph Wind | 1010.9 | 8.4 | 47.7 |



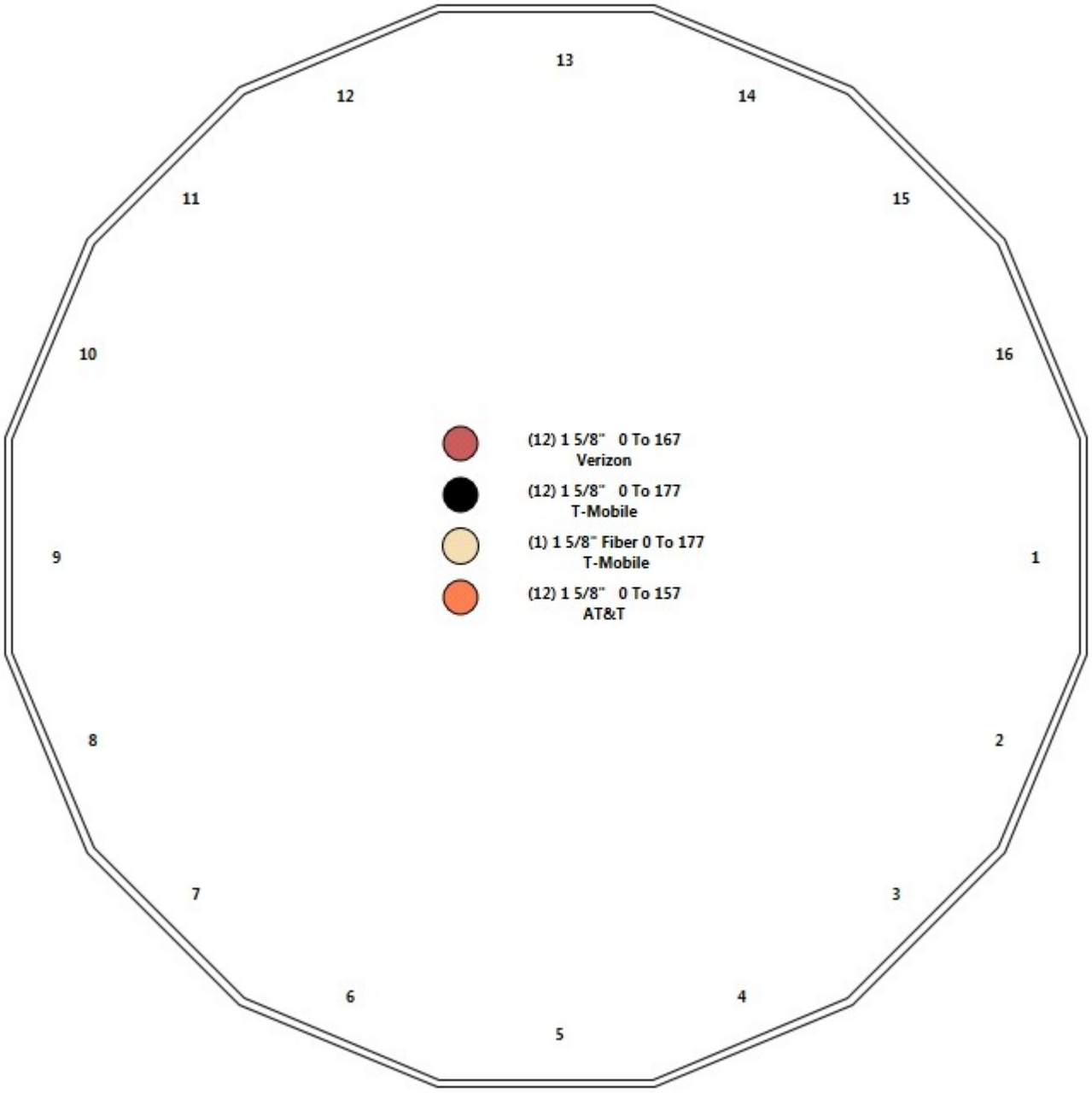
# Structure: CT02652-S-SBA - Coax Line Placement

**Type:** Monopole
**Site Name:** Colchester 3 CT
**Height:** 180.00 (ft)

7/16/2019



Tower Engineering Solutions



# Shaft Properties

| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT02652-S-SBA | | **Code:** | EIA/TIA-222-H | 7/16/2019 |
| **Site Name:** | Colchester 3 CT | | **Exposure:** | C | |
| **Height:** | 180.00 (ft) | | **Crest Height:** | 0.00 | |
| **Base Elev:** | 0.000 (ft) | | **Site Class:** | B - Competent Rock | |
| **Gh:** | 1.1 | **Topography:** 1 | **Struct Class:** | II | Page: 4 |

Tower Engineering Solutions

| Sec. No. | Shape | Length (ft) | Thick (in) | Fy (ksi) | Joint Type | Overlap (in) | Weight (lb) |
|---|---|---|---|---|---|---|---|
| 1 | 16 | 53.000 | 0.4380 | 65 | | 0.00 | 13,640 |
| 2 | 16 | 53.000 | 0.3750 | 65 | Slip | 85.00 | 9,822 |
| 3 | 16 | 39.410 | 0.3130 | 65 | Slip | 72.00 | 5,085 |
| 4 | 16 | 52.923 | 0.2190 | 65 | Slip | 63.00 | 3,789 |
| | | | | | **Total Shaft Weight:** | | **32,335** |

| | Bottom | | | | | | Top | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sec. No.** | **Dia (in)** | **Elev (ft)** | **Area (sqin)** | **Ix (in^4)** | **W/t Ratio** | **D/t Ratio** | **Dia (in)** | **Elev (ft)** | **Area (sqin)** | **Ix (in^4)** | **W/t Ratio** | **D/t Ratio** | **Taper** |
| 1 | 60.00 | 0.00 | 83.22 | 37298.12 | 25.66 | 136.99 | 49.13 | 53.00 | 68.04 | 20382.3 | 20.72 | 112.1 | 0.205022 |
| 2 | 51.34 | 45.92 | 60.96 | 20001.00 | 25.64 | 136.90 | 40.47 | 98.92 | 47.96 | 9740.99 | 19.88 | 107.9 | 0.205022 |
| 3 | 42.33 | 92.92 | 41.95 | 9354.08 | 25.31 | 135.23 | 34.25 | 132.33 | 33.88 | 4928.56 | 20.17 | 109.4 | 0.205022 |
| 4 | 35.76 | 127.0 | 24.83 | 3962.37 | 30.89 | 163.29 | 24.91 | 180.00 | 17.25 | 1328.51 | 21.03 | 113.7 | 0.205022 |

# Load Summary

| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT02652-S-SBA | **Code:** | EIA/TIA-222-H | 7/16/2019 | |
| **Site Name:** | Colchester 3 CT | **Exposure:** | C | | |
| **Height:** | 180.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 5 | |

Tower Engineering Solutions

## Discrete Appurtenances

| | | | | No Ice | | | Ice | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **No.** | **Elev (ft)** | **Description** | **Qty** | **Weight (lb)** | **CaAa (sf)** | **CaAa Factor** | **Weight (lb)** | **CaAa (sf)** | **CaAa Factor** | **Hor. Ecc. (ft)** | **Vert Ecc (ft)** |
| 1 | 180.00 | Lightning Rod | 1 | 35.00 | 1.05 | 1.00 | 56.33 | 2.661 | 1.00 | 0.00 | 3.50 |
| 2 | 177.00 | EMS RR90-17-02DP | 9 | 18.00 | 4.36 | 0.78 | 78.38 | 5.005 | 0.78 | 0.00 | 0.00 |
| 3 | 177.00 | Low Profile Platform | 1 | 2000.00 | 24.00 | 1.00 | 3182.89 | 37.059 | 1.00 | 0.00 | 0.00 |
| 4 | 177.00 | KRY 112 489/2 | 3 | 15.40 | 0.65 | 0.75 | 27.34 | 1.065 | 0.75 | 0.00 | 0.46 |
| 5 | 177.00 | KRY 112 144/2 | 3 | 9.70 | 0.41 | 0.75 | 16.14 | 0.732 | 0.75 | 0.00 | 0.29 |
| 6 | 177.00 | Ericsson Radio 4449 | 3 | 74.00 | 1.65 | 0.75 | 115.89 | 1.976 | 0.75 | 0.00 | 0.63 |
| 7 | 177.00 | Kathrein 782 10662 Bias-T | 3 | 1.80 | 0.28 | 0.75 | 4.87 | 0.552 | 0.75 | 0.00 | 0.24 |
| 8 | 177.00 | APXVAARR18_43-U-NA20 | 3 | 106.00 | 15.76 | 0.76 | 320.43 | 15.714 | 0.76 | 0.00 | 0.00 |
| 9 | 167.00 | BXA-70063-6CF | 6 | 17.00 | 7.57 | 0.74 | 116.93 | 9.432 | 0.74 | 0.00 | 0.00 |
| 10 | 167.00 | BXA-171063-12CF | 6 | 15.00 | 4.78 | 0.84 | 79.57 | 6.370 | 0.84 | 0.00 | 0.00 |
| 11 | 167.00 | RRH2x40-AWS | 3 | 44.00 | 2.52 | 0.75 | 84.92 | 3.344 | 0.75 | 0.00 | 0.00 |
| 12 | 167.00 | RRH2x40-07-U | 3 | 50.70 | 2.23 | 0.75 | 90.31 | 2.945 | 0.75 | 0.00 | 0.00 |
| 13 | 167.00 | Low Profile Platform | 1 | 2000.00 | 24.00 | 1.00 | 3176.03 | 36.983 | 1.00 | 0.00 | 0.00 |
| 14 | 157.00 | 7770.00 | 9 | 35.00 | 5.50 | 0.73 | 118.82 | 6.199 | 0.73 | 0.00 | -3.00 |
| 15 | 157.00 | Low Profile Platform | 1 | 2000.00 | 24.00 | 1.00 | 3168.80 | 36.904 | 1.00 | 0.00 | 0.00 |
| 16 | 157.00 | LGP21903 Diplexers | 6 | 5.50 | 0.63 | 0.75 | 10.65 | 1.305 | 0.75 | 0.00 | 0.00 |
| 17 | 157.00 | LGP21401 TMA | 6 | 14.10 | 1.29 | 0.75 | 30.84 | 1.850 | 1.00 | 0.00 | 0.00 |
| | | **Totals:** | **67** | **7,726.40** | | | **14,766.52** | | | | |

## Linear Appurtenances

| **Bottom Elev. (ft)** | **Top Elev. (ft)** | **Description** | **Exposed Width** | **Exposed** |
|---|---|---|---|---|
| 0.00 | 180.00 | (1) Climbing Ladder | 0.00 | Outside |
| 0.00 | 177.00 | (12) 1 5/8" Coax | 0.00 | Inside |
| 0.00 | 177.00 | (1) 1 5/8" Fiber | 0.00 | Inside |
| 0.00 | 167.00 | (12) 1 5/8" Coax | 0.00 | Inside |
| 0.00 | 157.00 | (12) 1 5/8" Coax | 0.00 | Inside |

# Shaft Section Properties

| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT02652-S-SBA | **Code:** | EIA/TIA-222-H | 7/16/2019 | |
| **Site Name:** | Colchester 3 CT | **Exposure:** | C | | |
| **Height:** | 180.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 6 | |

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 | | 0.4380 | 60.000 | 83.221 | 37298.1 | 25.66 | 136.99 | 73.5 | 1219. | 0.0 |
| 5.00 | | 0.4380 | 58.975 | 81.789 | 35405.3 | 25.19 | 134.65 | 74.1 | 1177. | 1403.7 |
| 10.00 | | 0.4380 | 57.950 | 80.357 | 33577.6 | 24.73 | 132.31 | 74.6 | 1136. | 1379.4 |
| 15.00 | | 0.4380 | 56.925 | 78.924 | 31813.9 | 24.26 | 129.96 | 75.1 | 1096. | 1355.0 |
| 20.00 | | 0.4380 | 55.900 | 77.492 | 30113.1 | 23.79 | 127.62 | 75.6 | 1056. | 1330.6 |
| 25.00 | | 0.4380 | 54.874 | 76.060 | 28474.0 | 23.33 | 125.28 | 76.2 | 1017. | 1306.3 |
| 30.00 | | 0.4380 | 53.849 | 74.627 | 26895.5 | 22.86 | 122.94 | 76.7 | 979.7 | 1281.9 |
| 35.00 | | 0.4380 | 52.824 | 73.195 | 25376.4 | 22.40 | 120.60 | 77.2 | 942.3 | 1257.5 |
| 40.00 | | 0.4380 | 51.799 | 71.763 | 23915.7 | 21.93 | 118.26 | 77.8 | 905.7 | 1233.1 |
| 45.00 | | 0.4380 | 50.774 | 70.330 | 22512.1 | 21.47 | 115.92 | 78.3 | 869.7 | 1208.8 |
| 45.92 | Bot - Section 2 | 0.4380 | 50.586 | 70.068 | 22260.8 | 21.38 | 115.49 | 78.4 | 863.2 | 219.0 |
| 50.00 | | 0.4380 | 49.749 | 68.898 | 21164.5 | 21.00 | 113.58 | 78.8 | 834.5 | 1805.5 |
| 53.00 | Top - Section 1 | 0.3750 | 49.884 | 59.225 | 18339.4 | 24.87 | 133.02 | 0.0 | 0.0 | 1307.3 |
| 55.00 | | 0.3750 | 49.474 | 58.734 | 17887.4 | 24.65 | 131.93 | 74.7 | 709.2 | 401.4 |
| 60.00 | | 0.3750 | 48.449 | 57.508 | 16790.3 | 24.11 | 129.20 | 75.3 | 679.8 | 988.9 |
| 65.00 | | 0.3750 | 47.424 | 56.282 | 15738.9 | 23.56 | 126.46 | 75.9 | 651.0 | 968.0 |
| 70.00 | | 0.3750 | 46.398 | 55.056 | 14732.4 | 23.02 | 123.73 | 76.5 | 622.8 | 947.1 |
| 75.00 | | 0.3750 | 45.373 | 53.829 | 13769.7 | 22.48 | 121.00 | 77.1 | 595.3 | 926.3 |
| 80.00 | | 0.3750 | 44.348 | 52.603 | 12849.9 | 21.93 | 118.26 | 77.8 | 568.4 | 905.4 |
| 85.00 | | 0.3750 | 43.323 | 51.377 | 11972.0 | 21.39 | 115.53 | 78.4 | 542.1 | 884.5 |
| 90.00 | | 0.3750 | 42.298 | 50.150 | 11135.1 | 20.84 | 112.79 | 79.0 | 516.4 | 863.7 |
| 92.92 | Bot - Section 3 | 0.3750 | 41.700 | 49.435 | 10665.4 | 20.53 | 111.20 | 79.3 | 501.7 | 494.2 |
| 95.00 | | 0.3750 | 41.273 | 48.924 | 10338.1 | 20.30 | 110.06 | 79.6 | 491.3 | 644.5 |
| 98.92 | Top - Section 2 | 0.3130 | 41.096 | 40.720 | 8556.2 | 24.53 | 131.30 | 0.0 | 0.0 | 1193.7 |
| 100.00 | | 0.3130 | 40.874 | 40.499 | 8417.2 | 24.38 | 130.59 | 75.0 | 403.9 | 149.7 |
| 105.00 | | 0.3130 | 39.849 | 39.475 | 7795.0 | 23.73 | 127.31 | 75.7 | 383.7 | 680.3 |
| 110.00 | | 0.3130 | 38.824 | 38.452 | 7204.2 | 23.08 | 124.04 | 76.5 | 364.0 | 662.9 |
| 115.00 | | 0.3130 | 37.798 | 37.428 | 6644.1 | 22.43 | 120.76 | 77.2 | 344.8 | 645.5 |
| 120.00 | | 0.3130 | 36.773 | 36.405 | 6113.8 | 21.78 | 117.49 | 77.9 | 326.1 | 628.1 |
| 125.00 | | 0.3130 | 35.748 | 35.381 | 5612.5 | 21.13 | 114.21 | 78.7 | 308.0 | 610.7 |
| 127.08 | Bot - Section 4 | 0.3130 | 35.322 | 34.956 | 5412.6 | 20.86 | 112.85 | 79.0 | 300.6 | 248.5 |
| 130.00 | | 0.3130 | 34.723 | 34.357 | 5139.3 | 20.48 | 110.94 | 79.4 | 290.3 | 589.7 |
| 132.33 | Top - Section 3 | 0.2190 | 34.684 | 24.078 | 3613.2 | 29.91 | 158.37 | 0.0 | 0.0 | 462.1 |
| 135.00 | | 0.2190 | 34.136 | 23.695 | 3443.5 | 29.41 | 155.87 | 69.3 | 197.9 | 217.3 |
| 140.00 | | 0.2190 | 33.111 | 22.979 | 3140.6 | 28.48 | 151.19 | 70.3 | 186.1 | 397.0 |
| 145.00 | | 0.2190 | 32.086 | 22.262 | 2856.0 | 27.55 | 146.51 | 71.4 | 174.6 | 384.9 |
| 150.00 | | 0.2190 | 31.061 | 21.546 | 2589.2 | 26.62 | 141.83 | 72.5 | 163.5 | 372.7 |
| 155.00 | | 0.2190 | 30.036 | 20.830 | 2339.5 | 25.69 | 137.15 | 73.5 | 152.8 | 360.5 |
| 157.00 | | 0.2190 | 29.626 | 20.544 | 2244.3 | 25.32 | 135.28 | 73.9 | 148.6 | 140.8 |
| 160.00 | | 0.2190 | 29.010 | 20.114 | 2106.4 | 24.76 | 132.47 | 74.6 | 142.4 | 207.5 |
| 165.00 | | 0.2190 | 27.985 | 19.398 | 1889.3 | 23.83 | 127.79 | 75.6 | 132.4 | 336.1 |
| 167.00 | | 0.2190 | 27.575 | 19.111 | 1806.8 | 23.45 | 125.91 | 76.0 | 128.5 | 131.0 |
| 170.00 | | 0.2190 | 26.960 | 18.682 | 1687.7 | 22.90 | 123.11 | 76.7 | 122.8 | 192.9 |
| 175.00 | | 0.2190 | 25.935 | 17.966 | 1500.9 | 21.96 | 118.43 | 77.7 | 113.5 | 311.8 |
| 177.00 | | 0.2190 | 25.525 | 17.679 | 1430.3 | 21.59 | 116.55 | 78.1 | 109.9 | 121.3 |
| 180.00 | | 0.2190 | 24.910 | 17.249 | 1328.5 | 21.03 | 113.74 | 78.8 | 104.6 | 178.3 |
| | | | | | | | | | | **32335.3** |

# Wind Loading - Shaft

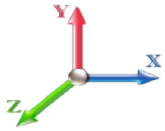
| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT02652-S-SBA | **Code:** | EIA/TIA-222-H | 7/16/2019 | |
| **Site Name:** | Colchester 3 CT | **Exposure:** | C | | |
| **Height:** | 180.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 7 | |

Tower Engineering Solutions

**Load Case:** 1.2D + 1.0W 122 mph Wind

**Dead Load Factor** 1.20

**Wind Load Factor** 1.00




**Iterations** 26

| 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 | 30.355 | 33.39 | 569.55 | 0.750 | 0.000 | 0.00 | 0.000 | 0.00 | 0.0 | 0.0 | 0.0 |
| 5.00 | | 1.00 | 0.85 | 30.355 | 33.39 | 559.82 | 0.750 | 0.000 | 5.00 | 25.272 | 18.95 | 632.9 | 0.0 | 1684.5 |
| 10.00 | | 1.00 | 0.85 | 30.355 | 33.39 | 550.09 | 0.750 | 0.000 | 5.00 | 24.837 | 18.63 | 622.0 | 0.0 | 1655.2 |
| 15.00 | | 1.00 | 0.85 | 30.355 | 33.39 | 540.36 | 0.750 | 0.000 | 5.00 | 24.401 | 18.30 | 611.1 | 0.0 | 1626.0 |
| 20.00 | | 1.00 | 0.90 | 32.208 | 35.43 | 546.58 | 0.750 | 0.000 | 5.00 | 23.966 | 17.97 | 636.8 | 0.0 | 1596.7 |
| 25.00 | | 1.00 | 0.95 | 33.758 | 37.13 | 549.31 | 0.750 | 0.000 | 5.00 | 23.530 | 17.65 | 655.3 | 0.0 | 1567.5 |
| 30.00 | | 1.00 | 0.98 | 35.079 | 38.59 | 549.50 | 0.750 | 0.000 | 5.00 | 23.095 | 17.32 | 668.4 | 0.0 | 1538.3 |
| 35.00 | | 1.00 | 1.01 | 36.236 | 39.86 | 547.85 | 0.750 | 0.000 | 5.00 | 22.659 | 16.99 | 677.4 | 0.0 | 1509.0 |
| 40.00 | | 1.00 | 1.04 | 37.269 | 41.00 | 544.83 | 0.750 | 0.000 | 5.00 | 22.224 | 16.67 | 683.3 | 0.0 | 1479.8 |
| 45.00 | | 1.00 | 1.07 | 38.204 | 42.02 | 540.71 | 0.750 | 0.000 | 5.00 | 21.788 | 16.34 | 686.7 | 0.0 | 1450.5 |
| 45.92 | Bot - Section 2 | 1.00 | 1.07 | 38.367 | 42.20 | 539.85 | 0.750 | 0.000 | 0.92 | 3.947 | 2.96 | 124.9 | 0.0 | 262.8 |
| 50.00 | | 1.00 | 1.09 | 39.061 | 42.97 | 535.70 | 0.750 | 0.000 | 4.08 | 17.666 | 13.25 | 569.3 | 0.0 | 2166.6 |
| 53.00 | Top - Section 1 | 1.00 | 1.11 | 39.543 | 43.50 | 532.33 | 0.750 | 0.000 | 3.00 | 12.794 | 9.60 | 417.4 | 0.0 | 1568.8 |
| 55.00 | | 1.00 | 1.12 | 39.853 | 43.84 | 538.11 | 0.750 | 0.000 | 2.00 | 8.442 | 6.33 | 277.6 | 0.0 | 481.7 |
| 60.00 | | 1.00 | 1.14 | 40.590 | 44.65 | 531.81 | 0.750 | 0.000 | 5.00 | 20.800 | 15.60 | 696.5 | 0.0 | 1186.6 |
| 65.00 | | 1.00 | 1.16 | 41.280 | 45.41 | 524.96 | 0.750 | 0.000 | 5.00 | 20.365 | 15.27 | 693.5 | 0.0 | 1161.6 |
| 70.00 | | 1.00 | 1.17 | 41.929 | 46.12 | 517.63 | 0.750 | 0.000 | 5.00 | 19.929 | 14.95 | 689.4 | 0.0 | 1136.6 |
| 75.00 | | 1.00 | 1.19 | 42.542 | 46.80 | 509.89 | 0.750 | 0.000 | 5.00 | 19.494 | 14.62 | 684.2 | 0.0 | 1111.5 |
| 80.00 | | 1.00 | 1.21 | 43.124 | 47.44 | 501.76 | 0.750 | 0.000 | 5.00 | 19.058 | 14.29 | 678.0 | 0.0 | 1086.5 |
| 85.00 | | 1.00 | 1.22 | 43.678 | 48.05 | 493.30 | 0.750 | 0.000 | 5.00 | 18.623 | 13.97 | 671.1 | 0.0 | 1061.5 |
| 90.00 | | 1.00 | 1.24 | 44.207 | 48.63 | 484.54 | 0.750 | 0.000 | 5.00 | 18.187 | 13.64 | 663.3 | 0.0 | 1036.4 |
| 92.92 | Bot - Section 3 | 1.00 | 1.25 | 44.505 | 48.95 | 479.29 | 0.750 | 0.000 | 2.92 | 10.408 | 7.81 | 382.1 | 0.0 | 593.0 |
| 95.00 | | 1.00 | 1.25 | 44.713 | 49.18 | 475.49 | 0.750 | 0.000 | 2.08 | 7.454 | 5.59 | 275.0 | 0.0 | 773.4 |
| 98.92 | Top - Section 2 | 1.00 | 1.26 | 45.095 | 49.60 | 468.23 | 0.750 | 0.000 | 3.92 | 13.810 | 10.36 | 513.8 | 0.0 | 1432.4 |
| 100.00 | | 1.00 | 1.27 | 45.198 | 49.72 | 473.44 | 0.750 | 0.000 | 1.08 | 3.773 | 2.83 | 140.7 | 0.0 | 179.6 |
| 105.00 | | 1.00 | 1.28 | 45.665 | 50.23 | 463.95 | 0.750 | 0.000 | 5.00 | 17.147 | 12.86 | 646.0 | 0.0 | 816.4 |
| 110.00 | | 1.00 | 1.29 | 46.114 | 50.73 | 454.23 | 0.750 | 0.000 | 5.00 | 16.711 | 12.53 | 635.8 | 0.0 | 795.5 |
| 115.00 | | 1.00 | 1.30 | 46.548 | 51.20 | 444.31 | 0.750 | 0.000 | 5.00 | 16.276 | 12.21 | 625.0 | 0.0 | 774.6 |
| 120.00 | | 1.00 | 1.32 | 46.967 | 51.66 | 434.20 | 0.750 | 0.000 | 5.00 | 15.840 | 11.88 | 613.8 | 0.0 | 753.7 |
| 125.00 | | 1.00 | 1.33 | 47.372 | 52.11 | 423.92 | 0.750 | 0.000 | 5.00 | 15.405 | 11.55 | 602.0 | 0.0 | 732.8 |
| 127.08 | Bot - Section 4 | 1.00 | 1.33 | 47.537 | 52.29 | 419.59 | 0.750 | 0.000 | 2.08 | 6.270 | 4.70 | 245.9 | 0.0 | 298.2 |
| 130.00 | | 1.00 | 1.34 | 47.765 | 52.54 | 413.46 | 0.750 | 0.000 | 2.92 | 8.808 | 6.61 | 347.1 | 0.0 | 707.6 |
| 132.33 | Top - Section 3 | 1.00 | 1.34 | 47.944 | 52.74 | 408.54 | 0.750 | 0.000 | 2.33 | 6.904 | 5.18 | 273.1 | 0.0 | 554.5 |
| 135.00 | | 1.00 | 1.35 | 48.146 | 52.96 | 408.09 | 0.750 | 0.000 | 2.67 | 7.816 | 5.86 | 310.5 | 0.0 | 260.7 |
| 140.00 | | 1.00 | 1.36 | 48.516 | 53.37 | 397.35 | 0.750 | 0.000 | 5.00 | 14.284 | 10.71 | 571.7 | 0.0 | 476.5 |
| 145.00 | | 1.00 | 1.37 | 48.876 | 53.76 | 386.48 | 0.750 | 0.000 | 5.00 | 13.849 | 10.39 | 558.4 | 0.0 | 461.8 |
| 150.00 | | 1.00 | 1.38 | 49.226 | 54.15 | 375.47 | 0.750 | 0.000 | 5.00 | 13.413 | 10.06 | 544.7 | 0.0 | 447.2 |
| 155.00 | | 1.00 | 1.39 | 49.567 | 54.52 | 364.33 | 0.750 | 0.000 | 5.00 | 12.978 | 9.73 | 530.7 | 0.0 | 432.6 |
| 157.00 | Appurtenance(s) | 1.00 | 1.39 | 49.701 | 54.67 | 359.84 | 0.750 | 0.000 | 2.00 | 5.069 | 3.80 | 207.9 | 0.0 | 168.9 |
| 160.00 | | 1.00 | 1.40 | 49.899 | 54.89 | 353.07 | 0.750 | 0.000 | 3.00 | 7.473 | 5.60 | 307.6 | 0.0 | 249.0 |
| 165.00 | | 1.00 | 1.41 | 50.224 | 55.25 | 341.70 | 0.750 | 0.000 | 5.00 | 12.107 | 9.08 | 501.6 | 0.0 | 403.3 |
| 167.00 | Appurtenance(s) | 1.00 | 1.41 | 50.351 | 55.39 | 337.12 | 0.750 | 0.000 | 2.00 | 4.721 | 3.54 | 196.1 | 0.0 | 157.2 |
| 170.00 | | 1.00 | 1.42 | 50.540 | 55.59 | 330.22 | 0.750 | 0.000 | 3.00 | 6.950 | 5.21 | 289.8 | 0.0 | 231.5 |
| 175.00 | | 1.00 | 1.42 | 50.850 | 55.93 | 318.64 | 0.750 | 0.000 | 5.00 | 11.236 | 8.43 | 471.3 | 0.0 | 374.1 |
| 177.00 | Appurtenance(s) | 1.00 | 1.43 | 50.971 | 56.07 | 313.97 | 0.750 | 0.000 | 2.00 | 4.372 | 3.28 | 183.9 | 0.0 | 145.5 |
| 180.00 | Appurtenance(s) | 1.00 | 1.43 | 51.152 | 56.27 | 306.95 | 0.750 | 0.000 | 3.00 | 6.428 | 4.82 | 271.3 | 0.0 | 213.9 |

# Wind Loading - Shaft

| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT02652-S-SBA | **Code:** | EIA/TIA-222-H | 7/16/2019 | |
| **Site Name:** | Colchester 3 CT | **Exposure:** | C | | |
| **Height:** | 180.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 8 | |

Tower Engineering Solutions

| | | | |
|---|---|---|---|
| **Totals:** | **180.00** | **22,284.7** | **38,802.4** |

# Discrete Appurtenance Forces

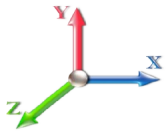
| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT02652-S-SBA | **Code:** | EIA/TIA-222-H | 7/16/2019 | |
| **Site Name:** | Colchester 3 CT | **Exposure:** | C | | |
| **Height:** | 180.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 9 | |

Tower Engineering Solutions

**Load Case:** 1.2D + 1.0W 122 mph Wind

**Dead Load Factor** 1.20

**Wind Load Factor** 1.00




**Iterations** 26

| 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 | 180.00 | Lightning Rod | 1 | 51.360 | 56.496 | 1.00 | 1.00 | 1.05 | 42.00 | 0.000 | 3.500 | 59.32 | 0.00 | 207.62 |
| 2 | 177.00 | Low Profile Platform | 1 | 50.971 | 56.068 | 1.00 | 1.00 | 24.00 | 2400.00 | 0.000 | 0.000 | 1345.64 | 0.00 | 0.00 |
| 3 | 177.00 | EMS RR90-17-02DP | 9 | 50.971 | 56.068 | 0.62 | 0.80 | 24.49 | 194.40 | 0.000 | 0.000 | 1372.88 | 0.00 | 0.00 |
| 4 | 177.00 | APXVAARR18_43-U-NA2 | 3 | 50.971 | 56.068 | 0.61 | 0.80 | 28.75 | 381.60 | 0.000 | 0.000 | 1611.76 | 0.00 | 0.00 |
| 5 | 177.00 | Kathrein 782 10662 Bias-T | 3 | 50.986 | 56.084 | 0.60 | 0.80 | 0.50 | 6.48 | 0.000 | 0.237 | 28.27 | 0.00 | 6.71 |
| 6 | 177.00 | Ericsson Radio 4449 | 3 | 51.009 | 56.110 | 0.60 | 0.80 | 2.97 | 266.40 | 0.000 | 0.625 | 166.65 | 0.00 | 104.15 |
| 7 | 177.00 | KRY 112 144/2 | 3 | 50.989 | 56.088 | 0.60 | 0.80 | 0.74 | 34.92 | 0.000 | 0.287 | 41.39 | 0.00 | 11.90 |
| 8 | 177.00 | KRY 112 489/2 | 3 | 50.999 | 56.099 | 0.60 | 0.80 | 1.17 | 55.44 | 0.000 | 0.458 | 65.64 | 0.00 | 30.08 |
| 9 | 167.00 | Low Profile Platform | 1 | 50.351 | 55.386 | 1.00 | 1.00 | 24.00 | 2400.00 | 0.000 | 0.000 | 1329.27 | 0.00 | 0.00 |
| 10 | 167.00 | RRH2x40-07-U | 3 | 50.351 | 55.386 | 0.60 | 0.80 | 4.01 | 182.52 | 0.000 | 0.000 | 222.32 | 0.00 | 0.00 |
| 11 | 167.00 | RRH2x40-AWS | 3 | 50.351 | 55.386 | 0.60 | 0.80 | 4.54 | 158.40 | 0.000 | 0.000 | 251.23 | 0.00 | 0.00 |
| 12 | 167.00 | BXA-171063-12CF | 6 | 50.351 | 55.386 | 0.67 | 0.80 | 19.27 | 108.00 | 0.000 | 0.000 | 1067.46 | 0.00 | 0.00 |
| 13 | 167.00 | BXA-70063-6CF | 6 | 50.351 | 55.386 | 0.59 | 0.80 | 26.89 | 122.40 | 0.000 | 0.000 | 1489.26 | 0.00 | 0.00 |
| 14 | 157.00 | LGP21401 TMA | 6 | 49.701 | 54.671 | 0.60 | 0.80 | 4.64 | 101.52 | 0.000 | 0.000 | 253.89 | 0.00 | 0.00 |
| 15 | 157.00 | LGP21903 Diplexers | 6 | 49.701 | 54.671 | 0.60 | 0.80 | 2.27 | 39.60 | 0.000 | 0.000 | 123.99 | 0.00 | 0.00 |
| 16 | 157.00 | Low Profile Platform | 1 | 49.701 | 54.671 | 1.00 | 1.00 | 24.00 | 2400.00 | 0.000 | 0.000 | 1312.10 | 0.00 | 0.00 |
| 17 | 157.00 | 7770.00 | 9 | 49.499 | 54.449 | 0.58 | 0.80 | 28.91 | 378.00 | 0.000 | -3.000 | 1574.02 | 0.00 | -4722.06 |
| | | | | | | | **Totals:** | | **9,271.68** | | | **12,315.09** | | |

# Total Applied Force Summary

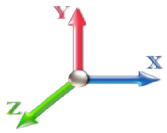
| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT02652-S-SBA | **Code:** | EIA/TIA-222-H | 7/16/2019 | |
| **Site Name:** | Colchester 3 CT | **Exposure:** | C | | |
| **Height:** | 180.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 10 | |

Tower Engineering Solutions

**Load Case:** 1.2D + 1.0W 122 mph Wind

**Dead Load Factor** 1.20

**Wind Load Factor** 1.00




**Iterations** 26

| 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 | | 632.89 | 1957.12 | 0.00 | 0.00 |
| 10.00 | | 621.99 | 1927.88 | 0.00 | 0.00 |
| 15.00 | | 611.08 | 1898.63 | 0.00 | 0.00 |
| 20.00 | | 636.81 | 1869.39 | 0.00 | 0.00 |
| 25.00 | | 655.31 | 1840.15 | 0.00 | 0.00 |
| 30.00 | | 668.35 | 1810.90 | 0.00 | 0.00 |
| 35.00 | | 677.38 | 1781.66 | 0.00 | 0.00 |
| 40.00 | | 683.30 | 1752.42 | 0.00 | 0.00 |
| 45.00 | | 686.73 | 1723.18 | 0.00 | 0.00 |
| 45.92 | | 124.94 | 312.74 | 0.00 | 0.00 |
| 50.00 | | 569.28 | 2389.30 | 0.00 | 0.00 |
| 53.00 | | 417.37 | 1732.33 | 0.00 | 0.00 |
| 55.00 | | 277.56 | 590.72 | 0.00 | 0.00 |
| 60.00 | | 696.53 | 1459.28 | 0.00 | 0.00 |
| 65.00 | | 693.53 | 1434.25 | 0.00 | 0.00 |
| 70.00 | | 689.37 | 1409.21 | 0.00 | 0.00 |
| 75.00 | | 684.17 | 1384.17 | 0.00 | 0.00 |
| 80.00 | | 678.04 | 1359.14 | 0.00 | 0.00 |
| 85.00 | | 671.06 | 1334.10 | 0.00 | 0.00 |
| 90.00 | | 663.30 | 1309.06 | 0.00 | 0.00 |
| 92.92 | | 382.15 | 752.06 | 0.00 | 0.00 |
| 95.00 | | 274.98 | 887.01 | 0.00 | 0.00 |
| 98.92 | | 513.76 | 1645.99 | 0.00 | 0.00 |
| 100.00 | | 140.67 | 238.71 | 0.00 | 0.00 |
| 105.00 | | 645.97 | 1089.04 | 0.00 | 0.00 |
| 110.00 | | 635.76 | 1068.14 | 0.00 | 0.00 |
| 115.00 | | 625.02 | 1047.25 | 0.00 | 0.00 |
| 120.00 | | 613.77 | 1026.35 | 0.00 | 0.00 |
| 125.00 | | 602.05 | 1005.45 | 0.00 | 0.00 |
| 127.08 | | 245.90 | 411.46 | 0.00 | 0.00 |
| 130.00 | | 347.08 | 866.99 | 0.00 | 0.00 |
| 132.33 | | 273.07 | 681.36 | 0.00 | 0.00 |
| 135.00 | | 310.45 | 406.52 | 0.00 | 0.00 |
| 140.00 | | 571.74 | 749.10 | 0.00 | 0.00 |
| 145.00 | | 558.42 | 734.48 | 0.00 | 0.00 |
| 150.00 | | 544.73 | 719.85 | 0.00 | 0.00 |
| 155.00 | | 530.69 | 705.23 | 0.00 | 0.00 |
| 157.00 | (22) attachments | 3471.86 | 3197.12 | 0.00 | -4722.06 |
| 160.00 | | 307.64 | 367.68 | 0.00 | 0.00 |
| 165.00 | | 501.64 | 601.11 | 0.00 | 0.00 |
| 167.00 | (19) attachments | 4555.64 | 3207.67 | 0.00 | 0.00 |
| 170.00 | | 289.81 | 305.21 | 0.00 | 0.00 |
| 175.00 | | 471.35 | 496.99 | 0.00 | 0.00 |
| 177.00 | (25) attachments | 4816.09 | 3533.94 | 0.00 | 152.85 |
| 180.00 | (1) attachments | 330.58 | 280.78 | 0.00 | 207.62 |

# Total Applied Force Summary

| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT02652-S-SBA | **Code:** | EIA/TIA-222-H | 7/16/2019 | |
| **Site Name:** | Colchester 3 CT | **Exposure:** | C | | |
| **Height:** | 180.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 11 | |

| | | | | |
|---|---|---|---|---|
| **Totals:** | **34,599.80** | **57,301.10** | **0.00** | **-4,361.58** |

# Linear Appurtenance Segment Forces (Factored)

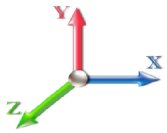
| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT02652-S-SBA | **Code:** | EIA/TIA-222-H | 7/16/2019 | |
| **Site Name:** | Colchester 3 CT | **Exposure:** | C | | |
| **Height:** | 180.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 12 | |

Tower Engineering Solutions

**Load Case:** 1.2D + 1.0W 122 mph Wind

**Dead Load Factor** 1.20

**Wind Load Factor** 1.00




**Iterations** 26

| Top Elev (ft) | Description | Wind Exposed | Length (ft) | Ca | Exposed Width (in) | Area (sqft) | CaAa (sqft) | Ra | Cf Adjust Factor | qz (psf) | F X (lb) | Dead Load (lb) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 30.355 | 0.00 | 41.40 |
| 10.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 30.355 | 0.00 | 41.40 |
| 15.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 30.355 | 0.00 | 41.40 |
| 20.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 32.208 | 0.00 | 41.40 |
| 25.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 33.758 | 0.00 | 41.40 |
| 30.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 35.079 | 0.00 | 41.40 |
| 35.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 36.236 | 0.00 | 41.40 |
| 40.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 37.269 | 0.00 | 41.40 |
| 45.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 38.204 | 0.00 | 41.40 |
| 45.92 | Climbing Ladder | Yes | 0.92 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 38.367 | 0.00 | 7.59 |
| 50.00 | Climbing Ladder | Yes | 4.08 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 39.061 | 0.00 | 33.81 |
| 53.00 | Climbing Ladder | Yes | 3.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 39.543 | 0.00 | 24.84 |
| 55.00 | Climbing Ladder | Yes | 2.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 39.853 | 0.00 | 16.56 |
| 60.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 40.590 | 0.00 | 41.40 |
| 65.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 41.280 | 0.00 | 41.40 |
| 70.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 41.929 | 0.00 | 41.40 |
| 75.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 42.542 | 0.00 | 41.40 |
| 80.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 43.124 | 0.00 | 41.40 |
| 85.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 43.678 | 0.00 | 41.40 |
| 90.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 44.207 | 0.00 | 41.40 |
| 92.92 | Climbing Ladder | Yes | 2.92 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 44.505 | 0.00 | 24.15 |
| 95.00 | Climbing Ladder | Yes | 2.08 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 44.713 | 0.00 | 17.25 |
| 98.92 | Climbing Ladder | Yes | 3.92 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 45.095 | 0.00 | 32.43 |
| 100.00 | Climbing Ladder | Yes | 1.08 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 45.198 | 0.00 | 8.97 |
| 105.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 45.665 | 0.00 | 41.40 |
| 110.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 46.114 | 0.00 | 41.40 |
| 115.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 46.548 | 0.00 | 41.40 |
| 120.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 46.967 | 0.00 | 41.40 |
| 125.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 47.372 | 0.00 | 41.40 |
| 127.08 | Climbing Ladder | Yes | 2.08 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 47.537 | 0.00 | 17.19 |
| 130.00 | Climbing Ladder | Yes | 2.92 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 47.765 | 0.00 | 24.21 |
| 132.33 | Climbing Ladder | Yes | 2.33 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 47.944 | 0.00 | 19.26 |
| 135.00 | Climbing Ladder | Yes | 2.67 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 48.146 | 0.00 | 22.14 |
| 140.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 48.516 | 0.00 | 41.40 |
| 145.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 48.876 | 0.00 | 41.40 |
| 150.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 49.226 | 0.00 | 41.40 |
| 155.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 49.567 | 0.00 | 41.40 |
| 157.00 | Climbing Ladder | Yes | 2.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 49.701 | 0.00 | 16.56 |
| 160.00 | Climbing Ladder | Yes | 3.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 49.899 | 0.00 | 24.84 |
| 165.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 50.224 | 0.00 | 41.40 |
| 167.00 | Climbing Ladder | Yes | 2.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 50.351 | 0.00 | 16.56 |
| 170.00 | Climbing Ladder | Yes | 3.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 50.540 | 0.00 | 24.84 |
| 175.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 50.850 | 0.00 | 41.40 |
| 177.00 | Climbing Ladder | Yes | 2.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 50.971 | 0.00 | 16.56 |
| 180.00 | Climbing Ladder | Yes | 3.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 51.152 | 0.00 | 24.84 |
| | | | | | | | | | | **Totals:** | **0.0** | **1,490.4** |

# Calculated Forces

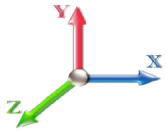
| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT02652-S-SBA | **Code:** | EIA/TIA-222-H | 7/16/2019 | |
| **Site Name:** | Colchester 3 CT | **Exposure:** | C | | |
| **Height:** | 180.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 13 | |

Tower Engineering Solutions

**Load Case:** 1.2D + 1.0W 122 mph Wind

**Dead Load Factor** 1.20

**Wind Load Factor** 1.00




**Iterations** 26

| Seg Elev (ft) | Pu FY (-) (kips) | Vu FX (-) (kips) | Tu MY (-) (ft-kips) | Mu MZ (ft-kips) | Mu MX (ft-kips) | Resultant Moment (ft-kips) | phi Pn (kips) | phi Vn (kips) | phi Tn (ft-kips) | phi Mn (ft-kips) | Total Deflect (in) | Rotation Sway (deg) | Rotation Twist (deg) | Stress Ratio |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | -57.25 | -34.68 | 0.00 | -4207.2 | 0.00 | 4207.20 | 5508.12 | 1460.53 | 7226.63 | 6725.55 | 0.00 | 0.000 | 0.000 | 0.637 |
| 5.00 | -55.20 | -34.20 | 0.00 | -4033.8 | 0.00 | 4033.80 | 5452.09 | 1435.40 | 6980.02 | 6541.73 | 0.08 | -0.157 | 0.000 | 0.627 |
| 10.00 | -53.18 | -33.71 | 0.00 | -3862.8 | 0.00 | 3862.82 | 5394.71 | 1410.26 | 6737.68 | 6358.68 | 0.33 | -0.316 | 0.000 | 0.618 |
| 15.00 | -51.20 | -33.23 | 0.00 | -3694.2 | 0.00 | 3694.25 | 5335.97 | 1385.12 | 6499.64 | 6176.49 | 0.75 | -0.476 | 0.000 | 0.608 |
| 20.00 | -49.24 | -32.72 | 0.00 | -3528.0 | 0.00 | 3528.08 | 5275.87 | 1359.98 | 6265.87 | 5995.24 | 1.34 | -0.637 | 0.000 | 0.598 |
| 25.00 | -47.32 | -32.18 | 0.00 | -3364.4 | 0.00 | 3364.49 | 5214.41 | 1334.85 | 6036.38 | 5815.02 | 2.09 | -0.800 | 0.000 | 0.588 |
| 30.00 | -45.43 | -31.61 | 0.00 | -3203.6 | 0.00 | 3203.62 | 5151.59 | 1309.71 | 5811.17 | 5635.92 | 3.02 | -0.964 | 0.000 | 0.578 |
| 35.00 | -43.57 | -31.03 | 0.00 | -3045.5 | 0.00 | 3045.57 | 5087.42 | 1284.57 | 5590.25 | 5458.02 | 4.12 | -1.129 | 0.000 | 0.567 |
| 40.00 | -41.74 | -30.43 | 0.00 | -2890.4 | 0.00 | 2890.44 | 5021.88 | 1259.44 | 5373.61 | 5281.41 | 5.39 | -1.296 | 0.000 | 0.556 |
| 45.00 | -39.98 | -29.77 | 0.00 | -2738.3 | 0.00 | 2738.31 | 4954.99 | 1234.30 | 5161.25 | 5106.18 | 6.84 | -1.463 | 0.000 | 0.545 |
| 45.92 | -39.63 | -29.69 | 0.00 | -2711.0 | 0.00 | 2711.02 | 4942.58 | 1229.69 | 5122.78 | 5074.21 | 7.12 | -1.495 | 0.000 | 0.543 |
| 50.00 | -37.20 | -29.14 | 0.00 | -2589.7 | 0.00 | 2589.77 | 4886.75 | 1209.16 | 4953.16 | 4932.41 | 8.46 | -1.633 | 0.000 | 0.533 |
| 53.00 | -35.43 | -28.72 | 0.00 | -2502.3 | 0.00 | 2502.35 | 3967.43 | 1039.40 | 4274.84 | 4025.79 | 9.52 | -1.736 | 0.000 | 0.631 |
| 55.00 | -34.79 | -28.51 | 0.00 | -2444.9 | 0.00 | 2444.91 | 3947.58 | 1030.79 | 4204.32 | 3972.23 | 10.26 | -1.805 | 0.000 | 0.625 |
| 60.00 | -33.26 | -27.87 | 0.00 | -2302.3 | 0.00 | 2302.38 | 3897.00 | 1009.27 | 4030.59 | 3838.84 | 12.25 | -1.994 | 0.000 | 0.609 |
| 65.00 | -31.76 | -27.23 | 0.00 | -2163.0 | 0.00 | 2163.02 | 3845.06 | 987.75 | 3860.53 | 3706.29 | 14.44 | -2.183 | 0.000 | 0.593 |
| 70.00 | -30.29 | -26.59 | 0.00 | -2026.8 | 0.00 | 2026.86 | 3791.77 | 966.22 | 3694.13 | 3574.65 | 16.83 | -2.372 | 0.000 | 0.576 |
| 75.00 | -28.86 | -25.94 | 0.00 | -1893.9 | 0.00 | 1893.93 | 3737.12 | 944.70 | 3531.40 | 3444.02 | 19.41 | -2.561 | 0.000 | 0.558 |
| 80.00 | -27.45 | -25.29 | 0.00 | -1764.2 | 0.00 | 1764.24 | 3681.11 | 923.18 | 3372.34 | 3314.49 | 22.20 | -2.750 | 0.000 | 0.540 |
| 85.00 | -26.07 | -24.64 | 0.00 | -1637.7 | 0.00 | 1637.79 | 3623.74 | 901.66 | 3216.94 | 3186.13 | 25.18 | -2.939 | 0.000 | 0.522 |
| 90.00 | -24.73 | -23.97 | 0.00 | -1514.6 | 0.00 | 1514.60 | 3565.02 | 880.14 | 3065.20 | 3059.03 | 28.36 | -3.126 | 0.000 | 0.503 |
| 92.92 | -23.96 | -23.59 | 0.00 | -1444.6 | 0.00 | 1444.69 | 3530.13 | 867.59 | 2978.38 | 2985.51 | 30.30 | -3.236 | 0.000 | 0.491 |
| 95.00 | -23.05 | -23.31 | 0.00 | -1395.5 | 0.00 | 1395.55 | 3504.93 | 858.62 | 2917.13 | 2933.28 | 31.73 | -3.315 | 0.000 | 0.483 |
| 98.92 | -21.40 | -22.73 | 0.00 | -1304.2 | 0.00 | 1304.26 | 2742.07 | 714.64 | 2421.16 | 2291.78 | 34.51 | -3.461 | 0.000 | 0.578 |
| 100.00 | -21.12 | -22.62 | 0.00 | -1279.6 | 0.00 | 1279.64 | 2732.96 | 710.75 | 2394.86 | 2271.63 | 35.30 | -3.502 | 0.000 | 0.572 |
| 105.00 | -20.00 | -21.98 | 0.00 | -1166.5 | 0.00 | 1166.53 | 2690.08 | 692.79 | 2275.34 | 2179.04 | 39.07 | -3.708 | 0.000 | 0.544 |
| 110.00 | -18.90 | -21.34 | 0.00 | -1056.6 | 0.00 | 1056.62 | 2645.83 | 674.83 | 2158.87 | 2087.20 | 43.06 | -3.911 | 0.000 | 0.514 |
| 115.00 | -17.83 | -20.71 | 0.00 | -949.91 | 0.00 | 949.91 | 2600.23 | 656.86 | 2045.47 | 1996.19 | 47.26 | -4.109 | 0.000 | 0.484 |
| 120.00 | -16.78 | -20.07 | 0.00 | -846.38 | 0.00 | 846.38 | 2553.28 | 638.90 | 1935.12 | 1906.09 | 51.67 | -4.301 | 0.000 | 0.452 |
| 125.00 | -15.78 | -19.43 | 0.00 | -746.01 | 0.00 | 746.01 | 2504.96 | 620.94 | 1827.84 | 1816.99 | 56.27 | -4.487 | 0.000 | 0.418 |
| 127.08 | -15.36 | -19.18 | 0.00 | -705.66 | 0.00 | 705.66 | 2484.49 | 613.48 | 1784.18 | 1780.31 | 58.24 | -4.563 | 0.000 | 0.404 |
| 130.00 | -14.49 | -18.79 | 0.00 | -649.59 | 0.00 | 649.59 | 2455.29 | 602.97 | 1723.61 | 1728.99 | 61.06 | -4.667 | 0.000 | 0.383 |
| 132.33 | -13.81 | -18.48 | 0.00 | -605.88 | 0.00 | 605.88 | 1489.30 | 422.56 | 1209.83 | 1053.29 | 63.35 | -4.748 | 0.000 | 0.586 |
| 135.00 | -13.38 | -18.17 | 0.00 | -556.48 | 0.00 | 556.48 | 1477.63 | 415.84 | 1171.66 | 1028.31 | 66.04 | -4.838 | 0.000 | 0.552 |
| 140.00 | -12.62 | -17.58 | 0.00 | -465.62 | 0.00 | 465.62 | 1454.76 | 403.27 | 1101.91 | 981.60 | 71.21 | -5.049 | 0.000 | 0.485 |
| 145.00 | -11.89 | -17.00 | 0.00 | -377.71 | 0.00 | 377.71 | 1430.53 | 390.71 | 1034.29 | 934.97 | 76.60 | -5.240 | 0.000 | 0.414 |
| 150.00 | -11.18 | -16.42 | 0.00 | -292.72 | 0.00 | 292.72 | 1404.94 | 378.14 | 968.82 | 888.50 | 82.17 | -5.407 | 0.000 | 0.339 |
| 155.00 | -10.50 | -15.84 | 0.00 | -210.63 | 0.00 | 210.63 | 1377.99 | 365.57 | 905.49 | 842.29 | 87.91 | -5.545 | 0.000 | 0.260 |
| 157.00 | -7.65 | -12.08 | 0.00 | -178.95 | 0.00 | 178.95 | 1366.83 | 360.54 | 880.75 | 823.90 | 90.24 | -5.593 | 0.000 | 0.224 |
| 160.00 | -7.30 | -11.75 | 0.00 | -142.71 | 0.00 | 142.71 | 1349.68 | 353.00 | 844.29 | 796.42 | 93.77 | -5.654 | 0.000 | 0.186 |
| 165.00 | -6.74 | -11.19 | 0.00 | -83.98 | 0.00 | 83.98 | 1320.02 | 340.43 | 785.24 | 750.97 | 99.72 | -5.730 | 0.000 | 0.118 |
| 167.00 | -4.00 | -6.34 | 0.00 | -61.59 | 0.00 | 61.59 | 1307.77 | 335.40 | 762.22 | 732.93 | 102.12 | -5.752 | 0.000 | 0.087 |
| 170.00 | -3.72 | -6.02 | 0.00 | -42.57 | 0.00 | 42.57 | 1289.00 | 327.86 | 728.33 | 706.04 | 105.74 | -5.777 | 0.000 | 0.064 |
| 175.00 | -3.27 | -5.51 | 0.00 | -12.44 | 0.00 | 12.44 | 1256.62 | 315.30 | 673.56 | 661.70 | 111.80 | -5.800 | 0.000 | 0.022 |
| 177.00 | -0.25 | -0.36 | 0.00 | -1.28 | 0.00 | 1.28 | 1243.29 | 310.27 | 652.25 | 644.16 | 114.22 | -5.803 | 0.000 | 0.002 |
| 180.00 | 0.00 | -0.33 | 0.00 | -0.21 | 0.00 | 0.21 | 1222.88 | 302.73 | 620.93 | 618.05 | 117.86 | -5.803 | 0.000 | 0.000 |

# Wind Loading - Shaft

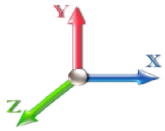
| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT02652-S-SBA | **Code:** | EIA/TIA-222-H | 7/16/2019 | |
| **Site Name:** | Colchester 3 CT | **Exposure:** | C | | |
| **Height:** | 180.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 14 | |

Tower Engineering Solutions

**Load Case:** 0.9D + 1.0W 122 mph Wind

**Dead Load Factor** 0.90

**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 | 30.355 | 33.39 | 569.55 | 0.750 | 0.000 | 0.00 | 0.000 | 0.00 | 0.0 | 0.0 | 0.0 |
| 5.00 | | 1.00 | 0.85 | 30.355 | 33.39 | 559.82 | 0.750 | 0.000 | 5.00 | 25.272 | 18.95 | 632.9 | 0.0 | 1263.4 |
| 10.00 | | 1.00 | 0.85 | 30.355 | 33.39 | 550.09 | 0.750 | 0.000 | 5.00 | 24.837 | 18.63 | 622.0 | 0.0 | 1241.4 |
| 15.00 | | 1.00 | 0.85 | 30.355 | 33.39 | 540.36 | 0.750 | 0.000 | 5.00 | 24.401 | 18.30 | 611.1 | 0.0 | 1219.5 |
| 20.00 | | 1.00 | 0.90 | 32.208 | 35.43 | 546.58 | 0.750 | 0.000 | 5.00 | 23.966 | 17.97 | 636.8 | 0.0 | 1197.6 |
| 25.00 | | 1.00 | 0.95 | 33.758 | 37.13 | 549.31 | 0.750 | 0.000 | 5.00 | 23.530 | 17.65 | 655.3 | 0.0 | 1175.6 |
| 30.00 | | 1.00 | 0.98 | 35.079 | 38.59 | 549.50 | 0.750 | 0.000 | 5.00 | 23.095 | 17.32 | 668.4 | 0.0 | 1153.7 |
| 35.00 | | 1.00 | 1.01 | 36.236 | 39.86 | 547.85 | 0.750 | 0.000 | 5.00 | 22.659 | 16.99 | 677.4 | 0.0 | 1131.8 |
| 40.00 | | 1.00 | 1.04 | 37.269 | 41.00 | 544.83 | 0.750 | 0.000 | 5.00 | 22.224 | 16.67 | 683.3 | 0.0 | 1109.8 |
| 45.00 | | 1.00 | 1.07 | 38.204 | 42.02 | 540.71 | 0.750 | 0.000 | 5.00 | 21.788 | 16.34 | 686.7 | 0.0 | 1087.9 |
| 45.92 | Bot - Section 2 | 1.00 | 1.07 | 38.367 | 42.20 | 539.85 | 0.750 | 0.000 | 0.92 | 3.947 | 2.96 | 124.9 | 0.0 | 197.1 |
| 50.00 | | 1.00 | 1.09 | 39.061 | 42.97 | 535.70 | 0.750 | 0.000 | 4.08 | 17.666 | 13.25 | 569.3 | 0.0 | 1625.0 |
| 53.00 | Top - Section 1 | 1.00 | 1.11 | 39.543 | 43.50 | 532.33 | 0.750 | 0.000 | 3.00 | 12.794 | 9.60 | 417.4 | 0.0 | 1176.6 |
| 55.00 | | 1.00 | 1.12 | 39.853 | 43.84 | 538.11 | 0.750 | 0.000 | 2.00 | 8.442 | 6.33 | 277.6 | 0.0 | 361.3 |
| 60.00 | | 1.00 | 1.14 | 40.590 | 44.65 | 531.81 | 0.750 | 0.000 | 5.00 | 20.800 | 15.60 | 696.5 | 0.0 | 890.0 |
| 65.00 | | 1.00 | 1.16 | 41.280 | 45.41 | 524.96 | 0.750 | 0.000 | 5.00 | 20.365 | 15.27 | 693.5 | 0.0 | 871.2 |
| 70.00 | | 1.00 | 1.17 | 41.929 | 46.12 | 517.63 | 0.750 | 0.000 | 5.00 | 19.929 | 14.95 | 689.4 | 0.0 | 852.4 |
| 75.00 | | 1.00 | 1.19 | 42.542 | 46.80 | 509.89 | 0.750 | 0.000 | 5.00 | 19.494 | 14.62 | 684.2 | 0.0 | 833.6 |
| 80.00 | | 1.00 | 1.21 | 43.124 | 47.44 | 501.76 | 0.750 | 0.000 | 5.00 | 19.058 | 14.29 | 678.0 | 0.0 | 814.9 |
| 85.00 | | 1.00 | 1.22 | 43.678 | 48.05 | 493.30 | 0.750 | 0.000 | 5.00 | 18.623 | 13.97 | 671.1 | 0.0 | 796.1 |
| 90.00 | | 1.00 | 1.24 | 44.207 | 48.63 | 484.54 | 0.750 | 0.000 | 5.00 | 18.187 | 13.64 | 663.3 | 0.0 | 777.3 |
| 92.92 | Bot - Section 3 | 1.00 | 1.25 | 44.505 | 48.95 | 479.29 | 0.750 | 0.000 | 2.92 | 10.408 | 7.81 | 382.1 | 0.0 | 444.8 |
| 95.00 | | 1.00 | 1.25 | 44.713 | 49.18 | 475.49 | 0.750 | 0.000 | 2.08 | 7.454 | 5.59 | 275.0 | 0.0 | 580.1 |
| 98.92 | Top - Section 2 | 1.00 | 1.26 | 45.095 | 49.60 | 468.23 | 0.750 | 0.000 | 3.92 | 13.810 | 10.36 | 513.8 | 0.0 | 1074.3 |
| 100.00 | | 1.00 | 1.27 | 45.198 | 49.72 | 473.44 | 0.750 | 0.000 | 1.08 | 3.773 | 2.83 | 140.7 | 0.0 | 134.7 |
| 105.00 | | 1.00 | 1.28 | 45.665 | 50.23 | 463.95 | 0.750 | 0.000 | 5.00 | 17.147 | 12.86 | 646.0 | 0.0 | 612.3 |
| 110.00 | | 1.00 | 1.29 | 46.114 | 50.73 | 454.23 | 0.750 | 0.000 | 5.00 | 16.711 | 12.53 | 635.8 | 0.0 | 596.6 |
| 115.00 | | 1.00 | 1.30 | 46.548 | 51.20 | 444.31 | 0.750 | 0.000 | 5.00 | 16.276 | 12.21 | 625.0 | 0.0 | 581.0 |
| 120.00 | | 1.00 | 1.32 | 46.967 | 51.66 | 434.20 | 0.750 | 0.000 | 5.00 | 15.840 | 11.88 | 613.8 | 0.0 | 565.3 |
| 125.00 | | 1.00 | 1.33 | 47.372 | 52.11 | 423.92 | 0.750 | 0.000 | 5.00 | 15.405 | 11.55 | 602.0 | 0.0 | 549.6 |
| 127.08 | Bot - Section 4 | 1.00 | 1.33 | 47.537 | 52.29 | 419.59 | 0.750 | 0.000 | 2.08 | 6.270 | 4.70 | 245.9 | 0.0 | 223.7 |
| 130.00 | | 1.00 | 1.34 | 47.765 | 52.54 | 413.46 | 0.750 | 0.000 | 2.92 | 8.808 | 6.61 | 347.1 | 0.0 | 530.7 |
| 132.33 | Top - Section 3 | 1.00 | 1.34 | 47.944 | 52.74 | 408.54 | 0.750 | 0.000 | 2.33 | 6.904 | 5.18 | 273.1 | 0.0 | 415.9 |
| 135.00 | | 1.00 | 1.35 | 48.146 | 52.96 | 408.09 | 0.750 | 0.000 | 2.67 | 7.816 | 5.86 | 310.5 | 0.0 | 195.6 |
| 140.00 | | 1.00 | 1.36 | 48.516 | 53.37 | 397.35 | 0.750 | 0.000 | 5.00 | 14.284 | 10.71 | 571.7 | 0.0 | 357.3 |
| 145.00 | | 1.00 | 1.37 | 48.876 | 53.76 | 386.48 | 0.750 | 0.000 | 5.00 | 13.849 | 10.39 | 558.4 | 0.0 | 346.4 |
| 150.00 | | 1.00 | 1.38 | 49.226 | 54.15 | 375.47 | 0.750 | 0.000 | 5.00 | 13.413 | 10.06 | 544.7 | 0.0 | 335.4 |
| 155.00 | | 1.00 | 1.39 | 49.567 | 54.52 | 364.33 | 0.750 | 0.000 | 5.00 | 12.978 | 9.73 | 530.7 | 0.0 | 324.4 |
| 157.00 | Appurtenance(s) | 1.00 | 1.39 | 49.701 | 54.67 | 359.84 | 0.750 | 0.000 | 2.00 | 5.069 | 3.80 | 207.9 | 0.0 | 126.7 |
| 160.00 | | 1.00 | 1.40 | 49.899 | 54.89 | 353.07 | 0.750 | 0.000 | 3.00 | 7.473 | 5.60 | 307.6 | 0.0 | 186.8 |
| 165.00 | | 1.00 | 1.41 | 50.224 | 55.25 | 341.70 | 0.750 | 0.000 | 5.00 | 12.107 | 9.08 | 501.6 | 0.0 | 302.5 |
| 167.00 | Appurtenance(s) | 1.00 | 1.41 | 50.351 | 55.39 | 337.12 | 0.750 | 0.000 | 2.00 | 4.721 | 3.54 | 196.1 | 0.0 | 117.9 |
| 170.00 | | 1.00 | 1.42 | 50.540 | 55.59 | 330.22 | 0.750 | 0.000 | 3.00 | 6.950 | 5.21 | 289.8 | 0.0 | 173.6 |
| 175.00 | | 1.00 | 1.42 | 50.850 | 55.93 | 318.64 | 0.750 | 0.000 | 5.00 | 11.236 | 8.43 | 471.3 | 0.0 | 280.6 |
| 177.00 | Appurtenance(s) | 1.00 | 1.43 | 50.971 | 56.07 | 313.97 | 0.750 | 0.000 | 2.00 | 4.372 | 3.28 | 183.9 | 0.0 | 109.2 |
| 180.00 | Appurtenance(s) | 1.00 | 1.43 | 51.152 | 56.27 | 306.95 | 0.750 | 0.000 | 3.00 | 6.428 | 4.82 | 271.3 | 0.0 | 160.5 |

# Wind Loading - Shaft

| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT02652-S-SBA | **Code:** | EIA/TIA-222-H | 7/16/2019 | |
| **Site Name:** | Colchester 3 CT | **Exposure:** | C | | |
| **Height:** | 180.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 15 | |

| | | | |
|---|---|---|---|
| **Totals:** | **180.00** | **22,284.7** | **29,101.8** |

# Discrete Appurtenance Forces

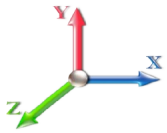
| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT02652-S-SBA | **Code:** | EIA/TIA-222-H | 7/16/2019 | |
| **Site Name:** | Colchester 3 CT | **Exposure:** | C | | |
| **Height:** | 180.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 16 | |

Tower Engineering Solutions

**Load Case:** 0.9D + 1.0W 122 mph Wind

**Dead Load Factor** 0.90

**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 | 180.00 | Lightning Rod | 1 | 51.360 | 56.496 | 1.00 | 1.00 | 1.05 | 31.50 | 0.000 | 3.500 | 59.32 | 0.00 | 207.62 |
| 2 | 177.00 | Low Profile Platform | 1 | 50.971 | 56.068 | 1.00 | 1.00 | 24.00 | 1800.00 | 0.000 | 0.000 | 1345.64 | 0.00 | 0.00 |
| 3 | 177.00 | EMS RR90-17-02DP | 9 | 50.971 | 56.068 | 0.62 | 0.80 | 24.49 | 145.80 | 0.000 | 0.000 | 1372.88 | 0.00 | 0.00 |
| 4 | 177.00 | APXVAARR18_43-U-NA2 | 3 | 50.971 | 56.068 | 0.61 | 0.80 | 28.75 | 286.20 | 0.000 | 0.000 | 1611.76 | 0.00 | 0.00 |
| 5 | 177.00 | Kathrein 782 10662 Bias-T | 3 | 50.986 | 56.084 | 0.60 | 0.80 | 0.50 | 4.86 | 0.000 | 0.237 | 28.27 | 0.00 | 6.71 |
| 6 | 177.00 | Ericsson Radio 4449 | 3 | 51.009 | 56.110 | 0.60 | 0.80 | 2.97 | 199.80 | 0.000 | 0.625 | 166.65 | 0.00 | 104.15 |
| 7 | 177.00 | KRY 112 144/2 | 3 | 50.989 | 56.088 | 0.60 | 0.80 | 0.74 | 26.19 | 0.000 | 0.287 | 41.39 | 0.00 | 11.90 |
| 8 | 177.00 | KRY 112 489/2 | 3 | 50.999 | 56.099 | 0.60 | 0.80 | 1.17 | 41.58 | 0.000 | 0.458 | 65.64 | 0.00 | 30.08 |
| 9 | 167.00 | Low Profile Platform | 1 | 50.351 | 55.386 | 1.00 | 1.00 | 24.00 | 1800.00 | 0.000 | 0.000 | 1329.27 | 0.00 | 0.00 |
| 10 | 167.00 | RRH2x40-07-U | 3 | 50.351 | 55.386 | 0.60 | 0.80 | 4.01 | 136.89 | 0.000 | 0.000 | 222.32 | 0.00 | 0.00 |
| 11 | 167.00 | RRH2x40-AWS | 3 | 50.351 | 55.386 | 0.60 | 0.80 | 4.54 | 118.80 | 0.000 | 0.000 | 251.23 | 0.00 | 0.00 |
| 12 | 167.00 | BXA-171063-12CF | 6 | 50.351 | 55.386 | 0.67 | 0.80 | 19.27 | 81.00 | 0.000 | 0.000 | 1067.46 | 0.00 | 0.00 |
| 13 | 167.00 | BXA-70063-6CF | 6 | 50.351 | 55.386 | 0.59 | 0.80 | 26.89 | 91.80 | 0.000 | 0.000 | 1489.26 | 0.00 | 0.00 |
| 14 | 157.00 | LGP21401 TMA | 6 | 49.701 | 54.671 | 0.60 | 0.80 | 4.64 | 76.14 | 0.000 | 0.000 | 253.89 | 0.00 | 0.00 |
| 15 | 157.00 | LGP21903 Diplexers | 6 | 49.701 | 54.671 | 0.60 | 0.80 | 2.27 | 29.70 | 0.000 | 0.000 | 123.99 | 0.00 | 0.00 |
| 16 | 157.00 | Low Profile Platform | 1 | 49.701 | 54.671 | 1.00 | 1.00 | 24.00 | 1800.00 | 0.000 | 0.000 | 1312.10 | 0.00 | 0.00 |
| 17 | 157.00 | 7770.00 | 9 | 49.499 | 54.449 | 0.58 | 0.80 | 28.91 | 283.50 | 0.000 | -3.000 | 1574.02 | 0.00 | -4722.06 |
| | | | | | | | **Totals:** | | **6,953.76** | | | **12,315.09** | | |

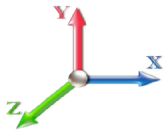
# Total Applied Force Summary

| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT02652-S-SBA | **Code:** | EIA/TIA-222-H | 7/16/2019 | |
| **Site Name:** | Colchester 3 CT | **Exposure:** | C | | |
| **Height:** | 180.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 17 | |

**Load Case:** 0.9D + 1.0W 122 mph Wind

**Dead Load Factor** 0.90

**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 | | 632.89 | 1467.84 | 0.00 | 0.00 |
| 10.00 | | 621.99 | 1445.91 | 0.00 | 0.00 |
| 15.00 | | 611.08 | 1423.97 | 0.00 | 0.00 |
| 20.00 | | 636.81 | 1402.04 | 0.00 | 0.00 |
| 25.00 | | 655.31 | 1380.11 | 0.00 | 0.00 |
| 30.00 | | 668.35 | 1358.18 | 0.00 | 0.00 |
| 35.00 | | 677.38 | 1336.25 | 0.00 | 0.00 |
| 40.00 | | 683.30 | 1314.31 | 0.00 | 0.00 |
| 45.00 | | 686.73 | 1292.38 | 0.00 | 0.00 |
| 45.92 | | 124.94 | 234.56 | 0.00 | 0.00 |
| 50.00 | | 569.28 | 1791.97 | 0.00 | 0.00 |
| 53.00 | | 417.37 | 1299.25 | 0.00 | 0.00 |
| 55.00 | | 277.56 | 443.04 | 0.00 | 0.00 |
| 60.00 | | 696.53 | 1094.46 | 0.00 | 0.00 |
| 65.00 | | 693.53 | 1075.68 | 0.00 | 0.00 |
| 70.00 | | 689.37 | 1056.91 | 0.00 | 0.00 |
| 75.00 | | 684.17 | 1038.13 | 0.00 | 0.00 |
| 80.00 | | 678.04 | 1019.35 | 0.00 | 0.00 |
| 85.00 | | 671.06 | 1000.57 | 0.00 | 0.00 |
| 90.00 | | 663.30 | 981.80 | 0.00 | 0.00 |
| 92.92 | | 382.15 | 564.04 | 0.00 | 0.00 |
| 95.00 | | 274.98 | 665.26 | 0.00 | 0.00 |
| 98.92 | | 513.76 | 1234.49 | 0.00 | 0.00 |
| 100.00 | | 140.67 | 179.03 | 0.00 | 0.00 |
| 105.00 | | 645.97 | 816.78 | 0.00 | 0.00 |
| 110.00 | | 635.76 | 801.11 | 0.00 | 0.00 |
| 115.00 | | 625.02 | 785.43 | 0.00 | 0.00 |
| 120.00 | | 613.77 | 769.76 | 0.00 | 0.00 |
| 125.00 | | 602.05 | 754.09 | 0.00 | 0.00 |
| 127.08 | | 245.90 | 308.59 | 0.00 | 0.00 |
| 130.00 | | 347.08 | 650.24 | 0.00 | 0.00 |
| 132.33 | | 273.07 | 511.02 | 0.00 | 0.00 |
| 135.00 | | 310.45 | 304.89 | 0.00 | 0.00 |
| 140.00 | | 571.74 | 561.82 | 0.00 | 0.00 |
| 145.00 | | 558.42 | 550.86 | 0.00 | 0.00 |
| 150.00 | | 544.73 | 539.89 | 0.00 | 0.00 |
| 155.00 | | 530.69 | 528.92 | 0.00 | 0.00 |
| 157.00 | (22) attachments | 3471.86 | 2397.84 | 0.00 | -4722.06 |
| 160.00 | | 307.64 | 275.76 | 0.00 | 0.00 |
| 165.00 | | 501.64 | 450.83 | 0.00 | 0.00 |
| 167.00 | (19) attachments | 4555.64 | 2405.75 | 0.00 | 0.00 |
| 170.00 | | 289.81 | 228.91 | 0.00 | 0.00 |
| 175.00 | | 471.35 | 372.74 | 0.00 | 0.00 |
| 177.00 | (25) attachments | 4816.09 | 2650.46 | 0.00 | 152.85 |
| 180.00 | (1) attachments | 330.58 | 210.58 | 0.00 | 207.62 |

# Total Applied Force Summary

| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT02652-S-SBA | **Code:** | EIA/TIA-222-H | 7/16/2019 | |
| **Site Name:** | Colchester 3 CT | **Exposure:** | C | | |
| **Height:** | 180.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 18 | |

| | | | | |
|---|---|---|---|---|
| **Totals:** | **34,599.80** | **42,975.82** | **0.00** | **-4,361.58** |

# Linear Appurtenance Segment Forces (Factored)

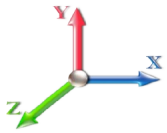
| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT02652-S-SBA | **Code:** | EIA/TIA-222-H | 7/16/2019 | |
| **Site Name:** | Colchester 3 CT | **Exposure:** | C | | |
| **Height:** | 180.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 19 | |

Tower Engineering Solutions

**Load Case:** 0.9D + 1.0W 122 mph Wind

**Dead Load Factor** 0.90

**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) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 30.355 | 0.00 | 31.05 |
| 10.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 30.355 | 0.00 | 31.05 |
| 15.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 30.355 | 0.00 | 31.05 |
| 20.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 32.208 | 0.00 | 31.05 |
| 25.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 33.758 | 0.00 | 31.05 |
| 30.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 35.079 | 0.00 | 31.05 |
| 35.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 36.236 | 0.00 | 31.05 |
| 40.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 37.269 | 0.00 | 31.05 |
| 45.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 38.204 | 0.00 | 31.05 |
| 45.92 | Climbing Ladder | Yes | 0.92 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 38.367 | 0.00 | 5.69 |
| 50.00 | Climbing Ladder | Yes | 4.08 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 39.061 | 0.00 | 25.36 |
| 53.00 | Climbing Ladder | Yes | 3.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 39.543 | 0.00 | 18.63 |
| 55.00 | Climbing Ladder | Yes | 2.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 39.853 | 0.00 | 12.42 |
| 60.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 40.590 | 0.00 | 31.05 |
| 65.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 41.280 | 0.00 | 31.05 |
| 70.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 41.929 | 0.00 | 31.05 |
| 75.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 42.542 | 0.00 | 31.05 |
| 80.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 43.124 | 0.00 | 31.05 |
| 85.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 43.678 | 0.00 | 31.05 |
| 90.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 44.207 | 0.00 | 31.05 |
| 92.92 | Climbing Ladder | Yes | 2.92 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 44.505 | 0.00 | 18.11 |
| 95.00 | Climbing Ladder | Yes | 2.08 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 44.713 | 0.00 | 12.94 |
| 98.92 | Climbing Ladder | Yes | 3.92 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 45.095 | 0.00 | 24.32 |
| 100.00 | Climbing Ladder | Yes | 1.08 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 45.198 | 0.00 | 6.73 |
| 105.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 45.665 | 0.00 | 31.05 |
| 110.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 46.114 | 0.00 | 31.05 |
| 115.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 46.548 | 0.00 | 31.05 |
| 120.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 46.967 | 0.00 | 31.05 |
| 125.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 47.372 | 0.00 | 31.05 |
| 127.08 | Climbing Ladder | Yes | 2.08 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 47.537 | 0.00 | 12.90 |
| 130.00 | Climbing Ladder | Yes | 2.92 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 47.765 | 0.00 | 18.15 |
| 132.33 | Climbing Ladder | Yes | 2.33 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 47.944 | 0.00 | 14.45 |
| 135.00 | Climbing Ladder | Yes | 2.67 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 48.146 | 0.00 | 16.60 |
| 140.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 48.516 | 0.00 | 31.05 |
| 145.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 48.876 | 0.00 | 31.05 |
| 150.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 49.226 | 0.00 | 31.05 |
| 155.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 49.567 | 0.00 | 31.05 |
| 157.00 | Climbing Ladder | Yes | 2.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 49.701 | 0.00 | 12.42 |
| 160.00 | Climbing Ladder | Yes | 3.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 49.899 | 0.00 | 18.63 |
| 165.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 50.224 | 0.00 | 31.05 |
| 167.00 | Climbing Ladder | Yes | 2.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 50.351 | 0.00 | 12.42 |
| 170.00 | Climbing Ladder | Yes | 3.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 50.540 | 0.00 | 18.63 |
| 175.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 50.850 | 0.00 | 31.05 |
| 177.00 | Climbing Ladder | Yes | 2.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 50.971 | 0.00 | 12.42 |
| 180.00 | Climbing Ladder | Yes | 3.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 51.152 | 0.00 | 18.63 |
| | | | | | | | | | | **Totals:** | **0.0** | **1,117.8** |

# Calculated Forces

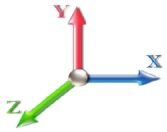
| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT02652-S-SBA | **Code:** | EIA/TIA-222-H | 7/16/2019 | |
| **Site Name:** | Colchester 3 CT | **Exposure:** | C | | |
| **Height:** | 180.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 20 | |

Tower Engineering Solutions

**Load Case:** 0.9D + 1.0W 122 mph Wind

**Dead Load Factor** 0.90

**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 | -42.93 | -34.66 | 0.00 | -4158.1 | 0.00 | 4158.14 | 5508.12 | 1460.53 | 7226.63 | 6725.55 | 0.00 | 0.000 | 0.000 | 0.627 |
| 5.00 | -41.37 | -34.14 | 0.00 | -3984.8 | 0.00 | 3984.85 | 5452.09 | 1435.40 | 6980.02 | 6541.73 | 0.08 | -0.155 | 0.000 | 0.617 |
| 10.00 | -39.83 | -33.62 | 0.00 | -3814.1 | 0.00 | 3814.18 | 5394.71 | 1410.26 | 6737.68 | 6358.68 | 0.33 | -0.312 | 0.000 | 0.608 |
| 15.00 | -38.32 | -33.10 | 0.00 | -3646.0 | 0.00 | 3646.09 | 5335.97 | 1385.12 | 6499.64 | 6176.49 | 0.74 | -0.470 | 0.000 | 0.598 |
| 20.00 | -36.83 | -32.56 | 0.00 | -3480.5 | 0.00 | 3480.58 | 5275.87 | 1359.98 | 6265.87 | 5995.24 | 1.32 | -0.629 | 0.000 | 0.588 |
| 25.00 | -35.37 | -31.98 | 0.00 | -3317.8 | 0.00 | 3317.80 | 5214.41 | 1334.85 | 6036.38 | 5815.02 | 2.07 | -0.790 | 0.000 | 0.578 |
| 30.00 | -33.94 | -31.39 | 0.00 | -3157.8 | 0.00 | 3157.89 | 5151.59 | 1309.71 | 5811.17 | 5635.92 | 2.98 | -0.952 | 0.000 | 0.567 |
| 35.00 | -32.52 | -30.78 | 0.00 | -3000.9 | 0.00 | 3000.94 | 5087.42 | 1284.57 | 5590.25 | 5458.02 | 4.06 | -1.115 | 0.000 | 0.557 |
| 40.00 | -31.14 | -30.16 | 0.00 | -2847.0 | 0.00 | 2847.04 | 5021.88 | 1259.44 | 5373.61 | 5281.41 | 5.32 | -1.278 | 0.000 | 0.546 |
| 45.00 | -29.81 | -29.49 | 0.00 | -2696.2 | 0.00 | 2696.24 | 4954.99 | 1234.30 | 5161.25 | 5106.18 | 6.75 | -1.443 | 0.000 | 0.535 |
| 45.92 | -29.54 | -29.41 | 0.00 | -2669.2 | 0.00 | 2669.20 | 4942.58 | 1229.69 | 5122.78 | 5074.21 | 7.03 | -1.474 | 0.000 | 0.533 |
| 50.00 | -27.70 | -28.85 | 0.00 | -2549.1 | 0.00 | 2549.13 | 4886.75 | 1209.16 | 4953.16 | 4932.41 | 8.35 | -1.611 | 0.000 | 0.523 |
| 53.00 | -26.37 | -28.43 | 0.00 | -2462.5 | 0.00 | 2462.59 | 3967.43 | 1039.40 | 4274.84 | 4025.79 | 9.39 | -1.712 | 0.000 | 0.619 |
| 55.00 | -25.88 | -28.20 | 0.00 | -2405.7 | 0.00 | 2405.73 | 3947.58 | 1030.79 | 4204.32 | 3972.23 | 10.12 | -1.780 | 0.000 | 0.613 |
| 60.00 | -24.72 | -27.55 | 0.00 | -2264.7 | 0.00 | 2264.75 | 3897.00 | 1009.27 | 4030.59 | 3838.84 | 12.09 | -1.965 | 0.000 | 0.597 |
| 65.00 | -23.58 | -26.89 | 0.00 | -2127.0 | 0.00 | 2127.02 | 3845.06 | 987.75 | 3860.53 | 3706.29 | 14.25 | -2.151 | 0.000 | 0.581 |
| 70.00 | -22.47 | -26.23 | 0.00 | -1992.5 | 0.00 | 1992.57 | 3791.77 | 966.22 | 3694.13 | 3574.65 | 16.60 | -2.337 | 0.000 | 0.564 |
| 75.00 | -21.37 | -25.58 | 0.00 | -1861.4 | 0.00 | 1861.40 | 3737.12 | 944.70 | 3531.40 | 3444.02 | 19.15 | -2.524 | 0.000 | 0.547 |
| 80.00 | -20.31 | -24.92 | 0.00 | -1733.5 | 0.00 | 1733.53 | 3681.11 | 923.18 | 3372.34 | 3314.49 | 21.89 | -2.709 | 0.000 | 0.529 |
| 85.00 | -19.26 | -24.26 | 0.00 | -1608.9 | 0.00 | 1608.94 | 3623.74 | 901.66 | 3216.94 | 3186.13 | 24.82 | -2.894 | 0.000 | 0.511 |
| 90.00 | -18.26 | -23.59 | 0.00 | -1487.6 | 0.00 | 1487.65 | 3565.02 | 880.14 | 3065.20 | 3059.03 | 27.95 | -3.078 | 0.000 | 0.492 |
| 92.92 | -17.68 | -23.21 | 0.00 | -1418.8 | 0.00 | 1418.83 | 3530.13 | 867.59 | 2978.38 | 2985.51 | 29.87 | -3.186 | 0.000 | 0.481 |
| 95.00 | -16.98 | -22.93 | 0.00 | -1370.4 | 0.00 | 1370.48 | 3504.93 | 858.62 | 2917.13 | 2933.28 | 31.27 | -3.264 | 0.000 | 0.473 |
| 98.92 | -15.75 | -22.37 | 0.00 | -1280.6 | 0.00 | 1280.67 | 2742.07 | 714.64 | 2421.16 | 2291.78 | 34.01 | -3.407 | 0.000 | 0.566 |
| 100.00 | -15.53 | -22.25 | 0.00 | -1256.4 | 0.00 | 1256.44 | 2732.96 | 710.75 | 2394.86 | 2271.63 | 34.79 | -3.447 | 0.000 | 0.560 |
| 105.00 | -14.68 | -21.61 | 0.00 | -1145.1 | 0.00 | 1145.18 | 2690.08 | 692.79 | 2275.34 | 2179.04 | 38.51 | -3.650 | 0.000 | 0.532 |
| 110.00 | -13.85 | -20.97 | 0.00 | -1037.1 | 0.00 | 1037.13 | 2645.83 | 674.83 | 2158.87 | 2087.20 | 42.43 | -3.849 | 0.000 | 0.503 |
| 115.00 | -13.04 | -20.34 | 0.00 | -932.28 | 0.00 | 932.28 | 2600.23 | 656.86 | 2045.47 | 1996.19 | 46.57 | -4.044 | 0.000 | 0.473 |
| 120.00 | -12.25 | -19.71 | 0.00 | -830.60 | 0.00 | 830.60 | 2553.28 | 638.90 | 1935.12 | 1906.09 | 50.90 | -4.232 | 0.000 | 0.442 |
| 125.00 | -11.50 | -19.08 | 0.00 | -732.06 | 0.00 | 732.06 | 2504.96 | 620.94 | 1827.84 | 1816.99 | 55.43 | -4.414 | 0.000 | 0.408 |
| 127.08 | -11.18 | -18.82 | 0.00 | -692.45 | 0.00 | 692.45 | 2484.49 | 613.48 | 1784.18 | 1780.31 | 57.36 | -4.489 | 0.000 | 0.394 |
| 130.00 | -10.53 | -18.44 | 0.00 | -637.42 | 0.00 | 637.42 | 2455.29 | 602.97 | 1723.61 | 1728.99 | 60.14 | -4.591 | 0.000 | 0.374 |
| 132.33 | -10.02 | -18.15 | 0.00 | -594.51 | 0.00 | 594.51 | 1489.30 | 422.56 | 1209.83 | 1053.29 | 62.40 | -4.671 | 0.000 | 0.573 |
| 135.00 | -9.70 | -17.84 | 0.00 | -546.00 | 0.00 | 546.00 | 1477.63 | 415.84 | 1171.66 | 1028.31 | 65.03 | -4.759 | 0.000 | 0.539 |
| 140.00 | -9.13 | -17.25 | 0.00 | -456.82 | 0.00 | 456.82 | 1454.76 | 403.27 | 1101.91 | 981.60 | 70.13 | -4.966 | 0.000 | 0.473 |
| 145.00 | -8.57 | -16.67 | 0.00 | -370.56 | 0.00 | 370.56 | 1430.53 | 390.71 | 1034.29 | 934.97 | 75.42 | -5.153 | 0.000 | 0.404 |
| 150.00 | -8.04 | -16.10 | 0.00 | -287.20 | 0.00 | 287.20 | 1404.94 | 378.14 | 968.82 | 888.50 | 80.90 | -5.317 | 0.000 | 0.331 |
| 155.00 | -7.54 | -15.54 | 0.00 | -206.70 | 0.00 | 206.70 | 1377.99 | 365.57 | 905.49 | 842.29 | 86.54 | -5.453 | 0.000 | 0.253 |
| 157.00 | -5.48 | -11.86 | 0.00 | -175.63 | 0.00 | 175.63 | 1366.83 | 360.54 | 880.75 | 823.90 | 88.83 | -5.499 | 0.000 | 0.218 |
| 160.00 | -5.22 | -11.53 | 0.00 | -140.06 | 0.00 | 140.06 | 1349.68 | 353.00 | 844.29 | 796.42 | 92.30 | -5.559 | 0.000 | 0.181 |
| 165.00 | -4.81 | -10.99 | 0.00 | -82.42 | 0.00 | 82.42 | 1320.02 | 340.43 | 785.24 | 750.97 | 98.16 | -5.634 | 0.000 | 0.114 |
| 167.00 | -2.86 | -6.22 | 0.00 | -60.44 | 0.00 | 60.44 | 1307.77 | 335.40 | 762.22 | 732.93 | 100.52 | -5.656 | 0.000 | 0.085 |
| 170.00 | -2.66 | -5.91 | 0.00 | -41.77 | 0.00 | 41.77 | 1289.00 | 327.86 | 728.33 | 706.04 | 104.08 | -5.680 | 0.000 | 0.062 |
| 175.00 | -2.34 | -5.41 | 0.00 | -12.22 | 0.00 | 12.22 | 1256.62 | 315.30 | 673.56 | 661.70 | 110.03 | -5.703 | 0.000 | 0.021 |
| 177.00 | -0.18 | -0.35 | 0.00 | -1.26 | 0.00 | 1.26 | 1243.29 | 310.27 | 652.25 | 644.16 | 112.42 | -5.705 | 0.000 | 0.002 |
| 180.00 | 0.00 | -0.33 | 0.00 | -0.21 | 0.00 | 0.21 | 1222.88 | 302.73 | 620.93 | 618.05 | 116.00 | -5.706 | 0.000 | 0.000 |

# Wind Loading - Shaft

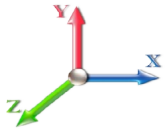
| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT02652-S-SBA | **Code:** | EIA/TIA-222-H | 7/16/2019 | |
| **Site Name:** | Colchester 3 CT | **Exposure:** | C | | |
| **Height:** | 180.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **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 | 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 | 5.099 | 5.61 | 0.00 | 1.200 | 0.000 | 0.00 | 0.000 | 0.00 | 0.0 | 0.0 | 0.0 |
| 5.00 | | 1.00 | 0.85 | 5.099 | 5.61 | 0.00 | 1.200 | 0.828 | 5.00 | 25.962 | 31.15 | 174.7 | 313.1 | 1997.6 |
| 10.00 | | 1.00 | 0.85 | 5.099 | 5.61 | 0.00 | 1.200 | 0.887 | 5.00 | 25.576 | 30.69 | 172.1 | 330.1 | 1985.4 |
| 15.00 | | 1.00 | 0.85 | 5.099 | 5.61 | 0.00 | 1.200 | 0.924 | 5.00 | 25.171 | 30.21 | 169.4 | 338.0 | 1964.0 |
| 20.00 | | 1.00 | 0.90 | 5.410 | 5.95 | 0.00 | 1.200 | 0.951 | 5.00 | 24.758 | 29.71 | 176.8 | 341.9 | 1938.6 |
| 25.00 | | 1.00 | 0.95 | 5.670 | 6.24 | 0.00 | 1.200 | 0.973 | 5.00 | 24.341 | 29.21 | 182.2 | 343.4 | 1910.9 |
| 30.00 | | 1.00 | 0.98 | 5.892 | 6.48 | 0.00 | 1.200 | 0.991 | 5.00 | 23.920 | 28.70 | 186.0 | 343.4 | 1881.7 |
| 35.00 | | 1.00 | 1.01 | 6.086 | 6.69 | 0.00 | 1.200 | 1.006 | 5.00 | 23.497 | 28.20 | 188.8 | 342.3 | 1851.3 |
| 40.00 | | 1.00 | 1.04 | 6.260 | 6.89 | 0.00 | 1.200 | 1.019 | 5.00 | 23.073 | 27.69 | 190.7 | 340.4 | 1820.2 |
| 45.00 | | 1.00 | 1.07 | 6.417 | 7.06 | 0.00 | 1.200 | 1.032 | 5.00 | 22.648 | 27.18 | 191.8 | 337.8 | 1788.4 |
| 45.92 | Bot - Section 2 | 1.00 | 1.07 | 6.444 | 7.09 | 0.00 | 1.200 | 1.034 | 0.92 | 4.105 | 4.93 | 34.9 | 61.8 | 324.6 |
| 50.00 | | 1.00 | 1.09 | 6.561 | 7.22 | 0.00 | 1.200 | 1.042 | 4.08 | 18.375 | 22.05 | 159.1 | 277.4 | 2444.0 |
| 53.00 | Top - Section 1 | 1.00 | 1.11 | 6.642 | 7.31 | 0.00 | 1.200 | 1.049 | 3.00 | 13.318 | 15.98 | 116.8 | 202.6 | 1771.3 |
| 55.00 | | 1.00 | 1.12 | 6.694 | 7.36 | 0.00 | 1.200 | 1.052 | 2.00 | 8.793 | 10.55 | 77.7 | 134.5 | 616.1 |
| 60.00 | | 1.00 | 1.14 | 6.818 | 7.50 | 0.00 | 1.200 | 1.062 | 5.00 | 21.685 | 26.02 | 195.1 | 332.3 | 1518.9 |
| 65.00 | | 1.00 | 1.16 | 6.934 | 7.63 | 0.00 | 1.200 | 1.070 | 5.00 | 21.256 | 25.51 | 194.5 | 328.1 | 1489.7 |
| 70.00 | | 1.00 | 1.17 | 7.043 | 7.75 | 0.00 | 1.200 | 1.078 | 5.00 | 20.828 | 24.99 | 193.6 | 323.6 | 1460.1 |
| 75.00 | | 1.00 | 1.19 | 7.146 | 7.86 | 0.00 | 1.200 | 1.086 | 5.00 | 20.398 | 24.48 | 192.4 | 318.8 | 1430.3 |
| 80.00 | | 1.00 | 1.21 | 7.243 | 7.97 | 0.00 | 1.200 | 1.093 | 5.00 | 19.969 | 23.96 | 190.9 | 313.8 | 1400.3 |
| 85.00 | | 1.00 | 1.22 | 7.336 | 8.07 | 0.00 | 1.200 | 1.099 | 5.00 | 19.539 | 23.45 | 189.2 | 308.7 | 1370.1 |
| 90.00 | | 1.00 | 1.24 | 7.425 | 8.17 | 0.00 | 1.200 | 1.106 | 5.00 | 19.108 | 22.93 | 187.3 | 303.3 | 1339.7 |
| 92.92 | Bot - Section 3 | 1.00 | 1.25 | 7.475 | 8.22 | 0.00 | 1.200 | 1.109 | 2.92 | 10.947 | 13.14 | 108.0 | 175.1 | 768.1 |
| 95.00 | | 1.00 | 1.25 | 7.510 | 8.26 | 0.00 | 1.200 | 1.112 | 2.08 | 7.840 | 9.41 | 77.7 | 125.9 | 899.3 |
| 98.92 | Top - Section 2 | 1.00 | 1.26 | 7.574 | 8.33 | 0.00 | 1.200 | 1.116 | 3.92 | 14.538 | 17.45 | 145.4 | 233.3 | 1665.7 |
| 100.00 | | 1.00 | 1.27 | 7.592 | 8.35 | 0.00 | 1.200 | 1.117 | 1.08 | 3.974 | 4.77 | 39.8 | 64.3 | 243.9 |
| 105.00 | | 1.00 | 1.28 | 7.670 | 8.44 | 0.00 | 1.200 | 1.123 | 5.00 | 18.082 | 21.70 | 183.1 | 290.8 | 1107.2 |
| 110.00 | | 1.00 | 1.29 | 7.746 | 8.52 | 0.00 | 1.200 | 1.128 | 5.00 | 17.651 | 21.18 | 180.5 | 284.8 | 1080.3 |
| 115.00 | | 1.00 | 1.30 | 7.818 | 8.60 | 0.00 | 1.200 | 1.133 | 5.00 | 17.220 | 20.66 | 177.7 | 278.8 | 1053.4 |
| 120.00 | | 1.00 | 1.32 | 7.889 | 8.68 | 0.00 | 1.200 | 1.138 | 5.00 | 16.788 | 20.15 | 174.8 | 272.6 | 1026.4 |
| 125.00 | | 1.00 | 1.33 | 7.957 | 8.75 | 0.00 | 1.200 | 1.142 | 5.00 | 16.357 | 19.63 | 171.8 | 266.4 | 999.2 |
| 127.08 | Bot - Section 4 | 1.00 | 1.33 | 7.985 | 8.78 | 0.00 | 1.200 | 1.144 | 2.08 | 6.666 | 8.00 | 70.3 | 109.5 | 407.8 |
| 130.00 | | 1.00 | 1.34 | 8.023 | 8.83 | 0.00 | 1.200 | 1.147 | 2.92 | 9.367 | 11.24 | 99.2 | 153.9 | 861.5 |
| 132.33 | Top - Section 3 | 1.00 | 1.34 | 8.053 | 8.86 | 0.00 | 1.200 | 1.149 | 2.33 | 7.349 | 8.82 | 78.1 | 121.1 | 675.6 |
| 135.00 | | 1.00 | 1.35 | 8.087 | 8.90 | 0.00 | 1.200 | 1.151 | 2.67 | 8.329 | 9.99 | 88.9 | 137.3 | 398.0 |
| 140.00 | | 1.00 | 1.36 | 8.149 | 8.96 | 0.00 | 1.200 | 1.155 | 5.00 | 15.247 | 18.30 | 164.0 | 250.2 | 726.7 |
| 145.00 | | 1.00 | 1.37 | 8.209 | 9.03 | 0.00 | 1.200 | 1.160 | 5.00 | 14.815 | 17.78 | 160.5 | 243.6 | 705.5 |
| 150.00 | | 1.00 | 1.38 | 8.268 | 9.10 | 0.00 | 1.200 | 1.163 | 5.00 | 14.383 | 17.26 | 157.0 | 236.9 | 684.2 |
| 155.00 | | 1.00 | 1.39 | 8.326 | 9.16 | 0.00 | 1.200 | 1.167 | 5.00 | 13.950 | 16.74 | 153.3 | 230.2 | 662.8 |
| 157.00 | Appurtenance(s) | 1.00 | 1.39 | 8.348 | 9.18 | 0.00 | 1.200 | 1.169 | 2.00 | 5.459 | 6.55 | 60.2 | 91.0 | 259.9 |
| 160.00 | | 1.00 | 1.40 | 8.381 | 9.22 | 0.00 | 1.200 | 1.171 | 3.00 | 8.059 | 9.67 | 89.2 | 134.0 | 383.0 |
| 165.00 | | 1.00 | 1.41 | 8.436 | 9.28 | 0.00 | 1.200 | 1.175 | 5.00 | 13.086 | 15.70 | 145.7 | 216.5 | 619.8 |
| 167.00 | Appurtenance(s) | 1.00 | 1.41 | 8.457 | 9.30 | 0.00 | 1.200 | 1.176 | 2.00 | 5.113 | 6.14 | 57.1 | 85.5 | 242.7 |
| 170.00 | | 1.00 | 1.42 | 8.489 | 9.34 | 0.00 | 1.200 | 1.178 | 3.00 | 7.540 | 9.05 | 84.5 | 125.7 | 357.2 |
| 175.00 | | 1.00 | 1.42 | 8.541 | 9.40 | 0.00 | 1.200 | 1.182 | 5.00 | 12.220 | 14.66 | 137.8 | 202.5 | 576.6 |
| 177.00 | Appurtenance(s) | 1.00 | 1.43 | 8.561 | 9.42 | 0.00 | 1.200 | 1.183 | 2.00 | 4.767 | 5.72 | 53.9 | 79.9 | 225.4 |
| 180.00 | Appurtenance(s) | 1.00 | 1.43 | 8.592 | 9.45 | 0.00 | 1.200 | 1.185 | 3.00 | 7.020 | 8.42 | 79.6 | 117.2 | 331.2 |

## Wind Loading - Shaft

| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT02652-S-SBA | **Code:** | EIA/TIA-222-H | 7/16/2019 | |
| **Site Name:** | Colchester 3 CT | **Exposure:** | C | | |
| **Height:** | 180.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 22 | |

| | | | |
|---|---|---|---|
| **Totals:** | **180.00** | **6,302.2** | **49,264.6** |

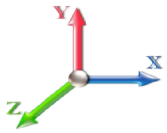
# Discrete Appurtenance Forces

| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT02652-S-SBA | **Code:** | EIA/TIA-222-H | 7/16/2019 | |
| **Site Name:** | Colchester 3 CT | **Exposure:** | C | | |
| **Height:** | 180.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 23 | |

**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 | 180.00 | Lightning Rod | 1 | 8.627 | 9.489 | 1.00 | 1.00 | 2.66 | 54.33 | 0.000 | 3.500 | 25.26 | 0.00 | 88.39 |
| 2 | 177.00 | Low Profile Platform | 1 | 8.561 | 9.418 | 1.00 | 1.00 | 37.06 | 3082.89 | 0.000 | 0.000 | 349.01 | 0.00 | 0.00 |
| 3 | 177.00 | EMS RR90-17-02DP | 9 | 8.561 | 9.418 | 0.62 | 0.80 | 28.11 | 737.80 | 0.000 | 0.000 | 264.73 | 0.00 | 0.00 |
| 4 | 177.00 | APXVAARR18_43-U-NA2 | 3 | 8.561 | 9.418 | 0.61 | 0.80 | 28.66 | 1024.89 | 0.000 | 0.000 | 269.92 | 0.00 | 0.00 |
| 5 | 177.00 | Kathrein 782 10662 Bias-T | 3 | 8.564 | 9.420 | 0.60 | 0.80 | 0.99 | 7.58 | 0.000 | 0.237 | 9.36 | 0.00 | 2.22 |
| 6 | 177.00 | Ericsson Radio 4449 | 3 | 8.568 | 9.425 | 0.60 | 0.80 | 3.56 | 392.07 | 0.000 | 0.625 | 33.52 | 0.00 | 20.95 |
| 7 | 177.00 | KRY 112 144/2 | 3 | 8.564 | 9.421 | 0.60 | 0.80 | 1.32 | 41.05 | 0.000 | 0.287 | 12.41 | 0.00 | 3.57 |
| 8 | 177.00 | KRY 112 489/2 | 3 | 8.566 | 9.423 | 0.60 | 0.80 | 1.92 | 76.27 | 0.000 | 0.458 | 18.06 | 0.00 | 8.28 |
| 9 | 167.00 | Low Profile Platform | 1 | 8.457 | 9.303 | 1.00 | 1.00 | 36.98 | 3076.04 | 0.000 | 0.000 | 344.06 | 0.00 | 0.00 |
| 10 | 167.00 | RRH2x40-07-U | 3 | 8.457 | 9.303 | 0.60 | 0.80 | 5.30 | 250.96 | 0.000 | 0.000 | 49.32 | 0.00 | 0.00 |
| 11 | 167.00 | RRH2x40-AWS | 3 | 8.457 | 9.303 | 0.60 | 0.80 | 6.02 | 228.96 | 0.000 | 0.000 | 55.99 | 0.00 | 0.00 |
| 12 | 167.00 | BXA-171063-12CF | 6 | 8.457 | 9.303 | 0.67 | 0.80 | 25.68 | 330.43 | 0.000 | 0.000 | 238.93 | 0.00 | 0.00 |
| 13 | 167.00 | BXA-70063-6CF | 6 | 8.457 | 9.303 | 0.59 | 0.80 | 33.50 | 466.99 | 0.000 | 0.000 | 311.69 | 0.00 | 0.00 |
| 14 | 157.00 | LGP21401 TMA | 6 | 8.348 | 9.183 | 0.80 | 0.80 | 8.88 | 159.38 | 0.000 | 0.000 | 81.53 | 0.00 | 0.00 |
| 15 | 157.00 | LGP21903 Diplexers | 6 | 8.348 | 9.183 | 0.60 | 0.80 | 4.70 | 57.30 | 0.000 | 0.000 | 43.14 | 0.00 | 0.00 |
| 16 | 157.00 | Low Profile Platform | 1 | 8.348 | 9.183 | 1.00 | 1.00 | 36.90 | 3068.80 | 0.000 | 0.000 | 338.88 | 0.00 | 0.00 |
| 17 | 157.00 | 7770.00 | 9 | 8.314 | 9.146 | 0.58 | 0.80 | 32.58 | 1132.36 | 0.000 | -3.000 | 297.96 | 0.00 | -893.87 |
| | | | | | | | **Totals:** | | **14,188.10** | | | **2,743.76** | | |

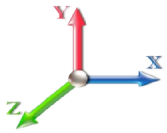
# Total Applied Force Summary

| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT02652-S-SBA | **Code:** | EIA/TIA-222-H | 7/16/2019 | |
| **Site Name:** | Colchester 3 CT | **Exposure:** | C | | |
| **Height:** | 180.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 24 | |

**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 | | 174.73 | 2287.81 | 0.00 | 0.00 |
| 10.00 | | 172.13 | 2276.93 | 0.00 | 0.00 |
| 15.00 | | 169.41 | 2256.40 | 0.00 | 0.00 |
| 20.00 | | 176.80 | 2231.64 | 0.00 | 0.00 |
| 25.00 | | 182.18 | 2204.44 | 0.00 | 0.00 |
| 30.00 | | 186.04 | 2175.62 | 0.00 | 0.00 |
| 35.00 | | 188.78 | 2145.66 | 0.00 | 0.00 |
| 40.00 | | 190.65 | 2114.82 | 0.00 | 0.00 |
| 45.00 | | 191.84 | 2083.29 | 0.00 | 0.00 |
| 45.92 | | 34.92 | 378.68 | 0.00 | 0.00 |
| 50.00 | | 159.14 | 2685.11 | 0.00 | 0.00 |
| 53.00 | | 116.76 | 1948.52 | 0.00 | 0.00 |
| 55.00 | | 77.69 | 734.31 | 0.00 | 0.00 |
| 60.00 | | 195.15 | 1814.58 | 0.00 | 0.00 |
| 65.00 | | 194.54 | 1785.54 | 0.00 | 0.00 |
| 70.00 | | 193.62 | 1756.21 | 0.00 | 0.00 |
| 75.00 | | 192.40 | 1726.61 | 0.00 | 0.00 |
| 80.00 | | 190.92 | 1696.78 | 0.00 | 0.00 |
| 85.00 | | 189.21 | 1666.73 | 0.00 | 0.00 |
| 90.00 | | 187.29 | 1636.50 | 0.00 | 0.00 |
| 92.92 | | 108.02 | 941.25 | 0.00 | 0.00 |
| 95.00 | | 77.73 | 1023.04 | 0.00 | 0.00 |
| 98.92 | | 145.35 | 1898.35 | 0.00 | 0.00 |
| 100.00 | | 39.83 | 308.26 | 0.00 | 0.00 |
| 105.00 | | 183.07 | 1404.35 | 0.00 | 0.00 |
| 110.00 | | 180.47 | 1377.67 | 0.00 | 0.00 |
| 115.00 | | 177.71 | 1350.86 | 0.00 | 0.00 |
| 120.00 | | 174.82 | 1323.93 | 0.00 | 0.00 |
| 125.00 | | 171.80 | 1296.89 | 0.00 | 0.00 |
| 127.08 | | 70.26 | 531.43 | 0.00 | 0.00 |
| 130.00 | | 99.20 | 1035.59 | 0.00 | 0.00 |
| 132.33 | | 78.12 | 814.18 | 0.00 | 0.00 |
| 135.00 | | 88.91 | 557.32 | 0.00 | 0.00 |
| 140.00 | | 164.01 | 1024.73 | 0.00 | 0.00 |
| 145.00 | | 160.54 | 1003.61 | 0.00 | 0.00 |
| 150.00 | | 156.98 | 982.40 | 0.00 | 0.00 |
| 155.00 | | 153.31 | 961.11 | 0.00 | 0.00 |
| 157.00 | (22) attachments | 821.66 | 4797.12 | 0.00 | -893.87 |
| 160.00 | | 89.16 | 517.17 | 0.00 | 0.00 |
| 165.00 | | 145.71 | 843.45 | 0.00 | 0.00 |
| 167.00 | (19) attachments | 1057.06 | 4685.56 | 0.00 | 0.00 |
| 170.00 | | 84.48 | 446.49 | 0.00 | 0.00 |
| 175.00 | | 137.77 | 725.51 | 0.00 | 0.00 |
| 177.00 | (25) attachments | 1010.88 | 5647.55 | 0.00 | 35.02 |
| 180.00 | (1) attachments | 104.87 | 426.02 | 0.00 | 88.39 |

# Total Applied Force Summary

| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT02652-S-SBA | **Code:** | EIA/TIA-222-H | 7/16/2019 | |
| **Site Name:** | Colchester 3 CT | **Exposure:** | C | | |
| **Height:** | 180.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 25 | |

Tower Engineering Solutions

| | | | | |
|---|---|---|---|---|
| **Totals:** | **9,045.92** | **73,530.00** | **0.00** | **-770.46** |

# Linear Appurtenance Segment Forces (Factored)

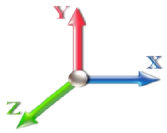
| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT02652-S-SBA | **Code:** | EIA/TIA-222-H | 7/16/2019 | |
| **Site Name:** | Colchester 3 CT | **Exposure:** | C | | |
| **Height:** | 180.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 26 | |

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) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 5.099 | 0.00 | 59.00 |
| 10.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 5.099 | 0.00 | 60.32 |
| 15.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 5.099 | 0.00 | 61.16 |
| 20.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 5.410 | 0.00 | 61.78 |
| 25.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 5.670 | 0.00 | 62.28 |
| 30.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 5.892 | 0.00 | 62.70 |
| 35.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 6.086 | 0.00 | 63.07 |
| 40.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 6.260 | 0.00 | 63.40 |
| 45.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 6.417 | 0.00 | 63.69 |
| 45.92 | Climbing Ladder | Yes | 0.92 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 6.444 | 0.00 | 11.69 |
| 50.00 | Climbing Ladder | Yes | 4.08 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 6.561 | 0.00 | 52.23 |
| 53.00 | Climbing Ladder | Yes | 3.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 6.642 | 0.00 | 38.46 |
| 55.00 | Climbing Ladder | Yes | 2.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 6.694 | 0.00 | 25.68 |
| 60.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 6.818 | 0.00 | 64.43 |
| 65.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 6.934 | 0.00 | 64.64 |
| 70.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 7.043 | 0.00 | 64.83 |
| 75.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 7.146 | 0.00 | 65.02 |
| 80.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 7.243 | 0.00 | 65.19 |
| 85.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 7.336 | 0.00 | 65.36 |
| 90.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 7.425 | 0.00 | 65.52 |
| 92.92 | Climbing Ladder | Yes | 2.92 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 7.475 | 0.00 | 38.27 |
| 95.00 | Climbing Ladder | Yes | 2.08 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 7.510 | 0.00 | 27.36 |
| 98.92 | Climbing Ladder | Yes | 3.92 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 7.574 | 0.00 | 51.53 |
| 100.00 | Climbing Ladder | Yes | 1.08 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 7.592 | 0.00 | 14.26 |
| 105.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 7.670 | 0.00 | 65.95 |
| 110.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 7.746 | 0.00 | 66.09 |
| 115.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 7.818 | 0.00 | 66.21 |
| 120.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 7.889 | 0.00 | 66.34 |
| 125.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 7.957 | 0.00 | 66.46 |
| 127.08 | Climbing Ladder | Yes | 2.08 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 7.985 | 0.00 | 27.62 |
| 130.00 | Climbing Ladder | Yes | 2.92 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 8.023 | 0.00 | 38.92 |
| 132.33 | Climbing Ladder | Yes | 2.33 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 8.053 | 0.00 | 31.00 |
| 135.00 | Climbing Ladder | Yes | 2.67 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 8.087 | 0.00 | 35.65 |
| 140.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 8.149 | 0.00 | 66.79 |
| 145.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 8.209 | 0.00 | 66.90 |
| 150.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 8.268 | 0.00 | 67.00 |
| 155.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 8.326 | 0.00 | 67.10 |
| 157.00 | Climbing Ladder | Yes | 2.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 8.348 | 0.00 | 26.85 |
| 160.00 | Climbing Ladder | Yes | 3.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 8.381 | 0.00 | 40.32 |
| 165.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 8.436 | 0.00 | 67.29 |
| 167.00 | Climbing Ladder | Yes | 2.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 8.457 | 0.00 | 26.93 |
| 170.00 | Climbing Ladder | Yes | 3.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 8.489 | 0.00 | 40.43 |
| 175.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 8.541 | 0.00 | 67.47 |
| 177.00 | Climbing Ladder | Yes | 2.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 8.561 | 0.00 | 27.00 |
| 180.00 | Climbing Ladder | Yes | 3.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 8.592 | 0.00 | 40.53 |
| | | | | | | | | | | **Totals:** | **0.0** | **2,340.7** |

# Calculated Forces

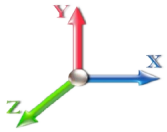
| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT02652-S-SBA | **Code:** | EIA/TIA-222-H | 7/16/2019 | |
| **Site Name:** | Colchester 3 CT | **Exposure:** | C | | |
| **Height:** | 180.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 27 | |

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 | -73.53 | -9.07 | 0.00 | -1085.0 | 0.00 | 1085.01 | 5508.12 | 1460.53 | 7226.63 | 6725.55 | 0.00 | 0.000 | 0.000 | 0.175 |
| 5.00 | -71.23 | -8.95 | 0.00 | -1039.6 | 0.00 | 1039.65 | 5452.09 | 1435.40 | 6980.02 | 6541.73 | 0.02 | -0.041 | 0.000 | 0.172 |
| 10.00 | -68.95 | -8.82 | 0.00 | -994.91 | 0.00 | 994.91 | 5394.71 | 1410.26 | 6737.68 | 6358.68 | 0.09 | -0.081 | 0.000 | 0.169 |
| 15.00 | -66.69 | -8.70 | 0.00 | -950.80 | 0.00 | 950.80 | 5335.97 | 1385.12 | 6499.64 | 6176.49 | 0.19 | -0.123 | 0.000 | 0.166 |
| 20.00 | -64.45 | -8.56 | 0.00 | -907.32 | 0.00 | 907.32 | 5275.87 | 1359.98 | 6265.87 | 5995.24 | 0.34 | -0.164 | 0.000 | 0.164 |
| 25.00 | -62.24 | -8.42 | 0.00 | -864.51 | 0.00 | 864.51 | 5214.41 | 1334.85 | 6036.38 | 5815.02 | 0.54 | -0.206 | 0.000 | 0.161 |
| 30.00 | -60.06 | -8.27 | 0.00 | -822.43 | 0.00 | 822.43 | 5151.59 | 1309.71 | 5811.17 | 5635.92 | 0.78 | -0.248 | 0.000 | 0.158 |
| 35.00 | -57.91 | -8.11 | 0.00 | -781.09 | 0.00 | 781.09 | 5087.42 | 1284.57 | 5590.25 | 5458.02 | 1.06 | -0.291 | 0.000 | 0.155 |
| 40.00 | -55.79 | -7.95 | 0.00 | -740.54 | 0.00 | 740.54 | 5021.88 | 1259.44 | 5373.61 | 5281.41 | 1.39 | -0.333 | 0.000 | 0.151 |
| 45.00 | -53.70 | -7.77 | 0.00 | -700.78 | 0.00 | 700.78 | 4954.99 | 1234.30 | 5161.25 | 5106.18 | 1.76 | -0.376 | 0.000 | 0.148 |
| 45.92 | -53.32 | -7.75 | 0.00 | -693.66 | 0.00 | 693.66 | 4942.58 | 1229.69 | 5122.78 | 5074.21 | 1.83 | -0.384 | 0.000 | 0.148 |
| 50.00 | -50.63 | -7.60 | 0.00 | -662.01 | 0.00 | 662.01 | 4886.75 | 1209.16 | 4953.16 | 4932.41 | 2.18 | -0.420 | 0.000 | 0.145 |
| 53.00 | -48.68 | -7.49 | 0.00 | -639.20 | 0.00 | 639.20 | 3967.43 | 1039.40 | 4274.84 | 4025.79 | 2.45 | -0.446 | 0.000 | 0.171 |
| 55.00 | -47.95 | -7.43 | 0.00 | -624.22 | 0.00 | 624.22 | 3947.58 | 1030.79 | 4204.32 | 3972.23 | 2.64 | -0.463 | 0.000 | 0.169 |
| 60.00 | -46.13 | -7.26 | 0.00 | -587.06 | 0.00 | 587.06 | 3897.00 | 1009.27 | 4030.59 | 3838.84 | 3.15 | -0.512 | 0.000 | 0.165 |
| 65.00 | -44.34 | -7.09 | 0.00 | -550.75 | 0.00 | 550.75 | 3845.06 | 987.75 | 3860.53 | 3706.29 | 3.71 | -0.560 | 0.000 | 0.160 |
| 70.00 | -42.58 | -6.91 | 0.00 | -515.32 | 0.00 | 515.32 | 3791.77 | 966.22 | 3694.13 | 3574.65 | 4.32 | -0.608 | 0.000 | 0.155 |
| 75.00 | -40.85 | -6.73 | 0.00 | -480.76 | 0.00 | 480.76 | 3737.12 | 944.70 | 3531.40 | 3444.02 | 4.99 | -0.656 | 0.000 | 0.151 |
| 80.00 | -39.15 | -6.56 | 0.00 | -447.09 | 0.00 | 447.09 | 3681.11 | 923.18 | 3372.34 | 3314.49 | 5.70 | -0.704 | 0.000 | 0.146 |
| 85.00 | -37.48 | -6.38 | 0.00 | -414.31 | 0.00 | 414.31 | 3623.74 | 901.66 | 3216.94 | 3186.13 | 6.46 | -0.752 | 0.000 | 0.140 |
| 90.00 | -35.84 | -6.19 | 0.00 | -382.43 | 0.00 | 382.43 | 3565.02 | 880.14 | 3065.20 | 3059.03 | 7.28 | -0.799 | 0.000 | 0.135 |
| 92.92 | -34.90 | -6.08 | 0.00 | -364.37 | 0.00 | 364.37 | 3530.13 | 867.59 | 2978.38 | 2985.51 | 7.77 | -0.827 | 0.000 | 0.132 |
| 95.00 | -33.87 | -6.01 | 0.00 | -351.70 | 0.00 | 351.70 | 3504.93 | 858.62 | 2917.13 | 2933.28 | 8.14 | -0.847 | 0.000 | 0.130 |
| 98.92 | -31.97 | -5.85 | 0.00 | -328.17 | 0.00 | 328.17 | 2742.07 | 714.64 | 2421.16 | 2291.78 | 8.85 | -0.883 | 0.000 | 0.155 |
| 100.00 | -31.66 | -5.82 | 0.00 | -321.83 | 0.00 | 321.83 | 2732.96 | 710.75 | 2394.86 | 2271.63 | 9.05 | -0.894 | 0.000 | 0.153 |
| 105.00 | -30.26 | -5.64 | 0.00 | -292.73 | 0.00 | 292.73 | 2690.08 | 692.79 | 2275.34 | 2179.04 | 10.01 | -0.946 | 0.000 | 0.146 |
| 110.00 | -28.88 | -5.46 | 0.00 | -264.53 | 0.00 | 264.53 | 2645.83 | 674.83 | 2158.87 | 2087.20 | 11.03 | -0.996 | 0.000 | 0.138 |
| 115.00 | -27.53 | -5.28 | 0.00 | -237.21 | 0.00 | 237.21 | 2600.23 | 656.86 | 2045.47 | 1996.19 | 12.10 | -1.046 | 0.000 | 0.129 |
| 120.00 | -26.20 | -5.11 | 0.00 | -210.79 | 0.00 | 210.79 | 2553.28 | 638.90 | 1935.12 | 1906.09 | 13.22 | -1.094 | 0.000 | 0.121 |
| 125.00 | -24.91 | -4.92 | 0.00 | -185.26 | 0.00 | 185.26 | 2504.96 | 620.94 | 1827.84 | 1816.99 | 14.39 | -1.140 | 0.000 | 0.112 |
| 127.08 | -24.37 | -4.85 | 0.00 | -175.03 | 0.00 | 175.03 | 2484.49 | 613.48 | 1784.18 | 1780.31 | 14.89 | -1.159 | 0.000 | 0.108 |
| 130.00 | -23.34 | -4.74 | 0.00 | -160.85 | 0.00 | 160.85 | 2455.29 | 602.97 | 1723.61 | 1728.99 | 15.61 | -1.185 | 0.000 | 0.103 |
| 132.33 | -22.52 | -4.65 | 0.00 | -149.82 | 0.00 | 149.82 | 1489.30 | 422.56 | 1209.83 | 1053.29 | 16.19 | -1.205 | 0.000 | 0.157 |
| 135.00 | -21.97 | -4.57 | 0.00 | -137.38 | 0.00 | 137.38 | 1477.63 | 415.84 | 1171.66 | 1028.31 | 16.87 | -1.227 | 0.000 | 0.149 |
| 140.00 | -20.94 | -4.40 | 0.00 | -114.54 | 0.00 | 114.54 | 1454.76 | 403.27 | 1101.91 | 981.60 | 18.19 | -1.279 | 0.000 | 0.131 |
| 145.00 | -19.94 | -4.23 | 0.00 | -92.54 | 0.00 | 92.54 | 1430.53 | 390.71 | 1034.29 | 934.97 | 19.55 | -1.326 | 0.000 | 0.113 |
| 150.00 | -18.96 | -4.06 | 0.00 | -71.38 | 0.00 | 71.38 | 1404.94 | 378.14 | 968.82 | 888.50 | 20.96 | -1.367 | 0.000 | 0.094 |
| 155.00 | -18.00 | -3.89 | 0.00 | -51.06 | 0.00 | 51.06 | 1377.99 | 365.57 | 905.49 | 842.29 | 22.42 | -1.400 | 0.000 | 0.074 |
| 157.00 | -13.22 | -2.96 | 0.00 | -43.27 | 0.00 | 43.27 | 1366.83 | 360.54 | 880.75 | 823.90 | 23.00 | -1.412 | 0.000 | 0.062 |
| 160.00 | -12.71 | -2.86 | 0.00 | -34.40 | 0.00 | 34.40 | 1349.68 | 353.00 | 844.29 | 796.42 | 23.90 | -1.427 | 0.000 | 0.053 |
| 165.00 | -11.87 | -2.70 | 0.00 | -20.10 | 0.00 | 20.10 | 1320.02 | 340.43 | 785.24 | 750.97 | 25.40 | -1.445 | 0.000 | 0.036 |
| 167.00 | -7.21 | -1.52 | 0.00 | -14.71 | 0.00 | 14.71 | 1307.77 | 335.40 | 762.22 | 732.93 | 26.01 | -1.450 | 0.000 | 0.026 |
| 170.00 | -6.76 | -1.43 | 0.00 | -10.14 | 0.00 | 10.14 | 1289.00 | 327.86 | 728.33 | 706.04 | 26.92 | -1.456 | 0.000 | 0.020 |
| 175.00 | -6.04 | -1.27 | 0.00 | -3.01 | 0.00 | 3.01 | 1256.62 | 315.30 | 673.56 | 661.70 | 28.45 | -1.462 | 0.000 | 0.009 |
| 177.00 | -0.42 | -0.12 | 0.00 | -0.44 | 0.00 | 0.44 | 1243.29 | 310.27 | 652.25 | 644.16 | 29.06 | -1.462 | 0.000 | 0.001 |
| 180.00 | 0.00 | -0.10 | 0.00 | -0.09 | 0.00 | 0.09 | 1222.88 | 302.73 | 620.93 | 618.05 | 29.98 | -1.462 | 0.000 | 0.000 |

# Seismic Segment Forces (Factored)

| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT02652-S-SBA | **Code:** | EIA/TIA-222-H | 7/16/2019 | |
| **Site Name:** | Colchester 3 CT | **Exposure:** | C | | |
| **Height:** | 180.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 28 | |

Tower Engineering Solutions

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Load Case:** | 1.2D + 1.0Ev + 1.0Eh | | | | | **Iterations** | 23 |
| **Gust Response Factor** | 1.10 | | | **Sds** | 0.12 | **Ss** | 0.20 |
| **Dead Load Factor** | 1.20 | **Seismic Load Factor** | 1.00 | **Sd1** | 0.03 | **S1** | 0.06 |
| **Wind Load Factor** | 0.00 | **Structure Frequency (f1)** | 0.32 | **SA** | 0.01 | **Seismic Importance Factor** | 1.00 |

| Top Elev (ft) | Description | Wz (lb) | a | b | c | Lateral Fs (lb) | R: 1.50 |
|---|---|---|---|---|---|---|---|
| 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 5.00 | | 1403.7 | 0.00 | 0.03 | 0.02 | 55.76 | |
| 10.00 | | 1379.3 | 0.01 | 0.05 | 0.03 | 62.30 | |
| 15.00 | | 1354.9 | 0.01 | 0.06 | 0.03 | 64.85 | |
| 20.00 | | 1330.6 | 0.02 | 0.07 | 0.04 | 65.59 | |
| 25.00 | | 1306.2 | 0.04 | 0.07 | 0.04 | 65.46 | |
| 30.00 | | 1281.8 | 0.05 | 0.07 | 0.04 | 64.98 | |
| 35.00 | | 1257.5 | 0.07 | 0.07 | 0.04 | 64.41 | |
| 40.00 | | 1233.1 | 0.09 | 0.07 | 0.04 | 63.91 | |
| 45.00 | | 1208.7 | 0.12 | 0.07 | 0.03 | 63.51 | |
| 45.92 | Bot - Section 2 | 218.97 | 0.12 | 0.07 | 0.03 | 11.53 | |
| 50.00 | | 1805.5 | 0.15 | 0.07 | 0.03 | 96.26 | |
| 53.00 | Top - Section 1 | 1307.2 | 0.16 | 0.07 | 0.03 | 70.29 | |
| 55.00 | | 401.39 | 0.18 | 0.07 | 0.03 | 21.69 | |
| 60.00 | | 988.87 | 0.21 | 0.06 | 0.02 | 53.91 | |
| 65.00 | | 968.00 | 0.25 | 0.06 | 0.02 | 52.64 | |
| 70.00 | | 947.14 | 0.29 | 0.05 | 0.01 | 50.32 | |
| 75.00 | | 926.28 | 0.33 | 0.04 | 0.01 | 46.29 | |
| 80.00 | | 905.41 | 0.37 | 0.03 | 0.01 | 39.78 | |
| 85.00 | | 884.55 | 0.42 | 0.01 | 0.01 | 30.35 | |
| 90.00 | | 863.69 | 0.47 | -0.01 | 0.01 | 18.85 | |
| 92.92 | Bot - Section 3 | 494.18 | 0.50 | -0.02 | 0.01 | 7.03 | |
| 95.00 | | 644.51 | 0.53 | -0.03 | 0.01 | 5.86 | |
| 98.92 | Top - Section 2 | 1193.6 | 0.57 | -0.04 | 0.01 | 0.94 | |
| 100.00 | | 149.70 | 0.58 | -0.05 | 0.01 | -0.17 | |
| 105.00 | | 680.33 | 0.64 | -0.07 | 0.02 | -5.29 | |
| 110.00 | | 662.92 | 0.71 | -0.09 | 0.03 | -7.34 | |
| 115.00 | | 645.50 | 0.77 | -0.11 | 0.05 | -7.47 | |
| 120.00 | | 628.09 | 0.84 | -0.12 | 0.07 | -6.09 | |
| 125.00 | | 610.68 | 0.91 | -0.12 | 0.09 | -3.47 | |
| 127.08 | Bot - Section 4 | 248.52 | 0.94 | -0.12 | 0.10 | -0.85 | |
| 130.00 | | 589.65 | 0.99 | -0.11 | 0.12 | 0.18 | |
| 132.33 | Top - Section 3 | 462.07 | 1.02 | -0.10 | 0.14 | 1.74 | |
| 135.00 | | 217.29 | 1.06 | -0.09 | 0.17 | 1.80 | |
| 140.00 | | 397.05 | 1.14 | -0.04 | 0.21 | 7.23 | |
| 145.00 | | 384.86 | 1.23 | 0.03 | 0.27 | 11.60 | |
| 150.00 | | 372.68 | 1.31 | 0.14 | 0.35 | 16.44 | |
| 155.00 | | 360.49 | 1.40 | 0.29 | 0.43 | 21.71 | |
| 157.00 | Appurtenance(s) | 2573.3 | 1.44 | 0.36 | 0.47 | 173.13 | |
| 160.00 | | 207.52 | 1.49 | 0.48 | 0.53 | 16.29 | |
| 165.00 | | 336.12 | 1.59 | 0.74 | 0.65 | 33.28 | |
| 167.00 | Appurtenance(s) | 2607.1 | 1.63 | 0.86 | 0.71 | 281.22 | |
| 170.00 | | 192.90 | 1.69 | 1.07 | 0.79 | 23.50 | |
| 175.00 | | 311.76 | 1.79 | 1.48 | 0.95 | 45.82 | |
| 177.00 | Appurtenance(s) | 2903.9 | 1.83 | 1.67 | 1.03 | 458.02 | |
| 180.00 | Appurtenance(s) | 213.28 | 1.89 | 1.98 | 1.14 | 37.23 | |

# Seismic Segment Forces (Factored)

| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT02652-S-SBA | **Code:** | EIA/TIA-222-H | 7/16/2019 | |
| **Site Name:** | Colchester 3 CT | **Exposure:** | C | | |
| **Height:** | 180.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 29 | |

| | | | | | |
|---|---|---|---|---|---|
| | **Totals:** | **40,061.7** | **2,175.1** | **Total Wind:** | **34,599.8** |

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

# Calculated Forces

| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT02652-S-SBA | **Code:** | EIA/TIA-222-H | 7/16/2019 | |
| **Site Name:** | Colchester 3 CT | **Exposure:** | C | | |
| **Height:** | 180.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 30 | |

Tower Engineering Solutions

**Load Case:** 1.2D + 1.0Ev + 1.0Eh

**Iterations** 23

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Gust Response Factor** | 1.10 | | | **Sds** | 0.12 | | | **Ss** | 0.20 |
| **Dead Load Factor** | 1.20 | **Seismic Load Factor** | 1.00 | **Sd1** | 0.03 | | | **S1** | 0.06 |
| **Wind Load Factor** | 0.00 | **Structure Frequency (f1)** | 0.32 | **SA** | 0.01 | | | **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 | -57.30 | -2.21 | 0.00 | -249.42 | 0.00 | 249.42 | 5508.12 | 1460.53 | 7226.63 | 6725.55 | | 0.00 | 0.00 | 0.047 |
| 5.00 | -55.34 | -2.16 | 0.00 | -238.37 | 0.00 | 238.37 | 5452.09 | 1435.40 | 6980.02 | 6541.73 | | 0.01 | -0.01 | 0.047 |
| 10.00 | -53.42 | -2.11 | 0.00 | -227.56 | 0.00 | 227.56 | 5394.71 | 1410.26 | 6737.68 | 6358.68 | | 0.02 | -0.02 | 0.046 |
| 15.00 | -51.52 | -2.05 | 0.00 | -217.02 | 0.00 | 217.02 | 5335.97 | 1385.12 | 6499.64 | 6176.49 | | 0.04 | -0.03 | 0.045 |
| 20.00 | -49.65 | -1.99 | 0.00 | -206.76 | 0.00 | 206.76 | 5275.87 | 1359.98 | 6265.87 | 5995.24 | | 0.08 | -0.04 | 0.044 |
| 25.00 | -47.81 | -1.93 | 0.00 | -196.80 | 0.00 | 196.80 | 5214.41 | 1334.85 | 6036.38 | 5815.02 | | 0.12 | -0.05 | 0.043 |
| 30.00 | -46.00 | -1.88 | 0.00 | -187.13 | 0.00 | 187.13 | 5151.59 | 1309.71 | 5811.17 | 5635.92 | | 0.18 | -0.06 | 0.042 |
| 35.00 | -44.21 | -1.82 | 0.00 | -177.75 | 0.00 | 177.75 | 5087.42 | 1284.57 | 5590.25 | 5458.02 | | 0.24 | -0.07 | 0.041 |
| 40.00 | -42.46 | -1.76 | 0.00 | -168.67 | 0.00 | 168.67 | 5021.88 | 1259.44 | 5373.61 | 5281.41 | | 0.32 | -0.08 | 0.040 |
| 45.00 | -40.74 | -1.70 | 0.00 | -159.88 | 0.00 | 159.88 | 4954.99 | 1234.30 | 5161.25 | 5106.18 | | 0.40 | -0.09 | 0.040 |
| 45.92 | -40.42 | -1.69 | 0.00 | -158.33 | 0.00 | 158.33 | 4942.58 | 1229.69 | 5122.78 | 5074.21 | | 0.42 | -0.09 | 0.039 |
| 50.00 | -38.04 | -1.59 | 0.00 | -151.44 | 0.00 | 151.44 | 4886.75 | 1209.16 | 4953.16 | 4932.41 | | 0.50 | -0.10 | 0.038 |
| 53.00 | -36.30 | -1.52 | 0.00 | -146.66 | 0.00 | 146.66 | 3967.43 | 1039.40 | 4274.84 | 4025.79 | | 0.56 | -0.10 | 0.046 |
| 55.00 | -35.71 | -1.50 | 0.00 | -143.62 | 0.00 | 143.62 | 3947.58 | 1030.79 | 4204.32 | 3972.23 | | 0.60 | -0.11 | 0.045 |
| 60.00 | -34.25 | -1.45 | 0.00 | -136.10 | 0.00 | 136.10 | 3897.00 | 1009.27 | 4030.59 | 3838.84 | | 0.72 | -0.12 | 0.044 |
| 65.00 | -32.82 | -1.40 | 0.00 | -128.83 | 0.00 | 128.83 | 3845.06 | 987.75 | 3860.53 | 3706.29 | | 0.85 | -0.13 | 0.043 |
| 70.00 | -31.41 | -1.36 | 0.00 | -121.81 | 0.00 | 121.81 | 3791.77 | 966.22 | 3694.13 | 3574.65 | | 0.99 | -0.14 | 0.042 |
| 75.00 | -30.02 | -1.31 | 0.00 | -115.02 | 0.00 | 115.02 | 3737.12 | 944.70 | 3531.40 | 3444.02 | | 1.14 | -0.15 | 0.041 |
| 80.00 | -28.67 | -1.28 | 0.00 | -108.46 | 0.00 | 108.46 | 3681.11 | 923.18 | 3372.34 | 3314.49 | | 1.30 | -0.16 | 0.041 |
| 85.00 | -27.33 | -1.25 | 0.00 | -102.08 | 0.00 | 102.08 | 3623.74 | 901.66 | 3216.94 | 3186.13 | | 1.48 | -0.17 | 0.040 |
| 90.00 | -26.02 | -1.23 | 0.00 | -95.85 | 0.00 | 95.85 | 3565.02 | 880.14 | 3065.20 | 3059.03 | | 1.67 | -0.19 | 0.039 |
| 92.92 | -25.27 | -1.22 | 0.00 | -92.26 | 0.00 | 92.26 | 3530.13 | 867.59 | 2978.38 | 2985.51 | | 1.79 | -0.19 | 0.038 |
| 95.00 | -24.38 | -1.22 | 0.00 | -89.72 | 0.00 | 89.72 | 3504.93 | 858.62 | 2917.13 | 2933.28 | | 1.87 | -0.20 | 0.038 |
| 98.92 | -22.74 | -1.21 | 0.00 | -84.96 | 0.00 | 84.96 | 2742.07 | 714.64 | 2421.16 | 2291.78 | | 2.04 | -0.21 | 0.045 |
| 100.00 | -22.50 | -1.21 | 0.00 | -83.65 | 0.00 | 83.65 | 2732.96 | 710.75 | 2394.86 | 2271.63 | | 2.08 | -0.21 | 0.045 |
| 105.00 | -21.41 | -1.21 | 0.00 | -77.58 | 0.00 | 77.58 | 2690.08 | 692.79 | 2275.34 | 2179.04 | | 2.31 | -0.22 | 0.044 |
| 110.00 | -20.34 | -1.22 | 0.00 | -71.51 | 0.00 | 71.51 | 2645.83 | 674.83 | 2158.87 | 2087.20 | | 2.55 | -0.24 | 0.042 |
| 115.00 | -19.29 | -1.22 | 0.00 | -65.43 | 0.00 | 65.43 | 2600.23 | 656.86 | 2045.47 | 1996.19 | | 2.81 | -0.25 | 0.040 |
| 120.00 | -18.27 | -1.21 | 0.00 | -59.35 | 0.00 | 59.35 | 2553.28 | 638.90 | 1935.12 | 1906.09 | | 3.08 | -0.26 | 0.038 |
| 125.00 | -17.26 | -1.21 | 0.00 | -53.28 | 0.00 | 53.28 | 2504.96 | 620.94 | 1827.84 | 1816.99 | | 3.36 | -0.28 | 0.036 |
| 127.08 | -16.85 | -1.21 | 0.00 | -50.76 | 0.00 | 50.76 | 2484.49 | 613.48 | 1784.18 | 1780.31 | | 3.48 | -0.28 | 0.035 |
| 130.00 | -15.98 | -1.21 | 0.00 | -47.22 | 0.00 | 47.22 | 2455.29 | 602.97 | 1723.61 | 1728.99 | | 3.66 | -0.29 | 0.034 |
| 132.33 | -15.30 | -1.21 | 0.00 | -44.40 | 0.00 | 44.40 | 1489.30 | 422.56 | 1209.83 | 1053.29 | | 3.80 | -0.30 | 0.052 |
| 135.00 | -14.89 | -1.21 | 0.00 | -41.17 | 0.00 | 41.17 | 1477.63 | 415.84 | 1171.66 | 1028.31 | | 3.97 | -0.30 | 0.050 |
| 140.00 | -14.14 | -1.20 | 0.00 | -35.15 | 0.00 | 35.15 | 1454.76 | 403.27 | 1101.91 | 981.60 | | 4.30 | -0.32 | 0.046 |
| 145.00 | -13.41 | -1.19 | 0.00 | -29.15 | 0.00 | 29.15 | 1430.53 | 390.71 | 1034.29 | 934.97 | | 4.64 | -0.33 | 0.041 |
| 150.00 | -12.69 | -1.17 | 0.00 | -23.23 | 0.00 | 23.23 | 1404.94 | 378.14 | 968.82 | 888.50 | | 4.99 | -0.35 | 0.035 |
| 155.00 | -11.98 | -1.14 | 0.00 | -17.39 | 0.00 | 17.39 | 1377.99 | 365.57 | 905.49 | 842.29 | | 5.36 | -0.36 | 0.029 |
| 157.00 | -8.79 | -0.95 | 0.00 | -15.10 | 0.00 | 15.10 | 1366.83 | 360.54 | 880.75 | 823.90 | | 5.51 | -0.36 | 0.025 |
| 160.00 | -8.42 | -0.93 | 0.00 | -12.25 | 0.00 | 12.25 | 1349.68 | 353.00 | 844.29 | 796.42 | | 5.74 | -0.37 | 0.022 |
| 165.00 | -7.82 | -0.90 | 0.00 | -7.58 | 0.00 | 7.58 | 1320.02 | 340.43 | 785.24 | 750.97 | | 6.13 | -0.37 | 0.016 |
| 167.00 | -4.61 | -0.59 | 0.00 | -5.79 | 0.00 | 5.79 | 1307.77 | 335.40 | 762.22 | 732.93 | | 6.29 | -0.38 | 0.011 |
| 170.00 | -4.31 | -0.57 | 0.00 | -4.00 | 0.00 | 4.00 | 1289.00 | 327.86 | 728.33 | 706.04 | | 6.52 | -0.38 | 0.009 |
| 175.00 | -3.81 | -0.52 | 0.00 | -1.16 | 0.00 | 1.16 | 1256.62 | 315.30 | 673.56 | 661.70 | | 6.92 | -0.38 | 0.005 |
| 177.00 | -0.28 | -0.04 | 0.00 | -0.12 | 0.00 | 0.12 | 1243.29 | 310.27 | 652.25 | 644.16 | | 7.08 | -0.38 | 0.000 |
| 180.00 | 0.00 | -0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 1222.88 | 302.73 | 620.93 | 618.05 | | 7.32 | -0.38 | 0.000 |

# Calculated Forces

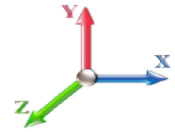
| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT02652-S-SBA | | **Code:** | EIA/TIA-222-H | 7/16/2019 |
| **Site Name:** | Colchester 3 CT | | **Exposure:** | C | |
| **Height:** | 180.00 (ft) | | **Crest Height:** | 0.00 | |
| **Base Elev:** | 0.000 (ft) | | **Site Class:** | B - Competent Rock | |
| **Gh:** | 1.1 | **Topography:** 1 | **Struct Class:** | II | Page: 31 |

# Seismic Segment Forces (Factored)

| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT02652-S-SBA | **Code:** | EIA/TIA-222-H | 7/16/2019 | |
| **Site Name:** | Colchester 3 CT | **Exposure:** | C | | |
| **Height:** | 180.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 32 | |

Tower Engineering Solutions

**Load Case:** 0.9D + 1.0Ev + 1.0Eh




| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Gust Response Factor** | 1.10 | | | **Sds** | 0.12 | **Iterations** | 23 |
| **Dead Load Factor** | 0.90 | **Seismic Load Factor** | 1.00 | **Sd1** | 0.03 | **Ss** | 0.20 |
| **Wind Load Factor** | 0.00 | **Structure Frequency (f1)** | 0.32 | **SA** | 0.01 | **S1** | 0.06 |
| | | | | | | **Seismic Importance Factor** | 1.00 |

| Top Elev (ft) | Description | Wz (lb) | a | b | c | Lateral Fs (lb) | R: 1.50 |
|---|---|---|---|---|---|---|---|
| 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 5.00 | | 1403.7 | 0.00 | 0.03 | 0.02 | 55.76 | |
| 10.00 | | 1379.3 | 0.01 | 0.05 | 0.03 | 62.30 | |
| 15.00 | | 1354.9 | 0.01 | 0.06 | 0.03 | 64.85 | |
| 20.00 | | 1330.6 | 0.02 | 0.07 | 0.04 | 65.59 | |
| 25.00 | | 1306.2 | 0.04 | 0.07 | 0.04 | 65.46 | |
| 30.00 | | 1281.8 | 0.05 | 0.07 | 0.04 | 64.98 | |
| 35.00 | | 1257.5 | 0.07 | 0.07 | 0.04 | 64.41 | |
| 40.00 | | 1233.1 | 0.09 | 0.07 | 0.04 | 63.91 | |
| 45.00 | | 1208.7 | 0.12 | 0.07 | 0.03 | 63.51 | |
| 45.92 | Bot - Section 2 | 218.97 | 0.12 | 0.07 | 0.03 | 11.53 | |
| 50.00 | | 1805.5 | 0.15 | 0.07 | 0.03 | 96.26 | |
| 53.00 | Top - Section 1 | 1307.2 | 0.16 | 0.07 | 0.03 | 70.29 | |
| 55.00 | | 401.39 | 0.18 | 0.07 | 0.03 | 21.69 | |
| 60.00 | | 988.87 | 0.21 | 0.06 | 0.02 | 53.91 | |
| 65.00 | | 968.00 | 0.25 | 0.06 | 0.02 | 52.64 | |
| 70.00 | | 947.14 | 0.29 | 0.05 | 0.01 | 50.32 | |
| 75.00 | | 926.28 | 0.33 | 0.04 | 0.01 | 46.29 | |
| 80.00 | | 905.41 | 0.37 | 0.03 | 0.01 | 39.78 | |
| 85.00 | | 884.55 | 0.42 | 0.01 | 0.01 | 30.35 | |
| 90.00 | | 863.69 | 0.47 | -0.01 | 0.01 | 18.85 | |
| 92.92 | Bot - Section 3 | 494.18 | 0.50 | -0.02 | 0.01 | 7.03 | |
| 95.00 | | 644.51 | 0.53 | -0.03 | 0.01 | 5.86 | |
| 98.92 | Top - Section 2 | 1193.6 | 0.57 | -0.04 | 0.01 | 0.94 | |
| 100.00 | | 149.70 | 0.58 | -0.05 | 0.01 | -0.17 | |
| 105.00 | | 680.33 | 0.64 | -0.07 | 0.02 | -5.29 | |
| 110.00 | | 662.92 | 0.71 | -0.09 | 0.03 | -7.34 | |
| 115.00 | | 645.50 | 0.77 | -0.11 | 0.05 | -7.47 | |
| 120.00 | | 628.09 | 0.84 | -0.12 | 0.07 | -6.09 | |
| 125.00 | | 610.68 | 0.91 | -0.12 | 0.09 | -3.47 | |
| 127.08 | Bot - Section 4 | 248.52 | 0.94 | -0.12 | 0.10 | -0.85 | |
| 130.00 | | 589.65 | 0.99 | -0.11 | 0.12 | 0.18 | |
| 132.33 | Top - Section 3 | 462.07 | 1.02 | -0.10 | 0.14 | 1.74 | |
| 135.00 | | 217.29 | 1.06 | -0.09 | 0.17 | 1.80 | |
| 140.00 | | 397.05 | 1.14 | -0.04 | 0.21 | 7.23 | |
| 145.00 | | 384.86 | 1.23 | 0.03 | 0.27 | 11.60 | |
| 150.00 | | 372.68 | 1.31 | 0.14 | 0.35 | 16.44 | |
| 155.00 | | 360.49 | 1.40 | 0.29 | 0.43 | 21.71 | |
| 157.00 | Appurtenance(s) | 2573.3 | 1.44 | 0.36 | 0.47 | 173.13 | |
| 160.00 | | 207.52 | 1.49 | 0.48 | 0.53 | 16.29 | |
| 165.00 | | 336.12 | 1.59 | 0.74 | 0.65 | 33.28 | |
| 167.00 | Appurtenance(s) | 2607.1 | 1.63 | 0.86 | 0.71 | 281.22 | |
| 170.00 | | 192.90 | 1.69 | 1.07 | 0.79 | 23.50 | |
| 175.00 | | 311.76 | 1.79 | 1.48 | 0.95 | 45.82 | |
| 177.00 | Appurtenance(s) | 2903.9 | 1.83 | 1.67 | 1.03 | 458.02 | |
| 180.00 | Appurtenance(s) | 213.28 | 1.89 | 1.98 | 1.14 | 37.23 | |

# Seismic Segment Forces (Factored)

| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT02652-S-SBA | **Code:** | EIA/TIA-222-H | 7/16/2019 | |
| **Site Name:** | Colchester 3 CT | **Exposure:** | C | | |
| **Height:** | 180.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 33 | |

| | | | |
|---|---|---|---|
| **Totals:** | **40,061.7** | **2,175.1** | **Total Wind:** **34,599.8** |

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

# Calculated Forces

| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT02652-S-SBA | **Code:** | EIA/TIA-222-H | 7/16/2019 | |
| **Site Name:** | Colchester 3 CT | **Exposure:** | C | | |
| **Height:** | 180.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 34 | |

Tower Engineering Solutions

**Load Case:** 0.9D + 1.0Ev + 1.0Eh

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Gust Response Factor** | 1.10 | | | **Sds** | 0.12 | | | **Iterations** | 23 |
| **Dead Load Factor** | 0.90 | **Seismic Load Factor** | 1.00 | **Sd1** | 0.03 | | | **Ss** | 0.20 |
| **Wind Load Factor** | 0.00 | **Structure Frequency (f1)** | 0.32 | **SA** | 0.01 | | | **S1** | 0.06 |
| | | | | | | | | **Seismic Importance Factor** | 1.00 |

| Seg Elev (ft) | Pu FY (-) (kips) | Vu FX (-) (kips) | Tu MY (-) (ft-kips) | Mu MZ (ft-kips) | Mu MX (ft-kips) | Resultant Moment (ft-kips) | phi Pn (kips) | phi Vn (kips) | phi Tn (ft-kips) | phi Mn (ft-kips) | Total Deflect (in) | Rotation Sway (deg) | Rotation Twist (deg) | Stress Ratio |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | -42.98 | -2.21 | 0.00 | -246.45 | 0.00 | 246.45 | 5508.12 | 1460.53 | 7226.63 | 6725.55 | | 0.00 | 0.00 | 0.044 |
| 5.00 | -41.51 | -2.16 | 0.00 | -235.41 | 0.00 | 235.41 | 5452.09 | 1435.40 | 6980.02 | 6541.73 | | 0.00 | -0.01 | 0.044 |
| 10.00 | -40.06 | -2.10 | 0.00 | -224.61 | 0.00 | 224.61 | 5394.71 | 1410.26 | 6737.68 | 6358.68 | | 0.02 | -0.02 | 0.043 |
| 15.00 | -38.64 | -2.04 | 0.00 | -214.10 | 0.00 | 214.10 | 5335.97 | 1385.12 | 6499.64 | 6176.49 | | 0.04 | -0.03 | 0.042 |
| 20.00 | -37.23 | -1.98 | 0.00 | -203.88 | 0.00 | 203.88 | 5275.87 | 1359.98 | 6265.87 | 5995.24 | | 0.08 | -0.04 | 0.041 |
| 25.00 | -35.85 | -1.92 | 0.00 | -193.96 | 0.00 | 193.96 | 5214.41 | 1334.85 | 6036.38 | 5815.02 | | 0.12 | -0.05 | 0.040 |
| 30.00 | -34.50 | -1.86 | 0.00 | -184.35 | 0.00 | 184.35 | 5151.59 | 1309.71 | 5811.17 | 5635.92 | | 0.18 | -0.06 | 0.039 |
| 35.00 | -33.16 | -1.80 | 0.00 | -175.04 | 0.00 | 175.04 | 5087.42 | 1284.57 | 5590.25 | 5458.02 | | 0.24 | -0.07 | 0.039 |
| 40.00 | -31.84 | -1.74 | 0.00 | -166.03 | 0.00 | 166.03 | 5021.88 | 1259.44 | 5373.61 | 5281.41 | | 0.31 | -0.07 | 0.038 |
| 45.00 | -30.55 | -1.68 | 0.00 | -157.32 | 0.00 | 157.32 | 4954.99 | 1234.30 | 5161.25 | 5106.18 | | 0.40 | -0.08 | 0.037 |
| 45.92 | -30.32 | -1.67 | 0.00 | -155.78 | 0.00 | 155.78 | 4942.58 | 1229.69 | 5122.78 | 5074.21 | | 0.41 | -0.09 | 0.037 |
| 50.00 | -28.53 | -1.57 | 0.00 | -148.96 | 0.00 | 148.96 | 4886.75 | 1209.16 | 4953.16 | 4932.41 | | 0.49 | -0.09 | 0.036 |
| 53.00 | -27.23 | -1.50 | 0.00 | -144.23 | 0.00 | 144.23 | 3967.43 | 1039.40 | 4274.84 | 4025.79 | | 0.55 | -0.10 | 0.043 |
| 55.00 | -26.78 | -1.49 | 0.00 | -141.22 | 0.00 | 141.22 | 3947.58 | 1030.79 | 4204.32 | 3972.23 | | 0.59 | -0.10 | 0.042 |
| 60.00 | -25.69 | -1.43 | 0.00 | -133.79 | 0.00 | 133.79 | 3897.00 | 1009.27 | 4030.59 | 3838.84 | | 0.71 | -0.12 | 0.041 |
| 65.00 | -24.61 | -1.38 | 0.00 | -126.62 | 0.00 | 126.62 | 3845.06 | 987.75 | 3860.53 | 3706.29 | | 0.84 | -0.13 | 0.041 |
| 70.00 | -23.56 | -1.34 | 0.00 | -119.70 | 0.00 | 119.70 | 3791.77 | 966.22 | 3694.13 | 3574.65 | | 0.97 | -0.14 | 0.040 |
| 75.00 | -22.52 | -1.29 | 0.00 | -113.02 | 0.00 | 113.02 | 3737.12 | 944.70 | 3531.40 | 3444.02 | | 1.12 | -0.15 | 0.039 |
| 80.00 | -21.50 | -1.25 | 0.00 | -106.56 | 0.00 | 106.56 | 3681.11 | 923.18 | 3372.34 | 3314.49 | | 1.29 | -0.16 | 0.038 |
| 85.00 | -20.50 | -1.22 | 0.00 | -100.29 | 0.00 | 100.29 | 3623.74 | 901.66 | 3216.94 | 3186.13 | | 1.46 | -0.17 | 0.037 |
| 90.00 | -19.52 | -1.21 | 0.00 | -94.17 | 0.00 | 94.17 | 3565.02 | 880.14 | 3065.20 | 3059.03 | | 1.65 | -0.18 | 0.036 |
| 92.92 | -18.95 | -1.20 | 0.00 | -90.65 | 0.00 | 90.65 | 3530.13 | 867.59 | 2978.38 | 2985.51 | | 1.76 | -0.19 | 0.036 |
| 95.00 | -18.29 | -1.19 | 0.00 | -88.15 | 0.00 | 88.15 | 3504.93 | 858.62 | 2917.13 | 2933.28 | | 1.84 | -0.19 | 0.035 |
| 98.92 | -17.05 | -1.19 | 0.00 | -83.48 | 0.00 | 83.48 | 2742.07 | 714.64 | 2421.16 | 2291.78 | | 2.01 | -0.20 | 0.043 |
| 100.00 | -16.87 | -1.19 | 0.00 | -82.19 | 0.00 | 82.19 | 2732.96 | 710.75 | 2394.86 | 2271.63 | | 2.05 | -0.21 | 0.042 |
| 105.00 | -16.05 | -1.19 | 0.00 | -76.24 | 0.00 | 76.24 | 2690.08 | 692.79 | 2275.34 | 2179.04 | | 2.28 | -0.22 | 0.041 |
| 110.00 | -15.25 | -1.19 | 0.00 | -70.28 | 0.00 | 70.28 | 2645.83 | 674.83 | 2158.87 | 2087.20 | | 2.51 | -0.23 | 0.039 |
| 115.00 | -14.47 | -1.19 | 0.00 | -64.31 | 0.00 | 64.31 | 2600.23 | 656.86 | 2045.47 | 1996.19 | | 2.77 | -0.25 | 0.038 |
| 120.00 | -13.70 | -1.19 | 0.00 | -58.35 | 0.00 | 58.35 | 2553.28 | 638.90 | 1935.12 | 1906.09 | | 3.03 | -0.26 | 0.036 |
| 125.00 | -12.94 | -1.19 | 0.00 | -52.39 | 0.00 | 52.39 | 2504.96 | 620.94 | 1827.84 | 1816.99 | | 3.31 | -0.27 | 0.034 |
| 127.08 | -12.63 | -1.19 | 0.00 | -49.92 | 0.00 | 49.92 | 2484.49 | 613.48 | 1784.18 | 1780.31 | | 3.43 | -0.28 | 0.033 |
| 130.00 | -11.98 | -1.19 | 0.00 | -46.44 | 0.00 | 46.44 | 2455.29 | 602.97 | 1723.61 | 1728.99 | | 3.60 | -0.29 | 0.032 |
| 132.33 | -11.47 | -1.19 | 0.00 | -43.67 | 0.00 | 43.67 | 1489.30 | 422.56 | 1209.83 | 1053.29 | | 3.74 | -0.29 | 0.049 |
| 135.00 | -11.17 | -1.18 | 0.00 | -40.50 | 0.00 | 40.50 | 1477.63 | 415.84 | 1171.66 | 1028.31 | | 3.91 | -0.30 | 0.047 |
| 140.00 | -10.61 | -1.18 | 0.00 | -34.58 | 0.00 | 34.58 | 1454.76 | 403.27 | 1101.91 | 981.60 | | 4.23 | -0.31 | 0.043 |
| 145.00 | -10.06 | -1.16 | 0.00 | -28.69 | 0.00 | 28.69 | 1430.53 | 390.71 | 1034.29 | 934.97 | | 4.57 | -0.33 | 0.038 |
| 150.00 | -9.52 | -1.15 | 0.00 | -22.87 | 0.00 | 22.87 | 1404.94 | 378.14 | 968.82 | 888.50 | | 4.92 | -0.34 | 0.033 |
| 155.00 | -8.99 | -1.12 | 0.00 | -17.13 | 0.00 | 17.13 | 1377.99 | 365.57 | 905.49 | 842.29 | | 5.28 | -0.35 | 0.027 |
| 157.00 | -6.59 | -0.94 | 0.00 | -14.88 | 0.00 | 14.88 | 1366.83 | 360.54 | 880.75 | 823.90 | | 5.43 | -0.36 | 0.023 |
| 160.00 | -6.31 | -0.92 | 0.00 | -12.07 | 0.00 | 12.07 | 1349.68 | 353.00 | 844.29 | 796.42 | | 5.65 | -0.36 | 0.020 |
| 165.00 | -5.86 | -0.88 | 0.00 | -7.48 | 0.00 | 7.48 | 1320.02 | 340.43 | 785.24 | 750.97 | | 6.03 | -0.37 | 0.014 |
| 167.00 | -3.46 | -0.59 | 0.00 | -5.71 | 0.00 | 5.71 | 1307.77 | 335.40 | 762.22 | 732.93 | | 6.19 | -0.37 | 0.010 |
| 170.00 | -3.23 | -0.56 | 0.00 | -3.95 | 0.00 | 3.95 | 1289.00 | 327.86 | 728.33 | 706.04 | | 6.42 | -0.37 | 0.008 |
| 175.00 | -2.86 | -0.51 | 0.00 | -1.14 | 0.00 | 1.14 | 1256.62 | 315.30 | 673.56 | 661.70 | | 6.81 | -0.37 | 0.004 |
| 177.00 | -0.21 | -0.04 | 0.00 | -0.12 | 0.00 | 0.12 | 1243.29 | 310.27 | 652.25 | 644.16 | | 6.97 | -0.37 | 0.000 |
| 180.00 | 0.00 | -0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 1222.88 | 302.73 | 620.93 | 618.05 | | 7.20 | -0.37 | 0.000 |

# Calculated Forces

| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT02652-S-SBA | | **Code:** | EIA/TIA-222-H | 7/16/2019 |
| **Site Name:** | Colchester 3 CT | | **Exposure:** | C | |
| **Height:** | 180.00 (ft) | | **Crest Height:** | 0.00 | |
| **Base Elev:** | 0.000 (ft) | | **Site Class:** | B - Competent Rock | |
| **Gh:** | 1.1 | **Topography:** 1 | **Struct Class:** | II | Page: 35 |

# Wind Loading - Shaft

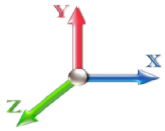
| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT02652-S-SBA | **Code:** | EIA/TIA-222-H | 7/16/2019 | |
| **Site Name:** | Colchester 3 CT | **Exposure:** | C | | |
| **Height:** | 180.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 36 | |

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 | 7.342 | 8.08 | 280.11 | 0.750 | 0.000 | 0.00 | 0.000 | 0.00 | 0.0 | 0.0 | 0.0 |
| 5.00 | | 1.00 | 0.85 | 7.342 | 8.08 | 275.32 | 0.750 | 0.000 | 5.00 | 25.272 | 18.95 | 153.1 | 0.0 | 1403.7 |
| 10.00 | | 1.00 | 0.85 | 7.342 | 8.08 | 270.54 | 0.750 | 0.000 | 5.00 | 24.837 | 18.63 | 150.4 | 0.0 | 1379.4 |
| 15.00 | | 1.00 | 0.85 | 7.342 | 8.08 | 265.75 | 0.750 | 0.000 | 5.00 | 24.401 | 18.30 | 147.8 | 0.0 | 1355.0 |
| 20.00 | | 1.00 | 0.90 | 7.790 | 8.57 | 268.81 | 0.750 | 0.000 | 5.00 | 23.966 | 17.97 | 154.0 | 0.0 | 1330.6 |
| 25.00 | | 1.00 | 0.95 | 8.165 | 8.98 | 270.15 | 0.750 | 0.000 | 5.00 | 23.530 | 17.65 | 158.5 | 0.0 | 1306.3 |
| 30.00 | | 1.00 | 0.98 | 8.484 | 9.33 | 270.24 | 0.750 | 0.000 | 5.00 | 23.095 | 17.32 | 161.7 | 0.0 | 1281.9 |
| 35.00 | | 1.00 | 1.01 | 8.764 | 9.64 | 269.44 | 0.750 | 0.000 | 5.00 | 22.659 | 16.99 | 163.8 | 0.0 | 1257.5 |
| 40.00 | | 1.00 | 1.04 | 9.014 | 9.92 | 267.95 | 0.750 | 0.000 | 5.00 | 22.224 | 16.67 | 165.3 | 0.0 | 1233.1 |
| 45.00 | | 1.00 | 1.07 | 9.241 | 10.16 | 265.92 | 0.750 | 0.000 | 5.00 | 21.788 | 16.34 | 166.1 | 0.0 | 1208.8 |
| 45.92 | Bot - Section 2 | 1.00 | 1.07 | 9.280 | 10.21 | 265.50 | 0.750 | 0.000 | 0.92 | 3.947 | 2.96 | 30.2 | 0.0 | 219.0 |
| 50.00 | | 1.00 | 1.09 | 9.448 | 10.39 | 263.46 | 0.750 | 0.000 | 4.08 | 17.666 | 13.25 | 137.7 | 0.0 | 1805.5 |
| 53.00 | Top - Section 1 | 1.00 | 1.11 | 9.564 | 10.52 | 261.80 | 0.750 | 0.000 | 3.00 | 12.794 | 9.60 | 100.9 | 0.0 | 1307.3 |
| 55.00 | | 1.00 | 1.12 | 9.639 | 10.60 | 264.64 | 0.750 | 0.000 | 2.00 | 8.442 | 6.33 | 67.1 | 0.0 | 401.4 |
| 60.00 | | 1.00 | 1.14 | 9.817 | 10.80 | 261.54 | 0.750 | 0.000 | 5.00 | 20.800 | 15.60 | 168.5 | 0.0 | 988.9 |
| 65.00 | | 1.00 | 1.16 | 9.984 | 10.98 | 258.18 | 0.750 | 0.000 | 5.00 | 20.365 | 15.27 | 167.7 | 0.0 | 968.0 |
| 70.00 | | 1.00 | 1.17 | 10.141 | 11.16 | 254.57 | 0.750 | 0.000 | 5.00 | 19.929 | 14.95 | 166.7 | 0.0 | 947.1 |
| 75.00 | | 1.00 | 1.19 | 10.290 | 11.32 | 250.76 | 0.750 | 0.000 | 5.00 | 19.494 | 14.62 | 165.5 | 0.0 | 926.3 |
| 80.00 | | 1.00 | 1.21 | 10.430 | 11.47 | 246.77 | 0.750 | 0.000 | 5.00 | 19.058 | 14.29 | 164.0 | 0.0 | 905.4 |
| 85.00 | | 1.00 | 1.22 | 10.564 | 11.62 | 242.61 | 0.750 | 0.000 | 5.00 | 18.623 | 13.97 | 162.3 | 0.0 | 884.5 |
| 90.00 | | 1.00 | 1.24 | 10.692 | 11.76 | 238.30 | 0.750 | 0.000 | 5.00 | 18.187 | 13.64 | 160.4 | 0.0 | 863.7 |
| 92.92 | Bot - Section 3 | 1.00 | 1.25 | 10.764 | 11.84 | 235.72 | 0.750 | 0.000 | 2.92 | 10.408 | 7.81 | 92.4 | 0.0 | 494.2 |
| 95.00 | | 1.00 | 1.25 | 10.815 | 11.90 | 233.85 | 0.750 | 0.000 | 2.08 | 7.454 | 5.59 | 66.5 | 0.0 | 644.5 |
| 98.92 | Top - Section 2 | 1.00 | 1.26 | 10.907 | 12.00 | 230.28 | 0.750 | 0.000 | 3.92 | 13.810 | 10.36 | 124.3 | 0.0 | 1193.7 |
| 100.00 | | 1.00 | 1.27 | 10.932 | 12.03 | 232.84 | 0.750 | 0.000 | 1.08 | 3.773 | 2.83 | 34.0 | 0.0 | 149.7 |
| 105.00 | | 1.00 | 1.28 | 11.045 | 12.15 | 228.17 | 0.750 | 0.000 | 5.00 | 17.147 | 12.86 | 156.2 | 0.0 | 680.3 |
| 110.00 | | 1.00 | 1.29 | 11.154 | 12.27 | 223.39 | 0.750 | 0.000 | 5.00 | 16.711 | 12.53 | 153.8 | 0.0 | 662.9 |
| 115.00 | | 1.00 | 1.30 | 11.259 | 12.38 | 218.51 | 0.750 | 0.000 | 5.00 | 16.276 | 12.21 | 151.2 | 0.0 | 645.5 |
| 120.00 | | 1.00 | 1.32 | 11.360 | 12.50 | 213.54 | 0.750 | 0.000 | 5.00 | 15.840 | 11.88 | 148.5 | 0.0 | 628.1 |
| 125.00 | | 1.00 | 1.33 | 11.458 | 12.60 | 208.48 | 0.750 | 0.000 | 5.00 | 15.405 | 11.55 | 145.6 | 0.0 | 610.7 |
| 127.08 | Bot - Section 4 | 1.00 | 1.33 | 11.498 | 12.65 | 206.36 | 0.750 | 0.000 | 2.08 | 6.270 | 4.70 | 59.5 | 0.0 | 248.5 |
| 130.00 | | 1.00 | 1.34 | 11.553 | 12.71 | 203.34 | 0.750 | 0.000 | 2.92 | 8.808 | 6.61 | 83.9 | 0.0 | 589.7 |
| 132.33 | Top - Section 3 | 1.00 | 1.34 | 11.596 | 12.76 | 200.92 | 0.750 | 0.000 | 2.33 | 6.904 | 5.18 | 66.0 | 0.0 | 462.1 |
| 135.00 | | 1.00 | 1.35 | 11.645 | 12.81 | 200.70 | 0.750 | 0.000 | 2.67 | 7.816 | 5.86 | 75.1 | 0.0 | 217.3 |
| 140.00 | | 1.00 | 1.36 | 11.735 | 12.91 | 195.42 | 0.750 | 0.000 | 5.00 | 14.284 | 10.71 | 138.3 | 0.0 | 397.0 |
| 145.00 | | 1.00 | 1.37 | 11.822 | 13.00 | 190.07 | 0.750 | 0.000 | 5.00 | 13.849 | 10.39 | 135.1 | 0.0 | 384.9 |
| 150.00 | | 1.00 | 1.38 | 11.906 | 13.10 | 184.66 | 0.750 | 0.000 | 5.00 | 13.413 | 10.06 | 131.8 | 0.0 | 372.7 |
| 155.00 | | 1.00 | 1.39 | 11.989 | 13.19 | 179.18 | 0.750 | 0.000 | 5.00 | 12.978 | 9.73 | 128.4 | 0.0 | 360.5 |
| 157.00 | Appurtenance(s) | 1.00 | 1.39 | 12.021 | 13.22 | 176.97 | 0.750 | 0.000 | 2.00 | 5.069 | 3.80 | 50.3 | 0.0 | 140.8 |
| 160.00 | | 1.00 | 1.40 | 12.069 | 13.28 | 173.64 | 0.750 | 0.000 | 3.00 | 7.473 | 5.60 | 74.4 | 0.0 | 207.5 |
| 165.00 | | 1.00 | 1.41 | 12.148 | 13.36 | 168.05 | 0.750 | 0.000 | 5.00 | 12.107 | 9.08 | 121.3 | 0.0 | 336.1 |
| 167.00 | Appurtenance(s) | 1.00 | 1.41 | 12.178 | 13.40 | 165.80 | 0.750 | 0.000 | 2.00 | 4.721 | 3.54 | 47.4 | 0.0 | 131.0 |
| 170.00 | | 1.00 | 1.42 | 12.224 | 13.45 | 162.40 | 0.750 | 0.000 | 3.00 | 6.950 | 5.21 | 70.1 | 0.0 | 192.9 |
| 175.00 | | 1.00 | 1.42 | 12.299 | 13.53 | 156.71 | 0.750 | 0.000 | 5.00 | 11.236 | 8.43 | 114.0 | 0.0 | 311.8 |
| 177.00 | Appurtenance(s) | 1.00 | 1.43 | 12.328 | 13.56 | 154.41 | 0.750 | 0.000 | 2.00 | 4.372 | 3.28 | 44.5 | 0.0 | 121.3 |
| 180.00 | Appurtenance(s) | 1.00 | 1.43 | 12.372 | 13.61 | 150.96 | 0.750 | 0.000 | 3.00 | 6.428 | 4.82 | 65.6 | 0.0 | 178.3 |

# Wind Loading - Shaft

| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT02652-S-SBA | **Code:** | EIA/TIA-222-H | 7/16/2019 | |
| **Site Name:** | Colchester 3 CT | **Exposure:** | C | | |
| **Height:** | 180.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 37 | |

| | | | |
|---|---|---|---|
| **Totals:** | **180.00** | **5,390.0** | **32,335.3** |

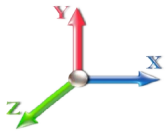
# Discrete Appurtenance Forces

| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT02652-S-SBA | **Code:** | EIA/TIA-222-H | 7/16/2019 | |
| **Site Name:** | Colchester 3 CT | **Exposure:** | C | | |
| **Height:** | 180.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 38 | |

**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 | 180.00 | Lightning Rod | 1 | 12.422 | 13.665 | 1.00 | 1.00 | 1.05 | 35.00 | 0.000 | 3.500 | 14.35 | 0.00 | 50.22 |
| 2 | 177.00 | Low Profile Platform | 1 | 12.328 | 13.561 | 1.00 | 1.00 | 24.00 | 2000.00 | 0.000 | 0.000 | 325.47 | 0.00 | 0.00 |
| 3 | 177.00 | EMS RR90-17-02DP | 9 | 12.328 | 13.561 | 0.62 | 0.80 | 24.49 | 162.00 | 0.000 | 0.000 | 332.06 | 0.00 | 0.00 |
| 4 | 177.00 | APXVAARR18_43-U-NA2 | 3 | 12.328 | 13.561 | 0.61 | 0.80 | 28.75 | 318.00 | 0.000 | 0.000 | 389.84 | 0.00 | 0.00 |
| 5 | 177.00 | Kathrein 782 10662 Bias-T | 3 | 12.332 | 13.565 | 0.60 | 0.80 | 0.50 | 5.40 | 0.000 | 0.237 | 6.84 | 0.00 | 1.62 |
| 6 | 177.00 | Ericsson Radio 4449 | 3 | 12.338 | 13.571 | 0.60 | 0.80 | 2.97 | 222.00 | 0.000 | 0.625 | 40.31 | 0.00 | 25.19 |
| 7 | 177.00 | KRY 112 144/2 | 3 | 12.333 | 13.566 | 0.60 | 0.80 | 0.74 | 29.10 | 0.000 | 0.287 | 10.01 | 0.00 | 2.88 |
| 8 | 177.00 | KRY 112 489/2 | 3 | 12.335 | 13.569 | 0.60 | 0.80 | 1.17 | 46.20 | 0.000 | 0.458 | 15.88 | 0.00 | 7.28 |
| 9 | 167.00 | Low Profile Platform | 1 | 12.178 | 13.396 | 1.00 | 1.00 | 24.00 | 2000.00 | 0.000 | 0.000 | 321.51 | 0.00 | 0.00 |
| 10 | 167.00 | RRH2x40-07-U | 3 | 12.178 | 13.396 | 0.60 | 0.80 | 4.01 | 152.10 | 0.000 | 0.000 | 53.77 | 0.00 | 0.00 |
| 11 | 167.00 | RRH2x40-AWS | 3 | 12.178 | 13.396 | 0.60 | 0.80 | 4.54 | 132.00 | 0.000 | 0.000 | 60.77 | 0.00 | 0.00 |
| 12 | 167.00 | BXA-171063-12CF | 6 | 12.178 | 13.396 | 0.67 | 0.80 | 19.27 | 90.00 | 0.000 | 0.000 | 258.19 | 0.00 | 0.00 |
| 13 | 167.00 | BXA-70063-6CF | 6 | 12.178 | 13.396 | 0.59 | 0.80 | 26.89 | 102.00 | 0.000 | 0.000 | 360.21 | 0.00 | 0.00 |
| 14 | 157.00 | LGP21401 TMA | 6 | 12.021 | 13.223 | 0.60 | 0.80 | 4.64 | 84.60 | 0.000 | 0.000 | 61.41 | 0.00 | 0.00 |
| 15 | 157.00 | LGP21903 Diplexers | 6 | 12.021 | 13.223 | 0.60 | 0.80 | 2.27 | 33.00 | 0.000 | 0.000 | 29.99 | 0.00 | 0.00 |
| 16 | 157.00 | Low Profile Platform | 1 | 12.021 | 13.223 | 1.00 | 1.00 | 24.00 | 2000.00 | 0.000 | 0.000 | 317.36 | 0.00 | 0.00 |
| 17 | 157.00 | 7770.00 | 9 | 11.972 | 13.170 | 0.58 | 0.80 | 28.91 | 315.00 | 0.000 | -3.000 | 380.71 | 0.00 | -1142.13 |
| | | | | | | | **Totals:** | | **7,726.40** | | | **2,978.66** | | |

# Total Applied Force Summary

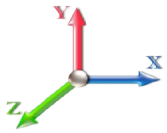
| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT02652-S-SBA | **Code:** | EIA/TIA-222-H | 7/16/2019 | |
| **Site Name:** | Colchester 3 CT | **Exposure:** | C | | |
| **Height:** | 180.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 39 | |

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 | | 153.08 | 1630.93 | 0.00 | 0.00 |
| 10.00 | | 150.44 | 1606.56 | 0.00 | 0.00 |
| 15.00 | | 147.80 | 1582.19 | 0.00 | 0.00 |
| 20.00 | | 154.03 | 1557.82 | 0.00 | 0.00 |
| 25.00 | | 158.50 | 1533.46 | 0.00 | 0.00 |
| 30.00 | | 161.65 | 1509.09 | 0.00 | 0.00 |
| 35.00 | | 163.84 | 1484.72 | 0.00 | 0.00 |
| 40.00 | | 165.27 | 1460.35 | 0.00 | 0.00 |
| 45.00 | | 166.10 | 1435.98 | 0.00 | 0.00 |
| 45.92 | | 30.22 | 260.62 | 0.00 | 0.00 |
| 50.00 | | 137.69 | 1991.08 | 0.00 | 0.00 |
| 53.00 | | 100.95 | 1443.61 | 0.00 | 0.00 |
| 55.00 | | 67.13 | 492.27 | 0.00 | 0.00 |
| 60.00 | | 168.47 | 1216.07 | 0.00 | 0.00 |
| 65.00 | | 167.74 | 1195.20 | 0.00 | 0.00 |
| 70.00 | | 166.74 | 1174.34 | 0.00 | 0.00 |
| 75.00 | | 165.48 | 1153.48 | 0.00 | 0.00 |
| 80.00 | | 164.00 | 1132.61 | 0.00 | 0.00 |
| 85.00 | | 162.31 | 1111.75 | 0.00 | 0.00 |
| 90.00 | | 160.43 | 1090.89 | 0.00 | 0.00 |
| 92.92 | | 92.43 | 626.71 | 0.00 | 0.00 |
| 95.00 | | 66.51 | 739.17 | 0.00 | 0.00 |
| 98.92 | | 124.26 | 1371.66 | 0.00 | 0.00 |
| 100.00 | | 34.02 | 198.93 | 0.00 | 0.00 |
| 105.00 | | 156.24 | 907.53 | 0.00 | 0.00 |
| 110.00 | | 153.77 | 890.12 | 0.00 | 0.00 |
| 115.00 | | 151.17 | 872.70 | 0.00 | 0.00 |
| 120.00 | | 148.45 | 855.29 | 0.00 | 0.00 |
| 125.00 | | 145.62 | 837.88 | 0.00 | 0.00 |
| 127.08 | | 59.48 | 342.88 | 0.00 | 0.00 |
| 130.00 | | 83.95 | 722.49 | 0.00 | 0.00 |
| 132.33 | | 66.05 | 567.80 | 0.00 | 0.00 |
| 135.00 | | 75.09 | 338.76 | 0.00 | 0.00 |
| 140.00 | | 138.29 | 624.25 | 0.00 | 0.00 |
| 145.00 | | 135.06 | 612.06 | 0.00 | 0.00 |
| 150.00 | | 131.75 | 599.88 | 0.00 | 0.00 |
| 155.00 | | 128.36 | 587.69 | 0.00 | 0.00 |
| 157.00 | (22) attachments | 839.74 | 2664.27 | 0.00 | -1142.13 |
| 160.00 | | 74.41 | 306.40 | 0.00 | 0.00 |
| 165.00 | | 121.33 | 500.92 | 0.00 | 0.00 |
| 167.00 | (19) attachments | 1101.87 | 2673.06 | 0.00 | 0.00 |
| 170.00 | | 70.10 | 254.34 | 0.00 | 0.00 |
| 175.00 | | 114.01 | 414.16 | 0.00 | 0.00 |
| 177.00 | (25) attachments | 1164.87 | 2944.95 | 0.00 | 36.97 |
| 180.00 | (1) attachments | 79.96 | 233.98 | 0.00 | 50.22 |

# Total Applied Force Summary

| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT02652-S-SBA | | **Code:** | EIA/TIA-222-H | 7/16/2019 |
| **Site Name:** | Colchester 3 CT | | **Exposure:** | C | |
| **Height:** | 180.00 (ft) | | **Crest Height:** | 0.00 | |
| **Base Elev:** | 0.000 (ft) | | **Site Class:** | B - Competent Rock | |
| **Gh:** | 1.1 | **Topography:** 1 | **Struct Class:** | II | Page: 40 |

Tower Engineering Solutions

| | | | | |
|---|---|---|---|---|
| **Totals:** | **8,368.67** | **47,750.92** | **0.00** | **-1,054.94** |

# Linear Appurtenance Segment Forces (Factored)

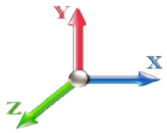
| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT02652-S-SBA | **Code:** | EIA/TIA-222-H | 7/16/2019 | |
| **Site Name:** | Colchester 3 CT | **Exposure:** | C | | |
| **Height:** | 180.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 41 | |

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) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 7.342 | 0.00 | 34.50 |
| 10.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 7.342 | 0.00 | 34.50 |
| 15.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 7.342 | 0.00 | 34.50 |
| 20.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 7.790 | 0.00 | 34.50 |
| 25.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 8.165 | 0.00 | 34.50 |
| 30.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 8.484 | 0.00 | 34.50 |
| 35.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 8.764 | 0.00 | 34.50 |
| 40.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 9.014 | 0.00 | 34.50 |
| 45.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 9.241 | 0.00 | 34.50 |
| 45.92 | Climbing Ladder | Yes | 0.92 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 9.280 | 0.00 | 6.33 |
| 50.00 | Climbing Ladder | Yes | 4.08 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 9.448 | 0.00 | 28.17 |
| 53.00 | Climbing Ladder | Yes | 3.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 9.564 | 0.00 | 20.70 |
| 55.00 | Climbing Ladder | Yes | 2.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 9.639 | 0.00 | 13.80 |
| 60.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 9.817 | 0.00 | 34.50 |
| 65.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 9.984 | 0.00 | 34.50 |
| 70.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 10.141 | 0.00 | 34.50 |
| 75.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 10.290 | 0.00 | 34.50 |
| 80.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 10.430 | 0.00 | 34.50 |
| 85.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 10.564 | 0.00 | 34.50 |
| 90.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 10.692 | 0.00 | 34.50 |
| 92.92 | Climbing Ladder | Yes | 2.92 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 10.764 | 0.00 | 20.13 |
| 95.00 | Climbing Ladder | Yes | 2.08 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 10.815 | 0.00 | 14.37 |
| 98.92 | Climbing Ladder | Yes | 3.92 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 10.907 | 0.00 | 27.03 |
| 100.00 | Climbing Ladder | Yes | 1.08 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 10.932 | 0.00 | 7.47 |
| 105.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 11.045 | 0.00 | 34.50 |
| 110.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 11.154 | 0.00 | 34.50 |
| 115.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 11.259 | 0.00 | 34.50 |
| 120.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 11.360 | 0.00 | 34.50 |
| 125.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 11.458 | 0.00 | 34.50 |
| 127.08 | Climbing Ladder | Yes | 2.08 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 11.498 | 0.00 | 14.33 |
| 130.00 | Climbing Ladder | Yes | 2.92 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 11.553 | 0.00 | 20.17 |
| 132.33 | Climbing Ladder | Yes | 2.33 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 11.596 | 0.00 | 16.05 |
| 135.00 | Climbing Ladder | Yes | 2.67 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 11.645 | 0.00 | 18.45 |
| 140.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 11.735 | 0.00 | 34.50 |
| 145.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 11.822 | 0.00 | 34.50 |
| 150.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 11.906 | 0.00 | 34.50 |
| 155.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 11.989 | 0.00 | 34.50 |
| 157.00 | Climbing Ladder | Yes | 2.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 12.021 | 0.00 | 13.80 |
| 160.00 | Climbing Ladder | Yes | 3.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 12.069 | 0.00 | 20.70 |
| 165.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 12.148 | 0.00 | 34.50 |
| 167.00 | Climbing Ladder | Yes | 2.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 12.178 | 0.00 | 13.80 |
| 170.00 | Climbing Ladder | Yes | 3.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 12.224 | 0.00 | 20.70 |
| 175.00 | Climbing Ladder | Yes | 5.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 12.299 | 0.00 | 34.50 |
| 177.00 | Climbing Ladder | Yes | 2.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 12.328 | 0.00 | 13.80 |
| 180.00 | Climbing Ladder | Yes | 3.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 12.372 | 0.00 | 20.70 |
| | | | | | | | | | | **Totals:** | **0.0** | **1,242.0** |

# Calculated Forces

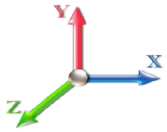
| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT02652-S-SBA | **Code:** | EIA/TIA-222-H | 7/16/2019 | |
| **Site Name:** | Colchester 3 CT | **Exposure:** | C | | |
| **Height:** | 180.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 42 | |

Tower Engineering Solutions

**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 | -47.75 | -8.38 | 0.00 | -1010.8 | 0.00 | 1010.86 | 5508.12 | 1460.53 | 7226.63 | 6725.55 | 0.00 | 0.000 | 0.000 | 0.159 |
| 5.00 | -46.11 | -8.26 | 0.00 | -968.94 | 0.00 | 968.94 | 5452.09 | 1435.40 | 6980.02 | 6541.73 | 0.02 | -0.038 | 0.000 | 0.157 |
| 10.00 | -44.50 | -8.14 | 0.00 | -927.64 | 0.00 | 927.64 | 5394.71 | 1410.26 | 6737.68 | 6358.68 | 0.08 | -0.076 | 0.000 | 0.154 |
| 15.00 | -42.91 | -8.02 | 0.00 | -886.95 | 0.00 | 886.95 | 5335.97 | 1385.12 | 6499.64 | 6176.49 | 0.18 | -0.114 | 0.000 | 0.152 |
| 20.00 | -41.35 | -7.89 | 0.00 | -846.87 | 0.00 | 846.87 | 5275.87 | 1359.98 | 6265.87 | 5995.24 | 0.32 | -0.153 | 0.000 | 0.149 |
| 25.00 | -39.81 | -7.75 | 0.00 | -807.43 | 0.00 | 807.43 | 5214.41 | 1334.85 | 6036.38 | 5815.02 | 0.50 | -0.192 | 0.000 | 0.147 |
| 30.00 | -38.30 | -7.61 | 0.00 | -768.68 | 0.00 | 768.68 | 5151.59 | 1309.71 | 5811.17 | 5635.92 | 0.72 | -0.231 | 0.000 | 0.144 |
| 35.00 | -36.81 | -7.47 | 0.00 | -730.62 | 0.00 | 730.62 | 5087.42 | 1284.57 | 5590.25 | 5458.02 | 0.99 | -0.271 | 0.000 | 0.141 |
| 40.00 | -35.34 | -7.32 | 0.00 | -693.30 | 0.00 | 693.30 | 5021.88 | 1259.44 | 5373.61 | 5281.41 | 1.29 | -0.311 | 0.000 | 0.138 |
| 45.00 | -33.91 | -7.16 | 0.00 | -656.71 | 0.00 | 656.71 | 4954.99 | 1234.30 | 5161.25 | 5106.18 | 1.64 | -0.351 | 0.000 | 0.135 |
| 45.92 | -33.64 | -7.14 | 0.00 | -650.15 | 0.00 | 650.15 | 4942.58 | 1229.69 | 5122.78 | 5074.21 | 1.71 | -0.359 | 0.000 | 0.135 |
| 50.00 | -31.65 | -7.00 | 0.00 | -621.01 | 0.00 | 621.01 | 4886.75 | 1209.16 | 4953.16 | 4932.41 | 2.03 | -0.392 | 0.000 | 0.132 |
| 53.00 | -30.20 | -6.90 | 0.00 | -600.00 | 0.00 | 600.00 | 3967.43 | 1039.40 | 4274.84 | 4025.79 | 2.29 | -0.417 | 0.000 | 0.157 |
| 55.00 | -29.71 | -6.85 | 0.00 | -586.19 | 0.00 | 586.19 | 3947.58 | 1030.79 | 4204.32 | 3972.23 | 2.46 | -0.433 | 0.000 | 0.155 |
| 60.00 | -28.49 | -6.69 | 0.00 | -551.96 | 0.00 | 551.96 | 3897.00 | 1009.27 | 4030.59 | 3838.84 | 2.94 | -0.478 | 0.000 | 0.151 |
| 65.00 | -27.29 | -6.54 | 0.00 | -518.50 | 0.00 | 518.50 | 3845.06 | 987.75 | 3860.53 | 3706.29 | 3.47 | -0.524 | 0.000 | 0.147 |
| 70.00 | -26.11 | -6.38 | 0.00 | -485.82 | 0.00 | 485.82 | 3791.77 | 966.22 | 3694.13 | 3574.65 | 4.04 | -0.569 | 0.000 | 0.143 |
| 75.00 | -24.96 | -6.22 | 0.00 | -453.93 | 0.00 | 453.93 | 3737.12 | 944.70 | 3531.40 | 3444.02 | 4.66 | -0.614 | 0.000 | 0.139 |
| 80.00 | -23.82 | -6.06 | 0.00 | -422.83 | 0.00 | 422.83 | 3681.11 | 923.18 | 3372.34 | 3314.49 | 5.33 | -0.660 | 0.000 | 0.134 |
| 85.00 | -22.71 | -5.91 | 0.00 | -392.51 | 0.00 | 392.51 | 3623.74 | 901.66 | 3216.94 | 3186.13 | 6.04 | -0.705 | 0.000 | 0.130 |
| 90.00 | -21.61 | -5.74 | 0.00 | -362.99 | 0.00 | 362.99 | 3565.02 | 880.14 | 3065.20 | 3059.03 | 6.81 | -0.750 | 0.000 | 0.125 |
| 92.92 | -20.99 | -5.65 | 0.00 | -346.23 | 0.00 | 346.23 | 3530.13 | 867.59 | 2978.38 | 2985.51 | 7.27 | -0.776 | 0.000 | 0.122 |
| 95.00 | -20.24 | -5.58 | 0.00 | -334.46 | 0.00 | 334.46 | 3504.93 | 858.62 | 2917.13 | 2933.28 | 7.62 | -0.795 | 0.000 | 0.120 |
| 98.92 | -18.87 | -5.45 | 0.00 | -312.59 | 0.00 | 312.59 | 2742.07 | 714.64 | 2421.16 | 2291.78 | 8.28 | -0.830 | 0.000 | 0.143 |
| 100.00 | -18.67 | -5.42 | 0.00 | -306.68 | 0.00 | 306.68 | 2732.96 | 710.75 | 2394.86 | 2271.63 | 8.47 | -0.840 | 0.000 | 0.142 |
| 105.00 | -17.76 | -5.27 | 0.00 | -279.58 | 0.00 | 279.58 | 2690.08 | 692.79 | 2275.34 | 2179.04 | 9.38 | -0.889 | 0.000 | 0.135 |
| 110.00 | -16.87 | -5.11 | 0.00 | -253.25 | 0.00 | 253.25 | 2645.83 | 674.83 | 2158.87 | 2087.20 | 10.34 | -0.938 | 0.000 | 0.128 |
| 115.00 | -16.00 | -4.96 | 0.00 | -227.68 | 0.00 | 227.68 | 2600.23 | 656.86 | 2045.47 | 1996.19 | 11.34 | -0.985 | 0.000 | 0.120 |
| 120.00 | -15.14 | -4.81 | 0.00 | -202.88 | 0.00 | 202.88 | 2553.28 | 638.90 | 1935.12 | 1906.09 | 12.40 | -1.032 | 0.000 | 0.112 |
| 125.00 | -14.30 | -4.66 | 0.00 | -178.84 | 0.00 | 178.84 | 2504.96 | 620.94 | 1827.84 | 1816.99 | 13.51 | -1.076 | 0.000 | 0.104 |
| 127.08 | -13.96 | -4.59 | 0.00 | -169.17 | 0.00 | 169.17 | 2484.49 | 613.48 | 1784.18 | 1780.31 | 13.98 | -1.094 | 0.000 | 0.101 |
| 130.00 | -13.24 | -4.50 | 0.00 | -155.74 | 0.00 | 155.74 | 2455.29 | 602.97 | 1723.61 | 1728.99 | 14.66 | -1.119 | 0.000 | 0.096 |
| 132.33 | -12.67 | -4.43 | 0.00 | -145.27 | 0.00 | 145.27 | 1489.30 | 422.56 | 1209.83 | 1053.29 | 15.21 | -1.139 | 0.000 | 0.147 |
| 135.00 | -12.33 | -4.36 | 0.00 | -133.43 | 0.00 | 133.43 | 1477.63 | 415.84 | 1171.66 | 1028.31 | 15.85 | -1.160 | 0.000 | 0.138 |
| 140.00 | -11.70 | -4.21 | 0.00 | -111.65 | 0.00 | 111.65 | 1454.76 | 403.27 | 1101.91 | 981.60 | 17.09 | -1.211 | 0.000 | 0.122 |
| 145.00 | -11.09 | -4.07 | 0.00 | -90.58 | 0.00 | 90.58 | 1430.53 | 390.71 | 1034.29 | 934.97 | 18.39 | -1.257 | 0.000 | 0.105 |
| 150.00 | -10.49 | -3.94 | 0.00 | -70.21 | 0.00 | 70.21 | 1404.94 | 378.14 | 968.82 | 888.50 | 19.72 | -1.297 | 0.000 | 0.087 |
| 155.00 | -9.91 | -3.80 | 0.00 | -50.53 | 0.00 | 50.53 | 1377.99 | 365.57 | 905.49 | 842.29 | 21.10 | -1.330 | 0.000 | 0.067 |
| 157.00 | -7.26 | -2.90 | 0.00 | -42.93 | 0.00 | 42.93 | 1366.83 | 360.54 | 880.75 | 823.90 | 21.66 | -1.341 | 0.000 | 0.057 |
| 160.00 | -6.96 | -2.82 | 0.00 | -34.24 | 0.00 | 34.24 | 1349.68 | 353.00 | 844.29 | 796.42 | 22.51 | -1.356 | 0.000 | 0.048 |
| 165.00 | -6.46 | -2.69 | 0.00 | -20.15 | 0.00 | 20.15 | 1320.02 | 340.43 | 785.24 | 750.97 | 23.94 | -1.374 | 0.000 | 0.032 |
| 167.00 | -3.81 | -1.52 | 0.00 | -14.78 | 0.00 | 14.78 | 1307.77 | 335.40 | 762.22 | 732.93 | 24.52 | -1.379 | 0.000 | 0.023 |
| 170.00 | -3.56 | -1.45 | 0.00 | -10.21 | 0.00 | 10.21 | 1289.00 | 327.86 | 728.33 | 706.04 | 25.38 | -1.385 | 0.000 | 0.017 |
| 175.00 | -3.15 | -1.32 | 0.00 | -2.99 | 0.00 | 2.99 | 1256.62 | 315.30 | 673.56 | 661.70 | 26.84 | -1.391 | 0.000 | 0.007 |
| 177.00 | -0.23 | -0.09 | 0.00 | -0.31 | 0.00 | 0.31 | 1243.29 | 310.27 | 652.25 | 644.16 | 27.42 | -1.391 | 0.000 | 0.001 |
| 180.00 | 0.00 | -0.08 | 0.00 | -0.05 | 0.00 | 0.05 | 1222.88 | 302.73 | 620.93 | 618.05 | 28.30 | -1.392 | 0.000 | 0.000 |

# Final Analysis Summary

| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT02652-S-SBA | **Code:** | EIA/TIA-222-H | 7/16/2019 | |
| **Site Name:** | Colchester 3 CT | **Exposure:** | C | | |
| **Height:** | 180.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 43 | |

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 + 1.0W 122 mph Wind | 34.7 | 0.00 | 57.25 | 0.00 | 0.00 | 4207.20 |
| 0.9D + 1.0W 122 mph Wind | 34.7 | 0.00 | 42.93 | 0.00 | 0.00 | 4158.14 |
| 1.2D + 1.0Di + 1.0Wi 50 mph Wind | 9.1 | 0.00 | 73.53 | 0.00 | 0.00 | 1085.01 |
| 1.2D + 1.0Ev + 1.0Eh | 2.2 | 0.00 | 57.30 | 0.00 | 0.00 | 249.42 |
| 0.9D + 1.0Ev + 1.0Eh | 2.2 | 0.00 | 42.98 | 0.00 | 0.00 | 246.45 |
| 1.0D + 1.0W 60 mph Wind | 8.4 | 0.00 | 47.75 | 0.00 | 0.00 | 1010.86 |

## 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 + 1.0W 122 mph Wind | -57.25 | -34.68 | 0.00 | -4207.2 | 0.00 | -4207.2 | 5508.12 | 1460.5 | 7226.63 | 6725.55 | 0.00 | 0.637 |
| 0.9D + 1.0W 122 mph Wind | -42.93 | -34.66 | 0.00 | -4158.1 | 0.00 | -4158.1 | 5508.12 | 1460.5 | 7226.63 | 6725.55 | 0.00 | 0.627 |
| 1.2D + 1.0Di + 1.0Wi 50 mph Wind | -73.53 | -9.07 | 0.00 | -1085.0 | 0.00 | -1085.0 | 5508.12 | 1460.5 | 7226.63 | 6725.55 | 0.00 | 0.175 |
| 1.2D + 1.0Ev + 1.0Eh | -15.30 | -1.21 | 0.00 | -44.40 | 0.00 | -44.40 | 1489.30 | 422.56 | 1209.83 | 1053.29 | 132.33 | 0.052 |
| 0.9D + 1.0Ev + 1.0Eh | -11.47 | -1.19 | 0.00 | -43.67 | 0.00 | -43.67 | 1489.30 | 422.56 | 1209.83 | 1053.29 | 132.33 | 0.049 |
| 1.0D + 1.0W 60 mph Wind | -47.75 | -8.38 | 0.00 | -1010.8 | 0.00 | -1010.8 | 5508.12 | 1460.5 | 7226.63 | 6725.55 | 0.00 | 0.159 |

# Base Plate Summary

| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT02652-S-SB | **Code:** | EIA/TIA-222-H | 7/16/2019 | |
| **Site Name:** | Colchester 3 CT | **Exposure:** | C | | |
| **Height:** | 180.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 44 | |

Tower Engineering Solutions

## Reactions

### Original Design

| | |
|---|---|
| **Moment (kip-ft):** | 5045.00 |
| **Axial (kip):** | 56.10 |
| **Shear (kip):** | 39.50 |

### Analysis

| | |
|---|---|
| **Moment (kip-ft):** | 4207.20 |
| **Axial (kip):** | 73.53 |
| **Shear (kip):** | 34.68 |
| **Moment Design %:** | 83.39 |

## Base Plate

| | |
|---|---|
| **Yield (ksi):** | 60.00 |
| **Width (in):** | 74.62 |
| **Style:** | Polygon |
| **Polygon Sides:** | 16.00 |
| **Clip Length (in):** | 14.84 |
| **Effective Len (in):** | 13.35 |
| **Moment (kip-in):** | 650.05 |
| **Allow Stress (ksi):** | 81.00 |
| **Applied Stress (ksi):** | 0.00 |
| **Stress Ratio:** | 0.48 |

## Anchor Bolts

| | |
|---|---|
| **Bolt Circle:** | 68.62 |
| **Number Bolts:** | 20.00 |
| **Bolt Type:** | 2.25" 18J |
| **Bolt Diameter (in):** | 2.25 |
| **Yield (ksi):** | 75.00 |
| **Ultimate (ksi):** | 100.00 |
| **Arrangement:** | Radial |
| **Cluster Dist (in):** | 0.00 |
| **Start Angle (deg):** | 0.00 |

### Compression

| | |
|---|---|
| **Force (kip):** | 150.82 |
| **Allowable (kip):** | 243.75 |
| **Ratio:** | 0.62 |

### Tension

| | |
|---|---|
| **Force (kip):** | 143.47 |
| **Allowable (kip):** | 243.75 |
| **Ratio:** | 0.59 |

# Monopole Mat Foundation Design

| | | | |
|---|---|---|---|
| | | | Date: 7/16/2019 |
| **Customer Name:** | T-Mobile | **EIA/TIA Standard:** | EIA-222-H |
| **Site Name:** | | **Structure Height (Ft.):** | 180 |
| **Site Number:** | CT02652-S-SBA | **Engineer Name:** | D. Zhou |
| **Engr. Number:** | 77997 | **Engineer Login ID:** | |

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

**Structure Type:** Monopole

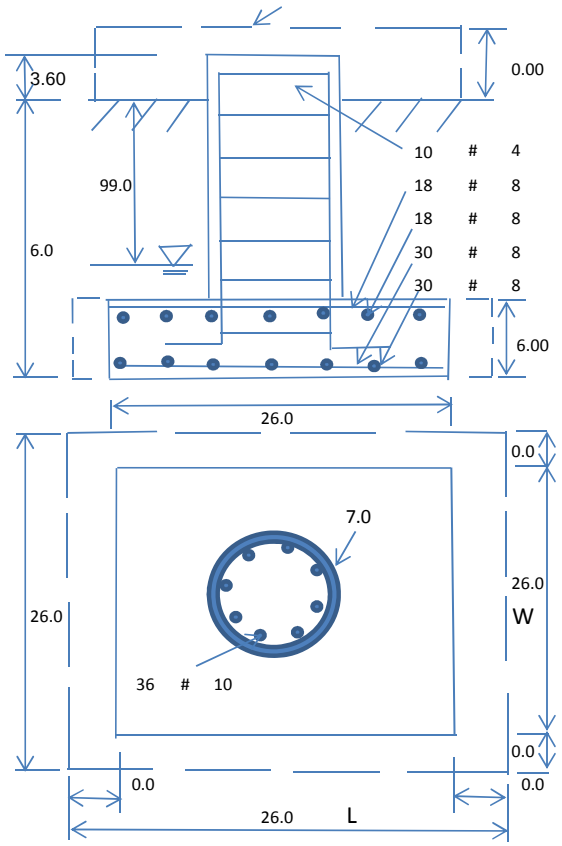
**Analysis or Design?** Analysis

**Base Reactions (Factored):**

| | | | |
|---|---|---|---|
| Axial Load (Kips): | 57.3 | Shear Force (Kips): | 34.7 |
| Uplift Force (Kips): | 0.0 | Moment (Kips-ft): | 4207.2 |
| Allowable overstress %: | 5.0% | | |

**Foundation Geometries:**

| | | | |
|---|---|---|---|
| | | Mods required -Yes/No ?: | No |
| Diameter of Pier (ft.): | 7.0 | Depth of Base BG (ft.): | 6.0 |
| Pier Height A. G. (ft.): | 3.60 | Thickness of Pad (ft): | 6.00 |
| Length of Pad (ft.): | 26 | Width of Pad (ft.): | 26 |
| Final Length of pad (ft) | 26.0 | Final width of pad (ft): | 26.0 |




**Material Properties and Reabr Info:**

| | | | | |
|---|---|---|---|---|
| Concrete Strength (psi): | 3000 | Steel Elastic Modulus: | 29000 | ksi |
| Vertical bar yield (ksi) | 60 | Tie steel yield (ksi): | 60 | |
| Vertical Rebar Size #: | 10 | 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): | 30 | Qty. of Rebar in Pad (W): | 30 | |
| Rebar at the top of the concrete pad: | | | | |
| Qty. of Rebar in Pad (L): | 18 | Qty. of Rebar in Pad (W): | 18 | |
| Apply 1.35 factor for e/w Per G: | 1.35 | | | |

**Soil Design Parameters:**

| | | | | | | |
|---|---|---|---|---|---|---|
| Soil Unit Weight (pcf): | 130.0 | Soil Buoyant Weight: | 50.0 | Pcf | | |
| Water Table B.G.S. (ft): | 99.0 | Unit Weight of Water: | 62.4 | pcf | Angle from Top of Pad: | 38 |
| Ultimate Bearing Pressure (psf): | 15000 | Ultimate Skin Friction: | 1200 | Psf | Angle from Bottm of Pad: | 40 |
| Consider Friction for O.T.M. (Y/N): | No | Consider Friction for bearing (Y/N): | No | | Angle from Bottm of Pad: | 25 |
| Consider soil hor. resist. for OTM.: | No | Reduction factor on the maximum soil bearing pressure: | | | 1.00 | |

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

| | | | |
|---|---|---|---|
| Total Dry Soil Volume (cu. Ft.): | 0.00 | Total Dry Soil Weight (Kips): | 0.00 |
| Total Buoyant Soil Volume (cu. Ft.): | 0.00 | Total Buoyant Soil Weight (Kips): | 0.00 |
| Total Effective Soil Weight (Kips): | 0.00 | Weight from the Concrete Block at Top (K): | 0.00 |
| Total Dry Concrete Volume (cu. Ft.): | 4194.54 | Total Dry Concrete Weight (Kips): | 629.18 |
| Total Buoyant Concrete Volume (cu. Ft.): | 0.00 | Total Buoyant Concrete Weight (Kips): | 0.00 |
| Total Effective Concrete Weight (Kips): | 629.18 | Total Vertical Load on Base (Kips): | 686.43 |

**Check Soil Capacities:**

| | | | | | Load/ Capacity Ratio | |
|---|---|---|---|---|---|---|
| Calculated Maxium Net Soil Pressure under the base (psf): | 2825 | < | Allowable Factored Soil Bearing (psf): | 11250 | 0.25 | OK! |
| Allowable Foundation Overturning Resistance (kips-ft.): | 8105.7 | > | Design Factored Momont (kips-ft): | 4540 | 0.56 | OK! |
| Factor of Safety Against Overturning (O. R. Moment/Design Moment): | 1.79 | OK! | | | | |

**Check the capacities of Reinforceing Concrete:**

| | | | | | | |
|---|---|---|---|---|---|---|
| Strength reduction factor (Flexure and axial tension): | 0.90 | Strength reduction factor (Shear): | 0.75 | | | |
| Strength reduction factor (Axial compresion): | 0.65 | Wind Load Factor on Concrete Design: | 1.00 | | | |
| | | | | | Load/ Capacity Ratio | |
| (1) Concrete Pier: | | | | | | |
| Vertical Steel Rebar Area (sq. in./each): | 1.27 | | Tie / Stirrup Area (sq. in./each): | 0.20 | | |
| Calculated Moment Capacity (Mn,Kips-Ft): | 7405.8 | > | Design Factored Moment (Mu, Kips-F | 4332.1 | 0.58 | OK! |
| Calculated Shear Capacity (Kips): | 589.7 | > | Design Factored Shear (Kips): | 34.7 | 0.06 | OK! |
| Calculated Tension Capacity (Tn, Kips): | 2468.9 | > | Design Factored Tension (Tu Kips): | 0.0 | 0.00 | OK! |
| Calculated Compression Capacity (Pn, Kips): | 7287.8 | > | Design Factored Axial Load (Pu Kips): | 57.3 | 0.01 | OK! |
| Moment & Axial Strength Combination: | 0.58 | OK! | Check Tie Spacing (Design/Required): | | 1 | OK! |
| Pier Reinforcement Ratio: | 0.008 | | Reinforcement Ratio is satisfied per ACI | | | |
| (2).Concrete Pad: | | | | | | |
| One-Way Design Shear Capacity (L-Direction, Kips): | 1755.9 | > | One-Way Factored Shear (L-D. Kips): | 179.6 | 0.10 | OK! |
| One-Way Design Shear Capacity (W-Direction, Kips): | 1755.9 | > | One-Way Factored Shear (W-D., Kips) | 179.6 | 0.10 | OK! |
| One-Way Design Shear Capacity (Corner-Corner. Kips): | 1239.4 | > | One-Way Factored Shear (C-C, Kips): | 174.5 | 0.14 | OK! |
| Lower Steel Pad Reinforcement Ratio (L-Direct. ): | 0.0011 | OK! | Lower Steel Pad Reinf. Ratio (W-Direc | 0.0011 | | |
| Lower Steel Pad Moment Capacity (L-Direction. Kips-ft): | 7210.2 | > | Moment at Bottom ( L-Dir. K-Ft): | 1602.7 | 0.22 | OK! |
| Lower Steel Pad Moment Capacity (W-Direction. Kips-ft): | 7210.2 | > | Moment at Bottom ( W-Dir. K-Ft): | 1602.7 | 0.22 | OK! |
| Lower Steel Pad Moment Capacity (Corner-Corner,K-ft): | 10165.1 | > | Moment at Bottom ( C-C Dir. K-Ft): | 2266.5 | 0.22 | OK! |
| Upper Steel Pad Reinforcement Ratio (L-Direct. ): | 0.0007 | OK! | Upper Steel Reinf. Ratio (W-Dir. ): | 0.0007 | | |
| Upper Steel Pad Moment Capacity (L-Direc. Kips-ft): | 4349.0 | > | Moment at the top (L-Dir K-Ft): | 709.8 | 0.16 | OK! |
| Upper Steel Pad Moment Capacity (W-Direc. Kips-ft): | 4349.0 | > | Moment at the top (W-Dir K-Ft): | 709.8 | 0.16 | OK! |
| Upper Steel Pad Moment Capacity (Corner-Corner. K-ft): | 6139.0 | > | Moment at the top (C-C Dir. K-Ft): | 665.0 | 0.11 | OK! |
| (3).Check Punching Shear Capacity due to Moment in the Pier: | | | | | | |
| Moment transferred by punching shear: | 1682.9 | k-ft. | Max. factored shear stress $v_{u\_CD}$: | | 2.5 | Psi |
| Max. factored shear stress $v_{u\_AB}$: | 4.9 | Psi | Factored shear Strength $\phi v_n$: | | 164.3 | Psi |
| Max. factored shear stress $v_u$: | 4.9 | Psi | Check Usage of Punching Shear Capacity: | | 0.03 | OK! |

# EXHIBIT 8

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

# Antenna Mount Analysis Report

**Existing 180-Ft Monopole Tower**
**Customer Name: SBA Communications Corp**
**Customer Site Number: CT02652-S-SBA / Colchester 3 CT**
**Customer Site Name: Colchester 3 CT**
**Carrier Name: T-Mobile (App#: 116752, V1)**
**Carrier Site ID / Name: CT11472A / Colchester**
**Site Location: 29 Mahoney Road**
**Colchester, Connecticut**
**New London County**
**Latitude: 41.564533**
**Longitude: -72.251697**

**Analysis Result:**

**Max Structural Usage: 59.4% [Pass]**

**Report Prepared By: Ishwor Dhakal**


8/6/19

## Introduction

The purpose of this report is to summarize the analysis results on the (1) Low profile platform at 177.00' 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 Full Metal Tower Services, dated 4/29/2019. |
| Antenna Loading | SBA, Application #: 116752, v1. |
| Modification Drawings | N/A. |

## Analysis Criteria

Wind Speed Used in the Analysis: 122 mph (3-Sec. Gust) (Ultimate Wind Speed)
Wind Speed with Ice: 50 mph (3-Sec. Gust) with 1" radial ice concurrent
Service Load Wind Speed: 60 mph +0" Radial ice
Standard/Codes: 2018 IBC ANSI/TIA 222-H/ 2015 IBC / 2018 CSBC
Exposure Category: C
Risk Category: II
Topographic Category: 1
Crest Height (Ft): 0
Ground Elevation Factor: 0.987

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) Low profile platform at 177.00' elevation.

## Final Antenna Configuration

| | |
|---|---|
| 9 | EMS RR90-17-02DP |
| 3 | RFS APXVAARR18_43-U-NA20 |
| 3 | Ericsson KRY 112 489/2 |
| 3 | Ericsson KRY 112 144/2 |
| 3 | Ericsson Radio 4449 |
| 3 | Kathrein Scala 782 11056 |

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

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

## Analysis Results

Our calculations have determined that under design wind load the existing mounts will be structurally adequate/inadequate to support the proposed antenna configuration. The maximum structural usage is 59.4%, which occurs in the end connection member. The proposed equipment must be installed as stipulated in the Final Antenna Configuration section of this report. The analysis results are void if the proposed equipment is not installed in accordance with this report.

## Attachments

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

# Standard Conditions

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

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

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

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

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

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

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

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

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


04.29.2019 10:43


04.29.2019 11:03

# Structure: CT02652-S-SBA - Colchester 3 CT

**Sector:** **A**

**Structure Type:** Monopole

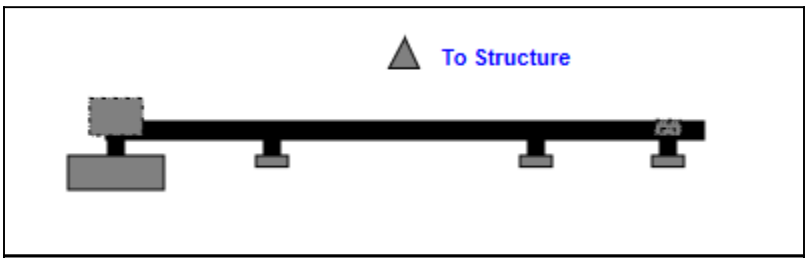
**Mount Elev:** 177.00

8/6/2019



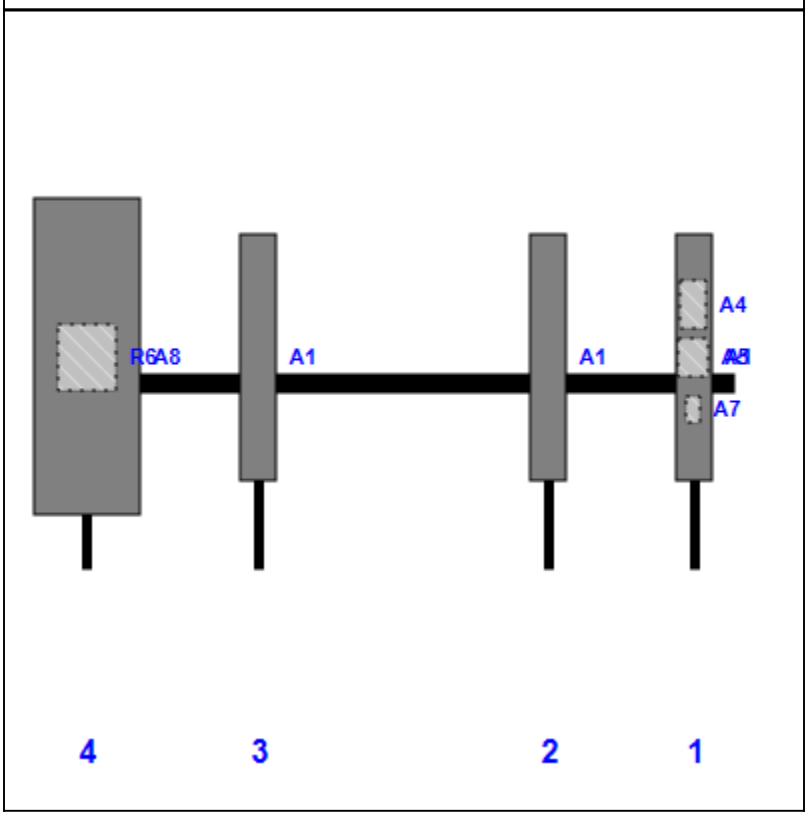
Tower Engineering Solutions

## Plan View



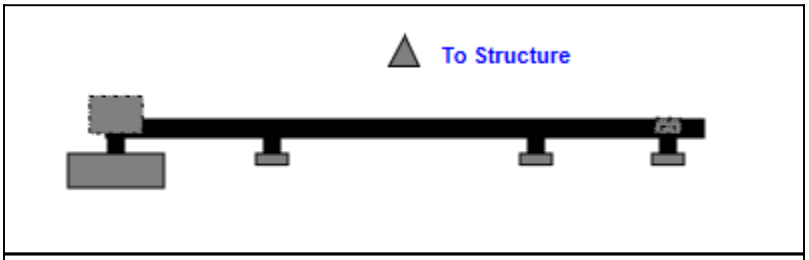

## Front View

**Looking Toward Structure**



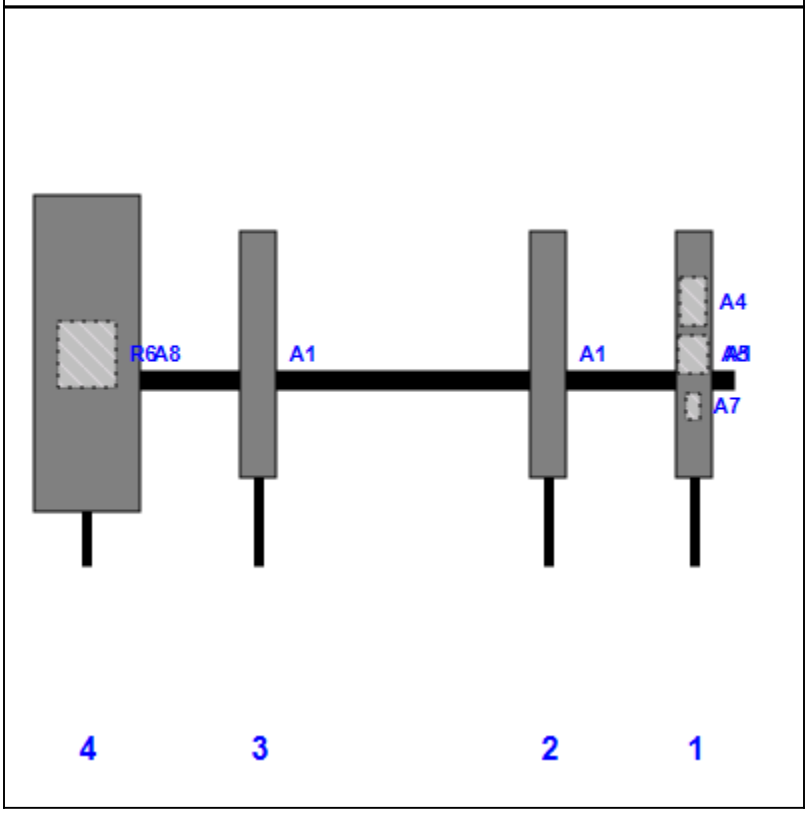

| Ref # | Model | Height (in) | Width (in) | H Dist From Left | Pipe # | Pipe Pos V | Antenna Pos | Center Ant From Top | Antenna H Offset |
|---|---|---|---|---|---|---|---|---|---|
| A1 | RR90-17-02DP | 56.00 | 8.00 | 141.00 | 1 | a | Front | 24.00 | 0.00 |
| A4 | KRY 112 489/2 | 11.00 | 6.10 | 141.00 | 1 | a | Behind | 12.00 | 0.00 |
| A5 | KRY 112 144/2 | 8.60 | 6.60 | 141.00 | 1 | a | Behind | 24.00 | 0.00 |
| A7 | 782 11056 | 5.50 | 3.20 | 141.00 | 1 | a | Behind | 36.00 | 0.00 |
| A1 | RR90-17-02DP | 56.00 | 8.00 | 108.00 | 2 | a | Front | 24.00 | 0.00 |
| A1 | RR90-17-02DP | 56.00 | 8.00 | 42.00 | 3 | a | Front | 24.00 | 0.00 |
| A8 | APXVAARR18_43-U-NA20 | 72.00 | 24.00 | 3.00 | 4 | a | Front | 24.00 | 0.00 |
| R6 | Radio 4449 | 15.00 | 13.20 | 3.00 | 4 | a | Behind | 24.00 | 0.00 |

### Plan View




### Front View

**Looking Toward Structure**




| Ref # | Model | Height (in) | Width (in) | H Dist From Left | Pipe # | Pipe Pos V | Antenna Pos | Center Ant From Top | Antenna H Offset |
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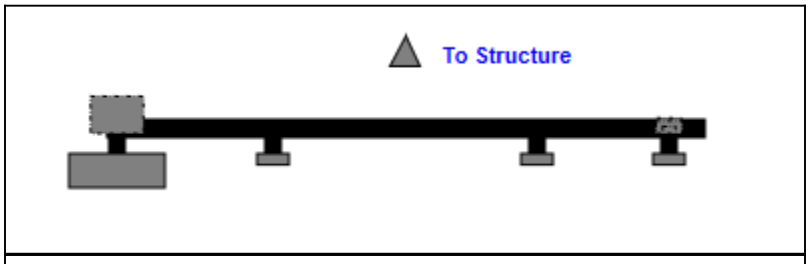
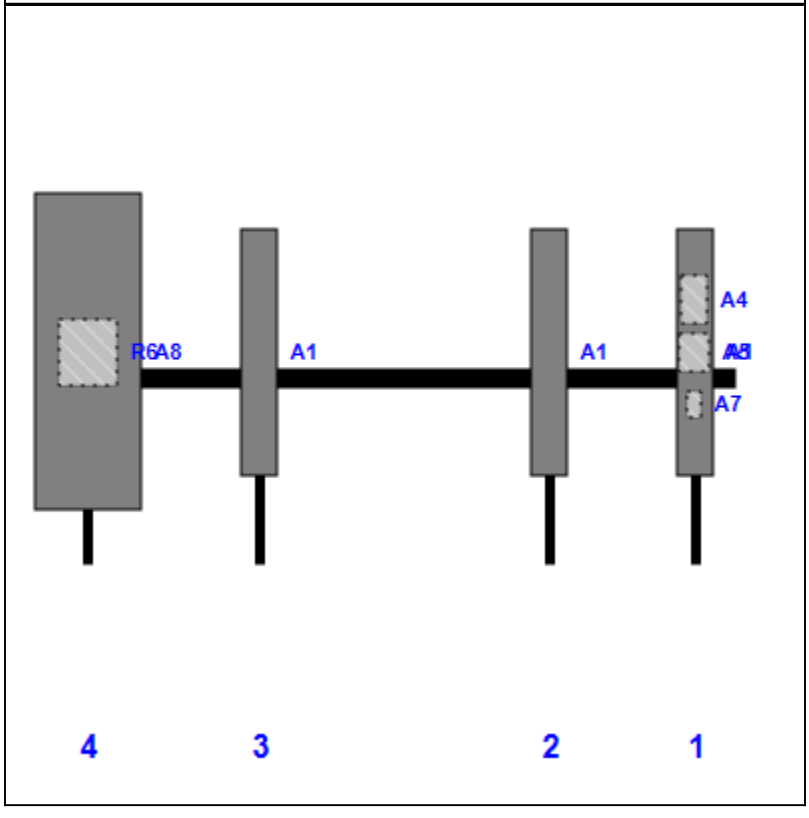
| A1 | RR90-17-02DP | 56.00 | 8.00 | 42.00 | 3 | a | Front | 24.00 | 0.00 |
| A8 | APXVAARR18_43-U-NA20 | 72.00 | 24.00 | 3.00 | 4 | a | Front | 24.00 | 0.00 |
| R6 | Radio 4449 | 15.00 | 13.20 | 3.00 | 4 | a | Behind | 24.00 | 0.00 |

## Plan View




## Front View

**Looking Toward Structure**



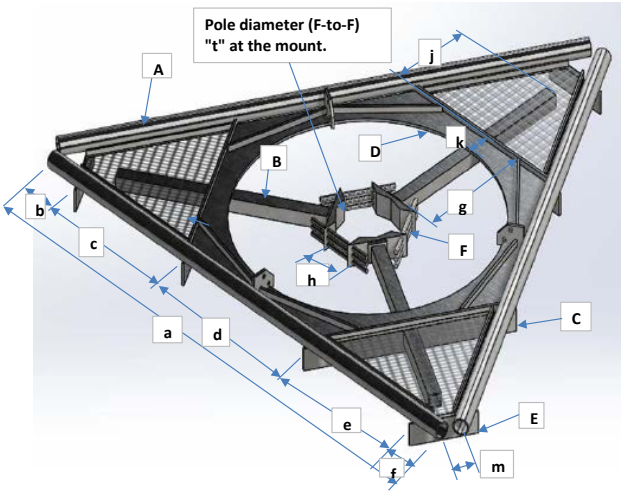

| Ref # | Model | Height (in) | Width (in) | H Dist From Left | Pipe # | Pipe Pos V | Antenna Pos | Center Ant From Top | Antenna H Offset |
|---|---|---|---|---|---|---|---|---|---|
| A1 | RR90-17-02DP | 56.00 | 8.00 | 141.00 | 1 | a | Front | 24.00 | 0.00 |
| A4 | KRY 112 489/2 | 11.00 | 6.10 | 141.00 | 1 | a | Behind | 12.00 | 0.00 |
| A5 | KRY 112 144/2 | 8.60 | 6.60 | 141.00 | 1 | a | Behind | 24.00 | 0.00 |
| A7 | 782 11056 | 5.50 | 3.20 | 141.00 | 1 | a | Behind | 36.00 | 0.00 |
| A1 | RR90-17-02DP | 56.00 | 8.00 | 108.00 | 2 | a | Front | 24.00 | 0.00 |
| A1 | RR90-17-02DP | 56.00 | 8.00 | 42.00 | 3 | a | Front | 24.00 | 0.00 |
| A8 | APXVAARR18_43-U-NA20 | 72.00 | 24.00 | 3.00 | 4 | a | Front | 24.00 | 0.00 |
| R6 | Radio 4449 | 15.00 | 13.20 | 3.00 | 4 | a | Behind | 24.00 | 0.00 |

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

FCC # 1228267

| | | | |
|---|---|---|---|
| **Tower Owner:** | SBA Communications | **Mapping Date:** | 4/29/19 |
| **Site Name:** | Colchester 3 CT | **Structure Type:** | Monopole |
| **Site Number or ID:** | CT02652-S-SBA | **Structure Height (Ft.):** | 180 |
| **Mapping Contractor:** | Full Metal Tower Services | **Mount Height (Ft.):** | 178.3 |






| Geometries (Unit: inches) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **a** | 150 | **e** | 35 | **j** | 15 | **o** | N/A | **s** | N/A |
| **b** | 15 | **f** | 15 | **k** | 7 | **p** | N/A | **t** | 26 |
| **c** | 35 | **g** | 33 | **m** | 12 | **q** | N/A | **u *** | 30 |
| **d** | 50 | **h** | 29 | **n** | N/A | **r** | N/A | **v *** | 72 |

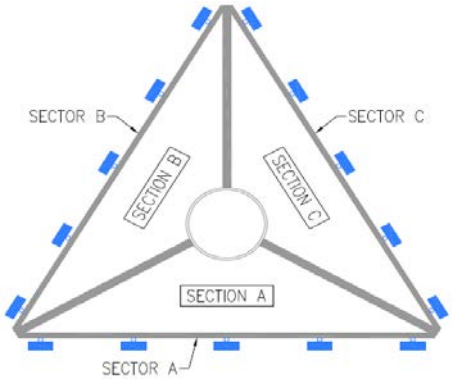
**Members/Bolts (Unit: inches)** *** - See Ant. Layout for "u", "v" and member "K" (pipe)**

| Items | Member | Lx (O.D.) | Ly (I.D.) | T | Items | Member | Lx (O.D.) | Ly (I.D.) | T |
|---|---|---|---|---|---|---|---|---|---|
| **A** | 3.5 OD x 0.216 Pipe | 3.5 | 3.068 | 0.216 | **F** | 5/8" Bolt | | 29 | |
| **B** | Tubing 4x4x1/4 | 4 | 4 | 0.25 | **G** | | | | |
| **C** | 3/8" Thick. Plate | 0 | 0 | 0.375 | **H** | | | | |
| **D** | 1/4" Thick. Plate | 0 | 0 | 0.25 | **J** | | | | |
| **E** | 3/8" Thick. Plate | 0 | 0 | 0.375 | **K* (pipe)** | 2.375 OD x 0.154 Pipe | 2.375 | 2.067 | 0.154 |

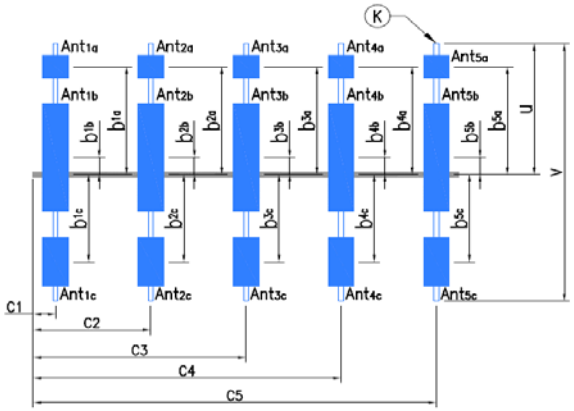
| | |
|---|---|
| Distance from top of main platform member to lowest tip of ant./eqpt. of Carrier above. (N/A if > 10 ft.) | N/A |
| Distance from top of main platform member to highest tip of ant./eqpt. of Carrier below. (N/A if > 10 ft.) | 3 |

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

(3) TMAs (6"x4"x12") Mounted to member A behind Antenn Pos2




**Climbing ladder is Located at Section A, at 90° Degree Azimuth**



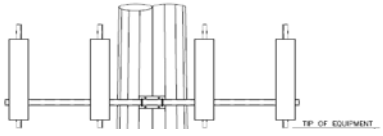

**Antenna Layout**

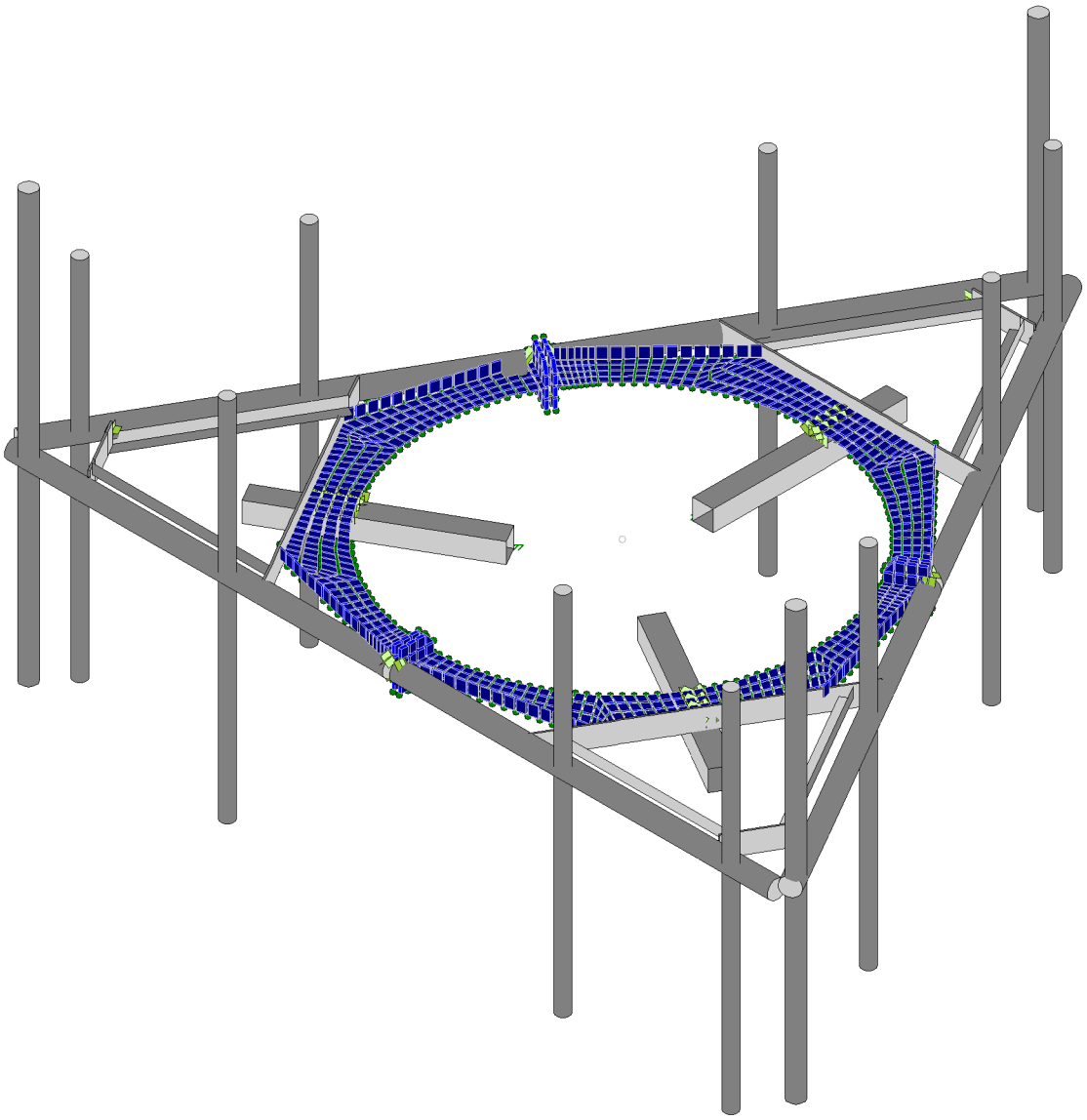
| Ants. Items | Enter antenna model. If not labled, enter "Unknown". If no antenna at specified location, enter "N/A". If antennas and the locations are the same on all three sectors, only enter one sector. | | | | | Mounting Locations (Unit: inches) | | | Photos of antennas |
|---|---|---|---|---|---|---|---|---|---|
| | Antenna Models if Known | Width (in.) | Depth (in.) | Height (in.) | Coax Size and Qty | Vertical Distances"$b_{1a}$, $b_{2a}$, $b_{3a}$, $b_{1b}$...." (In.) | Horiz. offset (Use "-" if Ant. is inside) | Horiz. offset "$C_1$, $C_2$, $C_3$, $C_4$, $C_5$" (in.) | Photo Numbers |
| **Sector A** | | | | | | | | | |
| $Ant_{1a}$ | | | | | | | | | |
| $Ant_{1b}$ | Antenna A | 8.5 | 3 | 56 | 1/2" (2) | +4" | 6 | 9 | |
| $Ant_{1c}$ | TMA A | 6 | 4 | 12 | 1/2" (2) | +12" | N/A | 9 | |
| $Ant_{2a}$ | | | | | | | | | |
| $Ant_{2b}$ | Antenna B | 12 | 7.5 | 96.5 | 1/2" (2) | +10" | 7 | 147 | |
| $Ant_{2c}$ | | | | | | | | | |
| $Ant_{3a}$ | | | | | | | | | |
| $Ant_{3b}$ | | | | | | | | | |
| $Ant_{3c}$ | | | | | | | | | |
| $Ant_{4a}$ | | | | | | | | | |
| $Ant_{4b}$ | | | | | | | | | |
| $Ant_{4c}$ | | | | | | | | | |
| $Ant_{5a}$ | | | | | | | | | |
| $Ant_{5b}$ | | | | | | | | | |
| $Ant_{5c}$ | | | | | | | | | |
| Are Ant same as sector A? | Yes | **Antennas on Sector B are the same as Sector A** | | | | | | | |

**Azimuth (Degree) of Each Sector and Climbing Information**

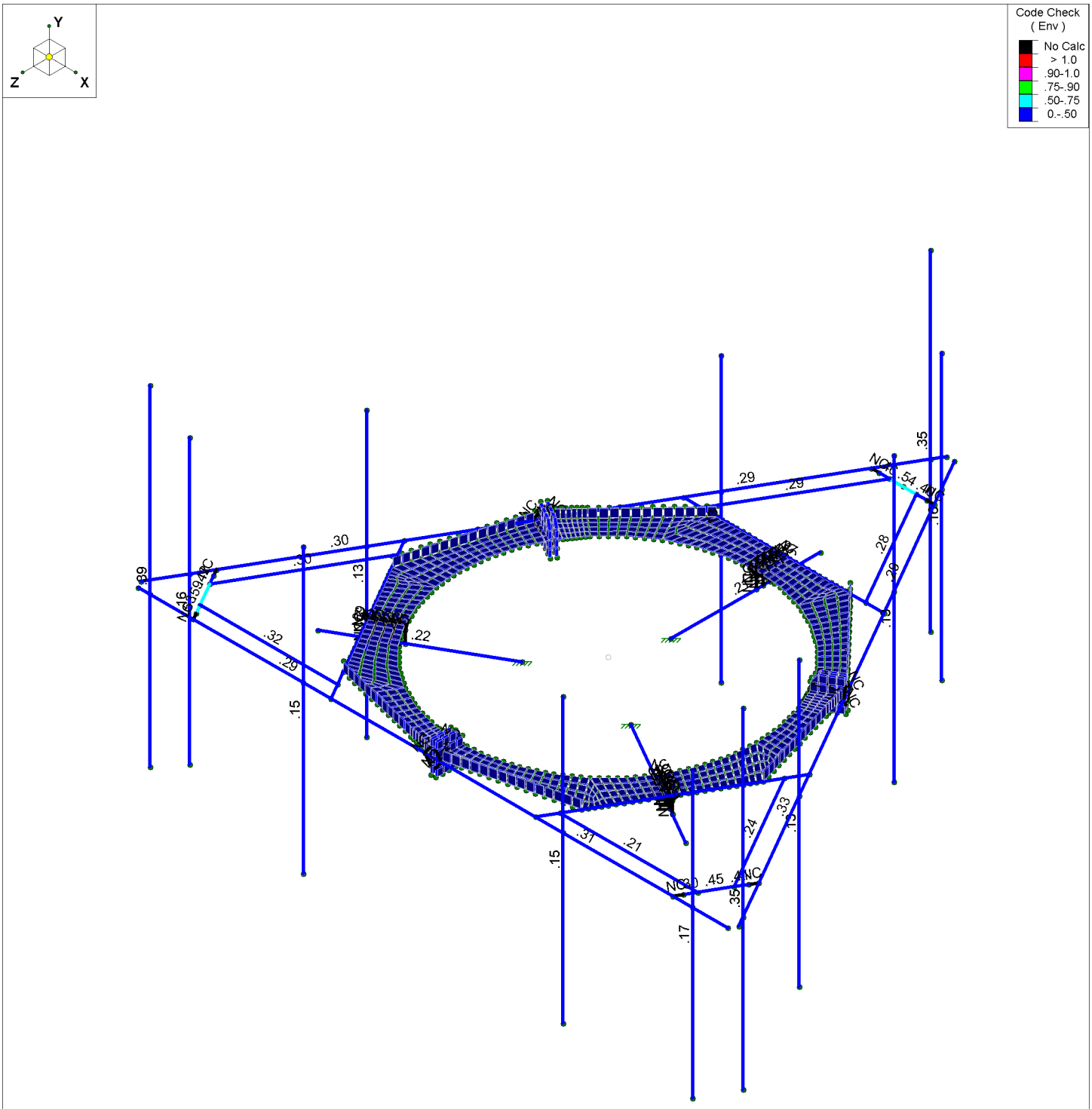
| | | | |
|---|---|---|---|
| Sector A: | 60° | Deg | |
| Sector B: | 180° | Deg | |
| Sector C: | 310° | Deg | |
| Climbing | 90° | Deg | Located at Section A |
| Climbing Facility | Corrosion Type: | | No corrosion observed |
| | Access: | | Climbing path was unobstructed. |
| | Condition: | | N/A |

| | | |
|---|---|---|
| Are Ant same as sector A/B? | Same As A | **Antennas on Sector C are the same as Sector A** |



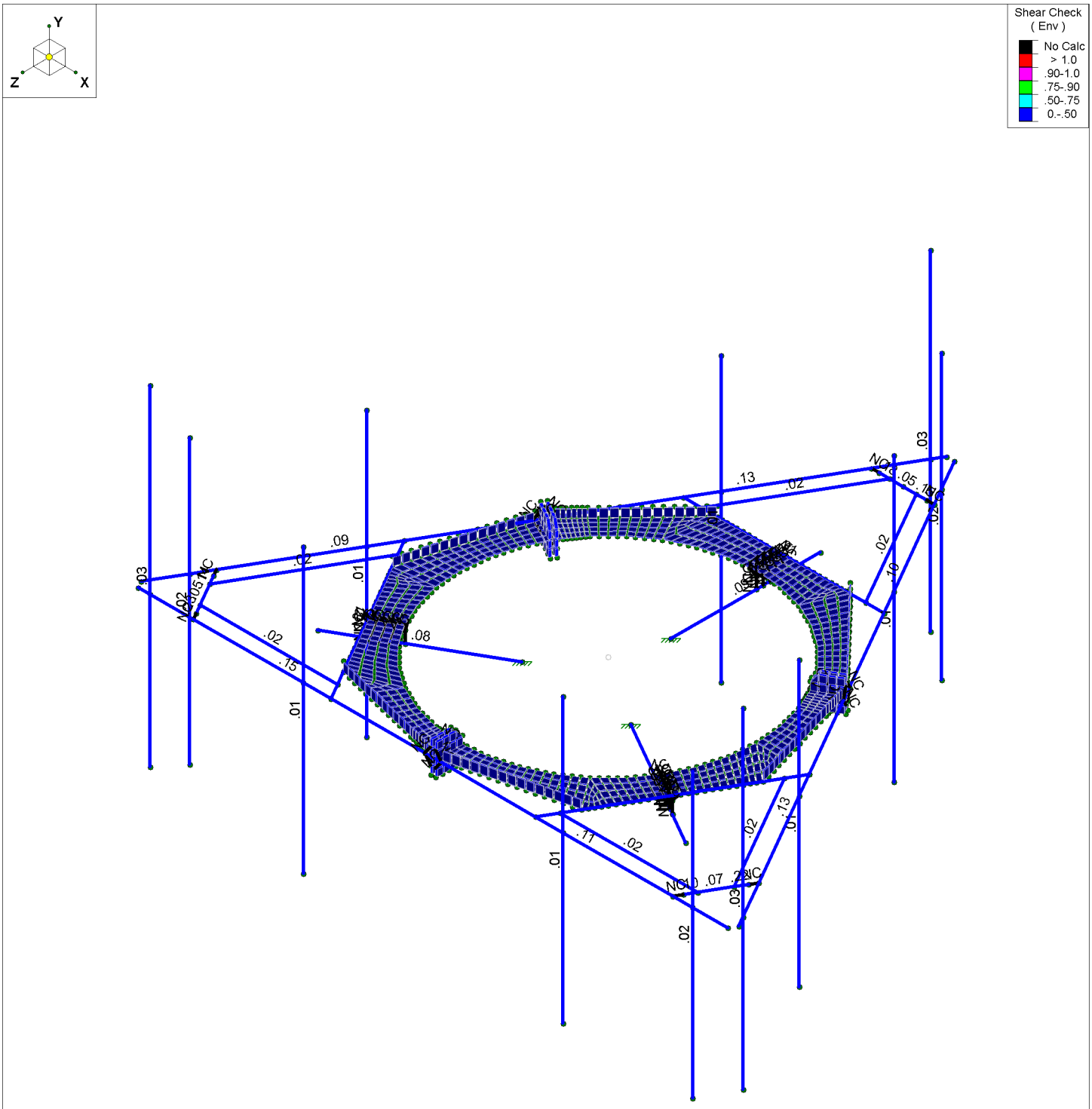



| | | |
|---|---|---|
| Tower Engineering Solutio... | CT02652-S-SBA_MT_LO_Loads Only_H | SK - 1 |
| | | Aug 6, 2019 at 2:44 PM |
| TES Project No. 77893 | | CT02652-S-SBA_77893_H_RISA_L... |




Member Code Checks Displayed (Enveloped)
Results for LC 1, 1.2D+1.0W (Front)

| | | |
|---|---|---|
| Tower Engineering Solutio... | CT02652-S-SBA_MT_LO_Loads Only_H | SK - 2 |
| | | Aug 6, 2019 at 2:45 PM |
| TES Project No. 77893 | | CT02652-S-SBA_77893_H_RISA_L... |




Member Shear Checks Displayed (Enveloped)
Results for LC 1, 1.2D+1.0W (Front)

| | | |
|---|---|---|
| Tower Engineering Solutio... | CT02652-S-SBA_MT_LO_Loads Only_H | SK - 3 |
| | | Aug 6, 2019 at 2:45 PM |
| TES Project No. 77893 | | CT02652-S-SBA_77893_H_RISA_L... |

## Basic Load Cases

| | BLC Description | Category | X Gravity | Y Gravity | Z Gravity | Joint | Point | Distributed | Area(Me... | Surface(P... |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Antenna D | None | | | | | 36 | | | |
| 2 | Antenna Di | None | | | | | 36 | | | |
| 3 | Antenna W Front | None | | | | | 36 | | | |
| 4 | Antenna Wi Front | None | | | | | 36 | | | |
| 5 | Antenna W Side | None | | | | | 36 | | | |
| 6 | Antenna Wi Side | None | | | | | 36 | | | |
| 7 | Service Lm1 | None | | | | | 1 | | | |
| 8 | Service Lm2 | None | | | | | 1 | | | |
| 9 | Structure D | None | | -1 | | | | | 3 | |
| 10 | Structure Di | None | | | | | | 39 | 3 | |
| 11 | Structure W Front | None | | | | | | 39 | | |
| 12 | Structure Wi Front | None | | | | | | 39 | | |
| 13 | Structure W Side | None | | | | | | 39 | | |
| 14 | Structure Wi Side | None | | | | | | 39 | | |
| 15 | Antenna Wm Front | None | | | | | 36 | | | |
| 16 | Antenna Wm Side | None | | | | | 36 | | | |
| 17 | Structure Wm Front | None | | | | | | 39 | | |
| 18 | Structure Wm Side | None | | | | | | 39 | | |
| 19 | Service Lv1 | None | | | | | 1 | | | |
| 20 | Service Lv2 | None | | | | | 1 | | | |
| 21 | BLC 9 Transient Area... | None | | | | | | 36 | | |
| 22 | BLC 10 Transient Are... | None | | | | | | 36 | | |

## 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+1.0W (Front) | Yes | Y | | 1 | 1.2 | 9 | 1.2 | 3 | 1 | 11 | 1 | | | | | | | | | | | | |
| 2 | 1.2D+1.0W (Back) | Yes | Y | | 1 | 1.2 | 9 | 1.2 | 3 | -1 | 11 | -1 | | | | | | | | | | | | |
| 3 | 1.2D+1.0W (Left) | Yes | Y | | 1 | 1.2 | 9 | 1.2 | 5 | 1 | 13 | 1 | | | | | | | | | | | | |
| 4 | 1.2D+1.0W (Right) | Yes | Y | | 1 | 1.2 | 9 | 1.2 | 5 | -1 | 13 | -1 | | | | | | | | | | | | |
| 5 | 1.2D+1.0Di+1.0Wi (... | Yes | Y | | 1 | 1.2 | 9 | 1.2 | 2 | 1 | 10 | 1 | 4 | 1 | 12 | 1 | | | | | | | | |
| 6 | 1.2D+1.0Di+1.0Wi (... | Yes | Y | | 1 | 1.2 | 9 | 1.2 | 2 | 1 | 10 | 1 | 4 | -1 | 12 | -1 | | | | | | | | |
| 7 | 1.2D+1.0Di+1.0Wi (... | Yes | Y | | 1 | 1.2 | 9 | 1.2 | 2 | 1 | 10 | 1 | 6 | 1 | 14 | 1 | | | | | | | | |
| 8 | 1.2D+1.0Di+1.0Wi (... | Yes | Y | | 1 | 1.2 | 9 | 1.2 | 2 | 1 | 10 | 1 | 6 | -1 | 14 | -1 | | | | | | | | |
| 9 | 1.2D+1.5Lm1+1.0... | Yes | Y | | 1 | 1.2 | 9 | 1.2 | 7 | 1.5 | 15 | 1 | 17 | 1 | | | | | | | | | | |
| 10 | 1.2D+1.5LmL2+1.0... | Yes | Y | | 1 | 1.2 | 9 | 1.2 | 8 | 1.5 | 15 | 1 | 17 | 1 | | | | | | | | | | |
| 11 | 1.2D+1.5Lv1 (Maint... | Yes | Y | | 1 | 1.2 | 9 | 1.2 | 19 | 1.5 | | | | | | | | | | | | | | |
| 12 | 1.2D+1.5Lv2 (Maint... | Yes | Y | | 1 | 1.2 | 9 | 1.2 | 20 | 1.5 | | | | | | | | | | | | | | |
| 13 | 1.4D | Yes | Y | | 1 | 1.4 | 9 | 1.4 | | | | | | | | | | | | | | | | |

## Joint Coordinates and Temperatures

| | Label | X [ft] | Y [ft] | Z [ft] | Temp [F] | Detach From Diap... |
|---|---|---|---|---|---|---|
| 1 | N1 | -6.25 | 0 | 3.704857 | 0 | |
| 2 | N2 | 6.25 | 0 | 3.704857 | 0 | |
| 3 | CG | 0 | 0 | 0 | 0 | |
| 4 | N4 | -5.083 | 0 | 3.704857 | 0 | |

## Joint Coordinates and Temperatures (Continued)

| | Label | X [ft] | Y [ft] | Z [ft] | Temp [F] | Detach From Diap... |
|---|---|---|---|---|---|---|
| 5 | N5 | -2.167 | 0 | 3.704857 | 0 | |
| 6 | N6 | 2.167 | 0 | 3.704857 | 0 | |
| 7 | N7 | 5.083 | 0 | 3.704857 | 0 | |
| 8 | N8 | 6.3335 | 0 | 3.56023 | 0 | |
| 9 | N9 | 0.0835 | 0 | -7.265087 | 0 | |
| 10 | N11 | 5.75 | 0 | 2.549579 | 0 | |
| 11 | N12 | 4.292 | 0 | 0.024249 | 0 | |
| 12 | N13 | 2.125 | 0 | -3.729106 | 0 | |
| 13 | N14 | 0.667 | 0 | -6.254436 | 0 | |
| 14 | N15 | -0.0835 | 0 | -7.265087 | 0 | |
| 15 | N16 | -6.3335 | 0 | 3.56023 | 0 | |
| 16 | N18 | -0.667 | 0 | -6.254436 | 0 | |
| 17 | N19 | -2.125 | 0 | -3.729106 | 0 | |
| 18 | N20 | -4.292 | 0 | 0.024249 | 0 | |
| 19 | N21 | -5.75 | 0 | 2.549579 | 0 | |
| 20 | N22 | -5.275258 | 0 | 3.371857 | 0 | |
| 21 | N23 | -2.359258 | 0 | 3.371857 | 0 | |
| 22 | N24 | 5.275258 | 0 | 3.371857 | 0 | |
| 23 | N25 | 2.359258 | 0 | 3.371857 | 0 | |
| 24 | N25A | 5.557743 | 0 | 2.882579 | 0 | |
| 25 | N26 | 4.099743 | 0 | 0.357249 | 0 | |
| 26 | N27 | 0.282485 | 0 | -6.254436 | 0 | |
| 27 | N28 | 1.740485 | 0 | -3.729106 | 0 | |
| 28 | N30 | -0.282485 | 0 | -6.254436 | 0 | |
| 29 | N31 | -1.740485 | 0 | -3.729106 | 0 | |
| 30 | N32 | -5.557743 | 0 | 2.882579 | 0 | |
| 31 | N33 | -4.099743 | 0 | 0.357249 | 0 | |
| 32 | N34 | -0.052083 | 0 | 3.704857 | 0 | |
| 33 | N86 | 0 | -.333 | -1.333333 | 0 | |
| 34 | N89 | -2.525758 | 0 | 3.083471 | 0 | |
| 35 | N93 | 2.525758 | 0 | 3.083471 | 0 | |
| 36 | N92A | -5e-14 | 0 | -3.729106 | 0 | |
| 37 | N93A | -2e-14 | 0 | -3.146106 | 0 | |
| 38 | N117 | -2.724607 | 0 | 1.573053 | 0 | |
| 39 | N119 | -2.410057 | 0 | 2.022278 | 0 | |
| 40 | N121 | -2.022278 | 0 | 2.410057 | 0 | |
| 41 | N123 | -1.573053 | 0 | 2.724607 | 0 | |
| 42 | N125 | -1.076031 | 0 | 2.956372 | 0 | |
| 43 | N127 | -0.546315 | 0 | 3.098309 | 0 | |
| 44 | N129 | -0.052083 | 0 | 3.146106 | 0 | |
| 45 | N131 | 0.546315 | 0 | 3.098309 | 0 | |
| 46 | N133 | 1.076031 | 0 | 2.956372 | 0 | |
| 47 | N135 | 1.573053 | 0 | 2.724607 | 0 | |
| 48 | N137 | 2.022278 | 0 | 2.410057 | 0 | |
| 49 | N139 | 2.410057 | 0 | 2.022278 | 0 | |
| 50 | N141 | 2.724607 | 0 | 1.573053 | 0 | |
| 51 | N134 | -3.2295 | 0 | 1.864553 | 0 | |
| 52 | N137A | -2.9795 | 0 | 2.297565 | 0 | |
| 53 | N138 | -2.7295 | 0 | 2.730578 | 0 | |
| 54 | N140 | 3.2295 | 0 | 1.864553 | 0 | |
| 55 | N141A | 2.9795 | 0 | 2.297565 | 0 | |
| 56 | N142 | 2.7295 | 0 | 2.730578 | 0 | |

## Joint Coordinates and Temperatures (Continued)

| | Label | X [ft] | Y [ft] | Z [ft] | Temp [F] | Detach From Diap... |
|---|---|---|---|---|---|---|
| 57 | N143B | -1.894318 | 0 | 3.238817 | 0 | |
| 58 | N144A | -1.262879 | 0 | 3.394164 | 0 | |
| 59 | N145A | -0.631439 | 0 | 3.54951 | 0 | |
| 60 | N146 | 0.631439 | 0 | 3.54951 | 0 | |
| 61 | N147A | 1.262879 | 0 | 3.394164 | 0 | |
| 62 | N148 | 1.894318 | 0 | 3.238817 | 0 | |
| 63 | N163A | -0.273158 | 0 | 3.122207 | 0 | |
| 64 | N164 | -0.317303 | 0 | 3.626794 | 0 | |
| 65 | N200 | -4e-14 | 0 | -3.583356 | 0 | |
| 66 | N204 | -4e-14 | 0 | -3.437606 | 0 | |
| 67 | N208 | -4e-14 | 0 | -3.291856 | 0 | |
| 68 | N407 | 2.850831 | 0 | 1.645928 | 0 | |
| 69 | N411 | 2.977054 | 0 | 1.718803 | 0 | |
| 70 | N415 | 3.103277 | 0 | 1.791678 | 0 | |
| 71 | N419 | 2.64597 | 0 | 1.685359 | 0 | |
| 72 | N420 | 2.567332 | 0 | 1.797665 | 0 | |
| 73 | N421 | 2.488694 | 0 | 1.909971 | 0 | |
| 74 | N422 | 2.776227 | 0 | 1.757221 | 0 | |
| 75 | N423 | 2.701624 | 0 | 1.868514 | 0 | |
| 76 | N424 | 2.627021 | 0 | 1.979807 | 0 | |
| 77 | N425 | 2.552418 | 0 | 2.0911 | 0 | |
| 78 | N426 | 2.906485 | 0 | 1.829082 | 0 | |
| 79 | N427 | 2.835916 | 0 | 1.939362 | 0 | |
| 80 | N428 | 2.765347 | 0 | 2.049642 | 0 | |
| 81 | N429 | 2.694778 | 0 | 2.159922 | 0 | |
| 82 | N430 | 3.036743 | 0 | 1.900944 | 0 | |
| 83 | N431 | 2.970208 | 0 | 2.010211 | 0 | |
| 84 | N432 | 2.903674 | 0 | 2.119477 | 0 | |
| 85 | N433 | 2.837139 | 0 | 2.228744 | 0 | |
| 86 | N434 | 3.167 | 0 | 1.972806 | 0 | |
| 87 | N435 | 3.1045 | 0 | 2.081059 | 0 | |
| 88 | N436 | 3.042 | 0 | 2.189312 | 0 | |
| 89 | N437 | 2.313112 | 0 | 2.119222 | 0 | |
| 90 | N438 | 2.216167 | 0 | 2.216167 | 0 | |
| 91 | N439 | 2.119222 | 0 | 2.313112 | 0 | |
| 92 | N440 | 2.464084 | 0 | 2.190871 | 0 | |
| 93 | N441 | 2.37575 | 0 | 2.290643 | 0 | |
| 94 | N442 | 2.287417 | 0 | 2.390415 | 0 | |
| 95 | N443 | 2.199083 | 0 | 2.490187 | 0 | |
| 96 | N444 | 2.615056 | 0 | 2.262521 | 0 | |
| 97 | N445 | 2.535334 | 0 | 2.365119 | 0 | |
| 98 | N446 | 2.455611 | 0 | 2.467718 | 0 | |
| 99 | N447 | 2.375889 | 0 | 2.570317 | 0 | |
| 100 | N448 | 2.766028 | 0 | 2.33417 | 0 | |
| 101 | N449 | 2.694917 | 0 | 2.439596 | 0 | |
| 102 | N450 | 2.623806 | 0 | 2.545022 | 0 | |
| 103 | N451 | 2.552695 | 0 | 2.650448 | 0 | |
| 104 | N452 | 2.917 | 0 | 2.405819 | 0 | |
| 105 | N453 | 2.8545 | 0 | 2.514072 | 0 | |
| 106 | N454 | 2.792 | 0 | 2.622325 | 0 | |
| 107 | N455 | 2.399888 | 0 | 2.915117 | 0 | |
| 108 | N456 | 2.274018 | 0 | 2.746764 | 0 | |

## Joint Coordinates and Temperatures (Continued)

| | Label | X [ft] | Y [ft] | Z [ft] | Temp [F] | Detach From Diap... |
|---|---|---|---|---|---|---|
| 109 | N457 | 2.148148 | 0 | 2.57841 | 0 | |
| 110 | N458 | 2.367898 | 0 | 3.122307 | 0 | |
| 111 | N459 | 2.253416 | 0 | 2.963904 | 0 | |
| 112 | N460 | 2.138935 | 0 | 2.805501 | 0 | |
| 113 | N461 | 2.024453 | 0 | 2.647098 | 0 | |
| 114 | N462 | 1.909971 | 0 | 2.488694 | 0 | |
| 115 | N463 | 2.210038 | 0 | 3.161144 | 0 | |
| 116 | N464 | 2.106945 | 0 | 3.012691 | 0 | |
| 117 | N465 | 2.003852 | 0 | 2.864238 | 0 | |
| 118 | N466 | 1.900758 | 0 | 2.715785 | 0 | |
| 119 | N467 | 1.797665 | 0 | 2.567332 | 0 | |
| 120 | N468 | 2.052178 | 0 | 3.199981 | 0 | |
| 121 | N469 | 1.960473 | 0 | 3.061478 | 0 | |
| 122 | N470 | 1.868769 | 0 | 2.922975 | 0 | |
| 123 | N471 | 1.777064 | 0 | 2.784472 | 0 | |
| 124 | N472 | 1.685359 | 0 | 2.64597 | 0 | |
| 125 | N473 | 1.814002 | 0 | 3.110265 | 0 | |
| 126 | N474 | 1.733686 | 0 | 2.981712 | 0 | |
| 127 | N475 | 1.653369 | 0 | 2.85316 | 0 | |
| 128 | N476 | 1.736458 | 0 | 3.277654 | 0 | |
| 129 | N477 | 1.664543 | 0 | 3.153877 | 0 | |
| 130 | N478 | 1.592628 | 0 | 3.030101 | 0 | |
| 131 | N479 | 1.520713 | 0 | 2.906325 | 0 | |
| 132 | N480 | 1.448797 | 0 | 2.782549 | 0 | |
| 133 | N481 | 1.578599 | 0 | 3.31649 | 0 | |
| 134 | N482 | 1.515084 | 0 | 3.19749 | 0 | |
| 135 | N483 | 1.45157 | 0 | 3.07849 | 0 | |
| 136 | N484 | 1.388056 | 0 | 2.95949 | 0 | |
| 137 | N485 | 1.324542 | 0 | 2.84049 | 0 | |
| 138 | N486 | 1.420739 | 0 | 3.355327 | 0 | |
| 139 | N487 | 1.365626 | 0 | 3.241103 | 0 | |
| 140 | N488 | 1.310513 | 0 | 3.126879 | 0 | |
| 141 | N489 | 1.2554 | 0 | 3.012655 | 0 | |
| 142 | N490 | 1.200287 | 0 | 2.898431 | 0 | |
| 143 | N491 | 1.216167 | 0 | 3.284716 | 0 | |
| 144 | N492 | 1.169455 | 0 | 3.175268 | 0 | |
| 145 | N493 | 1.122743 | 0 | 3.06582 | 0 | |
| 146 | N494 | 1.105019 | 0 | 3.433 | 0 | |
| 147 | N495 | 1.064665 | 0 | 3.322714 | 0 | |
| 148 | N496 | 1.024311 | 0 | 3.212428 | 0 | |
| 149 | N497 | 0.983957 | 0 | 3.102142 | 0 | |
| 150 | N498 | 0.943602 | 0 | 2.991856 | 0 | |
| 151 | N499 | 0.947159 | 0 | 3.471837 | 0 | |
| 152 | N500 | 0.913163 | 0 | 3.360713 | 0 | |
| 153 | N501 | 0.879166 | 0 | 3.249589 | 0 | |
| 154 | N502 | 0.84517 | 0 | 3.138465 | 0 | |
| 155 | N503 | 0.811173 | 0 | 3.027341 | 0 | |
| 156 | N504 | 0.789299 | 0 | 3.510674 | 0 | |
| 157 | N505 | 0.761661 | 0 | 3.398712 | 0 | |
| 158 | N506 | 0.734022 | 0 | 3.286749 | 0 | |
| 159 | N507 | 0.706383 | 0 | 3.174787 | 0 | |
| 160 | N508 | 0.678744 | 0 | 3.062825 | 0 | |

## Joint Coordinates and Temperatures (Continued)

| | Label | X [ft] | Y [ft] | Z [ft] | Temp [F] | Detach From Diap... |
|---|---|---|---|---|---|---|
| 161 | N509 | 0.610158 | 0 | 3.43671 | 0 | |
| 162 | N510 | 0.588877 | 0 | 3.32391 | 0 | |
| 163 | N511 | 0.567596 | 0 | 3.211109 | 0 | |
| 164 | N512 | 0.409737 | 0 | 3.110258 | 0 | |
| 165 | N513 | 0.273158 | 0 | 3.122207 | 0 | |
| 166 | N514 | 0.136579 | 0 | 3.134156 | 0 | |
| 167 | N515 | 0.425697 | 0 | 3.22978 | 0 | |
| 168 | N516 | 0.283798 | 0 | 3.248451 | 0 | |
| 169 | N517 | 0.141899 | 0 | 3.267122 | 0 | |
| 170 | N518 | -0.052083 | 0 | 3.285793 | 0 | |
| 171 | N519 | 0.441658 | 0 | 3.349303 | 0 | |
| 172 | N520 | 0.294439 | 0 | 3.374696 | 0 | |
| 173 | N521 | 0.147219 | 0 | 3.400088 | 0 | |
| 174 | N522 | -0.052083 | 0 | 3.425481 | 0 | |
| 175 | N523 | 0.457619 | 0 | 3.468825 | 0 | |
| 176 | N524 | 0.305079 | 0 | 3.50094 | 0 | |
| 177 | N525 | 0.15254 | 0 | 3.533054 | 0 | |
| 178 | N526 | -0.052083 | 0 | 3.565169 | 0 | |
| 179 | N527 | 0.47358 | 0 | 3.588347 | 0 | |
| 180 | N528 | 0.31572 | 0 | 3.627184 | 0 | |
| 181 | N529 | 0.15786 | 0 | 3.66602 | 0 | |
| 182 | N530 | -0.678744 | 0 | 3.062825 | 0 | |
| 183 | N531 | -0.811173 | 0 | 3.027341 | 0 | |
| 184 | N532 | -0.943602 | 0 | 2.991856 | 0 | |
| 185 | N533 | -0.567596 | 0 | 3.211109 | 0 | |
| 186 | N534 | -0.706383 | 0 | 3.174787 | 0 | |
| 187 | N535 | -0.84517 | 0 | 3.138465 | 0 | |
| 188 | N536 | -0.983957 | 0 | 3.102142 | 0 | |
| 189 | N537 | -1.122743 | 0 | 3.06582 | 0 | |
| 190 | N538 | -0.588877 | 0 | 3.32391 | 0 | |
| 191 | N539 | -0.734022 | 0 | 3.286749 | 0 | |
| 192 | N540 | -0.879166 | 0 | 3.249589 | 0 | |
| 193 | N541 | -1.024311 | 0 | 3.212428 | 0 | |
| 194 | N542 | -1.169455 | 0 | 3.175268 | 0 | |
| 195 | N543 | -0.610158 | 0 | 3.43671 | 0 | |
| 196 | N544 | -0.761661 | 0 | 3.398712 | 0 | |
| 197 | N545 | -0.913163 | 0 | 3.360713 | 0 | |
| 198 | N546 | -1.064665 | 0 | 3.322714 | 0 | |
| 199 | N547 | -1.216167 | 0 | 3.284716 | 0 | |
| 200 | N548 | -0.789299 | 0 | 3.510674 | 0 | |
| 201 | N549 | -0.947159 | 0 | 3.471837 | 0 | |
| 202 | N550 | -1.105019 | 0 | 3.433 | 0 | |
| 203 | N551 | -1.448797 | 0 | 2.782549 | 0 | |
| 204 | N552 | -1.324542 | 0 | 2.84049 | 0 | |
| 205 | N553 | -1.200287 | 0 | 2.898431 | 0 | |
| 206 | N554 | -1.653369 | 0 | 2.85316 | 0 | |
| 207 | N555 | -1.520713 | 0 | 2.906325 | 0 | |
| 208 | N556 | -1.388056 | 0 | 2.95949 | 0 | |
| 209 | N557 | -1.2554 | 0 | 3.012655 | 0 | |
| 210 | N558 | -1.733686 | 0 | 2.981712 | 0 | |
| 211 | N559 | -1.592628 | 0 | 3.030101 | 0 | |
| 212 | N560 | -1.45157 | 0 | 3.07849 | 0 | |

## Joint Coordinates and Temperatures (Continued)

| | Label | X [ft] | Y [ft] | Z [ft] | Temp [F] | Detach From Diap... |
|---|---|---|---|---|---|---|
| 213 | N561 | -1.310513 | 0 | 3.126879 | 0 | |
| 214 | N562 | -1.814002 | 0 | 3.110265 | 0 | |
| 215 | N563 | -1.664543 | 0 | 3.153877 | 0 | |
| 216 | N564 | -1.515084 | 0 | 3.19749 | 0 | |
| 217 | N565 | -1.365626 | 0 | 3.241103 | 0 | |
| 218 | N566 | -1.736458 | 0 | 3.277654 | 0 | |
| 219 | N567 | -1.578599 | 0 | 3.31649 | 0 | |
| 220 | N568 | -1.420739 | 0 | 3.355327 | 0 | |
| 221 | N569 | -1.685359 | 0 | 2.64597 | 0 | |
| 222 | N570 | -1.797665 | 0 | 2.567332 | 0 | |
| 223 | N571 | -1.909971 | 0 | 2.488694 | 0 | |
| 224 | N572 | -1.811229 | 0 | 2.814323 | 0 | |
| 225 | N573 | -1.908193 | 0 | 2.733289 | 0 | |
| 226 | N574 | -2.005156 | 0 | 2.652255 | 0 | |
| 227 | N575 | -2.10212 | 0 | 2.571221 | 0 | |
| 228 | N576 | -2.199083 | 0 | 2.490187 | 0 | |
| 229 | N577 | -2.049405 | 0 | 2.904039 | 0 | |
| 230 | N578 | -2.131026 | 0 | 2.820609 | 0 | |
| 231 | N579 | -2.212647 | 0 | 2.737178 | 0 | |
| 232 | N580 | -2.294268 | 0 | 2.653748 | 0 | |
| 233 | N581 | -2.375889 | 0 | 2.570317 | 0 | |
| 234 | N582 | -2.287581 | 0 | 2.993755 | 0 | |
| 235 | N583 | -2.35386 | 0 | 2.907928 | 0 | |
| 236 | N584 | -2.420138 | 0 | 2.822101 | 0 | |
| 237 | N585 | -2.486416 | 0 | 2.736275 | 0 | |
| 238 | N586 | -2.552695 | 0 | 2.650448 | 0 | |
| 239 | N587 | -2.576693 | 0 | 2.995247 | 0 | |
| 240 | N588 | -2.627629 | 0 | 2.907024 | 0 | |
| 241 | N589 | -2.678565 | 0 | 2.818801 | 0 | |
| 242 | N590 | -2.119222 | 0 | 2.313112 | 0 | |
| 243 | N591 | -2.216167 | 0 | 2.216167 | 0 | |
| 244 | N592 | -2.313112 | 0 | 2.119222 | 0 | |
| 245 | N593 | -2.287417 | 0 | 2.390415 | 0 | |
| 246 | N594 | -2.37575 | 0 | 2.290643 | 0 | |
| 247 | N595 | -2.464084 | 0 | 2.190871 | 0 | |
| 248 | N596 | -2.552418 | 0 | 2.0911 | 0 | |
| 249 | N597 | -2.455611 | 0 | 2.467718 | 0 | |
| 250 | N598 | -2.535334 | 0 | 2.365119 | 0 | |
| 251 | N599 | -2.615056 | 0 | 2.262521 | 0 | |
| 252 | N600 | -2.694778 | 0 | 2.159922 | 0 | |
| 253 | N601 | -2.623806 | 0 | 2.545022 | 0 | |
| 254 | N602 | -2.694917 | 0 | 2.439596 | 0 | |
| 255 | N603 | -2.766028 | 0 | 2.33417 | 0 | |
| 256 | N604 | -2.837139 | 0 | 2.228744 | 0 | |
| 257 | N605 | -2.792 | 0 | 2.622325 | 0 | |
| 258 | N606 | -2.8545 | 0 | 2.514072 | 0 | |
| 259 | N607 | -2.917 | 0 | 2.405819 | 0 | |
| 260 | N608 | -2.488694 | 0 | 1.909971 | 0 | |
| 261 | N609 | -2.567332 | 0 | 1.797665 | 0 | |
| 262 | N610 | -2.64597 | 0 | 1.685359 | 0 | |
| 263 | N611 | -2.627021 | 0 | 1.979807 | 0 | |
| 264 | N612 | -2.701624 | 0 | 1.868514 | 0 | |

## Joint Coordinates and Temperatures (Continued)

| | Label | X [ft] | Y [ft] | Z [ft] | Temp [F] | Detach From Diap... |
|---|---|---|---|---|---|---|
| 265 | N613 | -2.776227 | 0 | 1.757221 | 0 | |
| 266 | N614 | -2.850831 | 0 | 1.645928 | 0 | |
| 267 | N615 | -2.765347 | 0 | 2.049642 | 0 | |
| 268 | N616 | -2.835916 | 0 | 1.939362 | 0 | |
| 269 | N617 | -2.906485 | 0 | 1.829082 | 0 | |
| 270 | N618 | -2.977054 | 0 | 1.718803 | 0 | |
| 271 | N619 | -2.903674 | 0 | 2.119477 | 0 | |
| 272 | N620 | -2.970208 | 0 | 2.010211 | 0 | |
| 273 | N621 | -3.036743 | 0 | 1.900944 | 0 | |
| 274 | N622 | -3.103277 | 0 | 1.791678 | 0 | |
| 275 | N623 | -3.042 | 0 | 2.189312 | 0 | |
| 276 | N624 | -3.1045 | 0 | 2.081059 | 0 | |
| 277 | N625 | -3.167 | 0 | 1.972806 | 0 | |
| 278 | N794 | -0.478026 | 0 | 3.104284 | 0 | |
| 279 | N795 | -0.409737 | 0 | 3.110258 | 0 | |
| 280 | N796 | -0.341447 | 0 | 3.116233 | 0 | |
| 281 | N797 | -0.496746 | 0 | 3.220421 | 0 | |
| 282 | N798 | -0.425895 | 0 | 3.229732 | 0 | |
| 283 | N799 | -0.355045 | 0 | 3.239043 | 0 | |
| 284 | N800 | -0.284194 | 0 | 3.248354 | 0 | |
| 285 | N801 | -0.515466 | 0 | 3.336557 | 0 | |
| 286 | N802 | -0.442054 | 0 | 3.349205 | 0 | |
| 287 | N803 | -0.368642 | 0 | 3.361853 | 0 | |
| 288 | N804 | -0.295231 | 0 | 3.374501 | 0 | |
| 289 | N805 | -0.534186 | 0 | 3.452694 | 0 | |
| 290 | N806 | -0.458213 | 0 | 3.468679 | 0 | |
| 291 | N807 | -0.38224 | 0 | 3.484663 | 0 | |
| 292 | N808 | -0.306267 | 0 | 3.500647 | 0 | |
| 293 | N809 | -0.552905 | 0 | 3.568831 | 0 | |
| 294 | N810 | -0.474371 | 0 | 3.588152 | 0 | |
| 295 | N811 | -0.395837 | 0 | 3.607473 | 0 | |
| 296 | N812 | -0.204868 | 0 | 3.128182 | 0 | |
| 297 | N813 | -0.136579 | 0 | 3.134156 | 0 | |
| 298 | N815 | -0.213146 | 0 | 3.257714 | 0 | |
| 299 | N816 | -0.142097 | 0 | 3.267074 | 0 | |
| 300 | N818 | -0.221423 | 0 | 3.387246 | 0 | |
| 301 | N819 | -0.147615 | 0 | 3.399991 | 0 | |
| 302 | N821 | -0.2297 | 0 | 3.516778 | 0 | |
| 303 | N822 | -0.153133 | 0 | 3.532908 | 0 | |
| 304 | N824 | -0.237978 | 0 | 3.64631 | 0 | |
| 305 | N825 | -0.158652 | 0 | 3.665826 | 0 | |
| 306 | N899 | 2.627629 | 0 | 2.907024 | 0 | |
| 307 | N900 | 2.425845 | 0 | 2.741368 | 0 | |
| 308 | N901 | -2.210038 | 0 | 3.161144 | 0 | |
| 309 | N902 | -1.99771 | 0 | 3.015632 | 0 | |
| 310 | N902A | -5e-14 | -.333 | -3.729106 | 0 | |
| 311 | N903B | -2e-14 | -.333 | -3.146106 | 0 | |
| 312 | N904B | -4e-14 | -.333 | -3.583356 | 0 | |
| 313 | N905 | -4e-14 | -.333 | -3.437606 | 0 | |
| 314 | N906 | -4e-14 | -.333 | -3.291856 | 0 | |
| 315 | N912 | -3.2295 | -.333 | 1.864553 | 0 | |
| 316 | N913 | -2.724607 | -.333 | 1.573053 | 0 | |

## Joint Coordinates and Temperatures (Continued)

| | Label | X [ft] | Y [ft] | Z [ft] | Temp [F] | Detach From Diap... |
|---|---|---|---|---|---|---|
| 317 | N914 | -3.103277 | -.333 | 1.791678 | 0 | |
| 318 | N915 | -2.977054 | -.333 | 1.718803 | 0 | |
| 319 | N916 | -2.850831 | -.333 | 1.645928 | 0 | |
| 320 | N922 | 3.2295 | -.333 | 1.864553 | 0 | |
| 321 | N923 | 2.724607 | -.333 | 1.573053 | 0 | |
| 322 | N924 | 3.103277 | -.333 | 1.791678 | 0 | |
| 323 | N925 | 2.977054 | -.333 | 1.718803 | 0 | |
| 324 | N926 | 2.850831 | -.333 | 1.645928 | 0 | |
| 325 | N911 | -2.023557 | 0 | 2.959835 | 0 | |
| 326 | N912A | -2.195728 | 0 | 3.041071 | 0 | |
| 327 | N913A | -2.367898 | 0 | 3.122307 | 0 | |
| 328 | N914A | -2.103874 | 0 | 3.088388 | 0 | |
| 329 | N915A | -1.838463 | 0 | 2.906498 | 0 | |
| 330 | N916A | -1.865698 | 0 | 2.998672 | 0 | |
| 331 | N917 | -1.958938 | 0 | 3.099326 | 0 | |
| 332 | N918 | -2.052178 | 0 | 3.199981 | 0 | |
| 333 | N919 | 2.576693 | 0 | 2.995247 | 0 | |
| 334 | N920 | 2.463312 | 0 | 2.869657 | 0 | |
| 335 | N921 | 2.526737 | 0 | 2.824196 | 0 | |
| 336 | N922A | 2.349931 | 0 | 2.744066 | 0 | |
| 337 | N923A | 2.678565 | 0 | 2.818801 | 0 | |
| 338 | N924A | 2.539716 | 0 | 2.737322 | 0 | |
| 339 | N925A | 2.400867 | 0 | 2.655843 | 0 | |
| 340 | N926A | 2.274507 | 0 | 2.617127 | 0 | |
| 341 | N952A | 0.052084 | 0 | 3.704857 | 0 | |
| 342 | N953A | 0.052084 | 0 | 3.146106 | 0 | |
| 343 | N954A | 0.052084 | 0 | 3.285793 | 0 | |
| 344 | N955A | 0.052084 | 0 | 3.425481 | 0 | |
| 345 | N956A | 0.052084 | 0 | 3.565169 | 0 | |
| 346 | N952B | -0.052083 | 0.333333 | 3.704857 | 0 | |
| 347 | N955B | -0.052083 | 0.333333 | 3.285793 | 0 | |
| 348 | N956B | -0.052083 | 0.333333 | 3.425481 | 0 | |
| 349 | N957A | -0.052083 | 0.333333 | 3.565169 | 0 | |
| 350 | N958 | 0.052084 | 0.333333 | 3.704857 | 0 | |
| 351 | N960 | 0.052084 | 0.333333 | 3.285793 | 0 | |
| 352 | N961 | 0.052084 | 0.333333 | 3.425481 | 0 | |
| 353 | N962 | 0.052084 | 0.333333 | 3.565169 | 0 | |
| 354 | N963 | -0.052083 | -0.333333 | 3.704857 | 0 | |
| 355 | N964 | -0.052083 | -0.333333 | 3.146106 | 0 | |
| 356 | N966 | -0.052083 | -0.333333 | 3.285793 | 0 | |
| 357 | N967 | -0.052083 | -0.333333 | 3.425481 | 0 | |
| 358 | N968 | -0.052083 | -0.333333 | 3.565169 | 0 | |
| 359 | N969 | 0.052084 | -0.333333 | 3.704857 | 0 | |
| 360 | N970 | 0.052084 | -0.333333 | 3.146106 | 0 | |
| 361 | N971 | 0.052084 | -0.333333 | 3.285793 | 0 | |
| 362 | N972 | 0.052084 | -0.333333 | 3.425481 | 0 | |
| 363 | N973 | 0.052084 | -0.333333 | 3.565169 | 0 | |
| 364 | N976 | -0.052083 | -0.166666 | 3.704857 | 0 | |
| 365 | N977 | -0.052083 | -0.166666 | 3.146106 | 0 | |
| 366 | N979 | -0.052083 | -0.166666 | 3.285793 | 0 | |
| 367 | N980 | -0.052083 | -0.166666 | 3.425481 | 0 | |
| 368 | N981 | -0.052083 | -0.166666 | 3.565169 | 0 | |

## Joint Coordinates and Temperatures (Continued)

| | Label | X [ft] | Y [ft] | Z [ft] | Temp [F] | Detach From Diap... |
|---|---|---|---|---|---|---|
| 369 | N982 | 0.052084 | -0.166666 | 3.704857 | 0 | |
| 370 | N983 | 0.052084 | -0.166666 | 3.146106 | 0 | |
| 371 | N984 | 0.052084 | -0.166666 | 3.285793 | 0 | |
| 372 | N985 | 0.052084 | -0.166666 | 3.425481 | 0 | |
| 373 | N986 | 0.052084 | -0.166666 | 3.565169 | 0 | |
| 374 | N992 | -0.052083 | 0.166667 | 3.704857 | 0 | |
| 375 | N993 | -0.052083 | 0.166667 | 3.146106 | 0 | |
| 376 | N995 | -0.052083 | 0.166667 | 3.285793 | 0 | |
| 377 | N996 | -0.052083 | 0.166667 | 3.425481 | 0 | |
| 378 | N997 | -0.052083 | 0.166667 | 3.565169 | 0 | |
| 379 | N998 | 0.052084 | 0.166667 | 3.704857 | 0 | |
| 380 | N999 | 0.052084 | 0.166667 | 3.146106 | 0 | |
| 381 | N1000 | 0.052084 | 0.166667 | 3.285793 | 0 | |
| 382 | N1001 | 0.052084 | 0.166667 | 3.425481 | 0 | |
| 383 | N1002 | 0.052084 | 0.166667 | 3.565169 | 0 | |
| 384 | N426A | 3.234542 | 0 | -1.807323 | 0 | |
| 385 | N427A | 3.933243 | 0 | 0.645635 | 0 | |
| 386 | N428A | 1.407485 | 0 | -3.729106 | 0 | |
| 387 | N430A | 2.956372 | 0 | 1.076031 | 0 | |
| 388 | N431A | 3.098309 | 0 | 0.546315 | 0 | |
| 389 | N432A | 3.146106 | 0 | -4.2e-13 | 0 | |
| 390 | N433A | 3.098309 | 0 | -0.546315 | 0 | |
| 391 | N434A | 2.956372 | 0 | -1.076031 | 0 | |
| 392 | N435A | 2.750649 | 0 | -1.527948 | 0 | |
| 393 | N436A | 2.410057 | 0 | -2.022278 | 0 | |
| 394 | N437A | 2.022278 | 0 | -2.410057 | 0 | |
| 395 | N438A | 1.573053 | 0 | -2.724607 | 0 | |
| 396 | N439A | 1.076031 | 0 | -2.956372 | 0 | |
| 397 | N440A | 0.546315 | 0 | -3.098309 | 0 | |
| 398 | N443A | 3.4795 | 0 | 1.43154 | 0 | |
| 399 | N444A | 3.7295 | 0 | 0.998527 | 0 | |
| 400 | N446A | 0.5 | 0 | -3.729106 | 0 | |
| 401 | N447A | 1 | 0 | -3.729106 | 0 | |
| 402 | N448A | 3.752057 | 0 | 0.021119 | 0 | |
| 403 | N449A | 3.570871 | 0 | -0.603397 | 0 | |
| 404 | N450A | 3.389686 | 0 | -1.227913 | 0 | |
| 405 | N451A | 2.758246 | 0 | -2.321598 | 0 | |
| 406 | N452A | 2.307993 | 0 | -2.790767 | 0 | |
| 407 | N453A | 1.857739 | 0 | -3.259936 | 0 | |
| 408 | N454A | 2.84049 | 0 | -1.324542 | 0 | |
| 409 | N455A | 3.299547 | 0 | -1.538604 | 0 | |
| 410 | N459A | 0.136579 | 0 | -3.134156 | 0 | |
| 411 | N460A | 0.273158 | 0 | -3.122207 | 0 | |
| 412 | N461A | 0.409737 | 0 | -3.110258 | 0 | |
| 413 | N462A | 0.133684 | 0 | -3.282894 | 0 | |
| 414 | N463A | 0.267368 | 0 | -3.273932 | 0 | |
| 415 | N464A | 0.401052 | 0 | -3.26497 | 0 | |
| 416 | N465A | 0.534737 | 0 | -3.256008 | 0 | |
| 417 | N466A | 0.130789 | 0 | -3.431631 | 0 | |
| 418 | N467A | 0.261579 | 0 | -3.425656 | 0 | |
| 419 | N468A | 0.392368 | 0 | -3.419682 | 0 | |
| 420 | N469A | 0.523158 | 0 | -3.413707 | 0 | |

## Joint Coordinates and Temperatures (Continued)

| | Label | X [ft] | Y [ft] | Z [ft] | Temp [F] | Detach From Diap... |
|---|---|---|---|---|---|---|
| 421 | N470A | 0.127895 | 0 | -3.580368 | 0 | |
| 422 | N471A | 0.255789 | 0 | -3.577381 | 0 | |
| 423 | N472A | 0.383684 | 0 | -3.574394 | 0 | |
| 424 | N473A | 0.511579 | 0 | -3.571406 | 0 | |
| 425 | N474A | 0.125 | 0 | -3.729106 | 0 | |
| 426 | N475A | 0.25 | 0 | -3.729106 | 0 | |
| 427 | N476A | 0.375 | 0 | -3.729106 | 0 | |
| 428 | N477A | 0.678744 | 0 | -3.062825 | 0 | |
| 429 | N478A | 0.811173 | 0 | -3.027341 | 0 | |
| 430 | N479A | 0.943602 | 0 | -2.991856 | 0 | |
| 431 | N480A | 0.665308 | 0 | -3.229395 | 0 | |
| 432 | N481A | 0.79588 | 0 | -3.202782 | 0 | |
| 433 | N482A | 0.926452 | 0 | -3.176169 | 0 | |
| 434 | N483A | 1.057024 | 0 | -3.149556 | 0 | |
| 435 | N484A | 0.651872 | 0 | -3.395965 | 0 | |
| 436 | N485A | 0.780587 | 0 | -3.378223 | 0 | |
| 437 | N486A | 0.909301 | 0 | -3.360481 | 0 | |
| 438 | N487A | 1.038016 | 0 | -3.342739 | 0 | |
| 439 | N488A | 0.638436 | 0 | -3.562535 | 0 | |
| 440 | N489A | 0.765293 | 0 | -3.553664 | 0 | |
| 441 | N490A | 0.892151 | 0 | -3.544793 | 0 | |
| 442 | N491A | 1.019008 | 0 | -3.535922 | 0 | |
| 443 | N492A | 0.625 | 0 | -3.729106 | 0 | |
| 444 | N493A | 0.75 | 0 | -3.729106 | 0 | |
| 445 | N494A | 0.875 | 0 | -3.729106 | 0 | |
| 446 | N495A | 1.324622 | 0 | -3.535922 | 0 | |
| 447 | N496A | 1.241758 | 0 | -3.342739 | 0 | |
| 448 | N497A | 1.158895 | 0 | -3.149556 | 0 | |
| 449 | N498A | 1.520048 | 0 | -3.611813 | 0 | |
| 450 | N499A | 1.440108 | 0 | -3.433468 | 0 | |
| 451 | N500A | 1.360168 | 0 | -3.255122 | 0 | |
| 452 | N501A | 1.280227 | 0 | -3.076777 | 0 | |
| 453 | N502A | 1.200287 | 0 | -2.898431 | 0 | |
| 454 | N503A | 1.632612 | 0 | -3.494521 | 0 | |
| 455 | N504A | 1.555594 | 0 | -3.331013 | 0 | |
| 456 | N505A | 1.478577 | 0 | -3.167505 | 0 | |
| 457 | N506A | 1.40156 | 0 | -3.003998 | 0 | |
| 458 | N507A | 1.324542 | 0 | -2.84049 | 0 | |
| 459 | N508A | 1.745175 | 0 | -3.377229 | 0 | |
| 460 | N509A | 1.671081 | 0 | -3.228559 | 0 | |
| 461 | N510A | 1.596986 | 0 | -3.079889 | 0 | |
| 462 | N511A | 1.522892 | 0 | -2.931219 | 0 | |
| 463 | N512A | 1.448797 | 0 | -2.782549 | 0 | |
| 464 | N513A | 1.786567 | 0 | -3.126104 | 0 | |
| 465 | N514A | 1.715396 | 0 | -2.992272 | 0 | |
| 466 | N515A | 1.644224 | 0 | -2.85844 | 0 | |
| 467 | N516A | 1.970302 | 0 | -3.142644 | 0 | |
| 468 | N517A | 1.899066 | 0 | -3.018475 | 0 | |
| 469 | N518A | 1.827831 | 0 | -2.894307 | 0 | |
| 470 | N519A | 1.756595 | 0 | -2.770138 | 0 | |
| 471 | N520A | 1.685359 | 0 | -2.64597 | 0 | |
| 472 | N521A | 2.082866 | 0 | -3.025352 | 0 | |

## Joint Coordinates and Temperatures (Continued)

| | Label | X [ft] | Y [ft] | Z [ft] | Temp [F] | Detach From Diap... |
|---|---|---|---|---|---|---|
| 473 | N522A | 2.011566 | 0 | -2.910847 | 0 | |
| 474 | N523A | 1.940265 | 0 | -2.796342 | 0 | |
| 475 | N524A | 1.868965 | 0 | -2.681837 | 0 | |
| 476 | N525A | 1.797665 | 0 | -2.567332 | 0 | |
| 477 | N526A | 2.195429 | 0 | -2.908059 | 0 | |
| 478 | N527A | 2.124065 | 0 | -2.803218 | 0 | |
| 479 | N528A | 2.0527 | 0 | -2.698377 | 0 | |
| 480 | N529A | 1.981336 | 0 | -2.593536 | 0 | |
| 481 | N530A | 1.909971 | 0 | -2.488694 | 0 | |
| 482 | N531A | 2.236564 | 0 | -2.695589 | 0 | |
| 483 | N532A | 2.165135 | 0 | -2.600412 | 0 | |
| 484 | N533A | 2.093706 | 0 | -2.505234 | 0 | |
| 485 | N534A | 2.420556 | 0 | -2.673475 | 0 | |
| 486 | N535A | 2.345223 | 0 | -2.583384 | 0 | |
| 487 | N536A | 2.269889 | 0 | -2.493293 | 0 | |
| 488 | N537A | 2.194556 | 0 | -2.403203 | 0 | |
| 489 | N538A | 2.119222 | 0 | -2.313112 | 0 | |
| 490 | N539A | 2.53312 | 0 | -2.556182 | 0 | |
| 491 | N540A | 2.453881 | 0 | -2.471179 | 0 | |
| 492 | N541A | 2.374643 | 0 | -2.386175 | 0 | |
| 493 | N542A | 2.295405 | 0 | -2.301171 | 0 | |
| 494 | N543A | 2.216167 | 0 | -2.216167 | 0 | |
| 495 | N544A | 2.645683 | 0 | -2.43889 | 0 | |
| 496 | N545A | 2.56254 | 0 | -2.358973 | 0 | |
| 497 | N546A | 2.479397 | 0 | -2.279056 | 0 | |
| 498 | N547A | 2.396255 | 0 | -2.199139 | 0 | |
| 499 | N548A | 2.313112 | 0 | -2.119222 | 0 | |
| 500 | N549A | 2.671199 | 0 | -2.246768 | 0 | |
| 501 | N550A | 2.584152 | 0 | -2.171938 | 0 | |
| 502 | N551A | 2.497104 | 0 | -2.097108 | 0 | |
| 503 | N552A | 2.488694 | 0 | -1.909971 | 0 | |
| 504 | N553A | 2.567332 | 0 | -1.797665 | 0 | |
| 505 | N554A | 2.64597 | 0 | -1.685359 | 0 | |
| 506 | N555A | 2.584223 | 0 | -1.983555 | 0 | |
| 507 | N556A | 2.671342 | 0 | -1.870002 | 0 | |
| 508 | N557A | 2.758461 | 0 | -1.756449 | 0 | |
| 509 | N558A | 2.871622 | 0 | -1.597792 | 0 | |
| 510 | N559A | 2.679752 | 0 | -2.057138 | 0 | |
| 511 | N560A | 2.775353 | 0 | -1.942339 | 0 | |
| 512 | N561A | 2.870953 | 0 | -1.82754 | 0 | |
| 513 | N562A | 2.992595 | 0 | -1.667635 | 0 | |
| 514 | N563A | 2.775281 | 0 | -2.130722 | 0 | |
| 515 | N564A | 2.879363 | 0 | -2.014676 | 0 | |
| 516 | N565A | 2.983445 | 0 | -1.89863 | 0 | |
| 517 | N566A | 3.113569 | 0 | -1.737479 | 0 | |
| 518 | N567A | 2.87081 | 0 | -2.204305 | 0 | |
| 519 | N568A | 2.983373 | 0 | -2.087013 | 0 | |
| 520 | N569A | 3.095937 | 0 | -1.969721 | 0 | |
| 521 | N570A | 2.991856 | 0 | -0.943602 | 0 | |
| 522 | N571A | 3.027341 | 0 | -0.811173 | 0 | |
| 523 | N572A | 3.062825 | 0 | -0.678744 | 0 | |
| 524 | N573A | 3.064701 | 0 | -1.114002 | 0 | |

## Joint Coordinates and Temperatures (Continued)

| | Label | X [ft] | Y [ft] | Z [ft] | Temp [F] | Detach From Diap... |
|---|---|---|---|---|---|---|
| 525 | N574A | 3.102638 | 0 | -0.975648 | 0 | |
| 526 | N575A | 3.140575 | 0 | -0.837294 | 0 | |
| 527 | N576A | 3.178512 | 0 | -0.69894 | 0 | |
| 528 | N577A | 3.21645 | 0 | -0.560586 | 0 | |
| 529 | N578A | 3.173029 | 0 | -1.151972 | 0 | |
| 530 | N579A | 3.213419 | 0 | -1.007693 | 0 | |
| 531 | N580A | 3.25381 | 0 | -0.863414 | 0 | |
| 532 | N581A | 3.2942 | 0 | -0.719135 | 0 | |
| 533 | N582A | 3.33459 | 0 | -0.574856 | 0 | |
| 534 | N583A | 3.281357 | 0 | -1.189942 | 0 | |
| 535 | N584A | 3.324201 | 0 | -1.039738 | 0 | |
| 536 | N585A | 3.367044 | 0 | -0.889534 | 0 | |
| 537 | N586A | 3.409888 | 0 | -0.73933 | 0 | |
| 538 | N587A | 3.452731 | 0 | -0.589126 | 0 | |
| 539 | N588A | 3.434982 | 0 | -1.071784 | 0 | |
| 540 | N589A | 3.480279 | 0 | -0.915655 | 0 | |
| 541 | N590A | 3.525575 | 0 | -0.759526 | 0 | |
| 542 | N591A | 3.134156 | 0 | -0.136579 | 0 | |
| 543 | N592A | 3.122207 | 0 | -0.273158 | 0 | |
| 544 | N593A | 3.110258 | 0 | -0.409737 | 0 | |
| 545 | N594A | 3.297593 | 0 | 0.00528 | 0 | |
| 546 | N595A | 3.277307 | 0 | -0.136187 | 0 | |
| 547 | N596A | 3.257022 | 0 | -0.277653 | 0 | |
| 548 | N597A | 3.236736 | 0 | -0.419119 | 0 | |
| 549 | N598A | 3.449081 | 0 | 0.01056 | 0 | |
| 550 | N599A | 3.420459 | 0 | -0.135794 | 0 | |
| 551 | N600A | 3.391836 | 0 | -0.282148 | 0 | |
| 552 | N601A | 3.363213 | 0 | -0.428502 | 0 | |
| 553 | N602A | 3.600569 | 0 | 0.015839 | 0 | |
| 554 | N603A | 3.56361 | 0 | -0.135402 | 0 | |
| 555 | N604A | 3.52665 | 0 | -0.286644 | 0 | |
| 556 | N605A | 3.48969 | 0 | -0.437885 | 0 | |
| 557 | N606A | 3.706761 | 0 | -0.13501 | 0 | |
| 558 | N607A | 3.661464 | 0 | -0.291139 | 0 | |
| 559 | N608A | 3.616168 | 0 | -0.447268 | 0 | |
| 560 | N609A | 3.134156 | 0 | 0.136579 | 0 | |
| 561 | N610A | 3.122207 | 0 | 0.273158 | 0 | |
| 562 | N611A | 3.110258 | 0 | 0.409737 | 0 | |
| 563 | N612A | 3.34289 | 0 | 0.161409 | 0 | |
| 564 | N613A | 3.321194 | 0 | 0.285899 | 0 | |
| 565 | N614A | 3.299498 | 0 | 0.410389 | 0 | |
| 566 | N615A | 3.277803 | 0 | 0.534879 | 0 | |
| 567 | N616A | 3.256107 | 0 | 0.659368 | 0 | |
| 568 | N617A | 3.539674 | 0 | 0.322818 | 0 | |
| 569 | N618A | 3.508232 | 0 | 0.435218 | 0 | |
| 570 | N619A | 3.476789 | 0 | 0.547619 | 0 | |
| 571 | N620A | 3.445347 | 0 | 0.66002 | 0 | |
| 572 | N621A | 3.413905 | 0 | 0.772421 | 0 | |
| 573 | N622A | 3.736458 | 0 | 0.484226 | 0 | |
| 574 | N623A | 3.695269 | 0 | 0.584538 | 0 | |
| 575 | N624A | 3.65408 | 0 | 0.68485 | 0 | |
| 576 | N625A | 3.612891 | 0 | 0.785162 | 0 | |

## Joint Coordinates and Temperatures (Continued)

| | Label | X [ft] | Y [ft] | Z [ft] | Temp [F] | Detach From Diap... |
|---|---|---|---|---|---|---|
| 577 | N626 | 3.571702 | 0 | 0.885474 | 0 | |
| 578 | N627 | 3.882307 | 0 | 0.733858 | 0 | |
| 579 | N628 | 3.831371 | 0 | 0.822081 | 0 | |
| 580 | N629 | 3.780436 | 0 | 0.910304 | 0 | |
| 581 | N630 | 3.062825 | 0 | 0.678744 | 0 | |
| 582 | N631 | 3.027341 | 0 | 0.811173 | 0 | |
| 583 | N632 | 2.991856 | 0 | 0.943602 | 0 | |
| 584 | N633 | 3.213869 | 0 | 0.785754 | 0 | |
| 585 | N634 | 3.171631 | 0 | 0.912139 | 0 | |
| 586 | N635 | 3.129392 | 0 | 1.038524 | 0 | |
| 587 | N636 | 3.087154 | 0 | 1.164909 | 0 | |
| 588 | N637 | 3.364913 | 0 | 0.892763 | 0 | |
| 589 | N638 | 3.31592 | 0 | 1.013104 | 0 | |
| 590 | N639 | 3.266928 | 0 | 1.133445 | 0 | |
| 591 | N640 | 3.217936 | 0 | 1.253786 | 0 | |
| 592 | N641 | 3.515956 | 0 | 0.999772 | 0 | |
| 593 | N642 | 3.46021 | 0 | 1.114069 | 0 | |
| 594 | N643 | 3.404464 | 0 | 1.228366 | 0 | |
| 595 | N644 | 3.348718 | 0 | 1.342663 | 0 | |
| 596 | N645 | 3.667 | 0 | 1.106781 | 0 | |
| 597 | N646 | 3.6045 | 0 | 1.215034 | 0 | |
| 598 | N647 | 3.542 | 0 | 1.323287 | 0 | |
| 599 | N648 | 2.898431 | 0 | 1.200287 | 0 | |
| 600 | N649 | 2.84049 | 0 | 1.324542 | 0 | |
| 601 | N650 | 2.782549 | 0 | 1.448797 | 0 | |
| 602 | N651 | 3.028073 | 0 | 1.285163 | 0 | |
| 603 | N652 | 2.968992 | 0 | 1.405418 | 0 | |
| 604 | N653 | 2.909911 | 0 | 1.525673 | 0 | |
| 605 | N655 | 3.157716 | 0 | 1.37004 | 0 | |
| 606 | N656 | 3.097495 | 0 | 1.486294 | 0 | |
| 607 | N657 | 3.037274 | 0 | 1.602549 | 0 | |
| 608 | N659 | 3.287358 | 0 | 1.454917 | 0 | |
| 609 | N660 | 3.225998 | 0 | 1.56717 | 0 | |
| 610 | N661 | 3.164637 | 0 | 1.679424 | 0 | |
| 611 | N663 | 3.417 | 0 | 1.539793 | 0 | |
| 612 | N664 | 3.3545 | 0 | 1.648046 | 0 | |
| 613 | N665 | 3.292 | 0 | 1.7563 | 0 | |
| 614 | N666 | 2.927402 | 0 | -1.138159 | 0 | |
| 615 | N667 | 2.898431 | 0 | -1.200287 | 0 | |
| 616 | N668 | 2.86946 | 0 | -1.262414 | 0 | |
| 617 | N669 | 3.037339 | 0 | -1.180016 | 0 | |
| 618 | N670 | 3.009977 | 0 | -1.24603 | 0 | |
| 619 | N671 | 2.982616 | 0 | -1.312044 | 0 | |
| 620 | N672 | 2.955254 | 0 | -1.378058 | 0 | |
| 621 | N673 | 3.147276 | 0 | -1.221872 | 0 | |
| 622 | N674 | 3.121524 | 0 | -1.291773 | 0 | |
| 623 | N675 | 3.095771 | 0 | -1.361673 | 0 | |
| 624 | N676 | 3.070019 | 0 | -1.431573 | 0 | |
| 625 | N677 | 3.257214 | 0 | -1.263729 | 0 | |
| 626 | N678 | 3.23307 | 0 | -1.337516 | 0 | |
| 627 | N679 | 3.208927 | 0 | -1.411302 | 0 | |
| 628 | N680 | 3.184783 | 0 | -1.485089 | 0 | |

## Joint Coordinates and Temperatures (Continued)

| | Label | X [ft] | Y [ft] | Z [ft] | Temp [F] | Detach From Diap... |
|---|---|---|---|---|---|---|
| 629 | N681 | 3.367151 | 0 | -1.305586 | 0 | |
| 630 | N682 | 3.344617 | 0 | -1.383258 | 0 | |
| 631 | N683 | 3.322082 | 0 | -1.460931 | 0 | |
| 632 | N684 | 2.811519 | 0 | -1.38667 | 0 | |
| 633 | N685 | 2.782549 | 0 | -1.448797 | 0 | |
| 634 | N686 | 2.927836 | 0 | -1.444267 | 0 | |
| 635 | N687 | 2.900417 | 0 | -1.510477 | 0 | |
| 636 | N688 | 3.044152 | 0 | -1.501865 | 0 | |
| 637 | N689 | 3.018286 | 0 | -1.572157 | 0 | |
| 638 | N690 | 3.160469 | 0 | -1.559463 | 0 | |
| 639 | N691 | 3.136155 | 0 | -1.633837 | 0 | |
| 640 | N692 | 3.276786 | 0 | -1.61706 | 0 | |
| 641 | N693 | 3.254024 | 0 | -1.695516 | 0 | |
| 642 | N694 | 1.203743 | 0 | -3.729106 | 0 | |
| 643 | N695 | 1.161172 | 0 | -3.471528 | 0 | |
| 644 | N696 | 3.84265 | 0 | 0.333377 | 0 | |
| 645 | N697 | 3.610468 | 0 | 0.222251 | 0 | |
| 646 | N698 | 3.575071 | 0 | 0.272534 | 0 | |
| 647 | N699 | 3.731509 | 0 | 0.38102 | 0 | |
| 648 | N700 | 3.887946 | 0 | 0.489506 | 0 | |
| 649 | N701 | 3.726559 | 0 | 0.277814 | 0 | |
| 650 | N702 | 3.436332 | 0 | 0.138907 | 0 | |
| 651 | N703 | 3.529775 | 0 | 0.116405 | 0 | |
| 652 | N704 | 3.663564 | 0 | 0.146827 | 0 | |
| 653 | N705 | 3.797353 | 0 | 0.177248 | 0 | |
| 654 | N706 | 1.305614 | 0 | -3.729106 | 0 | |
| 655 | N707 | 1.253539 | 0 | -3.568119 | 0 | |
| 656 | N708 | 1.182457 | 0 | -3.600317 | 0 | |
| 657 | N709 | 1.201465 | 0 | -3.407133 | 0 | |
| 658 | N710 | 1.101871 | 0 | -3.729106 | 0 | |
| 659 | N711 | 1.100733 | 0 | -3.568119 | 0 | |
| 660 | N712 | 1.099594 | 0 | -3.407133 | 0 | |
| 661 | N713 | 1.129244 | 0 | -3.278344 | 0 | |
| 662 | N714 | 3.182458 | 0 | -1.897535 | 0 | |
| 663 | N715 | 2.698565 | 0 | -1.618159 | 0 | |
| 664 | N716 | 2.819539 | 0 | -1.688003 | 0 | |
| 665 | N717 | 2.940512 | 0 | -1.757847 | 0 | |
| 666 | N718 | 3.061485 | 0 | -1.827691 | 0 | |
| 667 | N719 | 3.234542 | 0.333333 | -1.807323 | 0 | |
| 668 | N720 | 2.871622 | 0.333333 | -1.597792 | 0 | |
| 669 | N721 | 2.992595 | 0.333333 | -1.667635 | 0 | |
| 670 | N722 | 3.113569 | 0.333333 | -1.737479 | 0 | |
| 671 | N723 | 3.182458 | 0.333333 | -1.897535 | 0 | |
| 672 | N724 | 2.819539 | 0.333333 | -1.688003 | 0 | |
| 673 | N725 | 2.940512 | 0.333333 | -1.757847 | 0 | |
| 674 | N726 | 3.061485 | 0.333333 | -1.827691 | 0 | |
| 675 | N727 | 3.234542 | -0.333333 | -1.807323 | 0 | |
| 676 | N728 | 2.750649 | -0.333333 | -1.527948 | 0 | |
| 677 | N729 | 2.871622 | -0.333333 | -1.597792 | 0 | |
| 678 | N730 | 2.992595 | -0.333333 | -1.667635 | 0 | |
| 679 | N731 | 3.113569 | -0.333333 | -1.737479 | 0 | |
| 680 | N732 | 3.182458 | -0.333333 | -1.897535 | 0 | |

## Joint Coordinates and Temperatures (Continued)

| | Label | X [ft] | Y [ft] | Z [ft] | Temp [F] | Detach From Diap... |
|---|---|---|---|---|---|---|
| 681 | N733 | 2.698565 | -0.333333 | -1.618159 | 0 | |
| 682 | N734 | 2.819539 | -0.333333 | -1.688003 | 0 | |
| 683 | N735 | 2.940512 | -0.333333 | -1.757847 | 0 | |
| 684 | N736 | 3.061485 | -0.333333 | -1.827691 | 0 | |
| 685 | N737 | 3.234542 | -0.166666 | -1.807323 | 0 | |
| 686 | N738 | 2.750649 | -0.166666 | -1.527948 | 0 | |
| 687 | N739 | 2.871622 | -0.166666 | -1.597792 | 0 | |
| 688 | N740 | 2.992595 | -0.166666 | -1.667635 | 0 | |
| 689 | N741 | 3.113569 | -0.166666 | -1.737479 | 0 | |
| 690 | N742 | 3.182458 | -0.166666 | -1.897535 | 0 | |
| 691 | N743 | 2.698565 | -0.166666 | -1.618159 | 0 | |
| 692 | N744 | 2.819539 | -0.166666 | -1.688003 | 0 | |
| 693 | N745 | 2.940512 | -0.166666 | -1.757847 | 0 | |
| 694 | N746 | 3.061485 | -0.166666 | -1.827691 | 0 | |
| 695 | N747 | 3.234542 | 0.166667 | -1.807323 | 0 | |
| 696 | N748 | 2.750649 | 0.166667 | -1.527948 | 0 | |
| 697 | N749 | 2.871622 | 0.166667 | -1.597792 | 0 | |
| 698 | N750 | 2.992595 | 0.166667 | -1.667635 | 0 | |
| 699 | N751 | 3.113569 | 0.166667 | -1.737479 | 0 | |
| 700 | N752 | 3.182458 | 0.166667 | -1.897535 | 0 | |
| 701 | N753 | 2.698565 | 0.166667 | -1.618159 | 0 | |
| 702 | N754 | 2.819539 | 0.166667 | -1.688003 | 0 | |
| 703 | N755 | 2.940512 | 0.166667 | -1.757847 | 0 | |
| 704 | N756 | 3.061485 | 0.166667 | -1.827691 | 0 | |
| 705 | N760 | -3.182459 | 0 | -1.897534 | 0 | |
| 706 | N761 | -1.407485 | 0 | -3.729106 | 0 | |
| 707 | N762 | -3.933243 | 0 | 0.645635 | 0 | |
| 708 | N764 | -0.546315 | 0 | -3.098309 | 0 | |
| 709 | N765 | -1.076031 | 0 | -2.956372 | 0 | |
| 710 | N766 | -1.573053 | 0 | -2.724607 | 0 | |
| 711 | N767 | -2.022278 | 0 | -2.410057 | 0 | |
| 712 | N768 | -2.410057 | 0 | -2.022278 | 0 | |
| 713 | N769 | -2.698566 | 0 | -1.618158 | 0 | |
| 714 | N770 | -2.956372 | 0 | -1.076031 | 0 | |
| 715 | N771 | -3.098309 | 0 | -0.546315 | 0 | |
| 716 | N772 | -3.146106 | 0 | 1e-14 | 0 | |
| 717 | N773 | -3.098309 | 0 | 0.546315 | 0 | |
| 718 | N774 | -2.956372 | 0 | 1.076031 | 0 | |
| 719 | N777 | -0.5 | 0 | -3.729106 | 0 | |
| 720 | N778 | -1 | 0 | -3.729106 | 0 | |
| 721 | N780 | -3.4795 | 0 | 1.43154 | 0 | |
| 722 | N781 | -3.7295 | 0 | 0.998527 | 0 | |
| 723 | N782 | -1.857739 | 0 | -3.259936 | 0 | |
| 724 | N783 | -2.307993 | 0 | -2.790767 | 0 | |
| 725 | N784 | -2.758246 | 0 | -2.321598 | 0 | |
| 726 | N785 | -3.389686 | 0 | -1.227913 | 0 | |
| 727 | N786 | -3.570871 | 0 | -0.603397 | 0 | |
| 728 | N787 | -3.752057 | 0 | 0.021119 | 0 | |
| 729 | N788 | -2.567332 | 0 | -1.797665 | 0 | |
| 730 | N789 | -2.982244 | 0 | -2.08819 | 0 | |
| 731 | N793 | -2.782549 | 0 | 1.448797 | 0 | |
| 732 | N794A | -2.84049 | 0 | 1.324542 | 0 | |

## Joint Coordinates and Temperatures (Continued)

| | Label | X [ft] | Y [ft] | Z [ft] | Temp [F] | Detach From Diap... |
|---|---|---|---|---|---|---|
| 733 | N795A | -2.898431 | 0 | 1.200287 | 0 | |
| 734 | N796A | -2.909911 | 0 | 1.525673 | 0 | |
| 735 | N797A | -2.968992 | 0 | 1.405418 | 0 | |
| 736 | N798A | -3.028073 | 0 | 1.285163 | 0 | |
| 737 | N799A | -3.087154 | 0 | 1.164909 | 0 | |
| 738 | N800A | -3.037274 | 0 | 1.602549 | 0 | |
| 739 | N801A | -3.097495 | 0 | 1.486294 | 0 | |
| 740 | N802A | -3.157716 | 0 | 1.37004 | 0 | |
| 741 | N803A | -3.217936 | 0 | 1.253786 | 0 | |
| 742 | N804A | -3.164637 | 0 | 1.679424 | 0 | |
| 743 | N805A | -3.225998 | 0 | 1.56717 | 0 | |
| 744 | N806A | -3.287358 | 0 | 1.454917 | 0 | |
| 745 | N807A | -3.348718 | 0 | 1.342663 | 0 | |
| 746 | N808A | -3.292 | 0 | 1.7563 | 0 | |
| 747 | N809A | -3.3545 | 0 | 1.648046 | 0 | |
| 748 | N810A | -3.417 | 0 | 1.539793 | 0 | |
| 749 | N811A | -2.991856 | 0 | 0.943602 | 0 | |
| 750 | N812A | -3.027341 | 0 | 0.811173 | 0 | |
| 751 | N813A | -3.062825 | 0 | 0.678744 | 0 | |
| 752 | N814 | -3.129392 | 0 | 1.038524 | 0 | |
| 753 | N815A | -3.171631 | 0 | 0.912139 | 0 | |
| 754 | N816A | -3.213869 | 0 | 0.785754 | 0 | |
| 755 | N817 | -3.256107 | 0 | 0.659368 | 0 | |
| 756 | N818A | -3.266928 | 0 | 1.133445 | 0 | |
| 757 | N819A | -3.31592 | 0 | 1.013104 | 0 | |
| 758 | N820 | -3.364913 | 0 | 0.892763 | 0 | |
| 759 | N821A | -3.413905 | 0 | 0.772421 | 0 | |
| 760 | N822A | -3.404464 | 0 | 1.228366 | 0 | |
| 761 | N823 | -3.46021 | 0 | 1.114069 | 0 | |
| 762 | N824A | -3.515956 | 0 | 0.999772 | 0 | |
| 763 | N825A | -3.571702 | 0 | 0.885474 | 0 | |
| 764 | N826 | -3.542 | 0 | 1.323287 | 0 | |
| 765 | N827 | -3.6045 | 0 | 1.215034 | 0 | |
| 766 | N828 | -3.667 | 0 | 1.106781 | 0 | |
| 767 | N829 | -3.724509 | 0 | 0.620805 | 0 | |
| 768 | N830 | -3.515776 | 0 | 0.595975 | 0 | |
| 769 | N831 | -3.307043 | 0 | 0.571145 | 0 | |
| 770 | N832 | -3.887946 | 0 | 0.489506 | 0 | |
| 771 | N833 | -3.693524 | 0 | 0.469564 | 0 | |
| 772 | N834 | -3.499102 | 0 | 0.449621 | 0 | |
| 773 | N835 | -3.30468 | 0 | 0.429679 | 0 | |
| 774 | N836 | -3.110258 | 0 | 0.409737 | 0 | |
| 775 | N837 | -3.84265 | 0 | 0.333377 | 0 | |
| 776 | N838 | -3.662539 | 0 | 0.318322 | 0 | |
| 777 | N839 | -3.482429 | 0 | 0.303267 | 0 | |
| 778 | N840 | -3.302318 | 0 | 0.288213 | 0 | |
| 779 | N841 | -3.122207 | 0 | 0.273158 | 0 | |
| 780 | N842 | -3.797353 | 0 | 0.177248 | 0 | |
| 781 | N843 | -3.631554 | 0 | 0.167081 | 0 | |
| 782 | N844 | -3.465755 | 0 | 0.156913 | 0 | |
| 783 | N845 | -3.299956 | 0 | 0.146746 | 0 | |
| 784 | N846 | -3.134156 | 0 | 0.136579 | 0 | |

## Joint Coordinates and Temperatures (Continued)

| | Label | X [ft] | Y [ft] | Z [ft] | Temp [F] | Detach From Diap... |
|---|---|---|---|---|---|---|
| 785 | N847 | -3.600569 | 0 | 0.015839 | 0 | |
| 786 | N848 | -3.449081 | 0 | 0.01056 | 0 | |
| 787 | N849 | -3.297593 | 0 | 0.00528 | 0 | |
| 788 | N850 | -3.706761 | 0 | -0.13501 | 0 | |
| 789 | N851 | -3.56361 | 0 | -0.135402 | 0 | |
| 790 | N852 | -3.420459 | 0 | -0.135794 | 0 | |
| 791 | N853 | -3.277307 | 0 | -0.136187 | 0 | |
| 792 | N854 | -3.134156 | 0 | -0.136579 | 0 | |
| 793 | N855 | -3.661464 | 0 | -0.291139 | 0 | |
| 794 | N856 | -3.52665 | 0 | -0.286644 | 0 | |
| 795 | N857 | -3.391836 | 0 | -0.282148 | 0 | |
| 796 | N858 | -3.257022 | 0 | -0.277653 | 0 | |
| 797 | N859 | -3.122207 | 0 | -0.273158 | 0 | |
| 798 | N860 | -3.616168 | 0 | -0.447268 | 0 | |
| 799 | N861 | -3.48969 | 0 | -0.437885 | 0 | |
| 800 | N862 | -3.363213 | 0 | -0.428502 | 0 | |
| 801 | N863 | -3.236736 | 0 | -0.419119 | 0 | |
| 802 | N864 | -3.110258 | 0 | -0.409737 | 0 | |
| 803 | N865 | -3.452731 | 0 | -0.589126 | 0 | |
| 804 | N866 | -3.33459 | 0 | -0.574856 | 0 | |
| 805 | N867 | -3.21645 | 0 | -0.560586 | 0 | |
| 806 | N868 | -3.525575 | 0 | -0.759526 | 0 | |
| 807 | N869 | -3.409888 | 0 | -0.73933 | 0 | |
| 808 | N870 | -3.2942 | 0 | -0.719135 | 0 | |
| 809 | N871 | -3.178512 | 0 | -0.69894 | 0 | |
| 810 | N872 | -3.062825 | 0 | -0.678744 | 0 | |
| 811 | N873 | -3.480279 | 0 | -0.915655 | 0 | |
| 812 | N874 | -3.367044 | 0 | -0.889534 | 0 | |
| 813 | N875 | -3.25381 | 0 | -0.863414 | 0 | |
| 814 | N876 | -3.140575 | 0 | -0.837294 | 0 | |
| 815 | N877 | -3.027341 | 0 | -0.811173 | 0 | |
| 816 | N878 | -3.434982 | 0 | -1.071784 | 0 | |
| 817 | N879 | -3.324201 | 0 | -1.039738 | 0 | |
| 818 | N880 | -3.213419 | 0 | -1.007693 | 0 | |
| 819 | N881 | -3.102638 | 0 | -0.975648 | 0 | |
| 820 | N882 | -2.991856 | 0 | -0.943602 | 0 | |
| 821 | N883 | -3.281357 | 0 | -1.189942 | 0 | |
| 822 | N884 | -3.173029 | 0 | -1.151972 | 0 | |
| 823 | N885 | -3.064701 | 0 | -1.114002 | 0 | |
| 824 | N886 | -2.898431 | 0 | -1.200287 | 0 | |
| 825 | N887 | -2.84049 | 0 | -1.324542 | 0 | |
| 826 | N888 | -2.782549 | 0 | -1.448797 | 0 | |
| 827 | N889 | -3.009921 | 0 | -1.246225 | 0 | |
| 828 | N890 | -2.955141 | 0 | -1.378449 | 0 | |
| 829 | N891 | -2.900361 | 0 | -1.510673 | 0 | |
| 830 | N892 | -2.819539 | 0 | -1.688002 | 0 | |
| 831 | N893 | -3.12141 | 0 | -1.292164 | 0 | |
| 832 | N894 | -3.069791 | 0 | -1.432356 | 0 | |
| 833 | N895 | -3.018173 | 0 | -1.572548 | 0 | |
| 834 | N896 | -2.940512 | 0 | -1.757846 | 0 | |
| 835 | N897 | -3.2329 | 0 | -1.338103 | 0 | |
| 836 | N898 | -3.184442 | 0 | -1.486263 | 0 | |

## Joint Coordinates and Temperatures (Continued)

| | Label | X [ft] | Y [ft] | Z [ft] | Temp [F] | Detach From Diap... |
|---|---|---|---|---|---|---|
| 837 | N899C | -3.135985 | 0 | -1.634424 | 0 | |
| 838 | N900B | -3.061486 | 0 | -1.82769 | 0 | |
| 839 | N901B | -3.344389 | 0 | -1.384042 | 0 | |
| 840 | N902B | -3.299093 | 0 | -1.540171 | 0 | |
| 841 | N903 | -3.253797 | 0 | -1.6963 | 0 | |
| 842 | N904 | -2.313112 | 0 | -2.119222 | 0 | |
| 843 | N905A | -2.216167 | 0 | -2.216167 | 0 | |
| 844 | N906A | -2.119222 | 0 | -2.313112 | 0 | |
| 845 | N907 | -2.497104 | 0 | -2.097108 | 0 | |
| 846 | N908 | -2.396255 | 0 | -2.199139 | 0 | |
| 847 | N909 | -2.295405 | 0 | -2.301171 | 0 | |
| 848 | N910 | -2.194556 | 0 | -2.403203 | 0 | |
| 849 | N911A | -2.093706 | 0 | -2.505234 | 0 | |
| 850 | N912B | -2.584152 | 0 | -2.171938 | 0 | |
| 851 | N913B | -2.479397 | 0 | -2.279056 | 0 | |
| 852 | N914B | -2.374643 | 0 | -2.386175 | 0 | |
| 853 | N915B | -2.269889 | 0 | -2.493293 | 0 | |
| 854 | N916B | -2.165135 | 0 | -2.600412 | 0 | |
| 855 | N917A | -2.671199 | 0 | -2.246768 | 0 | |
| 856 | N918A | -2.56254 | 0 | -2.358973 | 0 | |
| 857 | N919A | -2.453881 | 0 | -2.471179 | 0 | |
| 858 | N920A | -2.345223 | 0 | -2.583384 | 0 | |
| 859 | N921A | -2.236564 | 0 | -2.695589 | 0 | |
| 860 | N922B | -2.645683 | 0 | -2.43889 | 0 | |
| 861 | N923B | -2.53312 | 0 | -2.556182 | 0 | |
| 862 | N924B | -2.420556 | 0 | -2.673475 | 0 | |
| 863 | N925B | -1.685359 | 0 | -2.64597 | 0 | |
| 864 | N926B | -1.797665 | 0 | -2.567332 | 0 | |
| 865 | N927 | -1.909971 | 0 | -2.488694 | 0 | |
| 866 | N928 | -1.644224 | 0 | -2.85844 | 0 | |
| 867 | N929 | -1.756595 | 0 | -2.770138 | 0 | |
| 868 | N930 | -1.868965 | 0 | -2.681837 | 0 | |
| 869 | N931 | -1.981336 | 0 | -2.593536 | 0 | |
| 870 | N932 | -1.715396 | 0 | -2.992272 | 0 | |
| 871 | N933 | -1.827831 | 0 | -2.894307 | 0 | |
| 872 | N934 | -1.940265 | 0 | -2.796342 | 0 | |
| 873 | N935 | -2.0527 | 0 | -2.698377 | 0 | |
| 874 | N936 | -1.786567 | 0 | -3.126104 | 0 | |
| 875 | N937 | -1.899066 | 0 | -3.018475 | 0 | |
| 876 | N938 | -2.011566 | 0 | -2.910847 | 0 | |
| 877 | N939 | -2.124065 | 0 | -2.803218 | 0 | |
| 878 | N940 | -1.970302 | 0 | -3.142644 | 0 | |
| 879 | N941 | -2.082866 | 0 | -3.025352 | 0 | |
| 880 | N942 | -2.195429 | 0 | -2.908059 | 0 | |
| 881 | N943 | -1.448797 | 0 | -2.782549 | 0 | |
| 882 | N944 | -1.324542 | 0 | -2.84049 | 0 | |
| 883 | N945 | -1.200287 | 0 | -2.898431 | 0 | |
| 884 | N946 | -1.531661 | 0 | -2.975732 | 0 | |
| 885 | N947 | -1.413002 | 0 | -3.019188 | 0 | |
| 886 | N948 | -1.294342 | 0 | -3.062644 | 0 | |
| 887 | N949 | -1.175683 | 0 | -3.1061 | 0 | |
| 888 | N950 | -1.057024 | 0 | -3.149556 | 0 | |

## Joint Coordinates and Temperatures (Continued)

| | Label | X [ft] | Y [ft] | Z [ft] | Temp [F] | Detach From Diap... |
|---|---|---|---|---|---|---|
| 889 | N951A | -1.490269 | 0 | -3.226856 | 0 | |
| 890 | N952C | -1.377206 | 0 | -3.255827 | 0 | |
| 891 | N953B | -1.264142 | 0 | -3.284798 | 0 | |
| 892 | N954B | -1.151079 | 0 | -3.313768 | 0 | |
| 893 | N955C | -1.038016 | 0 | -3.342739 | 0 | |
| 894 | N956C | -1.448877 | 0 | -3.477981 | 0 | |
| 895 | N957B | -1.34141 | 0 | -3.492466 | 0 | |
| 896 | N958A | -1.233942 | 0 | -3.506952 | 0 | |
| 897 | N959 | -1.126475 | 0 | -3.521437 | 0 | |
| 898 | N960A | -1.019008 | 0 | -3.535922 | 0 | |
| 899 | N961A | -1.305614 | 0 | -3.729106 | 0 | |
| 900 | N962A | -1.203743 | 0 | -3.729106 | 0 | |
| 901 | N963A | -1.101871 | 0 | -3.729106 | 0 | |
| 902 | N964A | -0.943602 | 0 | -2.991856 | 0 | |
| 903 | N965 | -0.811173 | 0 | -3.027341 | 0 | |
| 904 | N966A | -0.678744 | 0 | -3.062825 | 0 | |
| 905 | N967A | -0.926452 | 0 | -3.176169 | 0 | |
| 906 | N968A | -0.79588 | 0 | -3.202782 | 0 | |
| 907 | N969A | -0.665308 | 0 | -3.229395 | 0 | |
| 908 | N970A | -0.534737 | 0 | -3.256008 | 0 | |
| 909 | N971A | -0.909301 | 0 | -3.360481 | 0 | |
| 910 | N972A | -0.780587 | 0 | -3.378223 | 0 | |
| 911 | N973A | -0.651872 | 0 | -3.395965 | 0 | |
| 912 | N974 | -0.523158 | 0 | -3.413707 | 0 | |
| 913 | N975 | -0.892151 | 0 | -3.544793 | 0 | |
| 914 | N976A | -0.765293 | 0 | -3.553664 | 0 | |
| 915 | N977A | -0.638436 | 0 | -3.562535 | 0 | |
| 916 | N978 | -0.511579 | 0 | -3.571406 | 0 | |
| 917 | N979A | -0.875 | 0 | -3.729106 | 0 | |
| 918 | N980A | -0.75 | 0 | -3.729106 | 0 | |
| 919 | N981A | -0.625 | 0 | -3.729106 | 0 | |
| 920 | N982A | -0.409737 | 0 | -3.110258 | 0 | |
| 921 | N983A | -0.273158 | 0 | -3.122207 | 0 | |
| 922 | N984A | -0.136579 | 0 | -3.134156 | 0 | |
| 923 | N985A | -0.401052 | 0 | -3.26497 | 0 | |
| 924 | N986A | -0.267368 | 0 | -3.273932 | 0 | |
| 925 | N987 | -0.133684 | 0 | -3.282894 | 0 | |
| 926 | N989 | -0.392368 | 0 | -3.419682 | 0 | |
| 927 | N990 | -0.261579 | 0 | -3.425656 | 0 | |
| 928 | N991 | -0.130789 | 0 | -3.431631 | 0 | |
| 929 | N993A | -0.383684 | 0 | -3.574394 | 0 | |
| 930 | N994 | -0.255789 | 0 | -3.577381 | 0 | |
| 931 | N995A | -0.127895 | 0 | -3.580368 | 0 | |
| 932 | N997A | -0.375 | 0 | -3.729106 | 0 | |
| 933 | N998A | -0.25 | 0 | -3.729106 | 0 | |
| 934 | N999A | -0.125 | 0 | -3.729106 | 0 | |
| 935 | N1000A | -2.449376 | 0 | -1.966125 | 0 | |
| 936 | N1001A | -2.488694 | 0 | -1.909971 | 0 | |
| 937 | N1002A | -2.528013 | 0 | -1.853818 | 0 | |
| 938 | N1003 | -2.540593 | 0 | -2.040405 | 0 | |
| 939 | N1004 | -2.584082 | 0 | -1.983702 | 0 | |
| 940 | N1005 | -2.627571 | 0 | -1.926999 | 0 | |

## Joint Coordinates and Temperatures (Continued)

| | Label | X [ft] | Y [ft] | Z [ft] | Temp [F] | Detach From Diap... |
|---|---|---|---|---|---|---|
| 941 | N1006 | -2.67106 | 0 | -1.870296 | 0 | |
| 942 | N1007 | -2.631811 | 0 | -2.114685 | 0 | |
| 943 | N1008 | -2.67947 | 0 | -2.057433 | 0 | |
| 944 | N1009 | -2.727129 | 0 | -2.00018 | 0 | |
| 945 | N1010 | -2.774788 | 0 | -1.942928 | 0 | |
| 946 | N1011 | -2.723028 | 0 | -2.188965 | 0 | |
| 947 | N1012 | -2.774858 | 0 | -2.131163 | 0 | |
| 948 | N1013 | -2.826687 | 0 | -2.073361 | 0 | |
| 949 | N1014 | -2.878516 | 0 | -2.015559 | 0 | |
| 950 | N1015 | -2.814246 | 0 | -2.263246 | 0 | |
| 951 | N1016 | -2.870245 | 0 | -2.204894 | 0 | |
| 952 | N1017 | -2.926245 | 0 | -2.146542 | 0 | |
| 953 | N1018 | -2.606651 | 0 | -1.741512 | 0 | |
| 954 | N1019 | -2.64597 | 0 | -1.685359 | 0 | |
| 955 | N1020 | -2.71469 | 0 | -1.813446 | 0 | |
| 956 | N1021 | -2.75832 | 0 | -1.756597 | 0 | |
| 957 | N1022 | -2.822729 | 0 | -1.885381 | 0 | |
| 958 | N1023 | -2.870671 | 0 | -1.827834 | 0 | |
| 959 | N1024 | -2.930769 | 0 | -1.957315 | 0 | |
| 960 | N1025 | -2.983022 | 0 | -1.899072 | 0 | |
| 961 | N1026 | -3.038808 | 0 | -2.029249 | 0 | |
| 962 | N1027 | -3.095372 | 0 | -1.970309 | 0 | |
| 963 | N1028 | -3.831371 | 0 | 0.822081 | 0 | |
| 964 | N1029 | -3.587017 | 0 | 0.730159 | 0 | |
| 965 | N1030 | -1.632612 | 0 | -3.494521 | 0 | |
| 966 | N1031 | -1.612759 | 0 | -3.237883 | 0 | |
| 967 | N1032 | -1.551514 | 0 | -3.23237 | 0 | |
| 968 | N1033 | -1.535781 | 0 | -3.422091 | 0 | |
| 969 | N1034 | -1.520048 | 0 | -3.611813 | 0 | |
| 970 | N1035 | -1.622685 | 0 | -3.366202 | 0 | |
| 971 | N1036 | -1.597869 | 0 | -3.045405 | 0 | |
| 972 | N1037 | -1.664077 | 0 | -3.115077 | 0 | |
| 973 | N1038 | -1.704626 | 0 | -3.246153 | 0 | |
| 974 | N1039 | -1.745175 | 0 | -3.377229 | 0 | |
| 975 | N1040 | -3.882307 | 0 | 0.733858 | 0 | |
| 976 | N1041 | -3.716852 | 0 | 0.698463 | 0 | |
| 977 | N1042 | -3.709194 | 0 | 0.77612 | 0 | |
| 978 | N1043 | -3.551397 | 0 | 0.663067 | 0 | |
| 979 | N1044 | -3.780436 | 0 | 0.910304 | 0 | |
| 980 | N1045 | -3.640448 | 0 | 0.830797 | 0 | |
| 981 | N1046 | -3.500461 | 0 | 0.75129 | 0 | |
| 982 | N1047 | -3.403752 | 0 | 0.661218 | 0 | |
| 983 | N1048 | -3.234542 | 0 | -1.807322 | 0 | |
| 984 | N1049 | -2.750649 | 0 | -1.527947 | 0 | |
| 985 | N1050 | -2.871623 | 0 | -1.597791 | 0 | |
| 986 | N1051 | -2.992596 | 0 | -1.667635 | 0 | |
| 987 | N1052 | -3.113569 | 0 | -1.737479 | 0 | |
| 988 | N1053 | -3.182459 | 0.333333 | -1.897534 | 0 | |
| 989 | N1054 | -2.819539 | 0.333333 | -1.688002 | 0 | |
| 990 | N1055 | -2.940512 | 0.333333 | -1.757846 | 0 | |
| 991 | N1056 | -3.061486 | 0.333333 | -1.82769 | 0 | |
| 992 | N1057 | -3.234542 | 0.333333 | -1.807322 | 0 | |

## Joint Coordinates and Temperatures (Continued)

| | Label | X [ft] | Y [ft] | Z [ft] | Temp [F] | Detach From Diap... |
|---|---|---|---|---|---|---|
| 993 | N1058 | -2.871623 | 0.333333 | -1.597791 | 0 | |
| 994 | N1059 | -2.992596 | 0.333333 | -1.667635 | 0 | |
| 995 | N1060 | -3.113569 | 0.333333 | -1.737479 | 0 | |
| 996 | N1061 | -3.182459 | -0.333333 | -1.897534 | 0 | |
| 997 | N1062 | -2.698566 | -0.333333 | -1.618158 | 0 | |
| 998 | N1063 | -2.819539 | -0.333333 | -1.688002 | 0 | |
| 999 | N1064 | -2.940512 | -0.333333 | -1.757846 | 0 | |
| 1000 | N1065 | -3.061486 | -0.333333 | -1.82769 | 0 | |
| 1001 | N1066 | -3.234542 | -0.333333 | -1.807322 | 0 | |
| 1002 | N1067 | -2.750649 | -0.333333 | -1.527947 | 0 | |
| 1003 | N1068 | -2.871623 | -0.333333 | -1.597791 | 0 | |
| 1004 | N1069 | -2.992596 | -0.333333 | -1.667635 | 0 | |
| 1005 | N1070 | -3.113569 | -0.333333 | -1.737479 | 0 | |
| 1006 | N1071 | -3.182459 | -0.166666 | -1.897534 | 0 | |
| 1007 | N1072 | -2.698566 | -0.166666 | -1.618158 | 0 | |
| 1008 | N1073 | -2.819539 | -0.166666 | -1.688002 | 0 | |
| 1009 | N1074 | -2.940512 | -0.166666 | -1.757846 | 0 | |
| 1010 | N1075 | -3.061486 | -0.166666 | -1.82769 | 0 | |
| 1011 | N1076 | -3.234542 | -0.166666 | -1.807322 | 0 | |
| 1012 | N1077 | -2.750649 | -0.166666 | -1.527947 | 0 | |
| 1013 | N1078 | -2.871623 | -0.166666 | -1.597791 | 0 | |
| 1014 | N1079 | -2.992596 | -0.166666 | -1.667635 | 0 | |
| 1015 | N1080 | -3.113569 | -0.166666 | -1.737479 | 0 | |
| 1016 | N1081 | -3.182459 | 0.166667 | -1.897534 | 0 | |
| 1017 | N1082 | -2.698566 | 0.166667 | -1.618158 | 0 | |
| 1018 | N1083 | -2.819539 | 0.166667 | -1.688002 | 0 | |
| 1019 | N1084 | -2.940512 | 0.166667 | -1.757846 | 0 | |
| 1020 | N1085 | -3.061486 | 0.166667 | -1.82769 | 0 | |
| 1021 | N1086 | -3.234542 | 0.166667 | -1.807322 | 0 | |
| 1022 | N1087 | -2.750649 | 0.166667 | -1.527947 | 0 | |
| 1023 | N1088 | -2.871623 | 0.166667 | -1.597791 | 0 | |
| 1024 | N1089 | -2.992596 | 0.166667 | -1.667635 | 0 | |
| 1025 | N1090 | -3.113569 | 0.166667 | -1.737479 | 0 | |
| 1026 | N1066A | -2.525758 | 0.208333 | 3.083471 | 0 | |
| 1027 | N1067A | 2.525758 | 0.208333 | 3.083471 | 0 | |
| 1028 | N1068A | -1.894318 | 0.208333 | 3.238817 | 0 | |
| 1029 | N1069A | -1.262879 | 0.208333 | 3.394164 | 0 | |
| 1030 | N1070A | -0.631439 | 0.208333 | 3.54951 | 0 | |
| 1031 | N1071A | 0.631439 | 0.208333 | 3.54951 | 0 | |
| 1032 | N1072A | 1.262879 | 0.208333 | 3.394164 | 0 | |
| 1033 | N1073A | 1.894318 | 0.208333 | 3.238817 | 0 | |
| 1034 | N1074A | -0.317303 | 0.208333 | 3.626794 | 0 | |
| 1035 | N1075A | 2.367898 | 0.208333 | 3.122307 | 0 | |
| 1036 | N1076A | 2.210038 | 0.208333 | 3.161144 | 0 | |
| 1037 | N1077A | 2.052178 | 0.208333 | 3.199981 | 0 | |
| 1038 | N1078A | 1.736458 | 0.208333 | 3.277654 | 0 | |
| 1039 | N1079A | 1.578599 | 0.208333 | 3.31649 | 0 | |
| 1040 | N1080A | 1.420739 | 0.208333 | 3.355327 | 0 | |
| 1041 | N1081A | 1.105019 | 0.208333 | 3.433 | 0 | |
| 1042 | N1082A | 0.947159 | 0.208333 | 3.471837 | 0 | |
| 1043 | N1083A | 0.789299 | 0.208333 | 3.510674 | 0 | |
| 1044 | N1084A | 0.47358 | 0.208333 | 3.588347 | 0 | |

## Joint Coordinates and Temperatures (Continued)

| | Label | X [ft] | Y [ft] | Z [ft] | Temp [F] | Detach From Diap... |
|---|---|---|---|---|---|---|
| 1045 | N1085A | 0.31572 | 0.208333 | 3.627184 | 0 | |
| 1046 | N1086A | 0.15786 | 0.208333 | 3.66602 | 0 | |
| 1047 | N1087A | -0.789299 | 0.208333 | 3.510674 | 0 | |
| 1048 | N1088A | -0.947159 | 0.208333 | 3.471837 | 0 | |
| 1049 | N1089A | -1.105019 | 0.208333 | 3.433 | 0 | |
| 1050 | N1090A | -1.736458 | 0.208333 | 3.277654 | 0 | |
| 1051 | N1091 | -1.578599 | 0.208333 | 3.31649 | 0 | |
| 1052 | N1092 | -1.420739 | 0.208333 | 3.355327 | 0 | |
| 1053 | N1093 | -0.552905 | 0.208333 | 3.568831 | 0 | |
| 1054 | N1094 | -0.474371 | 0.208333 | 3.588152 | 0 | |
| 1055 | N1095 | -0.395837 | 0.208333 | 3.607473 | 0 | |
| 1056 | N1096 | -0.237978 | 0.208333 | 3.64631 | 0 | |
| 1057 | N1097 | -0.158652 | 0.208333 | 3.665826 | 0 | |
| 1058 | N1098 | -2.210038 | 0.208333 | 3.161144 | 0 | |
| 1059 | N1099 | -2.367898 | 0.208333 | 3.122307 | 0 | |
| 1060 | N1100 | -2.052178 | 0.208333 | 3.199981 | 0 | |
| 1061 | N1136 | 3.933243 | 0.208333 | 0.645635 | 0 | |
| 1062 | N1137 | 1.407485 | 0.208333 | -3.729106 | 0 | |
| 1063 | N1138 | 3.752057 | 0.208333 | 0.021119 | 0 | |
| 1064 | N1139 | 3.570871 | 0.208333 | -0.603397 | 0 | |
| 1065 | N1140 | 3.389686 | 0.208333 | -1.227913 | 0 | |
| 1066 | N1141 | 2.758246 | 0.208333 | -2.321598 | 0 | |
| 1067 | N1142 | 2.307993 | 0.208333 | -2.790767 | 0 | |
| 1068 | N1143 | 1.857739 | 0.208333 | -3.259936 | 0 | |
| 1069 | N1144 | 3.299547 | 0.208333 | -1.538604 | 0 | |
| 1070 | N1145 | 1.520048 | 0.208333 | -3.611813 | 0 | |
| 1071 | N1146 | 1.632612 | 0.208333 | -3.494521 | 0 | |
| 1072 | N1147 | 1.745175 | 0.208333 | -3.377229 | 0 | |
| 1073 | N1148 | 1.970302 | 0.208333 | -3.142644 | 0 | |
| 1074 | N1149 | 2.082866 | 0.208333 | -3.025352 | 0 | |
| 1075 | N1150 | 2.195429 | 0.208333 | -2.908059 | 0 | |
| 1076 | N1151 | 2.420556 | 0.208333 | -2.673475 | 0 | |
| 1077 | N1152 | 2.53312 | 0.208333 | -2.556182 | 0 | |
| 1078 | N1153 | 2.645683 | 0.208333 | -2.43889 | 0 | |
| 1079 | N1154 | 2.87081 | 0.208333 | -2.204305 | 0 | |
| 1080 | N1155 | 2.983373 | 0.208333 | -2.087013 | 0 | |
| 1081 | N1156 | 3.095937 | 0.208333 | -1.969721 | 0 | |
| 1082 | N1157 | 3.434982 | 0.208333 | -1.071784 | 0 | |
| 1083 | N1158 | 3.480279 | 0.208333 | -0.915655 | 0 | |
| 1084 | N1159 | 3.525575 | 0.208333 | -0.759526 | 0 | |
| 1085 | N1160 | 3.706761 | 0.208333 | -0.13501 | 0 | |
| 1086 | N1161 | 3.661464 | 0.208333 | -0.291139 | 0 | |
| 1087 | N1162 | 3.616168 | 0.208333 | -0.447268 | 0 | |
| 1088 | N1163 | 3.367151 | 0.208333 | -1.305586 | 0 | |
| 1089 | N1164 | 3.344617 | 0.208333 | -1.383258 | 0 | |
| 1090 | N1165 | 3.322082 | 0.208333 | -1.460931 | 0 | |
| 1091 | N1166 | 3.276786 | 0.208333 | -1.61706 | 0 | |
| 1092 | N1167 | 3.254024 | 0.208333 | -1.695516 | 0 | |
| 1093 | N1168 | 3.84265 | 0.208333 | 0.333377 | 0 | |
| 1094 | N1169 | 3.887946 | 0.208333 | 0.489506 | 0 | |
| 1095 | N1170 | 3.797353 | 0.208333 | 0.177248 | 0 | |
| 1096 | N1206 | -1.407485 | 0.208333 | -3.729106 | 0 | |

## Joint Coordinates and Temperatures (Continued)

| | Label | X [ft] | Y [ft] | Z [ft] | Temp [F] | Detach From Diap... |
|---|---|---|---|---|---|---|
| 1097 | N1207 | -3.933243 | 0.208333 | 0.645635 | 0 | |
| 1098 | N1208 | -1.857739 | 0.208333 | -3.259936 | 0 | |
| 1099 | N1209 | -2.307993 | 0.208333 | -2.790767 | 0 | |
| 1100 | N1210 | -2.758246 | 0.208333 | -2.321598 | 0 | |
| 1101 | N1211 | -3.389686 | 0.208333 | -1.227913 | 0 | |
| 1102 | N1212 | -3.570871 | 0.208333 | -0.603397 | 0 | |
| 1103 | N1213 | -3.752057 | 0.208333 | 0.021119 | 0 | |
| 1104 | N1214 | -2.982244 | 0.208333 | -2.08819 | 0 | |
| 1105 | N1215 | -3.887946 | 0.208333 | 0.489506 | 0 | |
| 1106 | N1216 | -3.84265 | 0.208333 | 0.333377 | 0 | |
| 1107 | N1217 | -3.797353 | 0.208333 | 0.177248 | 0 | |
| 1108 | N1218 | -3.706761 | 0.208333 | -0.13501 | 0 | |
| 1109 | N1219 | -3.661464 | 0.208333 | -0.291139 | 0 | |
| 1110 | N1220 | -3.616168 | 0.208333 | -0.447268 | 0 | |
| 1111 | N1221 | -3.525575 | 0.208333 | -0.759526 | 0 | |
| 1112 | N1222 | -3.480279 | 0.208333 | -0.915655 | 0 | |
| 1113 | N1223 | -3.434982 | 0.208333 | -1.071784 | 0 | |
| 1114 | N1224 | -3.344389 | 0.208333 | -1.384042 | 0 | |
| 1115 | N1225 | -3.299093 | 0.208333 | -1.540171 | 0 | |
| 1116 | N1226 | -3.253797 | 0.208333 | -1.6963 | 0 | |
| 1117 | N1227 | -2.645683 | 0.208333 | -2.43889 | 0 | |
| 1118 | N1228 | -2.53312 | 0.208333 | -2.556182 | 0 | |
| 1119 | N1229 | -2.420556 | 0.208333 | -2.673475 | 0 | |
| 1120 | N1230 | -1.970302 | 0.208333 | -3.142644 | 0 | |
| 1121 | N1231 | -2.082866 | 0.208333 | -3.025352 | 0 | |
| 1122 | N1232 | -2.195429 | 0.208333 | -2.908059 | 0 | |
| 1123 | N1233 | -2.814246 | 0.208333 | -2.263246 | 0 | |
| 1124 | N1234 | -2.870245 | 0.208333 | -2.204894 | 0 | |
| 1125 | N1235 | -2.926245 | 0.208333 | -2.146542 | 0 | |
| 1126 | N1236 | -3.038808 | 0.208333 | -2.029249 | 0 | |
| 1127 | N1237 | -3.095372 | 0.208333 | -1.970309 | 0 | |
| 1128 | N1238 | -1.632612 | 0.208333 | -3.494521 | 0 | |
| 1129 | N1239 | -1.520048 | 0.208333 | -3.611813 | 0 | |
| 1130 | N1240 | -1.745175 | 0.208333 | -3.377229 | 0 | |
| 1131 | N1171 | -0.507185 | 0 | -6.254436 | 0 | |
| 1132 | N1172 | 0.507185 | 0 | -6.254436 | 0 | |
| 1133 | N1175 | -5.162908 | 0 | 3.566453 | 0 | |
| 1134 | N1176 | -5.670093 | 0 | 2.687983 | 0 | |
| 1135 | N1179 | 5.670093 | 0 | 2.687983 | 0 | |
| 1136 | N1180 | 5.162908 | 0 | 3.566453 | 0 | |
| 1137 | N1143B | -3.247595 | -.333 | 1.875 | 0 | |
| 1138 | N1144B | 3.247595 | -.333 | 1.875 | 0 | |
| 1139 | N1145B | -4e-14 | 0 | -6.254436 | 0 | |
| 1140 | N1174 | -4e-14 | -0.333333 | -4.504436 | 0 | |
| 1141 | N1172B | -1.1547 | -.333 | 0.666667 | 0 | |
| 1142 | N1173A | -3.900956 | -0.333333 | 2.252218 | 0 | |
| 1143 | N1174A | 1.1547 | -.333 | 0.666667 | 0 | |
| 1144 | N1175A | 3.900956 | -0.333333 | 2.252218 | 0 | |
| 1145 | N1172A | -2e-14 | -0.083333 | -3.146106 | 0 | |
| 1146 | N1173 | -4e-14 | -0.083333 | -3.291856 | 0 | |
| 1147 | N1174B | -4e-14 | -0.083333 | -3.437606 | 0 | |
| 1148 | N1175B | -4e-14 | -0.083333 | -3.583356 | 0 | |

## Joint Coordinates and Temperatures (Continued)

| | Label | X [ft] | Y [ft] | Z [ft] | Temp [F] | Detach From Diap... |
|---|---|---|---|---|---|---|
| 1149 | N1176A | -5e-14 | -0.083333 | -3.729106 | 0 | |
| 1150 | N1197 | -2.724607 | -0.083333 | 1.573053 | 0 | |
| 1151 | N1198 | -2.850831 | -0.083333 | 1.645928 | 0 | |
| 1152 | N1199 | -2.977054 | -0.083333 | 1.718803 | 0 | |
| 1153 | N1200 | -3.103277 | -0.083333 | 1.791678 | 0 | |
| 1154 | N1201 | -3.2295 | -0.083333 | 1.864553 | 0 | |
| 1155 | N1222A | 2.724607 | -0.083333 | 1.573053 | 0 | |
| 1156 | N1223A | 2.850831 | -0.083333 | 1.645928 | 0 | |
| 1157 | N1224A | 2.977054 | -0.083333 | 1.718803 | 0 | |
| 1158 | N1225A | 3.103277 | -0.083333 | 1.791678 | 0 | |
| 1159 | N1226A | 3.2295 | -0.083333 | 1.864553 | 0 | |
| 1160 | N1160A | 5.5 | 0 | 3.704857 | 0 | |
| 1161 | N1161A | 2.75 | 0 | 3.704857 | 0 | |
| 1162 | N1162A | -2.75 | 0 | 3.704857 | 0 | |
| 1163 | N1163A | -6 | 0 | 3.704857 | 0 | |
| 1164 | N1164A | -6 | 3.833333 | 3.704857 | 0 | |
| 1165 | N1165A | -6 | -3.166667 | 3.704857 | 0 | |
| 1166 | N1166A | 5.5 | 2.5 | 3.704857 | 0 | |
| 1167 | N1167A | 2.75 | 2.5 | 3.704857 | 0 | |
| 1168 | N1168A | -2.75 | 2.5 | 3.704857 | 0 | |
| 1169 | N1169A | 5.5 | -3.5 | 3.704857 | 0 | |
| 1170 | N1170A | 2.75 | -3.5 | 3.704857 | 0 | |
| 1171 | N1171A | -2.75 | -3.5 | 3.704857 | 0 | |
| 1172 | N1172C | 6.2085 | 3.833333 | 3.343724 | 0 | |
| 1173 | N1173B | 6.2085 | -3.166667 | 3.343724 | 0 | |
| 1174 | N1174C | 0.4585 | 2.5 | -6.615568 | 0 | |
| 1175 | N1175C | 1.8335 | 2.5 | -4.233998 | 0 | |
| 1176 | N1176B | 4.5835 | 2.5 | 0.529141 | 0 | |
| 1177 | N1177 | 0.4585 | -3.5 | -6.615568 | 0 | |
| 1178 | N1178 | 1.8335 | -3.5 | -4.233998 | 0 | |
| 1179 | N1179A | 4.5835 | -3.5 | 0.529141 | 0 | |
| 1180 | N1180A | -0.2085 | 3.833333 | -7.048581 | 0 | |
| 1181 | N1181 | -0.2085 | -3.166667 | -7.048581 | 0 | |
| 1182 | N1182 | -5.9585 | 2.5 | 2.910711 | 0 | |
| 1183 | N1183 | -4.5835 | 2.5 | 0.529141 | 0 | |
| 1184 | N1184 | -1.8335 | 2.5 | -4.233998 | 0 | |
| 1185 | N1185 | -5.9585 | -3.5 | 2.910711 | 0 | |
| 1186 | N1186 | -4.5835 | -3.5 | 0.529141 | 0 | |
| 1187 | N1187 | -1.8335 | -3.5 | -4.233998 | 0 | |
| 1188 | N1188 | 4.5835 | 0 | 0.529141 | 0 | |
| 1189 | N1189 | 6.2085 | 0 | 3.343724 | 0 | |
| 1190 | N1190 | 1.8335 | 0 | -4.233998 | 0 | |
| 1191 | N1191 | 0.4585 | 0 | -6.615568 | 0 | |
| 1192 | N1192 | -1.8335 | 0 | -4.233998 | 0 | |
| 1193 | N1193 | -0.2085 | 0 | -7.048581 | 0 | |
| 1194 | N1194 | -4.5835 | 0 | 0.529141 | 0 | |
| 1195 | N1195 | -5.9585 | 0 | 2.910711 | 0 | |
| 1196 | N1196 | -0.177083 | 0 | 3.704857 | 0 | |
| 1197 | N1200A | 0.177083 | 0 | 3.704857 | 0 | |
| 1198 | N1203 | 3.297042 | 0 | -1.69907 | 0 | |
| 1199 | N1204 | 3.119959 | 0 | -2.005787 | 0 | |
| 1200 | N1210A | -3.119959 | 0 | -2.005787 | 0 | |

## Joint Coordinates and Temperatures (Continued)

| | Label | X [ft] | Y [ft] | Z [ft] | Temp [F] | Detach From Diap... |
|---|---|---|---|---|---|---|
| 1201 | N1211A | -3.297042 | 0 | -1.69907 | 0 | |

## Hot Rolled Steel Section Sets

| | Label | Shape | Type | Design List | Material | Design ... | A [in2] | Iyy [in4] | Izz [in4] | J [in4] |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Mount Pipes 1 | PIPE_2.0 | Beam | Pipe | A53 Gr.B | Typical | 1.02 | .627 | .627 | 1.25 |
| 2 | Footrails | PIPE_3.0 | Beam | Pipe | A53 Gr.B | Typical | 2.07 | 2.85 | 2.85 | 5.69 |
| 3 | Plan Bracing | PL3/8x4 | Beam | RECT | A36 Gr.36 | Typical | 1.5 | .018 | 2 | .066 |
| 4 | Handrails | PIPE_2.0 | Beam | Pipe | A53 Gr.B | Typical | 1.02 | .627 | .627 | 1.25 |
| 5 | Grating Angle | L2x2x4 | Beam | Single Angle | A36 Gr.36 | Typical | .944 | .346 | .346 | .021 |
| 6 | Standoff Arm | HSS4x4x6 | Beam | SquareTube | A500 Gr.B Rect | Typical | 4.78 | 10.3 | 10.3 | 17.5 |
| 7 | Plate Bracing2 | PL3/8x4 | Beam | RECT | A36 Gr.36 | Typical | 1.5 | .018 | 2 | .066 |
| 8 | MP 2 | PIPE_2.5 | Beam | Pipe | A53 Gr.B | Typical | 1.61 | 1.45 | 1.45 | 2.89 |

## Hot Rolled Steel Properties

| | Label | E [ksi] | G [ksi] | Nu | Therm (\1E... | Density[k/ft... | Yield[ksi] | Ry | Fu[ksi] | Rt |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | A36 Gr.36 | 29000 | 11154 | .3 | .65 | .49 | 36 | 1.5 | 58 | 1.2 |
| 2 | A572 Gr.50 | 29000 | 11154 | .3 | .65 | .49 | 50 | 1.1 | 65 | 1.1 |
| 3 | A992 | 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 |

## Member Primary Data

| | Label | I Joint | J Joint | K Joint | Rotate(deg) | Section/Shape | Type | Design List | Material | Design Rules |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | M1 | N1 | N34 | | | Footrails | Beam | Pipe | A53 Gr.B | Typical |
| 2 | M5 | N20 | N5 | | | Plan Bracing | Beam | RECT | A36 Gr.36 | Typical |
| 3 | M7 | N6 | N12 | | | Plan Bracing | Beam | RECT | A36 Gr.36 | Typical |
| 4 | M8 | N1171 | N30 | | | Plate Bracing2 | Beam | RECT | A36 Gr.36 | Typical |
| 5 | M9 | N13 | N19 | | | Plan Bracing | Beam | RECT | A36 Gr.36 | Typical |
| 6 | M10 | N22 | N23 | | 270 | Grating Angle | Beam | Single Angle | A36 Gr.36 | Typical |
| 7 | M11 | N24 | N25 | | | Grating Angle | Beam | Single Angle | A36 Gr.36 | Typical |
| 8 | M12 | N25A | N26 | | 270 | Grating Angle | Beam | Single Angle | A36 Gr.36 | Typical |
| 9 | M13 | N27 | N28 | | | Grating Angle | Beam | Single Angle | A36 Gr.36 | Typical |
| 10 | M14 | N30 | N31 | | 270 | Grating Angle | Beam | Single Angle | A36 Gr.36 | Typical |
| 11 | M15 | N32 | N33 | | | Grating Angle | Beam | Single Angle | A36 Gr.36 | Typical |
| 12 | M16 | N952A | N2 | | | Footrails | Beam | Pipe | A53 Gr.B | Typical |
| 13 | M36 | N86 | N1174 | | | HSS4x4x4 | Beam | SquareTube | A500 Gr.B... | Typical |
| 14 | M44 | N93A | N1172A | | | RIGID | None | None | RIGID | Typical |
| 15 | M45 | N208 | N1173 | | | RIGID | None | None | RIGID | Typical |
| 16 | M46 | N204 | N1174B | | | RIGID | None | None | RIGID | Typical |
| 17 | M47 | N200 | N1175B | | | RIGID | None | None | RIGID | Typical |
| 18 | M48 | N92A | N1176A | | | RIGID | None | None | RIGID | Typical |
| 19 | M46A | N996 | N1001 | | | RIGID | None | None | RIGID | Typical |
| 20 | M47A | N980 | N985 | | | RIGID | None | None | RIGID | Typical |
| 21 | M48A | N979 | N984 | | | RIGID | None | None | RIGID | Typical |
| 22 | M54B | N8 | N426A | | | Footrails | Beam | Pipe | A53 Gr.B | Typical |

## Member Primary Data (Continued)

| | Label | I Joint | J Joint | K Joint | Rotate(deg) | Section/Shape | Type | Design List | Material | Design Rules |
|---|---|---|---|---|---|---|---|---|---|---|
| 23 | M55B | N714 | N9 | | | Footrails | Beam | Pipe | A53 Gr.B | Typical |
| 24 | M56B | N750 | N755 | | | RIGID | None | None | RIGID | Typical |
| 25 | M57B | N740 | N745 | | | RIGID | None | None | RIGID | Typical |
| 26 | M58A | N739 | N744 | | | RIGID | None | None | RIGID | Typical |
| 27 | M68 | N15 | N760 | | | Footrails | Beam | Pipe | A53 Gr.B | Typical |
| 28 | M69 | N1048 | N16 | | | Footrails | Beam | Pipe | A53 Gr.B | Typical |
| 29 | M70 | N1084 | N1089 | | | RIGID | None | None | RIGID | Typical |
| 30 | M71 | N1074 | N1079 | | | RIGID | None | None | RIGID | Typical |
| 31 | M72 | N1073 | N1078 | | | RIGID | None | None | RIGID | Typical |
| 32 | M55A | N18 | N1171 | | | RIGID | None | None | RIGID | Typical |
| 33 | M56A | N14 | N1172 | | | RIGID | None | None | RIGID | Typical |
| 34 | M55C | N1175 | N22 | | | Plate Bracing2 | Beam | RECT | A36 Gr.36 | Typical |
| 35 | M56C | N4 | N1175 | | | RIGID | None | None | RIGID | Typical |
| 36 | M57A | N21 | N1176 | | | RIGID | None | None | RIGID | Typical |
| 37 | M58B | N1179 | N25A | | | Plate Bracing2 | Beam | RECT | A36 Gr.36 | Typical |
| 38 | M59 | N11 | N1179 | | | RIGID | None | None | RIGID | Typical |
| 39 | M60 | N7 | N1180 | | | RIGID | None | None | RIGID | Typical |
| 40 | M64 | N32 | N1176 | | | Plate Bracing2 | Beam | RECT | A36 Gr.36 | Typical |
| 41 | M65 | N30 | N27 | | | Plate Bracing2 | Beam | RECT | A36 Gr.36 | Typical |
| 42 | M66 | N27 | N1172 | | | Plate Bracing2 | Beam | RECT | A36 Gr.36 | Typical |
| 43 | M67 | N25A | N24 | | | Plate Bracing2 | Beam | RECT | A36 Gr.36 | Typical |
| 44 | M68A | N24 | N1180 | | | Plate Bracing2 | Beam | RECT | A36 Gr.36 | Typical |
| 45 | M69A | N22 | N32 | | | Plate Bracing2 | Beam | RECT | A36 Gr.36 | Typical |
| 46 | M65A | N1172B | N1173A | | | HSS4x4x4 | Beam | SquareTube | A500 Gr.B... | Typical |
| 47 | M66A | N1174A | N1175A | | | HSS4x4x4 | Beam | SquareTube | A500 Gr.B... | Typical |
| 48 | M67A | N1172A | N903B | | | RIGID | None | None | RIGID | Typical |
| 49 | M68B | N1173 | N906 | | | RIGID | None | None | RIGID | Typical |
| 50 | M69B | N1174B | N905 | | | RIGID | None | None | RIGID | Typical |
| 51 | M70A | N1175B | N904B | | | RIGID | None | None | RIGID | Typical |
| 52 | M71A | N1176A | N902A | | | RIGID | None | None | RIGID | Typical |
| 53 | M72A | N1172A | N984A | | | RIGID | None | None | RIGID | Typical |
| 54 | M73 | N1172A | N459A | | | RIGID | None | None | RIGID | Typical |
| 55 | M74 | N1173 | N987 | | | RIGID | None | None | RIGID | Typical |
| 56 | M75 | N1173 | N462A | | | RIGID | None | None | RIGID | Typical |
| 57 | M76 | N1174B | N991 | | | RIGID | None | None | RIGID | Typical |
| 58 | M77 | N1174B | N466A | | | RIGID | None | None | RIGID | Typical |
| 59 | M78 | N1175B | N995A | | | RIGID | None | None | RIGID | Typical |
| 60 | M79 | N1175B | N470A | | | RIGID | None | None | RIGID | Typical |
| 61 | M80 | N1176A | N999A | | | RIGID | None | None | RIGID | Typical |
| 62 | M81 | N1176A | N474A | | | RIGID | None | None | RIGID | Typical |
| 63 | M72B | N117 | N1197 | | | RIGID | None | None | RIGID | Typical |
| 64 | M73A | N614 | N1198 | | | RIGID | None | None | RIGID | Typical |
| 65 | M74A | N618 | N1199 | | | RIGID | None | None | RIGID | Typical |
| 66 | M75A | N622 | N1200 | | | RIGID | None | None | RIGID | Typical |
| 67 | M76A | N134 | N1201 | | | RIGID | None | None | RIGID | Typical |
| 68 | M77A | N1197 | N913 | | | RIGID | None | None | RIGID | Typical |
| 69 | M78A | N1198 | N916 | | | RIGID | None | None | RIGID | Typical |
| 70 | M79A | N1199 | N915 | | | RIGID | None | None | RIGID | Typical |
| 71 | M80A | N1200 | N914 | | | RIGID | None | None | RIGID | Typical |
| 72 | M81A | N1201 | N912 | | | RIGID | None | None | RIGID | Typical |
| 73 | M82 | N1197 | N610 | | | RIGID | None | None | RIGID | Typical |
| 74 | M83 | N1197 | N793 | | | RIGID | None | None | RIGID | Typical |

## Member Primary Data (Continued)

| | Label | I Joint | J Joint | K Joint | Rotate(deg) | Section/Shape | Type | Design List | Material | Design Rules |
|---|---|---|---|---|---|---|---|---|---|---|
| 75 | M84 | N1198 | N613 | | | RIGID | None | None | RIGID | Typical |
| 76 | M85 | N1198 | N796A | | | RIGID | None | None | RIGID | Typical |
| 77 | M86 | N1199 | N617 | | | RIGID | None | None | RIGID | Typical |
| 78 | M87 | N1199 | N800A | | | RIGID | None | None | RIGID | Typical |
| 79 | M88 | N1200 | N621 | | | RIGID | None | None | RIGID | Typical |
| 80 | M89 | N1200 | N804A | | | RIGID | None | None | RIGID | Typical |
| 81 | M90 | N1201 | N625 | | | RIGID | None | None | RIGID | Typical |
| 82 | M91 | N1201 | N808A | | | RIGID | None | None | RIGID | Typical |
| 83 | M92 | N141 | N1222A | | | RIGID | None | None | RIGID | Typical |
| 84 | M93 | N407 | N1223A | | | RIGID | None | None | RIGID | Typical |
| 85 | M94 | N411 | N1224A | | | RIGID | None | None | RIGID | Typical |
| 86 | M95 | N415 | N1225A | | | RIGID | None | None | RIGID | Typical |
| 87 | M96 | N140 | N1226A | | | RIGID | None | None | RIGID | Typical |
| 88 | M97 | N1222A | N923 | | | RIGID | None | None | RIGID | Typical |
| 89 | M98 | N1223A | N926 | | | RIGID | None | None | RIGID | Typical |
| 90 | M99 | N1224A | N925 | | | RIGID | None | None | RIGID | Typical |
| 91 | M100 | N1225A | N924 | | | RIGID | None | None | RIGID | Typical |
| 92 | M101 | N1226A | N922 | | | RIGID | None | None | RIGID | Typical |
| 93 | M102 | N1222A | N650 | | | RIGID | None | None | RIGID | Typical |
| 94 | M103 | N1222A | N419 | | | RIGID | None | None | RIGID | Typical |
| 95 | M104 | N1223A | N653 | | | RIGID | None | None | RIGID | Typical |
| 96 | M105 | N1223A | N422 | | | RIGID | None | None | RIGID | Typical |
| 97 | M106 | N1224A | N657 | | | RIGID | None | None | RIGID | Typical |
| 98 | M107 | N1224A | N426 | | | RIGID | None | None | RIGID | Typical |
| 99 | M108 | N1225A | N661 | | | RIGID | None | None | RIGID | Typical |
| 100 | M109 | N1225A | N430 | | | RIGID | None | None | RIGID | Typical |
| 101 | M110 | N1226A | N665 | | | RIGID | None | None | RIGID | Typical |
| 102 | M111 | N1226A | N434 | | | RIGID | None | None | RIGID | Typical |
| 103 | MP3A | N1168A | N1171A | | | Mount Pipes 1 | Beam | Pipe | A53 Gr.B | Typical |
| 104 | MP2A | N1167A | N1170A | | | Mount Pipes 1 | Beam | Pipe | A53 Gr.B | Typical |
| 105 | MP1A | N1166A | N1169A | | | Mount Pipes 1 | Beam | Pipe | A53 Gr.B | Typical |
| 106 | MP4A | N1164A | N1165A | | | MP 2 | Beam | Pipe | A53 Gr.B | Typical |
| 107 | MP3C | N1176B | N1179A | | | Mount Pipes 1 | Beam | Pipe | A53 Gr.B | Typical |
| 108 | MP2C | N1175C | N1178 | | | Mount Pipes 1 | Beam | Pipe | A53 Gr.B | Typical |
| 109 | MP1C | N1174C | N1177 | | | Mount Pipes 1 | Beam | Pipe | A53 Gr.B | Typical |
| 110 | MP4C | N1172C | N1173B | | | MP 2 | Beam | Pipe | A53 Gr.B | Typical |
| 111 | MP3B | N1184 | N1187 | | | Mount Pipes 1 | Beam | Pipe | A53 Gr.B | Typical |
| 112 | MP2B | N1183 | N1186 | | | Mount Pipes 1 | Beam | Pipe | A53 Gr.B | Typical |
| 113 | MP1B | N1182 | N1185 | | | Mount Pipes 1 | Beam | Pipe | A53 Gr.B | Typical |
| 114 | MP4B | N1180A | N1181 | | | MP 2 | Beam | Pipe | A53 Gr.B | Typical |
| 115 | M115 | N992 | N1196 | | | RIGID | None | None | RIGID | Typical |
| 116 | M116 | N1196 | N976 | | | RIGID | None | None | RIGID | Typical |
| 117 | M117 | N998 | N1200A | | | RIGID | None | None | RIGID | Typical |
| 118 | M118 | N1200A | N982 | | | RIGID | None | None | RIGID | Typical |
| 119 | M119 | N747 | N1203 | | | RIGID | None | None | RIGID | Typical |
| 120 | M120 | N1203 | N737 | | | RIGID | None | None | RIGID | Typical |
| 121 | M121 | N752 | N1204 | | | RIGID | None | None | RIGID | Typical |
| 122 | M122 | N1204 | N742 | | | RIGID | None | None | RIGID | Typical |
| 123 | M123 | N1081 | N1210A | | | RIGID | None | None | RIGID | Typical |
| 124 | M124 | N1210A | N1071 | | | RIGID | None | None | RIGID | Typical |
| 125 | M125 | N1086 | N1211A | | | RIGID | None | None | RIGID | Typical |
| 126 | M126 | N1211A | N1076 | | | RIGID | None | None | RIGID | Typical |

## Member Advanced Data

| | Label | I Release | J Release | I Offset[in] | J Offset[in] | T/C Only | Physical | Analysis ... | Inactive | Seismic Design ... |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | M1 | | | | | | Yes | | | None |
| 2 | M5 | | | | | | Yes | | | None |
| 3 | M7 | | | | | | Yes | | | None |
| 4 | M8 | | | | | | Yes | | | None |
| 5 | M9 | | | | | | Yes | | | None |
| 6 | M10 | | | | | | Yes | | | None |
| 7 | M11 | | | | | | Yes | | | None |
| 8 | M12 | | | | | | Yes | | | None |
| 9 | M13 | | | | | | Yes | | | None |
| 10 | M14 | | | | | | Yes | | | None |
| 11 | M15 | | | | | | Yes | | | None |
| 12 | M16 | | | | | | Yes | | | None |
| 13 | M36 | | | | | | Yes | | | None |
| 14 | M44 | | | | | | Yes | | | None |
| 15 | M45 | | | | | | Yes | | | None |
| 16 | M46 | | | | | | Yes | | | None |
| 17 | M47 | | | | | | Yes | | | None |
| 18 | M48 | | | | | | Yes | | | None |
| 19 | M46A | | | | | | Yes | | | None |
| 20 | M47A | | | | | | Yes | | | None |
| 21 | M48A | | | | | | Yes | | | None |
| 22 | M54B | | | | | | Yes | | | None |
| 23 | M55B | | | | | | Yes | | | None |
| 24 | M56B | | | | | | Yes | | | None |
| 25 | M57B | | | | | | Yes | | | None |
| 26 | M58A | | | | | | Yes | | | None |
| 27 | M68 | | | | | | Yes | | | None |
| 28 | M69 | | | | | | Yes | | | None |
| 29 | M70 | | | | | | Yes | | | None |
| 30 | M71 | | | | | | Yes | | | None |
| 31 | M72 | | | | | | Yes | | | None |
| 32 | M55A | | | | | | Yes | | | None |
| 33 | M56A | | | | | | Yes | | | None |
| 34 | M55C | | | | | | Yes | | | None |
| 35 | M56C | | | | | | Yes | | | None |
| 36 | M57A | | | | | | Yes | | | None |
| 37 | M58B | | | | | | Yes | | | None |
| 38 | M59 | | | | | | Yes | | | None |
| 39 | M60 | | | | | | Yes | | | None |
| 40 | M64 | | | | | | Yes | | | None |
| 41 | M65 | | | | | | Yes | | | None |
| 42 | M66 | | | | | | Yes | | | None |
| 43 | M67 | | | | | | Yes | | | None |
| 44 | M68A | | | | | | Yes | | | None |
| 45 | M69A | | | | | | Yes | | | None |
| 46 | M65A | | | | | | Yes | | | None |
| 47 | M66A | | | | | | Yes | | | None |
| 48 | M67A | | | | | | Yes | | | None |
| 49 | M68B | | | | | | Yes | | | None |
| 50 | M69B | | | | | | Yes | | | None |
| 51 | M70A | | | | | | Yes | | | None |

## Member Advanced Data (Continued)

| | Label | I Release | J Release | I Offset[in] | J Offset[in] | T/C Only | Physical | Analysis ... | Inactive | Seismic Design ... |
|---|---|---|---|---|---|---|---|---|---|---|
| 52 | M71A | | | | | | Yes | | | None |
| 53 | M72A | | | | | | Yes | | | None |
| 54 | M73 | | | | | | Yes | | | None |
| 55 | M74 | | | | | | Yes | | | None |
| 56 | M75 | | | | | | Yes | | | None |
| 57 | M76 | | | | | | Yes | | | None |
| 58 | M77 | | | | | | Yes | | | None |
| 59 | M78 | | | | | | Yes | | | None |
| 60 | M79 | | | | | | Yes | | | None |
| 61 | M80 | | | | | | Yes | | | None |
| 62 | M81 | | | | | | Yes | | | None |
| 63 | M72B | | | | | | Yes | | | None |
| 64 | M73A | | | | | | Yes | | | None |
| 65 | M74A | | | | | | Yes | | | None |
| 66 | M75A | | | | | | Yes | | | None |
| 67 | M76A | | | | | | Yes | | | None |
| 68 | M77A | | | | | | Yes | | | None |
| 69 | M78A | | | | | | Yes | | | None |
| 70 | M79A | | | | | | Yes | | | None |
| 71 | M80A | | | | | | Yes | | | None |
| 72 | M81A | | | | | | Yes | | | None |
| 73 | M82 | | | | | | Yes | | | None |
| 74 | M83 | | | | | | Yes | | | None |
| 75 | M84 | | | | | | Yes | | | None |
| 76 | M85 | | | | | | Yes | | | None |
| 77 | M86 | | | | | | Yes | | | None |
| 78 | M87 | | | | | | Yes | | | None |
| 79 | M88 | | | | | | Yes | | | None |
| 80 | M89 | | | | | | Yes | | | None |
| 81 | M90 | | | | | | Yes | | | None |
| 82 | M91 | | | | | | Yes | | | None |
| 83 | M92 | | | | | | Yes | | | None |
| 84 | M93 | | | | | | Yes | | | None |
| 85 | M94 | | | | | | Yes | | | None |
| 86 | M95 | | | | | | Yes | | | None |
| 87 | M96 | | | | | | Yes | | | None |
| 88 | M97 | | | | | | Yes | | | None |
| 89 | M98 | | | | | | Yes | | | None |
| 90 | M99 | | | | | | Yes | | | None |
| 91 | M100 | | | | | | Yes | | | None |
| 92 | M101 | | | | | | Yes | | | None |
| 93 | M102 | | | | | | Yes | | | None |
| 94 | M103 | | | | | | Yes | | | None |
| 95 | M104 | | | | | | Yes | | | None |
| 96 | M105 | | | | | | Yes | | | None |
| 97 | M106 | | | | | | Yes | | | None |
| 98 | M107 | | | | | | Yes | | | None |
| 99 | M108 | | | | | | Yes | | | None |
| 100 | M109 | | | | | | Yes | | | None |
| 101 | M110 | | | | | | Yes | | | None |
| 102 | M111 | | | | | | Yes | | | None |
| 103 | MP3A | | | | | | Yes | | | None |

## Member Advanced Data (Continued)

| | Label | I Release | J Release | I Offset[in] | J Offset[in] | T/C Only | Physical | Analysis ... | Inactive | Seismic Design ... |
|---|---|---|---|---|---|---|---|---|---|---|
| 104 | MP2A | | | | | | Yes | | | None |
| 105 | MP1A | | | | | | Yes | | | None |
| 106 | MP4A | | | | | | Yes | | | None |
| 107 | MP3C | | | | | | Yes | | | None |
| 108 | MP2C | | | | | | Yes | | | None |
| 109 | MP1C | | | | | | Yes | | | None |
| 110 | MP4C | | | | | | Yes | | | None |
| 111 | MP3B | | | | | | Yes | | | None |
| 112 | MP2B | | | | | | Yes | | | None |
| 113 | MP1B | | | | | | Yes | | | None |
| 114 | MP4B | | | | | | Yes | | | None |
| 115 | M115 | | | | | | Yes | | | None |
| 116 | M116 | | | | | | Yes | | | None |
| 117 | M117 | | | | | | Yes | | | None |
| 118 | M118 | | | | | | Yes | | | None |
| 119 | M119 | | | | | | Yes | | | None |
| 120 | M120 | | | | | | Yes | | | None |
| 121 | M121 | | | | | | Yes | | | None |
| 122 | M122 | | | | | | Yes | | | None |
| 123 | M123 | | | | | | Yes | | | None |
| 124 | M124 | | | | | | Yes | | | None |
| 125 | M125 | | | | | | Yes | | | None |
| 126 | M126 | | | | | | Yes | | | None |

## Hot Rolled Steel Design Parameters

| | Label | Shape | Length[ft] | Lbyy[ft] | Lbzz[ft] | Lcomp top[ft] | Lcomp bot[ft] | L-torqu... | Kyy | Kzz | Cb | Function |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | M1 | Footrails | 6.198 | | | Lbyy | | | 1 | 1 | | Lateral |
| 2 | M5 | Plan Bracing | 4.25 | Segment | Segment | Lbyy | | | .65 | .65 | | Lateral |
| 3 | M7 | Plan Bracing | 4.25 | Segment | Segment | Lbyy | | | .65 | .65 | | Lateral |
| 4 | M8 | Plate Bracin... | .225 | | | Lbyy | | | .65 | .65 | | Lateral |
| 5 | M9 | Plan Bracing | 4.25 | Segment | Segment | Lbyy | | | .65 | .65 | | Lateral |
| 6 | M10 | Grating Angle | 2.916 | | | Lbyy | | | .65 | .65 | | Lateral |
| 7 | M11 | Grating Angle | 2.916 | | | Lbyy | | | .65 | .65 | | Lateral |
| 8 | M12 | Grating Angle | 2.916 | | | Lbyy | | | .65 | .65 | | Lateral |
| 9 | M13 | Grating Angle | 2.916 | | | Lbyy | | | .65 | .65 | | Lateral |
| 10 | M14 | Grating Angle | 2.916 | | | Lbyy | | | .65 | .65 | | Lateral |
| 11 | M15 | Grating Angle | 2.916 | | | Lbyy | | | .65 | .65 | | Lateral |
| 12 | M16 | Footrails | 6.198 | | | Lbyy | | | 1 | 1 | | Lateral |
| 13 | M36 | HSS4x4x4 | 3.171 | | | Lbyy | | | 2.1 | 2.1 | | Lateral |
| 14 | M54B | Footrails | 6.198 | | | Lbyy | | | 1 | 1 | | Lateral |
| 15 | M55B | Footrails | 6.198 | | | Lbyy | | | 1 | 1 | | Lateral |
| 16 | M68 | Footrails | 6.198 | | | Lbyy | | | 1 | 1 | | Lateral |
| 17 | M69 | Footrails | 6.198 | | | Lbyy | | | 1 | 1 | | Lateral |
| 18 | M55C | Plate Bracin... | .225 | | | Lbyy | | | .65 | .65 | | Lateral |
| 19 | M58B | Plate Bracin... | .225 | | | Lbyy | | | .65 | .65 | | Lateral |
| 20 | M64 | Plate Bracin... | .225 | | | Lbyy | | | .65 | .65 | | Lateral |
| 21 | M65 | Plate Bracin... | .565 | | | Lbyy | | | .65 | .65 | | Lateral |
| 22 | M66 | Plate Bracin... | .225 | | | Lbyy | | | .65 | .65 | | Lateral |
| 23 | M67 | Plate Bracin... | .565 | | | Lbyy | | | .65 | .65 | | Lateral |
| 24 | M68A | Plate Bracin... | .225 | | | Lbyy | | | .65 | .65 | | Lateral |

## Hot Rolled Steel Design Parameters (Continued)

| | Label | Shape | Length[ft] | Lbyy[ft] | Lbzz[ft] | Lcomp top[ft] | Lcomp bot[ft] | L-torqu... | Kyy | Kzz | Cb | Function |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25 | M69A | Plate Bracin... | .565 | | | Lbyy | | | .65 | .65 | | Lateral |
| 26 | M65A | HSS4x4x4 | 3.171 | | | Lbyy | | | 2.1 | 2.1 | | Lateral |
| 27 | M66A | HSS4x4x4 | 3.171 | | | Lbyy | | | 2.1 | 2.1 | | Lateral |
| 28 | MP3A | Mount Pipe... | 6 | | | Lbyy | | | | | | Lateral |
| 29 | MP2A | Mount Pipe... | 6 | | | Lbyy | | | | | | Lateral |
| 30 | MP1A | Mount Pipe... | 6 | | | Lbyy | | | | | | Lateral |
| 31 | MP4A | MP 2 | 7 | | | Lbyy | | | | | | Lateral |
| 32 | MP3C | Mount Pipe... | 6 | | | Lbyy | | | | | | Lateral |
| 33 | MP2C | Mount Pipe... | 6 | | | Lbyy | | | | | | Lateral |
| 34 | MP1C | Mount Pipe... | 6 | | | Lbyy | | | | | | Lateral |
| 35 | MP4C | MP 2 | 7 | | | Lbyy | | | | | | Lateral |
| 36 | MP3B | Mount Pipe... | 6 | | | Lbyy | | | | | | Lateral |
| 37 | MP2B | Mount Pipe... | 6 | | | Lbyy | | | | | | Lateral |
| 38 | MP1B | Mount Pipe... | 6 | | | Lbyy | | | | | | Lateral |
| 39 | MP4B | MP 2 | 7 | | | Lbyy | | | | | | Lateral |

## Joint Loads and Enforced Displacements

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

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

| | Member Label | Direction | Magnitude[lb,k-ft] | Location[ft,%] |
|---|---|---|---|---|
| 1 | MP1A | Y | -6.75 | 0 |
| 2 | MP1A | Y | -6.75 | 4 |
| 3 | MP1B | Y | -6.75 | 0 |
| 4 | MP1B | Y | -6.75 | 4 |
| 5 | MP1C | Y | -6.75 | 0 |
| 6 | MP1C | Y | -6.75 | 4 |
| 7 | MP2A | Y | -6.75 | 0 |
| 8 | MP2A | Y | -6.75 | 4 |
| 9 | MP2B | Y | -6.75 | 0 |
| 10 | MP2B | Y | -6.75 | 4 |
| 11 | MP2C | Y | -6.75 | 0 |
| 12 | MP2C | Y | -6.75 | 4 |
| 13 | MP3A | Y | -6.75 | 0 |
| 14 | MP3A | Y | -6.75 | 4 |
| 15 | MP3B | Y | -6.75 | 0 |
| 16 | MP3B | Y | -6.75 | 4 |
| 17 | MP3C | Y | -6.75 | 0 |
| 18 | MP3C | Y | -6.75 | 4 |
| 19 | MP4A | Y | -53 | .5 |
| 20 | MP4A | Y | -53 | 6 |
| 21 | MP4B | Y | -53 | .5 |
| 22 | MP4B | Y | -53 | 6 |
| 23 | MP4C | Y | -53 | .5 |
| 24 | MP4C | Y | -53 | 6 |
| 25 | MP1A | Y | -15.4 | 1 |
| 26 | MP1B | Y | -15.4 | 1 |
| 27 | MP1C | Y | -15.4 | 1 |

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

| | Member Label | Direction | Magnitude[lb,k-ft] | Location[ft,%] |
|---|---|---|---|---|
| 28 | MP1A | Y | -9.7 | 2 |
| 29 | MP1B | Y | -9.7 | 2 |
| 30 | MP1C | Y | -9.7 | 2 |
| 31 | MP4A | Y | -70 | 2 |
| 32 | MP4B | Y | -70 | 2 |
| 33 | MP4C | Y | -70 | 2 |
| 34 | MP1A | Y | -1.8 | 3 |
| 35 | MP1B | Y | -1.8 | 3 |
| 36 | MP1C | Y | -1.8 | 3 |

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

| | Member Label | Direction | Magnitude[lb,k-ft] | Location[ft,%] |
|---|---|---|---|---|
| 1 | MP1A | Y | -30.316 | 0 |
| 2 | MP1A | Y | -30.316 | 4 |
| 3 | MP1B | Y | -30.316 | 0 |
| 4 | MP1B | Y | -30.316 | 4 |
| 5 | MP1C | Y | -30.316 | 0 |
| 6 | MP1C | Y | -30.316 | 4 |
| 7 | MP2A | Y | -30.316 | 0 |
| 8 | MP2A | Y | -30.316 | 4 |
| 9 | MP2B | Y | -30.316 | 0 |
| 10 | MP2B | Y | -30.316 | 4 |
| 11 | MP2C | Y | -30.316 | 0 |
| 12 | MP2C | Y | -30.316 | 4 |
| 13 | MP3A | Y | -30.316 | 0 |
| 14 | MP3A | Y | -30.316 | 4 |
| 15 | MP3B | Y | -30.316 | 0 |
| 16 | MP3B | Y | -30.316 | 4 |
| 17 | MP3C | Y | -30.316 | 0 |
| 18 | MP3C | Y | -30.316 | 4 |
| 19 | MP4A | Y | -107.215 | .5 |
| 20 | MP4A | Y | -107.215 | 6 |
| 21 | MP4B | Y | -107.215 | .5 |
| 22 | MP4B | Y | -107.215 | 6 |
| 23 | MP4C | Y | -107.215 | .5 |
| 24 | MP4C | Y | -107.215 | 6 |
| 25 | MP1A | Y | -14.496 | 1 |
| 26 | MP1B | Y | -14.496 | 1 |
| 27 | MP1C | Y | -14.496 | 1 |
| 28 | MP1A | Y | -11.713 | 2 |
| 29 | MP1B | Y | -11.713 | 2 |
| 30 | MP1C | Y | -11.713 | 2 |
| 31 | MP4A | Y | -42.519 | 2 |
| 32 | MP4B | Y | -42.519 | 2 |
| 33 | MP4C | Y | -42.519 | 2 |
| 34 | MP1A | Y | -4.884 | 3 |
| 35 | MP1B | Y | -4.884 | 3 |
| 36 | MP1C | Y | -4.884 | 3 |

## Member Point Loads (BLC 3 : Antenna W Front)

| | Member Label | Direction | Magnitude[lb,k-ft] | Location[ft,%] |
|---|---|---|---|---|

## Member Point Loads (BLC 3 : Antenna W Front) (Continued)

| | Member Label | Direction | Magnitude[lb,k-ft] | Location[ft,%] |
|---|---|---|---|---|
| 1 | MP1A | Z | -100.006 | 0 |
| 2 | MP1A | Z | -100.006 | 4 |
| 3 | MP1B | Z | -59.343 | 0 |
| 4 | MP1B | Z | -59.343 | 4 |
| 5 | MP1C | Z | -59.343 | 0 |
| 6 | MP1C | Z | -59.343 | 4 |
| 7 | MP2A | Z | -100.006 | 0 |
| 8 | MP2A | Z | -100.006 | 4 |
| 9 | MP2B | Z | -59.343 | 0 |
| 10 | MP2B | Z | -59.343 | 4 |
| 11 | MP2C | Z | -59.343 | 0 |
| 12 | MP2C | Z | -59.343 | 4 |
| 13 | MP3A | Z | -100.006 | 0 |
| 14 | MP3A | Z | -100.006 | 4 |
| 15 | MP3B | Z | -59.343 | 0 |
| 16 | MP3B | Z | -59.343 | 4 |
| 17 | MP3C | Z | -59.343 | 0 |
| 18 | MP3C | Z | -59.343 | 4 |
| 19 | MP4A | Z | -374.104 | .5 |
| 20 | MP4A | Z | -374.104 | 6 |
| 21 | MP4B | Z | -199.467 | .5 |
| 22 | MP4B | Z | -199.467 | 6 |
| 23 | MP4C | Z | -199.467 | .5 |
| 24 | MP4C | Z | -199.467 | 6 |
| 25 | MP1A | Z | -14.909 | 1 |
| 26 | MP1B | Z | -9.95 | 1 |
| 27 | MP1C | Z | -9.95 | 1 |
| 28 | MP1A | Z | -12.615 | 2 |
| 29 | MP1B | Z | -7.015 | 2 |
| 30 | MP1C | Z | -7.015 | 2 |
| 31 | MP4A | Z | -37.846 | 2 |
| 32 | MP4B | Z | -29.46 | 2 |
| 33 | MP4C | Z | -29.46 | 2 |
| 34 | MP1A | Z | -6.422 | 3 |
| 35 | MP1B | Z | -3.054 | 3 |
| 36 | MP1C | Z | -3.054 | 3 |

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

| | Member Label | Direction | Magnitude[lb,k-ft] | Location[ft,%] |
|---|---|---|---|---|
| 1 | MP1A | Z | -19.284 | 0 |
| 2 | MP1A | Z | -19.284 | 4 |
| 3 | MP1B | Z | -12.277 | 0 |
| 4 | MP1B | Z | -12.277 | 4 |
| 5 | MP1C | Z | -12.277 | 0 |
| 6 | MP1C | Z | -12.277 | 4 |
| 7 | MP2A | Z | -19.284 | 0 |
| 8 | MP2A | Z | -19.284 | 4 |
| 9 | MP2B | Z | -12.277 | 0 |
| 10 | MP2B | Z | -12.277 | 4 |
| 11 | MP2C | Z | -12.277 | 0 |
| 12 | MP2C | Z | -12.277 | 4 |

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

| | Member Label | Direction | Magnitude[lb,k-ft] | Location[ft,%] |
|---|---|---|---|---|
| 13 | MP3A | Z | -19.284 | 0 |
| 14 | MP3A | Z | -19.284 | 4 |
| 15 | MP3B | Z | -12.277 | 0 |
| 16 | MP3B | Z | -12.277 | 4 |
| 17 | MP3C | Z | -12.277 | 0 |
| 18 | MP3C | Z | -12.277 | 4 |
| 19 | MP4A | Z | -60.539 | .5 |
| 20 | MP4A | Z | -60.539 | 6 |
| 21 | MP4B | Z | -35.376 | .5 |
| 22 | MP4B | Z | -35.376 | 6 |
| 23 | MP4C | Z | -35.376 | .5 |
| 24 | MP4C | Z | -35.376 | 6 |
| 25 | MP1A | Z | -3.017 | 1 |
| 26 | MP1B | Z | -2.361 | 1 |
| 27 | MP1C | Z | -2.361 | 1 |
| 28 | MP1A | Z | -2.601 | 2 |
| 29 | MP1B | Z | -1.76 | 2 |
| 30 | MP1C | Z | -1.76 | 2 |
| 31 | MP4A | Z | -7.711 | 2 |
| 32 | MP4B | Z | -6.173 | 2 |
| 33 | MP4C | Z | -6.173 | 2 |
| 34 | MP1A | Z | -1.055 | 3 |
| 35 | MP1B | Z | -.823 | 3 |
| 36 | MP1C | Z | -.823 | 3 |

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

| | Member Label | Direction | Magnitude[lb,k-ft] | Location[ft,%] |
|---|---|---|---|---|
| 1 | MP1A | X | 45.789 | 0 |
| 2 | MP1A | X | 45.789 | 4 |
| 3 | MP1B | X | 86.452 | 0 |
| 4 | MP1B | X | 86.452 | 4 |
| 5 | MP1C | X | 86.452 | 0 |
| 6 | MP1C | X | 86.452 | 4 |
| 7 | MP2A | X | 45.789 | 0 |
| 8 | MP2A | X | 45.789 | 4 |
| 9 | MP2B | X | 86.452 | 0 |
| 10 | MP2B | X | 86.452 | 4 |
| 11 | MP2C | X | 86.452 | 0 |
| 12 | MP2C | X | 86.452 | 4 |
| 13 | MP3A | X | 45.789 | 0 |
| 14 | MP3A | X | 45.789 | 4 |
| 15 | MP3B | X | 86.452 | 0 |
| 16 | MP3B | X | 86.452 | 4 |
| 17 | MP3C | X | 86.452 | 0 |
| 18 | MP3C | X | 86.452 | 4 |
| 19 | MP4A | X | 141.254 | .5 |
| 20 | MP4A | X | 141.254 | 6 |
| 21 | MP4B | X | 315.892 | .5 |
| 22 | MP4B | X | 315.892 | 6 |
| 23 | MP4C | X | 315.892 | .5 |
| 24 | MP4C | X | 315.892 | 6 |

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

| | Member Label | Direction | Magnitude[lb,k-ft] | Location[ft,%] |
|---|---|---|---|---|
| 25 | MP1A | X | 16.595 | 1 |
| 26 | MP1B | X | 26.512 | 1 |
| 27 | MP1C | X | 26.512 | 1 |
| 28 | MP1A | X | 10.295 | 2 |
| 29 | MP1B | X | 21.497 | 2 |
| 30 | MP1C | X | 21.497 | 2 |
| 31 | MP4A | X | 53.329 | 2 |
| 32 | MP4B | X | 70.102 | 2 |
| 33 | MP4C | X | 70.102 | 2 |
| 34 | MP1A | X | 3.862 | 3 |
| 35 | MP1B | X | 10.599 | 3 |
| 36 | MP1C | X | 10.599 | 3 |

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

| | Member Label | Direction | Magnitude[lb,k-ft] | Location[ft,%] |
|---|---|---|---|---|
| 1 | MP1A | X | 9.941 | 0 |
| 2 | MP1A | X | 9.941 | 4 |
| 3 | MP1B | X | 16.948 | 0 |
| 4 | MP1B | X | 16.948 | 4 |
| 5 | MP1C | X | 16.948 | 0 |
| 6 | MP1C | X | 16.948 | 4 |
| 7 | MP2A | X | 9.941 | 0 |
| 8 | MP2A | X | 9.941 | 4 |
| 9 | MP2B | X | 16.948 | 0 |
| 10 | MP2B | X | 16.948 | 4 |
| 11 | MP2C | X | 16.948 | 0 |
| 12 | MP2C | X | 16.948 | 4 |
| 13 | MP3A | X | 9.941 | 0 |
| 14 | MP3A | X | 9.941 | 4 |
| 15 | MP3B | X | 16.948 | 0 |
| 16 | MP3B | X | 16.948 | 4 |
| 17 | MP3C | X | 16.948 | 0 |
| 18 | MP3C | X | 16.948 | 4 |
| 19 | MP4A | X | 26.988 | .5 |
| 20 | MP4A | X | 26.988 | 6 |
| 21 | MP4B | X | 52.151 | .5 |
| 22 | MP4B | X | 52.151 | 6 |
| 23 | MP4C | X | 52.151 | .5 |
| 24 | MP4C | X | 52.151 | 6 |
| 25 | MP1A | X | 4.285 | 1 |
| 26 | MP1B | X | 5.596 | 1 |
| 27 | MP1C | X | 5.596 | 1 |
| 28 | MP1A | X | 2.958 | 2 |
| 29 | MP1B | X | 4.64 | 2 |
| 30 | MP1C | X | 4.64 | 2 |
| 31 | MP4A | X | 11.32 | 2 |
| 32 | MP4B | X | 14.397 | 2 |
| 33 | MP4C | X | 14.397 | 2 |
| 34 | MP1A | X | 1.492 | 3 |
| 35 | MP1B | X | 1.956 | 3 |
| 36 | MP1C | X | 1.956 | 3 |

## Member Point Loads (BLC 7 : Service Lm1)

| | Member Label | Direction | Magnitude[lb,k-ft] | Location[ft,%] |
|---|---|---|---|---|
| 1 | MP3A | Y | -500 | %10 |

## Member Point Loads (BLC 8 : Service Lm2)

| | Member Label | Direction | Magnitude[lb,k-ft] | Location[ft,%] |
|---|---|---|---|---|
| 1 | MP1A | Y | -500 | %10 |

## Member Point Loads (BLC 15 : Antenna Wm Front)

| | Member Label | Direction | Magnitude[lb,k-ft] | Location[ft,%] |
|---|---|---|---|---|
| 1 | MP1A | Z | -6.047 | 0 |
| 2 | MP1A | Z | -6.047 | 4 |
| 3 | MP1B | Z | -3.588 | 0 |
| 4 | MP1B | Z | -3.588 | 4 |
| 5 | MP1C | Z | -3.588 | 0 |
| 6 | MP1C | Z | -3.588 | 4 |
| 7 | MP2A | Z | -6.047 | 0 |
| 8 | MP2A | Z | -6.047 | 4 |
| 9 | MP2B | Z | -3.588 | 0 |
| 10 | MP2B | Z | -3.588 | 4 |
| 11 | MP2C | Z | -3.588 | 0 |
| 12 | MP2C | Z | -3.588 | 4 |
| 13 | MP3A | Z | -6.047 | 0 |
| 14 | MP3A | Z | -6.047 | 4 |
| 15 | MP3B | Z | -3.588 | 0 |
| 16 | MP3B | Z | -3.588 | 4 |
| 17 | MP3C | Z | -3.588 | 0 |
| 18 | MP3C | Z | -3.588 | 4 |
| 19 | MP4A | Z | -22.621 | .5 |
| 20 | MP4A | Z | -22.621 | 6 |
| 21 | MP4B | Z | -12.061 | .5 |
| 22 | MP4B | Z | -12.061 | 6 |
| 23 | MP4C | Z | -12.061 | .5 |
| 24 | MP4C | Z | -12.061 | 6 |
| 25 | MP1A | Z | -.902 | 1 |
| 26 | MP1B | Z | -.602 | 1 |
| 27 | MP1C | Z | -.602 | 1 |
| 28 | MP1A | Z | -.763 | 2 |
| 29 | MP1B | Z | -.424 | 2 |
| 30 | MP1C | Z | -.424 | 2 |
| 31 | MP4A | Z | -2.288 | 2 |
| 32 | MP4B | Z | -1.781 | 2 |
| 33 | MP4C | Z | -1.781 | 2 |
| 34 | MP1A | Z | -.388 | 3 |
| 35 | MP1B | Z | -.185 | 3 |
| 36 | MP1C | Z | -.185 | 3 |

## Member Point Loads (BLC 16 : Antenna Wm Side)

| | Member Label | Direction | Magnitude[lb,k-ft] | Location[ft,%] |
|---|---|---|---|---|
| 1 | MP1A | X | 2.769 | 0 |
| 2 | MP1A | X | 2.769 | 4 |
| 3 | MP1B | X | 5.228 | 0 |

## Member Point Loads (BLC 16 : Antenna Wm Side) (Continued)

| | Member Label | Direction | Magnitude[lb,k-ft] | Location[ft,%] |
|---|---|---|---|---|
| 4 | MP1B | X | 5.228 | 4 |
| 5 | MP1C | X | 5.228 | 0 |
| 6 | MP1C | X | 5.228 | 4 |
| 7 | MP2A | X | 2.769 | 0 |
| 8 | MP2A | X | 2.769 | 4 |
| 9 | MP2B | X | 5.228 | 0 |
| 10 | MP2B | X | 5.228 | 4 |
| 11 | MP2C | X | 5.228 | 0 |
| 12 | MP2C | X | 5.228 | 4 |
| 13 | MP3A | X | 2.769 | 0 |
| 14 | MP3A | X | 2.769 | 4 |
| 15 | MP3B | X | 5.228 | 0 |
| 16 | MP3B | X | 5.228 | 4 |
| 17 | MP3C | X | 5.228 | 0 |
| 18 | MP3C | X | 5.228 | 4 |
| 19 | MP4A | X | 8.541 | .5 |
| 20 | MP4A | X | 8.541 | 6 |
| 21 | MP4B | X | 19.101 | .5 |
| 22 | MP4B | X | 19.101 | 6 |
| 23 | MP4C | X | 19.101 | .5 |
| 24 | MP4C | X | 19.101 | 6 |
| 25 | MP1A | X | 1.003 | 1 |
| 26 | MP1B | X | 1.603 | 1 |
| 27 | MP1C | X | 1.603 | 1 |
| 28 | MP1A | X | .623 | 2 |
| 29 | MP1B | X | 1.3 | 2 |
| 30 | MP1C | X | 1.3 | 2 |
| 31 | MP4A | X | 3.225 | 2 |
| 32 | MP4B | X | 4.239 | 2 |
| 33 | MP4C | X | 4.239 | 2 |
| 34 | MP1A | X | .234 | 3 |
| 35 | MP1B | X | .641 | 3 |
| 36 | MP1C | X | .641 | 3 |

## Member Point Loads (BLC 19 : Service Lv1)

| | Member Label | Direction | Magnitude[lb,k-ft] | Location[ft,%] |
|---|---|---|---|---|
| 1 | M65A | Y | -250 | %50 |

## Member Point Loads (BLC 20 : Service Lv2)

| | Member Label | Direction | Magnitude[lb,k-ft] | Location[ft,%] |
|---|---|---|---|---|
| 1 | M65A | Y | -250 | %100 |

## Member Distributed Loads (BLC 10 : Structure Di)

| | Member Label | Direction | Start Magnitude[lb/ft,... | End Magnitude[lb/ft,F... | Start Location[ft,%] | End Location[ft,%] |
|---|---|---|---|---|---|---|
| 1 | M1 | Y | -6.768 | -6.768 | 0 | %100 |
| 2 | M5 | Y | -7.516 | -7.516 | 0 | %100 |
| 3 | M7 | Y | -7.516 | -7.516 | 0 | %100 |
| 4 | M8 | Y | -7.516 | -7.516 | 0 | %100 |
| 5 | M9 | Y | -7.516 | -7.516 | 0 | %100 |

## Member Distributed Loads (BLC 10 : Structure Di) (Continued)

| | Member Label | Direction | Start Magnitude[lb/ft,... | End Magnitude[lb/ft,F... | Start Location[ft,%] | End Location[ft,%] |
|---|---|---|---|---|---|---|
| 6 | M10 | Y | -5.797 | -5.797 | 0 | %100 |
| 7 | M11 | Y | -5.797 | -5.797 | 0 | %100 |
| 8 | M12 | Y | -5.797 | -5.797 | 0 | %100 |
| 9 | M13 | Y | -5.797 | -5.797 | 0 | %100 |
| 10 | M14 | Y | -5.797 | -5.797 | 0 | %100 |
| 11 | M15 | Y | -5.797 | -5.797 | 0 | %100 |
| 12 | M16 | Y | -6.768 | -6.768 | 0 | %100 |
| 13 | M36 | Y | -9.885 | -9.885 | 0 | %100 |
| 14 | M54B | Y | -6.768 | -6.768 | 0 | %100 |
| 15 | M55B | Y | -6.768 | -6.768 | 0 | %100 |
| 16 | M68 | Y | -6.768 | -6.768 | 0 | %100 |
| 17 | M69 | Y | -6.768 | -6.768 | 0 | %100 |
| 18 | M55C | Y | -7.516 | -7.516 | 0 | %100 |
| 19 | M58B | Y | -7.516 | -7.516 | 0 | %100 |
| 20 | M64 | Y | -7.516 | -7.516 | 0 | %100 |
| 21 | M65 | Y | -7.516 | -7.516 | 0 | %100 |
| 22 | M66 | Y | -7.516 | -7.516 | 0 | %100 |
| 23 | M67 | Y | -7.516 | -7.516 | 0 | %100 |
| 24 | M68A | Y | -7.516 | -7.516 | 0 | %100 |
| 25 | M69A | Y | -7.516 | -7.516 | 0 | %100 |
| 26 | M65A | Y | -9.885 | -9.885 | 0 | %100 |
| 27 | M66A | Y | -9.885 | -9.885 | 0 | %100 |
| 28 | MP3A | Y | -5.142 | -5.142 | 0 | %100 |
| 29 | MP2A | Y | -5.142 | -5.142 | 0 | %100 |
| 30 | MP1A | Y | -5.142 | -5.142 | 0 | %100 |
| 31 | MP4A | Y | -5.864 | -5.864 | 0 | %100 |
| 32 | MP3C | Y | -5.142 | -5.142 | 0 | %100 |
| 33 | MP2C | Y | -5.142 | -5.142 | 0 | %100 |
| 34 | MP1C | Y | -5.142 | -5.142 | 0 | %100 |
| 35 | MP4C | Y | -5.864 | -5.864 | 0 | %100 |
| 36 | MP3B | Y | -5.142 | -5.142 | 0 | %100 |
| 37 | MP2B | Y | -5.142 | -5.142 | 0 | %100 |
| 38 | MP1B | Y | -5.142 | -5.142 | 0 | %100 |
| 39 | MP4B | Y | -5.864 | -5.864 | 0 | %100 |

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

| | Member Label | Direction | Start Magnitude[lb/ft,... | End Magnitude[lb/ft,F... | Start Location[ft,%] | End Location[ft,%] |
|---|---|---|---|---|---|---|
| 1 | M1 | PZ | -13.813 | -13.813 | 0 | %100 |
| 2 | M5 | PZ | -24.339 | -24.339 | 0 | %100 |
| 3 | M7 | PZ | -24.339 | -24.339 | 0 | %100 |
| 4 | M8 | PZ | -18.35 | -18.35 | 0 | %100 |
| 5 | M9 | PZ | -24.339 | -24.339 | 0 | %100 |
| 6 | M10 | PZ | -13.379 | -13.379 | 0 | %100 |
| 7 | M11 | PZ | -13.379 | -13.379 | 0 | %100 |
| 8 | M12 | PZ | -13.379 | -13.379 | 0 | %100 |
| 9 | M13 | PZ | -13.379 | -13.379 | 0 | %100 |
| 10 | M14 | PZ | -13.379 | -13.379 | 0 | %100 |
| 11 | M15 | PZ | -13.379 | -13.379 | 0 | %100 |
| 12 | M16 | PZ | -13.813 | -13.813 | 0 | %100 |
| 13 | M36 | PZ | -14.51 | -14.51 | 0 | %100 |
| 14 | M54B | PZ | -13.813 | -13.813 | 0 | %100 |

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

| | Member Label | Direction | Start Magnitude[lb/ft,... | End Magnitude[lb/ft,F... | Start Location[ft,%] | End Location[ft,%] |
|---|---|---|---|---|---|---|
| 15 | M55B | PZ | -13.813 | -13.813 | 0 | %100 |
| 16 | M68 | PZ | -13.813 | -13.813 | 0 | %100 |
| 17 | M69 | PZ | -13.813 | -13.813 | 0 | %100 |
| 18 | M55C | PZ | -18.35 | -18.35 | 0 | %100 |
| 19 | M58B | PZ | -18.35 | -18.35 | 0 | %100 |
| 20 | M64 | PZ | -18.35 | -18.35 | 0 | %100 |
| 21 | M65 | PZ | -18.35 | -18.35 | 0 | %100 |
| 22 | M66 | PZ | -18.35 | -18.35 | 0 | %100 |
| 23 | M67 | PZ | -18.35 | -18.35 | 0 | %100 |
| 24 | M68A | PZ | -18.35 | -18.35 | 0 | %100 |
| 25 | M69A | PZ | -18.35 | -18.35 | 0 | %100 |
| 26 | M65A | PZ | -14.51 | -14.51 | 0 | %100 |
| 27 | M66A | PZ | -14.51 | -14.51 | 0 | %100 |
| 28 | MP3A | PZ | -10.895 | -10.895 | 0 | %100 |
| 29 | MP2A | PZ | -10.895 | -10.895 | 0 | %100 |
| 30 | MP1A | PZ | -10.895 | -10.895 | 0 | %100 |
| 31 | MP4A | PZ | -13.189 | -13.189 | 0 | %100 |
| 32 | MP3C | PZ | -10.895 | -10.895 | 0 | %100 |
| 33 | MP2C | PZ | -10.895 | -10.895 | 0 | %100 |
| 34 | MP1C | PZ | -10.895 | -10.895 | 0 | %100 |
| 35 | MP4C | PZ | -13.189 | -13.189 | 0 | %100 |
| 36 | MP3B | PZ | -10.895 | -10.895 | 0 | %100 |
| 37 | MP2B | PZ | -10.895 | -10.895 | 0 | %100 |
| 38 | MP1B | PZ | -10.895 | -10.895 | 0 | %100 |
| 39 | MP4B | PZ | -13.189 | -13.189 | 0 | %100 |

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

| | Member Label | Direction | Start Magnitude[lb/ft,... | End Magnitude[lb/ft,F... | Start Location[ft,%] | End Location[ft,%] |
|---|---|---|---|---|---|---|
| 1 | M1 | PZ | -4.206 | -4.206 | 0 | %100 |
| 2 | M5 | PZ | -6.506 | -6.506 | 0 | %100 |
| 3 | M7 | PZ | -6.506 | -6.506 | 0 | %100 |
| 4 | M8 | PZ | -4.905 | -4.905 | 0 | %100 |
| 5 | M9 | PZ | -6.506 | -6.506 | 0 | %100 |
| 6 | M10 | PZ | -4.905 | -4.905 | 0 | %100 |
| 7 | M11 | PZ | -4.905 | -4.905 | 0 | %100 |
| 8 | M12 | PZ | -4.905 | -4.905 | 0 | %100 |
| 9 | M13 | PZ | -4.905 | -4.905 | 0 | %100 |
| 10 | M14 | PZ | -4.905 | -4.905 | 0 | %100 |
| 11 | M15 | PZ | -4.905 | -4.905 | 0 | %100 |
| 12 | M16 | PZ | -4.206 | -4.206 | 0 | %100 |
| 13 | M36 | PZ | -3.879 | -3.879 | 0 | %100 |
| 14 | M54B | PZ | -4.206 | -4.206 | 0 | %100 |
| 15 | M55B | PZ | -4.206 | -4.206 | 0 | %100 |
| 16 | M68 | PZ | -4.206 | -4.206 | 0 | %100 |
| 17 | M69 | PZ | -4.206 | -4.206 | 0 | %100 |
| 18 | M55C | PZ | -4.905 | -4.905 | 0 | %100 |
| 19 | M58B | PZ | -4.905 | -4.905 | 0 | %100 |
| 20 | M64 | PZ | -4.905 | -4.905 | 0 | %100 |
| 21 | M65 | PZ | -4.905 | -4.905 | 0 | %100 |
| 22 | M66 | PZ | -4.905 | -4.905 | 0 | %100 |
| 23 | M67 | PZ | -4.905 | -4.905 | 0 | %100 |

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

| | Member Label | Direction | Start Magnitude[lb/ft,... | End Magnitude[lb/ft,F... | Start Location[ft,%] | End Location[ft,%] |
|---|---|---|---|---|---|---|
| 24 | M68A | PZ | -4.905 | -4.905 | 0 | %100 |
| 25 | M69A | PZ | -4.905 | -4.905 | 0 | %100 |
| 26 | M65A | PZ | -3.879 | -3.879 | 0 | %100 |
| 27 | M66A | PZ | -3.879 | -3.879 | 0 | %100 |
| 28 | MP3A | PZ | -3.653 | -3.653 | 0 | %100 |
| 29 | MP2A | PZ | -3.653 | -3.653 | 0 | %100 |
| 30 | MP1A | PZ | -3.653 | -3.653 | 0 | %100 |
| 31 | MP4A | PZ | -4.038 | -4.038 | 0 | %100 |
| 32 | MP3C | PZ | -3.653 | -3.653 | 0 | %100 |
| 33 | MP2C | PZ | -3.653 | -3.653 | 0 | %100 |
| 34 | MP1C | PZ | -3.653 | -3.653 | 0 | %100 |
| 35 | MP4C | PZ | -4.038 | -4.038 | 0 | %100 |
| 36 | MP3B | PZ | -3.653 | -3.653 | 0 | %100 |
| 37 | MP2B | PZ | -3.653 | -3.653 | 0 | %100 |
| 38 | MP1B | PZ | -3.653 | -3.653 | 0 | %100 |
| 39 | MP4B | PZ | -4.038 | -4.038 | 0 | %100 |

## Member Distributed Loads (BLC 13 : Structure W Side)

| | Member Label | Direction | Start Magnitude[lb/ft,... | End Magnitude[lb/ft,F... | Start Location[ft,%] | End Location[ft,%] |
|---|---|---|---|---|---|---|
| 1 | M1 | PX | 13.813 | 13.813 | 0 | %100 |
| 2 | M5 | PX | 24.339 | 24.339 | 0 | %100 |
| 3 | M7 | PX | 24.339 | 24.339 | 0 | %100 |
| 4 | M8 | PX | 18.35 | 18.35 | 0 | %100 |
| 5 | M9 | PX | 24.339 | 24.339 | 0 | %100 |
| 6 | M10 | PX | 13.379 | 13.379 | 0 | %100 |
| 7 | M11 | PX | 13.379 | 13.379 | 0 | %100 |
| 8 | M12 | PX | 13.379 | 13.379 | 0 | %100 |
| 9 | M13 | PX | 13.379 | 13.379 | 0 | %100 |
| 10 | M14 | PX | 13.379 | 13.379 | 0 | %100 |
| 11 | M15 | PX | 13.379 | 13.379 | 0 | %100 |
| 12 | M16 | PX | 13.813 | 13.813 | 0 | %100 |
| 13 | M36 | PX | 14.51 | 14.51 | 0 | %100 |
| 14 | M54B | PX | 13.813 | 13.813 | 0 | %100 |
| 15 | M55B | PX | 13.813 | 13.813 | 0 | %100 |
| 16 | M68 | PX | 13.813 | 13.813 | 0 | %100 |
| 17 | M69 | PX | 13.813 | 13.813 | 0 | %100 |
| 18 | M55C | PX | 18.35 | 18.35 | 0 | %100 |
| 19 | M58B | PX | 18.35 | 18.35 | 0 | %100 |
| 20 | M64 | PX | 18.35 | 18.35 | 0 | %100 |
| 21 | M65 | PX | 18.35 | 18.35 | 0 | %100 |
| 22 | M66 | PX | 18.35 | 18.35 | 0 | %100 |
| 23 | M67 | PX | 18.35 | 18.35 | 0 | %100 |
| 24 | M68A | PX | 18.35 | 18.35 | 0 | %100 |
| 25 | M69A | PX | 18.35 | 18.35 | 0 | %100 |
| 26 | M65A | PX | 14.51 | 14.51 | 0 | %100 |
| 27 | M66A | PX | 14.51 | 14.51 | 0 | %100 |
| 28 | MP3A | PX | 10.895 | 10.895 | 0 | %100 |
| 29 | MP2A | PX | 10.895 | 10.895 | 0 | %100 |
| 30 | MP1A | PX | 10.895 | 10.895 | 0 | %100 |
| 31 | MP4A | PX | 13.189 | 13.189 | 0 | %100 |
| 32 | MP3C | PX | 10.895 | 10.895 | 0 | %100 |

## Member Distributed Loads (BLC 13 : Structure W Side) (Continued)

| | Member Label | Direction | Start Magnitude[lb/ft,... | End Magnitude[lb/ft,F... | Start Location[ft,%] | End Location[ft,%] |
|---|---|---|---|---|---|---|
| 33 | MP2C | PX | 10.895 | 10.895 | 0 | %100 |
| 34 | MP1C | PX | 10.895 | 10.895 | 0 | %100 |
| 35 | MP4C | PX | 13.189 | 13.189 | 0 | %100 |
| 36 | MP3B | PX | 10.895 | 10.895 | 0 | %100 |
| 37 | MP2B | PX | 10.895 | 10.895 | 0 | %100 |
| 38 | MP1B | PX | 10.895 | 10.895 | 0 | %100 |
| 39 | MP4B | PX | 13.189 | 13.189 | 0 | %100 |

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

| | Member Label | Direction | Start Magnitude[lb/ft,... | End Magnitude[lb/ft,F... | Start Location[ft,%] | End Location[ft,%] |
|---|---|---|---|---|---|---|
| 1 | M1 | PX | 4.206 | 4.206 | 0 | %100 |
| 2 | M5 | PX | 6.506 | 6.506 | 0 | %100 |
| 3 | M7 | PX | 6.506 | 6.506 | 0 | %100 |
| 4 | M8 | PX | 4.905 | 4.905 | 0 | %100 |
| 5 | M9 | PX | 6.506 | 6.506 | 0 | %100 |
| 6 | M10 | PX | 4.905 | 4.905 | 0 | %100 |
| 7 | M11 | PX | 4.905 | 4.905 | 0 | %100 |
| 8 | M12 | PX | 4.905 | 4.905 | 0 | %100 |
| 9 | M13 | PX | 4.905 | 4.905 | 0 | %100 |
| 10 | M14 | PX | 4.905 | 4.905 | 0 | %100 |
| 11 | M15 | PX | 4.905 | 4.905 | 0 | %100 |
| 12 | M16 | PX | 4.206 | 4.206 | 0 | %100 |
| 13 | M36 | PX | 3.879 | 3.879 | 0 | %100 |
| 14 | M54B | PX | 4.206 | 4.206 | 0 | %100 |
| 15 | M55B | PX | 4.206 | 4.206 | 0 | %100 |
| 16 | M68 | PX | 4.206 | 4.206 | 0 | %100 |
| 17 | M69 | PX | 4.206 | 4.206 | 0 | %100 |
| 18 | M55C | PX | 4.905 | 4.905 | 0 | %100 |
| 19 | M58B | PX | 4.905 | 4.905 | 0 | %100 |
| 20 | M64 | PX | 4.905 | 4.905 | 0 | %100 |
| 21 | M65 | PX | 4.905 | 4.905 | 0 | %100 |
| 22 | M66 | PX | 4.905 | 4.905 | 0 | %100 |
| 23 | M67 | PX | 4.905 | 4.905 | 0 | %100 |
| 24 | M68A | PX | 4.905 | 4.905 | 0 | %100 |
| 25 | M69A | PX | 4.905 | 4.905 | 0 | %100 |
| 26 | M65A | PX | 3.879 | 3.879 | 0 | %100 |
| 27 | M66A | PX | 3.879 | 3.879 | 0 | %100 |
| 28 | MP3A | PX | 3.653 | 3.653 | 0 | %100 |
| 29 | MP2A | PX | 3.653 | 3.653 | 0 | %100 |
| 30 | MP1A | PX | 3.653 | 3.653 | 0 | %100 |
| 31 | MP4A | PX | 4.038 | 4.038 | 0 | %100 |
| 32 | MP3C | PX | 3.653 | 3.653 | 0 | %100 |
| 33 | MP2C | PX | 3.653 | 3.653 | 0 | %100 |
| 34 | MP1C | PX | 3.653 | 3.653 | 0 | %100 |
| 35 | MP4C | PX | 4.038 | 4.038 | 0 | %100 |
| 36 | MP3B | PX | 3.653 | 3.653 | 0 | %100 |
| 37 | MP2B | PX | 3.653 | 3.653 | 0 | %100 |
| 38 | MP1B | PX | 3.653 | 3.653 | 0 | %100 |
| 39 | MP4B | PX | 4.038 | 4.038 | 0 | %100 |

## Member Distributed Loads (BLC 17 : Structure Wm Front)

| | Member Label | Direction | Start Magnitude[lb/ft,... | End Magnitude[lb/ft,F... | Start Location[ft,%] | End Location[ft,%] |
|---|---|---|---|---|---|---|
| 1 | M1 | PZ | -.835 | -.835 | 0 | %100 |
| 2 | M5 | PZ | -1.472 | -1.472 | 0 | %100 |
| 3 | M7 | PZ | -1.472 | -1.472 | 0 | %100 |
| 4 | M8 | PZ | -1.11 | -1.11 | 0 | %100 |
| 5 | M9 | PZ | -1.472 | -1.472 | 0 | %100 |
| 6 | M10 | PZ | -.809 | -.809 | 0 | %100 |
| 7 | M11 | PZ | -.809 | -.809 | 0 | %100 |
| 8 | M12 | PZ | -.809 | -.809 | 0 | %100 |
| 9 | M13 | PZ | -.809 | -.809 | 0 | %100 |
| 10 | M14 | PZ | -.809 | -.809 | 0 | %100 |
| 11 | M15 | PZ | -.809 | -.809 | 0 | %100 |
| 12 | M16 | PZ | -.835 | -.835 | 0 | %100 |
| 13 | M36 | PZ | -.877 | -.877 | 0 | %100 |
| 14 | M54B | PZ | -.835 | -.835 | 0 | %100 |
| 15 | M55B | PZ | -.835 | -.835 | 0 | %100 |
| 16 | M68 | PZ | -.835 | -.835 | 0 | %100 |
| 17 | M69 | PZ | -.835 | -.835 | 0 | %100 |
| 18 | M55C | PZ | -1.11 | -1.11 | 0 | %100 |
| 19 | M58B | PZ | -1.11 | -1.11 | 0 | %100 |
| 20 | M64 | PZ | -1.11 | -1.11 | 0 | %100 |
| 21 | M65 | PZ | -1.11 | -1.11 | 0 | %100 |
| 22 | M66 | PZ | -1.11 | -1.11 | 0 | %100 |
| 23 | M67 | PZ | -1.11 | -1.11 | 0 | %100 |
| 24 | M68A | PZ | -1.11 | -1.11 | 0 | %100 |
| 25 | M69A | PZ | -1.11 | -1.11 | 0 | %100 |
| 26 | M65A | PZ | -.877 | -.877 | 0 | %100 |
| 27 | M66A | PZ | -.877 | -.877 | 0 | %100 |
| 28 | MP3A | PZ | -.659 | -.659 | 0 | %100 |
| 29 | MP2A | PZ | -.659 | -.659 | 0 | %100 |
| 30 | MP1A | PZ | -.659 | -.659 | 0 | %100 |
| 31 | MP4A | PZ | -.797 | -.797 | 0 | %100 |
| 32 | MP3C | PZ | -.659 | -.659 | 0 | %100 |
| 33 | MP2C | PZ | -.659 | -.659 | 0 | %100 |
| 34 | MP1C | PZ | -.659 | -.659 | 0 | %100 |
| 35 | MP4C | PZ | -.797 | -.797 | 0 | %100 |
| 36 | MP3B | PZ | -.659 | -.659 | 0 | %100 |
| 37 | MP2B | PZ | -.659 | -.659 | 0 | %100 |
| 38 | MP1B | PZ | -.659 | -.659 | 0 | %100 |
| 39 | MP4B | PZ | -.797 | -.797 | 0 | %100 |

## Member Distributed Loads (BLC 18 : Structure Wm Side)

| | Member Label | Direction | Start Magnitude[lb/ft,... | End Magnitude[lb/ft,F... | Start Location[ft,%] | End Location[ft,%] |
|---|---|---|---|---|---|---|
| 1 | M1 | PX | .835 | .835 | 0 | %100 |
| 2 | M5 | PX | 1.472 | 1.472 | 0 | %100 |
| 3 | M7 | PX | 1.472 | 1.472 | 0 | %100 |
| 4 | M8 | PX | 1.11 | 1.11 | 0 | %100 |
| 5 | M9 | PX | 1.472 | 1.472 | 0 | %100 |
| 6 | M10 | PX | .809 | .809 | 0 | %100 |
| 7 | M11 | PX | .809 | .809 | 0 | %100 |
| 8 | M12 | PX | .809 | .809 | 0 | %100 |
| 9 | M13 | PX | .809 | .809 | 0 | %100 |

## Member Distributed Loads (BLC 18 : Structure Wm Side) (Continued)

| | Member Label | Direction | Start Magnitude[lb/ft,... | End Magnitude[lb/ft,F... | Start Location[ft,%] | End Location[ft,%] |
|---|---|---|---|---|---|---|
| 10 | M14 | PX | .809 | .809 | 0 | %100 |
| 11 | M15 | PX | .809 | .809 | 0 | %100 |
| 12 | M16 | PX | .835 | .835 | 0 | %100 |
| 13 | M36 | PX | .877 | .877 | 0 | %100 |
| 14 | M54B | PX | .835 | .835 | 0 | %100 |
| 15 | M55B | PX | .835 | .835 | 0 | %100 |
| 16 | M68 | PX | .835 | .835 | 0 | %100 |
| 17 | M69 | PX | .835 | .835 | 0 | %100 |
| 18 | M55C | PX | 1.11 | 1.11 | 0 | %100 |
| 19 | M58B | PX | 1.11 | 1.11 | 0 | %100 |
| 20 | M64 | PX | 1.11 | 1.11 | 0 | %100 |
| 21 | M65 | PX | 1.11 | 1.11 | 0 | %100 |
| 22 | M66 | PX | 1.11 | 1.11 | 0 | %100 |
| 23 | M67 | PX | 1.11 | 1.11 | 0 | %100 |
| 24 | M68A | PX | 1.11 | 1.11 | 0 | %100 |
| 25 | M69A | PX | 1.11 | 1.11 | 0 | %100 |
| 26 | M65A | PX | .877 | .877 | 0 | %100 |
| 27 | M66A | PX | .877 | .877 | 0 | %100 |
| 28 | MP3A | PX | .659 | .659 | 0 | %100 |
| 29 | MP2A | PX | .659 | .659 | 0 | %100 |
| 30 | MP1A | PX | .659 | .659 | 0 | %100 |
| 31 | MP4A | PX | .797 | .797 | 0 | %100 |
| 32 | MP3C | PX | .659 | .659 | 0 | %100 |
| 33 | MP2C | PX | .659 | .659 | 0 | %100 |
| 34 | MP1C | PX | .659 | .659 | 0 | %100 |
| 35 | MP4C | PX | .797 | .797 | 0 | %100 |
| 36 | MP3B | PX | .659 | .659 | 0 | %100 |
| 37 | MP2B | PX | .659 | .659 | 0 | %100 |
| 38 | MP1B | PX | .659 | .659 | 0 | %100 |
| 39 | MP4B | PX | .797 | .797 | 0 | %100 |

## Member Distributed Loads (BLC 21 : BLC 9 Transient Area Loads)

| | Member Label | Direction | Start Magnitude[lb/ft,... | End Magnitude[lb/ft,F... | Start Location[ft,%] | End Location[ft,%] |
|---|---|---|---|---|---|---|
| 1 | M5 | Y | -.673 | -5.13 | .425 | 1.558 |
| 2 | M5 | Y | -5.13 | -5.137 | 1.558 | 2.692 |
| 3 | M5 | Y | -5.137 | -.673 | 2.692 | 3.825 |
| 4 | M10 | Y | -1.884 | -3.796 | 0 | .583 |
| 5 | M10 | Y | -3.796 | -3.434 | .583 | 1.166 |
| 6 | M10 | Y | -3.434 | -2.559 | 1.166 | 1.75 |
| 7 | M10 | Y | -2.559 | -3.446 | 1.75 | 2.333 |
| 8 | M15 | Y | -.706 | -3.153 | 0 | .583 |
| 9 | M15 | Y | -3.153 | -3.2 | .583 | 1.166 |
| 10 | M15 | Y | -3.2 | -2.495 | 1.166 | 1.75 |
| 11 | M15 | Y | -2.495 | -3.437 | 1.75 | 2.333 |
| 12 | M69A | Y | -.945 | -.945 | 0 | .565 |
| 13 | M9 | Y | -.673 | -5.137 | .425 | 1.558 |
| 14 | M9 | Y | -5.137 | -5.13 | 1.558 | 2.692 |
| 15 | M9 | Y | -5.13 | -.673 | 2.692 | 3.825 |
| 16 | M13 | Y | -1.884 | -3.796 | 0 | .583 |
| 17 | M13 | Y | -3.796 | -3.434 | .583 | 1.166 |
| 18 | M13 | Y | -3.434 | -2.559 | 1.166 | 1.75 |

## Member Distributed Loads (BLC 21 : BLC 9 Transient Area Loads) (Continued)

| | Member Label | Direction | Start Magnitude[lb/ft,... | End Magnitude[lb/ft,F... | Start Location[ft,%] | End Location[ft,%] |
|---|---|---|---|---|---|---|
| 19 | M13 | Y | -2.559 | -3.446 | 1.75 | 2.333 |
| 20 | M14 | Y | -.706 | -3.153 | 0 | .583 |
| 21 | M14 | Y | -3.153 | -3.2 | .583 | 1.166 |
| 22 | M14 | Y | -3.2 | -2.495 | 1.166 | 1.75 |
| 23 | M14 | Y | -2.495 | -3.437 | 1.75 | 2.333 |
| 24 | M65 | Y | -.945 | -.945 | 0 | .565 |
| 25 | M7 | Y | -.672 | -5.132 | .425 | 1.558 |
| 26 | M7 | Y | -5.132 | -5.138 | 1.558 | 2.692 |
| 27 | M7 | Y | -5.138 | -.672 | 2.692 | 3.825 |
| 28 | M11 | Y | -.706 | -3.154 | 0 | .583 |
| 29 | M11 | Y | -3.154 | -3.2 | .583 | 1.166 |
| 30 | M11 | Y | -3.2 | -2.492 | 1.166 | 1.75 |
| 31 | M11 | Y | -2.492 | -3.429 | 1.75 | 2.333 |
| 32 | M12 | Y | -1.886 | -3.797 | 0 | .583 |
| 33 | M12 | Y | -3.797 | -3.435 | .583 | 1.166 |
| 34 | M12 | Y | -3.435 | -2.56 | 1.166 | 1.75 |
| 35 | M12 | Y | -2.56 | -3.447 | 1.75 | 2.333 |
| 36 | M67 | Y | -.943 | -.943 | 0 | .565 |

## Member Distributed Loads (BLC 22 : BLC 10 Transient Area Loads)

| | Member Label | Direction | Start Magnitude[lb/ft,... | End Magnitude[lb/ft,F... | Start Location[ft,%] | End Location[ft,%] |
|---|---|---|---|---|---|---|
| 1 | M5 | Y | -1.318 | -10.05 | .425 | 1.558 |
| 2 | M5 | Y | -10.05 | -10.064 | 1.558 | 2.692 |
| 3 | M5 | Y | -10.064 | -1.318 | 2.692 | 3.825 |
| 4 | M10 | Y | -3.691 | -7.437 | 0 | .583 |
| 5 | M10 | Y | -7.437 | -6.728 | .583 | 1.166 |
| 6 | M10 | Y | -6.728 | -5.014 | 1.166 | 1.75 |
| 7 | M10 | Y | -5.014 | -6.75 | 1.75 | 2.333 |
| 8 | M15 | Y | -1.382 | -6.178 | 0 | .583 |
| 9 | M15 | Y | -6.178 | -6.27 | .583 | 1.166 |
| 10 | M15 | Y | -6.27 | -4.887 | 1.166 | 1.75 |
| 11 | M15 | Y | -4.887 | -6.733 | 1.75 | 2.333 |
| 12 | M69A | Y | -1.852 | -1.852 | 0 | .565 |
| 13 | M9 | Y | -1.318 | -10.064 | .425 | 1.558 |
| 14 | M9 | Y | -10.064 | -10.05 | 1.558 | 2.692 |
| 15 | M9 | Y | -10.05 | -1.318 | 2.692 | 3.825 |
| 16 | M13 | Y | -3.691 | -7.437 | 0 | .583 |
| 17 | M13 | Y | -7.437 | -6.728 | .583 | 1.166 |
| 18 | M13 | Y | -6.728 | -5.014 | 1.166 | 1.75 |
| 19 | M13 | Y | -5.014 | -6.75 | 1.75 | 2.333 |
| 20 | M14 | Y | -1.382 | -6.178 | 0 | .583 |
| 21 | M14 | Y | -6.178 | -6.27 | .583 | 1.166 |
| 22 | M14 | Y | -6.27 | -4.887 | 1.166 | 1.75 |
| 23 | M14 | Y | -4.887 | -6.733 | 1.75 | 2.333 |
| 24 | M65 | Y | -1.852 | -1.852 | 0 | .565 |
| 25 | M7 | Y | -1.317 | -10.054 | .425 | 1.558 |
| 26 | M7 | Y | -10.054 | -10.066 | 1.558 | 2.692 |
| 27 | M7 | Y | -10.066 | -1.317 | 2.692 | 3.825 |
| 28 | M11 | Y | -1.384 | -6.179 | 0 | .583 |
| 29 | M11 | Y | -6.179 | -6.27 | .583 | 1.166 |
| 30 | M11 | Y | -6.27 | -4.882 | 1.166 | 1.75 |

## Member Distributed Loads (BLC 22 : BLC 10 Transient Area Loads) (Continued)

| | Member Label | Direction | Start Magnitude[lb/ft,... | End Magnitude[lb/ft,F... | Start Location[ft,%] | End Location[ft,%] |
|---|---|---|---|---|---|---|
| 31 | M11 | Y | -4.882 | -6.718 | 1.75 | 2.333 |
| 32 | M12 | Y | -3.694 | -7.439 | 0 | .583 |
| 33 | M12 | Y | -7.439 | -6.728 | .583 | 1.166 |
| 34 | M12 | Y | -6.728 | -5.015 | 1.166 | 1.75 |
| 35 | M12 | Y | -5.015 | -6.753 | 1.75 | 2.333 |
| 36 | M67 | Y | -1.846 | -1.846 | 0 | .565 |

## Member Area Loads (BLC 9 : Structure D)

| | Joint A | Joint B | Joint C | Joint D | Direction | Distribution | Magnitude[ksf] |
|---|---|---|---|---|---|---|---|
| 1 | N32 | N22 | N23 | N33 | Y | Two Way | -.005 |
| 2 | N30 | N27 | N28 | N31 | Y | Two Way | -.005 |
| 3 | N26 | N25A | N24 | N25 | Y | Two Way | -.005 |

## Member Area Loads (BLC 10 : Structure Di)

| | Joint A | Joint B | Joint C | Joint D | Direction | Distribution | Magnitude[ksf] |
|---|---|---|---|---|---|---|---|
| 1 | N32 | N22 | N23 | N33 | Y | Two Way | -.01 |
| 2 | N30 | N27 | N28 | N31 | Y | Two Way | -.01 |
| 3 | N26 | N25A | N24 | N25 | Y | Two Way | -.01 |

## 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 | N86 | Reaction | Reaction | Reaction | Reaction | Reaction | Reaction |
| 2 | N1172B | Reaction | Reaction | Reaction | Reaction | Reaction | Reaction |
| 3 | N1174A | 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 | N86 | max | 1415.348 | 4 | 1610.369 | 5 | 804.645 | 1 | 3.158 | 5 | 1.564 | 3 | .751 | 3 |
| 2 | | min | -1415.81 | 3 | 523.641 | 10 | -3348.888 | 2 | .203 | 2 | -1.565 | 4 | -.739 | 4 |
| 3 | N1172B | max | 597.607 | 4 | 1611.584 | 8 | 2128.854 | 1 | .134 | 1 | 1.205 | 1 | -.133 | 3 |
| 4 | | min | -2805.805 | 7 | 543.741 | 10 | -856.045 | 2 | -2.062 | 9 | -1.206 | 2 | -2.752 | 8 |
| 5 | N1174A | max | 2803.897 | 8 | 1896.067 | 10 | 1783.102 | 1 | .019 | 1 | .659 | 2 | 3.359 | 10 |
| 6 | | min | -584.027 | 3 | 543.247 | 4 | -511.67 | 2 | -2.095 | 10 | -.658 | 1 | .103 | 4 |
| 7 | Totals: | max | 4800.153 | 4 | 4746.017 | 8 | 4716.601 | 1 | | | | | | |
| 8 | | min | -4800.152 | 3 | 2213.459 | 3 | -4716.603 | 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 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 2 | | | min | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 3 | | 2 | max | 478.268 | 3 | -40.079 | 9 | 67.544 | 1 | .385 | 2 | .471 | 2 | .647 | 8 |
| 4 | | | min | -611.736 | 4 | -354.079 | 7 | -117.498 | 2 | -.303 | 1 | -.462 | 1 | -.047 | 3 |
| 5 | | 3 | max | 478.268 | 3 | -53.176 | 9 | 46.14 | 1 | .385 | 2 | .306 | 2 | 1.188 | 8 |
| 6 | | | min | -611.736 | 4 | -377.662 | 7 | -96.095 | 2 | -.303 | 1 | -.373 | 1 | .245 | 3 |
| 7 | | 4 | max | 677.732 | 3 | 162.327 | 4 | 280.365 | 1 | .32 | 9 | .239 | 2 | 1.579 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8 | | | min | -809.138 | 4 | -139.84 | 10 | -206.52 | 2 | -.373 | 10 | -.307 | 1 | .503 | 3 |
| 9 | | 5 | max | 464.095 | 3 | -16.088 | 9 | 93.922 | 1 | 0 | 9 | .044 | 1 | .102 | 6 |
| 10 | | | min | -511.5 | 4 | -173.167 | 10 | -59.295 | 2 | 0 | 10 | -.024 | 2 | .032 | 1 |
| 11 | M5 | 1 | max | 599.794 | 2 | -182.906 | 1 | 261.28 | 1 | .003 | 1 | .051 | 2 | .186 | 1 |
| 12 | | | min | -494.769 | 1 | -710.591 | 6 | -319.058 | 2 | -.033 | 6 | -.044 | 1 | -.373 | 2 |
| 13 | | 2 | max | -147.757 | 2 | -183.074 | 1 | .118 | 4 | .04 | 5 | 0 | 3 | .568 | 8 |
| 14 | | | min | -1344.67 | 5 | -736.396 | 6 | -.679 | 7 | .014 | 12 | 0 | 8 | .002 | 3 |
| 15 | | 3 | max | 0 | 11 | 1.866 | 5 | 1.141 | 3 | 0 | 1 | 0 | 4 | 0 | 6 |
| 16 | | | min | -.659 | 3 | .768 | 2 | -1.141 | 4 | 0 | 1 | 0 | 3 | 0 | 3 |
| 17 | | 4 | max | -38.143 | 4 | 821.302 | 9 | 1.398 | 5 | -.011 | 1 | 0 | 2 | .656 | 6 |
| 18 | | | min | -1387.883 | 7 | 85.308 | 10 | .081 | 2 | -.04 | 6 | 0 | 5 | -.045 | 1 |
| 19 | | 5 | max | 504.914 | 1 | 865.081 | 9 | 169.52 | 1 | .03 | 5 | .022 | 1 | .4 | 10 |
| 20 | | | min | -394.271 | 2 | 46.528 | 10 | -110.335 | 2 | 0 | 2 | -.015 | 2 | -.373 | 1 |
| 21 | M7 | 1 | max | 629.448 | 1 | -139.118 | 4 | 193.546 | 4 | .001 | 4 | .039 | 3 | .154 | 2 |
| 22 | | | min | -522.488 | 2 | -835.437 | 10 | -251.252 | 3 | -.032 | 7 | -.032 | 4 | -.34 | 1 |
| 23 | | 2 | max | 218.743 | 3 | -149.61 | 4 | .092 | 2 | .04 | 6 | 0 | 3 | .588 | 10 |
| 24 | | | min | -1419.296 | 8 | -831.954 | 10 | -.681 | 5 | .012 | 1 | 0 | 8 | -.028 | 1 |
| 25 | | 3 | max | 0 | 11 | 1.867 | 8 | 1.141 | 4 | 0 | 1 | 0 | 3 | 0 | 7 |
| 26 | | | min | -.659 | 4 | .768 | 3 | -1.141 | 3 | 0 | 1 | 0 | 4 | 0 | 4 |
| 27 | | 4 | max | -268.443 | 3 | 844.977 | 10 | 1.419 | 8 | -.012 | 4 | 0 | 4 | .665 | 7 |
| 28 | | | min | -1342.293 | 8 | 207.465 | 1 | -.086 | 3 | -.04 | 7 | 0 | 7 | -.08 | 4 |
| 29 | | 5 | max | 372.466 | 4 | 866.006 | 10 | 172.487 | 2 | .037 | 10 | .025 | 2 | .324 | 3 |
| 30 | | | min | -266.123 | 3 | 200.248 | 1 | -114.136 | 1 | 0 | 1 | -.018 | 1 | -.5 | 10 |
| 31 | M8 | 1 | max | 347.393 | 3 | -76.653 | 2 | 812.352 | 3 | .029 | 3 | .142 | 4 | .112 | 4 |
| 32 | | | min | -460.291 | 4 | -239.513 | 5 | -722.491 | 4 | -.051 | 4 | -.156 | 3 | -.179 | 3 |
| 33 | | 2 | max | 347.393 | 3 | -76.997 | 2 | 812.352 | 3 | .029 | 3 | .101 | 4 | .118 | 4 |
| 34 | | | min | -460.291 | 4 | -240.279 | 5 | -722.491 | 4 | -.051 | 4 | -.11 | 3 | -.172 | 3 |
| 35 | | 3 | max | 347.393 | 3 | -77.341 | 2 | 812.352 | 3 | .029 | 3 | .06 | 4 | .124 | 4 |
| 36 | | | min | -460.291 | 4 | -241.045 | 5 | -722.491 | 4 | -.051 | 4 | -.065 | 3 | -.165 | 3 |
| 37 | | 4 | max | 347.393 | 3 | -77.685 | 2 | 812.352 | 3 | .029 | 3 | .02 | 4 | .13 | 4 |
| 38 | | | min | -460.291 | 4 | -241.812 | 5 | -722.491 | 4 | -.051 | 4 | -.019 | 3 | -.158 | 3 |
| 39 | | 5 | max | 347.393 | 3 | -78.029 | 2 | 812.352 | 3 | .029 | 3 | .026 | 3 | .136 | 4 |
| 40 | | | min | -460.291 | 4 | -242.578 | 5 | -722.491 | 4 | -.051 | 4 | -.021 | 4 | -.151 | 3 |
| 41 | M9 | 1 | max | 727.996 | 4 | -90.261 | 10 | 235.057 | 3 | .002 | 3 | .048 | 4 | .239 | 3 |
| 42 | | | min | -620.736 | 3 | -711.888 | 5 | -293.405 | 4 | -.033 | 8 | -.04 | 3 | -.426 | 4 |
| 43 | | 2 | max | 104.828 | 1 | -124.281 | 10 | -.167 | 1 | .04 | 7 | 0 | 3 | .573 | 7 |
| 44 | | | min | -1400.867 | 6 | -733.932 | 5 | -.623 | 8 | .011 | 4 | 0 | 8 | -.016 | 4 |
| 45 | | 3 | max | 0 | 1 | -.768 | 1 | 1.521 | 1 | 0 | 1 | 0 | 1 | 0 | 7 |
| 46 | | | min | 0 | 6 | -1.866 | 6 | -1.521 | 2 | 0 | 1 | 0 | 2 | 0 | 2 |
| 47 | | 4 | max | -159.08 | 1 | 641.252 | 7 | 1.372 | 6 | -.013 | 3 | 0 | 4 | .643 | 8 |
| 48 | | | min | -1372.684 | 6 | 205.228 | 4 | .099 | 1 | -.04 | 8 | 0 | 7 | .036 | 3 |
| 49 | | 5 | max | 485.136 | 3 | 613.518 | 7 | 205.657 | 3 | .031 | 7 | .028 | 3 | .295 | 4 |
| 50 | | | min | -374.3 | 4 | 189.008 | 9 | -146.525 | 4 | -.004 | 4 | -.021 | 4 | -.327 | 3 |
| 51 | M10 | 1 | max | 235.169 | 1 | 107.449 | 1 | 17.345 | 2 | 0 | 2 | .114 | 2 | .195 | 1 |
| 52 | | | min | -138.555 | 2 | -88.731 | 2 | -27.872 | 1 | -.001 | 1 | -.127 | 1 | -.201 | 2 |
| 53 | | 2 | max | 235.169 | 1 | 117.202 | 1 | 11.891 | 2 | 0 | 2 | .073 | 2 | .122 | 1 |
| 54 | | | min | -138.555 | 2 | -98.484 | 2 | -33.326 | 1 | -.001 | 1 | -.085 | 1 | -.146 | 2 |
| 55 | | 3 | max | 235.169 | 1 | 126.955 | 1 | 6.082 | 2 | 0 | 2 | .024 | 2 | .04 | 1 |
| 56 | | | min | -138.555 | 2 | -108.238 | 2 | -41.68 | 5 | -.001 | 1 | -.041 | 1 | -.088 | 2 |
| 57 | | 4 | max | 235.169 | 1 | 136.708 | 1 | .782 | 2 | 0 | 2 | .005 | 1 | -.026 | 3 |
| 58 | | | min | -138.555 | 2 | -117.991 | 2 | -55.271 | 5 | -.001 | 1 | -.034 | 6 | -.087 | 8 |
| 59 | | 5 | max | 235.169 | 1 | 146.462 | 1 | -2.612 | 2 | 0 | 2 | .055 | 1 | .035 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 60 | | | min | -138.555 | 2 | -127.744 | 2 | -63.843 | 5 | -.001 | 1 | -.096 | 2 | -.146 | 1 |
| 61 | M11 | 1 | max | 281.986 | 4 | 10.514 | 4 | 80.248 | 3 | .002 | 3 | .08 | 4 | .12 | 4 |
| 62 | | | min | -187.661 | 3 | -30.354 | 10 | -63.598 | 4 | 0 | 4 | -.093 | 3 | -.109 | 3 |
| 63 | | 2 | max | 281.986 | 4 | 5.8 | 4 | 80.248 | 3 | .002 | 3 | .051 | 4 | .088 | 2 |
| 64 | | | min | -187.661 | 3 | -35.067 | 10 | -63.598 | 4 | 0 | 4 | -.064 | 3 | -.062 | 1 |
| 65 | | 3 | max | 281.986 | 4 | .262 | 4 | 80.248 | 3 | .002 | 3 | .02 | 4 | .063 | 6 |
| 66 | | | min | -187.661 | 3 | -40.606 | 10 | -63.598 | 4 | 0 | 4 | -.037 | 3 | -.013 | 1 |
| 67 | | 4 | max | 281.986 | 4 | -4.975 | 4 | 85.362 | 1 | .002 | 3 | -.002 | 1 | .09 | 10 |
| 68 | | | min | -187.661 | 3 | -50.994 | 7 | -67.775 | 2 | 0 | 4 | -.033 | 10 | .017 | 4 |
| 69 | | 5 | max | 281.986 | 4 | -8.364 | 4 | 95.115 | 1 | .002 | 3 | .028 | 1 | .135 | 5 |
| 70 | | | min | -187.661 | 3 | -59.556 | 7 | -77.528 | 2 | 0 | 4 | -.068 | 2 | -.012 | 4 |
| 71 | M12 | 1 | max | 226.736 | 4 | 80.049 | 4 | 9.414 | 3 | 0 | 3 | .078 | 3 | .148 | 4 |
| 72 | | | min | -130.499 | 3 | -61.65 | 3 | -24.004 | 10 | -.001 | 10 | -.092 | 4 | -.155 | 3 |
| 73 | | 2 | max | 230.959 | 4 | 87.363 | 4 | 3.959 | 3 | 0 | 3 | .048 | 3 | .093 | 4 |
| 74 | | | min | -134.722 | 3 | -68.965 | 3 | -29.459 | 10 | -.001 | 10 | -.06 | 4 | -.117 | 3 |
| 75 | | 3 | max | 235.183 | 4 | 94.678 | 4 | -1.851 | 3 | 0 | 3 | .016 | 1 | .032 | 4 |
| 76 | | | min | -138.945 | 3 | -76.28 | 3 | -40.136 | 8 | -.001 | 10 | -.032 | 2 | -.079 | 3 |
| 77 | | 4 | max | 239.406 | 4 | 101.993 | 4 | -7.151 | 3 | 0 | 3 | .006 | 4 | -.021 | 1 |
| 78 | | | min | -143.168 | 3 | -83.595 | 3 | -53.728 | 8 | -.001 | 10 | -.038 | 10 | -.1 | 10 |
| 79 | | 5 | max | 243.629 | 4 | 109.308 | 4 | -10.545 | 3 | 0 | 3 | .04 | 4 | .002 | 1 |
| 80 | | | min | -147.392 | 3 | -90.91 | 3 | -62.301 | 8 | -.001 | 10 | -.082 | 3 | -.136 | 6 |
| 81 | M13 | 1 | max | 183.422 | 2 | 15.033 | 3 | 99.911 | 4 | .002 | 4 | .108 | 3 | .174 | 3 |
| 82 | | | min | -87.816 | 1 | -23.287 | 4 | -82.839 | 3 | 0 | 3 | -.122 | 4 | -.162 | 4 |
| 83 | | 2 | max | 187.645 | 2 | 9.579 | 3 | 107.226 | 4 | .002 | 4 | .07 | 3 | .123 | 3 |
| 84 | | | min | -92.039 | 1 | -28.741 | 4 | -90.154 | 3 | 0 | 3 | -.082 | 4 | -.096 | 4 |
| 85 | | 3 | max | 191.868 | 2 | 3.77 | 3 | 114.541 | 4 | .002 | 4 | .025 | 3 | .071 | 3 |
| 86 | | | min | -96.262 | 1 | -39.148 | 8 | -97.469 | 3 | 0 | 3 | -.041 | 4 | -.022 | 4 |
| 87 | | 4 | max | 196.092 | 2 | -1.53 | 3 | 121.855 | 4 | .002 | 4 | 0 | 4 | .088 | 8 |
| 88 | | | min | -100.486 | 1 | -52.739 | 8 | -104.784 | 3 | 0 | 3 | -.032 | 7 | .018 | 3 |
| 89 | | 5 | max | 200.315 | 2 | -4.924 | 3 | 129.17 | 4 | .002 | 4 | .043 | 4 | .144 | 4 |
| 90 | | | min | -104.709 | 1 | -61.311 | 8 | -112.099 | 3 | 0 | 3 | -.084 | 3 | -.036 | 3 |
| 91 | M14 | 1 | max | 184.273 | 2 | 102.887 | 3 | 15.846 | 4 | 0 | 4 | .111 | 4 | .171 | 3 |
| 92 | | | min | -89.431 | 1 | -84.819 | 4 | -28.056 | 3 | -.001 | 3 | -.123 | 3 | -.178 | 4 |
| 93 | | 2 | max | 188.497 | 2 | 110.202 | 3 | 11.133 | 4 | 0 | 4 | .072 | 4 | .1 | 3 |
| 94 | | | min | -93.654 | 1 | -92.133 | 4 | -32.769 | 3 | -.001 | 3 | -.084 | 3 | -.125 | 4 |
| 95 | | 3 | max | 192.72 | 2 | 117.517 | 3 | 5.594 | 4 | 0 | 4 | .027 | 4 | .023 | 3 |
| 96 | | | min | -97.877 | 1 | -99.448 | 4 | -41.376 | 7 | -.001 | 3 | -.044 | 3 | -.071 | 4 |
| 97 | | 4 | max | 196.943 | 2 | 124.832 | 3 | .354 | 4 | 0 | 4 | -.002 | 3 | -.017 | 4 |
| 98 | | | min | -102.101 | 1 | -106.763 | 4 | -54.808 | 7 | -.001 | 3 | -.033 | 8 | -.089 | 7 |
| 99 | | 5 | max | 201.166 | 2 | 132.147 | 3 | -3.037 | 4 | 0 | 4 | .04 | 3 | .039 | 4 |
| 100 | | | min | -106.324 | 1 | -114.078 | 4 | -63.373 | 7 | -.001 | 3 | -.082 | 4 | -.15 | 3 |
| 101 | M15 | 1 | max | 247.434 | 1 | 16.615 | 1 | 110.513 | 2 | .002 | 2 | .114 | 1 | .179 | 1 |
| 102 | | | min | -154.133 | 2 | -26.498 | 2 | -94.114 | 1 | 0 | 1 | -.128 | 2 | -.166 | 2 |
| 103 | | 2 | max | 251.657 | 1 | 11.902 | 1 | 112.951 | 2 | .002 | 2 | .073 | 1 | .122 | 1 |
| 104 | | | min | -158.357 | 2 | -31.211 | 2 | -96.552 | 1 | 0 | 1 | -.085 | 2 | -.094 | 2 |
| 105 | | 3 | max | 255.881 | 1 | 6.363 | 1 | 115.39 | 2 | .002 | 2 | .027 | 1 | .067 | 1 |
| 106 | | | min | -162.58 | 2 | -38.9 | 6 | -98.99 | 1 | 0 | 1 | -.044 | 2 | -.017 | 2 |
| 107 | | 4 | max | 260.104 | 1 | 1.123 | 1 | 117.828 | 2 | .002 | 2 | -.003 | 3 | .088 | 6 |
| 108 | | | min | -166.803 | 2 | -52.332 | 6 | -101.429 | 1 | 0 | 1 | -.032 | 5 | .013 | 1 |
| 109 | | 5 | max | 264.327 | 1 | -2.268 | 1 | 120.266 | 2 | .002 | 2 | .035 | 2 | .147 | 2 |
| 110 | | | min | -171.026 | 2 | -60.897 | 6 | -103.867 | 1 | 0 | 1 | -.076 | 1 | -.039 | 1 |
| 111 | M16 | 1 | max | 450.296 | 4 | 126.096 | 6 | 62.382 | 2 | 0 | 1 | .051 | 3 | .101 | 6 |

## *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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 112 | | | min | -496.818 | 3 | 5.982 | 10 | -94.941 | 1 | 0 | 10 | -.033 | 4 | .032 | 1 |
| 113 | | 2 | max | 813.114 | 4 | 74.355 | 4 | 167.772 | 2 | .241 | 9 | .197 | 2 | 1.552 | 7 |
| 114 | | | min | -944.078 | 3 | -246.409 | 10 | -239.749 | 1 | -.479 | 10 | -.263 | 1 | .461 | 4 |
| 115 | | 3 | max | 603.004 | 4 | 533.185 | 10 | 185.612 | 3 | .314 | 3 | .153 | 4 | 1.234 | 10 |
| 116 | | | min | -736.22 | 3 | 160.243 | 4 | -137.898 | 4 | -.222 | 10 | -.216 | 3 | .178 | 4 |
| 117 | | 4 | max | 603.004 | 4 | 520.088 | 10 | 185.612 | 3 | .314 | 3 | .071 | 3 | .418 | 10 |
| 118 | | | min | -736.22 | 3 | 147.146 | 4 | -137.898 | 4 | -.222 | 10 | -.06 | 4 | -.06 | 4 |
| 119 | | 5 | max | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 120 | | | min | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 121 | M36 | 1 | max | 3348.888 | 2 | 1614.219 | 5 | 1416.097 | 4 | .739 | 4 | 1.564 | 3 | 3.158 | 5 |
| 122 | | | min | -804.645 | 1 | 524.197 | 10 | -1416.57 | 3 | -.751 | 3 | -1.565 | 4 | .203 | 2 |
| 123 | | 2 | max | 3348.888 | 2 | 1594.65 | 5 | 1404.594 | 4 | .739 | 4 | .445 | 3 | 1.886 | 5 |
| 124 | | | min | -804.645 | 1 | 512.464 | 10 | -1405.068 | 3 | -.751 | 3 | -.447 | 4 | -.226 | 2 |
| 125 | | 3 | max | 3348.888 | 2 | 1575.08 | 5 | 1393.091 | 4 | .739 | 4 | .662 | 4 | 1.05 | 1 |
| 126 | | | min | -804.645 | 1 | 500.731 | 10 | -1393.565 | 3 | -.751 | 3 | -.664 | 3 | -.645 | 2 |
| 127 | | 4 | max | 522.867 | 6 | 1157.697 | 5 | 901.214 | 3 | .106 | 10 | .021 | 4 | 0 | 1 |
| 128 | | | min | 179.12 | 1 | 388.995 | 2 | -887.645 | 4 | -.059 | 9 | -.02 | 3 | -.057 | 6 |
| 129 | | 5 | max | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 130 | | | min | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 131 | M44 | 1 | max | 238.503 | 5 | 123.559 | 10 | 568.218 | 1 | 0 | 4 | .016 | 5 | 0 | 9 |
| 132 | | | min | 77.092 | 10 | -81.959 | 4 | -433.214 | 2 | 0 | 3 | .005 | 10 | 0 | 10 |
| 133 | | 2 | max | 238.503 | 5 | 123.559 | 10 | 568.218 | 1 | 0 | 4 | .021 | 5 | .002 | 4 |
| 134 | | | min | 77.092 | 10 | -81.959 | 4 | -433.214 | 2 | 0 | 3 | -.004 | 2 | -.003 | 10 |
| 135 | | 3 | max | 238.503 | 5 | 123.559 | 10 | 568.218 | 1 | 0 | 4 | .033 | 1 | .003 | 4 |
| 136 | | | min | 77.092 | 10 | -81.959 | 4 | -433.214 | 2 | 0 | 3 | -.013 | 2 | -.005 | 10 |
| 137 | | 4 | max | 238.503 | 5 | 123.559 | 10 | 568.218 | 1 | 0 | 4 | .045 | 1 | .005 | 4 |
| 138 | | | min | 77.092 | 10 | -81.959 | 4 | -433.214 | 2 | 0 | 3 | -.022 | 2 | -.008 | 10 |
| 139 | | 5 | max | 238.503 | 5 | 123.559 | 10 | 568.218 | 1 | 0 | 4 | .056 | 1 | .007 | 4 |
| 140 | | | min | 77.092 | 10 | -81.959 | 4 | -433.214 | 2 | 0 | 3 | -.031 | 2 | -.01 | 10 |
| 141 | M45 | 1 | max | 40.741 | 5 | 59.563 | 10 | 85.885 | 2 | 0 | 4 | .032 | 5 | 0 | 9 |
| 142 | | | min | 14.167 | 2 | -52.549 | 4 | -158.924 | 1 | 0 | 3 | .01 | 10 | 0 | 10 |
| 143 | | 2 | max | 40.741 | 5 | 59.563 | 10 | 85.885 | 2 | 0 | 4 | .03 | 8 | .001 | 4 |
| 144 | | | min | 14.167 | 2 | -52.549 | 4 | -158.924 | 1 | 0 | 3 | .01 | 10 | -.002 | 10 |
| 145 | | 3 | max | 40.741 | 5 | 59.563 | 10 | 85.885 | 2 | 0 | 4 | .028 | 6 | .002 | 4 |
| 146 | | | min | 14.167 | 2 | -52.549 | 4 | -158.924 | 1 | 0 | 3 | .01 | 10 | -.003 | 10 |
| 147 | | 4 | max | 40.741 | 5 | 59.563 | 10 | 85.885 | 2 | 0 | 4 | .027 | 6 | .003 | 4 |
| 148 | | | min | 14.167 | 2 | -52.549 | 4 | -158.924 | 1 | 0 | 3 | .008 | 1 | -.004 | 10 |
| 149 | | 5 | max | 40.741 | 5 | 59.563 | 10 | 85.885 | 2 | 0 | 4 | .026 | 6 | .004 | 4 |
| 150 | | | min | 14.167 | 2 | -52.549 | 4 | -158.924 | 1 | 0 | 3 | .005 | 1 | -.005 | 10 |
| 151 | M46 | 1 | max | 25.345 | 5 | 63.377 | 4 | 86.923 | 2 | 0 | 4 | .032 | 5 | 0 | 9 |
| 152 | | | min | 8.503 | 2 | -65.378 | 3 | -131.796 | 1 | 0 | 3 | .011 | 10 | 0 | 10 |
| 153 | | 2 | max | 25.345 | 5 | 63.377 | 4 | 86.923 | 2 | 0 | 4 | .031 | 5 | .001 | 3 |
| 154 | | | min | 8.503 | 2 | -65.378 | 3 | -131.796 | 1 | 0 | 3 | .011 | 10 | -.001 | 4 |
| 155 | | 3 | max | 25.345 | 5 | 63.377 | 4 | 86.923 | 2 | 0 | 4 | .03 | 6 | .003 | 3 |
| 156 | | | min | 8.503 | 2 | -65.378 | 3 | -131.796 | 1 | 0 | 3 | .011 | 10 | -.003 | 4 |
| 157 | | 4 | max | 25.345 | 5 | 63.377 | 4 | 86.923 | 2 | 0 | 4 | .029 | 6 | .004 | 3 |
| 158 | | | min | 8.503 | 2 | -65.378 | 3 | -131.796 | 1 | 0 | 3 | .01 | 1 | -.004 | 4 |
| 159 | | 5 | max | 25.345 | 5 | 63.377 | 4 | 86.923 | 2 | 0 | 4 | .029 | 6 | .005 | 3 |
| 160 | | | min | 8.503 | 2 | -65.378 | 3 | -131.796 | 1 | 0 | 3 | .007 | 1 | -.005 | 4 |
| 161 | M47 | 1 | max | 18.921 | 5 | 79.624 | 4 | 73.123 | 2 | 0 | 4 | .032 | 5 | 0 | 9 |
| 162 | | | min | 7.269 | 2 | -80.522 | 3 | -115.298 | 1 | 0 | 3 | .011 | 2 | 0 | 10 |
| 163 | | 2 | max | 18.921 | 5 | 79.624 | 4 | 73.123 | 2 | 0 | 4 | .031 | 5 | .002 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 164 | | | min | 7.269 | 2 | -80.522 | 3 | -115.298 | 1 | 0 | 3 | .011 | 10 | -.002 | 4 |
| 165 | | 3 | max | 18.921 | 5 | 79.624 | 4 | 73.123 | 2 | 0 | 4 | .03 | 6 | .003 | 3 |
| 166 | | | min | 7.269 | 2 | -80.522 | 3 | -115.298 | 1 | 0 | 3 | .011 | 10 | -.003 | 4 |
| 167 | | 4 | max | 18.921 | 5 | 79.624 | 4 | 73.123 | 2 | 0 | 4 | .029 | 6 | .005 | 3 |
| 168 | | | min | 7.269 | 2 | -80.522 | 3 | -115.298 | 1 | 0 | 3 | .011 | 1 | -.005 | 4 |
| 169 | | 5 | max | 18.921 | 5 | 79.624 | 4 | 73.123 | 2 | 0 | 4 | .029 | 6 | .007 | 3 |
| 170 | | | min | 7.269 | 2 | -80.522 | 3 | -115.298 | 1 | 0 | 3 | .008 | 1 | -.007 | 4 |
| 171 | M48 | 1 | max | -71.068 | 2 | 227.889 | 4 | 117.108 | 2 | 0 | 4 | .016 | 5 | 0 | 9 |
| 172 | | | min | -212.25 | 5 | -222.592 | 3 | -79.398 | 1 | 0 | 3 | .005 | 2 | 0 | 10 |
| 173 | | 2 | max | -71.068 | 2 | 227.889 | 4 | 117.108 | 2 | 0 | 4 | .017 | 6 | .005 | 3 |
| 174 | | | min | -212.25 | 5 | -222.592 | 3 | -79.398 | 1 | 0 | 3 | .006 | 10 | -.005 | 4 |
| 175 | | 3 | max | -71.068 | 2 | 227.889 | 4 | 117.108 | 2 | 0 | 4 | .018 | 6 | .009 | 3 |
| 176 | | | min | -212.25 | 5 | -222.592 | 3 | -79.398 | 1 | 0 | 3 | .006 | 1 | -.009 | 4 |
| 177 | | 4 | max | -71.068 | 2 | 227.889 | 4 | 117.108 | 2 | 0 | 4 | .019 | 6 | .014 | 3 |
| 178 | | | min | -212.25 | 5 | -222.592 | 3 | -79.398 | 1 | 0 | 3 | .004 | 1 | -.014 | 4 |
| 179 | | 5 | max | -71.068 | 2 | 227.889 | 4 | 117.108 | 2 | 0 | 4 | .021 | 6 | .019 | 3 |
| 180 | | | min | -212.25 | 5 | -222.592 | 3 | -79.398 | 1 | 0 | 3 | .002 | 1 | -.019 | 4 |
| 181 | M46A | 1 | max | -1777.058 | 2 | 208.418 | 4 | 759.1 | 9 | 0 | 1 | -.065 | 1 | .097 | 6 |
| 182 | | | min | -4496.539 | 5 | -219.407 | 3 | -967.035 | 10 | 0 | 1 | -.282 | 6 | .012 | 1 |
| 183 | | 2 | max | -1777.058 | 2 | 208.418 | 4 | 759.1 | 9 | 0 | 1 | -.067 | 1 | .098 | 6 |
| 184 | | | min | -4496.539 | 5 | -219.407 | 3 | -967.035 | 10 | 0 | 1 | -.278 | 6 | .011 | 1 |
| 185 | | 3 | max | -1777.058 | 2 | 208.418 | 4 | 759.1 | 9 | 0 | 1 | -.07 | 1 | .098 | 6 |
| 186 | | | min | -4496.539 | 5 | -219.407 | 3 | -967.035 | 10 | 0 | 1 | -.274 | 6 | .01 | 1 |
| 187 | | 4 | max | -1777.058 | 2 | 208.418 | 4 | 759.1 | 9 | 0 | 1 | -.072 | 1 | .099 | 6 |
| 188 | | | min | -4496.539 | 5 | -219.407 | 3 | -967.035 | 10 | 0 | 1 | -.269 | 6 | .009 | 1 |
| 189 | | 5 | max | -1777.058 | 2 | 208.418 | 4 | 759.1 | 9 | 0 | 1 | -.067 | 9 | .099 | 6 |
| 190 | | | min | -4496.539 | 5 | -219.407 | 3 | -967.035 | 10 | 0 | 1 | -.266 | 10 | .008 | 1 |
| 191 | M47A | 1 | max | 4138.468 | 6 | 283.223 | 10 | 509.899 | 10 | 0 | 1 | .326 | 6 | .139 | 5 |
| 192 | | | min | 974.257 | 1 | -308.746 | 9 | -400.104 | 9 | 0 | 1 | .094 | 1 | .042 | 2 |
| 193 | | 2 | max | 4138.468 | 6 | 283.223 | 10 | 509.899 | 10 | 0 | 1 | .324 | 6 | .14 | 5 |
| 194 | | | min | 974.257 | 1 | -308.746 | 9 | -400.104 | 9 | 0 | 1 | .097 | 1 | .045 | 2 |
| 195 | | 3 | max | 4138.468 | 6 | 283.223 | 10 | 509.899 | 10 | 0 | 1 | .321 | 6 | .141 | 5 |
| 196 | | | min | 974.257 | 1 | -308.746 | 9 | -400.104 | 9 | 0 | 1 | .099 | 1 | .047 | 2 |
| 197 | | 4 | max | 4138.468 | 6 | 283.223 | 10 | 509.899 | 10 | 0 | 1 | .318 | 6 | .142 | 5 |
| 198 | | | min | 974.257 | 1 | -308.746 | 9 | -400.104 | 9 | 0 | 1 | .102 | 1 | .05 | 2 |
| 199 | | 5 | max | 4138.468 | 6 | 283.223 | 10 | 509.899 | 10 | 0 | 1 | .316 | 6 | .143 | 5 |
| 200 | | | min | 974.257 | 1 | -308.746 | 9 | -400.104 | 9 | 0 | 1 | .104 | 1 | .052 | 2 |
| 201 | M48A | 1 | max | -232.147 | 2 | 376.625 | 9 | 357.139 | 10 | 0 | 1 | .07 | 7 | .075 | 5 |
| 202 | | | min | -1246.59 | 5 | -498.739 | 10 | -295.324 | 9 | 0 | 1 | .028 | 4 | .014 | 2 |
| 203 | | 2 | max | -232.147 | 2 | 376.625 | 9 | 357.139 | 10 | 0 | 1 | .069 | 5 | .073 | 5 |
| 204 | | | min | -1246.59 | 5 | -498.739 | 10 | -295.324 | 9 | 0 | 1 | .029 | 2 | .01 | 2 |
| 205 | | 3 | max | -232.147 | 2 | 376.625 | 9 | 357.139 | 10 | 0 | 1 | .068 | 5 | .072 | 5 |
| 206 | | | min | -1246.59 | 5 | -498.739 | 10 | -295.324 | 9 | 0 | 1 | .026 | 2 | .006 | 2 |
| 207 | | 4 | max | -232.147 | 2 | 376.625 | 9 | 357.139 | 10 | 0 | 1 | .067 | 5 | .07 | 5 |
| 208 | | | min | -1246.59 | 5 | -498.739 | 10 | -295.324 | 9 | 0 | 1 | .022 | 2 | .002 | 2 |
| 209 | | 5 | max | -232.147 | 2 | 376.625 | 9 | 357.139 | 10 | 0 | 1 | .069 | 10 | .072 | 10 |
| 210 | | | min | -1246.59 | 5 | -498.739 | 10 | -295.324 | 9 | 0 | 1 | .019 | 2 | -.002 | 2 |
| 211 | M54B | 1 | max | 0 | 1 | .008 | 3 | .001 | 2 | 0 | 1 | 0 | 1 | 0 | 1 |
| 212 | | | min | 0 | 1 | -.004 | 5 | -.002 | 4 | 0 | 1 | 0 | 1 | 0 | 1 |
| 213 | | 2 | max | 681.322 | 1 | -89.891 | 3 | 66.145 | 4 | .341 | 3 | .372 | 3 | .638 | 6 |
| 214 | | | min | -814.59 | 2 | -538.529 | 10 | -115.108 | 3 | -.26 | 4 | -.363 | 4 | -.015 | 1 |
| 215 | | 3 | max | 690.59 | 1 | -102.988 | 3 | 50.092 | 4 | .341 | 3 | .206 | 3 | 1.329 | 10 |

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 216 | | | min | -823.858 | 2 | -551.626 | 10 | -99.055 | 3 | -.26 | 4 | -.273 | 4 | .266 | 1 |
| 217 | | 4 | max | 852.354 | 1 | 259.53 | 10 | 199.634 | 2 | .36 | 10 | .157 | 3 | 1.594 | 7 |
| 218 | | | min | -982.867 | 2 | -40.661 | 1 | -128.428 | 1 | -.001 | 9 | -.224 | 4 | .405 | 4 |
| 219 | | 5 | max | 500.212 | 1 | -17.863 | 10 | 118.742 | 4 | 0 | 10 | .049 | 2 | .102 | 7 |
| 220 | | | min | -546.878 | 2 | -106.946 | 5 | -84.425 | 3 | 0 | 4 | -.03 | 1 | .032 | 4 |
| 221 | M55B | 1 | max | 395.477 | 2 | 155.836 | 10 | 50.365 | 3 | 0 | 10 | .056 | 4 | .101 | 7 |
| 222 | | | min | -441.106 | 1 | 22.428 | 4 | -82.212 | 4 | 0 | 7 | -.037 | 3 | .032 | 4 |
| 223 | | 2 | max | 750.908 | 3 | 156.454 | 10 | 268.449 | 3 | .268 | 10 | .311 | 3 | 1.546 | 5 |
| 224 | | | min | -884.204 | 4 | -130.629 | 1 | -339.251 | 4 | -.059 | 9 | -.376 | 4 | .5 | 2 |
| 225 | | 3 | max | 729.419 | 3 | 480.985 | 5 | 213.861 | 4 | .317 | 4 | .217 | 3 | 1.108 | 5 |
| 226 | | | min | -865.682 | 4 | 176.499 | 2 | -165.3 | 3 | -.143 | 3 | -.281 | 4 | .303 | 2 |
| 227 | | 4 | max | 720.151 | 3 | 457.402 | 5 | 197.808 | 4 | .317 | 4 | .042 | 1 | .394 | 8 |
| 228 | | | min | -856.414 | 4 | 163.402 | 2 | -149.248 | 3 | -.143 | 3 | -.032 | 2 | -.011 | 3 |
| 229 | | 5 | max | 0 | 1 | .014 | 3 | 0 | 6 | 0 | 1 | 0 | 1 | 0 | 1 |
| 230 | | | min | 0 | 1 | -.02 | 1 | -.005 | 4 | 0 | 1 | 0 | 1 | 0 | 1 |
| 231 | M56B | 1 | max | -1684.021 | 1 | 170.205 | 2 | 667.169 | 10 | 0 | 3 | -.066 | 4 | .099 | 7 |
| 232 | | | min | -4498.958 | 6 | -181.853 | 1 | -158.774 | 4 | 0 | 8 | -.282 | 7 | .005 | 4 |
| 233 | | 2 | max | -1684.021 | 1 | 170.205 | 2 | 667.169 | 10 | 0 | 3 | -.071 | 4 | .098 | 7 |
| 234 | | | min | -4498.958 | 6 | -181.853 | 1 | -158.774 | 4 | 0 | 8 | -.277 | 7 | .008 | 4 |
| 235 | | 3 | max | -1684.021 | 1 | 170.205 | 2 | 667.169 | 10 | 0 | 3 | -.075 | 4 | .098 | 7 |
| 236 | | | min | -4498.958 | 6 | -181.853 | 1 | -158.774 | 4 | 0 | 8 | -.273 | 7 | .01 | 4 |
| 237 | | 4 | max | -1684.021 | 1 | 170.205 | 2 | 667.169 | 10 | 0 | 3 | -.079 | 4 | .098 | 7 |
| 238 | | | min | -4498.958 | 6 | -181.853 | 1 | -158.774 | 4 | 0 | 8 | -.268 | 7 | .013 | 4 |
| 239 | | 5 | max | -1684.021 | 1 | 170.205 | 2 | 667.169 | 10 | 0 | 3 | -.083 | 4 | .098 | 7 |
| 240 | | | min | -4498.958 | 6 | -181.853 | 1 | -158.774 | 4 | 0 | 8 | -.263 | 7 | .016 | 4 |
| 241 | M57B | 1 | max | 4147.049 | 7 | 45.035 | 9 | 157.429 | 2 | 0 | 6 | .325 | 7 | .138 | 8 |
| 242 | | | min | 938.595 | 4 | -153.174 | 10 | -352.904 | 10 | 0 | 12 | .104 | 4 | .046 | 3 |
| 243 | | 2 | max | 4147.049 | 7 | 45.035 | 9 | 157.429 | 2 | 0 | 6 | .323 | 7 | .139 | 8 |
| 244 | | | min | 938.595 | 4 | -153.174 | 10 | -352.904 | 10 | 0 | 12 | .1 | 4 | .048 | 3 |
| 245 | | 3 | max | 4147.049 | 7 | 45.035 | 9 | 157.429 | 2 | 0 | 6 | .322 | 7 | .14 | 8 |
| 246 | | | min | 938.595 | 4 | -153.174 | 10 | -352.904 | 10 | 0 | 12 | .096 | 4 | .048 | 1 |
| 247 | | 4 | max | 4147.049 | 7 | 45.035 | 9 | 157.429 | 2 | 0 | 6 | .32 | 7 | .142 | 6 |
| 248 | | | min | 938.595 | 4 | -153.174 | 10 | -352.904 | 10 | 0 | 12 | .092 | 4 | .049 | 1 |
| 249 | | 5 | max | 4147.049 | 7 | 45.035 | 9 | 157.429 | 2 | 0 | 6 | .319 | 7 | .143 | 6 |
| 250 | | | min | 938.595 | 4 | -153.174 | 10 | -352.904 | 10 | 0 | 12 | .088 | 4 | .049 | 1 |
| 251 | M58A | 1 | max | -306.678 | 3 | 346.832 | 10 | 58.272 | 2 | 0 | 8 | .071 | 8 | .074 | 8 |
| 252 | | | min | -1228.527 | 8 | -43.478 | 9 | -237.666 | 10 | 0 | 6 | .027 | 3 | .013 | 3 |
| 253 | | 2 | max | -306.678 | 3 | 346.832 | 10 | 58.272 | 2 | 0 | 8 | .069 | 8 | .072 | 8 |
| 254 | | | min | -1228.527 | 8 | -43.478 | 9 | -237.666 | 10 | 0 | 6 | .028 | 3 | .012 | 3 |
| 255 | | 3 | max | -306.678 | 3 | 346.832 | 10 | 58.272 | 2 | 0 | 8 | .068 | 6 | .07 | 8 |
| 256 | | | min | -1228.527 | 8 | -43.478 | 9 | -237.666 | 10 | 0 | 6 | .025 | 1 | .011 | 3 |
| 257 | | 4 | max | -306.678 | 3 | 346.832 | 10 | 58.272 | 2 | 0 | 8 | .067 | 6 | .069 | 8 |
| 258 | | | min | -1228.527 | 8 | -43.478 | 9 | -237.666 | 10 | 0 | 6 | .022 | 1 | .01 | 3 |
| 259 | | 5 | max | -306.678 | 3 | 346.832 | 10 | 58.272 | 2 | 0 | 8 | .066 | 6 | .067 | 8 |
| 260 | | | min | -1228.527 | 8 | -43.478 | 9 | -237.666 | 10 | 0 | 6 | .019 | 1 | .008 | 3 |
| 261 | M68 | 1 | max | 0 | 1 | .008 | 1 | .003 | 3 | 0 | 1 | 0 | 1 | 0 | 1 |
| 262 | | | min | 0 | 1 | -.004 | 4 | 0 | 2 | 0 | 1 | 0 | 1 | 0 | 1 |
| 263 | | 2 | max | 802.221 | 4 | -107.773 | 1 | 29.165 | 2 | .354 | 4 | .36 | 4 | .637 | 5 |
| 264 | | | min | -935.898 | 3 | -355.64 | 6 | -77.656 | 1 | -.273 | 3 | -.348 | 3 | -.009 | 2 |
| 265 | | 3 | max | 811.489 | 4 | -120.87 | 1 | 23.814 | 2 | .354 | 4 | .288 | 4 | 1.176 | 7 |
| 266 | | | min | -945.166 | 3 | -379.224 | 6 | -72.305 | 1 | -.273 | 3 | -.353 | 3 | .303 | 2 |
| 267 | | 4 | max | 879.46 | 4 | 149.129 | 1 | 287.535 | 3 | .144 | 4 | .23 | 4 | 1.581 | 5 |

## *Envelope Member Section Forces (Continued)*

| | Member | Sec | | Axial[lb] | LC | y Shear[lb] | LC | z Shear[lb] | LC | Torque[k-... | LC | y-y Mome... | LC | z-z Mome... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 268 | | | min | -1009.268 | 3 | -53.135 | 2 | -214.822 | 4 | -.022 | 3 | -.297 | 3 | .479 | 2 |
| 269 | | 5 | max | 505.948 | 2 | -34.451 | 3 | 85.142 | 2 | 0 | 4 | .056 | 3 | .101 | 8 |
| 270 | | | min | -553.098 | 1 | -106.737 | 8 | -51.538 | 1 | 0 | 3 | -.036 | 4 | .036 | 3 |
| 271 | M69 | 1 | max | 519.188 | 1 | 124.47 | 5 | 61.754 | 4 | 0 | 3 | .062 | 2 | .101 | 8 |
| 272 | | | min | -567.259 | 2 | 35.329 | 2 | -94.319 | 3 | 0 | 5 | -.044 | 1 | .036 | 3 |
| 273 | | 2 | max | 994.172 | 1 | 58.734 | 1 | 262.128 | 1 | .06 | 4 | .296 | 1 | 1.555 | 8 |
| 274 | | | min | -1126.492 | 2 | -139.708 | 2 | -331.47 | 2 | -.057 | 3 | -.359 | 2 | .466 | 3 |
| 275 | | 3 | max | 846.678 | 1 | 479.48 | 8 | 248.233 | 2 | .345 | 2 | .236 | 1 | 1.121 | 6 |
| 276 | | | min | -981.429 | 2 | 189.883 | 3 | -200.836 | 1 | -.17 | 1 | -.298 | 2 | .221 | 1 |
| 277 | | 4 | max | 837.41 | 1 | 455.897 | 8 | 242.883 | 2 | .345 | 2 | .082 | 2 | .401 | 6 |
| 278 | | | min | -972.161 | 2 | 176.786 | 3 | -195.485 | 1 | -.17 | 1 | -.071 | 1 | -.064 | 1 |
| 279 | | 5 | max | 0 | 1 | .012 | 3 | .001 | 3 | 0 | 1 | 0 | 1 | 0 | 1 |
| 280 | | | min | 0 | 1 | -.02 | 2 | -.004 | 2 | 0 | 1 | 0 | 1 | 0 | 1 |
| 281 | M70 | 1 | max | -1636.659 | 4 | 181.145 | 1 | 226.553 | 1 | 0 | 5 | -.088 | 3 | .097 | 5 |
| 282 | | | min | -4512.142 | 7 | -191.463 | 2 | -86.224 | 2 | 0 | 2 | -.278 | 8 | .013 | 2 |
| 283 | | 2 | max | -1636.659 | 4 | 181.145 | 1 | 226.553 | 1 | 0 | 5 | -.087 | 3 | .097 | 5 |
| 284 | | | min | -4512.142 | 7 | -191.463 | 2 | -86.224 | 2 | 0 | 2 | -.275 | 8 | .018 | 2 |
| 285 | | 3 | max | -1636.659 | 4 | 181.145 | 1 | 226.553 | 1 | 0 | 5 | -.086 | 3 | .098 | 8 |
| 286 | | | min | -4512.142 | 7 | -191.463 | 2 | -86.224 | 2 | 0 | 2 | -.271 | 8 | .015 | 3 |
| 287 | | 4 | max | -1636.659 | 4 | 181.145 | 1 | 226.553 | 1 | 0 | 5 | -.085 | 3 | .098 | 8 |
| 288 | | | min | -4512.142 | 7 | -191.463 | 2 | -86.224 | 2 | 0 | 2 | -.267 | 8 | .011 | 3 |
| 289 | | 5 | max | -1636.659 | 4 | 181.145 | 1 | 226.553 | 1 | 0 | 5 | -.084 | 3 | .099 | 8 |
| 290 | | | min | -4512.142 | 7 | -191.463 | 2 | -86.224 | 2 | 0 | 2 | -.264 | 8 | .008 | 3 |
| 291 | M71 | 1 | max | 4115.554 | 8 | 28.056 | 3 | 223.192 | 3 | 0 | 1 | .327 | 8 | .139 | 7 |
| 292 | | | min | 1137.25 | 3 | -100.709 | 9 | -308.896 | 4 | 0 | 5 | .099 | 3 | .039 | 4 |
| 293 | | 2 | max | 4115.554 | 8 | 28.056 | 3 | 223.192 | 3 | 0 | 1 | .323 | 8 | .14 | 7 |
| 294 | | | min | 1137.25 | 3 | -100.709 | 9 | -308.896 | 4 | 0 | 5 | .104 | 3 | .042 | 4 |
| 295 | | 3 | max | 4115.554 | 8 | 28.056 | 3 | 223.192 | 3 | 0 | 1 | .32 | 8 | .141 | 7 |
| 296 | | | min | 1137.25 | 3 | -100.709 | 9 | -308.896 | 4 | 0 | 5 | .11 | 3 | .044 | 4 |
| 297 | | 4 | max | 4115.554 | 8 | 28.056 | 3 | 223.192 | 3 | 0 | 1 | .318 | 5 | .142 | 7 |
| 298 | | | min | 1137.25 | 3 | -100.709 | 9 | -308.896 | 4 | 0 | 5 | .11 | 2 | .046 | 4 |
| 299 | | 5 | max | 4115.554 | 8 | 28.056 | 3 | 223.192 | 3 | 0 | 1 | .317 | 5 | .143 | 7 |
| 300 | | | min | 1137.25 | 3 | -100.709 | 9 | -308.896 | 4 | 0 | 5 | .103 | 2 | .048 | 4 |
| 301 | M72 | 1 | max | -262.88 | 4 | 165.207 | 4 | 114.154 | 3 | 0 | 8 | .071 | 6 | .073 | 7 |
| 302 | | | min | -1236.439 | 7 | -87.506 | 3 | -175.884 | 4 | 0 | 10 | .025 | 1 | .017 | 4 |
| 303 | | 2 | max | -262.88 | 4 | 165.207 | 4 | 114.154 | 3 | 0 | 8 | .069 | 6 | .072 | 7 |
| 304 | | | min | -1236.439 | 7 | -87.506 | 3 | -175.884 | 4 | 0 | 10 | .027 | 1 | .012 | 4 |
| 305 | | 3 | max | -262.88 | 4 | 165.207 | 4 | 114.154 | 3 | 0 | 8 | .068 | 7 | .071 | 7 |
| 306 | | | min | -1236.439 | 7 | -87.506 | 3 | -175.884 | 4 | 0 | 10 | .025 | 4 | .008 | 4 |
| 307 | | 4 | max | -262.88 | 4 | 165.207 | 4 | 114.154 | 3 | 0 | 8 | .067 | 7 | .07 | 7 |
| 308 | | | min | -1236.439 | 7 | -87.506 | 3 | -175.884 | 4 | 0 | 10 | .02 | 4 | .004 | 4 |
| 309 | | 5 | max | -262.88 | 4 | 165.207 | 4 | 114.154 | 3 | 0 | 8 | .066 | 7 | .068 | 7 |
| 310 | | | min | -1236.439 | 7 | -87.506 | 3 | -175.884 | 4 | 0 | 10 | .016 | 4 | 0 | 4 |
| 311 | M55A | 1 | max | 347.389 | 3 | -76.645 | 2 | 811.022 | 3 | .029 | 3 | .257 | 4 | .094 | 4 |
| 312 | | | min | -460.289 | 4 | -239.534 | 5 | -724.113 | 4 | -.051 | 4 | -.286 | 3 | -.199 | 3 |
| 313 | | 2 | max | 347.389 | 3 | -76.645 | 2 | 811.022 | 3 | .029 | 3 | .228 | 4 | .099 | 4 |
| 314 | | | min | -460.289 | 4 | -239.534 | 5 | -724.113 | 4 | -.051 | 4 | -.253 | 3 | -.194 | 3 |
| 315 | | 3 | max | 347.389 | 3 | -76.645 | 2 | 811.022 | 3 | .029 | 3 | .199 | 4 | .103 | 4 |
| 316 | | | min | -460.289 | 4 | -239.534 | 5 | -724.113 | 4 | -.051 | 4 | -.221 | 3 | -.189 | 3 |
| 317 | | 4 | max | 347.389 | 3 | -76.645 | 2 | 811.022 | 3 | .029 | 3 | .171 | 4 | .107 | 4 |
| 318 | | | min | -460.289 | 4 | -239.534 | 5 | -724.113 | 4 | -.051 | 4 | -.189 | 3 | -.184 | 3 |
| 319 | | 5 | max | 347.389 | 3 | -76.645 | 2 | 811.022 | 3 | .029 | 3 | .142 | 4 | .112 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 320 | | | min | -460.289 | 4 | -239.534 | 5 | -724.113 | 4 | -.051 | 4 | -.156 | 3 | -.179 | 3 |
| 321 | M56A | 1 | max | 172.768 | 3 | 240.804 | 5 | 549.379 | 3 | .04 | 3 | .227 | 4 | .286 | 4 |
| 322 | | | min | -285.5 | 4 | 75.682 | 2 | -642.523 | 4 | -.034 | 4 | -.198 | 3 | -.089 | 3 |
| 323 | | 2 | max | 172.768 | 3 | 240.804 | 5 | 549.379 | 3 | .04 | 3 | .201 | 4 | .282 | 4 |
| 324 | | | min | -285.5 | 4 | 75.682 | 2 | -642.523 | 4 | -.034 | 4 | -.176 | 3 | -.093 | 3 |
| 325 | | 3 | max | 172.768 | 3 | 240.804 | 5 | 549.379 | 3 | .04 | 3 | .176 | 4 | .277 | 4 |
| 326 | | | min | -285.5 | 4 | 75.682 | 2 | -642.523 | 4 | -.034 | 4 | -.154 | 3 | -.098 | 3 |
| 327 | | 4 | max | 172.768 | 3 | 240.804 | 5 | 549.379 | 3 | .04 | 3 | .15 | 4 | .273 | 4 |
| 328 | | | min | -285.5 | 4 | 75.682 | 2 | -642.523 | 4 | -.034 | 4 | -.132 | 3 | -.103 | 3 |
| 329 | | 5 | max | 172.768 | 3 | 240.804 | 5 | 549.379 | 3 | .04 | 3 | .124 | 4 | .269 | 4 |
| 330 | | | min | -285.5 | 4 | 75.682 | 2 | -642.523 | 4 | -.034 | 4 | -.11 | 3 | -.108 | 3 |
| 331 | M55C | 1 | max | 572.568 | 1 | -86.008 | 1 | 941.483 | 1 | .041 | 1 | .161 | 2 | .168 | 2 |
| 332 | | | min | -684.734 | 2 | -237.298 | 8 | -849.452 | 2 | -.063 | 2 | -.176 | 1 | -.236 | 1 |
| 333 | | 2 | max | 573.015 | 1 | -86.352 | 1 | 941.74 | 1 | .041 | 1 | .114 | 2 | .177 | 2 |
| 334 | | | min | -685.18 | 2 | -238.065 | 8 | -849.71 | 2 | -.063 | 2 | -.124 | 1 | -.231 | 1 |
| 335 | | 3 | max | 573.461 | 1 | -86.696 | 1 | 941.998 | 1 | .041 | 1 | .066 | 2 | .185 | 2 |
| 336 | | | min | -685.627 | 2 | -238.831 | 8 | -849.968 | 2 | -.063 | 2 | -.071 | 1 | -.226 | 1 |
| 337 | | 4 | max | 573.907 | 1 | -87.04 | 1 | 942.256 | 1 | .041 | 1 | .018 | 2 | .193 | 2 |
| 338 | | | min | -686.073 | 2 | -239.597 | 8 | -850.225 | 2 | -.063 | 2 | -.018 | 1 | -.221 | 1 |
| 339 | | 5 | max | 574.354 | 1 | -87.384 | 1 | 942.513 | 1 | .041 | 1 | .035 | 1 | .201 | 2 |
| 340 | | | min | -686.519 | 2 | -240.363 | 8 | -850.483 | 2 | -.063 | 2 | -.03 | 2 | -.216 | 1 |
| 341 | M56C | 1 | max | 572.57 | 1 | -85.954 | 1 | 939.036 | 1 | .041 | 1 | .298 | 2 | .145 | 2 |
| 342 | | | min | -684.737 | 2 | -237.302 | 8 | -852.148 | 2 | -.063 | 2 | -.327 | 1 | -.25 | 1 |
| 343 | | 2 | max | 572.57 | 1 | -85.954 | 1 | 939.036 | 1 | .041 | 1 | .264 | 2 | .151 | 2 |
| 344 | | | min | -684.737 | 2 | -237.302 | 8 | -852.148 | 2 | -.063 | 2 | -.289 | 1 | -.246 | 1 |
| 345 | | 3 | max | 572.57 | 1 | -85.954 | 1 | 939.036 | 1 | .041 | 1 | .229 | 2 | .157 | 2 |
| 346 | | | min | -684.737 | 2 | -237.302 | 8 | -852.148 | 2 | -.063 | 2 | -.251 | 1 | -.243 | 1 |
| 347 | | 4 | max | 572.57 | 1 | -85.954 | 1 | 939.036 | 1 | .041 | 1 | .195 | 2 | .163 | 2 |
| 348 | | | min | -684.737 | 2 | -237.302 | 8 | -852.148 | 2 | -.063 | 2 | -.214 | 1 | -.239 | 1 |
| 349 | | 5 | max | 572.57 | 1 | -85.954 | 1 | 939.036 | 1 | .041 | 1 | .161 | 2 | .168 | 2 |
| 350 | | | min | -684.737 | 2 | -237.302 | 8 | -852.148 | 2 | -.063 | 2 | -.176 | 1 | -.236 | 1 |
| 351 | M57A | 1 | max | 400.67 | 1 | 238.573 | 8 | 520.122 | 1 | .039 | 1 | .22 | 2 | .392 | 2 |
| 352 | | | min | -512.003 | 2 | 85.057 | 1 | -613.141 | 2 | -.033 | 2 | -.191 | 1 | -.194 | 1 |
| 353 | | 2 | max | 400.67 | 1 | 238.573 | 8 | 520.122 | 1 | .039 | 1 | .195 | 2 | .387 | 2 |
| 354 | | | min | -512.003 | 2 | 85.057 | 1 | -613.141 | 2 | -.033 | 2 | -.17 | 1 | -.197 | 1 |
| 355 | | 3 | max | 400.67 | 1 | 238.573 | 8 | 520.122 | 1 | .039 | 1 | .171 | 2 | .381 | 2 |
| 356 | | | min | -512.003 | 2 | 85.057 | 1 | -613.141 | 2 | -.033 | 2 | -.149 | 1 | -.2 | 1 |
| 357 | | 4 | max | 400.67 | 1 | 238.573 | 8 | 520.122 | 1 | .039 | 1 | .146 | 2 | .375 | 2 |
| 358 | | | min | -512.003 | 2 | 85.057 | 1 | -613.141 | 2 | -.033 | 2 | -.128 | 1 | -.204 | 1 |
| 359 | | 5 | max | 400.67 | 1 | 238.573 | 8 | 520.122 | 1 | .039 | 1 | .122 | 2 | .37 | 2 |
| 360 | | | min | -512.003 | 2 | 85.057 | 1 | -613.141 | 2 | -.033 | 2 | -.108 | 1 | -.207 | 1 |
| 361 | M58B | 1 | max | 470.063 | 4 | 269.096 | 10 | 726.396 | 4 | .037 | 4 | .118 | 3 | .133 | 3 |
| 362 | | | min | -579.374 | 3 | -242.256 | 7 | -633.57 | 3 | -.059 | 3 | -.133 | 4 | -.199 | 4 |
| 363 | | 2 | max | 470.51 | 4 | 268.751 | 10 | 727.169 | 4 | .037 | 4 | .083 | 3 | .143 | 3 |
| 364 | | | min | -579.82 | 3 | -243.022 | 7 | -634.343 | 3 | -.059 | 3 | -.093 | 4 | -.196 | 4 |
| 365 | | 3 | max | 470.956 | 4 | 268.407 | 10 | 727.942 | 4 | .037 | 4 | .047 | 3 | .153 | 3 |
| 366 | | | min | -580.266 | 3 | -243.788 | 7 | -635.116 | 3 | -.059 | 3 | -.052 | 4 | -.193 | 4 |
| 367 | | 4 | max | 471.402 | 4 | 268.063 | 10 | 728.715 | 4 | .037 | 4 | .015 | 1 | .163 | 3 |
| 368 | | | min | -580.713 | 3 | -244.555 | 7 | -635.889 | 3 | -.059 | 3 | -.014 | 2 | -.19 | 4 |
| 369 | | 5 | max | 471.849 | 4 | 267.719 | 10 | 729.488 | 4 | .037 | 4 | .03 | 4 | .173 | 3 |
| 370 | | | min | -581.159 | 3 | -245.321 | 7 | -636.662 | 3 | -.059 | 3 | -.024 | 3 | -.186 | 4 |
| 371 | M59 | 1 | max | 470.064 | 4 | 269.113 | 10 | 724.9 | 4 | .037 | 4 | .22 | 3 | .114 | 10 |

## *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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 372 | | | min | -579.375 | 3 | -242.225 | 7 | -635.227 | 3 | -.059 | 3 | -.249 | 4 | -.209 | 4 |
| 373 | | 2 | max | 470.064 | 4 | 269.113 | 10 | 724.9 | 4 | .037 | 4 | .194 | 3 | .112 | 3 |
| 374 | | | min | -579.375 | 3 | -242.225 | 7 | -635.227 | 3 | -.059 | 3 | -.22 | 4 | -.206 | 4 |
| 375 | | 3 | max | 470.064 | 4 | 269.113 | 10 | 724.9 | 4 | .037 | 4 | .169 | 3 | .119 | 3 |
| 376 | | | min | -579.375 | 3 | -242.225 | 7 | -635.227 | 3 | -.059 | 3 | -.191 | 4 | -.204 | 4 |
| 377 | | 4 | max | 470.064 | 4 | 269.113 | 10 | 724.9 | 4 | .037 | 4 | .144 | 3 | .126 | 3 |
| 378 | | | min | -579.375 | 3 | -242.225 | 7 | -635.227 | 3 | -.059 | 3 | -.162 | 4 | -.202 | 4 |
| 379 | | 5 | max | 470.064 | 4 | 269.113 | 10 | 724.9 | 4 | .037 | 4 | .118 | 3 | .133 | 3 |
| 380 | | | min | -579.375 | 3 | -242.225 | 7 | -635.227 | 3 | -.059 | 3 | -.133 | 4 | -.199 | 4 |
| 381 | M60 | 1 | max | 326.538 | 4 | 243.291 | 7 | 344.627 | 2 | .028 | 2 | .153 | 1 | .376 | 3 |
| 382 | | | min | -435.689 | 3 | -313.968 | 10 | -436.12 | 1 | -.023 | 1 | -.123 | 2 | -.26 | 10 |
| 383 | | 2 | max | 326.538 | 4 | 243.291 | 7 | 344.627 | 2 | .028 | 2 | .135 | 1 | .369 | 3 |
| 384 | | | min | -435.689 | 3 | -313.968 | 10 | -436.12 | 1 | -.023 | 1 | -.109 | 2 | -.248 | 10 |
| 385 | | 3 | max | 326.538 | 4 | 243.291 | 7 | 344.627 | 2 | .028 | 2 | .118 | 1 | .362 | 3 |
| 386 | | | min | -435.689 | 3 | -313.968 | 10 | -436.12 | 1 | -.023 | 1 | -.096 | 2 | -.235 | 10 |
| 387 | | 4 | max | 326.538 | 4 | 243.291 | 7 | 344.627 | 2 | .028 | 2 | .1 | 1 | .355 | 3 |
| 388 | | | min | -435.689 | 3 | -313.968 | 10 | -436.12 | 1 | -.023 | 1 | -.082 | 2 | -.222 | 10 |
| 389 | | 5 | max | 326.538 | 4 | 243.291 | 7 | 344.627 | 2 | .028 | 2 | .083 | 1 | .348 | 3 |
| 390 | | | min | -435.689 | 3 | -313.968 | 10 | -436.12 | 1 | -.023 | 1 | -.068 | 2 | -.21 | 10 |
| 391 | M64 | 1 | max | 398.889 | 1 | -83.657 | 1 | 520.192 | 1 | .039 | 1 | .016 | 2 | .338 | 2 |
| 392 | | | min | -510.22 | 2 | -235.494 | 8 | -610.541 | 2 | -.033 | 2 | -.009 | 1 | -.226 | 1 |
| 393 | | 2 | max | 399.335 | 1 | -84.001 | 1 | 520.45 | 1 | .039 | 1 | .02 | 1 | .346 | 2 |
| 394 | | | min | -510.667 | 2 | -236.26 | 8 | -610.799 | 2 | -.033 | 2 | -.019 | 2 | -.221 | 1 |
| 395 | | 3 | max | 399.782 | 1 | -84.345 | 1 | 520.707 | 1 | .039 | 1 | .049 | 1 | .354 | 2 |
| 396 | | | min | -511.113 | 2 | -237.027 | 8 | -611.056 | 2 | -.033 | 2 | -.053 | 2 | -.217 | 1 |
| 397 | | 4 | max | 400.228 | 1 | -84.689 | 1 | 520.965 | 1 | .039 | 1 | .078 | 1 | .362 | 2 |
| 398 | | | min | -511.559 | 2 | -237.793 | 8 | -611.314 | 2 | -.033 | 2 | -.087 | 2 | -.212 | 1 |
| 399 | | 5 | max | 400.674 | 1 | -85.033 | 1 | 521.223 | 1 | .039 | 1 | .108 | 1 | .37 | 2 |
| 400 | | | min | -512.006 | 2 | -238.559 | 8 | -611.572 | 2 | -.033 | 2 | -.122 | 2 | -.207 | 1 |
| 401 | M65 | 1 | max | 324.186 | 3 | -69.56 | 2 | 649.571 | 3 | 0 | 10 | .183 | 4 | .159 | 4 |
| 402 | | | min | -405.008 | 4 | -233.886 | 5 | -645.546 | 4 | -.011 | 5 | -.182 | 3 | -.167 | 3 |
| 403 | | 2 | max | 324.186 | 3 | -70.586 | 2 | 649.571 | 3 | 0 | 10 | .092 | 4 | .177 | 4 |
| 404 | | | min | -405.008 | 4 | -236.235 | 5 | -645.546 | 4 | -.011 | 5 | -.09 | 3 | -.153 | 3 |
| 405 | | 3 | max | 324.186 | 3 | -71.611 | 2 | 649.571 | 3 | 0 | 10 | .003 | 7 | .195 | 4 |
| 406 | | | min | -405.008 | 4 | -238.594 | 5 | -645.546 | 4 | -.011 | 5 | 0 | 4 | -.139 | 3 |
| 407 | | 4 | max | 324.186 | 3 | -72.653 | 2 | 649.508 | 3 | 0 | 10 | .094 | 3 | .213 | 4 |
| 408 | | | min | -405.008 | 4 | -240.942 | 5 | -645.514 | 4 | -.011 | 5 | -.09 | 4 | -.125 | 3 |
| 409 | | 5 | max | 324.186 | 3 | -73.678 | 2 | 649.508 | 3 | 0 | 10 | .185 | 3 | .232 | 4 |
| 410 | | | min | -405.008 | 4 | -243.291 | 5 | -645.514 | 4 | -.011 | 5 | -.182 | 4 | -.111 | 3 |
| 411 | M66 | 1 | max | 172.77 | 3 | -74.301 | 2 | 549.856 | 3 | .04 | 3 | .02 | 4 | .244 | 4 |
| 412 | | | min | -285.511 | 4 | -237.727 | 5 | -641.645 | 4 | -.034 | 4 | -.014 | 3 | -.134 | 3 |
| 413 | | 2 | max | 172.77 | 3 | -74.645 | 2 | 549.856 | 3 | .04 | 3 | .017 | 3 | .251 | 4 |
| 414 | | | min | -285.511 | 4 | -238.494 | 5 | -641.645 | 4 | -.034 | 4 | -.016 | 4 | -.128 | 3 |
| 415 | | 3 | max | 172.77 | 3 | -74.989 | 2 | 549.856 | 3 | .04 | 3 | .048 | 3 | .257 | 4 |
| 416 | | | min | -285.511 | 4 | -239.26 | 5 | -641.645 | 4 | -.034 | 4 | -.052 | 4 | -.121 | 3 |
| 417 | | 4 | max | 172.77 | 3 | -75.333 | 2 | 549.856 | 3 | .04 | 3 | .079 | 3 | .263 | 4 |
| 418 | | | min | -285.511 | 4 | -240.026 | 5 | -641.645 | 4 | -.034 | 4 | -.088 | 4 | -.114 | 3 |
| 419 | | 5 | max | 172.77 | 3 | -75.678 | 2 | 549.856 | 3 | .04 | 3 | .11 | 3 | .269 | 4 |
| 420 | | | min | -285.511 | 4 | -240.792 | 5 | -641.645 | 4 | -.034 | 4 | -.124 | 4 | -.108 | 3 |
| 421 | M67 | 1 | max | 516.101 | 4 | 290.498 | 10 | 496.123 | 4 | .015 | 10 | .14 | 3 | .2 | 3 |
| 422 | | | min | -592.9 | 3 | -241.284 | 7 | -489.375 | 3 | -.012 | 3 | -.139 | 4 | -.206 | 4 |
| 423 | | 2 | max | 517.223 | 4 | 289.473 | 10 | 498.066 | 4 | .015 | 10 | .071 | 3 | .226 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 424 | | | min | -594.022 | 3 | -243.631 | 7 | -491.319 | 3 | -.012 | 3 | -.069 | 4 | -.2 | 4 |
| 425 | | 3 | max | 518.345 | 4 | 288.448 | 10 | 500.01 | 4 | .015 | 10 | .004 | 10 | .253 | 3 |
| 426 | | | min | -595.144 | 3 | -245.978 | 7 | -493.262 | 3 | -.012 | 3 | .001 | 1 | -.194 | 4 |
| 427 | | 4 | max | 519.468 | 4 | 287.423 | 10 | 501.954 | 4 | .015 | 10 | .072 | 4 | .279 | 3 |
| 428 | | | min | -596.267 | 3 | -248.325 | 7 | -495.206 | 3 | -.012 | 3 | -.069 | 3 | -.188 | 4 |
| 429 | | 5 | max | 520.59 | 4 | 286.399 | 10 | 503.898 | 4 | .015 | 10 | .143 | 4 | .306 | 3 |
| 430 | | | min | -597.389 | 3 | -250.673 | 7 | -497.15 | 3 | -.012 | 3 | -.139 | 3 | -.182 | 4 |
| 431 | M68A | 1 | max | 324.751 | 4 | 315.363 | 10 | 345.439 | 2 | .028 | 2 | .015 | 1 | .31 | 3 |
| 432 | | | min | -433.904 | 3 | -240.2 | 7 | -437.193 | 1 | -.023 | 1 | -.009 | 2 | -.196 | 4 |
| 433 | | 2 | max | 325.197 | 4 | 315.019 | 10 | 345.181 | 2 | .028 | 2 | .018 | 4 | .32 | 3 |
| 434 | | | min | -434.35 | 3 | -240.966 | 7 | -436.935 | 1 | -.023 | 1 | -.017 | 3 | -.193 | 4 |
| 435 | | 3 | max | 325.644 | 4 | 314.675 | 10 | 344.923 | 2 | .028 | 2 | .034 | 4 | .329 | 3 |
| 436 | | | min | -434.797 | 3 | -241.732 | 7 | -436.677 | 1 | -.023 | 1 | -.038 | 3 | -.19 | 4 |
| 437 | | 4 | max | 326.09 | 4 | 314.331 | 10 | 344.666 | 2 | .028 | 2 | .05 | 4 | .339 | 3 |
| 438 | | | min | -435.243 | 3 | -242.498 | 7 | -436.419 | 1 | -.023 | 1 | -.06 | 3 | -.192 | 10 |
| 439 | | 5 | max | 326.536 | 4 | 313.987 | 10 | 344.408 | 2 | .028 | 2 | .068 | 2 | .348 | 3 |
| 440 | | | min | -435.689 | 3 | -243.265 | 7 | -436.162 | 1 | -.023 | 1 | -.083 | 1 | -.21 | 10 |
| 441 | M69A | 1 | max | 599.244 | 1 | -60.829 | 1 | 689.977 | 1 | 0 | 1 | .193 | 2 | .232 | 2 |
| 442 | | | min | -678.747 | 2 | -237.612 | 6 | -680.696 | 2 | -.012 | 10 | -.193 | 1 | -.239 | 1 |
| 443 | | 2 | max | 600.367 | 1 | -61.854 | 1 | 690.625 | 1 | 0 | 1 | .097 | 2 | .255 | 2 |
| 444 | | | min | -679.869 | 2 | -239.96 | 6 | -681.344 | 2 | -.012 | 10 | -.096 | 1 | -.231 | 1 |
| 445 | | 3 | max | 601.489 | 1 | -62.88 | 1 | 691.273 | 1 | 0 | 1 | .003 | 5 | .278 | 2 |
| 446 | | | min | -680.991 | 2 | -242.309 | 6 | -681.992 | 2 | -.012 | 10 | 0 | 2 | -.222 | 1 |
| 447 | | 4 | max | 602.611 | 1 | -63.905 | 1 | 691.921 | 1 | 0 | 1 | .1 | 1 | .302 | 2 |
| 448 | | | min | -682.114 | 2 | -244.657 | 6 | -682.64 | 2 | -.012 | 10 | -.096 | 2 | -.213 | 1 |
| 449 | | 5 | max | 603.733 | 1 | -64.93 | 1 | 692.569 | 1 | 0 | 1 | .198 | 1 | .326 | 2 |
| 450 | | | min | -683.236 | 2 | -247.006 | 6 | -683.288 | 2 | -.012 | 10 | -.192 | 2 | -.204 | 1 |
| 451 | M65A | 1 | max | 3203.283 | 7 | 1615.502 | 8 | 1127.675 | 2 | .618 | 9 | 1.205 | 1 | 3.14 | 8 |
| 452 | | | min | -569.459 | 4 | 544.337 | 10 | -1128.259 | 1 | -.602 | 1 | -1.206 | 2 | .292 | 3 |
| 453 | | 2 | max | 3201.952 | 7 | 1595.933 | 8 | 1119.048 | 2 | .618 | 9 | .314 | 1 | 1.867 | 8 |
| 454 | | | min | -564.478 | 4 | 532.604 | 10 | -1119.632 | 1 | -.602 | 1 | -.315 | 2 | -.139 | 3 |
| 455 | | 3 | max | 3200.62 | 7 | 1576.363 | 8 | 1110.421 | 2 | .618 | 9 | .568 | 2 | .965 | 4 |
| 456 | | | min | -559.497 | 4 | 520.871 | 10 | -1111.004 | 1 | -.602 | 1 | -.571 | 1 | -.56 | 3 |
| 457 | | 4 | max | 901.769 | 12 | 1159.03 | 8 | 723.162 | 1 | .389 | 9 | .02 | 2 | .052 | 12 |
| 458 | | | min | 186.966 | 4 | 388.685 | 3 | -718.981 | 9 | -.062 | 4 | -.054 | 9 | -.056 | 7 |
| 459 | | 5 | max | 0 | 1 | 375 | 12 | 0 | 5 | 0 | 1 | 0 | 1 | 0 | 1 |
| 460 | | | min | 0 | 1 | -.006 | 4 | 0 | 4 | 0 | 1 | 0 | 1 | 0 | 1 |
| 461 | M66A | 1 | max | 3200.465 | 8 | 1900.349 | 10 | 730.698 | 1 | .48 | 1 | .659 | 2 | 3.956 | 10 |
| 462 | | | min | -552.266 | 3 | 543.239 | 4 | -732.022 | 2 | -.486 | 2 | -.658 | 1 | .279 | 4 |
| 463 | | 2 | max | 3199.134 | 8 | 1888.616 | 10 | 722.071 | 1 | .48 | 1 | .11 | 3 | 2.454 | 10 |
| 464 | | | min | -547.285 | 3 | 531.506 | 4 | -723.395 | 2 | -.486 | 2 | -.112 | 4 | -.147 | 4 |
| 465 | | 3 | max | 3197.802 | 8 | 1876.883 | 10 | 713.444 | 1 | .48 | 1 | .487 | 1 | .967 | 3 |
| 466 | | | min | -542.304 | 3 | 519.773 | 4 | -714.768 | 2 | -.486 | 2 | -.488 | 2 | -.564 | 4 |
| 467 | | 4 | max | 520.257 | 8 | 1344.677 | 10 | 627.668 | 2 | .079 | 3 | .02 | 9 | -.003 | 3 |
| 468 | | | min | 191.212 | 3 | 379.113 | 4 | -621.407 | 1 | -.144 | 9 | -.01 | 2 | -.056 | 8 |
| 469 | | 5 | max | 0 | 1 | .001 | 5 | 0 | 4 | 0 | 1 | 0 | 1 | 0 | 1 |
| 470 | | | min | 0 | 1 | -.006 | 3 | 0 | 2 | 0 | 1 | 0 | 1 | 0 | 1 |
| 471 | M67A | 1 | max | 501.181 | 5 | 2163.142 | 4 | 1719.184 | 1 | .331 | 4 | .165 | 1 | .182 | 3 |
| 472 | | | min | 152.732 | 10 | -2178.061 | 3 | -2200.039 | 2 | -.331 | 3 | -.171 | 2 | -.18 | 4 |
| 473 | | 2 | max | 501.181 | 5 | 2163.142 | 4 | 1719.184 | 1 | .331 | 4 | .272 | 1 | .317 | 3 |
| 474 | | | min | 152.732 | 10 | -2178.061 | 3 | -2200.039 | 2 | -.331 | 3 | -.308 | 2 | -.315 | 4 |
| 475 | | 3 | max | 501.181 | 5 | 2163.142 | 4 | 1719.184 | 1 | .331 | 4 | .379 | 1 | .453 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 476 | | | min | 152.732 | 10 | -2178.061 | 3 | -2200.039 | 2 | -.331 | 3 | -.446 | 2 | -.45 | 4 |
| 477 | | 4 | max | 501.181 | 5 | 2163.142 | 4 | 1719.184 | 1 | .331 | 4 | .486 | 1 | .589 | 3 |
| 478 | | | min | 152.732 | 10 | -2178.061 | 3 | -2200.039 | 2 | -.331 | 3 | -.583 | 2 | -.585 | 4 |
| 479 | | 5 | max | 501.181 | 5 | 2163.142 | 4 | 1719.184 | 1 | .331 | 4 | .594 | 1 | .725 | 3 |
| 480 | | | min | 152.732 | 10 | -2178.061 | 3 | -2200.039 | 2 | -.331 | 3 | -.72 | 2 | -.72 | 4 |
| 481 | M68B | 1 | max | -14.637 | 1 | 232.104 | 4 | -210.963 | 10 | .067 | 4 | .039 | 5 | .011 | 3 |
| 482 | | | min | -47.243 | 6 | -231.887 | 3 | -572.894 | 6 | -.065 | 3 | .004 | 2 | -.011 | 4 |
| 483 | | 2 | max | -14.637 | 1 | 232.104 | 4 | -210.963 | 10 | .067 | 4 | .016 | 1 | .025 | 3 |
| 484 | | | min | -47.243 | 6 | -231.887 | 3 | -572.894 | 6 | -.065 | 3 | -.014 | 2 | -.025 | 4 |
| 485 | | 3 | max | -14.637 | 1 | 232.104 | 4 | -210.963 | 10 | .067 | 4 | .002 | 1 | .04 | 3 |
| 486 | | | min | -47.243 | 6 | -231.887 | 3 | -572.894 | 6 | -.065 | 3 | -.037 | 6 | -.04 | 4 |
| 487 | | 4 | max | -14.637 | 1 | 232.104 | 4 | -210.963 | 10 | .067 | 4 | -.011 | 1 | .054 | 3 |
| 488 | | | min | -47.243 | 6 | -231.887 | 3 | -572.894 | 6 | -.065 | 3 | -.073 | 6 | -.054 | 4 |
| 489 | | 5 | max | -14.637 | 1 | 232.104 | 4 | -210.963 | 10 | .067 | 4 | -.025 | 1 | .069 | 3 |
| 490 | | | min | -47.243 | 6 | -231.887 | 3 | -572.894 | 6 | -.065 | 3 | -.109 | 6 | -.069 | 4 |
| 491 | M69B | 1 | max | -7.599 | 10 | 38.878 | 3 | -222.401 | 10 | .036 | 4 | .036 | 5 | .003 | 4 |
| 492 | | | min | -18.583 | 6 | -38.635 | 4 | -605.468 | 6 | -.035 | 3 | .004 | 2 | -.003 | 3 |
| 493 | | 2 | max | -7.599 | 10 | 38.878 | 3 | -222.401 | 10 | .036 | 4 | .011 | 1 | .005 | 4 |
| 494 | | | min | -18.583 | 6 | -38.635 | 4 | -605.468 | 6 | -.035 | 3 | -.014 | 2 | -.005 | 3 |
| 495 | | 3 | max | -7.599 | 10 | 38.878 | 3 | -222.401 | 10 | .036 | 4 | -.005 | 1 | .008 | 4 |
| 496 | | | min | -18.583 | 6 | -38.635 | 4 | -605.468 | 6 | -.035 | 3 | -.044 | 6 | -.008 | 3 |
| 497 | | 4 | max | -7.599 | 10 | 38.878 | 3 | -222.401 | 10 | .036 | 4 | -.02 | 1 | .01 | 4 |
| 498 | | | min | -18.583 | 6 | -38.635 | 4 | -605.468 | 6 | -.035 | 3 | -.082 | 6 | -.01 | 3 |
| 499 | | 5 | max | -7.599 | 10 | 38.878 | 3 | -222.401 | 10 | .036 | 4 | -.036 | 1 | .012 | 4 |
| 500 | | | min | -18.583 | 6 | -38.635 | 4 | -605.468 | 6 | -.035 | 3 | -.12 | 6 | -.013 | 3 |
| 501 | M70A | 1 | max | -12.936 | 1 | 88.251 | 3 | -227.306 | 10 | .014 | 9 | .035 | 5 | .008 | 4 |
| 502 | | | min | -43.148 | 6 | -87.815 | 4 | -615.289 | 6 | -.024 | 10 | .005 | 2 | -.007 | 3 |
| 503 | | 2 | max | -12.936 | 1 | 88.251 | 3 | -227.306 | 10 | .014 | 9 | .008 | 1 | .013 | 4 |
| 504 | | | min | -43.148 | 6 | -87.815 | 4 | -615.289 | 6 | -.024 | 10 | -.013 | 2 | -.013 | 3 |
| 505 | | 3 | max | -12.936 | 1 | 88.251 | 3 | -227.306 | 10 | .014 | 9 | -.009 | 1 | .018 | 4 |
| 506 | | | min | -43.148 | 6 | -87.815 | 4 | -615.289 | 6 | -.024 | 10 | -.046 | 6 | -.018 | 3 |
| 507 | | 4 | max | -12.936 | 1 | 88.251 | 3 | -227.306 | 10 | .014 | 9 | -.026 | 1 | .024 | 4 |
| 508 | | | min | -43.148 | 6 | -87.815 | 4 | -615.289 | 6 | -.024 | 10 | -.084 | 6 | -.024 | 3 |
| 509 | | 5 | max | -12.936 | 1 | 88.251 | 3 | -227.306 | 10 | .014 | 9 | -.042 | 1 | .029 | 4 |
| 510 | | | min | -43.148 | 6 | -87.815 | 4 | -615.289 | 6 | -.024 | 10 | -.123 | 6 | -.029 | 3 |
| 511 | M71A | 1 | max | 1136.852 | 5 | 912.08 | 3 | -177.575 | 1 | .01 | 4 | .049 | 5 | .227 | 3 |
| 512 | | | min | 377.375 | 2 | -898.523 | 4 | -520.76 | 6 | -.016 | 10 | .011 | 2 | -.217 | 4 |
| 513 | | 2 | max | 1136.852 | 5 | 912.08 | 3 | -177.575 | 1 | .01 | 4 | .019 | 5 | .17 | 3 |
| 514 | | | min | 377.375 | 2 | -898.523 | 4 | -520.76 | 6 | -.016 | 10 | -.006 | 2 | -.161 | 4 |
| 515 | | 3 | max | 1136.852 | 5 | 912.08 | 3 | -177.575 | 1 | .01 | 4 | .006 | 1 | .113 | 3 |
| 516 | | | min | 377.375 | 2 | -898.523 | 4 | -520.76 | 6 | -.016 | 10 | -.024 | 2 | -.12 | 10 |
| 517 | | 4 | max | 1136.852 | 5 | 912.08 | 3 | -177.575 | 1 | .01 | 4 | -.005 | 1 | .065 | 9 |
| 518 | | | min | 377.375 | 2 | -898.523 | 4 | -520.76 | 6 | -.016 | 10 | -.052 | 6 | -.113 | 10 |
| 519 | | 5 | max | 1136.852 | 5 | 912.08 | 3 | -177.575 | 1 | .01 | 4 | -.016 | 1 | .059 | 9 |
| 520 | | | min | 377.375 | 2 | -898.523 | 4 | -520.76 | 6 | -.016 | 10 | -.084 | 6 | -.106 | 10 |
| 521 | M72A | 1 | max | 1719.93 | 7 | 199.642 | 4 | 1439.158 | 3 | -.003 | 2 | .163 | 4 | .029 | 4 |
| 522 | | | min | -205.776 | 4 | -907.534 | 3 | -995.735 | 4 | -.01 | 5 | -.228 | 3 | -.149 | 7 |
| 523 | | 2 | max | 1719.93 | 7 | 199.642 | 4 | 1439.158 | 3 | -.003 | 2 | .123 | 4 | .021 | 4 |
| 524 | | | min | -205.776 | 4 | -907.534 | 3 | -995.735 | 4 | -.01 | 5 | -.171 | 3 | -.113 | 7 |
| 525 | | 3 | max | 1719.93 | 7 | 199.642 | 4 | 1439.158 | 3 | -.003 | 2 | .083 | 4 | .013 | 4 |
| 526 | | | min | -205.776 | 4 | -907.534 | 3 | -995.735 | 4 | -.01 | 5 | -.113 | 3 | -.077 | 7 |
| 527 | | 4 | max | 1719.93 | 7 | 199.642 | 4 | 1439.158 | 3 | -.003 | 2 | .043 | 4 | .005 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 528 | | | min | -205.776 | 4 | -907.534 | 3 | -995.735 | 4 | -.01 | 5 | -.055 | 3 | -.041 | 7 |
| 529 | | 5 | max | 1719.93 | 7 | 199.642 | 4 | 1439.158 | 3 | -.003 | 2 | .006 | 5 | -.001 | 3 |
| 530 | | | min | -205.776 | 4 | -907.534 | 3 | -995.735 | 4 | -.01 | 5 | .002 | 2 | -.005 | 8 |
| 531 | M73 | 1 | max | 1704.371 | 8 | 165.539 | 3 | 976.165 | 3 | .01 | 8 | .225 | 4 | .024 | 3 |
| 532 | | | min | -149.223 | 3 | -879.68 | 8 | -1421.089 | 4 | .001 | 10 | -.16 | 3 | -.146 | 8 |
| 533 | | 2 | max | 1704.371 | 8 | 165.539 | 3 | 976.165 | 3 | .01 | 8 | .168 | 4 | .017 | 3 |
| 534 | | | min | -149.223 | 3 | -879.68 | 8 | -1421.089 | 4 | .001 | 10 | -.121 | 3 | -.111 | 8 |
| 535 | | 3 | max | 1704.371 | 8 | 165.539 | 3 | 976.165 | 3 | .01 | 8 | .111 | 4 | .01 | 3 |
| 536 | | | min | -149.223 | 3 | -879.68 | 8 | -1421.089 | 4 | .001 | 10 | -.081 | 3 | -.076 | 8 |
| 537 | | 4 | max | 1704.371 | 8 | 165.539 | 3 | 976.165 | 3 | .01 | 8 | .054 | 4 | .004 | 3 |
| 538 | | | min | -149.223 | 3 | -879.68 | 8 | -1421.089 | 4 | .001 | 10 | -.042 | 3 | -.041 | 6 |
| 539 | | 5 | max | 1704.371 | 8 | 165.539 | 3 | 976.165 | 3 | .01 | 8 | 0 | 10 | -.001 | 4 |
| 540 | | | min | -149.223 | 3 | -879.68 | 8 | -1421.089 | 4 | .001 | 10 | -.006 | 8 | -.005 | 7 |
| 541 | M74 | 1 | max | 1436.918 | 6 | -180.624 | 1 | 405.587 | 7 | -.006 | 2 | .02 | 4 | -.031 | 1 |
| 542 | | | min | 261.698 | 1 | -945.534 | 6 | -89.288 | 4 | -.022 | 7 | -.057 | 3 | -.157 | 6 |
| 543 | | 2 | max | 1436.918 | 6 | -180.624 | 1 | 405.587 | 7 | -.006 | 2 | .016 | 4 | -.024 | 1 |
| 544 | | | min | 261.698 | 1 | -945.534 | 6 | -89.288 | 4 | -.022 | 7 | -.041 | 3 | -.119 | 6 |
| 545 | | 3 | max | 1436.918 | 6 | -180.624 | 1 | 405.587 | 7 | -.006 | 2 | .013 | 4 | -.017 | 1 |
| 546 | | | min | 261.698 | 1 | -945.534 | 6 | -89.288 | 4 | -.022 | 7 | -.025 | 3 | -.082 | 6 |
| 547 | | 4 | max | 1436.918 | 6 | -180.624 | 1 | 405.587 | 7 | -.006 | 2 | .009 | 4 | -.01 | 1 |
| 548 | | | min | 261.698 | 1 | -945.534 | 6 | -89.288 | 4 | -.022 | 7 | -.01 | 3 | -.045 | 6 |
| 549 | | 5 | max | 1436.918 | 6 | -180.624 | 1 | 405.587 | 7 | -.006 | 2 | .013 | 5 | -.002 | 3 |
| 550 | | | min | 261.698 | 1 | -945.534 | 6 | -89.288 | 4 | -.022 | 7 | .004 | 2 | -.008 | 8 |
| 551 | M75 | 1 | max | 1447.935 | 6 | -146.527 | 1 | 81.962 | 3 | .022 | 8 | .058 | 4 | -.026 | 1 |
| 552 | | | min | 196.04 | 1 | -951.568 | 6 | -423.415 | 8 | .003 | 10 | -.019 | 3 | -.158 | 6 |
| 553 | | 2 | max | 1447.935 | 6 | -146.527 | 1 | 81.962 | 3 | .022 | 8 | .042 | 4 | -.02 | 1 |
| 554 | | | min | 196.04 | 1 | -951.568 | 6 | -423.415 | 8 | .003 | 10 | -.016 | 3 | -.12 | 6 |
| 555 | | 3 | max | 1447.935 | 6 | -146.527 | 1 | 81.962 | 3 | .022 | 8 | .026 | 4 | -.014 | 1 |
| 556 | | | min | 196.04 | 1 | -951.568 | 6 | -423.415 | 8 | .003 | 10 | -.012 | 3 | -.083 | 6 |
| 557 | | 4 | max | 1447.935 | 6 | -146.527 | 1 | 81.962 | 3 | .022 | 8 | .01 | 4 | -.008 | 1 |
| 558 | | | min | 196.04 | 1 | -951.568 | 6 | -423.415 | 8 | .003 | 10 | -.009 | 3 | -.045 | 6 |
| 559 | | 5 | max | 1447.935 | 6 | -146.527 | 1 | 81.962 | 3 | .022 | 8 | -.002 | 10 | -.002 | 4 |
| 560 | | | min | 196.04 | 1 | -951.568 | 6 | -423.415 | 8 | .003 | 10 | -.014 | 8 | -.008 | 7 |
| 561 | M76 | 1 | max | 426.54 | 8 | -106.006 | 3 | 329.579 | 7 | -.006 | 2 | .006 | 4 | -.018 | 3 |
| 562 | | | min | 139.728 | 3 | -295.091 | 8 | -1.821 | 4 | -.022 | 7 | -.037 | 7 | -.05 | 8 |
| 563 | | 2 | max | 426.54 | 8 | -106.006 | 3 | 329.579 | 7 | -.006 | 2 | .006 | 4 | -.014 | 3 |
| 564 | | | min | 139.728 | 3 | -295.091 | 8 | -1.821 | 4 | -.022 | 7 | -.024 | 7 | -.038 | 8 |
| 565 | | 3 | max | 426.54 | 8 | -106.006 | 3 | 329.579 | 7 | -.006 | 2 | .005 | 4 | -.009 | 3 |
| 566 | | | min | 139.728 | 3 | -295.091 | 8 | -1.821 | 4 | -.022 | 7 | -.014 | 3 | -.027 | 8 |
| 567 | | 4 | max | 426.54 | 8 | -106.006 | 3 | 329.579 | 7 | -.006 | 2 | .005 | 4 | -.005 | 3 |
| 568 | | | min | 139.728 | 3 | -295.091 | 8 | -1.821 | 4 | -.022 | 7 | -.003 | 3 | -.015 | 8 |
| 569 | | 5 | max | 426.54 | 8 | -106.006 | 3 | 329.579 | 7 | -.006 | 2 | .014 | 7 | -.001 | 1 |
| 570 | | | min | 139.728 | 3 | -295.091 | 8 | -1.821 | 4 | -.022 | 7 | .004 | 2 | -.004 | 6 |
| 571 | M77 | 1 | max | 428.757 | 7 | -104.36 | 4 | -1.535 | 3 | .022 | 8 | .04 | 8 | -.017 | 4 |
| 572 | | | min | 136.768 | 4 | -297.292 | 7 | -348.137 | 8 | .003 | 10 | -.005 | 3 | -.05 | 7 |
| 573 | | 2 | max | 428.757 | 7 | -104.36 | 4 | -1.535 | 3 | .022 | 8 | .026 | 8 | -.013 | 4 |
| 574 | | | min | 136.768 | 4 | -297.292 | 7 | -348.137 | 8 | .003 | 10 | -.005 | 3 | -.038 | 7 |
| 575 | | 3 | max | 428.757 | 7 | -104.36 | 4 | -1.535 | 3 | .022 | 8 | .014 | 4 | -.009 | 4 |
| 576 | | | min | 136.768 | 4 | -297.292 | 7 | -348.137 | 8 | .003 | 10 | -.005 | 3 | -.027 | 7 |
| 577 | | 4 | max | 428.757 | 7 | -104.36 | 4 | -1.535 | 3 | .022 | 8 | .004 | 4 | -.005 | 4 |
| 578 | | | min | 136.768 | 4 | -297.292 | 7 | -348.137 | 8 | .003 | 10 | -.005 | 3 | -.015 | 7 |
| 579 | | 5 | max | 428.757 | 7 | -104.36 | 4 | -1.535 | 3 | .022 | 8 | -.002 | 10 | 0 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 580 | | | min | 136.768 | 4 | -297.292 | 7 | -348.137 | 8 | .003 | 10 | -.014 | 8 | -.004 | 6 |
| 581 | M78 | 1 | max | 142.232 | 1 | 279.479 | 2 | 281.304 | 7 | -.006 | 2 | -.006 | 9 | .042 | 2 |
| 582 | | | min | -451.742 | 2 | -107.385 | 1 | 66.196 | 9 | -.022 | 5 | -.029 | 7 | -.017 | 1 |
| 583 | | 2 | max | 142.232 | 1 | 279.479 | 2 | 281.304 | 7 | -.006 | 2 | -.003 | 1 | .031 | 2 |
| 584 | | | min | -451.742 | 2 | -107.385 | 1 | 66.196 | 9 | -.022 | 5 | -.018 | 7 | -.013 | 1 |
| 585 | | 3 | max | 142.232 | 1 | 279.479 | 2 | 281.304 | 7 | -.006 | 2 | .001 | 1 | .02 | 2 |
| 586 | | | min | -451.742 | 2 | -107.385 | 1 | 66.196 | 9 | -.022 | 5 | -.008 | 10 | -.008 | 1 |
| 587 | | 4 | max | 142.232 | 1 | 279.479 | 2 | 281.304 | 7 | -.006 | 2 | .005 | 1 | .01 | 2 |
| 588 | | | min | -451.742 | 2 | -107.385 | 1 | 66.196 | 9 | -.022 | 5 | -.002 | 2 | -.004 | 1 |
| 589 | | 5 | max | 142.232 | 1 | 279.479 | 2 | 281.304 | 7 | -.006 | 2 | .014 | 5 | 0 | 1 |
| 590 | | | min | -451.742 | 2 | -107.385 | 1 | 66.196 | 9 | -.022 | 5 | .004 | 2 | -.002 | 6 |
| 591 | M79 | 1 | max | 150.767 | 1 | 282.034 | 2 | -15.091 | 10 | .022 | 8 | .031 | 8 | .042 | 2 |
| 592 | | | min | -459.023 | 2 | -109.467 | 1 | -299.257 | 8 | .004 | 10 | 0 | 10 | -.017 | 1 |
| 593 | | 2 | max | 150.767 | 1 | 282.034 | 2 | -15.091 | 10 | .022 | 8 | .02 | 8 | .031 | 2 |
| 594 | | | min | -459.023 | 2 | -109.467 | 1 | -299.257 | 8 | .004 | 10 | 0 | 10 | -.013 | 1 |
| 595 | | 3 | max | 150.767 | 1 | 282.034 | 2 | -15.091 | 10 | .022 | 8 | .009 | 2 | .02 | 2 |
| 596 | | | min | -459.023 | 2 | -109.467 | 1 | -299.257 | 8 | .004 | 10 | -.002 | 1 | -.009 | 1 |
| 597 | | 4 | max | 150.767 | 1 | 282.034 | 2 | -15.091 | 10 | .022 | 8 | .002 | 2 | .01 | 2 |
| 598 | | | min | -459.023 | 2 | -109.467 | 1 | -299.257 | 8 | .004 | 10 | -.005 | 1 | -.004 | 1 |
| 599 | | 5 | max | 150.767 | 1 | 282.034 | 2 | -15.091 | 10 | .022 | 8 | -.003 | 10 | 0 | 1 |
| 600 | | | min | -459.023 | 2 | -109.467 | 1 | -299.257 | 8 | .004 | 10 | -.015 | 8 | -.002 | 6 |
| 601 | M80 | 1 | max | 483.659 | 1 | 3132.524 | 6 | 289.302 | 6 | -.014 | 3 | 0 | 1 | 1.709 | 8 |
| 602 | | | min | -3573.537 | 6 | 44.745 | 1 | 62.515 | 1 | -.035 | 7 | -.029 | 6 | .68 | 9 |
| 603 | | 2 | max | 483.659 | 1 | 3132.524 | 6 | 289.302 | 6 | -.014 | 3 | .003 | 1 | 1.606 | 8 |
| 604 | | | min | -3573.537 | 6 | 44.745 | 1 | 62.515 | 1 | -.035 | 7 | -.019 | 6 | .617 | 2 |
| 605 | | 3 | max | 483.659 | 1 | 3132.524 | 6 | 289.302 | 6 | -.014 | 3 | .005 | 1 | 1.503 | 8 |
| 606 | | | min | -3573.537 | 6 | 44.745 | 1 | 62.515 | 1 | -.035 | 7 | -.011 | 2 | .522 | 2 |
| 607 | | 4 | max | 483.659 | 1 | 3132.524 | 6 | 289.302 | 6 | -.014 | 3 | .007 | 1 | 1.406 | 5 |
| 608 | | | min | -3573.537 | 6 | 44.745 | 1 | 62.515 | 1 | -.035 | 7 | -.004 | 2 | .427 | 2 |
| 609 | | 5 | max | 483.659 | 1 | 3132.524 | 6 | 289.302 | 6 | -.014 | 3 | .016 | 5 | 1.31 | 5 |
| 610 | | | min | -3573.537 | 6 | 44.745 | 1 | 62.515 | 1 | -.035 | 7 | .002 | 2 | .332 | 2 |
| 611 | M81 | 1 | max | 635.614 | 1 | 3182.275 | 6 | -35.987 | 1 | .036 | 6 | .031 | 6 | 1.729 | 7 |
| 612 | | | min | -3543.906 | 6 | 104.932 | 1 | -302.408 | 6 | .013 | 1 | -.004 | 1 | .639 | 10 |
| 613 | | 2 | max | 635.614 | 1 | 3182.275 | 6 | -35.987 | 1 | .036 | 6 | .021 | 2 | 1.623 | 7 |
| 614 | | | min | -3543.906 | 6 | 104.932 | 1 | -302.408 | 6 | .013 | 1 | -.005 | 1 | .588 | 10 |
| 615 | | 3 | max | 635.614 | 1 | 3182.275 | 6 | -35.987 | 1 | .036 | 6 | .013 | 2 | 1.516 | 7 |
| 616 | | | min | -3543.906 | 6 | 104.932 | 1 | -302.408 | 6 | .013 | 1 | -.007 | 1 | .531 | 4 |
| 617 | | 4 | max | 635.614 | 1 | 3182.275 | 6 | -35.987 | 1 | .036 | 6 | .005 | 2 | 1.41 | 7 |
| 618 | | | min | -3543.906 | 6 | 104.932 | 1 | -302.408 | 6 | .013 | 1 | -.008 | 1 | .47 | 4 |
| 619 | | 5 | max | 635.614 | 1 | 3182.275 | 6 | -35.987 | 1 | .036 | 6 | -.003 | 2 | 1.309 | 5 |
| 620 | | | min | -3543.906 | 6 | 104.932 | 1 | -302.408 | 6 | .013 | 1 | -.016 | 5 | .376 | 2 |
| 621 | M72B | 1 | max | 238.708 | 8 | 456.903 | 4 | 178.567 | 3 | 0 | 2 | -.003 | 10 | -.004 | 3 |
| 622 | | | min | 79.515 | 3 | -338.657 | 3 | -549.789 | 9 | 0 | 1 | -.008 | 9 | -.014 | 8 |
| 623 | | 2 | max | 238.708 | 8 | 456.903 | 4 | 178.567 | 3 | 0 | 2 | .001 | 3 | .003 | 3 |
| 624 | | | min | 79.515 | 3 | -338.657 | 3 | -549.789 | 9 | 0 | 1 | -.019 | 9 | -.018 | 8 |
| 625 | | 3 | max | 238.708 | 8 | 456.903 | 4 | 178.567 | 3 | 0 | 2 | .005 | 3 | .01 | 3 |
| 626 | | | min | 79.515 | 3 | -338.657 | 3 | -549.789 | 9 | 0 | 1 | -.031 | 9 | -.027 | 4 |
| 627 | | 4 | max | 238.708 | 8 | 456.903 | 4 | 178.567 | 3 | 0 | 2 | .008 | 3 | .017 | 3 |
| 628 | | | min | 79.515 | 3 | -338.657 | 3 | -549.789 | 9 | 0 | 1 | -.042 | 9 | -.036 | 4 |
| 629 | | 5 | max | 238.708 | 8 | 456.903 | 4 | 178.567 | 3 | 0 | 2 | .012 | 3 | .024 | 3 |
| 630 | | | min | 79.515 | 3 | -338.657 | 3 | -549.789 | 9 | 0 | 1 | -.054 | 9 | -.046 | 4 |
| 631 | M73A | 1 | max | 40.802 | 8 | 46.709 | 3 | 105.658 | 4 | 0 | 2 | -.005 | 10 | -.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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 632 | | | min | 14.056 | 3 | -176.561 | 9 | -88.758 | 9 | 0 | 1 | -.016 | 8 | -.028 | 8 |
| 633 | | 2 | max | 40.802 | 8 | 46.709 | 3 | 105.658 | 4 | 0 | 2 | -.005 | 10 | -.01 | 10 |
| 634 | | | min | 14.056 | 3 | -176.561 | 9 | -88.758 | 9 | 0 | 1 | -.018 | 9 | -.026 | 6 |
| 635 | | 3 | max | 40.802 | 8 | 46.709 | 3 | 105.658 | 4 | 0 | 2 | -.004 | 10 | -.01 | 10 |
| 636 | | | min | 14.056 | 3 | -176.561 | 9 | -88.758 | 9 | 0 | 1 | -.019 | 9 | -.025 | 7 |
| 637 | | 4 | max | 40.802 | 8 | 46.709 | 3 | 105.658 | 4 | 0 | 2 | -.002 | 4 | -.009 | 4 |
| 638 | | | min | 14.056 | 3 | -176.561 | 9 | -88.758 | 9 | 0 | 1 | -.021 | 9 | -.023 | 7 |
| 639 | | 5 | max | 40.802 | 8 | 46.709 | 3 | 105.658 | 4 | 0 | 2 | 0 | 4 | -.007 | 4 |
| 640 | | | min | 14.056 | 3 | -176.561 | 9 | -88.758 | 9 | 0 | 1 | -.023 | 9 | -.022 | 7 |
| 641 | M74A | 1 | max | 25.383 | 8 | 56.204 | 1 | 104.134 | 4 | 0 | 4 | -.005 | 3 | -.009 | 3 |
| 642 | | | min | 8.505 | 3 | -120.064 | 9 | -81.027 | 3 | 0 | 3 | -.016 | 8 | -.028 | 8 |
| 643 | | 2 | max | 25.383 | 8 | 56.204 | 1 | 104.134 | 4 | 0 | 4 | -.005 | 10 | -.01 | 10 |
| 644 | | | min | 8.505 | 3 | -120.064 | 9 | -81.027 | 3 | 0 | 3 | -.017 | 9 | -.027 | 8 |
| 645 | | 3 | max | 25.383 | 8 | 56.204 | 1 | 104.134 | 4 | 0 | 4 | -.005 | 4 | -.01 | 2 |
| 646 | | | min | 8.505 | 3 | -120.064 | 9 | -81.027 | 3 | 0 | 3 | -.018 | 9 | -.026 | 5 |
| 647 | | 4 | max | 25.383 | 8 | 56.204 | 1 | 104.134 | 4 | 0 | 4 | -.002 | 4 | -.008 | 2 |
| 648 | | | min | 8.505 | 3 | -120.064 | 9 | -81.027 | 3 | 0 | 3 | -.019 | 9 | -.025 | 5 |
| 649 | | 5 | max | 25.383 | 8 | 56.204 | 1 | 104.134 | 4 | 0 | 4 | 0 | 4 | -.006 | 2 |
| 650 | | | min | 8.505 | 3 | -120.064 | 9 | -81.027 | 3 | 0 | 3 | -.02 | 9 | -.025 | 5 |
| 651 | M75A | 1 | max | 18.974 | 6 | 55.079 | 1 | 83.194 | 4 | 0 | 4 | -.005 | 3 | -.009 | 3 |
| 652 | | | min | 7.129 | 3 | -91.018 | 2 | -61.794 | 3 | 0 | 3 | -.016 | 8 | -.028 | 8 |
| 653 | | 2 | max | 18.974 | 6 | 55.079 | 1 | 83.194 | 4 | 0 | 4 | -.005 | 1 | -.01 | 10 |
| 654 | | | min | 7.129 | 3 | -91.018 | 2 | -61.794 | 3 | 0 | 3 | -.016 | 6 | -.027 | 8 |
| 655 | | 3 | max | 18.974 | 6 | 55.079 | 1 | 83.194 | 4 | 0 | 4 | -.004 | 1 | -.01 | 10 |
| 656 | | | min | 7.129 | 3 | -91.018 | 2 | -61.794 | 3 | 0 | 3 | -.015 | 6 | -.026 | 5 |
| 657 | | 4 | max | 18.974 | 6 | 55.079 | 1 | 83.194 | 4 | 0 | 4 | -.003 | 1 | -.008 | 2 |
| 658 | | | min | 7.129 | 3 | -91.018 | 2 | -61.794 | 3 | 0 | 3 | -.015 | 9 | -.026 | 5 |
| 659 | | 5 | max | 18.974 | 6 | 55.079 | 1 | 83.194 | 4 | 0 | 4 | -.002 | 4 | -.007 | 2 |
| 660 | | | min | 7.129 | 3 | -91.018 | 2 | -61.794 | 3 | 0 | 3 | -.015 | 9 | -.025 | 5 |
| 661 | M76A | 1 | max | -71.006 | 3 | 194.365 | 9 | 301.159 | 9 | 0 | 4 | -.003 | 3 | -.005 | 3 |
| 662 | | | min | -212.502 | 8 | -135.513 | 12 | -143.792 | 2 | 0 | 3 | -.008 | 8 | -.014 | 8 |
| 663 | | 2 | max | -71.006 | 3 | 194.365 | 9 | 301.159 | 9 | 0 | 4 | 0 | 1 | -.005 | 2 |
| 664 | | | min | -212.502 | 8 | -135.513 | 12 | -143.792 | 2 | 0 | 3 | -.009 | 6 | -.017 | 9 |
| 665 | | 3 | max | -71.006 | 3 | 194.365 | 9 | 301.159 | 9 | 0 | 4 | .005 | 9 | -.002 | 2 |
| 666 | | | min | -212.502 | 8 | -135.513 | 12 | -143.792 | 2 | 0 | 3 | -.011 | 6 | -.021 | 9 |
| 667 | | 4 | max | -71.006 | 3 | 194.365 | 9 | 301.159 | 9 | 0 | 4 | .012 | 9 | 0 | 2 |
| 668 | | | min | -212.502 | 8 | -135.513 | 12 | -143.792 | 2 | 0 | 3 | -.013 | 2 | -.025 | 9 |
| 669 | | 5 | max | -71.006 | 3 | 194.365 | 9 | 301.159 | 9 | 0 | 4 | .018 | 9 | .003 | 2 |
| 670 | | | min | -212.502 | 8 | -135.513 | 12 | -143.792 | 2 | 0 | 3 | -.016 | 2 | -.029 | 9 |
| 671 | M77A | 1 | max | 501.554 | 8 | 1588.815 | 4 | 2134.828 | 1 | .278 | 2 | .17 | 1 | .158 | 3 |
| 672 | | | min | 158.742 | 10 | -2001.514 | 3 | -1878.401 | 2 | -.278 | 1 | -.165 | 2 | -.153 | 4 |
| 673 | | 2 | max | 501.554 | 8 | 1588.815 | 4 | 2134.828 | 1 | .278 | 2 | .304 | 1 | .283 | 3 |
| 674 | | | min | 158.742 | 10 | -2001.514 | 3 | -1878.401 | 2 | -.278 | 1 | -.282 | 2 | -.252 | 4 |
| 675 | | 3 | max | 501.554 | 8 | 1588.815 | 4 | 2134.828 | 1 | .278 | 2 | .437 | 1 | .408 | 3 |
| 676 | | | min | 158.742 | 10 | -2001.514 | 3 | -1878.401 | 2 | -.278 | 1 | -.399 | 2 | -.351 | 4 |
| 677 | | 4 | max | 501.554 | 8 | 1588.815 | 4 | 2134.828 | 1 | .278 | 2 | .57 | 1 | .533 | 3 |
| 678 | | | min | 158.742 | 10 | -2001.514 | 3 | -1878.401 | 2 | -.278 | 1 | -.517 | 2 | -.45 | 4 |
| 679 | | 5 | max | 501.554 | 8 | 1588.815 | 4 | 2134.828 | 1 | .278 | 2 | .703 | 1 | .658 | 3 |
| 680 | | | min | 158.742 | 10 | -2001.514 | 3 | -1878.401 | 2 | -.278 | 1 | -.634 | 2 | -.549 | 4 |
| 681 | M78A | 1 | max | -14.185 | 12 | -145.548 | 1 | 315.828 | 5 | .061 | 2 | .002 | 1 | -.004 | 3 |
| 682 | | | min | -47.01 | 7 | -499.039 | 6 | -32.004 | 2 | -.116 | 9 | -.021 | 6 | -.034 | 8 |
| 683 | | 2 | max | -14.185 | 12 | -145.548 | 1 | 315.828 | 5 | .061 | 2 | .02 | 1 | .012 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 684 | | | min | -47.01 | 7 | -499.039 | 6 | -32.004 | 2 | -.116 | 9 | -.02 | 2 | -.013 | 4 |
| 685 | | 3 | max | -14.185 | 12 | -145.548 | 1 | 315.828 | 5 | .061 | 2 | .038 | 1 | .032 | 7 |
| 686 | | | min | -47.01 | 7 | -499.039 | 6 | -32.004 | 2 | -.116 | 9 | -.022 | 2 | -.002 | 4 |
| 687 | | 4 | max | -14.185 | 12 | -145.548 | 1 | 315.828 | 5 | .061 | 2 | .056 | 1 | .063 | 7 |
| 688 | | | min | -47.01 | 7 | -499.039 | 6 | -32.004 | 2 | -.116 | 9 | -.024 | 2 | .01 | 4 |
| 689 | | 5 | max | -14.185 | 12 | -145.548 | 1 | 315.828 | 5 | .061 | 2 | .074 | 1 | .094 | 7 |
| 690 | | | min | -47.01 | 7 | -499.039 | 6 | -32.004 | 2 | -.116 | 9 | -.026 | 2 | .021 | 4 |
| 691 | M79A | 1 | max | -7.392 | 1 | -208.171 | 10 | 306.885 | 7 | .035 | 2 | 0 | 3 | -.005 | 3 |
| 692 | | | min | -18.515 | 6 | -523.959 | 5 | 103.87 | 1 | -.11 | 9 | -.018 | 8 | -.031 | 8 |
| 693 | | 2 | max | -7.392 | 1 | -208.171 | 10 | 306.885 | 7 | .035 | 2 | .01 | 3 | .009 | 3 |
| 694 | | | min | -18.515 | 6 | -523.959 | 5 | 103.87 | 1 | -.11 | 9 | -.008 | 4 | -.006 | 4 |
| 695 | | 3 | max | -7.392 | 1 | -208.171 | 10 | 306.885 | 7 | .035 | 2 | .023 | 7 | .038 | 5 |
| 696 | | | min | -18.515 | 6 | -523.959 | 5 | 103.87 | 1 | -.11 | 9 | -.002 | 4 | .007 | 2 |
| 697 | | 4 | max | -7.392 | 1 | -208.171 | 10 | 306.885 | 7 | .035 | 2 | .042 | 7 | .07 | 5 |
| 698 | | | min | -18.515 | 6 | -523.959 | 5 | 103.87 | 1 | -.11 | 9 | .005 | 4 | .02 | 2 |
| 699 | | 5 | max | -7.392 | 1 | -208.171 | 10 | 306.885 | 7 | .035 | 2 | .061 | 7 | .103 | 5 |
| 700 | | | min | -18.515 | 6 | -523.959 | 5 | 103.87 | 1 | -.11 | 9 | .011 | 4 | .033 | 2 |
| 701 | M80A | 1 | max | -11.177 | 12 | -204.532 | 2 | 317.226 | 6 | .011 | 2 | -.001 | 3 | -.005 | 1 |
| 702 | | | min | -42.952 | 7 | -537.685 | 5 | 73.215 | 1 | -.102 | 9 | -.018 | 9 | -.03 | 6 |
| 703 | | 2 | max | -11.177 | 12 | -204.532 | 2 | 317.226 | 6 | .011 | 2 | .009 | 3 | .012 | 1 |
| 704 | | | min | -42.952 | 7 | -537.685 | 5 | 73.215 | 1 | -.102 | 9 | -.006 | 4 | -.007 | 2 |
| 705 | | 3 | max | -11.177 | 12 | -204.532 | 2 | 317.226 | 6 | .011 | 2 | .024 | 6 | .04 | 5 |
| 706 | | | min | -42.952 | 7 | -537.685 | 5 | 73.215 | 1 | -.102 | 9 | -.001 | 1 | .005 | 2 |
| 707 | | 4 | max | -11.177 | 12 | -204.532 | 2 | 317.226 | 6 | .011 | 2 | .044 | 6 | .074 | 5 |
| 708 | | | min | -42.952 | 7 | -537.685 | 5 | 73.215 | 1 | -.102 | 9 | .003 | 1 | .018 | 2 |
| 709 | | 5 | max | -11.177 | 12 | -204.532 | 2 | 317.226 | 6 | .011 | 2 | .064 | 6 | .107 | 5 |
| 710 | | | min | -42.952 | 7 | -537.685 | 5 | 73.215 | 1 | -.102 | 9 | .008 | 1 | .031 | 2 |
| 711 | M81A | 1 | max | 1138.195 | 8 | 177.056 | 2 | 814.006 | 9 | .011 | 2 | .152 | 1 | .259 | 9 |
| 712 | | | min | 360.737 | 12 | -782.974 | 12 | -509.741 | 1 | -.067 | 9 | -.506 | 9 | -.103 | 1 |
| 713 | | 2 | max | 1138.195 | 8 | 177.056 | 2 | 814.006 | 9 | .011 | 2 | .12 | 1 | .257 | 9 |
| 714 | | | min | 360.737 | 12 | -782.974 | 12 | -509.741 | 1 | -.067 | 9 | -.455 | 9 | -.077 | 4 |
| 715 | | 3 | max | 1138.195 | 8 | 177.056 | 2 | 814.006 | 9 | .011 | 2 | .089 | 4 | .256 | 9 |
| 716 | | | min | 360.737 | 12 | -782.974 | 12 | -509.741 | 1 | -.067 | 9 | -.405 | 9 | -.056 | 4 |
| 717 | | 4 | max | 1138.195 | 8 | 177.056 | 2 | 814.006 | 9 | .011 | 2 | .102 | 12 | .254 | 9 |
| 718 | | | min | 360.737 | 12 | -782.974 | 12 | -509.741 | 1 | -.067 | 9 | -.354 | 9 | -.035 | 4 |
| 719 | | 5 | max | 1138.195 | 8 | 177.056 | 2 | 814.006 | 9 | .011 | 2 | .13 | 12 | .252 | 9 |
| 720 | | | min | 360.737 | 12 | -782.974 | 12 | -509.741 | 1 | -.067 | 9 | -.303 | 9 | -.014 | 4 |
| 721 | M82 | 1 | max | 1775.564 | 1 | 312.225 | 2 | 1641.74 | 1 | -.002 | 10 | .195 | 2 | .047 | 2 |
| 722 | | | min | -383.762 | 2 | -1020.231 | 1 | -1197.321 | 2 | -.017 | 9 | -.261 | 1 | -.165 | 1 |
| 723 | | 2 | max | 1775.564 | 1 | 312.225 | 2 | 1641.74 | 1 | -.002 | 10 | .147 | 2 | .035 | 2 |
| 724 | | | min | -383.762 | 2 | -1020.231 | 1 | -1197.321 | 2 | -.017 | 9 | -.195 | 1 | -.124 | 1 |
| 725 | | 3 | max | 1775.564 | 1 | 312.225 | 2 | 1641.74 | 1 | -.002 | 10 | .099 | 2 | .022 | 2 |
| 726 | | | min | -383.762 | 2 | -1020.231 | 1 | -1197.321 | 2 | -.017 | 9 | -.129 | 1 | -.083 | 1 |
| 727 | | 4 | max | 1775.564 | 1 | 312.225 | 2 | 1641.74 | 1 | -.002 | 10 | .051 | 2 | .01 | 2 |
| 728 | | | min | -383.762 | 2 | -1020.231 | 1 | -1197.321 | 2 | -.017 | 9 | -.064 | 1 | -.042 | 5 |
| 729 | | 5 | max | 1775.564 | 1 | 312.225 | 2 | 1641.74 | 1 | -.002 | 10 | .01 | 9 | -.001 | 1 |
| 730 | | | min | -383.762 | 2 | -1020.231 | 1 | -1197.321 | 2 | -.017 | 9 | .001 | 10 | -.006 | 6 |
| 731 | M83 | 1 | max | 1709.381 | 7 | 164.755 | 4 | 824.622 | 4 | .01 | 8 | .202 | 3 | .024 | 4 |
| 732 | | | min | -98.212 | 4 | -890.096 | 7 | -1269.311 | 3 | .002 | 3 | -.136 | 4 | -.148 | 7 |
| 733 | | 2 | max | 1709.381 | 7 | 164.755 | 4 | 824.622 | 4 | .01 | 8 | .151 | 3 | .017 | 4 |
| 734 | | | min | -98.212 | 4 | -890.096 | 7 | -1269.311 | 3 | .002 | 3 | -.103 | 4 | -.112 | 7 |
| 735 | | 3 | max | 1709.381 | 7 | 164.755 | 4 | 824.622 | 4 | .01 | 8 | .1 | 3 | .011 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 736 | | | min | -98.212 | 4 | -890.096 | 7 | -1269.311 | 3 | .002 | 3 | -.07 | 4 | -.077 | 7 |
| 737 | | 4 | max | 1709.381 | 7 | 164.755 | 4 | 824.622 | 4 | .01 | 8 | .049 | 3 | .004 | 4 |
| 738 | | | min | -98.212 | 4 | -890.096 | 7 | -1269.311 | 3 | .002 | 3 | -.037 | 4 | -.041 | 7 |
| 739 | | 5 | max | 1709.381 | 7 | 164.755 | 4 | 824.622 | 4 | .01 | 8 | -.001 | 3 | -.002 | 2 |
| 740 | | | min | -98.212 | 4 | -890.096 | 7 | -1269.311 | 3 | .002 | 3 | -.006 | 8 | -.005 | 5 |
| 741 | M84 | 1 | max | 1425.179 | 7 | -194.995 | 4 | 704.571 | 9 | -.006 | 10 | .026 | 2 | -.033 | 4 |
| 742 | | | min | 286.498 | 4 | -938.728 | 7 | -120.953 | 2 | -.035 | 9 | -.09 | 9 | -.156 | 7 |
| 743 | | 2 | max | 1425.179 | 7 | -194.995 | 4 | 704.571 | 9 | -.006 | 10 | .021 | 2 | -.025 | 4 |
| 744 | | | min | 286.498 | 4 | -938.728 | 7 | -120.953 | 2 | -.035 | 9 | -.062 | 9 | -.119 | 7 |
| 745 | | 3 | max | 1425.179 | 7 | -194.995 | 4 | 704.571 | 9 | -.006 | 10 | .016 | 2 | -.018 | 4 |
| 746 | | | min | 286.498 | 4 | -938.728 | 7 | -120.953 | 2 | -.035 | 9 | -.034 | 9 | -.082 | 7 |
| 747 | | 4 | max | 1425.179 | 7 | -194.995 | 4 | 704.571 | 9 | -.006 | 10 | .011 | 2 | -.01 | 4 |
| 748 | | | min | 286.498 | 4 | -938.728 | 7 | -120.953 | 2 | -.035 | 9 | -.012 | 1 | -.045 | 7 |
| 749 | | 5 | max | 1425.179 | 7 | -194.995 | 4 | 704.571 | 9 | -.006 | 10 | .021 | 9 | -.002 | 1 |
| 750 | | | min | 286.498 | 4 | -938.728 | 7 | -120.953 | 2 | -.035 | 9 | .004 | 10 | -.008 | 6 |
| 751 | M85 | 1 | max | 1428.739 | 7 | -211.475 | 4 | 157.181 | 9 | .022 | 6 | .049 | 6 | -.036 | 4 |
| 752 | | | min | 296.89 | 4 | -938.763 | 7 | -400.552 | 6 | .006 | 3 | -.028 | 9 | -.156 | 7 |
| 753 | | 2 | max | 1428.739 | 7 | -211.475 | 4 | 157.181 | 9 | .022 | 6 | .034 | 7 | -.028 | 4 |
| 754 | | | min | 296.89 | 4 | -938.763 | 7 | -400.552 | 6 | .006 | 3 | -.022 | 9 | -.119 | 7 |
| 755 | | 3 | max | 1428.739 | 7 | -211.475 | 4 | 157.181 | 9 | .022 | 6 | .02 | 3 | -.02 | 4 |
| 756 | | | min | 296.89 | 4 | -938.763 | 7 | -400.552 | 6 | .006 | 3 | -.016 | 9 | -.081 | 7 |
| 757 | | 4 | max | 1428.739 | 7 | -211.475 | 4 | 157.181 | 9 | .022 | 6 | .008 | 3 | -.011 | 4 |
| 758 | | | min | 296.89 | 4 | -938.763 | 7 | -400.552 | 6 | .006 | 3 | -.01 | 9 | -.044 | 7 |
| 759 | | 5 | max | 1428.739 | 7 | -211.475 | 4 | 157.181 | 9 | .022 | 6 | -.004 | 3 | -.002 | 2 |
| 760 | | | min | 296.89 | 4 | -938.763 | 7 | -400.552 | 6 | .006 | 3 | -.014 | 6 | -.008 | 5 |
| 761 | M86 | 1 | max | 424.153 | 7 | -105.438 | 1 | 665.637 | 9 | -.006 | 10 | .011 | 2 | -.018 | 1 |
| 762 | | | min | 140.977 | 1 | -294.581 | 7 | -27.968 | 2 | -.034 | 9 | -.082 | 9 | -.05 | 7 |
| 763 | | 2 | max | 424.153 | 7 | -105.438 | 1 | 665.637 | 9 | -.006 | 10 | .01 | 2 | -.013 | 1 |
| 764 | | | min | 140.977 | 1 | -294.581 | 7 | -27.968 | 2 | -.034 | 9 | -.056 | 9 | -.038 | 7 |
| 765 | | 3 | max | 424.153 | 7 | -105.438 | 1 | 665.637 | 9 | -.006 | 10 | .008 | 2 | -.009 | 1 |
| 766 | | | min | 140.977 | 1 | -294.581 | 7 | -27.968 | 2 | -.034 | 9 | -.03 | 9 | -.027 | 7 |
| 767 | | 4 | max | 424.153 | 7 | -105.438 | 1 | 665.637 | 9 | -.006 | 10 | .007 | 2 | -.005 | 1 |
| 768 | | | min | 140.977 | 1 | -294.581 | 7 | -27.968 | 2 | -.034 | 9 | -.005 | 1 | -.015 | 7 |
| 769 | | 5 | max | 424.153 | 7 | -105.438 | 1 | 665.637 | 9 | -.006 | 10 | .021 | 9 | -.001 | 4 |
| 770 | | | min | 140.977 | 1 | -294.581 | 7 | -27.968 | 2 | -.034 | 9 | .004 | 10 | -.004 | 7 |
| 771 | M87 | 1 | max | 430.347 | 5 | -101.743 | 3 | 176.604 | 9 | .023 | 6 | .038 | 6 | -.017 | 3 |
| 772 | | | min | 138.549 | 2 | -298.247 | 5 | -334.831 | 6 | .006 | 3 | -.031 | 9 | -.05 | 5 |
| 773 | | 2 | max | 430.347 | 5 | -101.743 | 3 | 176.604 | 9 | .023 | 6 | .025 | 6 | -.013 | 3 |
| 774 | | | min | 138.549 | 2 | -298.247 | 5 | -334.831 | 6 | .006 | 3 | -.025 | 9 | -.039 | 5 |
| 775 | | 3 | max | 430.347 | 5 | -101.743 | 3 | 176.604 | 9 | .023 | 6 | .012 | 7 | -.009 | 2 |
| 776 | | | min | 138.549 | 2 | -298.247 | 5 | -334.831 | 6 | .006 | 3 | -.018 | 9 | -.027 | 5 |
| 777 | | 4 | max | 430.347 | 5 | -101.743 | 3 | 176.604 | 9 | .023 | 6 | .004 | 3 | -.005 | 2 |
| 778 | | | min | 138.549 | 2 | -298.247 | 5 | -334.831 | 6 | .006 | 3 | -.011 | 9 | -.015 | 5 |
| 779 | | 5 | max | 430.347 | 5 | -101.743 | 3 | 176.604 | 9 | .023 | 6 | -.004 | 3 | 0 | 9 |
| 780 | | | min | 138.549 | 2 | -298.247 | 5 | -334.831 | 6 | .006 | 3 | -.014 | 6 | -.004 | 7 |
| 781 | M88 | 1 | max | 74.328 | 4 | 235.795 | 3 | 627.584 | 9 | -.006 | 10 | -.002 | 4 | .035 | 1 |
| 782 | | | min | -390.913 | 7 | -63.869 | 4 | 56.869 | 4 | -.033 | 9 | -.074 | 9 | -.01 | 4 |
| 783 | | 2 | max | 74.328 | 4 | 235.795 | 3 | 627.584 | 9 | -.006 | 10 | 0 | 4 | .026 | 1 |
| 784 | | | min | -390.913 | 7 | -63.869 | 4 | 56.869 | 4 | -.033 | 9 | -.05 | 9 | -.008 | 2 |
| 785 | | 3 | max | 74.328 | 4 | 235.795 | 3 | 627.584 | 9 | -.006 | 10 | .002 | 4 | .017 | 1 |
| 786 | | | min | -390.913 | 7 | -63.869 | 4 | 56.869 | 4 | -.033 | 9 | -.027 | 9 | -.005 | 2 |
| 787 | | 4 | max | 74.328 | 4 | 235.795 | 3 | 627.584 | 9 | -.006 | 10 | .005 | 6 | .008 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 788 | | | min | -390.913 | 7 | -63.869 | 4 | 56.869 | 4 | -.033 | 9 | -.003 | 9 | -.003 | 2 |
| 789 | | 5 | max | 74.328 | 4 | 235.795 | 3 | 627.584 | 9 | -.006 | 10 | .021 | 9 | 0 | 9 |
| 790 | | | min | -390.913 | 7 | -63.869 | 4 | 56.869 | 4 | -.033 | 9 | .004 | 10 | -.002 | 7 |
| 791 | M89 | 1 | max | 127.755 | 4 | 267.68 | 3 | 170.14 | 9 | .022 | 6 | .03 | 7 | .04 | 3 |
| 792 | | | min | -436.05 | 3 | -94.846 | 4 | -292.821 | 6 | .005 | 3 | -.03 | 9 | -.015 | 4 |
| 793 | | 2 | max | 127.755 | 4 | 267.68 | 3 | 170.14 | 9 | .022 | 6 | .019 | 7 | .03 | 3 |
| 794 | | | min | -436.05 | 3 | -94.846 | 4 | -292.821 | 6 | .005 | 3 | -.024 | 9 | -.011 | 4 |
| 795 | | 3 | max | 127.755 | 4 | 267.68 | 3 | 170.14 | 9 | .022 | 6 | .008 | 7 | .019 | 3 |
| 796 | | | min | -436.05 | 3 | -94.846 | 4 | -292.821 | 6 | .005 | 3 | -.017 | 9 | -.007 | 4 |
| 797 | | 4 | max | 127.755 | 4 | 267.68 | 3 | 170.14 | 9 | .022 | 6 | .001 | 3 | .009 | 3 |
| 798 | | | min | -436.05 | 3 | -94.846 | 4 | -292.821 | 6 | .005 | 3 | -.011 | 9 | -.004 | 4 |
| 799 | | 5 | max | 127.755 | 4 | 267.68 | 3 | 170.14 | 9 | .022 | 6 | -.004 | 3 | 0 | 4 |
| 800 | | | min | -436.05 | 3 | -94.846 | 4 | -292.821 | 6 | .005 | 3 | -.015 | 6 | -.002 | 7 |
| 801 | M90 | 1 | max | 115.663 | 4 | 3060.303 | 5 | 431.953 | 9 | -.013 | 4 | .002 | 2 | 1.715 | 9 |
| 802 | | | min | -3480.095 | 7 | 277.656 | 2 | 45.699 | 4 | -.035 | 7 | -.054 | 9 | .652 | 1 |
| 803 | | 2 | max | 115.663 | 4 | 3060.303 | 5 | 431.953 | 9 | -.013 | 4 | .004 | 2 | 1.637 | 9 |
| 804 | | | min | -3480.095 | 7 | 277.656 | 2 | 45.699 | 4 | -.035 | 7 | -.038 | 9 | .565 | 1 |
| 805 | | 3 | max | 115.663 | 4 | 3060.303 | 5 | 431.953 | 9 | -.013 | 4 | .006 | 2 | 1.56 | 9 |
| 806 | | | min | -3480.095 | 7 | 277.656 | 2 | 45.699 | 4 | -.035 | 7 | -.024 | 12 | .478 | 1 |
| 807 | | 4 | max | 115.663 | 4 | 3060.303 | 5 | 431.953 | 9 | -.013 | 4 | .009 | 2 | 1.482 | 9 |
| 808 | | | min | -3480.095 | 7 | 277.656 | 2 | 45.699 | 4 | -.035 | 7 | -.01 | 12 | .392 | 1 |
| 809 | | 5 | max | 115.663 | 4 | 3060.303 | 5 | 431.953 | 9 | -.013 | 4 | .016 | 6 | 1.404 | 9 |
| 810 | | | min | -3480.095 | 7 | 277.656 | 2 | 45.699 | 4 | -.035 | 7 | .001 | 1 | .305 | 1 |
| 811 | M91 | 1 | max | 403.883 | 4 | 3161.011 | 7 | 19.506 | 9 | .035 | 6 | .052 | 12 | 1.725 | 8 |
| 812 | | | min | -3496.526 | 7 | 182.972 | 4 | -376.984 | 12 | .011 | 9 | -.01 | 9 | .622 | 3 |
| 813 | | 2 | max | 403.883 | 4 | 3161.011 | 7 | 19.506 | 9 | .035 | 6 | .038 | 12 | 1.626 | 8 |
| 814 | | | min | -3496.526 | 7 | 182.972 | 4 | -376.984 | 12 | .011 | 9 | -.009 | 9 | .53 | 3 |
| 815 | | 3 | max | 403.883 | 4 | 3161.011 | 7 | 19.506 | 9 | .035 | 6 | .024 | 12 | 1.527 | 8 |
| 816 | | | min | -3496.526 | 7 | 182.972 | 4 | -376.984 | 12 | .011 | 9 | -.009 | 9 | .438 | 3 |
| 817 | | 4 | max | 403.883 | 4 | 3161.011 | 7 | 19.506 | 9 | .035 | 6 | .01 | 12 | 1.428 | 8 |
| 818 | | | min | -3496.526 | 7 | 182.972 | 4 | -376.984 | 12 | .011 | 9 | -.008 | 9 | .345 | 3 |
| 819 | | 5 | max | 403.883 | 4 | 3161.011 | 7 | 19.506 | 9 | .035 | 6 | -.002 | 3 | 1.329 | 8 |
| 820 | | | min | -3496.526 | 7 | 182.972 | 4 | -376.984 | 12 | .011 | 9 | -.016 | 8 | .253 | 3 |
| 821 | M92 | 1 | max | 282.669 | 10 | 349.179 | 4 | 156.719 | 4 | 0 | 4 | -.003 | 4 | .016 | 10 |
| 822 | | | min | 78.434 | 4 | -461.013 | 3 | -316.359 | 10 | 0 | 3 | -.01 | 10 | .004 | 4 |
| 823 | | 2 | max | 282.669 | 10 | 349.179 | 4 | 156.719 | 4 | 0 | 4 | 0 | 4 | .023 | 10 |
| 824 | | | min | 78.434 | 4 | -461.013 | 3 | -316.359 | 10 | 0 | 3 | -.016 | 10 | -.003 | 4 |
| 825 | | 3 | max | 282.669 | 10 | 349.179 | 4 | 156.719 | 4 | 0 | 4 | .004 | 4 | .029 | 10 |
| 826 | | | min | 78.434 | 4 | -461.013 | 3 | -316.359 | 10 | 0 | 3 | -.023 | 10 | -.01 | 4 |
| 827 | | 4 | max | 282.669 | 10 | 349.179 | 4 | 156.719 | 4 | 0 | 4 | .007 | 4 | .037 | 3 |
| 828 | | | min | 78.434 | 4 | -461.013 | 3 | -316.359 | 10 | 0 | 3 | -.029 | 10 | -.017 | 4 |
| 829 | | 5 | max | 282.669 | 10 | 349.179 | 4 | 156.719 | 4 | 0 | 4 | .01 | 4 | .046 | 3 |
| 830 | | | min | 78.434 | 4 | -461.013 | 3 | -316.359 | 10 | 0 | 3 | -.036 | 10 | -.025 | 4 |
| 831 | M93 | 1 | max | 45.387 | 10 | 154.282 | 10 | 119.806 | 3 | 0 | 4 | -.005 | 4 | .032 | 10 |
| 832 | | | min | 13.493 | 4 | -34.349 | 4 | -85.884 | 4 | 0 | 3 | -.019 | 10 | .009 | 4 |
| 833 | | 2 | max | 45.387 | 10 | 154.282 | 10 | 119.806 | 3 | 0 | 4 | -.006 | 1 | .029 | 10 |
| 834 | | | min | 13.493 | 4 | -34.349 | 4 | -85.884 | 4 | 0 | 3 | -.018 | 10 | .01 | 4 |
| 835 | | 3 | max | 45.387 | 10 | 154.282 | 10 | 119.806 | 3 | 0 | 4 | -.004 | 3 | .026 | 10 |
| 836 | | | min | 13.493 | 4 | -34.349 | 4 | -85.884 | 4 | 0 | 3 | -.017 | 10 | .01 | 2 |
| 837 | | 4 | max | 45.387 | 10 | 154.282 | 10 | 119.806 | 3 | 0 | 4 | -.001 | 3 | .023 | 8 |
| 838 | | | min | 13.493 | 4 | -34.349 | 4 | -85.884 | 4 | 0 | 3 | -.016 | 10 | .008 | 2 |
| 839 | | 5 | max | 45.387 | 10 | 154.282 | 10 | 119.806 | 3 | 0 | 4 | .001 | 3 | .022 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 840 | | | min | 13.493 | 4 | -34.349 | 4 | -85.884 | 4 | 0 | 3 | -.016 | 10 | .007 | 2 |
| 841 | M94 | 1 | max | 29.755 | 10 | 109.56 | 10 | 113.527 | 3 | 0 | 4 | -.005 | 4 | .032 | 10 |
| 842 | | | min | 8.286 | 4 | -60.862 | 1 | -92.978 | 4 | 0 | 3 | -.019 | 10 | .009 | 4 |
| 843 | | 2 | max | 29.755 | 10 | 109.56 | 10 | 113.527 | 3 | 0 | 4 | -.005 | 1 | .03 | 10 |
| 844 | | | min | 8.286 | 4 | -60.862 | 1 | -92.978 | 4 | 0 | 3 | -.018 | 10 | .01 | 4 |
| 845 | | 3 | max | 29.755 | 10 | 109.56 | 10 | 113.527 | 3 | 0 | 4 | -.004 | 3 | .028 | 10 |
| 846 | | | min | 8.286 | 4 | -60.862 | 1 | -92.978 | 4 | 0 | 3 | -.018 | 10 | .01 | 2 |
| 847 | | 4 | max | 29.755 | 10 | 109.56 | 10 | 113.527 | 3 | 0 | 4 | -.002 | 3 | .026 | 10 |
| 848 | | | min | 8.286 | 4 | -60.862 | 1 | -92.978 | 4 | 0 | 3 | -.017 | 10 | .008 | 2 |
| 849 | | 5 | max | 29.755 | 10 | 109.56 | 10 | 113.527 | 3 | 0 | 4 | 0 | 3 | .025 | 5 |
| 850 | | | min | 8.286 | 4 | -60.862 | 1 | -92.978 | 4 | 0 | 3 | -.016 | 10 | .006 | 2 |
| 851 | M95 | 1 | max | 19.279 | 10 | 92.746 | 10 | 86.125 | 3 | 0 | 4 | -.005 | 4 | .032 | 10 |
| 852 | | | min | 6.592 | 4 | -52.325 | 1 | -65.918 | 4 | 0 | 3 | -.019 | 10 | .009 | 4 |
| 853 | | 2 | max | 19.279 | 10 | 92.746 | 10 | 86.125 | 3 | 0 | 4 | -.005 | 1 | .03 | 10 |
| 854 | | | min | 6.592 | 4 | -52.325 | 1 | -65.918 | 4 | 0 | 3 | -.018 | 10 | .01 | 4 |
| 855 | | 3 | max | 19.279 | 10 | 92.746 | 10 | 86.125 | 3 | 0 | 4 | -.005 | 1 | .029 | 10 |
| 856 | | | min | 6.592 | 4 | -52.325 | 1 | -65.918 | 4 | 0 | 3 | -.017 | 10 | .01 | 2 |
| 857 | | 4 | max | 19.279 | 10 | 92.746 | 10 | 86.125 | 3 | 0 | 4 | -.004 | 3 | .027 | 10 |
| 858 | | | min | 6.592 | 4 | -52.325 | 1 | -65.918 | 4 | 0 | 3 | -.016 | 10 | .008 | 2 |
| 859 | | 5 | max | 19.279 | 10 | 92.746 | 10 | 86.125 | 3 | 0 | 4 | -.002 | 3 | .025 | 5 |
| 860 | | | min | 6.592 | 4 | -52.325 | 1 | -65.918 | 4 | 0 | 3 | -.015 | 10 | .007 | 2 |
| 861 | M96 | 1 | max | -69.222 | 4 | 73.386 | 2 | 90.635 | 9 | 0 | 4 | -.003 | 4 | .016 | 10 |
| 862 | | | min | -249.191 | 10 | -107.551 | 4 | -69.946 | 2 | 0 | 3 | -.009 | 10 | .005 | 4 |
| 863 | | 2 | max | -69.222 | 4 | 73.386 | 2 | 90.635 | 9 | 0 | 4 | -.002 | 9 | .017 | 10 |
| 864 | | | min | -249.191 | 10 | -107.551 | 4 | -69.946 | 2 | 0 | 3 | -.009 | 6 | .005 | 2 |
| 865 | | 3 | max | -69.222 | 4 | 73.386 | 2 | 90.635 | 9 | 0 | 4 | 0 | 9 | .018 | 10 |
| 866 | | | min | -249.191 | 10 | -107.551 | 4 | -69.946 | 2 | 0 | 3 | -.01 | 6 | .004 | 2 |
| 867 | | 4 | max | -69.222 | 4 | 73.386 | 2 | 90.635 | 9 | 0 | 4 | .002 | 9 | .019 | 10 |
| 868 | | | min | -249.191 | 10 | -107.551 | 4 | -69.946 | 2 | 0 | 3 | -.011 | 6 | .002 | 2 |
| 869 | | 5 | max | -69.222 | 4 | 73.386 | 2 | 90.635 | 9 | 0 | 4 | .004 | 9 | .02 | 10 |
| 870 | | | min | -249.191 | 10 | -107.551 | 4 | -69.946 | 2 | 0 | 3 | -.011 | 6 | 0 | 2 |
| 871 | M97 | 1 | max | 608.938 | 10 | 2030.994 | 4 | 1741.059 | 1 | .212 | 1 | .139 | 1 | .154 | 3 |
| 872 | | | min | 169.859 | 4 | -1605.226 | 3 | -1506.814 | 2 | -.212 | 2 | -.137 | 2 | -.161 | 4 |
| 873 | | 2 | max | 608.938 | 10 | 2030.994 | 4 | 1741.059 | 1 | .212 | 1 | .248 | 1 | .254 | 3 |
| 874 | | | min | 169.859 | 4 | -1605.226 | 3 | -1506.814 | 2 | -.212 | 2 | -.231 | 2 | -.288 | 4 |
| 875 | | 3 | max | 608.938 | 10 | 2030.994 | 4 | 1741.059 | 1 | .212 | 1 | .357 | 1 | .354 | 3 |
| 876 | | | min | 169.859 | 4 | -1605.226 | 3 | -1506.814 | 2 | -.212 | 2 | -.325 | 2 | -.415 | 4 |
| 877 | | 4 | max | 608.938 | 10 | 2030.994 | 4 | 1741.059 | 1 | .212 | 1 | .466 | 1 | .455 | 3 |
| 878 | | | min | 169.859 | 4 | -1605.226 | 3 | -1506.814 | 2 | -.212 | 2 | -.419 | 2 | -.541 | 4 |
| 879 | | 5 | max | 608.938 | 10 | 2030.994 | 4 | 1741.059 | 1 | .212 | 1 | .574 | 1 | .555 | 3 |
| 880 | | | min | 169.859 | 4 | -1605.226 | 3 | -1506.814 | 2 | -.212 | 2 | -.513 | 2 | -.668 | 4 |
| 881 | M98 | 1 | max | -17.174 | 1 | 530.533 | 10 | 315.622 | 10 | .044 | 9 | -.001 | 1 | .042 | 10 |
| 882 | | | min | -46.768 | 8 | 183.025 | 1 | 23 | 2 | -.038 | 2 | -.023 | 10 | .004 | 4 |
| 883 | | 2 | max | -17.174 | 1 | 530.533 | 10 | 315.622 | 10 | .044 | 9 | .014 | 1 | .012 | 3 |
| 884 | | | min | -46.768 | 8 | 183.025 | 1 | 23 | 2 | -.038 | 2 | -.014 | 2 | -.011 | 4 |
| 885 | | 3 | max | -17.174 | 1 | 530.533 | 10 | 315.622 | 10 | .044 | 9 | .028 | 1 | 0 | 3 |
| 886 | | | min | -46.768 | 8 | 183.025 | 1 | 23 | 2 | -.038 | 2 | -.013 | 2 | -.032 | 8 |
| 887 | | 4 | max | -17.174 | 1 | 530.533 | 10 | 315.622 | 10 | .044 | 9 | .043 | 1 | -.012 | 3 |
| 888 | | | min | -46.768 | 8 | 183.025 | 1 | 23 | 2 | -.038 | 2 | -.011 | 2 | -.063 | 8 |
| 889 | | 5 | max | -17.174 | 1 | 530.533 | 10 | 315.622 | 10 | .044 | 9 | .06 | 5 | -.024 | 3 |
| 890 | | | min | -46.768 | 8 | 183.025 | 1 | 23 | 2 | -.038 | 2 | -.01 | 2 | -.094 | 8 |
| 891 | M99 | 1 | max | -7.146 | 4 | 576.045 | 10 | 330.431 | 10 | .042 | 9 | 0 | 4 | .038 | 10 |

## *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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 892 | | | min | -19.737 | 10 | 205.246 | 2 | 100.891 | 3 | -.017 | 2 | -.021 | 10 | .005 | 4 |
| 893 | | 2 | max | -7.146 | 4 | 576.045 | 10 | 330.431 | 10 | .042 | 9 | .011 | 4 | .007 | 2 |
| 894 | | | min | -19.737 | 10 | 205.246 | 2 | 100.891 | 3 | -.017 | 2 | -.009 | 3 | -.01 | 1 |
| 895 | | 3 | max | -7.146 | 4 | 576.045 | 10 | 330.431 | 10 | .042 | 9 | .023 | 8 | -.006 | 2 |
| 896 | | | min | -19.737 | 10 | 205.246 | 2 | 100.891 | 3 | -.017 | 2 | -.002 | 3 | -.038 | 5 |
| 897 | | 4 | max | -7.146 | 4 | 576.045 | 10 | 330.431 | 10 | .042 | 9 | .042 | 8 | -.019 | 2 |
| 898 | | | min | -19.737 | 10 | 205.246 | 2 | 100.891 | 3 | -.017 | 2 | .004 | 3 | -.07 | 5 |
| 899 | | 5 | max | -7.146 | 4 | 576.045 | 10 | 330.431 | 10 | .042 | 9 | .062 | 8 | -.032 | 2 |
| 900 | | | min | -19.737 | 10 | 205.246 | 2 | 100.891 | 3 | -.017 | 2 | .01 | 3 | -.106 | 10 |
| 901 | M100 | 1 | max | -14.458 | 9 | 593.415 | 10 | 337.032 | 10 | .04 | 9 | 0 | 4 | .036 | 10 |
| 902 | | | min | -42.643 | 8 | 207.166 | 2 | 87.702 | 1 | -.007 | 3 | -.021 | 10 | .006 | 4 |
| 903 | | 2 | max | -14.458 | 9 | 593.415 | 10 | 337.032 | 10 | .04 | 9 | .009 | 4 | .006 | 2 |
| 904 | | | min | -42.643 | 8 | 207.166 | 2 | 87.702 | 1 | -.007 | 3 | -.007 | 3 | -.011 | 1 |
| 905 | | 3 | max | -14.458 | 9 | 593.415 | 10 | 337.032 | 10 | .04 | 9 | .024 | 8 | -.007 | 2 |
| 906 | | | min | -42.643 | 8 | 207.166 | 2 | 87.702 | 1 | -.007 | 3 | 0 | 3 | -.04 | 5 |
| 907 | | 4 | max | -14.458 | 9 | 593.415 | 10 | 337.032 | 10 | .04 | 9 | .043 | 8 | -.02 | 2 |
| 908 | | | min | -42.643 | 8 | 207.166 | 2 | 87.702 | 1 | -.007 | 3 | .008 | 1 | -.075 | 10 |
| 909 | | 5 | max | -14.458 | 9 | 593.415 | 10 | 337.032 | 10 | .04 | 9 | .063 | 10 | -.032 | 2 |
| 910 | | | min | -42.643 | 8 | 207.166 | 2 | 87.702 | 1 | -.007 | 3 | .013 | 1 | -.112 | 10 |
| 911 | M101 | 1 | max | 1331.2 | 10 | 526.869 | 1 | 655.865 | 2 | .026 | 9 | .164 | 1 | .111 | 1 |
| 912 | | | min | 367.457 | 4 | -135.516 | 2 | -422.824 | 1 | -.004 | 3 | -.199 | 9 | -.094 | 9 |
| 913 | | 2 | max | 1331.2 | 10 | 526.869 | 1 | 655.865 | 2 | .026 | 9 | .138 | 1 | .088 | 3 |
| 914 | | | min | 367.457 | 4 | -135.516 | 2 | -422.824 | 1 | -.004 | 3 | -.175 | 9 | -.098 | 9 |
| 915 | | 3 | max | 1331.2 | 10 | 526.869 | 1 | 655.865 | 2 | .026 | 9 | .111 | 1 | .066 | 3 |
| 916 | | | min | 367.457 | 4 | -135.516 | 2 | -422.824 | 1 | -.004 | 3 | -.151 | 9 | -.102 | 9 |
| 917 | | 4 | max | 1331.2 | 10 | 526.869 | 1 | 655.865 | 2 | .026 | 9 | .091 | 3 | .045 | 3 |
| 918 | | | min | 367.457 | 4 | -135.516 | 2 | -422.824 | 1 | -.004 | 3 | -.127 | 9 | -.106 | 9 |
| 919 | | 5 | max | 1331.2 | 10 | 526.869 | 1 | 655.865 | 2 | .026 | 9 | .078 | 3 | .023 | 3 |
| 920 | | | min | 367.457 | 4 | -135.516 | 2 | -422.824 | 1 | -.004 | 3 | -.103 | 9 | -.115 | 10 |
| 921 | M102 | 1 | max | 1718.553 | 8 | 184.842 | 3 | 1292.615 | 4 | -.002 | 4 | .14 | 3 | .027 | 3 |
| 922 | | | min | -128.522 | 3 | -901.036 | 8 | -848.621 | 3 | -.01 | 10 | -.206 | 4 | -.15 | 8 |
| 923 | | 2 | max | 1718.553 | 8 | 184.842 | 3 | 1292.615 | 4 | -.002 | 4 | .106 | 3 | .019 | 3 |
| 924 | | | min | -128.522 | 3 | -901.036 | 8 | -848.621 | 3 | -.01 | 10 | -.154 | 4 | -.114 | 8 |
| 925 | | 3 | max | 1718.553 | 8 | 184.842 | 3 | 1292.615 | 4 | -.002 | 4 | .072 | 3 | .012 | 3 |
| 926 | | | min | -128.522 | 3 | -901.036 | 8 | -848.621 | 3 | -.01 | 10 | -.102 | 4 | -.078 | 8 |
| 927 | | 4 | max | 1718.553 | 8 | 184.842 | 3 | 1292.615 | 4 | -.002 | 4 | .038 | 3 | .005 | 3 |
| 928 | | | min | -128.522 | 3 | -901.036 | 8 | -848.621 | 3 | -.01 | 10 | -.051 | 4 | -.041 | 8 |
| 929 | | 5 | max | 1718.553 | 8 | 184.842 | 3 | 1292.615 | 4 | -.002 | 4 | .006 | 10 | -.001 | 4 |
| 930 | | | min | -128.522 | 3 | -901.036 | 8 | -848.621 | 3 | -.01 | 10 | .001 | 4 | -.005 | 7 |
| 931 | M103 | 1 | max | 1723.061 | 5 | 180.505 | 2 | 942.318 | 2 | .014 | 10 | .221 | 1 | .026 | 2 |
| 932 | | | min | -147.863 | 2 | -894.176 | 5 | -1387.422 | 1 | .003 | 1 | -.155 | 2 | -.149 | 5 |
| 933 | | 2 | max | 1723.061 | 5 | 180.505 | 2 | 942.318 | 2 | .014 | 10 | .165 | 1 | .019 | 2 |
| 934 | | | min | -147.863 | 2 | -894.176 | 5 | -1387.422 | 1 | .003 | 1 | -.117 | 2 | -.113 | 5 |
| 935 | | 3 | max | 1723.061 | 5 | 180.505 | 2 | 942.318 | 2 | .014 | 10 | .109 | 1 | .012 | 2 |
| 936 | | | min | -147.863 | 2 | -894.176 | 5 | -1387.422 | 1 | .003 | 1 | -.079 | 2 | -.077 | 5 |
| 937 | | 4 | max | 1723.061 | 5 | 180.505 | 2 | 942.318 | 2 | .014 | 10 | .054 | 1 | .004 | 2 |
| 938 | | | min | -147.863 | 2 | -894.176 | 5 | -1387.422 | 1 | .003 | 1 | -.041 | 2 | -.041 | 5 |
| 939 | | 5 | max | 1723.061 | 5 | 180.505 | 2 | 942.318 | 2 | .014 | 10 | -.002 | 1 | -.001 | 1 |
| 940 | | | min | -147.863 | 2 | -894.176 | 5 | -1387.422 | 1 | .003 | 1 | -.008 | 10 | -.005 | 6 |
| 941 | M104 | 1 | max | 1430.245 | 8 | -204.286 | 3 | 380.542 | 8 | -.005 | 4 | .006 | 3 | -.036 | 3 |
| 942 | | | min | 282.324 | 3 | -939.465 | 8 | 21.628 | 3 | -.022 | 10 | -.047 | 8 | -.156 | 8 |
| 943 | | 2 | max | 1430.245 | 8 | -204.286 | 3 | 380.542 | 8 | -.005 | 4 | .006 | 3 | -.028 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 944 | | | min | 282.324 | 3 | -939.465 | 8 | 21.628 | 3 | -.022 | 10 | -.032 | 8 | -.119 | 8 |
| 945 | | 3 | max | 1430.245 | 8 | -204.286 | 3 | 380.542 | 8 | -.005 | 4 | .007 | 3 | -.02 | 3 |
| 946 | | | min | 282.324 | 3 | -939.465 | 8 | 21.628 | 3 | -.022 | 10 | -.02 | 4 | -.081 | 8 |
| 947 | | 4 | max | 1430.245 | 8 | -204.286 | 3 | 380.542 | 8 | -.005 | 4 | .008 | 3 | -.012 | 3 |
| 948 | | | min | 282.324 | 3 | -939.465 | 8 | 21.628 | 3 | -.022 | 10 | -.008 | 4 | -.044 | 8 |
| 949 | | 5 | max | 1430.245 | 8 | -204.286 | 3 | 380.542 | 8 | -.005 | 4 | .014 | 10 | -.002 | 4 |
| 950 | | | min | 282.324 | 3 | -939.465 | 8 | 21.628 | 3 | -.022 | 10 | .003 | 4 | -.008 | 5 |
| 951 | M105 | 1 | max | 1433.388 | 8 | -171.578 | 3 | 35.845 | 2 | .029 | 10 | .052 | 5 | -.03 | 3 |
| 952 | | | min | 247.247 | 3 | -943.715 | 8 | -438.673 | 10 | .008 | 1 | -.013 | 2 | -.156 | 8 |
| 953 | | 2 | max | 1433.388 | 8 | -171.578 | 3 | 35.845 | 2 | .029 | 10 | .037 | 1 | -.023 | 3 |
| 954 | | | min | 247.247 | 3 | -943.715 | 8 | -438.673 | 10 | .008 | 1 | -.012 | 2 | -.119 | 8 |
| 955 | | 3 | max | 1433.388 | 8 | -171.578 | 3 | 35.845 | 2 | .029 | 10 | .023 | 1 | -.016 | 3 |
| 956 | | | min | 247.247 | 3 | -943.715 | 8 | -438.673 | 10 | .008 | 1 | -.01 | 2 | -.082 | 8 |
| 957 | | 4 | max | 1433.388 | 8 | -171.578 | 3 | 35.845 | 2 | .029 | 10 | .009 | 1 | -.009 | 3 |
| 958 | | | min | 247.247 | 3 | -943.715 | 8 | -438.673 | 10 | .008 | 1 | -.009 | 2 | -.045 | 8 |
| 959 | | 5 | max | 1433.388 | 8 | -171.578 | 3 | 35.845 | 2 | .029 | 10 | -.005 | 1 | -.002 | 1 |
| 960 | | | min | 247.247 | 3 | -943.715 | 8 | -438.673 | 10 | .008 | 1 | -.018 | 10 | -.008 | 6 |
| 961 | M106 | 1 | max | 428.459 | 5 | -96.723 | 4 | 311.215 | 8 | -.005 | 4 | .004 | 9 | -.016 | 4 |
| 962 | | | min | 135.028 | 4 | -296.634 | 5 | -4.391 | 9 | -.022 | 10 | -.035 | 8 | -.05 | 5 |
| 963 | | 2 | max | 428.459 | 5 | -96.723 | 4 | 311.215 | 8 | -.005 | 4 | .004 | 9 | -.013 | 4 |
| 964 | | | min | 135.028 | 4 | -296.634 | 5 | -4.391 | 9 | -.022 | 10 | -.023 | 8 | -.038 | 5 |
| 965 | | 3 | max | 428.459 | 5 | -96.723 | 4 | 311.215 | 8 | -.005 | 4 | .004 | 9 | -.009 | 4 |
| 966 | | | min | 135.028 | 4 | -296.634 | 5 | -4.391 | 9 | -.022 | 10 | -.011 | 4 | -.027 | 5 |
| 967 | | 4 | max | 428.459 | 5 | -96.723 | 4 | 311.215 | 8 | -.005 | 4 | .007 | 10 | -.005 | 4 |
| 968 | | | min | 135.028 | 4 | -296.634 | 5 | -4.391 | 9 | -.022 | 10 | -.004 | 4 | -.015 | 5 |
| 969 | | 5 | max | 428.459 | 5 | -96.723 | 4 | 311.215 | 8 | -.005 | 4 | .014 | 10 | -.001 | 9 |
| 970 | | | min | 135.028 | 4 | -296.634 | 5 | -4.391 | 9 | -.022 | 10 | .003 | 4 | -.004 | 5 |
| 971 | M107 | 1 | max | 426.853 | 8 | -102.548 | 1 | -37.046 | 2 | .029 | 10 | .045 | 10 | -.017 | 1 |
| 972 | | | min | 138.384 | 1 | -303.151 | 10 | -406.475 | 10 | .008 | 1 | -.002 | 2 | -.05 | 10 |
| 973 | | 2 | max | 426.853 | 8 | -102.548 | 1 | -37.046 | 2 | .029 | 10 | .029 | 10 | -.013 | 1 |
| 974 | | | min | 138.384 | 1 | -303.151 | 10 | -406.475 | 10 | .008 | 1 | -.003 | 2 | -.039 | 10 |
| 975 | | 3 | max | 426.853 | 8 | -102.548 | 1 | -37.046 | 2 | .029 | 10 | .015 | 9 | -.009 | 1 |
| 976 | | | min | 138.384 | 1 | -303.151 | 10 | -406.475 | 10 | .008 | 1 | -.005 | 2 | -.027 | 10 |
| 977 | | 4 | max | 426.853 | 8 | -102.548 | 1 | -37.046 | 2 | .029 | 10 | .004 | 1 | -.005 | 1 |
| 978 | | | min | 138.384 | 1 | -303.151 | 10 | -406.475 | 10 | .008 | 1 | -.006 | 2 | -.015 | 8 |
| 979 | | 5 | max | 426.853 | 8 | -102.548 | 1 | -37.046 | 2 | .029 | 10 | -.005 | 1 | -.001 | 3 |
| 980 | | | min | 138.384 | 1 | -303.151 | 10 | -406.475 | 10 | .008 | 1 | -.018 | 10 | -.004 | 8 |
| 981 | M108 | 1 | max | 146.505 | 3 | 284.076 | 4 | 274.467 | 8 | -.004 | 4 | .006 | 9 | .043 | 4 |
| 982 | | | min | -456.12 | 4 | -111.571 | 3 | -13.573 | 9 | -.022 | 10 | -.028 | 8 | -.018 | 3 |
| 983 | | 2 | max | 146.505 | 3 | 284.076 | 4 | 274.467 | 8 | -.004 | 4 | .005 | 9 | .032 | 4 |
| 984 | | | min | -456.12 | 4 | -111.571 | 3 | -13.573 | 9 | -.022 | 10 | -.018 | 8 | -.013 | 3 |
| 985 | | 3 | max | 146.505 | 3 | 284.076 | 4 | 274.467 | 8 | -.004 | 4 | .005 | 9 | .021 | 4 |
| 986 | | | min | -456.12 | 4 | -111.571 | 3 | -13.573 | 9 | -.022 | 10 | -.007 | 8 | -.009 | 3 |
| 987 | | 4 | max | 146.505 | 3 | 284.076 | 4 | 274.467 | 8 | -.004 | 4 | .007 | 10 | .01 | 4 |
| 988 | | | min | -456.12 | 4 | -111.571 | 3 | -13.573 | 9 | -.022 | 10 | -.002 | 4 | -.005 | 3 |
| 989 | | 5 | max | 146.505 | 3 | 284.076 | 4 | 274.467 | 8 | -.004 | 4 | .015 | 10 | 0 | 2 |
| 990 | | | min | -456.12 | 4 | -111.571 | 3 | -13.573 | 9 | -.022 | 10 | .003 | 4 | -.002 | 5 |
| 991 | M109 | 1 | max | 92.857 | 3 | 247.194 | 4 | -64.751 | 3 | .029 | 10 | .04 | 10 | .037 | 4 |
| 992 | | | min | -401.158 | 4 | -74.815 | 3 | -384.827 | 10 | .007 | 1 | .003 | 3 | -.012 | 3 |
| 993 | | 2 | max | 92.857 | 3 | 247.194 | 4 | -64.751 | 3 | .029 | 10 | .025 | 10 | .027 | 4 |
| 994 | | | min | -401.158 | 4 | -74.815 | 3 | -384.827 | 10 | .007 | 1 | 0 | 3 | -.009 | 3 |
| 995 | | 3 | max | 92.857 | 3 | 247.194 | 4 | -64.751 | 3 | .029 | 10 | .013 | 9 | .018 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 996 | | | min | -401.158 | 4 | -74.815 | 3 | -384.827 | 10 | .007 | 1 | -.001 | 3 | -.006 | 3 |
| 997 | | 4 | max | 92.857 | 3 | 247.194 | 4 | -64.751 | 3 | .029 | 10 | .001 | 9 | .008 | 4 |
| 998 | | | min | -401.158 | 4 | -74.815 | 3 | -384.827 | 10 | .007 | 1 | -.004 | 6 | -.003 | 3 |
| 999 | | 5 | max | 92.857 | 3 | 247.194 | 4 | -64.751 | 3 | .029 | 10 | -.005 | 1 | 0 | 9 |
| 1000 | | | min | -401.158 | 4 | -74.815 | 3 | -384.827 | 10 | .007 | 1 | -.019 | 10 | -.002 | 8 |
| 1001 | M110 | 1 | max | 455.087 | 3 | 3131.369 | 8 | 289.345 | 8 | -.011 | 9 | 0 | 3 | 1.714 | 7 |
| 1002 | | | min | -3557.733 | 8 | -2.125 | 3 | 55.881 | 9 | -.035 | 7 | -.03 | 8 | .604 | 4 |
| 1003 | | 2 | max | 455.087 | 3 | 3131.369 | 8 | 289.345 | 8 | -.011 | 9 | .003 | 3 | 1.619 | 7 |
| 1004 | | | min | -3557.733 | 8 | -2.125 | 3 | 55.881 | 9 | -.035 | 7 | -.019 | 8 | .507 | 4 |
| 1005 | | 3 | max | 455.087 | 3 | 3131.369 | 8 | 289.345 | 8 | -.011 | 9 | .006 | 3 | 1.523 | 7 |
| 1006 | | | min | -3557.733 | 8 | -2.125 | 3 | 55.881 | 9 | -.035 | 7 | -.012 | 4 | .41 | 4 |
| 1007 | | 4 | max | 455.087 | 3 | 3131.369 | 8 | 289.345 | 8 | -.011 | 9 | .009 | 3 | 1.428 | 7 |
| 1008 | | | min | -3557.733 | 8 | -2.125 | 3 | 55.881 | 9 | -.035 | 7 | -.006 | 4 | .314 | 4 |
| 1009 | | 5 | max | 455.087 | 3 | 3131.369 | 8 | 289.345 | 8 | -.011 | 9 | .016 | 7 | 1.332 | 7 |
| 1010 | | | min | -3557.733 | 8 | -2.125 | 3 | 55.881 | 9 | -.035 | 7 | 0 | 4 | .217 | 4 |
| 1011 | M111 | 1 | max | 320.567 | 3 | 3115.976 | 8 | -46.591 | 3 | .038 | 10 | .031 | 10 | 1.812 | 10 |
| 1012 | | | min | -3463.463 | 8 | 393.023 | 3 | -317.352 | 10 | .013 | 1 | -.001 | 3 | .618 | 1 |
| 1013 | | 2 | max | 320.567 | 3 | 3115.976 | 8 | -46.591 | 3 | .038 | 10 | .02 | 9 | 1.721 | 10 |
| 1014 | | | min | -3463.463 | 8 | 393.023 | 3 | -317.352 | 10 | .013 | 1 | -.003 | 3 | .539 | 1 |
| 1015 | | 3 | max | 320.567 | 3 | 3115.976 | 8 | -46.591 | 3 | .038 | 10 | .012 | 4 | 1.631 | 10 |
| 1016 | | | min | -3463.463 | 8 | 393.023 | 3 | -317.352 | 10 | .013 | 1 | -.005 | 3 | .46 | 1 |
| 1017 | | 4 | max | 320.567 | 3 | 3115.976 | 8 | -46.591 | 3 | .038 | 10 | .004 | 1 | 1.54 | 10 |
| 1018 | | | min | -3463.463 | 8 | 393.023 | 3 | -317.352 | 10 | .013 | 1 | -.007 | 2 | .382 | 1 |
| 1019 | | 5 | max | 320.567 | 3 | 3115.976 | 8 | -46.591 | 3 | .038 | 10 | -.002 | 1 | 1.449 | 10 |
| 1020 | | | min | -3463.463 | 8 | 393.023 | 3 | -317.352 | 10 | .013 | 1 | -.017 | 10 | .303 | 1 |
| 1021 | MP3A | 1 | max | 38.416 | 5 | 45.89 | 4 | 100.04 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 1022 | | | min | 8.1 | 2 | -45.751 | 3 | -100.158 | 2 | 0 | 1 | 0 | 1 | 0 | 1 |
| 1023 | | 2 | max | 764.347 | 9 | 62.233 | 4 | 116.382 | 1 | 0 | 1 | .162 | 1 | .081 | 3 |
| 1024 | | | min | 14.347 | 2 | -62.094 | 3 | -116.501 | 2 | 0 | 1 | -.162 | 2 | -.081 | 4 |
| 1025 | | 3 | max | -20.595 | 4 | 78.417 | 3 | 132.777 | 2 | 0 | 1 | .149 | 1 | .095 | 3 |
| 1026 | | | min | -66.337 | 5 | -78.536 | 4 | -132.677 | 1 | 0 | 1 | -.149 | 2 | -.095 | 4 |
| 1027 | | 4 | max | -6.247 | 4 | 16.285 | 3 | 16.429 | 2 | 0 | 1 | .012 | 1 | .012 | 3 |
| 1028 | | | min | -13.96 | 5 | -16.404 | 4 | -16.328 | 1 | 0 | 1 | -.012 | 2 | -.012 | 4 |
| 1029 | | 5 | max | 0 | 1 | -.047 | 1 | .376 | 6 | 0 | 1 | 0 | 1 | 0 | 1 |
| 1030 | | | min | 0 | 1 | -.438 | 6 | .015 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 1031 | MP2A | 1 | max | 38.416 | 8 | 45.756 | 4 | 100.031 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 1032 | | | min | 8.1 | 10 | -45.893 | 3 | -100.137 | 2 | 0 | 1 | 0 | 1 | 0 | 1 |
| 1033 | | 2 | max | 52.376 | 8 | 62.099 | 4 | 116.374 | 1 | 0 | 1 | .162 | 1 | .081 | 3 |
| 1034 | | | min | 14.347 | 10 | -62.236 | 3 | -116.479 | 2 | 0 | 1 | -.162 | 2 | -.081 | 4 |
| 1035 | | 3 | max | -20.595 | 1 | 78.539 | 3 | 132.759 | 2 | 0 | 1 | .149 | 1 | .095 | 3 |
| 1036 | | | min | -66.337 | 5 | -78.422 | 4 | -132.669 | 1 | 0 | 1 | -.149 | 2 | -.095 | 4 |
| 1037 | | 4 | max | -6.247 | 1 | 16.407 | 3 | 16.411 | 2 | 0 | 1 | .012 | 1 | .012 | 3 |
| 1038 | | | min | -13.96 | 5 | -16.29 | 4 | -16.321 | 1 | 0 | 1 | -.012 | 2 | -.012 | 4 |
| 1039 | | 5 | max | 0 | 1 | .432 | 6 | .337 | 6 | 0 | 1 | 0 | 1 | 0 | 1 |
| 1040 | | | min | 0 | 1 | .049 | 1 | .022 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 1041 | MP1A | 1 | max | 38.416 | 5 | 45.715 | 4 | 100.092 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 1042 | | | min | 8.1 | 1 | -46.102 | 3 | -100.292 | 2 | 0 | 1 | 0 | 1 | 0 | 1 |
| 1043 | | 2 | max | 782.827 | 10 | 78.653 | 4 | 131.344 | 1 | 0 | 1 | .17 | 1 | .09 | 3 |
| 1044 | | | min | 32.827 | 1 | -79.039 | 3 | -131.543 | 2 | 0 | 1 | -.17 | 2 | -.089 | 4 |
| 1045 | | 3 | max | -21.212 | 3 | 79.686 | 3 | 134.602 | 2 | 0 | 1 | .149 | 1 | .095 | 3 |
| 1046 | | | min | -68.349 | 7 | -79.517 | 4 | -134.514 | 1 | 0 | 1 | -.149 | 2 | -.095 | 4 |
| 1047 | | 4 | max | -6.247 | 3 | 16.45 | 3 | 16.418 | 2 | 0 | 1 | .012 | 1 | .012 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1048 | | | min | -13.96 | 7 | -16.281 | 4 | -16.331 | 1 | 0 | 1 | -.012 | 2 | -.012 | 4 |
| 1049 | | 5 | max | 0 | 1 | .622 | 7 | .337 | 8 | 0 | 1 | 0 | 1 | 0 | 1 |
| 1050 | | | min | 0 | 1 | .062 | 4 | .012 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 1051 | MP4A | 1 | max | 0 | 1 | 3.183 | 8 | .863 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 1052 | | | min | 0 | 1 | .093 | 3 | -2.272 | 6 | 0 | 1 | 0 | 1 | 0 | 1 |
| 1053 | | 2 | max | 192.582 | 7 | 165.529 | 4 | 398.047 | 1 | 0 | 1 | .489 | 1 | .197 | 3 |
| 1054 | | | min | 75.105 | 2 | -164.241 | 3 | -398.854 | 2 | 0 | 1 | -.491 | 2 | -.199 | 4 |
| 1055 | | 3 | max | 340.868 | 7 | 241.938 | 4 | 458.974 | 1 | 0 | 1 | 1.263 | 1 | .584 | 3 |
| 1056 | | | min | 170.61 | 2 | -240.65 | 3 | -459.78 | 2 | 0 | 1 | -1.266 | 2 | -.589 | 4 |
| 1057 | | 4 | max | -75.105 | 1 | 164.101 | 3 | 397.57 | 2 | 0 | 1 | .301 | 1 | .126 | 3 |
| 1058 | | | min | -192.582 | 6 | -164.729 | 4 | -397.177 | 1 | 0 | 1 | -.301 | 2 | -.127 | 4 |
| 1059 | | 5 | max | 0 | 1 | -.234 | 3 | 1.194 | 6 | 0 | 1 | 0 | 1 | 0 | 1 |
| 1060 | | | min | 0 | 1 | -1.832 | 8 | .007 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 1061 | MP3C | 1 | max | 38.416 | 5 | 86.455 | 4 | 59.352 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 1062 | | | min | 8.1 | 10 | -86.627 | 3 | -59.414 | 2 | 0 | 1 | 0 | 1 | 0 | 1 |
| 1063 | | 2 | max | 52.376 | 5 | 102.798 | 4 | 75.695 | 1 | 0 | 1 | .101 | 1 | .142 | 3 |
| 1064 | | | min | 14.347 | 10 | -102.97 | 3 | -75.757 | 2 | 0 | 1 | -.101 | 2 | -.142 | 4 |
| 1065 | | 3 | max | -20.595 | 11 | 119.248 | 3 | 92.059 | 2 | 0 | 1 | .108 | 1 | .136 | 3 |
| 1066 | | | min | -66.337 | 5 | -119.101 | 4 | -92.007 | 1 | 0 | 1 | -.108 | 2 | -.135 | 4 |
| 1067 | | 4 | max | -6.247 | 11 | 16.453 | 3 | 16.373 | 2 | 0 | 1 | .012 | 1 | .012 | 3 |
| 1068 | | | min | -13.96 | 5 | -16.307 | 4 | -16.321 | 1 | 0 | 1 | -.012 | 2 | -.012 | 4 |
| 1069 | | 5 | max | 0 | 1 | .545 | 7 | .198 | 8 | 0 | 1 | 0 | 1 | 0 | 1 |
| 1070 | | | min | 0 | 1 | .036 | 4 | .018 | 3 | 0 | 1 | 0 | 1 | 0 | 1 |
| 1071 | MP2C | 1 | max | 38.416 | 5 | 86.512 | 4 | 59.468 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 1072 | | | min | 8.1 | 3 | -86.535 | 3 | -59.296 | 2 | 0 | 1 | 0 | 1 | 0 | 1 |
| 1073 | | 2 | max | 52.376 | 5 | 102.854 | 4 | 75.81 | 1 | 0 | 1 | .101 | 1 | .142 | 3 |
| 1074 | | | min | 14.347 | 3 | -102.877 | 3 | -75.638 | 2 | 0 | 1 | -.101 | 2 | -.142 | 4 |
| 1075 | | 3 | max | -20.595 | 11 | 119.169 | 3 | 91.959 | 2 | 0 | 1 | .109 | 1 | .136 | 3 |
| 1076 | | | min | -66.337 | 5 | -119.149 | 4 | -92.105 | 1 | 0 | 1 | -.108 | 2 | -.136 | 4 |
| 1077 | | 4 | max | -6.247 | 11 | 16.375 | 3 | 16.273 | 2 | 0 | 1 | .012 | 1 | .012 | 3 |
| 1078 | | | min | -13.96 | 5 | -16.355 | 4 | -16.419 | 1 | 0 | 1 | -.012 | 2 | -.012 | 4 |
| 1079 | | 5 | max | 0 | 1 | .079 | 7 | -.048 | 4 | 0 | 1 | 0 | 1 | 0 | 1 |
| 1080 | | | min | 0 | 1 | -.012 | 4 | -.548 | 7 | 0 | 1 | 0 | 1 | 0 | 1 |
| 1081 | MP1C | 1 | max | 38.416 | 5 | 86.666 | 4 | 59.658 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 1082 | | | min | 8.1 | 1 | -86.646 | 3 | -59.223 | 2 | 0 | 1 | 0 | 1 | 0 | 1 |
| 1083 | | 2 | max | 85.352 | 5 | 129.521 | 4 | 85.951 | 1 | 0 | 1 | .107 | 1 | .155 | 3 |
| 1084 | | | min | 32.827 | 1 | -129.501 | 3 | -85.516 | 2 | 0 | 1 | -.106 | 2 | -.156 | 4 |
| 1085 | | 3 | max | -21.212 | 1 | 122.204 | 3 | 92.815 | 2 | 0 | 1 | .109 | 1 | .136 | 3 |
| 1086 | | | min | -68.349 | 5 | -122.213 | 4 | -93.006 | 1 | 0 | 1 | -.108 | 2 | -.136 | 4 |
| 1087 | | 4 | max | -6.247 | 1 | 16.382 | 3 | 16.257 | 2 | 0 | 1 | .012 | 1 | .012 | 3 |
| 1088 | | | min | -13.96 | 5 | -16.391 | 4 | -16.447 | 1 | 0 | 1 | -.012 | 2 | -.012 | 4 |
| 1089 | | 5 | max | 0 | 1 | .039 | 3 | -.069 | 4 | 0 | 1 | 0 | 1 | 0 | 1 |
| 1090 | | | min | 0 | 1 | -.048 | 4 | -.708 | 7 | 0 | 1 | 0 | 1 | 0 | 1 |
| 1091 | MP4C | 1 | max | 0 | 1 | .537 | 4 | .311 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 1092 | | | min | 0 | 1 | -3.499 | 7 | -1.898 | 6 | 0 | 1 | 0 | 1 | 0 | 1 |
| 1093 | | 2 | max | 192.582 | 6 | 339.509 | 4 | 222.858 | 1 | 0 | 1 | .27 | 1 | .418 | 3 |
| 1094 | | | min | 75.105 | 2 | -340.851 | 3 | -223.569 | 2 | 0 | 1 | -.271 | 2 | -.416 | 4 |
| 1095 | | 3 | max | 340.868 | 6 | 432.691 | 4 | 275.398 | 1 | 0 | 1 | .724 | 1 | 1.14 | 3 |
| 1096 | | | min | 170.61 | 2 | -434.033 | 3 | -276.109 | 2 | 0 | 1 | -.727 | 2 | -1.135 | 4 |
| 1097 | | 4 | max | -75.105 | 1 | 339.512 | 3 | 222.802 | 2 | 0 | 1 | .17 | 1 | .258 | 3 |
| 1098 | | | min | -192.582 | 7 | -338.859 | 4 | -222.456 | 1 | 0 | 1 | -.17 | 2 | -.257 | 4 |
| 1099 | | 5 | max | 0 | 1 | 1.955 | 7 | 1.034 | 6 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1100 | | | min | 0 | 1 | .113 | 4 | .091 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 1101 | MP3B | 1 | max | 38.416 | 5 | 86.54 | 4 | 59.48 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 1102 | | | min | 8.1 | 1 | -86.507 | 3 | -59.3 | 2 | 0 | 1 | 0 | 1 | 0 | 1 |
| 1103 | | 2 | max | 52.376 | 5 | 102.882 | 4 | 75.823 | 1 | 0 | 1 | .101 | 1 | .142 | 3 |
| 1104 | | | min | 14.347 | 1 | -102.85 | 3 | -75.643 | 2 | 0 | 1 | -.101 | 2 | -.142 | 4 |
| 1105 | | 3 | max | -20.595 | 1 | 119.145 | 3 | 91.962 | 2 | 0 | 1 | .109 | 1 | .136 | 3 |
| 1106 | | | min | -66.337 | 5 | -119.173 | 4 | -92.116 | 1 | 0 | 1 | -.108 | 2 | -.136 | 4 |
| 1107 | | 4 | max | -6.248 | 1 | 16.351 | 3 | 16.276 | 2 | 0 | 1 | .012 | 1 | .012 | 3 |
| 1108 | | | min | -13.96 | 5 | -16.379 | 4 | -16.43 | 1 | 0 | 1 | -.012 | 2 | -.012 | 4 |
| 1109 | | 5 | max | 0 | 1 | .008 | 3 | -.056 | 3 | 0 | 1 | 0 | 1 | 0 | 1 |
| 1110 | | | min | 0 | 1 | -.105 | 8 | -.566 | 8 | 0 | 1 | 0 | 1 | 0 | 1 |
| 1111 | MP2B | 1 | max | 38.416 | 5 | 86.598 | 4 | 59.355 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 1112 | | | min | 8.1 | 1 | -86.437 | 3 | -59.421 | 2 | 0 | 1 | 0 | 1 | 0 | 1 |
| 1113 | | 2 | max | 52.376 | 5 | 102.94 | 4 | 75.698 | 1 | 0 | 1 | .101 | 1 | .142 | 3 |
| 1114 | | | min | 14.347 | 1 | -102.78 | 3 | -75.764 | 2 | 0 | 1 | -.101 | 2 | -.142 | 4 |
| 1115 | | 3 | max | -20.595 | 3 | 119.086 | 3 | 92.066 | 2 | 0 | 1 | .108 | 1 | .135 | 3 |
| 1116 | | | min | -66.337 | 5 | -119.223 | 4 | -92.01 | 1 | 0 | 1 | -.108 | 2 | -.136 | 4 |
| 1117 | | 4 | max | -6.247 | 3 | 16.292 | 3 | 16.38 | 2 | 0 | 1 | .012 | 1 | .012 | 3 |
| 1118 | | | min | -13.96 | 5 | -16.428 | 4 | -16.323 | 1 | 0 | 1 | -.012 | 2 | -.012 | 4 |
| 1119 | | 5 | max | 0 | 1 | -.051 | 2 | .208 | 7 | 0 | 1 | 0 | 1 | 0 | 1 |
| 1120 | | | min | 0 | 1 | -.508 | 5 | .019 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 1121 | MP1B | 1 | max | 38.416 | 5 | 86.794 | 4 | 59.375 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 1122 | | | min | 8.1 | 1 | -86.428 | 3 | -59.611 | 2 | 0 | 1 | 0 | 1 | 0 | 1 |
| 1123 | | 2 | max | 85.352 | 5 | 129.649 | 4 | 85.668 | 1 | 0 | 1 | .106 | 1 | .155 | 3 |
| 1124 | | | min | 32.827 | 1 | -129.283 | 3 | -85.903 | 2 | 0 | 1 | -.107 | 2 | -.156 | 4 |
| 1125 | | 3 | max | -21.212 | 1 | 122.109 | 3 | 92.985 | 2 | 0 | 1 | .108 | 1 | .135 | 3 |
| 1126 | | | min | -68.349 | 5 | -122.269 | 4 | -92.882 | 1 | 0 | 1 | -.109 | 2 | -.136 | 4 |
| 1127 | | 4 | max | -6.247 | 1 | 16.286 | 3 | 16.426 | 2 | 0 | 1 | .012 | 1 | .012 | 3 |
| 1128 | | | min | -13.96 | 5 | -16.446 | 4 | -16.323 | 1 | 0 | 1 | -.012 | 2 | -.012 | 4 |
| 1129 | | 5 | max | 0 | 1 | -.054 | 2 | .384 | 6 | 0 | 1 | 0 | 1 | 0 | 1 |
| 1130 | | | min | 0 | 1 | -.602 | 5 | .02 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 1131 | MP4B | 1 | max | 0 | 1 | 1.121 | 4 | 3.741 | 5 | 0 | 1 | 0 | 1 | 0 | 1 |
| 1132 | | | min | 0 | 1 | -1.067 | 3 | .071 | 2 | 0 | 1 | 0 | 1 | 0 | 1 |
| 1133 | | 2 | max | 192.582 | 8 | 340.093 | 4 | 223.996 | 1 | 0 | 1 | .272 | 1 | .417 | 3 |
| 1134 | | | min | 75.105 | 1 | -340.04 | 3 | -222.476 | 2 | 0 | 1 | -.269 | 2 | -.417 | 4 |
| 1135 | | 3 | max | 340.868 | 8 | 433.275 | 4 | 276.536 | 1 | 0 | 1 | .728 | 1 | 1.137 | 3 |
| 1136 | | | min | 170.61 | 1 | -433.222 | 3 | -275.016 | 2 | 0 | 1 | -.723 | 2 | -1.138 | 4 |
| 1137 | | 4 | max | -75.105 | 1 | 339.117 | 3 | 222.27 | 2 | 0 | 1 | .171 | 1 | .257 | 3 |
| 1138 | | | min | -192.582 | 7 | -339.143 | 4 | -223.01 | 1 | 0 | 1 | -.169 | 2 | -.257 | 4 |
| 1139 | | 5 | max | 0 | 1 | .145 | 3 | -.277 | 2 | 0 | 1 | 0 | 1 | 0 | 1 |
| 1140 | | | min | 0 | 1 | -.171 | 4 | -2.151 | 5 | 0 | 1 | 0 | 1 | 0 | 1 |
| 1141 | M115 | 1 | max | -713.67 | 1 | -1024.66 | 1 | 973.925 | 9 | .299 | 8 | -.083 | 3 | .125 | 6 |
| 1142 | | | min | -1952.315 | 8 | -2754.368 | 8 | -1113.403 | 10 | .113 | 3 | -.221 | 8 | .037 | 1 |
| 1143 | | 2 | max | -713.67 | 1 | -1024.66 | 1 | 973.925 | 9 | .299 | 8 | -.046 | 9 | .268 | 6 |
| 1144 | | | min | -1952.315 | 8 | -2754.368 | 8 | -1113.403 | 10 | .113 | 3 | -.232 | 10 | .091 | 1 |
| 1145 | | 3 | max | -713.67 | 1 | -1024.66 | 1 | 973.925 | 9 | .299 | 8 | .004 | 9 | .411 | 6 |
| 1146 | | | min | -1952.315 | 8 | -2754.368 | 8 | -1113.403 | 10 | .113 | 3 | -.29 | 10 | .144 | 1 |
| 1147 | | 4 | max | -713.67 | 1 | -1024.66 | 1 | 973.925 | 9 | .299 | 8 | .055 | 9 | .554 | 6 |
| 1148 | | | min | -1952.315 | 8 | -2754.368 | 8 | -1113.403 | 10 | .113 | 3 | -.348 | 10 | .197 | 1 |
| 1149 | | 5 | max | -713.67 | 1 | -1024.66 | 1 | 973.925 | 9 | .299 | 8 | .106 | 9 | .697 | 6 |
| 1150 | | | min | -1952.315 | 8 | -2754.368 | 8 | -1113.403 | 10 | .113 | 3 | -.406 | 10 | .251 | 1 |
| 1151 | M116 | 1 | max | 1931.911 | 6 | 2691.475 | 6 | 1152.983 | 10 | .279 | 6 | .105 | 9 | .694 | 6 |

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1152 | | | min | 523.986 | 1 | 743.233 | 1 | -921.866 | 9 | .065 | 1 | -.396 | 10 | .202 | 1 |
| 1153 | | 2 | max | 1931.911 | 6 | 2691.475 | 6 | 1152.983 | 10 | .279 | 6 | .057 | 9 | .554 | 6 |
| 1154 | | | min | 523.986 | 1 | 743.233 | 1 | -921.866 | 9 | .065 | 1 | -.336 | 10 | .163 | 1 |
| 1155 | | 3 | max | 1931.911 | 6 | 2691.475 | 6 | 1152.983 | 10 | .279 | 6 | .009 | 9 | .414 | 6 |
| 1156 | | | min | 523.986 | 1 | 743.233 | 1 | -921.866 | 9 | .065 | 1 | -.276 | 10 | .124 | 1 |
| 1157 | | 4 | max | 1931.911 | 6 | 2691.475 | 6 | 1152.983 | 10 | .279 | 6 | -.039 | 9 | .274 | 6 |
| 1158 | | | min | 523.986 | 1 | 743.233 | 1 | -921.866 | 9 | .065 | 1 | -.216 | 10 | .085 | 1 |
| 1159 | | 5 | max | 1931.911 | 6 | 2691.475 | 6 | 1152.983 | 10 | .279 | 6 | -.049 | 1 | .133 | 6 |
| 1160 | | | min | 523.986 | 1 | 743.233 | 1 | -921.866 | 9 | .065 | 1 | -.206 | 6 | .047 | 1 |
| 1161 | M117 | 1 | max | -681.825 | 4 | -925.918 | 4 | 719.931 | 9 | -.097 | 4 | .222 | 7 | .125 | 6 |
| 1162 | | | min | -1959.623 | 7 | -2758.368 | 7 | -1453.251 | 10 | -.301 | 7 | .071 | 4 | .038 | 1 |
| 1163 | | 2 | max | -681.825 | 4 | -925.918 | 4 | 719.931 | 9 | -.097 | 4 | .221 | 7 | .267 | 6 |
| 1164 | | | min | -1959.623 | 7 | -2758.368 | 7 | -1453.251 | 10 | -.301 | 7 | .073 | 1 | .09 | 1 |
| 1165 | | 3 | max | -681.825 | 4 | -925.918 | 4 | 719.931 | 9 | -.097 | 4 | .221 | 6 | .41 | 6 |
| 1166 | | | min | -1959.623 | 7 | -2758.368 | 7 | -1453.251 | 10 | -.301 | 7 | .02 | 10 | .142 | 1 |
| 1167 | | 4 | max | -681.825 | 4 | -925.918 | 4 | 719.931 | 9 | -.097 | 4 | .222 | 6 | .553 | 6 |
| 1168 | | | min | -1959.623 | 7 | -2758.368 | 7 | -1453.251 | 10 | -.301 | 7 | -.055 | 10 | .193 | 1 |
| 1169 | | 5 | max | -681.825 | 4 | -925.918 | 4 | 719.931 | 9 | -.097 | 4 | .251 | 9 | .696 | 7 |
| 1170 | | | min | -1959.623 | 7 | -2758.368 | 7 | -1453.251 | 10 | -.301 | 7 | -.131 | 10 | .245 | 1 |
| 1171 | M118 | 1 | max | 1914.935 | 6 | 2685.324 | 6 | 1388.876 | 10 | -.069 | 1 | .244 | 9 | .693 | 6 |
| 1172 | | | min | 571.499 | 1 | 764.521 | 1 | -753.795 | 9 | -.279 | 6 | -.13 | 10 | .204 | 1 |
| 1173 | | 2 | max | 1914.935 | 6 | 2685.324 | 6 | 1388.876 | 10 | -.069 | 1 | .216 | 6 | .554 | 6 |
| 1174 | | | min | 571.499 | 1 | 764.521 | 1 | -753.795 | 9 | -.279 | 6 | -.057 | 10 | .165 | 1 |
| 1175 | | 3 | max | 1914.935 | 6 | 2685.324 | 6 | 1388.876 | 10 | -.069 | 1 | .212 | 6 | .414 | 6 |
| 1176 | | | min | 571.499 | 1 | 764.521 | 1 | -753.795 | 9 | -.279 | 6 | .015 | 10 | .125 | 1 |
| 1177 | | 4 | max | 1914.935 | 6 | 2685.324 | 6 | 1388.876 | 10 | -.069 | 1 | .209 | 6 | .274 | 6 |
| 1178 | | | min | 571.499 | 1 | 764.521 | 1 | -753.795 | 9 | -.279 | 6 | .045 | 1 | .085 | 1 |
| 1179 | | 5 | max | 1914.935 | 6 | 2685.324 | 6 | 1388.876 | 10 | -.069 | 1 | .205 | 6 | .134 | 6 |
| 1180 | | | min | 571.499 | 1 | 764.521 | 1 | -753.795 | 9 | -.279 | 6 | .052 | 1 | .045 | 1 |
| 1181 | M119 | 1 | max | -639.879 | 4 | -922.242 | 4 | 1092.39 | 10 | .3 | 6 | -.077 | 1 | .124 | 7 |
| 1182 | | | min | -1965.096 | 7 | -2766.078 | 7 | -2.075 | 9 | .105 | 1 | -.222 | 6 | .04 | 4 |
| 1183 | | 2 | max | -639.879 | 4 | -922.242 | 4 | 1092.39 | 10 | .3 | 6 | -.066 | 1 | .268 | 7 |
| 1184 | | | min | -1965.096 | 7 | -2766.078 | 7 | -2.075 | 9 | .105 | 1 | -.202 | 6 | .088 | 4 |
| 1185 | | 3 | max | -639.879 | 4 | -922.242 | 4 | 1092.39 | 10 | .3 | 6 | -.055 | 10 | .412 | 7 |
| 1186 | | | min | -1965.096 | 7 | -2766.078 | 7 | -2.075 | 9 | .105 | 1 | -.183 | 6 | .136 | 4 |
| 1187 | | 4 | max | -639.879 | 4 | -922.242 | 4 | 1092.39 | 10 | .3 | 6 | .002 | 10 | .557 | 7 |
| 1188 | | | min | -1965.096 | 7 | -2766.078 | 7 | -2.075 | 9 | .105 | 1 | -.163 | 6 | .184 | 4 |
| 1189 | | 5 | max | -639.879 | 4 | -922.242 | 4 | 1092.39 | 10 | .3 | 6 | .059 | 10 | .701 | 7 |
| 1190 | | | min | -1965.096 | 7 | -2766.078 | 7 | -2.075 | 9 | .105 | 1 | -.144 | 6 | .232 | 4 |
| 1191 | M120 | 1 | max | 1924.803 | 5 | 2684.454 | 7 | 18.74 | 9 | .278 | 7 | .059 | 10 | .694 | 7 |
| 1192 | | | min | 603.01 | 2 | 774.693 | 4 | -1044.357 | 10 | .072 | 4 | -.138 | 6 | .204 | 4 |
| 1193 | | 2 | max | 1924.803 | 5 | 2684.454 | 7 | 18.74 | 9 | .278 | 7 | .005 | 10 | .554 | 7 |
| 1194 | | | min | 603.01 | 2 | 774.693 | 4 | -1044.357 | 10 | .072 | 4 | -.153 | 6 | .163 | 4 |
| 1195 | | 3 | max | 1924.803 | 5 | 2684.454 | 7 | 18.74 | 9 | .278 | 7 | -.05 | 10 | .414 | 7 |
| 1196 | | | min | 603.01 | 2 | 774.693 | 4 | -1044.357 | 10 | .072 | 4 | -.169 | 7 | .123 | 4 |
| 1197 | | 4 | max | 1924.803 | 5 | 2684.454 | 7 | 18.74 | 9 | .278 | 7 | -.055 | 4 | .274 | 7 |
| 1198 | | | min | 603.01 | 2 | 774.693 | 4 | -1044.357 | 10 | .072 | 4 | -.187 | 7 | .083 | 4 |
| 1199 | | 5 | max | 1924.803 | 5 | 2684.454 | 7 | 18.74 | 9 | .278 | 7 | -.054 | 4 | .134 | 7 |
| 1200 | | | min | 603.01 | 2 | 774.693 | 4 | -1044.357 | 10 | .072 | 4 | -.205 | 7 | .042 | 4 |
| 1201 | M121 | 1 | max | -739.403 | 2 | -1031.45 | 2 | 801.293 | 10 | -.114 | 2 | .22 | 5 | .125 | 7 |
| 1202 | | | min | -1951.263 | 5 | -2741.414 | 5 | -190.021 | 9 | -.298 | 5 | .084 | 2 | .036 | 4 |
| 1203 | | 2 | max | -739.403 | 2 | -1031.45 | 2 | 801.293 | 10 | -.114 | 2 | .219 | 5 | .267 | 7 |

## *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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1204 | | | min | -1951.263 | 5 | -2741.414 | 5 | -190.021 | 9 | -.298 | 5 | .082 | 2 | .092 | 4 |
| 1205 | | 3 | max | -739.403 | 2 | -1031.45 | 2 | 801.293 | 10 | -.114 | 2 | .254 | 10 | .409 | 7 |
| 1206 | | | min | -1951.263 | 5 | -2741.414 | 5 | -190.021 | 9 | -.298 | 5 | .074 | 9 | .149 | 4 |
| 1207 | | 4 | max | -739.403 | 2 | -1031.45 | 2 | 801.293 | 10 | -.114 | 2 | .295 | 10 | .551 | 7 |
| 1208 | | | min | -1951.263 | 5 | -2741.414 | 5 | -190.021 | 9 | -.298 | 5 | .064 | 9 | .206 | 4 |
| 1209 | | 5 | max | -739.403 | 2 | -1031.45 | 2 | 801.293 | 10 | -.114 | 2 | .337 | 10 | .693 | 5 |
| 1210 | | | min | -1951.263 | 5 | -2741.414 | 5 | -190.021 | 9 | -.298 | 5 | .054 | 9 | .263 | 4 |
| 1211 | M122 | 1 | max | 1941.447 | 7 | 2699.839 | 7 | 150.756 | 9 | -.059 | 4 | .327 | 10 | .696 | 7 |
| 1212 | | | min | 439.958 | 4 | 704.695 | 4 | -831.608 | 10 | -.281 | 7 | .053 | 9 | .195 | 4 |
| 1213 | | 2 | max | 1941.447 | 7 | 2699.839 | 7 | 150.756 | 9 | -.059 | 4 | .284 | 10 | .555 | 7 |
| 1214 | | | min | 439.958 | 4 | 704.695 | 4 | -831.608 | 10 | -.281 | 7 | .054 | 4 | .158 | 4 |
| 1215 | | 3 | max | 1941.447 | 7 | 2699.839 | 7 | 150.756 | 9 | -.059 | 4 | .24 | 10 | .415 | 7 |
| 1216 | | | min | 439.958 | 4 | 704.695 | 4 | -831.608 | 10 | -.281 | 7 | .051 | 4 | .121 | 4 |
| 1217 | | 4 | max | 1941.447 | 7 | 2699.839 | 7 | 150.756 | 9 | -.059 | 4 | .209 | 7 | .274 | 7 |
| 1218 | | | min | 439.958 | 4 | 704.695 | 4 | -831.608 | 10 | -.281 | 7 | .048 | 4 | .085 | 4 |
| 1219 | | 5 | max | 1941.447 | 7 | 2699.839 | 7 | 150.756 | 9 | -.059 | 4 | .207 | 7 | .133 | 7 |
| 1220 | | | min | 439.958 | 4 | 704.695 | 4 | -831.608 | 10 | -.281 | 7 | .044 | 4 | .048 | 4 |
| 1221 | M123 | 1 | max | -729.374 | 2 | -1037.849 | 2 | 406.112 | 8 | .299 | 7 | -.082 | 4 | .124 | 8 |
| 1222 | | | min | -1954.8 | 5 | -2752.058 | 5 | 37.751 | 3 | .112 | 4 | -.221 | 7 | .041 | 3 |
| 1223 | | 2 | max | -729.374 | 2 | -1037.849 | 2 | 406.112 | 8 | .299 | 7 | -.064 | 4 | .266 | 8 |
| 1224 | | | min | -1954.8 | 5 | -2752.058 | 5 | 37.751 | 3 | .112 | 4 | -.202 | 7 | .104 | 3 |
| 1225 | | 3 | max | -729.374 | 2 | -1037.849 | 2 | 406.112 | 8 | .299 | 7 | -.046 | 4 | .409 | 5 |
| 1226 | | | min | -1954.8 | 5 | -2752.058 | 5 | 37.751 | 3 | .112 | 4 | -.184 | 7 | .159 | 2 |
| 1227 | | 4 | max | -729.374 | 2 | -1037.849 | 2 | 406.112 | 8 | .299 | 7 | -.029 | 4 | .552 | 5 |
| 1228 | | | min | -1954.8 | 5 | -2752.058 | 5 | 37.751 | 3 | .112 | 4 | -.165 | 7 | .213 | 2 |
| 1229 | | 5 | max | -729.374 | 2 | -1037.849 | 2 | 406.112 | 8 | .299 | 7 | -.011 | 4 | .696 | 5 |
| 1230 | | | min | -1954.8 | 5 | -2752.058 | 5 | 37.751 | 3 | .112 | 4 | -.147 | 7 | .267 | 2 |
| 1231 | M124 | 1 | max | 1940.847 | 8 | 2684.8 | 8 | 174.372 | 3 | .279 | 8 | -.009 | 4 | .691 | 8 |
| 1232 | | | min | 507.141 | 3 | 821.826 | 3 | -499.596 | 4 | .073 | 3 | -.142 | 7 | .225 | 3 |
| 1233 | | 2 | max | 1940.847 | 8 | 2684.8 | 8 | 174.372 | 3 | .279 | 8 | -.035 | 4 | .552 | 8 |
| 1234 | | | min | 507.141 | 3 | 821.826 | 3 | -499.596 | 4 | .073 | 3 | -.155 | 7 | .183 | 3 |
| 1235 | | 3 | max | 1940.847 | 8 | 2684.8 | 8 | 174.372 | 3 | .279 | 8 | -.057 | 2 | .412 | 8 |
| 1236 | | | min | 507.141 | 3 | 821.826 | 3 | -499.596 | 4 | .073 | 3 | -.169 | 5 | .14 | 3 |
| 1237 | | 4 | max | 1940.847 | 8 | 2684.8 | 8 | 174.372 | 3 | .279 | 8 | -.063 | 3 | .272 | 8 |
| 1238 | | | min | 507.141 | 3 | 821.826 | 3 | -499.596 | 4 | .073 | 3 | -.186 | 8 | .097 | 3 |
| 1239 | | 5 | max | 1940.847 | 8 | 2684.8 | 8 | 174.372 | 3 | .279 | 8 | -.054 | 3 | .133 | 5 |
| 1240 | | | min | 507.141 | 3 | 821.826 | 3 | -499.596 | 4 | .073 | 3 | -.205 | 8 | .049 | 2 |
| 1241 | M125 | 1 | max | -702.926 | 1 | -973.212 | 1 | 185.07 | 4 | -.1 | 1 | .222 | 6 | .124 | 5 |
| 1242 | | | min | -1957.751 | 6 | -2752.692 | 6 | -186.406 | 3 | -.301 | 6 | .073 | 1 | .044 | 2 |
| 1243 | | 2 | max | -702.926 | 1 | -973.212 | 1 | 185.07 | 4 | -.1 | 1 | .22 | 6 | .266 | 8 |
| 1244 | | | min | -1957.751 | 6 | -2752.692 | 6 | -186.406 | 3 | -.301 | 6 | .076 | 1 | .098 | 3 |
| 1245 | | 3 | max | -702.926 | 1 | -973.212 | 1 | 185.07 | 4 | -.1 | 1 | .22 | 8 | .409 | 8 |
| 1246 | | | min | -1957.751 | 6 | -2752.692 | 6 | -186.406 | 3 | -.301 | 6 | .067 | 3 | .151 | 3 |
| 1247 | | 4 | max | -702.926 | 1 | -973.212 | 1 | 185.07 | 4 | -.1 | 1 | .221 | 8 | .552 | 8 |
| 1248 | | | min | -1957.751 | 6 | -2752.692 | 6 | -186.406 | 3 | -.301 | 6 | .057 | 3 | .204 | 3 |
| 1249 | | 5 | max | -702.926 | 1 | -973.212 | 1 | 185.07 | 4 | -.1 | 1 | .221 | 8 | .695 | 8 |
| 1250 | | | min | -1957.751 | 6 | -2752.692 | 6 | -186.406 | 3 | -.301 | 6 | .048 | 3 | .256 | 3 |
| 1251 | M126 | 1 | max | 1927.416 | 5 | 2672.261 | 5 | 155.364 | 1 | -.078 | 2 | .219 | 8 | .689 | 5 |
| 1252 | | | min | 535.966 | 2 | 884.655 | 2 | -202.618 | 4 | -.278 | 5 | .035 | 3 | .237 | 3 |
| 1253 | | 2 | max | 1927.416 | 5 | 2672.261 | 5 | 155.364 | 1 | -.078 | 2 | .215 | 8 | .55 | 8 |
| 1254 | | | min | 535.966 | 2 | 884.655 | 2 | -202.618 | 4 | -.278 | 5 | .043 | 3 | .19 | 3 |
| 1255 | | 3 | max | 1927.416 | 5 | 2672.261 | 5 | 155.364 | 1 | -.078 | 2 | .211 | 8 | .411 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1256 | | | min | 535.966 | 2 | 884.655 | 2 | -202.618 | 4 | -.278 | 5 | .051 | 3 | .142 | 3 |
| 1257 | | 4 | max | 1927.416 | 5 | 2672.261 | 5 | 155.364 | 1 | -.078 | 2 | .207 | 8 | .272 | 8 |
| 1258 | | | min | 535.966 | 2 | 884.655 | 2 | -202.618 | 4 | -.278 | 5 | .059 | 3 | .095 | 3 |
| 1259 | | 5 | max | 1927.416 | 5 | 2672.261 | 5 | 155.364 | 1 | -.078 | 2 | .205 | 5 | .134 | 8 |
| 1260 | | | min | 535.966 | 2 | 884.655 | 2 | -202.618 | 4 | -.278 | 5 | .058 | 2 | .047 | 3 |

## Envelope Joint Displacements

| | Joint | | X [in] | LC | Y [in] | LC | Z [in] | LC | X Rotation [... | LC | Y Rotation [... | LC | Z Rotation [... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | N1 | max | .005 | 10 | -.245 | 3 | .126 | 2 | 1.23e-02 | 2 | 3.831e-03 | 2 | 1.774e-02 | 8 |
| 2 | | min | -.004 | 4 | -.862 | 8 | -.129 | 1 | -2.981e-03 | 1 | -3.929e-03 | 1 | 4.205e-03 | 3 |
| 3 | N2 | max | .005 | 3 | -.227 | 4 | .055 | 2 | 1.192e-02 | 10 | 1.133e-03 | 1 | -3.932e-03 | 4 |
| 4 | | min | -.005 | 4 | -.897 | 10 | -.056 | 1 | -6.109e-04 | 1 | -1.052e-03 | 2 | -1.716e-02 | 10 |
| 5 | CG | max | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 6 | | min | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 7 | N4 | max | .005 | 10 | -.161 | 1 | .075 | 2 | 1.172e-02 | 6 | 3.018e-03 | 2 | 1.708e-02 | 8 |
| 8 | | min | -.004 | 4 | -.619 | 6 | -.076 | 1 | -1.858e-03 | 1 | -3.116e-03 | 1 | 4.549e-03 | 3 |
| 9 | N5 | max | .005 | 10 | .014 | 1 | .015 | 2 | 1.079e-02 | 6 | 6.474e-04 | 2 | 1.054e-02 | 6 |
| 10 | | min | -.004 | 1 | -.148 | 9 | -.014 | 1 | 2.374e-04 | 1 | -4.665e-04 | 1 | 3.334e-03 | 1 |
| 11 | N6 | max | .004 | 10 | .008 | 1 | .011 | 2 | 1.045e-02 | 10 | 2.513e-04 | 3 | -3.277e-03 | 4 |
| 12 | | min | -.005 | 4 | -.141 | 10 | -.01 | 1 | 7.159e-04 | 1 | -4.447e-04 | 4 | -1.071e-02 | 10 |
| 13 | N7 | max | .005 | 3 | -.17 | 1 | .04 | 2 | 1.191e-02 | 10 | 1.069e-03 | 1 | -3.95e-03 | 4 |
| 14 | | min | -.005 | 4 | -.656 | 10 | -.04 | 1 | -5.229e-04 | 1 | -1.003e-03 | 4 | -1.699e-02 | 10 |
| 15 | N8 | max | .073 | 3 | -.182 | 4 | .033 | 2 | 1.123e-02 | 10 | 2.606e-03 | 3 | 1.335e-05 | 4 |
| 16 | | min | -.075 | 4 | -.872 | 7 | -.033 | 1 | 3.785e-04 | 1 | -2.702e-03 | 4 | -1.911e-02 | 7 |
| 17 | N9 | max | .097 | 3 | -.237 | 2 | .04 | 4 | -5.589e-03 | 4 | 2.03e-03 | 4 | 5.279e-03 | 4 |
| 18 | | min | -.097 | 4 | -.829 | 5 | -.039 | 3 | -1.818e-02 | 7 | -1.961e-03 | 3 | -4.566e-03 | 3 |
| 19 | N11 | max | .042 | 3 | -.124 | 4 | .022 | 2 | 1.106e-02 | 10 | 1.971e-03 | 3 | -9.579e-04 | 4 |
| 20 | | min | -.043 | 4 | -.626 | 7 | -.023 | 1 | 8.123e-04 | 1 | -2.066e-03 | 4 | -1.864e-02 | 7 |
| 21 | N12 | max | .013 | 3 | .015 | 4 | .008 | 3 | 4.848e-03 | 10 | 3.188e-04 | 1 | -1.804e-03 | 4 |
| 22 | | min | -.012 | 4 | -.12 | 7 | -.008 | 4 | 4.751e-04 | 1 | -1.306e-04 | 2 | -1.464e-02 | 7 |
| 23 | N13 | max | .021 | 3 | .003 | 4 | .008 | 2 | -3.611e-03 | 4 | 7.286e-04 | 4 | 1.554e-03 | 4 |
| 24 | | min | -.02 | 4 | -.116 | 7 | -.008 | 1 | -1.399e-02 | 7 | -9.199e-04 | 3 | -4.308e-03 | 3 |
| 25 | N14 | max | .073 | 3 | -.169 | 2 | .026 | 4 | -5.575e-03 | 4 | 1.976e-03 | 4 | 5.177e-03 | 4 |
| 26 | | min | -.073 | 4 | -.603 | 5 | -.026 | 3 | -1.814e-02 | 7 | -1.906e-03 | 3 | -4.482e-03 | 3 |
| 27 | N15 | max | .114 | 3 | -.228 | 2 | .05 | 3 | -4.789e-03 | 2 | 3.41e-03 | 4 | 6.759e-03 | 4 |
| 28 | | min | -.113 | 4 | -.864 | 5 | -.049 | 4 | -2.085e-02 | 5 | -3.489e-03 | 3 | -6.139e-03 | 3 |
| 29 | N16 | max | .075 | 2 | -.225 | 3 | .06 | 2 | 1.016e-02 | 6 | 1.904e-03 | 2 | 1.566e-02 | 8 |
| 30 | | min | -.075 | 1 | -.832 | 8 | -.061 | 1 | 4.183e-04 | 1 | -1.847e-03 | 1 | 3.117e-03 | 3 |
| 31 | N18 | max | .073 | 3 | -.163 | 2 | .026 | 3 | -5.221e-03 | 2 | 2.773e-03 | 4 | 5.785e-03 | 4 |
| 32 | | min | -.073 | 4 | -.619 | 5 | -.026 | 4 | -2.026e-02 | 5 | -2.855e-03 | 3 | -4.926e-03 | 3 |
| 33 | N19 | max | .02 | 3 | 0 | 3 | .013 | 2 | -4.191e-03 | 3 | 7.227e-04 | 4 | 4.417e-03 | 4 |
| 34 | | min | -.02 | 4 | -.117 | 8 | -.013 | 1 | -1.433e-02 | 8 | -5.383e-04 | 3 | -1.243e-03 | 3 |
| 35 | N20 | max | .012 | 3 | .008 | 3 | .017 | 2 | 4.355e-03 | 6 | 6.918e-04 | 2 | 1.383e-02 | 8 |
| 36 | | min | -.013 | 4 | -.117 | 8 | -.017 | 1 | 2.877e-04 | 1 | -8.874e-04 | 1 | 2.948e-03 | 3 |
| 37 | N21 | max | .052 | 2 | -.153 | 3 | .047 | 2 | 1.012e-02 | 6 | 1.883e-03 | 2 | 1.562e-02 | 8 |
| 38 | | min | -.052 | 1 | -.607 | 8 | -.048 | 1 | 4.42e-04 | 1 | -1.826e-03 | 1 | 3.2e-03 | 3 |
| 39 | N22 | max | .005 | 3 | -.175 | 3 | .076 | 2 | 1.096e-02 | 6 | 2.488e-03 | 1 | 1.614e-02 | 8 |
| 40 | | min | -.005 | 4 | -.613 | 8 | -.077 | 1 | -8.17e-04 | 1 | -2.209e-03 | 2 | 4.115e-03 | 3 |
| 41 | N23 | max | .005 | 10 | .008 | 1 | .016 | 2 | 1.162e-02 | 6 | 1.52e-03 | 2 | 1.252e-02 | 8 |
| 42 | | min | -.005 | 4 | -.127 | 9 | -.015 | 1 | 1.49e-03 | 1 | -1.901e-03 | 1 | 3.842e-03 | 3 |

## Envelope Joint Displacements (Continued)

| | Joint | | X [in] | LC | Y [in] | LC | Z [in] | LC | X Rotation [... | LC | Y Rotation [... | LC | Z Rotation [... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 43 | N24 | max | .005 | 3 | -.159 | 4 | .04 | 2 | 1.162e-02 | 10 | 1.712e-03 | 4 | -2.839e-03 | 4 |
| 44 | | min | -.005 | 4 | -.648 | 10 | -.04 | 1 | -6.738e-05 | 1 | -1.983e-03 | 3 | -1.623e-02 | 10 |
| 45 | N25 | max | .005 | 3 | .003 | 1 | .011 | 2 | 1.175e-02 | 10 | 1.45e-03 | 3 | -3.293e-03 | 4 |
| 46 | | min | -.005 | 4 | -.123 | 10 | -.01 | 1 | 1.756e-03 | 1 | -1.107e-03 | 4 | -1.267e-02 | 10 |
| 47 | N25A | max | .044 | 3 | -.139 | 4 | .022 | 2 | 1.09e-02 | 10 | 2.032e-03 | 4 | -2.448e-03 | 4 |
| 48 | | min | -.044 | 4 | -.634 | 10 | -.022 | 1 | 1.932e-04 | 1 | -1.759e-03 | 3 | -1.735e-02 | 7 |
| 49 | N26 | max | .014 | 3 | .011 | 4 | .008 | 3 | 5.887e-03 | 10 | 8.781e-04 | 1 | -3.123e-03 | 4 |
| 50 | | min | -.013 | 4 | -.102 | 10 | -.009 | 4 | 6.807e-04 | 1 | -1.241e-03 | 2 | -1.633e-02 | 7 |
| 51 | N27 | max | .073 | 3 | -.168 | 2 | .027 | 4 | -5.515e-03 | 2 | 1.905e-03 | 3 | 5.356e-03 | 4 |
| 52 | | min | -.073 | 4 | -.607 | 5 | -.027 | 3 | -1.781e-02 | 5 | -2.18e-03 | 4 | -4.566e-03 | 3 |
| 53 | N28 | max | .021 | 3 | -.003 | 4 | .008 | 2 | -5.123e-03 | 2 | 1.927e-03 | 4 | 1.131e-03 | 4 |
| 54 | | min | -.02 | 4 | -.098 | 7 | -.009 | 1 | -1.614e-02 | 5 | -1.581e-03 | 3 | -3.967e-03 | 3 |
| 55 | N30 | max | .073 | 3 | -.165 | 2 | .029 | 3 | -5.639e-03 | 2 | 2.29e-03 | 3 | 5.698e-03 | 4 |
| 56 | | min | -.073 | 4 | -.614 | 5 | -.029 | 4 | -1.901e-02 | 5 | -2.022e-03 | 4 | -4.811e-03 | 3 |
| 57 | N31 | max | .02 | 3 | -.004 | 3 | .013 | 2 | -5.026e-03 | 2 | 1.674e-03 | 4 | 4.018e-03 | 4 |
| 58 | | min | -.02 | 4 | -.099 | 8 | -.014 | 1 | -1.647e-02 | 5 | -2.046e-03 | 3 | -9.284e-04 | 3 |
| 59 | N32 | max | .053 | 2 | -.162 | 3 | .047 | 2 | 1.024e-02 | 6 | 2.062e-03 | 1 | 1.518e-02 | 8 |
| 60 | | min | -.053 | 1 | -.609 | 8 | -.047 | 1 | -5.347e-04 | 1 | -2.327e-03 | 2 | 3.685e-03 | 3 |
| 61 | N33 | max | .011 | 3 | .006 | 3 | .017 | 2 | 5.473e-03 | 6 | 2.044e-03 | 2 | 1.579e-02 | 8 |
| 62 | | min | -.012 | 4 | -.1 | 8 | -.017 | 1 | 3.911e-04 | 1 | -1.706e-03 | 1 | 3.919e-03 | 3 |
| 63 | N34 | max | .005 | 10 | .073 | 5 | .011 | 2 | 1.017e-02 | 6 | 4.08e-04 | 5 | 3.824e-03 | 8 |
| 64 | | min | -.004 | 1 | -.037 | 9 | -.019 | 1 | 3.981e-04 | 1 | -1.201e-05 | 2 | 1.083e-03 | 1 |
| 65 | N86 | max | 0 | 3 | 0 | 10 | 0 | 2 | 0 | 2 | 0 | 4 | 0 | 4 |
| 66 | | min | 0 | 4 | 0 | 5 | 0 | 1 | 0 | 5 | 0 | 3 | 0 | 3 |
| 67 | N89 | max | .004 | 10 | .005 | 1 | .015 | 2 | 8.828e-03 | 6 | 8.726e-04 | 1 | 8.245e-03 | 8 |
| 68 | | min | -.005 | 1 | -.108 | 9 | -.013 | 1 | 6.993e-04 | 1 | -3.017e-04 | 2 | 2.306e-03 | 3 |
| 69 | N93 | max | .007 | 10 | 0 | 1 | .011 | 2 | 9.222e-03 | 10 | 1.683e-04 | 2 | -1.984e-03 | 4 |
| 70 | | min | -.002 | 4 | -.108 | 10 | -.008 | 1 | 1.027e-03 | 1 | -7.358e-04 | 1 | -8.556e-03 | 10 |
| 71 | N92A | max | .02 | 3 | .004 | 2 | .003 | 2 | 4.313e-04 | 2 | 2.699e-04 | 4 | 1.34e-03 | 4 |
| 72 | | min | -.02 | 4 | -.054 | 5 | -.01 | 1 | -2.509e-03 | 5 | -2.674e-04 | 3 | -1.366e-03 | 3 |
| 73 | N93A | max | .018 | 3 | .001 | 2 | .003 | 2 | 4.103e-04 | 2 | 4.17e-04 | 4 | 1.351e-03 | 4 |
| 74 | | min | -.018 | 4 | -.036 | 5 | -.01 | 1 | -2.464e-03 | 5 | -4.148e-04 | 3 | -1.373e-03 | 3 |
| 75 | N117 | max | .002 | 3 | 0 | 3 | .015 | 2 | 2.192e-03 | 9 | 2.739e-04 | 2 | 2.202e-03 | 4 |
| 76 | | min | -.009 | 4 | -.036 | 8 | -.012 | 1 | -8.066e-04 | 1 | -2.711e-04 | 1 | -4.659e-04 | 3 |
| 77 | N119 | max | .002 | 2 | .003 | 1 | .015 | 2 | 2.551e-03 | 9 | 0 | 1 | 5.687e-03 | 8 |
| 78 | | min | -.008 | 1 | -.038 | 9 | -.013 | 1 | -1.179e-03 | 1 | 0 | 1 | 1.047e-03 | 3 |
| 79 | N121 | max | .002 | 2 | .02 | 10 | .015 | 2 | 4.664e-03 | 9 | 0 | 1 | 7.738e-03 | 8 |
| 80 | | min | -.007 | 1 | -.038 | 9 | -.014 | 1 | -5.672e-04 | 1 | 0 | 1 | 2.129e-03 | 1 |
| 81 | N123 | max | .003 | 2 | .038 | 10 | .014 | 2 | 6.579e-03 | 6 | 0 | 1 | 8.754e-03 | 6 |
| 82 | | min | -.006 | 1 | -.036 | 9 | -.016 | 1 | -6.46e-05 | 1 | 0 | 1 | 2.531e-03 | 1 |
| 83 | N125 | max | .004 | 10 | .067 | 5 | .013 | 2 | 9.087e-03 | 6 | 0 | 1 | 9.242e-03 | 6 |
| 84 | | min | -.005 | 1 | -.025 | 9 | -.017 | 1 | 3.801e-04 | 1 | 0 | 1 | 2.737e-03 | 1 |
| 85 | N127 | max | .004 | 10 | .108 | 5 | .012 | 2 | 1.141e-02 | 6 | 0 | 1 | 8.789e-03 | 6 |
| 86 | | min | -.005 | 1 | -.006 | 9 | -.018 | 1 | 8.941e-04 | 1 | 0 | 1 | 2.642e-03 | 1 |
| 87 | N129 | max | .005 | 10 | .133 | 5 | .011 | 2 | 1.023e-02 | 6 | 2.775e-04 | 5 | 1.677e-03 | 9 |
| 88 | | min | -.004 | 1 | .01 | 9 | -.019 | 1 | 4.393e-04 | 1 | 8.18e-05 | 10 | -1.688e-03 | 10 |
| 89 | N131 | max | .006 | 10 | .108 | 5 | .011 | 2 | 1.145e-02 | 6 | 0 | 1 | -2.771e-03 | 1 |
| 90 | | min | -.003 | 4 | .008 | 9 | -.017 | 1 | 9.061e-04 | 1 | 0 | 1 | -8.878e-03 | 6 |
| 91 | N133 | max | .007 | 10 | .066 | 5 | .011 | 2 | 9.074e-03 | 6 | 0 | 1 | -2.827e-03 | 1 |
| 92 | | min | -.002 | 4 | -.003 | 9 | -.015 | 1 | 4.586e-04 | 1 | 0 | 1 | -9.273e-03 | 6 |
| 93 | N135 | max | .008 | 10 | .033 | 5 | .011 | 2 | 6.637e-03 | 10 | 0 | 1 | -2.551e-03 | 1 |
| 94 | | min | -.002 | 4 | -.009 | 2 | -.013 | 1 | 8.613e-05 | 1 | 0 | 1 | -8.671e-03 | 6 |

## *Envelope Joint Displacements (Continued)*

| | Joint | | X [in] | LC | Y [in] | LC | Z [in] | LC | X Rotation [... | LC | Y Rotation [... | LC | Z Rotation [... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 95 | N137 | max | .009 | 10 | .014 | 1 | .011 | 2 | 4.282e-03 | 10 | 0 | 1 | -2.077e-03 | 4 |
| 96 | | min | -.001 | 4 | -.018 | 10 | -.01 | 1 | -3.983e-04 | 1 | 0 | 1 | -7.804e-03 | 7 |
| 97 | N139 | max | .01 | 10 | .002 | 1 | .011 | 2 | 1.195e-03 | 2 | 0 | 1 | -9.438e-04 | 4 |
| 98 | | min | -.001 | 4 | -.037 | 10 | -.008 | 1 | -1.054e-03 | 1 | 0 | 1 | -5.77e-03 | 10 |
| 99 | N141 | max | .011 | 10 | 0 | 4 | .01 | 2 | 1.83e-03 | 10 | 1.955e-04 | 4 | 5.099e-04 | 4 |
| 100 | | min | -.002 | 4 | -.046 | 10 | -.006 | 1 | -6.048e-04 | 1 | -1.928e-04 | 3 | -2.677e-03 | 10 |
| 101 | N134 | max | .002 | 3 | .002 | 3 | .016 | 2 | 2.41e-03 | 9 | 2.146e-04 | 4 | 2.261e-03 | 4 |
| 102 | | min | -.008 | 8 | -.054 | 8 | -.013 | 1 | -8.02e-04 | 1 | -2.143e-04 | 3 | -4.956e-04 | 3 |
| 103 | N137A | max | .002 | 2 | -.002 | 3 | .016 | 2 | 4.246e-03 | 9 | 2.683e-04 | 8 | 3.287e-03 | 8 |
| 104 | | min | -.008 | 1 | -.065 | 9 | -.012 | 1 | -2.846e-04 | 1 | -5.854e-07 | 3 | 4.215e-05 | 3 |
| 105 | N138 | max | .003 | 2 | 0 | 1 | .016 | 2 | 6.472e-03 | 6 | 3.997e-04 | 5 | 5.622e-03 | 8 |
| 106 | | min | -.007 | 1 | -.086 | 9 | -.013 | 1 | 2.936e-04 | 1 | 8.751e-05 | 3 | 1.127e-03 | 3 |
| 107 | N140 | max | .011 | 10 | .002 | 4 | .01 | 2 | 1.909e-03 | 10 | 2.426e-04 | 4 | 5.469e-04 | 4 |
| 108 | | min | -.002 | 4 | -.07 | 10 | -.006 | 1 | -6.197e-04 | 1 | -2.399e-04 | 3 | -2.701e-03 | 10 |
| 109 | N141A | max | .01 | 10 | -.002 | 4 | .01 | 2 | 4.166e-03 | 10 | 9.633e-05 | 2 | 6.041e-05 | 4 |
| 110 | | min | -.001 | 4 | -.075 | 10 | -.006 | 1 | -8.166e-05 | 1 | -3.246e-04 | 1 | -3.656e-03 | 10 |
| 111 | N142 | max | .008 | 10 | -.002 | 1 | .01 | 2 | 7.015e-03 | 10 | 7.915e-05 | 2 | -9.25e-04 | 4 |
| 112 | | min | -.002 | 4 | -.091 | 10 | -.007 | 1 | 5.544e-04 | 1 | -4.243e-04 | 5 | -5.898e-03 | 10 |
| 113 | N143B | max | .004 | 10 | .02 | 1 | .014 | 2 | 7.762e-03 | 6 | 5.433e-04 | 5 | 7.206e-03 | 8 |
| 114 | | min | -.005 | 1 | -.09 | 9 | -.015 | 1 | 2.155e-04 | 1 | 6.507e-06 | 2 | 2.147e-03 | 3 |
| 115 | N144A | max | .005 | 10 | .037 | 1 | .013 | 2 | 9.493e-03 | 6 | 4.765e-04 | 5 | 7.474e-03 | 8 |
| 116 | | min | -.004 | 1 | -.071 | 9 | -.017 | 1 | 4.841e-04 | 1 | 1.177e-04 | 2 | 2.383e-03 | 1 |
| 117 | N145A | max | .005 | 10 | .054 | 1 | .012 | 2 | 1.165e-02 | 6 | 3.39e-04 | 5 | 7.776e-03 | 6 |
| 118 | | min | -.004 | 1 | -.052 | 9 | -.018 | 1 | 9.599e-04 | 1 | 8.768e-05 | 3 | 2.445e-03 | 1 |
| 119 | N146 | max | .004 | 10 | .052 | 1 | .011 | 2 | 1.161e-02 | 6 | 1.503e-05 | 2 | -2.686e-03 | 9 |
| 120 | | min | -.004 | 1 | -.035 | 9 | -.017 | 1 | 9.585e-04 | 1 | -3.505e-04 | 5 | -8.17e-03 | 6 |
| 121 | N147A | max | .005 | 10 | .035 | 1 | .011 | 2 | 9.444e-03 | 6 | 2.157e-05 | 2 | -2.298e-03 | 9 |
| 122 | | min | -.003 | 4 | -.042 | 2 | -.014 | 1 | 5.487e-04 | 1 | -4.991e-04 | 5 | -7.577e-03 | 7 |
| 123 | N148 | max | .006 | 10 | .017 | 1 | .011 | 2 | 7.637e-03 | 6 | 7.942e-05 | 2 | -1.936e-03 | 4 |
| 124 | | min | -.003 | 4 | -.069 | 10 | -.011 | 1 | 3.522e-04 | 1 | -5.643e-04 | 5 | -7.339e-03 | 10 |
| 125 | N163A | max | .005 | 10 | .128 | 5 | .012 | 2 | 1.157e-02 | 6 | 0 | 1 | 5.491e-03 | 6 |
| 126 | | min | -.004 | 1 | .006 | 9 | -.019 | 1 | 8.679e-04 | 1 | 0 | 1 | 1.614e-03 | 1 |
| 127 | N164 | max | .005 | 10 | .062 | 5 | .012 | 2 | 1.207e-02 | 6 | 2.6e-04 | 9 | 7.434e-03 | 6 |
| 128 | | min | -.004 | 1 | -.042 | 9 | -.019 | 1 | 1.043e-03 | 1 | 4.735e-05 | 10 | 2.318e-03 | 1 |
| 129 | N200 | max | .02 | 3 | .003 | 2 | .003 | 2 | 4.284e-04 | 2 | 2.78e-04 | 4 | 1.341e-03 | 4 |
| 130 | | min | -.02 | 4 | -.05 | 5 | -.01 | 1 | -2.507e-03 | 5 | -2.756e-04 | 3 | -1.366e-03 | 3 |
| 131 | N204 | max | .019 | 3 | .003 | 2 | .003 | 2 | 4.242e-04 | 2 | 3.028e-04 | 4 | 1.347e-03 | 4 |
| 132 | | min | -.019 | 4 | -.045 | 5 | -.01 | 1 | -2.499e-03 | 5 | -3.003e-04 | 3 | -1.371e-03 | 3 |
| 133 | N208 | max | .019 | 3 | .002 | 2 | .003 | 2 | 4.183e-04 | 2 | 3.485e-04 | 4 | 1.354e-03 | 4 |
| 134 | | min | -.019 | 4 | -.041 | 5 | -.01 | 1 | -2.485e-03 | 5 | -3.461e-04 | 3 | -1.377e-03 | 3 |
| 135 | N407 | max | .011 | 10 | 0 | 4 | .01 | 2 | 1.856e-03 | 10 | 2.181e-04 | 4 | 5.205e-04 | 4 |
| 136 | | min | -.002 | 4 | -.052 | 10 | -.006 | 1 | -6.099e-04 | 1 | -2.154e-04 | 3 | -2.695e-03 | 10 |
| 137 | N411 | max | .011 | 10 | .001 | 4 | .01 | 2 | 1.878e-03 | 10 | 2.327e-04 | 4 | 5.296e-04 | 4 |
| 138 | | min | -.002 | 4 | -.058 | 10 | -.006 | 1 | -6.11e-04 | 1 | -2.299e-04 | 3 | -2.703e-03 | 10 |
| 139 | N415 | max | .011 | 10 | .002 | 4 | .01 | 2 | 1.895e-03 | 10 | 2.403e-04 | 4 | 5.383e-04 | 4 |
| 140 | | min | -.002 | 4 | -.064 | 10 | -.006 | 1 | -6.14e-04 | 1 | -2.376e-04 | 3 | -2.705e-03 | 10 |
| 141 | N419 | max | .011 | 10 | 0 | 4 | .01 | 2 | 1.83e-03 | 10 | 1.955e-04 | 4 | 5.099e-04 | 4 |
| 142 | | min | -.002 | 4 | -.046 | 10 | -.006 | 1 | -6.048e-04 | 1 | -1.928e-04 | 3 | -2.677e-03 | 10 |
| 143 | N420 | max | .011 | 10 | -.001 | 4 | .01 | 2 | 8.685e-04 | 2 | 0 | 1 | -2.753e-05 | 4 |
| 144 | | min | -.002 | 4 | -.045 | 10 | -.007 | 1 | -1.026e-03 | 1 | 0 | 1 | -3.906e-03 | 10 |
| 145 | N421 | max | .011 | 10 | 0 | 4 | .01 | 2 | 8.536e-04 | 2 | 0 | 1 | -5.148e-04 | 4 |
| 146 | | min | -.002 | 4 | -.041 | 10 | -.008 | 1 | -1.126e-03 | 1 | 0 | 1 | -4.937e-03 | 10 |

## *Envelope Joint Displacements (Continued)*

| | Joint | | X [in] | LC | Y [in] | LC | Z [in] | LC | X Rotation [... | LC | Y Rotation [... | LC | Z Rotation [... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 147 | N422 | max | .011 | 10 | 0 | 4 | .01 | 2 | 1.856e-03 | 10 | 2.181e-04 | 4 | 5.205e-04 | 4 |
| 148 | | min | -.002 | 4 | -.052 | 10 | -.006 | 1 | -6.099e-04 | 1 | -2.154e-04 | 3 | -2.695e-03 | 10 |
| 149 | N423 | max | .011 | 10 | 0 | 4 | .01 | 2 | 1.267e-03 | 2 | 0 | 1 | 1.107e-04 | 4 |
| 150 | | min | -.002 | 4 | -.052 | 10 | -.007 | 1 | -8.479e-04 | 1 | 0 | 1 | -3.564e-03 | 10 |
| 151 | N424 | max | .01 | 10 | 0 | 4 | .01 | 2 | 1.291e-03 | 2 | 0 | 1 | -2.354e-04 | 4 |
| 152 | | min | -.002 | 4 | -.05 | 10 | -.007 | 1 | -9.155e-04 | 1 | 0 | 1 | -4.279e-03 | 10 |
| 153 | N425 | max | .01 | 10 | 0 | 1 | .01 | 2 | 1.67e-03 | 10 | 0 | 1 | -5.574e-04 | 4 |
| 154 | | min | -.001 | 4 | -.047 | 10 | -.008 | 1 | -8.606e-04 | 1 | 0 | 1 | -4.924e-03 | 10 |
| 155 | N426 | max | .011 | 10 | 0 | 4 | .01 | 2 | 1.878e-03 | 10 | 2.327e-04 | 4 | 5.296e-04 | 4 |
| 156 | | min | -.002 | 4 | -.058 | 10 | -.006 | 1 | -6.11e-04 | 1 | -2.299e-04 | 3 | -2.703e-03 | 10 |
| 157 | N427 | max | .011 | 10 | 0 | 4 | .01 | 2 | 1.661e-03 | 10 | 0 | 1 | 2.979e-04 | 4 |
| 158 | | min | -.002 | 4 | -.058 | 10 | -.007 | 1 | -7.377e-04 | 1 | 0 | 1 | -3.169e-03 | 10 |
| 159 | N428 | max | .01 | 10 | 0 | 4 | .01 | 2 | 1.821e-03 | 10 | 0 | 1 | 4.14e-05 | 4 |
| 160 | | min | -.001 | 4 | -.058 | 10 | -.007 | 1 | -7.498e-04 | 1 | 0 | 1 | -3.681e-03 | 10 |
| 161 | N429 | max | .01 | 10 | -.001 | 4 | .01 | 2 | 2.354e-03 | 10 | 0 | 1 | -2.33e-04 | 4 |
| 162 | | min | -.001 | 4 | -.057 | 10 | -.007 | 1 | -6.553e-04 | 1 | 0 | 1 | -4.244e-03 | 10 |
| 163 | N430 | max | .011 | 10 | 0 | 4 | .01 | 2 | 1.895e-03 | 10 | 2.403e-04 | 4 | 5.383e-04 | 4 |
| 164 | | min | -.002 | 4 | -.064 | 10 | -.006 | 1 | -6.14e-04 | 1 | -2.376e-04 | 3 | -2.705e-03 | 10 |
| 165 | N431 | max | .011 | 10 | 0 | 4 | .01 | 2 | 2.05e-03 | 10 | 0 | 1 | 4.121e-04 | 4 |
| 166 | | min | -.001 | 4 | -.065 | 10 | -.006 | 1 | -6.318e-04 | 1 | 0 | 1 | -2.932e-03 | 10 |
| 167 | N432 | max | .01 | 10 | 0 | 4 | .01 | 2 | 2.544e-03 | 10 | 0 | 1 | 2.548e-04 | 4 |
| 168 | | min | -.001 | 4 | -.065 | 10 | -.006 | 1 | -5.307e-04 | 1 | 0 | 1 | -3.229e-03 | 10 |
| 169 | N433 | max | .01 | 10 | -.002 | 4 | .01 | 2 | 3.208e-03 | 10 | 0 | 1 | 4.002e-06 | 4 |
| 170 | | min | -.001 | 4 | -.066 | 10 | -.007 | 1 | -3.89e-04 | 1 | 0 | 1 | -3.749e-03 | 10 |
| 171 | N434 | max | .011 | 10 | .001 | 4 | .01 | 2 | 1.909e-03 | 10 | 2.426e-04 | 4 | 5.469e-04 | 4 |
| 172 | | min | -.001 | 4 | -.07 | 10 | -.006 | 1 | -6.197e-04 | 1 | -2.399e-04 | 3 | -2.701e-03 | 10 |
| 173 | N435 | max | .01 | 10 | 0 | 4 | .01 | 2 | 2.671e-03 | 10 | 9.85e-05 | 4 | 4.128e-04 | 4 |
| 174 | | min | -.001 | 4 | -.071 | 10 | -.006 | 1 | -4.346e-04 | 1 | -2.444e-04 | 3 | -2.944e-03 | 10 |
| 175 | N436 | max | .01 | 10 | 0 | 4 | .01 | 2 | 3.422e-03 | 10 | 9.353e-05 | 2 | 2.508e-04 | 4 |
| 176 | | min | -.001 | 4 | -.073 | 10 | -.006 | 1 | -2.557e-04 | 1 | -2.716e-04 | 1 | -3.261e-03 | 10 |
| 177 | N437 | max | .01 | 10 | .005 | 1 | .011 | 2 | 1.755e-03 | 10 | 0 | 1 | -1.322e-03 | 4 |
| 178 | | min | -.001 | 4 | -.032 | 10 | -.009 | 1 | -9.288e-04 | 1 | 0 | 1 | -6.458e-03 | 7 |
| 179 | N438 | max | .01 | 10 | .008 | 1 | .011 | 2 | 2.559e-03 | 10 | 0 | 1 | -1.608e-03 | 4 |
| 180 | | min | -.001 | 4 | -.026 | 10 | -.009 | 1 | -7.729e-04 | 1 | 0 | 1 | -7.012e-03 | 7 |
| 181 | N439 | max | .01 | 10 | .011 | 1 | .011 | 2 | 3.363e-03 | 10 | 0 | 1 | -1.862e-03 | 4 |
| 182 | | min | -.001 | 4 | -.022 | 10 | -.01 | 1 | -6.127e-04 | 1 | 0 | 1 | -7.472e-03 | 7 |
| 183 | N440 | max | .01 | 10 | .002 | 1 | .011 | 2 | 2.254e-03 | 10 | 0 | 1 | -8.774e-04 | 4 |
| 184 | | min | -.001 | 4 | -.044 | 10 | -.008 | 1 | -7.654e-04 | 1 | 0 | 1 | -5.526e-03 | 10 |
| 185 | N441 | max | .01 | 10 | .005 | 1 | .011 | 2 | 2.939e-03 | 10 | 0 | 1 | -1.168e-03 | 4 |
| 186 | | min | -.001 | 4 | -.041 | 10 | -.009 | 1 | -6.41e-04 | 1 | 0 | 1 | -6.046e-03 | 7 |
| 187 | N442 | max | .009 | 10 | .008 | 1 | .011 | 2 | 3.675e-03 | 10 | 0 | 1 | -1.401e-03 | 4 |
| 188 | | min | -.001 | 4 | -.039 | 10 | -.009 | 1 | -4.949e-04 | 1 | 0 | 1 | -6.471e-03 | 7 |
| 189 | N443 | max | .009 | 10 | .01 | 1 | .011 | 2 | 4.319e-03 | 10 | 0 | 1 | -1.59e-03 | 4 |
| 190 | | min | -.002 | 4 | -.037 | 10 | -.009 | 1 | -3.826e-04 | 1 | 0 | 1 | -6.759e-03 | 7 |
| 191 | N444 | max | .01 | 10 | 0 | 1 | .01 | 2 | 2.953e-03 | 10 | 0 | 1 | -5.218e-04 | 4 |
| 192 | | min | -.001 | 4 | -.056 | 10 | -.007 | 1 | -5.474e-04 | 1 | 0 | 1 | -4.821e-03 | 10 |
| 193 | N445 | max | .01 | 10 | .002 | 1 | .01 | 2 | 3.601e-03 | 10 | 0 | 1 | -7.907e-04 | 4 |
| 194 | | min | -.001 | 4 | -.055 | 10 | -.008 | 1 | -4.253e-04 | 1 | 0 | 1 | -5.333e-03 | 10 |
| 195 | N446 | max | .009 | 10 | .004 | 1 | .011 | 2 | 4.223e-03 | 10 | 0 | 1 | -1.039e-03 | 4 |
| 196 | | min | -.001 | 4 | -.055 | 10 | -.008 | 1 | -3.143e-04 | 1 | 0 | 1 | -5.789e-03 | 10 |
| 197 | N447 | max | .009 | 10 | .006 | 1 | .011 | 2 | 4.93e-03 | 10 | 0 | 1 | -1.249e-03 | 4 |
| 198 | | min | -.002 | 4 | -.055 | 10 | -.009 | 1 | -1.581e-04 | 1 | 0 | 1 | -6.162e-03 | 7 |

## Envelope Joint Displacements (Continued)

| | Joint | | X [in] | LC | Y [in] | LC | Z [in] | LC | X Rotation [... | LC | Y Rotation [... | LC | Z Rotation [... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 199 | N448 | max | .01 | 10 | -.002 | 1 | .01 | 2 | 3.877e-03 | 10 | 0 | 1 | -2.602e-04 | 4 |
| 200 | | min | -.001 | 4 | -.067 | 10 | -.007 | 1 | -2.499e-04 | 1 | 0 | 1 | -4.307e-03 | 10 |
| 201 | N449 | max | .009 | 10 | 0 | 1 | .01 | 2 | 4.536e-03 | 10 | 0 | 1 | -5.288e-04 | 4 |
| 202 | | min | -.001 | 4 | -.068 | 10 | -.007 | 1 | -1.185e-04 | 1 | 0 | 1 | -4.873e-03 | 10 |
| 203 | N450 | max | .009 | 10 | .001 | 1 | .01 | 2 | 5.184e-03 | 10 | 0 | 1 | -7.809e-04 | 4 |
| 204 | | min | -.001 | 4 | -.07 | 10 | -.008 | 1 | 1.167e-05 | 1 | 0 | 1 | -5.386e-03 | 10 |
| 205 | N451 | max | .009 | 10 | .003 | 1 | .01 | 2 | 5.679e-03 | 10 | 0 | 1 | -1.012e-03 | 4 |
| 206 | | min | -.002 | 4 | -.072 | 10 | -.008 | 1 | 7.985e-05 | 1 | 0 | 1 | -5.838e-03 | 10 |
| 207 | N452 | max | .01 | 10 | -.004 | 4 | .01 | 2 | 4.9e-03 | 10 | 9.509e-05 | 2 | -1.555e-04 | 4 |
| 208 | | min | -.001 | 4 | -.078 | 10 | -.006 | 1 | 8.677e-05 | 1 | -3.642e-04 | 1 | -4.124e-03 | 10 |
| 209 | N453 | max | .009 | 10 | -.003 | 1 | .01 | 2 | 5.62e-03 | 10 | 9.099e-05 | 2 | -3.927e-04 | 4 |
| 210 | | min | -.001 | 4 | -.082 | 10 | -.007 | 1 | 2.486e-04 | 1 | -3.916e-04 | 1 | -4.654e-03 | 10 |
| 211 | N454 | max | .009 | 10 | -.003 | 1 | .01 | 2 | 6.323e-03 | 10 | 8.523e-05 | 2 | -6.487e-04 | 4 |
| 212 | | min | -.001 | 4 | -.086 | 10 | -.007 | 1 | 4.035e-04 | 1 | -4.098e-04 | 1 | -5.243e-03 | 10 |
| 213 | N455 | max | .008 | 10 | .006 | 1 | .011 | 2 | 6.852e-03 | 10 | 0 | 1 | -1.317e-03 | 4 |
| 214 | | min | -.002 | 4 | -.081 | 10 | -.009 | 1 | 2.772e-04 | 1 | 0 | 1 | -5.942e-03 | 10 |
| 215 | N456 | max | .008 | 10 | .009 | 1 | .011 | 2 | 6.082e-03 | 10 | 0 | 1 | -1.494e-03 | 4 |
| 216 | | min | -.002 | 4 | -.058 | 10 | -.009 | 1 | 1.124e-04 | 1 | 0 | 1 | -6.587e-03 | 7 |
| 217 | N457 | max | .009 | 10 | .012 | 1 | .011 | 2 | 4.899e-03 | 10 | 0 | 1 | -1.676e-03 | 4 |
| 218 | | min | -.002 | 4 | -.037 | 10 | -.01 | 1 | -2.571e-04 | 1 | 0 | 1 | -6.834e-03 | 7 |
| 219 | N458 | max | .007 | 10 | .005 | 1 | .011 | 2 | 8.405e-03 | 10 | 1.078e-04 | 4 | -1.316e-03 | 9 |
| 220 | | min | -.002 | 4 | -.098 | 10 | -.009 | 1 | 8.393e-04 | 1 | -1.732e-04 | 3 | -6.388e-03 | 10 |
| 221 | N459 | max | .007 | 10 | .009 | 1 | .011 | 2 | 7.464e-03 | 10 | 0 | 1 | -1.599e-03 | 4 |
| 222 | | min | -.002 | 4 | -.074 | 10 | -.009 | 1 | 5.016e-04 | 1 | 0 | 1 | -6.696e-03 | 10 |
| 223 | N460 | max | .008 | 10 | .012 | 1 | .011 | 2 | 6.078e-03 | 10 | 0 | 1 | -1.667e-03 | 4 |
| 224 | | min | -.002 | 4 | -.052 | 10 | -.01 | 1 | 2.049e-05 | 1 | 0 | 1 | -6.66e-03 | 7 |
| 225 | N461 | max | .009 | 10 | .015 | 1 | .011 | 2 | 5.624e-03 | 10 | 0 | 1 | -1.935e-03 | 4 |
| 226 | | min | -.002 | 4 | -.032 | 10 | -.01 | 1 | -5.815e-05 | 1 | 0 | 1 | -7.329e-03 | 7 |
| 227 | N462 | max | .009 | 10 | .018 | 1 | .011 | 2 | 4.836e-03 | 10 | 0 | 1 | -2.278e-03 | 1 |
| 228 | | min | -.002 | 4 | -.015 | 2 | -.011 | 1 | -3.304e-04 | 1 | 0 | 1 | -8.026e-03 | 7 |
| 229 | N463 | max | .007 | 10 | .009 | 1 | .011 | 2 | 7.589e-03 | 10 | 1.235e-04 | 2 | -1.832e-03 | 4 |
| 230 | | min | -.002 | 4 | -.089 | 10 | -.01 | 1 | 4.369e-04 | 1 | -6.368e-04 | 5 | -7.567e-03 | 10 |
| 231 | N464 | max | .007 | 10 | .012 | 1 | .011 | 2 | 7.175e-03 | 10 | 0 | 1 | -1.762e-03 | 4 |
| 232 | | min | -.002 | 4 | -.067 | 10 | -.01 | 1 | 3.383e-04 | 1 | 0 | 1 | -6.757e-03 | 10 |
| 233 | N465 | max | .008 | 10 | .016 | 1 | .011 | 2 | 6.661e-03 | 10 | 0 | 1 | -1.884e-03 | 4 |
| 234 | | min | -.002 | 4 | -.046 | 10 | -.01 | 1 | 1.987e-04 | 1 | 0 | 1 | -7.076e-03 | 7 |
| 235 | N466 | max | .008 | 10 | .018 | 1 | .011 | 2 | 5.909e-03 | 10 | 0 | 1 | -2.136e-03 | 4 |
| 236 | | min | -.002 | 4 | -.026 | 10 | -.011 | 1 | -5.7e-05 | 1 | 0 | 1 | -7.556e-03 | 7 |
| 237 | N467 | max | .009 | 10 | .021 | 1 | .011 | 2 | 5.646e-03 | 10 | 0 | 1 | -2.409e-03 | 1 |
| 238 | | min | -.002 | 4 | -.013 | 2 | -.011 | 1 | -1.128e-04 | 1 | 0 | 1 | -8.34e-03 | 6 |
| 239 | N468 | max | .006 | 10 | .013 | 1 | .011 | 2 | 7.751e-03 | 10 | 2.292e-06 | 2 | -1.617e-03 | 9 |
| 240 | | min | -.002 | 4 | -.079 | 10 | -.01 | 1 | 5.243e-04 | 1 | -2.804e-04 | 5 | -6.702e-03 | 10 |
| 241 | N469 | max | .007 | 10 | .016 | 1 | .011 | 2 | 7.28e-03 | 10 | 0 | 1 | -1.912e-03 | 4 |
| 242 | | min | -.002 | 4 | -.059 | 10 | -.011 | 1 | 3.37e-04 | 1 | 0 | 1 | -7.107e-03 | 7 |
| 243 | N470 | max | .007 | 10 | .019 | 1 | .011 | 2 | 6.793e-03 | 10 | 0 | 1 | -2.073e-03 | 4 |
| 244 | | min | -.002 | 4 | -.039 | 10 | -.011 | 1 | 1.717e-04 | 1 | 0 | 1 | -7.329e-03 | 7 |
| 245 | N471 | max | .008 | 10 | .022 | 1 | .011 | 2 | 6.485e-03 | 10 | 0 | 1 | -2.327e-03 | 4 |
| 246 | | min | -.002 | 4 | -.023 | 2 | -.012 | 1 | 9.262e-05 | 1 | 0 | 1 | -7.859e-03 | 7 |
| 247 | N472 | max | .009 | 10 | .027 | 5 | .011 | 2 | 6.083e-03 | 10 | 0 | 1 | -2.458e-03 | 1 |
| 248 | | min | -.002 | 4 | -.011 | 2 | -.012 | 1 | -4.852e-05 | 1 | 0 | 1 | -8.477e-03 | 6 |
| 249 | N473 | max | .007 | 10 | .02 | 1 | .011 | 2 | 7.469e-03 | 6 | 0 | 1 | -2.033e-03 | 4 |
| 250 | | min | -.002 | 4 | -.05 | 10 | -.011 | 1 | 3.108e-04 | 1 | 0 | 1 | -7.184e-03 | 7 |

## *Envelope Joint Displacements (Continued)*

| | Joint | | X [in] | LC | Y [in] | LC | Z [in] | LC | X Rotation [... | LC | Y Rotation [... | LC | Z Rotation [... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 251 | N474 | max | .007 | 10 | .023 | 1 | .011 | 2 | 7.215e-03 | 6 | 0 | 1 | -2.236e-03 | 4 |
| 252 | | min | -.002 | 4 | -.033 | 2 | -.012 | 1 | 2.483e-04 | 1 | 0 | 1 | -7.592e-03 | 7 |
| 253 | N475 | max | .008 | 10 | .025 | 1 | .011 | 2 | 6.847e-03 | 6 | 0 | 1 | -2.439e-03 | 1 |
| 254 | | min | -.002 | 4 | -.021 | 2 | -.012 | 1 | 1.4e-04 | 1 | 0 | 1 | -8.038e-03 | 7 |
| 255 | N476 | max | .006 | 10 | .021 | 1 | .011 | 2 | 8.106e-03 | 6 | 1.244e-05 | 2 | -1.852e-03 | 9 |
| 256 | | min | -.003 | 4 | -.059 | 10 | -.012 | 1 | 4.34e-04 | 1 | -3.958e-04 | 5 | -6.949e-03 | 10 |
| 257 | N477 | max | .006 | 10 | .024 | 1 | .011 | 2 | 7.881e-03 | 6 | 0 | 1 | -2.178e-03 | 4 |
| 258 | | min | -.003 | 4 | -.042 | 2 | -.012 | 1 | 3.44e-04 | 1 | 0 | 1 | -7.438e-03 | 7 |
| 259 | N478 | max | .007 | 10 | .027 | 1 | .011 | 2 | 7.642e-03 | 6 | 0 | 1 | -2.391e-03 | 4 |
| 260 | | min | -.002 | 4 | -.03 | 2 | -.013 | 1 | 2.715e-04 | 1 | 0 | 1 | -7.789e-03 | 7 |
| 261 | N479 | max | .007 | 10 | .029 | 1 | .011 | 2 | 7.436e-03 | 6 | 0 | 1 | -2.535e-03 | 1 |
| 262 | | min | -.002 | 4 | -.018 | 2 | -.013 | 1 | 2.277e-04 | 1 | 0 | 1 | -8.288e-03 | 6 |
| 263 | N480 | max | .008 | 10 | .042 | 5 | .011 | 2 | 7.209e-03 | 6 | 0 | 1 | -2.628e-03 | 1 |
| 264 | | min | -.002 | 4 | -.007 | 9 | -.013 | 1 | 1.634e-04 | 1 | 0 | 1 | -8.856e-03 | 6 |
| 265 | N481 | max | .006 | 10 | .026 | 1 | .011 | 2 | 8.396e-03 | 6 | 4.592e-05 | 2 | -2.12e-03 | 4 |
| 266 | | min | -.003 | 4 | -.05 | 2 | -.013 | 1 | 4.001e-04 | 1 | -5.312e-04 | 5 | -7.362e-03 | 7 |
| 267 | N482 | max | .006 | 10 | .028 | 1 | .011 | 2 | 8.321e-03 | 6 | 0 | 1 | -2.293e-03 | 9 |
| 268 | | min | -.003 | 4 | -.038 | 2 | -.013 | 1 | 3.805e-04 | 1 | 0 | 1 | -7.541e-03 | 7 |
| 269 | N483 | max | .007 | 10 | .031 | 1 | .011 | 2 | 8.185e-03 | 6 | 0 | 1 | -2.528e-03 | 1 |
| 270 | | min | -.002 | 4 | -.027 | 2 | -.013 | 1 | 3.479e-04 | 1 | 0 | 1 | -7.987e-03 | 7 |
| 271 | N484 | max | .007 | 10 | .034 | 5 | .011 | 2 | 7.988e-03 | 6 | 0 | 1 | -2.61e-03 | 1 |
| 272 | | min | -.002 | 4 | -.015 | 9 | -.014 | 1 | 2.953e-04 | 1 | 0 | 1 | -8.483e-03 | 6 |
| 273 | N485 | max | .008 | 10 | .05 | 5 | .011 | 2 | 7.825e-03 | 6 | 0 | 1 | -2.703e-03 | 1 |
| 274 | | min | -.002 | 4 | -.006 | 9 | -.014 | 1 | 2.589e-04 | 1 | 0 | 1 | -9.013e-03 | 6 |
| 275 | N486 | max | .005 | 10 | .03 | 1 | .011 | 2 | 8.986e-03 | 6 | 6.764e-06 | 2 | -2.051e-03 | 9 |
| 276 | | min | -.003 | 4 | -.046 | 2 | -.013 | 1 | 5.062e-04 | 1 | -4.491e-04 | 5 | -7.178e-03 | 7 |
| 277 | N487 | max | .006 | 10 | .032 | 1 | .011 | 2 | 8.85e-03 | 6 | 0 | 1 | -2.413e-03 | 9 |
| 278 | | min | -.003 | 4 | -.035 | 2 | -.014 | 1 | 4.533e-04 | 1 | 0 | 1 | -7.73e-03 | 7 |
| 279 | N488 | max | .006 | 10 | .035 | 1 | .011 | 2 | 8.72e-03 | 6 | 0 | 1 | -2.588e-03 | 1 |
| 280 | | min | -.003 | 4 | -.024 | 9 | -.014 | 1 | 4.172e-04 | 1 | 0 | 1 | -8.14e-03 | 6 |
| 281 | N489 | max | .007 | 10 | .042 | 5 | .011 | 2 | 8.596e-03 | 6 | 0 | 1 | -2.676e-03 | 1 |
| 282 | | min | -.002 | 4 | -.014 | 9 | -.014 | 1 | 3.916e-04 | 1 | 0 | 1 | -8.642e-03 | 6 |
| 283 | N490 | max | .008 | 10 | .058 | 5 | .011 | 2 | 8.413e-03 | 6 | 0 | 1 | -2.768e-03 | 1 |
| 284 | | min | -.002 | 4 | -.005 | 9 | -.014 | 1 | 3.459e-04 | 1 | 0 | 1 | -9.158e-03 | 6 |
| 285 | N491 | max | .006 | 10 | .037 | 1 | .011 | 2 | 9.406e-03 | 6 | 0 | 1 | -2.474e-03 | 9 |
| 286 | | min | -.003 | 4 | -.031 | 9 | -.014 | 1 | 5.379e-04 | 1 | 0 | 1 | -7.815e-03 | 7 |
| 287 | N492 | max | .006 | 10 | .039 | 1 | .011 | 2 | 9.32e-03 | 6 | 0 | 1 | -2.639e-03 | 1 |
| 288 | | min | -.003 | 4 | -.022 | 9 | -.015 | 1 | 5.179e-04 | 1 | 0 | 1 | -8.274e-03 | 6 |
| 289 | N493 | max | .007 | 10 | .051 | 5 | .011 | 2 | 9.198e-03 | 6 | 0 | 1 | -2.73e-03 | 1 |
| 290 | | min | -.003 | 4 | -.013 | 9 | -.015 | 1 | 4.877e-04 | 1 | 0 | 1 | -8.761e-03 | 6 |
| 291 | N494 | max | .005 | 10 | .039 | 1 | .011 | 2 | 1.012e-02 | 6 | -3.167e-06 | 2 | -2.206e-03 | 9 |
| 292 | | min | -.003 | 1 | -.039 | 9 | -.015 | 1 | 6.828e-04 | 1 | -4.485e-04 | 5 | -7.391e-03 | 7 |
| 293 | N495 | max | .005 | 10 | .041 | 1 | .011 | 2 | 1.e-02 | 6 | 0 | 1 | -2.585e-03 | 9 |
| 294 | | min | -.003 | 4 | -.03 | 9 | -.015 | 1 | 6.431e-04 | 1 | 0 | 1 | -7.978e-03 | 7 |
| 295 | N496 | max | .006 | 10 | .046 | 5 | .011 | 2 | 9.908e-03 | 6 | 0 | 1 | -2.69e-03 | 1 |
| 296 | | min | -.003 | 4 | -.02 | 9 | -.015 | 1 | 6.189e-04 | 1 | 0 | 1 | -8.426e-03 | 6 |
| 297 | N497 | max | .006 | 10 | .061 | 5 | .011 | 2 | 9.804e-03 | 6 | 0 | 1 | -2.782e-03 | 1 |
| 298 | | min | -.003 | 4 | -.01 | 9 | -.015 | 1 | 5.965e-04 | 1 | 0 | 1 | -8.903e-03 | 6 |
| 299 | N498 | max | .007 | 10 | .077 | 5 | .011 | 2 | 9.726e-03 | 6 | 0 | 1 | -2.884e-03 | 1 |
| 300 | | min | -.002 | 4 | 0 | 9 | -.016 | 1 | 5.758e-04 | 1 | 0 | 1 | -9.414e-03 | 6 |
| 301 | N499 | max | .005 | 10 | .043 | 1 | .011 | 2 | 1.061e-02 | 6 | 9.676e-06 | 2 | -2.481e-03 | 9 |
| 302 | | min | -.004 | 1 | -.038 | 9 | -.016 | 1 | 7.583e-04 | 1 | -4.396e-04 | 5 | -7.85e-03 | 7 |

## *Envelope Joint Displacements (Continued)*

| | Joint | | X [in] | LC | Y [in] | LC | Z [in] | LC | X Rotation [... | LC | Y Rotation [... | LC | Z Rotation [... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 303 | N500 | max | .005 | 10 | .046 | 1 | .011 | 2 | 1.061e-02 | 6 | 0 | 1 | -2.628e-03 | 1 |
| 304 | | min | -.003 | 4 | -.028 | 9 | -.016 | 1 | 7.571e-04 | 1 | 0 | 1 | -8.048e-03 | 6 |
| 305 | N501 | max | .006 | 10 | .056 | 5 | .011 | 2 | 1.052e-02 | 6 | 0 | 1 | -2.721e-03 | 1 |
| 306 | | min | -.003 | 4 | -.018 | 9 | -.016 | 1 | 7.364e-04 | 1 | 0 | 1 | -8.514e-03 | 6 |
| 307 | N502 | max | .006 | 10 | .072 | 5 | .011 | 2 | 1.042e-02 | 6 | 0 | 1 | -2.82e-03 | 1 |
| 308 | | min | -.003 | 4 | -.008 | 9 | -.016 | 1 | 7.129e-04 | 1 | 0 | 1 | -8.998e-03 | 6 |
| 309 | N503 | max | .007 | 10 | .088 | 5 | .011 | 2 | 1.033e-02 | 6 | 0 | 1 | -2.906e-03 | 1 |
| 310 | | min | -.003 | 4 | .002 | 9 | -.016 | 1 | 6.904e-04 | 1 | 0 | 1 | -9.439e-03 | 6 |
| 311 | N504 | max | .005 | 10 | .048 | 1 | .011 | 2 | 1.129e-02 | 6 | -6.426e-06 | 2 | -2.284e-03 | 9 |
| 312 | | min | -.004 | 1 | -.037 | 9 | -.016 | 1 | 9.072e-04 | 1 | -4.026e-04 | 5 | -7.457e-03 | 7 |
| 313 | N505 | max | .005 | 10 | .05 | 5 | .011 | 2 | 1.12e-02 | 6 | 0 | 1 | -2.66e-03 | 1 |
| 314 | | min | -.003 | 4 | -.026 | 9 | -.016 | 1 | 8.778e-04 | 1 | 0 | 1 | -8.151e-03 | 6 |
| 315 | N506 | max | .006 | 10 | .066 | 5 | .011 | 2 | 1.112e-02 | 6 | 0 | 1 | -2.743e-03 | 1 |
| 316 | | min | -.003 | 4 | -.016 | 9 | -.017 | 1 | 8.54e-04 | 1 | 0 | 1 | -8.557e-03 | 6 |
| 317 | N507 | max | .006 | 10 | .082 | 5 | .011 | 2 | 1.099e-02 | 6 | 0 | 1 | -2.809e-03 | 1 |
| 318 | | min | -.003 | 4 | -.005 | 9 | -.017 | 1 | 8.216e-04 | 1 | 0 | 1 | -8.925e-03 | 6 |
| 319 | N508 | max | .007 | 10 | .098 | 5 | .011 | 2 | 1.094e-02 | 6 | 0 | 1 | -2.897e-03 | 1 |
| 320 | | min | -.003 | 4 | .005 | 9 | -.017 | 1 | 8.136e-04 | 1 | 0 | 1 | -9.359e-03 | 6 |
| 321 | N509 | max | .005 | 10 | .06 | 5 | .011 | 2 | 1.174e-02 | 6 | 0 | 1 | -2.65e-03 | 1 |
| 322 | | min | -.003 | 4 | -.025 | 9 | -.017 | 1 | 9.887e-04 | 1 | 0 | 1 | -8.099e-03 | 6 |
| 323 | N510 | max | .005 | 10 | .076 | 5 | .011 | 2 | 1.16e-02 | 6 | 0 | 1 | -2.698e-03 | 1 |
| 324 | | min | -.003 | 4 | -.014 | 9 | -.017 | 1 | 9.469e-04 | 1 | 0 | 1 | -8.386e-03 | 6 |
| 325 | N511 | max | .006 | 10 | .092 | 5 | .011 | 2 | 1.148e-02 | 6 | 0 | 1 | -2.75e-03 | 1 |
| 326 | | min | -.003 | 4 | -.003 | 9 | -.017 | 1 | 9.15e-04 | 1 | 0 | 1 | -8.668e-03 | 6 |
| 327 | N512 | max | .006 | 10 | .119 | 5 | .011 | 2 | 1.178e-02 | 6 | 0 | 1 | -2.451e-03 | 1 |
| 328 | | min | -.003 | 4 | .012 | 9 | -.018 | 1 | 9.549e-04 | 1 | 0 | 1 | -7.739e-03 | 6 |
| 329 | N513 | max | .006 | 10 | .128 | 5 | .011 | 2 | 1.153e-02 | 6 | 0 | 1 | -1.551e-03 | 9 |
| 330 | | min | -.003 | 4 | .014 | 9 | -.018 | 1 | 8.335e-04 | 1 | 0 | 1 | -5.554e-03 | 10 |
| 331 | N514 | max | .006 | 10 | .133 | 5 | .011 | 2 | 1.088e-02 | 6 | 0 | 1 | 3.56e-04 | 9 |
| 332 | | min | -.003 | 4 | .014 | 9 | -.018 | 1 | 6.51e-04 | 1 | 0 | 1 | -3.112e-03 | 10 |
| 333 | N515 | max | .006 | 10 | .103 | 5 | .011 | 2 | 1.155e-02 | 6 | 0 | 1 | -2.519e-03 | 1 |
| 334 | | min | -.003 | 4 | 0 | 9 | -.018 | 1 | 8.859e-04 | 1 | 0 | 1 | -7.856e-03 | 6 |
| 335 | N516 | max | .006 | 10 | .112 | 5 | .011 | 2 | 1.122e-02 | 6 | 0 | 1 | -1.835e-03 | 9 |
| 336 | | min | -.003 | 4 | .002 | 9 | -.018 | 1 | 7.515e-04 | 1 | 0 | 1 | -6.169e-03 | 10 |
| 337 | N517 | max | .005 | 10 | .118 | 5 | .011 | 2 | 1.017e-02 | 6 | 0 | 1 | -1.83e-04 | 9 |
| 338 | | min | -.003 | 4 | .003 | 9 | -.018 | 1 | 4.073e-04 | 1 | 0 | 1 | -3.886e-03 | 10 |
| 339 | N518 | max | .005 | 10 | .118 | 5 | .011 | 2 | 9.999e-03 | 6 | 2.611e-04 | 9 | 1.687e-03 | 9 |
| 340 | | min | -.004 | 1 | -.001 | 9 | -.019 | 1 | 3.798e-04 | 1 | 3.648e-05 | 10 | -1.737e-03 | 10 |
| 341 | N519 | max | .005 | 10 | .087 | 5 | .011 | 2 | 1.188e-02 | 6 | 0 | 1 | -2.628e-03 | 1 |
| 342 | | min | -.003 | 4 | -.011 | 9 | -.018 | 1 | 9.864e-04 | 1 | 0 | 1 | -8.09e-03 | 6 |
| 343 | N520 | max | .005 | 10 | .096 | 5 | .011 | 2 | 1.14e-02 | 6 | 0 | 1 | -2.163e-03 | 9 |
| 344 | | min | -.003 | 4 | -.009 | 9 | -.018 | 1 | 8.059e-04 | 1 | 0 | 1 | -6.906e-03 | 6 |
| 345 | N521 | max | .005 | 10 | .103 | 5 | .011 | 2 | 1.086e-02 | 6 | 0 | 1 | -7.182e-04 | 9 |
| 346 | | min | -.004 | 4 | -.009 | 9 | -.019 | 1 | 6.015e-04 | 1 | 0 | 1 | -4.854e-03 | 10 |
| 347 | N522 | max | .005 | 10 | .103 | 5 | .011 | 2 | 1.02e-02 | 6 | 1.94e-04 | 9 | 1.507e-03 | 9 |
| 348 | | min | -.004 | 1 | -.013 | 9 | -.019 | 1 | 4.252e-04 | 1 | -1.081e-05 | 10 | -1.399e-03 | 10 |
| 349 | N523 | max | .005 | 10 | .07 | 5 | .011 | 2 | 1.212e-02 | 6 | 0 | 1 | -2.623e-03 | 1 |
| 350 | | min | -.004 | 1 | -.023 | 9 | -.018 | 1 | 1.064e-03 | 1 | 0 | 1 | -8.003e-03 | 6 |
| 351 | N524 | max | .005 | 10 | .08 | 5 | .011 | 2 | 1.215e-02 | 6 | 0 | 1 | -2.494e-03 | 9 |
| 352 | | min | -.004 | 1 | -.021 | 9 | -.018 | 1 | 1.044e-03 | 1 | 0 | 1 | -7.691e-03 | 6 |
| 353 | N525 | max | .005 | 10 | .087 | 5 | .011 | 2 | 1.117e-02 | 6 | 0 | 1 | -1.198e-03 | 9 |
| 354 | | min | -.004 | 1 | -.021 | 9 | -.018 | 1 | 7.577e-04 | 1 | 0 | 1 | -5.596e-03 | 10 |

## Envelope Joint Displacements (Continued)

| | Joint | | X [in] | LC | Y [in] | LC | Z [in] | LC | X Rotation [... | LC | Y Rotation [... | LC | Z Rotation [... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 355 | N526 | max | .005 | 10 | .088 | 5 | .011 | 2 | 1.005e-02 | 6 | 2.078e-04 | 9 | 2.293e-03 | 9 |
| 356 | | min | -.004 | 1 | -.025 | 9 | -.019 | 1 | 3.957e-04 | 1 | -2.961e-05 | 10 | 8.918e-05 | 10 |
| 357 | N527 | max | .004 | 10 | .057 | 1 | .011 | 2 | 1.209e-02 | 6 | -9.553e-07 | 2 | -2.197e-03 | 9 |
| 358 | | min | -.004 | 1 | -.034 | 9 | -.018 | 1 | 1.066e-03 | 1 | -3.357e-04 | 10 | -7.229e-03 | 6 |
| 359 | N528 | max | .004 | 10 | .062 | 5 | .011 | 2 | 1.203e-02 | 6 | 3.537e-05 | 2 | -2.82e-03 | 1 |
| 360 | | min | -.004 | 1 | -.033 | 9 | -.018 | 1 | 1.041e-03 | 1 | -2.737e-04 | 10 | -8.545e-03 | 6 |
| 361 | N529 | max | .004 | 10 | .071 | 5 | .011 | 2 | 1.077e-02 | 6 | 8.583e-06 | 2 | -1.609e-03 | 9 |
| 362 | | min | -.004 | 1 | -.032 | 9 | -.018 | 1 | 6.441e-04 | 1 | -2.869e-04 | 10 | -6.259e-03 | 10 |
| 363 | N530 | max | .004 | 10 | .098 | 5 | .012 | 2 | 1.09e-02 | 6 | 0 | 1 | 9.276e-03 | 6 |
| 364 | | min | -.005 | 1 | -.011 | 9 | -.018 | 1 | 7.785e-04 | 1 | 0 | 1 | 2.785e-03 | 1 |
| 365 | N531 | max | .004 | 10 | .088 | 5 | .013 | 2 | 1.032e-02 | 6 | 0 | 1 | 9.393e-03 | 6 |
| 366 | | min | -.005 | 1 | -.016 | 9 | -.018 | 1 | 6.471e-04 | 1 | 0 | 1 | 2.812e-03 | 1 |
| 367 | N532 | max | .004 | 10 | .077 | 5 | .013 | 2 | 9.727e-03 | 6 | 0 | 1 | 9.368e-03 | 6 |
| 368 | | min | -.005 | 1 | -.02 | 9 | -.017 | 1 | 5.146e-04 | 1 | 0 | 1 | 2.791e-03 | 1 |
| 369 | N533 | max | .004 | 10 | .092 | 5 | .012 | 2 | 1.14e-02 | 6 | 0 | 1 | 8.567e-03 | 6 |
| 370 | | min | -.004 | 1 | -.018 | 9 | -.018 | 1 | 8.864e-04 | 1 | 0 | 1 | 2.604e-03 | 1 |
| 371 | N534 | max | .004 | 10 | .082 | 5 | .012 | 2 | 1.096e-02 | 6 | 0 | 1 | 8.888e-03 | 6 |
| 372 | | min | -.005 | 1 | -.022 | 9 | -.018 | 1 | 7.928e-04 | 1 | 0 | 1 | 2.698e-03 | 1 |
| 373 | N535 | max | .004 | 10 | .072 | 5 | .013 | 2 | 1.04e-02 | 6 | 0 | 1 | 8.951e-03 | 6 |
| 374 | | min | -.005 | 1 | -.027 | 9 | -.018 | 1 | 6.667e-04 | 1 | 0 | 1 | 2.711e-03 | 1 |
| 375 | N536 | max | .004 | 10 | .062 | 5 | .013 | 2 | 9.806e-03 | 6 | 0 | 1 | 8.879e-03 | 6 |
| 376 | | min | -.005 | 1 | -.032 | 9 | -.017 | 1 | 5.365e-04 | 1 | 0 | 1 | 2.681e-03 | 1 |
| 377 | N537 | max | .004 | 10 | .051 | 5 | .013 | 2 | 9.215e-03 | 6 | 0 | 1 | 8.732e-03 | 6 |
| 378 | | min | -.005 | 1 | -.037 | 9 | -.017 | 1 | 4.144e-04 | 1 | 0 | 1 | 2.626e-03 | 1 |
| 379 | N538 | max | .005 | 10 | .076 | 5 | .012 | 2 | 1.156e-02 | 6 | 0 | 1 | 8.365e-03 | 6 |
| 380 | | min | -.004 | 1 | -.029 | 9 | -.018 | 1 | 9.3e-04 | 1 | 0 | 1 | 2.571e-03 | 1 |
| 381 | N539 | max | .005 | 10 | .066 | 5 | .012 | 2 | 1.108e-02 | 6 | 0 | 1 | 8.511e-03 | 6 |
| 382 | | min | -.004 | 1 | -.034 | 9 | -.018 | 1 | 8.229e-04 | 1 | 0 | 1 | 2.614e-03 | 1 |
| 383 | N540 | max | .004 | 10 | .056 | 5 | .013 | 2 | 1.051e-02 | 6 | 0 | 1 | 8.502e-03 | 6 |
| 384 | | min | -.004 | 1 | -.039 | 9 | -.018 | 1 | 6.93e-04 | 1 | 0 | 1 | 2.609e-03 | 1 |
| 385 | N541 | max | .004 | 10 | .046 | 5 | .013 | 2 | 9.912e-03 | 6 | 0 | 1 | 8.402e-03 | 6 |
| 386 | | min | -.005 | 1 | -.043 | 9 | -.017 | 1 | 5.614e-04 | 1 | 0 | 1 | 2.573e-03 | 1 |
| 387 | N542 | max | .004 | 10 | .041 | 1 | .013 | 2 | 9.329e-03 | 6 | 0 | 1 | 8.265e-03 | 6 |
| 388 | | min | -.005 | 1 | -.048 | 9 | -.017 | 1 | 4.417e-04 | 1 | 0 | 1 | 2.528e-03 | 1 |
| 389 | N543 | max | .005 | 10 | .06 | 5 | .012 | 2 | 1.169e-02 | 6 | 0 | 1 | 8.096e-03 | 6 |
| 390 | | min | -.004 | 1 | -.04 | 9 | -.018 | 1 | 9.701e-04 | 1 | 0 | 1 | 2.514e-03 | 1 |
| 391 | N544 | max | .005 | 10 | .052 | 1 | .012 | 2 | 1.118e-02 | 6 | 0 | 1 | 8.119e-03 | 6 |
| 392 | | min | -.004 | 1 | -.045 | 9 | -.018 | 1 | 8.488e-04 | 1 | 0 | 1 | 2.525e-03 | 1 |
| 393 | N545 | max | .005 | 10 | .047 | 1 | .013 | 2 | 1.06e-02 | 6 | 0 | 1 | 8.057e-03 | 6 |
| 394 | | min | -.004 | 1 | -.05 | 9 | -.018 | 1 | 7.158e-04 | 1 | 0 | 1 | 2.506e-03 | 1 |
| 395 | N546 | max | .005 | 10 | .043 | 1 | .013 | 2 | 1.e-02 | 6 | 0 | 1 | 7.956e-03 | 6 |
| 396 | | min | -.004 | 1 | -.055 | 9 | -.017 | 1 | 5.843e-04 | 1 | 0 | 1 | 2.479e-03 | 1 |
| 397 | N547 | max | .004 | 10 | .039 | 1 | .013 | 2 | 9.424e-03 | 6 | 0 | 1 | 7.809e-03 | 6 |
| 398 | | min | -.004 | 1 | -.06 | 9 | -.017 | 1 | 4.657e-04 | 1 | 0 | 1 | 2.428e-03 | 1 |
| 399 | N548 | max | .005 | 10 | .05 | 1 | .013 | 2 | 1.12e-02 | 6 | 3.628e-04 | 5 | 7.718e-03 | 6 |
| 400 | | min | -.004 | 1 | -.057 | 9 | -.018 | 1 | 8.582e-04 | 1 | 8.56e-05 | 3 | 2.424e-03 | 1 |
| 401 | N549 | max | .005 | 10 | .045 | 1 | .013 | 2 | 1.064e-02 | 6 | 4.205e-04 | 5 | 7.653e-03 | 6 |
| 402 | | min | -.004 | 1 | -.062 | 9 | -.017 | 1 | 7.284e-04 | 1 | 1.085e-04 | 3 | 2.426e-03 | 1 |
| 403 | N550 | max | .005 | 10 | .041 | 1 | .013 | 2 | 1.008e-02 | 6 | 4.134e-04 | 5 | 7.501e-03 | 8 |
| 404 | | min | -.004 | 1 | -.066 | 9 | -.017 | 1 | 6.14e-04 | 1 | 9.441e-05 | 3 | 2.362e-03 | 1 |
| 405 | N551 | max | .003 | 10 | .044 | 10 | .014 | 2 | 7.292e-03 | 6 | 0 | 1 | 8.812e-03 | 6 |
| 406 | | min | -.006 | 1 | -.033 | 9 | -.016 | 1 | 7.146e-05 | 1 | 0 | 1 | 2.527e-03 | 1 |

## *Envelope Joint Displacements (Continued)*

| | Joint | | X [in] | LC | Y [in] | LC | Z [in] | LC | X Rotation [... | LC | Y Rotation [... | LC | Z Rotation [... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 407 | N552 | max | .003 | 10 | .051 | 5 | .014 | 2 | 7.834e-03 | 6 | 0 | 1 | 8.987e-03 | 6 |
| 408 | | min | -.006 | 1 | -.031 | 9 | -.016 | 1 | 1.38e-04 | 1 | 0 | 1 | 2.615e-03 | 1 |
| 409 | N553 | max | .003 | 10 | .059 | 5 | .013 | 2 | 8.446e-03 | 6 | 0 | 1 | 9.125e-03 | 6 |
| 410 | | min | -.006 | 1 | -.028 | 9 | -.017 | 1 | 2.572e-04 | 1 | 0 | 1 | 2.678e-03 | 1 |
| 411 | N554 | max | .003 | 10 | .028 | 1 | .014 | 2 | 6.849e-03 | 6 | 0 | 1 | 7.864e-03 | 6 |
| 412 | | min | -.006 | 1 | -.049 | 9 | -.015 | 1 | -2.079e-05 | 1 | 0 | 1 | 2.252e-03 | 1 |
| 413 | N555 | max | .003 | 10 | .033 | 10 | .014 | 2 | 7.441e-03 | 6 | 0 | 1 | 8.3e-03 | 6 |
| 414 | | min | -.006 | 1 | -.046 | 9 | -.016 | 1 | 8.978e-05 | 1 | 0 | 1 | 2.456e-03 | 1 |
| 415 | N556 | max | .003 | 10 | .038 | 10 | .014 | 2 | 8.038e-03 | 6 | 0 | 1 | 8.447e-03 | 6 |
| 416 | | min | -.006 | 1 | -.043 | 9 | -.016 | 1 | 1.996e-04 | 1 | 0 | 1 | 2.5e-03 | 1 |
| 417 | N557 | max | .004 | 10 | .043 | 10 | .013 | 2 | 8.612e-03 | 6 | 0 | 1 | 8.624e-03 | 6 |
| 418 | | min | -.005 | 1 | -.04 | 9 | -.017 | 1 | 2.964e-04 | 1 | 0 | 1 | 2.577e-03 | 1 |
| 419 | N558 | max | .003 | 10 | .025 | 1 | .014 | 2 | 7.353e-03 | 6 | 0 | 1 | 7.662e-03 | 8 |
| 420 | | min | -.006 | 1 | -.063 | 9 | -.015 | 1 | 1.632e-04 | 1 | 0 | 1 | 2.327e-03 | 1 |
| 421 | N559 | max | .004 | 10 | .029 | 1 | .014 | 2 | 7.698e-03 | 6 | 0 | 1 | 7.701e-03 | 8 |
| 422 | | min | -.005 | 1 | -.059 | 9 | -.016 | 1 | 1.547e-04 | 1 | 0 | 1 | 2.302e-03 | 1 |
| 423 | N560 | max | .004 | 10 | .033 | 1 | .014 | 2 | 8.211e-03 | 6 | 0 | 1 | 7.984e-03 | 6 |
| 424 | | min | -.005 | 1 | -.056 | 9 | -.016 | 1 | 2.382e-04 | 1 | 0 | 1 | 2.425e-03 | 1 |
| 425 | N561 | max | .004 | 10 | .037 | 1 | .014 | 2 | 8.756e-03 | 6 | 0 | 1 | 8.12e-03 | 6 |
| 426 | | min | -.005 | 1 | -.052 | 9 | -.016 | 1 | 3.327e-04 | 1 | 0 | 1 | 2.469e-03 | 1 |
| 427 | N562 | max | .004 | 10 | .023 | 1 | .014 | 2 | 7.506e-03 | 6 | 0 | 1 | 7.176e-03 | 8 |
| 428 | | min | -.005 | 1 | -.076 | 9 | -.015 | 1 | 1.447e-04 | 1 | 0 | 1 | 2.193e-03 | 1 |
| 429 | N563 | max | .004 | 10 | .027 | 1 | .014 | 2 | 7.969e-03 | 6 | 0 | 1 | 7.447e-03 | 8 |
| 430 | | min | -.005 | 1 | -.072 | 9 | -.015 | 1 | 2.413e-04 | 1 | 0 | 1 | 2.312e-03 | 1 |
| 431 | N564 | max | .004 | 10 | .031 | 1 | .014 | 2 | 8.37e-03 | 6 | 0 | 1 | 7.507e-03 | 8 |
| 432 | | min | -.005 | 1 | -.068 | 9 | -.016 | 1 | 2.79e-04 | 1 | 0 | 1 | 2.312e-03 | 1 |
| 433 | N565 | max | .004 | 10 | .035 | 1 | .014 | 2 | 8.878e-03 | 6 | 0 | 1 | 7.71e-03 | 8 |
| 434 | | min | -.005 | 1 | -.064 | 9 | -.016 | 1 | 3.639e-04 | 1 | 0 | 1 | 2.399e-03 | 1 |
| 435 | N566 | max | .004 | 10 | .024 | 1 | .014 | 2 | 8.132e-03 | 6 | 3.762e-04 | 8 | 6.929e-03 | 8 |
| 436 | | min | -.005 | 1 | -.085 | 9 | -.015 | 1 | 2.964e-04 | 1 | 5.117e-05 | 3 | 2.14e-03 | 1 |
| 437 | N567 | max | .005 | 10 | .029 | 1 | .014 | 2 | 8.485e-03 | 6 | 5.077e-04 | 5 | 7.3e-03 | 8 |
| 438 | | min | -.004 | 1 | -.081 | 9 | -.016 | 1 | 3.085e-04 | 1 | 7.772e-05 | 2 | 2.281e-03 | 3 |
| 439 | N568 | max | .005 | 10 | .033 | 1 | .014 | 2 | 8.988e-03 | 6 | 4.165e-04 | 8 | 7.231e-03 | 8 |
| 440 | | min | -.004 | 1 | -.076 | 9 | -.016 | 1 | 4.083e-04 | 1 | 8.615e-05 | 3 | 2.266e-03 | 1 |
| 441 | N569 | max | .003 | 2 | .034 | 10 | .014 | 2 | 5.831e-03 | 6 | 0 | 1 | 8.239e-03 | 6 |
| 442 | | min | -.007 | 1 | -.036 | 9 | -.015 | 1 | -2.045e-04 | 1 | 0 | 1 | 2.249e-03 | 1 |
| 443 | N570 | max | .002 | 2 | .03 | 10 | .014 | 2 | 5.389e-03 | 9 | 0 | 1 | 8.391e-03 | 8 |
| 444 | | min | -.007 | 1 | -.037 | 9 | -.015 | 1 | -2.748e-04 | 1 | 0 | 1 | 2.375e-03 | 1 |
| 445 | N571 | max | .002 | 2 | .025 | 10 | .015 | 2 | 5.07e-03 | 9 | 0 | 1 | 8.119e-03 | 8 |
| 446 | | min | -.007 | 1 | -.037 | 9 | -.015 | 1 | -4.017e-04 | 1 | 0 | 1 | 2.263e-03 | 1 |
| 447 | N572 | max | .003 | 10 | .023 | 1 | .014 | 2 | 6.335e-03 | 6 | 0 | 1 | 7.444e-03 | 8 |
| 448 | | min | -.006 | 1 | -.054 | 9 | -.015 | 1 | -7.652e-05 | 1 | 0 | 1 | 2.118e-03 | 1 |
| 449 | N573 | max | .003 | 2 | .021 | 1 | .015 | 2 | 5.817e-03 | 6 | 0 | 1 | 7.76e-03 | 8 |
| 450 | | min | -.006 | 1 | -.053 | 9 | -.015 | 1 | -1.318e-04 | 1 | 0 | 1 | 2.293e-03 | 3 |
| 451 | N574 | max | .003 | 2 | .018 | 1 | .015 | 2 | 5.443e-03 | 9 | 0 | 1 | 7.286e-03 | 8 |
| 452 | | min | -.007 | 1 | -.052 | 9 | -.014 | 1 | -2.247e-04 | 1 | 0 | 1 | 2.081e-03 | 1 |
| 453 | N575 | max | .003 | 2 | .015 | 1 | .015 | 2 | 5.125e-03 | 9 | 0 | 1 | 6.982e-03 | 8 |
| 454 | | min | -.007 | 1 | -.051 | 9 | -.014 | 1 | -3.803e-04 | 1 | 0 | 1 | 1.9e-03 | 3 |
| 455 | N576 | max | .002 | 2 | .012 | 1 | .015 | 2 | 4.776e-03 | 9 | 0 | 1 | 6.775e-03 | 8 |
| 456 | | min | -.007 | 1 | -.051 | 9 | -.014 | 1 | -5.203e-04 | 1 | 0 | 1 | 1.727e-03 | 3 |
| 457 | N577 | max | .003 | 10 | .017 | 1 | .015 | 2 | 6.596e-03 | 6 | 0 | 1 | 7.25e-03 | 8 |
| 458 | | min | -.006 | 1 | -.072 | 9 | -.014 | 1 | 8.202e-05 | 1 | 0 | 1 | 2.053e-03 | 3 |

## *Envelope Joint Displacements (Continued)*

| | Joint | | X [in] | LC | Y [in] | LC | Z [in] | LC | X Rotation [... | LC | Y Rotation [... | LC | Z Rotation [... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 459 | N578 | max | .003 | 2 | .015 | 1 | .015 | 2 | 6.103e-03 | 6 | 0 | 1 | 6.437e-03 | 8 |
| 460 | | min | -.006 | 1 | -.069 | 9 | -.014 | 1 | 5.611e-06 | 1 | 0 | 1 | 1.786e-03 | 3 |
| 461 | N579 | max | .003 | 2 | .013 | 1 | .015 | 2 | 5.659e-03 | 9 | 0 | 1 | 6.369e-03 | 8 |
| 462 | | min | -.006 | 1 | -.067 | 9 | -.014 | 1 | -1.995e-04 | 1 | 0 | 1 | 1.673e-03 | 3 |
| 463 | N580 | max | .003 | 2 | .011 | 1 | .015 | 2 | 5.374e-03 | 9 | 0 | 1 | 6.352e-03 | 8 |
| 464 | | min | -.007 | 1 | -.065 | 9 | -.014 | 1 | -3.207e-04 | 1 | 0 | 1 | 1.568e-03 | 3 |
| 465 | N581 | max | .003 | 2 | .009 | 1 | .015 | 2 | 5.078e-03 | 9 | 0 | 1 | 6.143e-03 | 8 |
| 466 | | min | -.007 | 1 | -.062 | 9 | -.013 | 1 | -3.944e-04 | 1 | 0 | 1 | 1.411e-03 | 3 |
| 467 | N582 | max | .003 | 10 | .011 | 1 | .015 | 2 | 7.041e-03 | 6 | 0 | 1 | 5.701e-03 | 8 |
| 468 | | min | -.006 | 1 | -.089 | 9 | -.014 | 1 | 2.358e-04 | 1 | 0 | 1 | 1.555e-03 | 1 |
| 469 | N583 | max | .003 | 10 | .01 | 1 | .015 | 2 | 6.415e-03 | 6 | 0 | 1 | 6.303e-03 | 8 |
| 470 | | min | -.006 | 1 | -.085 | 9 | -.014 | 1 | -2.292e-06 | 1 | 0 | 1 | 1.648e-03 | 3 |
| 471 | N584 | max | .003 | 2 | .008 | 1 | .015 | 2 | 6.164e-03 | 9 | 0 | 1 | 6.41e-03 | 8 |
| 472 | | min | -.006 | 1 | -.081 | 9 | -.013 | 1 | -3.929e-05 | 1 | 0 | 1 | 1.578e-03 | 3 |
| 473 | N585 | max | .003 | 2 | .007 | 1 | .015 | 2 | 5.926e-03 | 9 | 0 | 1 | 6.184e-03 | 8 |
| 474 | | min | -.006 | 1 | -.078 | 9 | -.013 | 1 | -6.177e-05 | 1 | 0 | 1 | 1.424e-03 | 3 |
| 475 | N586 | max | .003 | 2 | .005 | 1 | .015 | 2 | 5.643e-03 | 9 | 0 | 1 | 5.823e-03 | 8 |
| 476 | | min | -.007 | 1 | -.074 | 9 | -.013 | 1 | -1.099e-04 | 1 | 0 | 1 | 1.226e-03 | 3 |
| 477 | N587 | max | .003 | 10 | .004 | 1 | .015 | 2 | 8.216e-03 | 6 | 3.969e-04 | 5 | 7.484e-03 | 8 |
| 478 | | min | -.006 | 1 | -.102 | 9 | -.013 | 1 | 5.927e-04 | 1 | 7.577e-05 | 3 | 1.97e-03 | 3 |
| 479 | N588 | max | .003 | 2 | .003 | 1 | .016 | 2 | 7.632e-03 | 6 | 4.161e-04 | 5 | 6.815e-03 | 8 |
| 480 | | min | -.006 | 1 | -.097 | 9 | -.013 | 1 | 4.952e-04 | 1 | 9.425e-05 | 3 | 1.669e-03 | 3 |
| 481 | N589 | max | .003 | 2 | .002 | 1 | .016 | 2 | 7.052e-03 | 6 | 4.115e-04 | 5 | 6.197e-03 | 8 |
| 482 | | min | -.006 | 1 | -.091 | 9 | -.013 | 1 | 3.955e-04 | 1 | 9.363e-05 | 3 | 1.389e-03 | 3 |
| 483 | N590 | max | .002 | 2 | .015 | 10 | .015 | 2 | 4.162e-03 | 9 | 0 | 1 | 7.464e-03 | 8 |
| 484 | | min | -.007 | 1 | -.038 | 9 | -.014 | 1 | -7.472e-04 | 1 | 0 | 1 | 1.976e-03 | 3 |
| 485 | N591 | max | .002 | 2 | .011 | 10 | .015 | 2 | 3.648e-03 | 9 | 0 | 1 | 7.063e-03 | 8 |
| 486 | | min | -.008 | 1 | -.038 | 9 | -.014 | 1 | -9.091e-04 | 1 | 0 | 1 | 1.733e-03 | 3 |
| 487 | N592 | max | .002 | 2 | .006 | 1 | .015 | 2 | 3.105e-03 | 9 | 0 | 1 | 6.505e-03 | 8 |
| 488 | | min | -.008 | 1 | -.038 | 9 | -.013 | 1 | -1.059e-03 | 1 | 0 | 1 | 1.438e-03 | 3 |
| 489 | N593 | max | .002 | 2 | .01 | 1 | .015 | 2 | 4.333e-03 | 9 | 0 | 1 | 6.501e-03 | 8 |
| 490 | | min | -.007 | 1 | -.049 | 9 | -.013 | 1 | -6.612e-04 | 1 | 0 | 1 | 1.539e-03 | 3 |
| 491 | N594 | max | .002 | 2 | .007 | 1 | .015 | 2 | 3.853e-03 | 9 | 0 | 1 | 6.071e-03 | 8 |
| 492 | | min | -.008 | 1 | -.047 | 9 | -.013 | 1 | -7.931e-04 | 1 | 0 | 1 | 1.297e-03 | 3 |
| 493 | N595 | max | .002 | 2 | .004 | 1 | .015 | 2 | 3.36e-03 | 9 | 0 | 1 | 5.47e-03 | 8 |
| 494 | | min | -.008 | 1 | -.046 | 9 | -.013 | 1 | -9.102e-04 | 1 | 0 | 1 | 9.965e-04 | 3 |
| 495 | N596 | max | .002 | 2 | .001 | 1 | .015 | 2 | 2.898e-03 | 9 | 0 | 1 | 4.751e-03 | 8 |
| 496 | | min | -.008 | 1 | -.045 | 9 | -.013 | 1 | -9.987e-04 | 1 | 0 | 1 | 6.59e-04 | 3 |
| 497 | N597 | max | .002 | 2 | .007 | 1 | .015 | 2 | 4.668e-03 | 9 | 0 | 1 | 5.775e-03 | 8 |
| 498 | | min | -.007 | 1 | -.059 | 9 | -.013 | 1 | -4.94e-04 | 1 | 0 | 1 | 1.195e-03 | 3 |
| 499 | N598 | max | .002 | 2 | .004 | 1 | .015 | 2 | 4.221e-03 | 9 | 0 | 1 | 5.264e-03 | 8 |
| 500 | | min | -.007 | 1 | -.057 | 9 | -.013 | 1 | -5.981e-04 | 1 | 0 | 1 | 9.342e-04 | 3 |
| 501 | N599 | max | .002 | 2 | .002 | 1 | .015 | 2 | 3.749e-03 | 9 | 0 | 1 | 4.655e-03 | 8 |
| 502 | | min | -.008 | 1 | -.054 | 9 | -.013 | 1 | -7.061e-04 | 1 | 0 | 1 | 6.429e-04 | 3 |
| 503 | N600 | max | .002 | 2 | 0 | 1 | .016 | 2 | 3.269e-03 | 9 | 0 | 1 | 3.983e-03 | 8 |
| 504 | | min | -.008 | 1 | -.052 | 9 | -.012 | 1 | -8.085e-04 | 1 | 0 | 1 | 3.329e-04 | 3 |
| 505 | N601 | max | .003 | 2 | .003 | 1 | .015 | 2 | 5.228e-03 | 9 | 0 | 1 | 5.285e-03 | 8 |
| 506 | | min | -.007 | 1 | -.07 | 9 | -.013 | 1 | -1.99e-04 | 1 | 0 | 1 | 9.605e-04 | 3 |
| 507 | N602 | max | .002 | 2 | .002 | 1 | .016 | 2 | 4.766e-03 | 9 | 0 | 1 | 4.682e-03 | 8 |
| 508 | | min | -.007 | 1 | -.066 | 9 | -.013 | 1 | -3.077e-04 | 1 | 0 | 1 | 6.757e-04 | 3 |
| 509 | N603 | max | .002 | 2 | 0 | 1 | .016 | 2 | 4.266e-03 | 9 | 0 | 1 | 4.045e-03 | 8 |
| 510 | | min | -.008 | 1 | -.062 | 9 | -.013 | 1 | -4.313e-04 | 1 | 0 | 1 | 3.81e-04 | 3 |

## *Envelope Joint Displacements (Continued)*

| | Joint | | X [in] | LC | Y [in] | LC | Z [in] | LC | X Rotation [... | LC | Y Rotation [... | LC | Z Rotation [... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 511 | N604 | max | .002 | 2 | -.001 | 3 | .016 | 2 | 3.756e-03 | 9 | 0 | 1 | 3.415e-03 | 8 |
| 512 | | min | -.008 | 1 | -.058 | 9 | -.012 | 1 | -5.608e-04 | 1 | 0 | 1 | 9.294e-05 | 3 |
| 513 | N605 | max | .003 | 2 | 0 | 1 | .016 | 2 | 5.871e-03 | 9 | 3.793e-04 | 5 | 4.964e-03 | 8 |
| 514 | | min | -.007 | 1 | -.08 | 9 | -.013 | 1 | 1.62e-04 | 1 | 7.572e-05 | 3 | 8.244e-04 | 3 |
| 515 | N606 | max | .003 | 2 | -.001 | 1 | .016 | 2 | 5.354e-03 | 9 | 3.509e-04 | 5 | 4.353e-03 | 8 |
| 516 | | min | -.007 | 1 | -.074 | 9 | -.012 | 1 | 2.186e-05 | 1 | 5.803e-05 | 3 | 5.421e-04 | 3 |
| 517 | N607 | max | .002 | 2 | -.002 | 1 | .016 | 2 | 4.812e-03 | 9 | 3.125e-04 | 5 | 3.791e-03 | 8 |
| 518 | | min | -.008 | 1 | -.069 | 9 | -.012 | 1 | -1.271e-04 | 1 | 3.328e-05 | 3 | 2.804e-04 | 3 |
| 519 | N608 | max | .002 | 2 | 0 | 3 | .015 | 2 | 2.032e-03 | 9 | 0 | 1 | 4.699e-03 | 8 |
| 520 | | min | -.008 | 1 | -.038 | 9 | -.013 | 1 | -1.289e-03 | 10 | 0 | 1 | 5.978e-04 | 3 |
| 521 | N609 | max | .002 | 3 | 0 | 3 | .015 | 2 | 1.793e-03 | 9 | 0 | 1 | 3.512e-03 | 8 |
| 522 | | min | -.008 | 4 | -.038 | 9 | -.012 | 1 | -1.176e-03 | 1 | 0 | 1 | 8.859e-05 | 3 |
| 523 | N610 | max | .002 | 3 | 0 | 3 | .015 | 2 | 2.192e-03 | 9 | 2.739e-04 | 2 | 2.202e-03 | 4 |
| 524 | | min | -.008 | 4 | -.037 | 9 | -.012 | 1 | -8.066e-04 | 1 | -2.711e-04 | 1 | -4.659e-04 | 3 |
| 525 | N611 | max | .002 | 2 | 0 | 3 | .015 | 2 | 2.44e-03 | 9 | 0 | 1 | 4.e-03 | 8 |
| 526 | | min | -.008 | 1 | -.044 | 9 | -.012 | 1 | -1.058e-03 | 1 | 0 | 1 | 3.191e-04 | 3 |
| 527 | N612 | max | .002 | 3 | 0 | 3 | .015 | 2 | 2.232e-03 | 9 | 0 | 1 | 3.16e-03 | 8 |
| 528 | | min | -.008 | 4 | -.043 | 9 | -.012 | 1 | -1.003e-03 | 1 | 0 | 1 | -4.557e-05 | 3 |
| 529 | N613 | max | .002 | 3 | 0 | 3 | .016 | 2 | 2.25e-03 | 9 | 2.164e-04 | 2 | 2.225e-03 | 4 |
| 530 | | min | -.008 | 4 | -.041 | 9 | -.012 | 1 | -8.085e-04 | 1 | -2.135e-04 | 1 | -4.75e-04 | 3 |
| 531 | N614 | max | .002 | 3 | 0 | 3 | .016 | 2 | 2.25e-03 | 9 | 2.164e-04 | 2 | 2.225e-03 | 4 |
| 532 | | min | -.009 | 4 | -.04 | 8 | -.012 | 1 | -8.085e-04 | 1 | -2.135e-04 | 1 | -4.75e-04 | 3 |
| 533 | N615 | max | .002 | 2 | 0 | 3 | .016 | 2 | 2.82e-03 | 9 | 0 | 1 | 3.331e-03 | 8 |
| 534 | | min | -.008 | 1 | -.05 | 9 | -.012 | 1 | -8.983e-04 | 1 | 0 | 1 | 3.88e-05 | 3 |
| 535 | N616 | max | .002 | 2 | 0 | 3 | .016 | 2 | 2.498e-03 | 9 | 0 | 1 | 2.726e-03 | 8 |
| 536 | | min | -.008 | 1 | -.048 | 9 | -.012 | 1 | -8.99e-04 | 1 | 0 | 1 | -2.366e-04 | 3 |
| 537 | N617 | max | .002 | 3 | 0 | 3 | .016 | 2 | 2.306e-03 | 9 | 2.051e-04 | 4 | 2.241e-03 | 4 |
| 538 | | min | -.008 | 4 | -.046 | 9 | -.012 | 1 | -8.04e-04 | 1 | -2.049e-04 | 3 | -4.823e-04 | 3 |
| 539 | N618 | max | .002 | 3 | 0 | 3 | .016 | 2 | 2.306e-03 | 9 | 2.051e-04 | 4 | 2.241e-03 | 4 |
| 540 | | min | -.008 | 4 | -.045 | 8 | -.012 | 1 | -8.04e-04 | 1 | -2.049e-04 | 3 | -4.823e-04 | 3 |
| 541 | N619 | max | .002 | 2 | 0 | 3 | .016 | 2 | 3.21e-03 | 9 | 0 | 1 | 2.822e-03 | 8 |
| 542 | | min | -.008 | 1 | -.055 | 9 | -.012 | 1 | -6.972e-04 | 1 | 0 | 1 | -1.799e-04 | 3 |
| 543 | N620 | max | .002 | 2 | 0 | 3 | .016 | 2 | 2.803e-03 | 9 | 0 | 1 | 2.453e-03 | 8 |
| 544 | | min | -.008 | 1 | -.053 | 9 | -.012 | 1 | -7.919e-04 | 1 | 0 | 1 | -3.56e-04 | 3 |
| 545 | N621 | max | .002 | 2 | 0 | 3 | .016 | 2 | 2.36e-03 | 9 | 2.124e-04 | 4 | 2.253e-03 | 4 |
| 546 | | min | -.008 | 8 | -.05 | 9 | -.012 | 1 | -8.013e-04 | 1 | -2.121e-04 | 3 | -4.89e-04 | 3 |
| 547 | N622 | max | .002 | 3 | .001 | 3 | .016 | 2 | 2.36e-03 | 9 | 2.124e-04 | 4 | 2.253e-03 | 4 |
| 548 | | min | -.008 | 4 | -.049 | 8 | -.013 | 1 | -8.013e-04 | 1 | -2.121e-04 | 3 | -4.89e-04 | 3 |
| 549 | N623 | max | .002 | 2 | 0 | 3 | .016 | 2 | 3.658e-03 | 9 | 2.225e-04 | 4 | 2.851e-03 | 8 |
| 550 | | min | -.008 | 1 | -.061 | 9 | -.012 | 1 | -4.496e-04 | 1 | -4.454e-05 | 3 | -1.681e-04 | 3 |
| 551 | N624 | max | .002 | 2 | 0 | 3 | .016 | 2 | 3.05e-03 | 9 | 2.205e-04 | 4 | 2.492e-03 | 8 |
| 552 | | min | -.008 | 1 | -.058 | 9 | -.012 | 1 | -6.214e-04 | 1 | -7.368e-05 | 3 | -3.474e-04 | 3 |
| 553 | N625 | max | .002 | 2 | .001 | 3 | .016 | 2 | 2.41e-03 | 9 | 2.146e-04 | 4 | 2.261e-03 | 4 |
| 554 | | min | -.008 | 1 | -.055 | 9 | -.013 | 1 | -8.02e-04 | 1 | -2.143e-04 | 3 | -4.956e-04 | 3 |
| 555 | N794 | max | .004 | 10 | .114 | 5 | .012 | 2 | 1.161e-02 | 6 | 0 | 1 | 8.328e-03 | 6 |
| 556 | | min | -.005 | 1 | -.003 | 9 | -.018 | 1 | 9.323e-04 | 1 | 0 | 1 | 2.499e-03 | 1 |
| 557 | N795 | max | .004 | 10 | .119 | 5 | .012 | 2 | 1.17e-02 | 6 | 0 | 1 | 7.658e-03 | 6 |
| 558 | | min | -.004 | 1 | 0 | 9 | -.018 | 1 | 9.423e-04 | 1 | 0 | 1 | 2.29e-03 | 1 |
| 559 | N796 | max | .005 | 10 | .124 | 5 | .012 | 2 | 1.168e-02 | 6 | 0 | 1 | 6.73e-03 | 6 |
| 560 | | min | -.004 | 1 | .003 | 9 | -.019 | 1 | 9.201e-04 | 1 | 0 | 1 | 2.001e-03 | 1 |
| 561 | N797 | max | .005 | 10 | .098 | 5 | .012 | 2 | 1.152e-02 | 6 | 0 | 1 | 8.268e-03 | 6 |
| 562 | | min | -.004 | 1 | -.014 | 9 | -.018 | 1 | 9.035e-04 | 1 | 0 | 1 | 2.511e-03 | 1 |

## *Envelope Joint Displacements (Continued)*

| | Joint | | X [in] | LC | Y [in] | LC | Z [in] | LC | X Rotation [... | LC | Y Rotation [... | LC | Z Rotation [... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 563 | N798 | max | .005 | 10 | .103 | 5 | .012 | 2 | 1.153e-02 | 6 | 0 | 1 | 7.798e-03 | 6 |
| 564 | | min | -.004 | 1 | -.012 | 9 | -.018 | 1 | 8.894e-04 | 1 | 0 | 1 | 2.364e-03 | 1 |
| 565 | N799 | max | .005 | 10 | .108 | 5 | .012 | 2 | 1.143e-02 | 6 | 0 | 1 | 7.098e-03 | 6 |
| 566 | | min | -.004 | 1 | -.009 | 9 | -.019 | 1 | 8.385e-04 | 1 | 0 | 1 | 2.145e-03 | 1 |
| 567 | N800 | max | .005 | 10 | .112 | 5 | .012 | 2 | 1.116e-02 | 6 | 0 | 1 | 6.118e-03 | 6 |
| 568 | | min | -.004 | 1 | -.006 | 9 | -.019 | 1 | 7.367e-04 | 1 | 0 | 1 | 1.837e-03 | 1 |
| 569 | N801 | max | .005 | 10 | .081 | 5 | .012 | 2 | 1.171e-02 | 6 | 0 | 1 | 8.217e-03 | 6 |
| 570 | | min | -.004 | 1 | -.026 | 9 | -.018 | 1 | 9.587e-04 | 1 | 0 | 1 | 2.525e-03 | 1 |
| 571 | N802 | max | .005 | 10 | .087 | 5 | .012 | 2 | 1.177e-02 | 6 | 0 | 1 | 7.958e-03 | 6 |
| 572 | | min | -.004 | 1 | -.023 | 9 | -.018 | 1 | 9.621e-04 | 1 | 0 | 1 | 2.444e-03 | 1 |
| 573 | N803 | max | .005 | 10 | .092 | 5 | .012 | 2 | 1.169e-02 | 6 | 0 | 1 | 7.553e-03 | 6 |
| 574 | | min | -.004 | 1 | -.02 | 9 | -.019 | 1 | 9.202e-04 | 1 | 0 | 1 | 2.316e-03 | 1 |
| 575 | N804 | max | .005 | 10 | .096 | 5 | .012 | 2 | 1.149e-02 | 6 | 0 | 1 | 6.87e-03 | 6 |
| 576 | | min | -.004 | 1 | -.018 | 9 | -.019 | 1 | 8.413e-04 | 1 | 0 | 1 | 2.101e-03 | 1 |
| 577 | N805 | max | .005 | 10 | .065 | 5 | .012 | 2 | 1.19e-02 | 6 | 0 | 1 | 8.046e-03 | 6 |
| 578 | | min | -.004 | 1 | -.038 | 9 | -.018 | 1 | 1.018e-03 | 1 | 0 | 1 | 2.498e-03 | 1 |
| 579 | N806 | max | .005 | 10 | .07 | 5 | .012 | 2 | 1.204e-02 | 6 | 0 | 1 | 7.973e-03 | 6 |
| 580 | | min | -.004 | 1 | -.035 | 9 | -.018 | 1 | 1.048e-03 | 1 | 0 | 1 | 2.473e-03 | 1 |
| 581 | N807 | max | .005 | 10 | .075 | 5 | .012 | 2 | 1.214e-02 | 6 | 0 | 1 | 7.769e-03 | 6 |
| 582 | | min | -.004 | 1 | -.033 | 9 | -.019 | 1 | 1.064e-03 | 1 | 0 | 1 | 2.409e-03 | 1 |
| 583 | N808 | max | .005 | 10 | .08 | 5 | .012 | 2 | 1.201e-02 | 6 | 0 | 1 | 7.548e-03 | 6 |
| 584 | | min | -.004 | 1 | -.03 | 9 | -.019 | 1 | 1.011e-03 | 1 | 0 | 1 | 2.339e-03 | 1 |
| 585 | N809 | max | .005 | 10 | .056 | 1 | .012 | 2 | 1.182e-02 | 6 | 3.042e-04 | 5 | 7.81e-03 | 6 |
| 586 | | min | -.004 | 1 | -.049 | 9 | -.018 | 1 | 9.979e-04 | 1 | 7.696e-05 | 3 | 2.445e-03 | 1 |
| 587 | N810 | max | .005 | 10 | .058 | 1 | .012 | 2 | 1.197e-02 | 6 | 2.907e-04 | 5 | 7.717e-03 | 6 |
| 588 | | min | -.004 | 1 | -.047 | 9 | -.018 | 1 | 1.032e-03 | 1 | 7.522e-05 | 10 | 2.415e-03 | 1 |
| 589 | N811 | max | .005 | 10 | .06 | 1 | .012 | 2 | 1.198e-02 | 6 | 2.669e-04 | 9 | 7.88e-03 | 6 |
| 590 | | min | -.004 | 1 | -.045 | 9 | -.019 | 1 | 1.023e-03 | 1 | 5.255e-05 | 10 | 2.462e-03 | 1 |
| 591 | N812 | max | .005 | 10 | .131 | 5 | .012 | 2 | 1.121e-02 | 6 | 0 | 1 | 3.893e-03 | 6 |
| 592 | | min | -.004 | 1 | .008 | 9 | -.019 | 1 | 7.472e-04 | 1 | 0 | 1 | 1.118e-03 | 1 |
| 593 | N813 | max | .005 | 10 | .133 | 5 | .011 | 2 | 1.092e-02 | 6 | 0 | 1 | 2.362e-03 | 9 |
| 594 | | min | -.004 | 1 | .009 | 9 | -.019 | 1 | 6.489e-04 | 1 | 0 | 1 | 6.23e-05 | 10 |
| 595 | N815 | max | .005 | 10 | .116 | 5 | .012 | 2 | 1.081e-02 | 6 | 0 | 1 | 4.826e-03 | 6 |
| 596 | | min | -.004 | 1 | -.004 | 9 | -.019 | 1 | 6.146e-04 | 1 | 0 | 1 | 1.43e-03 | 1 |
| 597 | N816 | max | .005 | 10 | .118 | 5 | .011 | 2 | 1.018e-02 | 6 | 0 | 1 | 3.102e-03 | 8 |
| 598 | | min | -.004 | 1 | -.002 | 9 | -.019 | 1 | 3.999e-04 | 1 | 0 | 1 | 8.777e-04 | 1 |
| 599 | N818 | max | .005 | 10 | .1 | 5 | .012 | 2 | 1.107e-02 | 6 | 0 | 1 | 5.799e-03 | 6 |
| 600 | | min | -.004 | 1 | -.016 | 9 | -.019 | 1 | 6.904e-04 | 1 | 0 | 1 | 1.76e-03 | 1 |
| 601 | N819 | max | .005 | 10 | .103 | 5 | .011 | 2 | 1.085e-02 | 6 | 0 | 1 | 4.287e-03 | 6 |
| 602 | | min | -.004 | 1 | -.014 | 9 | -.019 | 1 | 6.044e-04 | 1 | 0 | 1 | 1.283e-03 | 1 |
| 603 | N821 | max | .005 | 10 | .084 | 5 | .012 | 2 | 1.18e-02 | 6 | 0 | 1 | 6.72e-03 | 6 |
| 604 | | min | -.004 | 1 | -.028 | 9 | -.019 | 1 | 9.361e-04 | 1 | 0 | 1 | 2.077e-03 | 1 |
| 605 | N822 | max | .005 | 10 | .087 | 5 | .011 | 2 | 1.12e-02 | 6 | 0 | 1 | 5.218e-03 | 6 |
| 606 | | min | -.004 | 1 | -.026 | 9 | -.019 | 1 | 7.394e-04 | 1 | 0 | 1 | 1.582e-03 | 1 |
| 607 | N824 | max | .005 | 10 | .067 | 5 | .012 | 2 | 1.159e-02 | 6 | 2.313e-04 | 9 | 8.139e-03 | 6 |
| 608 | | min | -.004 | 1 | -.04 | 9 | -.019 | 1 | 8.851e-04 | 1 | -1.164e-06 | 10 | 2.541e-03 | 1 |
| 609 | N825 | max | .005 | 10 | .071 | 5 | .011 | 2 | 1.076e-02 | 6 | 2.424e-04 | 9 | 5.985e-03 | 6 |
| 610 | | min | -.004 | 1 | -.038 | 9 | -.019 | 1 | 6.012e-04 | 1 | 3.609e-05 | 10 | 1.849e-03 | 1 |
| 611 | N899 | max | .008 | 10 | 0 | 1 | .01 | 2 | 8.109e-03 | 10 | 6.695e-05 | 2 | -1.415e-03 | 4 |
| 612 | | min | -.002 | 4 | -.099 | 10 | -.008 | 1 | 7.872e-04 | 1 | -4.396e-04 | 5 | -7.095e-03 | 10 |
| 613 | N900 | max | .008 | 10 | .005 | 1 | .011 | 2 | 5.932e-03 | 10 | 0 | 1 | -1.254e-03 | 4 |
| 614 | | min | -.002 | 4 | -.069 | 10 | -.009 | 1 | 6.456e-05 | 1 | 0 | 1 | -6.133e-03 | 10 |

## Envelope Joint Displacements (Continued)

| | Joint | | X [in] | LC | Y [in] | LC | Z [in] | LC | X Rotation [... | LC | Y Rotation [... | LC | Z Rotation [... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 615 | N901 | max | .004 | 10 | .012 | 1 | .015 | 2 | 7.539e-03 | 6 | 6.137e-04 | 5 | 7.359e-03 | 8 |
| 616 | | min | -.005 | 1 | -.099 | 9 | -.014 | 1 | 2.351e-04 | 1 | -1.131e-04 | 2 | 2.093e-03 | 3 |
| 617 | N902 | max | .003 | 10 | .018 | 1 | .015 | 2 | 7.135e-03 | 6 | 0 | 1 | 7.038e-03 | 8 |
| 618 | | min | -.006 | 1 | -.078 | 9 | -.014 | 1 | 1.814e-04 | 1 | 0 | 1 | 2.062e-03 | 3 |
| 619 | N902A | max | .015 | 3 | .004 | 2 | .001 | 6 | 4.313e-04 | 2 | 2.699e-04 | 4 | 1.34e-03 | 4 |
| 620 | | min | -.015 | 4 | -.054 | 5 | 0 | 1 | -2.509e-03 | 5 | -2.674e-04 | 3 | -1.366e-03 | 3 |
| 621 | N903B | max | .013 | 3 | .001 | 2 | 0 | 2 | 4.103e-04 | 2 | 4.17e-04 | 4 | 1.351e-03 | 4 |
| 622 | | min | -.013 | 4 | -.036 | 5 | 0 | 1 | -2.464e-03 | 5 | -4.148e-04 | 3 | -1.373e-03 | 3 |
| 623 | N904B | max | .014 | 3 | .003 | 2 | .001 | 6 | 4.284e-04 | 2 | 2.78e-04 | 4 | 1.341e-03 | 4 |
| 624 | | min | -.014 | 4 | -.05 | 5 | 0 | 1 | -2.507e-03 | 5 | -2.756e-04 | 3 | -1.366e-03 | 3 |
| 625 | N905 | max | .014 | 3 | .003 | 2 | 0 | 6 | 4.242e-04 | 2 | 3.028e-04 | 4 | 1.347e-03 | 4 |
| 626 | | min | -.014 | 4 | -.045 | 5 | 0 | 1 | -2.499e-03 | 5 | -3.003e-04 | 3 | -1.371e-03 | 3 |
| 627 | N906 | max | .013 | 3 | .002 | 2 | 0 | 6 | 4.183e-04 | 2 | 3.485e-04 | 4 | 1.354e-03 | 4 |
| 628 | | min | -.013 | 4 | -.041 | 5 | 0 | 1 | -2.485e-03 | 5 | -3.461e-04 | 3 | -1.377e-03 | 3 |
| 629 | N912 | max | .005 | 2 | .002 | 3 | .009 | 2 | 2.41e-03 | 9 | 2.146e-04 | 4 | 2.261e-03 | 4 |
| 630 | | min | -.005 | 1 | -.054 | 8 | -.01 | 1 | -8.02e-04 | 1 | -2.143e-04 | 3 | -4.956e-04 | 3 |
| 631 | N913 | max | .005 | 2 | 0 | 3 | .008 | 2 | 2.192e-03 | 9 | 2.739e-04 | 2 | 2.202e-03 | 4 |
| 632 | | min | -.004 | 1 | -.036 | 8 | -.009 | 1 | -8.066e-04 | 1 | -2.711e-04 | 1 | -4.659e-04 | 3 |
| 633 | N914 | max | .005 | 2 | .001 | 3 | .009 | 2 | 2.36e-03 | 9 | 2.124e-04 | 4 | 2.253e-03 | 4 |
| 634 | | min | -.005 | 1 | -.049 | 8 | -.009 | 1 | -8.013e-04 | 1 | -2.121e-04 | 3 | -4.89e-04 | 3 |
| 635 | N915 | max | .005 | 2 | 0 | 3 | .009 | 2 | 2.306e-03 | 9 | 2.051e-04 | 4 | 2.241e-03 | 4 |
| 636 | | min | -.005 | 1 | -.045 | 8 | -.009 | 1 | -8.04e-04 | 1 | -2.049e-04 | 3 | -4.823e-04 | 3 |
| 637 | N916 | max | .005 | 2 | 0 | 3 | .009 | 2 | 2.25e-03 | 9 | 2.164e-04 | 2 | 2.225e-03 | 4 |
| 638 | | min | -.004 | 1 | -.04 | 8 | -.009 | 1 | -8.085e-04 | 1 | -2.135e-04 | 1 | -4.75e-04 | 3 |
| 639 | N922 | max | .001 | 1 | .002 | 4 | .003 | 2 | 1.909e-03 | 10 | 2.426e-04 | 4 | 5.469e-04 | 4 |
| 640 | | min | -.002 | 2 | -.07 | 10 | -.003 | 1 | -6.197e-04 | 1 | -2.399e-04 | 3 | -2.701e-03 | 10 |
| 641 | N923 | max | .002 | 1 | 0 | 4 | .004 | 2 | 1.83e-03 | 10 | 1.955e-04 | 4 | 5.099e-04 | 4 |
| 642 | | min | -.002 | 2 | -.046 | 10 | -.004 | 1 | -6.048e-04 | 1 | -1.928e-04 | 3 | -2.677e-03 | 10 |
| 643 | N924 | max | .001 | 1 | .002 | 4 | .003 | 2 | 1.895e-03 | 10 | 2.403e-04 | 4 | 5.383e-04 | 4 |
| 644 | | min | -.002 | 2 | -.064 | 10 | -.004 | 1 | -6.14e-04 | 1 | -2.376e-04 | 3 | -2.705e-03 | 10 |
| 645 | N925 | max | .001 | 1 | .001 | 4 | .003 | 2 | 1.878e-03 | 10 | 2.327e-04 | 4 | 5.296e-04 | 4 |
| 646 | | min | -.002 | 2 | -.058 | 10 | -.004 | 1 | -6.11e-04 | 1 | -2.299e-04 | 3 | -2.703e-03 | 10 |
| 647 | N926 | max | .002 | 1 | 0 | 4 | .004 | 2 | 1.856e-03 | 10 | 2.181e-04 | 4 | 5.205e-04 | 4 |
| 648 | | min | -.002 | 2 | -.052 | 10 | -.004 | 1 | -6.099e-04 | 1 | -2.154e-04 | 3 | -2.695e-03 | 10 |
| 649 | N911 | max | .003 | 10 | .018 | 1 | .015 | 2 | 6.62e-03 | 6 | 0 | 1 | 6.745e-03 | 8 |
| 650 | | min | -.006 | 1 | -.075 | 9 | -.014 | 1 | -1.884e-05 | 1 | 0 | 1 | 1.977e-03 | 1 |
| 651 | N912A | max | .004 | 10 | .013 | 1 | .015 | 2 | 7.444e-03 | 6 | 0 | 1 | 6.941e-03 | 8 |
| 652 | | min | -.006 | 1 | -.089 | 9 | -.014 | 1 | 3.639e-04 | 1 | 0 | 1 | 1.939e-03 | 3 |
| 653 | N913A | max | .004 | 10 | .009 | 1 | .015 | 2 | 8.253e-03 | 6 | 4.695e-04 | 2 | 6.289e-03 | 6 |
| 654 | | min | -.005 | 1 | -.103 | 9 | -.014 | 1 | 6.858e-04 | 1 | -3.892e-04 | 1 | 1.754e-03 | 1 |
| 655 | N914A | max | .004 | 10 | .015 | 1 | .015 | 2 | 7.229e-03 | 6 | 0 | 1 | 6.723e-03 | 8 |
| 656 | | min | -.005 | 1 | -.088 | 9 | -.014 | 1 | 1.518e-04 | 1 | 0 | 1 | 1.983e-03 | 3 |
| 657 | N915A | max | .003 | 10 | .022 | 1 | .014 | 2 | 6.883e-03 | 6 | 0 | 1 | 7.63e-03 | 8 |
| 658 | | min | -.006 | 1 | -.062 | 9 | -.015 | 1 | 1.014e-04 | 1 | 0 | 1 | 2.306e-03 | 3 |
| 659 | N916A | max | .003 | 10 | .022 | 1 | .014 | 2 | 7.035e-03 | 6 | 0 | 1 | 7.208e-03 | 8 |
| 660 | | min | -.006 | 1 | -.07 | 9 | -.015 | 1 | 5.722e-05 | 1 | 0 | 1 | 2.161e-03 | 1 |
| 661 | N917 | max | .004 | 10 | .019 | 1 | .015 | 2 | 7.455e-03 | 6 | 0 | 1 | 7.066e-03 | 8 |
| 662 | | min | -.005 | 1 | -.082 | 9 | -.015 | 1 | 2.318e-04 | 1 | 0 | 1 | 2.1e-03 | 3 |
| 663 | N918 | max | .004 | 10 | .016 | 1 | .015 | 2 | 7.762e-03 | 6 | 2.995e-04 | 2 | 6.623e-03 | 8 |
| 664 | | min | -.005 | 1 | -.095 | 9 | -.014 | 1 | 3.501e-04 | 1 | -5.61e-05 | 1 | 1.979e-03 | 1 |
| 665 | N919 | max | .007 | 10 | 0 | 1 | .01 | 2 | 8.657e-03 | 10 | 5.251e-05 | 2 | -1.686e-03 | 4 |
| 666 | | min | -.002 | 4 | -.103 | 10 | -.008 | 1 | 9.039e-04 | 1 | -4.273e-04 | 5 | -7.782e-03 | 10 |

## *Envelope Joint Displacements (Continued)*

| | Joint | | X [in] | LC | Y [in] | LC | Z [in] | LC | X Rotation [... | LC | Y Rotation [... | LC | Z Rotation [... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 667 | N920 | max | .008 | 10 | .004 | 1 | .011 | 2 | 6.782e-03 | 10 | 0 | 1 | -1.378e-03 | 4 |
| 668 | | min | -.002 | 4 | -.082 | 10 | -.008 | 1 | 2.797e-04 | 1 | 0 | 1 | -6.539e-03 | 10 |
| 669 | N921 | max | .008 | 10 | .003 | 1 | .01 | 2 | 6.857e-03 | 10 | 0 | 1 | -1.314e-03 | 4 |
| 670 | | min | -.002 | 4 | -.083 | 10 | -.008 | 1 | 3.627e-04 | 1 | 0 | 1 | -6.59e-03 | 10 |
| 671 | N922A | max | .008 | 10 | .007 | 1 | .011 | 2 | 5.942e-03 | 10 | 0 | 1 | -1.309e-03 | 4 |
| 672 | | min | -.002 | 4 | -.064 | 10 | -.009 | 1 | 6.316e-05 | 1 | 0 | 1 | -6.073e-03 | 7 |
| 673 | N923A | max | .008 | 10 | -.001 | 1 | .01 | 2 | 7.562e-03 | 10 | 7.425e-05 | 2 | -1.162e-03 | 4 |
| 674 | | min | -.002 | 4 | -.095 | 10 | -.007 | 1 | 6.707e-04 | 1 | -4.352e-04 | 5 | -6.468e-03 | 10 |
| 675 | N924A | max | .008 | 10 | .003 | 1 | .01 | 2 | 6.251e-03 | 10 | 0 | 1 | -1.161e-03 | 4 |
| 676 | | min | -.002 | 4 | -.078 | 10 | -.008 | 1 | 2.123e-04 | 1 | 0 | 1 | -6.211e-03 | 10 |
| 677 | N925A | max | .009 | 10 | .006 | 1 | .011 | 2 | 5.438e-03 | 10 | 0 | 1 | -1.215e-03 | 4 |
| 678 | | min | -.002 | 4 | -.062 | 10 | -.009 | 1 | -4.444e-05 | 1 | 0 | 1 | -6.009e-03 | 7 |
| 679 | N926A | max | .009 | 10 | .009 | 1 | .011 | 2 | 5.255e-03 | 10 | 0 | 1 | -1.464e-03 | 4 |
| 680 | | min | -.002 | 4 | -.05 | 10 | -.009 | 1 | -1.02e-04 | 1 | 0 | 1 | -6.55e-03 | 7 |
| 681 | N952A | max | .004 | 10 | .073 | 5 | .011 | 2 | 1.012e-02 | 6 | 1.466e-04 | 2 | -2.895e-04 | 9 |
| 682 | | min | -.004 | 1 | -.034 | 9 | -.019 | 1 | 4.312e-04 | 1 | -4.839e-04 | 1 | -4.502e-03 | 10 |
| 683 | N953A | max | .006 | 10 | .132 | 5 | .011 | 2 | 1.019e-02 | 6 | 4.901e-05 | 2 | 1.464e-03 | 9 |
| 684 | | min | -.003 | 4 | .012 | 9 | -.019 | 1 | 4.488e-04 | 1 | -3.158e-04 | 1 | -1.822e-03 | 10 |
| 685 | N954A | max | .005 | 10 | .118 | 5 | .011 | 2 | 9.992e-03 | 6 | 5.068e-05 | 2 | 1.492e-03 | 9 |
| 686 | | min | -.003 | 4 | 0 | 9 | -.019 | 1 | 4.073e-04 | 1 | -3.008e-04 | 10 | -1.838e-03 | 10 |
| 687 | N955A | max | .005 | 10 | .103 | 5 | .011 | 2 | 1.016e-02 | 6 | 3.214e-05 | 2 | 1.291e-03 | 9 |
| 688 | | min | -.004 | 1 | -.011 | 9 | -.019 | 1 | 4.359e-04 | 1 | -2.09e-04 | 10 | -1.768e-03 | 10 |
| 689 | N956A | max | .004 | 10 | .088 | 5 | .011 | 2 | 1.003e-02 | 6 | 4.668e-05 | 3 | 4.458e-04 | 9 |
| 690 | | min | -.004 | 1 | -.023 | 9 | -.019 | 1 | 4.215e-04 | 1 | -2.438e-04 | 10 | -3.171e-03 | 10 |
| 691 | N952B | max | .002 | 10 | .073 | 5 | .043 | 2 | 0 | 1 | -1.549e-03 | 1 | 1.821e-03 | 9 |
| 692 | | min | -.013 | 8 | -.037 | 9 | -.017 | 1 | 0 | 1 | -4.594e-03 | 6 | -7.523e-04 | 10 |
| 693 | N955B | max | .012 | 10 | .118 | 5 | .043 | 2 | 0 | 1 | 1.104e-04 | 9 | 1.316e-03 | 9 |
| 694 | | min | -.008 | 9 | -.001 | 9 | -.017 | 1 | 0 | 1 | -7.095e-04 | 10 | -1.975e-03 | 10 |
| 695 | N956B | max | .01 | 10 | .103 | 5 | .043 | 2 | 0 | 1 | -8.058e-04 | 9 | 2.066e-03 | 9 |
| 696 | | min | -.009 | 9 | -.013 | 9 | -.017 | 1 | 0 | 1 | -2.397e-03 | 6 | -5.62e-04 | 10 |
| 697 | N957A | max | .006 | 10 | .088 | 5 | .043 | 2 | 0 | 1 | -8.277e-04 | 9 | 1.916e-03 | 9 |
| 698 | | min | -.01 | 9 | -.025 | 9 | -.017 | 1 | 0 | 1 | -2.437e-03 | 6 | -8.236e-04 | 10 |
| 699 | N958 | max | .02 | 10 | .073 | 5 | .042 | 2 | 0 | 1 | 4.636e-03 | 6 | 9.249e-04 | 9 |
| 700 | | min | -.002 | 9 | -.034 | 9 | -.017 | 1 | 0 | 1 | 1.347e-03 | 1 | -2.297e-03 | 10 |
| 701 | N960 | max | .011 | 10 | .118 | 5 | .042 | 2 | 0 | 1 | 5.312e-04 | 6 | 1.708e-03 | 9 |
| 702 | | min | -.009 | 9 | 0 | 9 | -.017 | 1 | 0 | 1 | -6.945e-05 | 1 | -1.378e-03 | 10 |
| 703 | N961 | max | .013 | 10 | .103 | 5 | .042 | 2 | 0 | 1 | 2.469e-03 | 6 | 8.63e-04 | 9 |
| 704 | | min | -.007 | 9 | -.011 | 9 | -.017 | 1 | 0 | 1 | 6.187e-04 | 1 | -2.725e-03 | 10 |
| 705 | N962 | max | .016 | 10 | .088 | 5 | .042 | 2 | 0 | 1 | 2.514e-03 | 6 | 1.025e-03 | 9 |
| 706 | | min | -.005 | 9 | -.023 | 9 | -.017 | 1 | 0 | 1 | 6.205e-04 | 1 | -2.453e-03 | 10 |
| 707 | N963 | max | .013 | 6 | .073 | 5 | -.018 | 3 | 0 | 1 | 5.023e-03 | 6 | 1.706e-03 | 9 |
| 708 | | min | 0 | 1 | -.037 | 9 | -.047 | 5 | 0 | 1 | 1.578e-03 | 1 | -9.587e-04 | 10 |
| 709 | N964 | max | .004 | 2 | .132 | 5 | -.018 | 3 | 0 | 1 | 1.475e-05 | 2 | 1.31e-03 | 9 |
| 710 | | min | -.004 | 1 | .01 | 9 | -.047 | 5 | 0 | 1 | -1.344e-04 | 5 | -1.792e-03 | 10 |
| 711 | N966 | max | .004 | 2 | .118 | 5 | -.018 | 3 | 0 | 1 | 4.396e-04 | 6 | 1.427e-03 | 9 |
| 712 | | min | -.004 | 1 | -.001 | 9 | -.047 | 5 | 0 | 1 | 7.216e-05 | 1 | -1.819e-03 | 10 |
| 713 | N967 | max | .005 | 2 | .103 | 5 | -.018 | 3 | 0 | 1 | 2.423e-03 | 6 | 2.063e-03 | 9 |
| 714 | | min | -.004 | 1 | -.013 | 9 | -.047 | 5 | 0 | 1 | 6.67e-04 | 1 | -3.804e-04 | 10 |
| 715 | N968 | max | .008 | 2 | .088 | 5 | -.018 | 3 | 0 | 1 | 2.719e-03 | 6 | 1.902e-03 | 9 |
| 716 | | min | -.002 | 1 | -.025 | 9 | -.047 | 5 | 0 | 1 | 8.775e-04 | 1 | -7.726e-04 | 10 |
| 717 | N969 | max | -.002 | 2 | .073 | 5 | -.018 | 3 | 0 | 1 | -1.742e-03 | 1 | 1.086e-03 | 9 |
| 718 | | min | -.013 | 8 | -.034 | 9 | -.047 | 5 | 0 | 1 | -5.02e-03 | 6 | -2.152e-03 | 10 |

## Envelope Joint Displacements (Continued)

| | Joint | | X [in] | LC | Y [in] | LC | Z [in] | LC | X Rotation [... | LC | Y Rotation [... | LC | Z Rotation [... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 719 | N970 | max | .005 | 2 | .132 | 5 | -.018 | 3 | 0 | 1 | 8.024e-05 | 12 | 1.535e-03 | 9 |
| 720 | | min | -.004 | 1 | .012 | 9 | -.047 | 5 | 0 | 1 | 5.237e-06 | 1 | -1.329e-03 | 10 |
| 721 | N971 | max | .005 | 2 | .118 | 5 | -.018 | 3 | 0 | 1 | -1.641e-04 | 12 | 1.567e-03 | 9 |
| 722 | | min | -.004 | 1 | 0 | 9 | -.047 | 5 | 0 | 1 | -4.755e-04 | 8 | -1.493e-03 | 10 |
| 723 | N972 | max | .003 | 2 | .103 | 5 | -.018 | 3 | 0 | 1 | -8.163e-04 | 1 | 7.195e-04 | 9 |
| 724 | | min | -.005 | 1 | -.011 | 9 | -.047 | 5 | 0 | 1 | -2.443e-03 | 6 | -2.712e-03 | 10 |
| 725 | N973 | max | .001 | 2 | .088 | 5 | -.018 | 3 | 0 | 1 | -1.02e-03 | 1 | 9.736e-04 | 9 |
| 726 | | min | -.007 | 8 | -.023 | 9 | -.047 | 5 | 0 | 1 | -2.733e-03 | 6 | -2.42e-03 | 10 |
| 727 | N976 | max | .009 | 7 | .073 | 5 | -.004 | 2 | 1.017e-02 | 6 | 4.149e-04 | 5 | 3.85e-03 | 6 |
| 728 | | min | -.001 | 1 | -.037 | 9 | -.029 | 5 | 3.98e-04 | 1 | -1.752e-05 | 2 | 1.091e-03 | 1 |
| 729 | N977 | max | .004 | 2 | .132 | 5 | -.004 | 2 | 0 | 1 | 4.67e-04 | 5 | 1.69e-03 | 9 |
| 730 | | min | -.004 | 1 | .01 | 9 | -.029 | 5 | 0 | 1 | 1.859e-04 | 3 | -1.628e-03 | 10 |
| 731 | N979 | max | .004 | 2 | .118 | 5 | -.004 | 2 | 0 | 1 | 3.793e-05 | 2 | 1.381e-03 | 9 |
| 732 | | min | -.004 | 1 | -.001 | 9 | -.029 | 5 | 0 | 1 | -6.33e-05 | 1 | -1.515e-03 | 10 |
| 733 | N980 | max | .004 | 2 | .103 | 5 | -.004 | 2 | 0 | 1 | 3.296e-05 | 2 | 1.513e-03 | 9 |
| 734 | | min | -.004 | 1 | -.013 | 9 | -.029 | 5 | 0 | 1 | -6.106e-05 | 1 | -1.667e-03 | 10 |
| 735 | N981 | max | .006 | 2 | .088 | 5 | -.004 | 2 | 0 | 1 | 3.987e-03 | 6 | 2.062e-03 | 9 |
| 736 | | min | -.003 | 1 | -.025 | 9 | -.029 | 5 | 0 | 1 | 1.187e-03 | 1 | -3.769e-04 | 10 |
| 737 | N982 | max | 0 | 2 | .073 | 5 | -.004 | 2 | 1.012e-02 | 6 | 1.501e-04 | 2 | -3.002e-04 | 9 |
| 738 | | min | -.009 | 8 | -.034 | 9 | -.029 | 5 | 4.312e-04 | 1 | -4.919e-04 | 1 | -4.524e-03 | 10 |
| 739 | N983 | max | .004 | 2 | .132 | 5 | -.004 | 2 | 0 | 1 | -7.798e-05 | 2 | 1.392e-03 | 9 |
| 740 | | min | -.003 | 1 | .012 | 9 | -.029 | 5 | 0 | 1 | -5.128e-04 | 5 | -1.794e-03 | 10 |
| 741 | N984 | max | .004 | 2 | .118 | 5 | -.004 | 2 | 0 | 1 | 3.793e-05 | 2 | 1.381e-03 | 9 |
| 742 | | min | -.004 | 1 | 0 | 9 | -.029 | 5 | 0 | 1 | -6.33e-05 | 1 | -1.515e-03 | 10 |
| 743 | N985 | max | .004 | 2 | .103 | 5 | -.004 | 2 | 0 | 1 | 3.296e-05 | 2 | 1.513e-03 | 9 |
| 744 | | min | -.004 | 1 | -.011 | 9 | -.029 | 5 | 0 | 1 | -6.106e-05 | 1 | -1.667e-03 | 10 |
| 745 | N986 | max | .002 | 2 | .088 | 5 | -.004 | 2 | 0 | 1 | -1.37e-03 | 1 | 7.315e-04 | 9 |
| 746 | | min | -.005 | 1 | -.023 | 9 | -.029 | 5 | 0 | 1 | -3.971e-03 | 6 | -2.746e-03 | 10 |
| 747 | N992 | max | .002 | 10 | .073 | 5 | .027 | 2 | 1.017e-02 | 6 | 4.149e-04 | 5 | 3.85e-03 | 6 |
| 748 | | min | -.008 | 8 | -.037 | 9 | -.018 | 1 | 3.98e-04 | 1 | -1.752e-05 | 2 | 1.091e-03 | 1 |
| 749 | N993 | max | .009 | 10 | .133 | 5 | .027 | 2 | 0 | 1 | 3.05e-04 | 9 | 1.351e-03 | 9 |
| 750 | | min | -.006 | 9 | .01 | 9 | -.018 | 1 | 0 | 1 | 3.149e-05 | 10 | -2.235e-03 | 10 |
| 751 | N995 | max | .009 | 10 | .118 | 5 | .027 | 2 | 0 | 1 | 1.967e-04 | 9 | 1.412e-03 | 9 |
| 752 | | min | -.006 | 9 | -.001 | 9 | -.018 | 1 | 0 | 1 | -2.162e-04 | 10 | -1.896e-03 | 10 |
| 753 | N996 | max | .008 | 10 | .103 | 5 | .027 | 2 | 0 | 1 | 3.472e-04 | 9 | 1.519e-03 | 9 |
| 754 | | min | -.005 | 9 | -.013 | 9 | -.018 | 1 | 0 | 1 | -4.336e-04 | 10 | -1.674e-03 | 10 |
| 755 | N997 | max | .005 | 10 | .088 | 5 | .027 | 2 | 0 | 1 | -1.25e-03 | 1 | 2.097e-03 | 9 |
| 756 | | min | -.006 | 9 | -.025 | 9 | -.018 | 1 | 0 | 1 | -3.61e-03 | 6 | -3.533e-04 | 10 |
| 757 | N998 | max | .013 | 10 | .073 | 5 | .027 | 2 | 1.012e-02 | 6 | 1.501e-04 | 2 | -3.002e-04 | 9 |
| 758 | | min | -.002 | 4 | -.034 | 9 | -.018 | 1 | 4.312e-04 | 1 | -4.919e-04 | 1 | -4.524e-03 | 10 |
| 759 | N999 | max | .009 | 10 | .132 | 5 | .027 | 2 | 0 | 1 | 1.081e-04 | 2 | 1.876e-03 | 9 |
| 760 | | min | -.005 | 9 | .012 | 9 | -.018 | 1 | 0 | 1 | -3.643e-04 | 1 | -1.389e-03 | 10 |
| 761 | N1000 | max | .009 | 10 | .118 | 5 | .027 | 2 | 0 | 1 | 2.543e-04 | 2 | 1.677e-03 | 9 |
| 762 | | min | -.005 | 9 | 0 | 9 | -.018 | 1 | 0 | 1 | -2.656e-04 | 1 | -1.564e-03 | 10 |
| 763 | N1001 | max | .008 | 10 | .103 | 5 | .027 | 2 | 0 | 1 | 3.472e-04 | 9 | 1.519e-03 | 9 |
| 764 | | min | -.005 | 9 | -.011 | 9 | -.018 | 1 | 0 | 1 | -4.336e-04 | 10 | -1.674e-03 | 10 |
| 765 | N1002 | max | .011 | 10 | .088 | 5 | .027 | 2 | 0 | 1 | 3.629e-03 | 6 | 7.165e-04 | 9 |
| 766 | | min | -.003 | 4 | -.023 | 9 | -.018 | 1 | 0 | 1 | 1.057e-03 | 1 | -2.798e-03 | 10 |
| 767 | N426A | max | .014 | 3 | .072 | 8 | .01 | 2 | 7.459e-04 | 4 | 5.349e-04 | 4 | -8.601e-04 | 4 |
| 768 | | min | -.021 | 4 | -.017 | 3 | -.007 | 1 | -2.142e-03 | 3 | -2.017e-04 | 3 | -1.075e-02 | 7 |
| 769 | N427A | max | .011 | 3 | .009 | 4 | .008 | 2 | 3.411e-03 | 10 | 1.095e-03 | 4 | -1.848e-03 | 4 |
| 770 | | min | -.008 | 4 | -.093 | 10 | -.007 | 1 | -3.698e-05 | 1 | -5.264e-04 | 3 | -1.175e-02 | 7 |

## Envelope Joint Displacements (Continued)

| | Joint | | X [in] | LC | Y [in] | LC | Z [in] | LC | X Rotation [... | LC | Y Rotation [... | LC | Z Rotation [... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 771 | N428A | max | .021 | 3 | -.004 | 2 | .005 | 2 | -3.281e-03 | 2 | -7.15e-05 | 1 | 8.747e-04 | 4 |
| 772 | | min | -.02 | 4 | -.085 | 5 | -.008 | 1 | -1.138e-02 | 5 | -6.804e-04 | 6 | -3.598e-03 | 3 |
| 773 | N430A | max | .01 | 3 | .007 | 4 | .01 | 2 | 5.003e-03 | 6 | 0 | 1 | 5.591e-04 | 4 |
| 774 | | min | -.005 | 4 | -.035 | 10 | -.006 | 1 | 1.003e-03 | 1 | 0 | 1 | -3.316e-03 | 10 |
| 775 | N431A | max | .012 | 3 | .018 | 4 | .01 | 2 | 5.088e-03 | 6 | 0 | 1 | -2.552e-04 | 4 |
| 776 | | min | -.009 | 4 | -.02 | 3 | -.006 | 1 | 1.225e-03 | 1 | 0 | 1 | -6.996e-03 | 7 |
| 777 | N432A | max | .013 | 3 | .034 | 8 | .01 | 2 | 4.502e-03 | 6 | 0 | 1 | -8.936e-04 | 4 |
| 778 | | min | -.012 | 4 | -.012 | 3 | -.006 | 1 | 1.15e-03 | 1 | 0 | 1 | -1.015e-02 | 7 |
| 779 | N433A | max | .013 | 3 | .066 | 8 | .01 | 2 | 3.699e-03 | 6 | 0 | 1 | -1.43e-03 | 4 |
| 780 | | min | -.016 | 4 | .001 | 3 | -.006 | 1 | 9.394e-04 | 1 | 0 | 1 | -1.256e-02 | 7 |
| 781 | N434A | max | .014 | 3 | .107 | 8 | .01 | 2 | 2.656e-03 | 10 | 0 | 1 | -1.887e-03 | 4 |
| 782 | | min | -.018 | 4 | .022 | 3 | -.006 | 1 | 1.906e-04 | 3 | 0 | 1 | -1.434e-02 | 7 |
| 783 | N435A | max | .014 | 3 | .132 | 8 | .01 | 2 | -1.724e-04 | 4 | 3.436e-04 | 4 | -3.645e-04 | 4 |
| 784 | | min | -.02 | 4 | .036 | 3 | -.006 | 1 | -4.975e-03 | 7 | -9.34e-05 | 3 | -8.976e-03 | 7 |
| 785 | N436A | max | .015 | 3 | .107 | 8 | .009 | 2 | -2.97e-03 | 4 | 0 | 1 | 5.78e-04 | 4 |
| 786 | | min | -.021 | 4 | .024 | 3 | -.007 | 1 | -1.341e-02 | 7 | 0 | 1 | -5.49e-03 | 7 |
| 787 | N437A | max | .016 | 3 | .065 | 8 | .007 | 2 | -2.907e-03 | 4 | 0 | 1 | 9.356e-04 | 4 |
| 788 | | min | -.021 | 4 | .005 | 1 | -.007 | 1 | -1.254e-02 | 7 | 0 | 1 | -3.221e-03 | 7 |
| 789 | N438A | max | .017 | 3 | .041 | 10 | .005 | 2 | -2.576e-03 | 4 | 0 | 1 | 1.064e-03 | 4 |
| 790 | | min | -.02 | 4 | -.008 | 1 | -.008 | 1 | -1.075e-02 | 7 | 0 | 1 | -1.961e-03 | 3 |
| 791 | N439A | max | .018 | 3 | .021 | 10 | .004 | 2 | -2.01e-03 | 2 | 0 | 1 | 1.665e-03 | 10 |
| 792 | | min | -.02 | 4 | -.018 | 1 | -.009 | 1 | -8.469e-03 | 5 | 0 | 1 | -7.761e-04 | 3 |
| 793 | N440A | max | .018 | 3 | .006 | 2 | .003 | 2 | -4.971e-04 | 2 | 0 | 1 | 3.003e-03 | 8 |
| 794 | | min | -.019 | 4 | -.027 | 1 | -.009 | 1 | -4.879e-03 | 5 | 0 | 1 | 1.838e-04 | 3 |
| 795 | N443A | max | .01 | 10 | .005 | 4 | .009 | 2 | 1.652e-03 | 10 | 4.854e-04 | 4 | -6.569e-05 | 4 |
| 796 | | min | -.003 | 4 | -.071 | 10 | -.006 | 1 | -6.932e-04 | 1 | -2.559e-04 | 3 | -4.832e-03 | 10 |
| 797 | N444A | max | .01 | 3 | .007 | 4 | .008 | 2 | 2.203e-03 | 10 | 5.725e-04 | 4 | -9.902e-04 | 4 |
| 798 | | min | -.006 | 4 | -.081 | 10 | -.006 | 1 | -4.719e-04 | 1 | -2.304e-04 | 3 | -8.383e-03 | 7 |
| 799 | N446A | max | .02 | 3 | .003 | 2 | .003 | 2 | -4.075e-04 | 2 | 5.989e-05 | 4 | 9.656e-04 | 4 |
| 800 | | min | -.02 | 4 | -.058 | 5 | -.009 | 1 | -4.53e-03 | 5 | -2.872e-04 | 3 | -2.16e-03 | 3 |
| 801 | N447A | max | .02 | 3 | 0 | 2 | .004 | 2 | -1.849e-03 | 2 | -4.481e-05 | 4 | 7.748e-04 | 4 |
| 802 | | min | -.02 | 4 | -.07 | 5 | -.009 | 1 | -7.992e-03 | 5 | -3.995e-04 | 6 | -3.033e-03 | 3 |
| 803 | N448A | max | .013 | 3 | .023 | 4 | .008 | 2 | 3.064e-03 | 10 | 6.982e-04 | 4 | -1.064e-03 | 4 |
| 804 | | min | -.012 | 4 | -.063 | 3 | -.007 | 1 | 1.442e-04 | 1 | -2.497e-04 | 3 | -1.036e-02 | 7 |
| 805 | N449A | max | .014 | 3 | .038 | 4 | .009 | 2 | 2.736e-03 | 10 | 5.111e-04 | 8 | -1.331e-03 | 4 |
| 806 | | min | -.016 | 4 | -.045 | 3 | -.007 | 1 | -2.953e-05 | 1 | -8.608e-05 | 3 | -1.202e-02 | 7 |
| 807 | N450A | max | .014 | 3 | .052 | 4 | .009 | 2 | 2.302e-03 | 10 | 3.67e-04 | 8 | -1.843e-03 | 4 |
| 808 | | min | -.019 | 4 | -.028 | 3 | -.007 | 1 | -5.299e-04 | 3 | -2.776e-05 | 3 | -1.404e-02 | 7 |
| 809 | N451A | max | .016 | 3 | .049 | 4 | .009 | 2 | -3.012e-03 | 4 | -7.996e-05 | 4 | 5.86e-04 | 4 |
| 810 | | min | -.021 | 4 | -.025 | 3 | -.006 | 1 | -1.286e-02 | 7 | -3.37e-04 | 6 | -6.002e-03 | 7 |
| 811 | N452A | max | .017 | 3 | .03 | 4 | .008 | 2 | -2.78e-03 | 4 | -1.286e-04 | 1 | 7.954e-04 | 4 |
| 812 | | min | -.02 | 4 | -.038 | 3 | -.007 | 1 | -1.12e-02 | 7 | -4.766e-04 | 6 | -4.43e-03 | 7 |
| 813 | N453A | max | .019 | 3 | .011 | 4 | .006 | 2 | -2.713e-03 | 4 | -1.14e-04 | 1 | 9.26e-04 | 4 |
| 814 | | min | -.02 | 4 | -.051 | 3 | -.007 | 1 | -9.961e-03 | 5 | -5.353e-04 | 6 | -3.139e-03 | 3 |
| 815 | N454A | max | .014 | 3 | .128 | 8 | .01 | 2 | 9.292e-04 | 4 | 0 | 1 | -1.433e-03 | 4 |
| 816 | | min | -.019 | 4 | .034 | 3 | -.006 | 1 | -1.494e-03 | 3 | 0 | 1 | -1.281e-02 | 7 |
| 817 | N455A | max | .014 | 3 | .062 | 8 | .01 | 2 | 1.981e-03 | 10 | 2.81e-04 | 8 | -1.913e-03 | 4 |
| 818 | | min | -.02 | 4 | -.02 | 3 | -.007 | 1 | -8.758e-04 | 3 | -4.312e-05 | 3 | -1.421e-02 | 7 |
| 819 | N459A | max | .018 | 3 | .001 | 2 | .002 | 2 | 4.103e-04 | 2 | 4.17e-04 | 4 | 1.351e-03 | 4 |
| 820 | | min | -.018 | 4 | -.036 | 5 | -.01 | 1 | -2.464e-03 | 5 | -4.148e-04 | 3 | -1.373e-03 | 3 |
| 821 | N460A | max | .018 | 3 | .002 | 2 | .002 | 2 | 2.843e-04 | 2 | 0 | 1 | 2.208e-03 | 8 |
| 822 | | min | -.019 | 4 | -.034 | 5 | -.01 | 1 | -2.841e-03 | 5 | 0 | 1 | -2.553e-04 | 3 |

## *Envelope Joint Displacements (Continued)*

| | Joint | | X [in] | LC | Y [in] | LC | Z [in] | LC | X Rotation [... | LC | Y Rotation [... | LC | Z Rotation [... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 823 | N461A | max | .018 | 3 | .004 | 2 | .003 | 2 | -6.083e-05 | 2 | 0 | 1 | 2.943e-03 | 8 |
| 824 | | min | -.019 | 4 | -.03 | 5 | -.009 | 1 | -3.772e-03 | 5 | 0 | 1 | 1.6e-04 | 3 |
| 825 | N462A | max | .019 | 3 | .002 | 2 | .002 | 2 | 4.183e-04 | 2 | 3.485e-04 | 4 | 1.354e-03 | 4 |
| 826 | | min | -.019 | 4 | -.041 | 5 | -.01 | 1 | -2.485e-03 | 5 | -3.461e-04 | 3 | -1.377e-03 | 3 |
| 827 | N463A | max | .019 | 3 | .002 | 2 | .002 | 2 | 2.489e-04 | 2 | 0 | 1 | 1.57e-03 | 4 |
| 828 | | min | -.019 | 4 | -.039 | 5 | -.01 | 1 | -2.91e-03 | 5 | 0 | 1 | -7.083e-04 | 3 |
| 829 | N464A | max | .019 | 3 | .004 | 2 | .002 | 2 | -9.17e-06 | 2 | 0 | 1 | 1.897e-03 | 8 |
| 830 | | min | -.019 | 4 | -.037 | 5 | -.009 | 1 | -3.59e-03 | 5 | 0 | 1 | -4.514e-04 | 3 |
| 831 | N465A | max | .019 | 3 | .005 | 2 | .003 | 2 | -3.407e-04 | 2 | 0 | 1 | 1.932e-03 | 8 |
| 832 | | min | -.019 | 4 | -.034 | 5 | -.009 | 1 | -4.441e-03 | 5 | 0 | 1 | -4.495e-04 | 3 |
| 833 | N466A | max | .019 | 3 | .003 | 2 | .002 | 2 | 4.242e-04 | 2 | 3.028e-04 | 4 | 1.347e-03 | 4 |
| 834 | | min | -.019 | 4 | -.045 | 5 | -.01 | 1 | -2.499e-03 | 5 | -3.003e-04 | 3 | -1.371e-03 | 3 |
| 835 | N467A | max | .019 | 3 | .003 | 2 | .002 | 2 | 3.098e-04 | 2 | 0 | 1 | 1.444e-03 | 4 |
| 836 | | min | -.019 | 4 | -.045 | 5 | -.01 | 1 | -2.774e-03 | 5 | 0 | 1 | -1.067e-03 | 3 |
| 837 | N468A | max | .019 | 3 | .004 | 2 | .002 | 2 | 9.08e-05 | 2 | 0 | 1 | 1.468e-03 | 4 |
| 838 | | min | -.019 | 4 | -.043 | 5 | -.009 | 1 | -3.337e-03 | 5 | 0 | 1 | -9.462e-04 | 3 |
| 839 | N469A | max | .019 | 3 | .004 | 2 | .003 | 2 | -2.342e-04 | 2 | 0 | 1 | 1.442e-03 | 4 |
| 840 | | min | -.019 | 4 | -.042 | 5 | -.009 | 1 | -4.158e-03 | 5 | 0 | 1 | -1.038e-03 | 3 |
| 841 | N470A | max | .02 | 3 | .003 | 2 | .002 | 2 | 4.284e-04 | 2 | 2.78e-04 | 4 | 1.341e-03 | 4 |
| 842 | | min | -.02 | 4 | -.05 | 5 | -.01 | 1 | -2.507e-03 | 5 | -2.756e-04 | 3 | -1.366e-03 | 3 |
| 843 | N471A | max | .02 | 3 | .004 | 2 | .002 | 2 | 3.369e-04 | 2 | 0 | 1 | 1.318e-03 | 4 |
| 844 | | min | -.02 | 4 | -.05 | 5 | -.01 | 1 | -2.733e-03 | 5 | 0 | 1 | -1.311e-03 | 3 |
| 845 | N472A | max | .02 | 3 | .004 | 2 | .002 | 2 | 1.109e-04 | 2 | 0 | 1 | 1.254e-03 | 4 |
| 846 | | min | -.02 | 4 | -.049 | 5 | -.009 | 1 | -3.29e-03 | 5 | 0 | 1 | -1.46e-03 | 3 |
| 847 | N473A | max | .02 | 3 | .004 | 2 | .003 | 2 | -2.265e-04 | 2 | 0 | 1 | 1.185e-03 | 4 |
| 848 | | min | -.02 | 4 | -.05 | 5 | -.009 | 1 | -4.124e-03 | 5 | 0 | 1 | -1.625e-03 | 3 |
| 849 | N474A | max | .02 | 3 | .004 | 2 | .002 | 2 | 4.313e-04 | 2 | 2.699e-04 | 4 | 1.34e-03 | 4 |
| 850 | | min | -.02 | 4 | -.054 | 5 | -.01 | 1 | -2.509e-03 | 5 | -2.674e-04 | 3 | -1.366e-03 | 3 |
| 851 | N475A | max | .02 | 3 | .004 | 2 | .002 | 2 | 1.792e-04 | 2 | 1.524e-04 | 4 | 1.193e-03 | 4 |
| 852 | | min | -.02 | 4 | -.055 | 5 | -.01 | 1 | -3.115e-03 | 5 | -2.986e-04 | 3 | -1.645e-03 | 3 |
| 853 | N476A | max | .02 | 3 | .004 | 2 | .003 | 2 | -1.004e-04 | 2 | 1.108e-04 | 4 | 1.068e-03 | 4 |
| 854 | | min | -.02 | 4 | -.056 | 5 | -.009 | 1 | -3.788e-03 | 5 | -2.878e-04 | 3 | -1.91e-03 | 3 |
| 855 | N477A | max | .018 | 3 | .008 | 2 | .003 | 2 | -9.296e-04 | 2 | 0 | 1 | 2.814e-03 | 8 |
| 856 | | min | -.019 | 4 | -.025 | 1 | -.009 | 1 | -5.953e-03 | 5 | 0 | 1 | 7.188e-05 | 3 |
| 857 | N478A | max | .018 | 3 | .011 | 10 | .003 | 2 | -1.305e-03 | 2 | 0 | 1 | 2.397e-03 | 8 |
| 858 | | min | -.019 | 4 | -.022 | 1 | -.009 | 1 | -6.848e-03 | 5 | 0 | 1 | -1.582e-04 | 3 |
| 859 | N479A | max | .018 | 3 | .016 | 10 | .004 | 2 | -1.661e-03 | 2 | 0 | 1 | 2.037e-03 | 10 |
| 860 | | min | -.02 | 4 | -.02 | 1 | -.009 | 1 | -7.676e-03 | 5 | 0 | 1 | -4.277e-04 | 3 |
| 861 | N480A | max | .019 | 3 | .006 | 2 | .003 | 2 | -7.053e-04 | 2 | 0 | 1 | 1.81e-03 | 8 |
| 862 | | min | -.019 | 4 | -.032 | 1 | -.009 | 1 | -5.349e-03 | 5 | 0 | 1 | -5.377e-04 | 3 |
| 863 | N481A | max | .019 | 3 | .008 | 2 | .003 | 2 | -1.071e-03 | 2 | 0 | 1 | 1.635e-03 | 10 |
| 864 | | min | -.019 | 4 | -.031 | 1 | -.009 | 1 | -6.236e-03 | 5 | 0 | 1 | -7.125e-04 | 3 |
| 865 | N482A | max | .018 | 3 | .01 | 2 | .004 | 2 | -1.397e-03 | 2 | 0 | 1 | 1.453e-03 | 4 |
| 866 | | min | -.019 | 4 | -.03 | 1 | -.009 | 1 | -6.994e-03 | 5 | 0 | 1 | -9.594e-04 | 3 |
| 867 | N483A | max | .018 | 3 | .011 | 2 | .004 | 2 | -1.672e-03 | 2 | 0 | 1 | 1.361e-03 | 4 |
| 868 | | min | -.02 | 4 | -.029 | 1 | -.009 | 1 | -7.599e-03 | 5 | 0 | 1 | -1.22e-03 | 3 |
| 869 | N484A | max | .019 | 3 | .005 | 2 | .003 | 2 | -5.857e-04 | 2 | 0 | 1 | 1.408e-03 | 4 |
| 870 | | min | -.019 | 4 | -.04 | 5 | -.009 | 1 | -5.034e-03 | 5 | 0 | 1 | -1.159e-03 | 3 |
| 871 | N485A | max | .019 | 3 | .006 | 2 | .003 | 2 | -9.34e-04 | 2 | 0 | 1 | 1.356e-03 | 4 |
| 872 | | min | -.019 | 4 | -.039 | 1 | -.009 | 1 | -5.884e-03 | 5 | 0 | 1 | -1.331e-03 | 3 |
| 873 | N486A | max | .019 | 3 | .007 | 2 | .004 | 2 | -1.265e-03 | 2 | 0 | 1 | 1.315e-03 | 4 |
| 874 | | min | -.02 | 4 | -.039 | 1 | -.009 | 1 | -6.673e-03 | 5 | 0 | 1 | -1.523e-03 | 3 |

## Envelope Joint Displacements (Continued)

| | Joint | | X [in] | LC | Y [in] | LC | Z [in] | LC | X Rotation [... | LC | Y Rotation [... | LC | Z Rotation [... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 875 | N487A | max | .019 | 3 | .007 | 2 | .004 | 2 | -1.575e-03 | 2 | 0 | 1 | 1.195e-03 | 4 |
| 876 | | min | -.02 | 4 | -.039 | 1 | -.009 | 1 | -7.39e-03 | 5 | 0 | 1 | -1.759e-03 | 3 |
| 877 | N488A | max | .02 | 3 | .004 | 2 | .003 | 2 | -5.823e-04 | 2 | 0 | 1 | 1.136e-03 | 4 |
| 878 | | min | -.02 | 4 | -.05 | 5 | -.009 | 1 | -5.003e-03 | 5 | 0 | 1 | -1.803e-03 | 3 |
| 879 | N489A | max | .02 | 3 | .004 | 2 | .003 | 2 | -9.425e-04 | 2 | 0 | 1 | 1.1e-03 | 4 |
| 880 | | min | -.02 | 4 | -.051 | 5 | -.009 | 1 | -5.883e-03 | 5 | 0 | 1 | -1.984e-03 | 3 |
| 881 | N490A | max | .02 | 3 | .004 | 2 | .003 | 2 | -1.287e-03 | 2 | 0 | 1 | 1.053e-03 | 4 |
| 882 | | min | -.02 | 4 | -.052 | 5 | -.009 | 1 | -6.711e-03 | 5 | 0 | 1 | -2.173e-03 | 3 |
| 883 | N491A | max | .02 | 3 | .004 | 2 | .004 | 2 | -1.588e-03 | 2 | 0 | 1 | 1.066e-03 | 4 |
| 884 | | min | -.02 | 4 | -.053 | 5 | -.009 | 1 | -7.406e-03 | 5 | 0 | 1 | -2.34e-03 | 3 |
| 885 | N492A | max | .02 | 3 | .003 | 2 | .003 | 2 | -7.391e-04 | 2 | 1.999e-05 | 4 | 8.853e-04 | 4 |
| 886 | | min | -.02 | 4 | -.06 | 5 | -.009 | 1 | -5.33e-03 | 5 | -3.207e-04 | 7 | -2.398e-03 | 3 |
| 887 | N493A | max | .02 | 3 | .002 | 2 | .003 | 2 | -1.091e-03 | 2 | -9.239e-06 | 4 | 8.268e-04 | 4 |
| 888 | | min | -.02 | 4 | -.063 | 5 | -.009 | 1 | -6.177e-03 | 5 | -3.523e-04 | 7 | -2.622e-03 | 3 |
| 889 | N494A | max | .02 | 3 | 0 | 2 | .003 | 2 | -1.46e-03 | 2 | -3.048e-05 | 4 | 7.9e-04 | 4 |
| 890 | | min | -.02 | 4 | -.067 | 5 | -.009 | 1 | -7.061e-03 | 5 | -3.8e-04 | 6 | -2.834e-03 | 3 |
| 891 | N495A | max | .02 | 3 | .003 | 2 | .005 | 2 | -1.994e-03 | 4 | 0 | 1 | 7.485e-04 | 4 |
| 892 | | min | -.02 | 4 | -.06 | 5 | -.008 | 1 | -8.153e-03 | 5 | 0 | 1 | -2.844e-03 | 3 |
| 893 | N496A | max | .019 | 3 | .008 | 2 | .004 | 2 | -2.015e-03 | 2 | 0 | 1 | 9.828e-04 | 4 |
| 894 | | min | -.02 | 4 | -.041 | 1 | -.008 | 1 | -8.378e-03 | 5 | 0 | 1 | -2.227e-03 | 3 |
| 895 | N497A | max | .018 | 3 | .012 | 10 | .004 | 2 | -1.859e-03 | 2 | 0 | 1 | 1.242e-03 | 4 |
| 896 | | min | -.02 | 4 | -.029 | 1 | -.008 | 1 | -7.989e-03 | 5 | 0 | 1 | -1.506e-03 | 3 |
| 897 | N498A | max | .02 | 3 | -.001 | 2 | .005 | 2 | -2.229e-03 | 4 | 3.661e-04 | 4 | -9.422e-06 | 4 |
| 898 | | min | -.02 | 4 | -.075 | 5 | -.008 | 1 | -9.26e-03 | 7 | -4.304e-04 | 3 | -3.888e-03 | 7 |
| 899 | N499A | max | .019 | 3 | .005 | 2 | .005 | 2 | -2.396e-03 | 2 | 0 | 1 | 6.25e-04 | 4 |
| 900 | | min | -.02 | 4 | -.052 | 5 | -.008 | 1 | -9.18e-03 | 5 | 0 | 1 | -2.863e-03 | 3 |
| 901 | N500A | max | .019 | 3 | .01 | 2 | .005 | 2 | -2.122e-03 | 4 | 0 | 1 | 9.984e-04 | 4 |
| 902 | | min | -.02 | 4 | -.038 | 1 | -.008 | 1 | -8.495e-03 | 5 | 0 | 1 | -2.229e-03 | 3 |
| 903 | N501A | max | .018 | 3 | .017 | 10 | .005 | 2 | -2.212e-03 | 2 | 0 | 1 | 1.081e-03 | 4 |
| 904 | | min | -.02 | 4 | -.027 | 1 | -.008 | 1 | -8.825e-03 | 5 | 0 | 1 | -1.688e-03 | 3 |
| 905 | N502A | max | .018 | 3 | .026 | 10 | .004 | 2 | -2.206e-03 | 4 | 0 | 1 | 1.401e-03 | 10 |
| 906 | | min | -.02 | 4 | -.016 | 1 | -.008 | 1 | -8.996e-03 | 5 | 0 | 1 | -1.042e-03 | 3 |
| 907 | N503A | max | .02 | 3 | .002 | 4 | .006 | 2 | -2.727e-03 | 2 | -9.797e-05 | 1 | 9.74e-04 | 4 |
| 908 | | min | -.019 | 4 | -.066 | 5 | -.008 | 1 | -9.97e-03 | 5 | -6.023e-04 | 6 | -3.018e-03 | 3 |
| 909 | N504A | max | .019 | 3 | .007 | 2 | .005 | 2 | -2.348e-03 | 4 | 0 | 1 | 7.096e-04 | 4 |
| 910 | | min | -.02 | 4 | -.046 | 1 | -.008 | 1 | -9.183e-03 | 5 | 0 | 1 | -2.748e-03 | 3 |
| 911 | N505A | max | .018 | 3 | .013 | 10 | .005 | 2 | -2.378e-03 | 4 | 0 | 1 | 8.419e-04 | 4 |
| 912 | | min | -.02 | 4 | -.035 | 1 | -.008 | 1 | -9.207e-03 | 5 | 0 | 1 | -2.368e-03 | 3 |
| 913 | N506A | max | .018 | 3 | .022 | 10 | .005 | 2 | -2.273e-03 | 4 | 0 | 1 | 1.098e-03 | 4 |
| 914 | | min | -.02 | 4 | -.024 | 1 | -.008 | 1 | -9.238e-03 | 7 | 0 | 1 | -1.846e-03 | 3 |
| 915 | N507A | max | .017 | 3 | .032 | 10 | .005 | 2 | -2.427e-03 | 4 | 0 | 1 | 1.182e-03 | 4 |
| 916 | | min | -.02 | 4 | -.013 | 1 | -.008 | 1 | -9.749e-03 | 7 | 0 | 1 | -1.361e-03 | 3 |
| 917 | N508A | max | .019 | 3 | .006 | 4 | .006 | 2 | -2.36e-03 | 4 | 1.206e-04 | 4 | 4.444e-04 | 4 |
| 918 | | min | -.02 | 4 | -.056 | 7 | -.008 | 1 | -9.416e-03 | 7 | -3.586e-04 | 3 | -3.413e-03 | 7 |
| 919 | N509A | max | .019 | 3 | .01 | 4 | .006 | 2 | -2.532e-03 | 4 | 0 | 1 | 7.813e-04 | 4 |
| 920 | | min | -.02 | 4 | -.043 | 3 | -.008 | 1 | -9.629e-03 | 5 | 0 | 1 | -2.812e-03 | 3 |
| 921 | N510A | max | .018 | 3 | .018 | 10 | .006 | 2 | -2.394e-03 | 4 | 0 | 1 | 9.048e-04 | 4 |
| 922 | | min | -.02 | 4 | -.031 | 1 | -.008 | 1 | -9.592e-03 | 7 | 0 | 1 | -2.473e-03 | 3 |
| 923 | N511A | max | .018 | 3 | .027 | 10 | .005 | 2 | -2.451e-03 | 4 | 0 | 1 | 9.886e-04 | 4 |
| 924 | | min | -.02 | 4 | -.021 | 1 | -.008 | 1 | -9.888e-03 | 7 | 0 | 1 | -2.087e-03 | 3 |
| 925 | N512A | max | .017 | 3 | .037 | 10 | .005 | 2 | -2.443e-03 | 4 | 0 | 1 | 1.147e-03 | 4 |
| 926 | | min | -.02 | 4 | -.011 | 1 | -.008 | 1 | -1.019e-02 | 7 | 0 | 1 | -1.638e-03 | 3 |

## *Envelope Joint Displacements (Continued)*

| | Joint | | X [in] | LC | Y [in] | LC | Z [in] | LC | X Rotation [... | LC | Y Rotation [... | LC | Z Rotation [... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 927 | N513A | max | .018 | 3 | .014 | 4 | .006 | 2 | -2.487e-03 | 4 | 0 | 1 | 8.042e-04 | 4 |
| 928 | | min | -.02 | 4 | -.04 | 3 | -.008 | 1 | -9.85e-03 | 7 | 0 | 1 | -2.936e-03 | 3 |
| 929 | N514A | max | .018 | 3 | .023 | 10 | .006 | 2 | -2.527e-03 | 4 | 0 | 1 | 8.724e-04 | 4 |
| 930 | | min | -.02 | 4 | -.029 | 3 | -.008 | 1 | -1.01e-02 | 7 | 0 | 1 | -2.658e-03 | 3 |
| 931 | N515A | max | .017 | 3 | .032 | 10 | .006 | 2 | -2.505e-03 | 4 | 0 | 1 | 9.909e-04 | 4 |
| 932 | | min | -.02 | 4 | -.018 | 1 | -.008 | 1 | -1.033e-02 | 7 | 0 | 1 | -2.326e-03 | 3 |
| 933 | N516A | max | .018 | 3 | .016 | 4 | .007 | 2 | -2.481e-03 | 4 | -1.163e-05 | 4 | 6.526e-04 | 4 |
| 934 | | min | -.02 | 4 | -.048 | 3 | -.007 | 1 | -9.912e-03 | 7 | -3.869e-04 | 7 | -3.606e-03 | 7 |
| 935 | N517A | max | .018 | 3 | .019 | 10 | .007 | 2 | -2.602e-03 | 4 | 0 | 1 | 8.341e-04 | 4 |
| 936 | | min | -.02 | 4 | -.037 | 3 | -.007 | 1 | -1.028e-02 | 7 | 0 | 1 | -3.133e-03 | 7 |
| 937 | N518A | max | .018 | 3 | .028 | 10 | .006 | 2 | -2.572e-03 | 4 | 0 | 1 | 9.015e-04 | 4 |
| 938 | | min | -.02 | 4 | -.026 | 3 | -.007 | 1 | -1.05e-02 | 7 | 0 | 1 | -2.855e-03 | 3 |
| 939 | N519A | max | .017 | 3 | .038 | 10 | .006 | 2 | -2.619e-03 | 4 | 0 | 1 | 9.583e-04 | 4 |
| 940 | | min | -.02 | 4 | -.015 | 1 | -.008 | 1 | -1.085e-02 | 7 | 0 | 1 | -2.559e-03 | 3 |
| 941 | N520A | max | .017 | 3 | .048 | 10 | .006 | 2 | -2.647e-03 | 4 | 0 | 1 | 1.046e-03 | 4 |
| 942 | | min | -.02 | 4 | -.005 | 1 | -.008 | 1 | -1.123e-02 | 7 | 0 | 1 | -2.247e-03 | 3 |
| 943 | N521A | max | .018 | 3 | .02 | 4 | .007 | 2 | -2.703e-03 | 4 | -1.254e-04 | 1 | 8.764e-04 | 4 |
| 944 | | min | -.02 | 4 | -.045 | 3 | -.007 | 1 | -1.045e-02 | 7 | -5.057e-04 | 6 | -3.64e-03 | 7 |
| 945 | N522A | max | .018 | 3 | .024 | 10 | .007 | 2 | -2.62e-03 | 4 | 0 | 1 | 8.293e-04 | 4 |
| 946 | | min | -.02 | 4 | -.034 | 3 | -.007 | 1 | -1.061e-02 | 7 | 0 | 1 | -3.459e-03 | 7 |
| 947 | N523A | max | .017 | 3 | .034 | 10 | .007 | 2 | -2.666e-03 | 4 | 0 | 1 | 8.792e-04 | 4 |
| 948 | | min | -.02 | 4 | -.023 | 3 | -.007 | 1 | -1.095e-02 | 7 | 0 | 1 | -3.099e-03 | 7 |
| 949 | N524A | max | .017 | 3 | .044 | 10 | .006 | 2 | -2.692e-03 | 4 | 0 | 1 | 9.53e-04 | 4 |
| 950 | | min | -.02 | 4 | -.011 | 3 | -.007 | 1 | -1.13e-02 | 7 | 0 | 1 | -2.823e-03 | 3 |
| 951 | N525A | max | .016 | 3 | .053 | 10 | .006 | 2 | -2.743e-03 | 4 | 0 | 1 | 1.01e-03 | 4 |
| 952 | | min | -.02 | 4 | -.001 | 1 | -.008 | 1 | -1.168e-02 | 7 | 0 | 1 | -2.539e-03 | 3 |
| 953 | N526A | max | .018 | 3 | .025 | 4 | .008 | 2 | -2.61e-03 | 4 | -8.452e-05 | 4 | 6.984e-04 | 4 |
| 954 | | min | -.02 | 4 | -.041 | 3 | -.007 | 1 | -1.062e-02 | 7 | -4.286e-04 | 6 | -4.225e-03 | 7 |
| 955 | N527A | max | .017 | 3 | .03 | 10 | .007 | 2 | -2.709e-03 | 4 | 0 | 1 | 8.189e-04 | 4 |
| 956 | | min | -.02 | 4 | -.03 | 3 | -.007 | 1 | -1.105e-02 | 7 | 0 | 1 | -3.821e-03 | 7 |
| 957 | N528A | max | .017 | 3 | .04 | 10 | .007 | 2 | -2.73e-03 | 4 | 0 | 1 | 8.692e-04 | 4 |
| 958 | | min | -.02 | 4 | -.019 | 3 | -.007 | 1 | -1.137e-02 | 7 | 0 | 1 | -3.486e-03 | 7 |
| 959 | N529A | max | .017 | 3 | .049 | 10 | .007 | 2 | -2.78e-03 | 4 | 0 | 1 | 9.162e-04 | 4 |
| 960 | | min | -.02 | 4 | -.008 | 3 | -.007 | 1 | -1.174e-02 | 7 | 0 | 1 | -3.124e-03 | 3 |
| 961 | N530A | max | .016 | 3 | .059 | 10 | .007 | 2 | -2.82e-03 | 4 | 0 | 1 | 9.857e-04 | 4 |
| 962 | | min | -.02 | 4 | .002 | 1 | -.007 | 1 | -1.21e-02 | 7 | 0 | 1 | -2.836e-03 | 3 |
| 963 | N531A | max | .017 | 3 | .036 | 10 | .008 | 2 | -2.754e-03 | 4 | 0 | 1 | 7.789e-04 | 4 |
| 964 | | min | -.02 | 4 | -.027 | 3 | -.007 | 1 | -1.142e-02 | 7 | 0 | 1 | -4.257e-03 | 7 |
| 965 | N532A | max | .017 | 3 | .045 | 10 | .008 | 2 | -2.807e-03 | 4 | 0 | 1 | 8.234e-04 | 4 |
| 966 | | min | -.02 | 4 | -.016 | 3 | -.007 | 1 | -1.179e-02 | 7 | 0 | 1 | -3.943e-03 | 7 |
| 967 | N533A | max | .016 | 3 | .055 | 10 | .007 | 2 | -2.854e-03 | 4 | 0 | 1 | 8.811e-04 | 4 |
| 968 | | min | -.02 | 4 | -.006 | 3 | -.007 | 1 | -1.215e-02 | 7 | 0 | 1 | -3.589e-03 | 7 |
| 969 | N534A | max | .017 | 3 | .035 | 4 | .008 | 2 | -2.732e-03 | 4 | -1.122e-04 | 4 | 6.321e-04 | 4 |
| 970 | | min | -.02 | 4 | -.035 | 3 | -.007 | 1 | -1.14e-02 | 7 | -4.295e-04 | 6 | -5.096e-03 | 7 |
| 971 | N535A | max | .017 | 3 | .042 | 10 | .008 | 2 | -2.836e-03 | 4 | 0 | 1 | 7.353e-04 | 4 |
| 972 | | min | -.02 | 4 | -.024 | 3 | -.007 | 1 | -1.187e-02 | 7 | 0 | 1 | -4.69e-03 | 7 |
| 973 | N536A | max | .016 | 3 | .052 | 10 | .008 | 2 | -2.878e-03 | 4 | 0 | 1 | 7.813e-04 | 4 |
| 974 | | min | -.02 | 4 | -.012 | 3 | -.007 | 1 | -1.222e-02 | 7 | 0 | 1 | -4.379e-03 | 7 |
| 975 | N537A | max | .016 | 3 | .062 | 10 | .008 | 2 | -2.93e-03 | 4 | 0 | 1 | 8.28e-04 | 4 |
| 976 | | min | -.021 | 4 | -.001 | 3 | -.007 | 1 | -1.258e-02 | 7 | 0 | 1 | -4.047e-03 | 7 |
| 977 | N538A | max | .016 | 3 | .076 | 8 | .007 | 2 | -2.99e-03 | 4 | 0 | 1 | 8.814e-04 | 4 |
| 978 | | min | -.021 | 4 | .01 | 1 | -.007 | 1 | -1.299e-02 | 7 | 0 | 1 | -3.72e-03 | 7 |

## Envelope Joint Displacements (Continued)

| | Joint | | X [in] | LC | Y [in] | LC | Z [in] | LC | X Rotation [... | LC | Y Rotation [... | LC | Z Rotation [... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 979 | N539A | max | .016 | 3 | .04 | 4 | .009 | 2 | -2.898e-03 | 4 | -1.172e-04 | 1 | 6.837e-04 | 4 |
| 980 | | min | -.02 | 4 | -.032 | 3 | -.006 | 1 | -1.206e-02 | 7 | -4.21e-04 | 6 | -5.292e-03 | 7 |
| 981 | N540A | max | .016 | 3 | .048 | 10 | .009 | 2 | -2.884e-03 | 4 | 0 | 1 | 6.638e-04 | 4 |
| 982 | | min | -.02 | 4 | -.02 | 3 | -.007 | 1 | -1.224e-02 | 7 | 0 | 1 | -5.18e-03 | 7 |
| 983 | N541A | max | .016 | 3 | .058 | 10 | .008 | 2 | -2.939e-03 | 4 | 0 | 1 | 7.11e-04 | 4 |
| 984 | | min | -.021 | 4 | -.008 | 3 | -.007 | 1 | -1.261e-02 | 7 | 0 | 1 | -4.869e-03 | 7 |
| 985 | N542A | max | .016 | 3 | .071 | 8 | .008 | 2 | -2.996e-03 | 4 | 0 | 1 | 7.639e-04 | 4 |
| 986 | | min | -.021 | 4 | .003 | 3 | -.007 | 1 | -1.298e-02 | 7 | 0 | 1 | -4.537e-03 | 7 |
| 987 | N543A | max | .015 | 3 | .087 | 8 | .008 | 2 | -3.044e-03 | 4 | 0 | 1 | 8.085e-04 | 4 |
| 988 | | min | -.021 | 4 | .015 | 1 | -.007 | 1 | -1.332e-02 | 7 | 0 | 1 | -4.233e-03 | 7 |
| 989 | N544A | max | .016 | 3 | .044 | 4 | .009 | 2 | -2.813e-03 | 4 | -9.798e-05 | 4 | 4.891e-04 | 4 |
| 990 | | min | -.021 | 4 | -.028 | 3 | -.006 | 1 | -1.207e-02 | 7 | -3.873e-04 | 6 | -6.074e-03 | 7 |
| 991 | N545A | max | .016 | 3 | .054 | 10 | .009 | 2 | -2.945e-03 | 4 | 0 | 1 | 5.935e-04 | 4 |
| 992 | | min | -.021 | 4 | -.016 | 3 | -.006 | 1 | -1.264e-02 | 7 | 0 | 1 | -5.65e-03 | 7 |
| 993 | N546A | max | .016 | 3 | .065 | 8 | .009 | 2 | -2.988e-03 | 4 | 0 | 1 | 6.36e-04 | 4 |
| 994 | | min | -.021 | 4 | -.004 | 3 | -.007 | 1 | -1.295e-02 | 7 | 0 | 1 | -5.367e-03 | 7 |
| 995 | N547A | max | .015 | 3 | .081 | 8 | .008 | 2 | -3.012e-03 | 4 | 0 | 1 | 6.787e-04 | 4 |
| 996 | | min | -.021 | 4 | .008 | 3 | -.007 | 1 | -1.321e-02 | 7 | 0 | 1 | -5.069e-03 | 7 |
| 997 | N548A | max | .015 | 3 | .097 | 8 | .008 | 2 | -3.069e-03 | 4 | 0 | 1 | 7.104e-04 | 4 |
| 998 | | min | -.021 | 4 | .02 | 3 | -.007 | 1 | -1.356e-02 | 7 | 0 | 1 | -4.806e-03 | 7 |
| 999 | N549A | max | .016 | 3 | .059 | 10 | .009 | 2 | -2.958e-03 | 4 | 0 | 1 | 5.041e-04 | 4 |
| 1000 | | min | -.021 | 4 | -.013 | 3 | -.006 | 1 | -1.287e-02 | 7 | 0 | 1 | -6.145e-03 | 7 |
| 1001 | N550A | max | .015 | 3 | .075 | 8 | .009 | 2 | -2.963e-03 | 4 | 0 | 1 | 5.475e-04 | 4 |
| 1002 | | min | -.021 | 4 | 0 | 3 | -.006 | 1 | -1.305e-02 | 7 | 0 | 1 | -5.875e-03 | 7 |
| 1003 | N551A | max | .015 | 3 | .091 | 8 | .009 | 2 | -2.973e-03 | 4 | 0 | 1 | 5.813e-04 | 4 |
| 1004 | | min | -.021 | 4 | .012 | 3 | -.006 | 1 | -1.324e-02 | 7 | 0 | 1 | -5.626e-03 | 7 |
| 1005 | N552A | max | .015 | 3 | .119 | 8 | .009 | 2 | -2.667e-03 | 4 | 0 | 1 | 3.818e-04 | 4 |
| 1006 | | min | -.021 | 4 | .03 | 1 | -.006 | 1 | -1.259e-02 | 7 | 0 | 1 | -6.348e-03 | 7 |
| 1007 | N553A | max | .014 | 3 | .128 | 8 | .009 | 2 | -1.977e-03 | 4 | 0 | 1 | 1.559e-04 | 4 |
| 1008 | | min | -.021 | 4 | .034 | 1 | -.006 | 1 | -1.047e-02 | 7 | 0 | 1 | -7.289e-03 | 7 |
| 1009 | N554A | max | .014 | 3 | .132 | 8 | .009 | 2 | -9.634e-04 | 4 | 0 | 1 | -1.581e-04 | 4 |
| 1010 | | min | -.021 | 4 | .036 | 1 | -.006 | 1 | -7.112e-03 | 7 | 0 | 1 | -8.491e-03 | 7 |
| 1011 | N555A | max | .015 | 3 | .102 | 8 | .009 | 2 | -2.714e-03 | 4 | 0 | 1 | 4.995e-04 | 4 |
| 1012 | | min | -.021 | 4 | .017 | 3 | -.006 | 1 | -1.258e-02 | 7 | 0 | 1 | -6.094e-03 | 7 |
| 1013 | N556A | max | .015 | 3 | .112 | 8 | .009 | 2 | -2.17e-03 | 4 | 0 | 1 | 3.806e-04 | 4 |
| 1014 | | min | -.021 | 4 | .022 | 3 | -.006 | 1 | -1.094e-02 | 7 | 0 | 1 | -6.664e-03 | 7 |
| 1015 | N557A | max | .014 | 3 | .117 | 8 | .01 | 2 | -1.143e-03 | 4 | 0 | 1 | 2.252e-04 | 4 |
| 1016 | | min | -.021 | 4 | .024 | 3 | -.006 | 1 | -7.7e-03 | 7 | 0 | 1 | -7.329e-03 | 7 |
| 1017 | N558A | max | .014 | 3 | .117 | 8 | .01 | 2 | -1.44e-04 | 4 | 3.123e-04 | 4 | -3.2e-04 | 4 |
| 1018 | | min | -.02 | 4 | .023 | 3 | -.006 | 1 | -4.872e-03 | 7 | -8.861e-05 | 3 | -8.765e-03 | 7 |
| 1019 | N559A | max | .015 | 3 | .086 | 8 | .009 | 2 | -2.878e-03 | 4 | 0 | 1 | 4.878e-04 | 4 |
| 1020 | | min | -.021 | 4 | .004 | 3 | -.006 | 1 | -1.294e-02 | 7 | 0 | 1 | -6.263e-03 | 7 |
| 1021 | N560A | max | .015 | 3 | .096 | 8 | .01 | 2 | -2.44e-03 | 4 | 0 | 1 | 4.837e-04 | 4 |
| 1022 | | min | -.021 | 4 | .008 | 3 | -.006 | 1 | -1.168e-02 | 7 | 0 | 1 | -6.448e-03 | 7 |
| 1023 | N561A | max | .014 | 3 | .102 | 8 | .01 | 2 | -1.604e-03 | 4 | 0 | 1 | 2.628e-04 | 4 |
| 1024 | | min | -.021 | 4 | .011 | 3 | -.006 | 1 | -9.084e-03 | 7 | 0 | 1 | -7.327e-03 | 7 |
| 1025 | N562A | max | .014 | 3 | .102 | 8 | .01 | 2 | -2.338e-04 | 4 | 2.31e-04 | 4 | -3.152e-04 | 4 |
| 1026 | | min | -.021 | 4 | .009 | 3 | -.006 | 1 | -4.859e-03 | 7 | -9.073e-05 | 3 | -9.005e-03 | 7 |
| 1027 | N563A | max | .015 | 3 | .069 | 8 | .01 | 2 | -2.935e-03 | 4 | 0 | 1 | 4.405e-04 | 4 |
| 1028 | | min | -.021 | 4 | -.009 | 3 | -.006 | 1 | -1.298e-02 | 7 | 0 | 1 | -6.521e-03 | 7 |
| 1029 | N564A | max | .015 | 3 | .079 | 8 | .01 | 2 | -2.819e-03 | 4 | 0 | 1 | 4.31e-04 | 4 |
| 1030 | | min | -.021 | 4 | -.005 | 3 | -.006 | 1 | -1.273e-02 | 7 | 0 | 1 | -6.703e-03 | 7 |

## Envelope Joint Displacements (Continued)

| | Joint | | X [in] | LC | Y [in] | LC | Z [in] | LC | X Rotation [... | LC | Y Rotation [... | LC | Z Rotation [... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1031 | N565A | max | .015 | 3 | .087 | 8 | .01 | 2 | -1.95e-03 | 4 | 0 | 1 | 3.133e-04 | 4 |
| 1032 | | min | -.021 | 4 | -.003 | 3 | -.006 | 1 | -1.009e-02 | 7 | 0 | 1 | -7.111e-03 | 7 |
| 1033 | N566A | max | .014 | 3 | .087 | 8 | .01 | 2 | 2.871e-04 | 4 | 2.537e-04 | 4 | -5.922e-04 | 4 |
| 1034 | | min | -.021 | 4 | -.004 | 3 | -.006 | 1 | -3.183e-03 | 7 | -1.1e-04 | 3 | -9.797e-03 | 7 |
| 1035 | N567A | max | .015 | 3 | .054 | 4 | .01 | 2 | -2.762e-03 | 4 | -5.461e-05 | 4 | 3.429e-04 | 4 |
| 1036 | | min | -.021 | 4 | -.022 | 3 | -.006 | 1 | -1.229e-02 | 7 | -3.239e-04 | 6 | -6.886e-03 | 7 |
| 1037 | N568A | max | .015 | 3 | .062 | 8 | .01 | 2 | -3.079e-03 | 4 | -8.61e-06 | 4 | 5.953e-04 | 4 |
| 1038 | | min | -.021 | 4 | -.019 | 3 | -.006 | 1 | -1.341e-02 | 7 | -2.386e-04 | 6 | -6.176e-03 | 7 |
| 1039 | N569A | max | .015 | 3 | .071 | 8 | .01 | 2 | -2.152e-03 | 4 | 1.934e-05 | 4 | 5.649e-04 | 4 |
| 1040 | | min | -.021 | 4 | -.016 | 3 | -.006 | 1 | -1.065e-02 | 7 | -2.523e-04 | 7 | -6.327e-03 | 7 |
| 1041 | N570A | max | .014 | 3 | .098 | 8 | .01 | 2 | 3.101e-03 | 10 | 0 | 1 | -1.836e-03 | 4 |
| 1042 | | min | -.018 | 4 | .017 | 3 | -.006 | 1 | 5.866e-04 | 3 | 0 | 1 | -1.414e-02 | 7 |
| 1043 | N571A | max | .014 | 3 | .088 | 8 | .01 | 2 | 3.34e-03 | 10 | 0 | 1 | -1.72e-03 | 4 |
| 1044 | | min | -.017 | 4 | .012 | 3 | -.006 | 1 | 7.697e-04 | 1 | 0 | 1 | -1.37e-02 | 7 |
| 1045 | N572A | max | .014 | 3 | .077 | 8 | .01 | 2 | 3.497e-03 | 6 | 0 | 1 | -1.584e-03 | 4 |
| 1046 | | min | -.016 | 4 | .007 | 3 | -.006 | 1 | 8.719e-04 | 1 | 0 | 1 | -1.317e-02 | 7 |
| 1047 | N573A | max | .014 | 3 | .091 | 8 | .01 | 2 | 2.626e-03 | 10 | 0 | 1 | -1.862e-03 | 4 |
| 1048 | | min | -.019 | 4 | .009 | 3 | -.006 | 1 | 3.583e-05 | 3 | 0 | 1 | -1.422e-02 | 7 |
| 1049 | N574A | max | .014 | 3 | .082 | 8 | .01 | 2 | 2.937e-03 | 10 | 0 | 1 | -1.805e-03 | 4 |
| 1050 | | min | -.018 | 4 | .005 | 3 | -.006 | 1 | 3.355e-04 | 3 | 0 | 1 | -1.4e-02 | 7 |
| 1051 | N575A | max | .014 | 3 | .072 | 8 | .01 | 2 | 3.133e-03 | 10 | 0 | 1 | -1.686e-03 | 4 |
| 1052 | | min | -.017 | 4 | 0 | 3 | -.006 | 1 | 5.297e-04 | 1 | 0 | 1 | -1.355e-02 | 7 |
| 1053 | N576A | max | .014 | 3 | .061 | 8 | .01 | 2 | 3.261e-03 | 10 | 0 | 1 | -1.545e-03 | 4 |
| 1054 | | min | -.017 | 4 | -.005 | 3 | -.006 | 1 | 6.146e-04 | 1 | 0 | 1 | -1.3e-02 | 7 |
| 1055 | N577A | max | .014 | 3 | .051 | 8 | .01 | 2 | 3.34e-03 | 10 | 0 | 1 | -1.402e-03 | 4 |
| 1056 | | min | -.016 | 4 | -.01 | 3 | -.006 | 1 | 6.672e-04 | 1 | 0 | 1 | -1.241e-02 | 7 |
| 1057 | N578A | max | .014 | 3 | .076 | 8 | .01 | 2 | 2.54e-03 | 10 | 0 | 1 | -1.881e-03 | 4 |
| 1058 | | min | -.019 | 4 | -.003 | 3 | -.006 | 1 | -1.483e-04 | 3 | 0 | 1 | -1.425e-02 | 7 |
| 1059 | N579A | max | .014 | 3 | .066 | 8 | .01 | 2 | 2.757e-03 | 10 | 0 | 1 | -1.788e-03 | 4 |
| 1060 | | min | -.018 | 4 | -.008 | 3 | -.006 | 1 | 7.969e-05 | 3 | 0 | 1 | -1.391e-02 | 7 |
| 1061 | N580A | max | .014 | 3 | .056 | 8 | .01 | 2 | 2.912e-03 | 10 | 0 | 1 | -1.656e-03 | 4 |
| 1062 | | min | -.017 | 4 | -.012 | 3 | -.006 | 1 | 2.512e-04 | 3 | 0 | 1 | -1.342e-02 | 7 |
| 1063 | N581A | max | .014 | 3 | .046 | 8 | .01 | 2 | 3.021e-03 | 10 | 0 | 1 | -1.512e-03 | 4 |
| 1064 | | min | -.017 | 4 | -.017 | 3 | -.006 | 1 | 3.585e-04 | 1 | 0 | 1 | -1.285e-02 | 7 |
| 1065 | N582A | max | .014 | 3 | .041 | 4 | .009 | 2 | 3.106e-03 | 10 | 0 | 1 | -1.373e-03 | 4 |
| 1066 | | min | -.016 | 4 | -.022 | 3 | -.006 | 1 | 4.164e-04 | 1 | 0 | 1 | -1.228e-02 | 7 |
| 1067 | N583A | max | .014 | 3 | .06 | 8 | .01 | 2 | 2.41e-03 | 10 | 0 | 1 | -1.885e-03 | 4 |
| 1068 | | min | -.019 | 4 | -.016 | 3 | -.007 | 1 | -3.537e-04 | 3 | 0 | 1 | -1.423e-02 | 7 |
| 1069 | N584A | max | .014 | 3 | .05 | 4 | .009 | 2 | 2.568e-03 | 10 | 0 | 1 | -1.764e-03 | 4 |
| 1070 | | min | -.018 | 4 | -.02 | 3 | -.007 | 1 | -1.741e-04 | 3 | 0 | 1 | -1.38e-02 | 7 |
| 1071 | N585A | max | .014 | 3 | .047 | 4 | .009 | 2 | 2.694e-03 | 10 | 0 | 1 | -1.623e-03 | 4 |
| 1072 | | min | -.018 | 4 | -.025 | 3 | -.007 | 1 | -2.41e-05 | 3 | 0 | 1 | -1.327e-02 | 7 |
| 1073 | N586A | max | .014 | 3 | .043 | 4 | .009 | 2 | 2.806e-03 | 10 | 0 | 1 | -1.481e-03 | 4 |
| 1074 | | min | -.017 | 4 | -.029 | 3 | -.007 | 1 | 1.053e-04 | 3 | 0 | 1 | -1.271e-02 | 7 |
| 1075 | N587A | max | .014 | 3 | .039 | 4 | .009 | 2 | 2.875e-03 | 10 | 0 | 1 | -1.345e-03 | 4 |
| 1076 | | min | -.016 | 4 | -.034 | 3 | -.007 | 1 | 1.802e-04 | 1 | 0 | 1 | -1.213e-02 | 7 |
| 1077 | N588A | max | .014 | 3 | .049 | 4 | .009 | 2 | 2.383e-03 | 10 | 3.915e-04 | 8 | -1.725e-03 | 4 |
| 1078 | | min | -.018 | 4 | -.033 | 3 | -.007 | 1 | -4.063e-04 | 3 | -1.466e-05 | 3 | -1.362e-02 | 7 |
| 1079 | N589A | max | .014 | 3 | .045 | 4 | .009 | 2 | 2.52e-03 | 10 | 4.499e-04 | 8 | -1.592e-03 | 4 |
| 1080 | | min | -.018 | 4 | -.037 | 3 | -.007 | 1 | -2.632e-04 | 3 | -3.931e-05 | 3 | -1.311e-02 | 7 |
| 1081 | N590A | max | .014 | 3 | .041 | 4 | .009 | 2 | 2.559e-03 | 10 | 4.464e-04 | 8 | -1.452e-03 | 4 |
| 1082 | | min | -.017 | 4 | -.041 | 3 | -.007 | 1 | -1.69e-04 | 3 | -2.813e-05 | 3 | -1.254e-02 | 7 |

## *Envelope Joint Displacements (Continued)*

| | Joint | | X [in] | LC | Y [in] | LC | Z [in] | LC | X Rotation [... | LC | Y Rotation [... | LC | Z Rotation [... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1083 | N591A | max | .013 | 3 | .042 | 8 | .01 | 2 | 4.192e-03 | 6 | 0 | 1 | -1.026e-03 | 4 |
| 1084 | | min | -.013 | 4 | -.008 | 3 | -.006 | 1 | 1.098e-03 | 1 | 0 | 1 | -1.079e-02 | 7 |
| 1085 | N592A | max | .013 | 3 | .051 | 8 | .01 | 2 | 4.087e-03 | 6 | 0 | 1 | -1.145e-03 | 4 |
| 1086 | | min | -.014 | 4 | -.005 | 3 | -.006 | 1 | 1.065e-03 | 1 | 0 | 1 | -1.135e-02 | 7 |
| 1087 | N593A | max | .013 | 3 | .059 | 8 | .01 | 2 | 3.908e-03 | 6 | 0 | 1 | -1.284e-03 | 4 |
| 1088 | | min | -.015 | 4 | -.002 | 3 | -.006 | 1 | 1.015e-03 | 1 | 0 | 1 | -1.195e-02 | 7 |
| 1089 | N594A | max | .013 | 3 | .028 | 4 | .01 | 2 | 3.613e-03 | 6 | 0 | 1 | -8.471e-04 | 4 |
| 1090 | | min | -.012 | 4 | -.024 | 3 | -.006 | 1 | 7.72e-04 | 1 | 0 | 1 | -9.928e-03 | 7 |
| 1091 | N595A | max | .013 | 3 | .032 | 4 | .01 | 2 | 3.711e-03 | 6 | 0 | 1 | -1.011e-03 | 4 |
| 1092 | | min | -.013 | 4 | -.021 | 3 | -.006 | 1 | 8.096e-04 | 1 | 0 | 1 | -1.066e-02 | 7 |
| 1093 | N596A | max | .013 | 3 | .035 | 4 | .01 | 2 | 3.542e-03 | 6 | 0 | 1 | -1.136e-03 | 4 |
| 1094 | | min | -.014 | 4 | -.017 | 3 | -.006 | 1 | 7.804e-04 | 1 | 0 | 1 | -1.125e-02 | 7 |
| 1095 | N597A | max | .013 | 3 | .043 | 8 | .01 | 2 | 3.441e-03 | 10 | 0 | 1 | -1.266e-03 | 4 |
| 1096 | | min | -.015 | 4 | -.014 | 3 | -.006 | 1 | 7.389e-04 | 1 | 0 | 1 | -1.184e-02 | 7 |
| 1097 | N598A | max | .013 | 3 | .027 | 4 | .009 | 2 | 3.262e-03 | 10 | 0 | 1 | -9.719e-04 | 4 |
| 1098 | | min | -.012 | 4 | -.037 | 3 | -.006 | 1 | 5.132e-04 | 1 | 0 | 1 | -1.026e-02 | 7 |
| 1099 | N599A | max | .013 | 3 | .03 | 4 | .009 | 2 | 3.18e-03 | 10 | 0 | 1 | -1.005e-03 | 4 |
| 1100 | | min | -.013 | 4 | -.033 | 3 | -.006 | 1 | 5.145e-04 | 1 | 0 | 1 | -1.059e-02 | 7 |
| 1101 | N600A | max | .013 | 3 | .034 | 4 | .009 | 2 | 3.242e-03 | 10 | 0 | 1 | -1.127e-03 | 4 |
| 1102 | | min | -.014 | 4 | -.03 | 3 | -.006 | 1 | 5.175e-04 | 1 | 0 | 1 | -1.117e-02 | 7 |
| 1103 | N601A | max | .013 | 3 | .037 | 4 | .009 | 2 | 3.167e-03 | 10 | 0 | 1 | -1.242e-03 | 4 |
| 1104 | | min | -.015 | 4 | -.026 | 3 | -.006 | 1 | 4.749e-04 | 1 | 0 | 1 | -1.171e-02 | 7 |
| 1105 | N602A | max | .013 | 3 | .025 | 4 | .009 | 2 | 2.975e-03 | 10 | 0 | 1 | -9.582e-04 | 4 |
| 1106 | | min | -.012 | 4 | -.05 | 3 | -.007 | 1 | 2.836e-04 | 1 | 0 | 1 | -1.014e-02 | 7 |
| 1107 | N603A | max | .013 | 3 | .028 | 4 | .009 | 2 | 3.034e-03 | 10 | 0 | 1 | -1.057e-03 | 4 |
| 1108 | | min | -.013 | 4 | -.046 | 3 | -.007 | 1 | 2.973e-04 | 1 | 0 | 1 | -1.068e-02 | 7 |
| 1109 | N604A | max | .013 | 3 | .032 | 4 | .009 | 2 | 2.956e-03 | 10 | 0 | 1 | -1.116e-03 | 4 |
| 1110 | | min | -.014 | 4 | -.042 | 3 | -.007 | 1 | 2.722e-04 | 1 | 0 | 1 | -1.106e-02 | 7 |
| 1111 | N605A | max | .013 | 3 | .035 | 4 | .009 | 2 | 2.967e-03 | 10 | 0 | 1 | -1.229e-03 | 4 |
| 1112 | | min | -.015 | 4 | -.038 | 3 | -.007 | 1 | 2.417e-04 | 1 | 0 | 1 | -1.161e-02 | 7 |
| 1113 | N606A | max | .013 | 3 | .026 | 4 | .008 | 2 | 2.673e-03 | 10 | 4.092e-04 | 8 | -1.06e-03 | 4 |
| 1114 | | min | -.013 | 4 | -.059 | 3 | -.007 | 1 | 9.175e-05 | 1 | -7.289e-05 | 3 | -1.056e-02 | 7 |
| 1115 | N607A | max | .013 | 3 | .03 | 4 | .008 | 2 | 2.913e-03 | 10 | 5.89e-04 | 4 | -1.142e-03 | 4 |
| 1116 | | min | -.014 | 4 | -.054 | 3 | -.007 | 1 | 8.512e-05 | 1 | -1.587e-04 | 3 | -1.105e-02 | 7 |
| 1117 | N608A | max | .013 | 3 | .034 | 4 | .008 | 2 | 2.673e-03 | 10 | 4.553e-04 | 8 | -1.212e-03 | 4 |
| 1118 | | min | -.015 | 4 | -.05 | 3 | -.007 | 1 | 1.481e-05 | 3 | -5.77e-05 | 3 | -1.146e-02 | 7 |
| 1119 | N609A | max | .013 | 3 | .028 | 8 | .01 | 2 | 4.4e-03 | 6 | 0 | 1 | -6.807e-04 | 4 |
| 1120 | | min | -.012 | 4 | -.013 | 3 | -.006 | 1 | 1.136e-03 | 1 | 0 | 1 | -9.234e-03 | 7 |
| 1121 | N610A | max | .012 | 3 | .024 | 4 | .01 | 2 | 4.86e-03 | 6 | 0 | 1 | -6.195e-04 | 4 |
| 1122 | | min | -.011 | 4 | -.015 | 3 | -.006 | 1 | 1.218e-03 | 1 | 0 | 1 | -8.773e-03 | 7 |
| 1123 | N611A | max | .012 | 3 | .021 | 4 | .01 | 2 | 4.99e-03 | 6 | 0 | 1 | -4.559e-04 | 4 |
| 1124 | | min | -.01 | 4 | -.017 | 3 | -.006 | 1 | 1.232e-03 | 1 | 0 | 1 | -7.969e-03 | 7 |
| 1125 | N612A | max | .013 | 3 | .024 | 4 | .009 | 2 | 3.505e-03 | 6 | 0 | 1 | -7.284e-04 | 4 |
| 1126 | | min | -.011 | 4 | -.03 | 3 | -.006 | 1 | 6.805e-04 | 1 | 0 | 1 | -9.272e-03 | 7 |
| 1127 | N613A | max | .012 | 3 | .022 | 4 | .009 | 2 | 4.024e-03 | 6 | 0 | 1 | -7.086e-04 | 4 |
| 1128 | | min | -.011 | 4 | -.03 | 3 | -.006 | 1 | 7.824e-04 | 1 | 0 | 1 | -8.974e-03 | 7 |
| 1129 | N614A | max | .012 | 3 | .02 | 4 | .009 | 2 | 3.903e-03 | 6 | 0 | 1 | -5.432e-04 | 4 |
| 1130 | | min | -.01 | 4 | -.03 | 3 | -.006 | 1 | 7.485e-04 | 1 | 0 | 1 | -8.201e-03 | 7 |
| 1131 | N615A | max | .012 | 3 | .017 | 4 | .01 | 2 | 4.001e-03 | 6 | 0 | 1 | -3.749e-04 | 4 |
| 1132 | | min | -.009 | 4 | -.031 | 3 | -.006 | 1 | 7.409e-04 | 1 | 0 | 1 | -7.394e-03 | 7 |
| 1133 | N616A | max | .011 | 3 | .015 | 4 | .01 | 2 | 4.172e-03 | 6 | 0 | 1 | -2.321e-04 | 4 |
| 1134 | | min | -.008 | 4 | -.032 | 3 | -.006 | 1 | 7.412e-04 | 1 | 0 | 1 | -6.65e-03 | 7 |

## Envelope Joint Displacements (Continued)

| | Joint | | X [in] | LC | Y [in] | LC | Z [in] | LC | X Rotation [... | LC | Y Rotation [... | LC | Z Rotation [... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1135 | N617A | max | .012 | 3 | .019 | 4 | .009 | 2 | 3.275e-03 | 10 | 0 | 1 | -8.703e-04 | 4 |
| 1136 | | min | -.01 | 4 | -.047 | 3 | -.006 | 1 | 3.698e-04 | 1 | 0 | 1 | -9.377e-03 | 7 |
| 1137 | N618A | max | .012 | 3 | .018 | 4 | .009 | 2 | 2.735e-03 | 6 | 0 | 1 | -6.718e-04 | 4 |
| 1138 | | min | -.01 | 4 | -.046 | 3 | -.006 | 1 | 2.634e-04 | 1 | 0 | 1 | -8.545e-03 | 7 |
| 1139 | N619A | max | .012 | 3 | .016 | 4 | .009 | 2 | 3.036e-03 | 6 | 0 | 1 | -5.3e-04 | 4 |
| 1140 | | min | -.009 | 4 | -.044 | 3 | -.006 | 1 | 2.951e-04 | 1 | 0 | 1 | -7.867e-03 | 7 |
| 1141 | N620A | max | .011 | 3 | .014 | 4 | .009 | 2 | 3.315e-03 | 6 | 0 | 1 | -4.335e-04 | 4 |
| 1142 | | min | -.008 | 4 | -.045 | 10 | -.006 | 1 | 3.278e-04 | 1 | 0 | 1 | -7.321e-03 | 7 |
| 1143 | N621A | max | .011 | 3 | .012 | 4 | .009 | 2 | 3.389e-03 | 6 | 0 | 1 | -3.303e-04 | 4 |
| 1144 | | min | -.007 | 4 | -.047 | 10 | -.006 | 1 | 3.145e-04 | 1 | 0 | 1 | -6.745e-03 | 7 |
| 1145 | N622A | max | .012 | 3 | .014 | 4 | .008 | 2 | 1.862e-03 | 10 | 0 | 1 | -8.462e-04 | 4 |
| 1146 | | min | -.009 | 4 | -.066 | 10 | -.007 | 1 | -1.282e-04 | 1 | 0 | 1 | -8.979e-03 | 7 |
| 1147 | N623A | max | .012 | 3 | .013 | 4 | .008 | 2 | 2.675e-03 | 10 | 0 | 1 | -8.241e-04 | 4 |
| 1148 | | min | -.009 | 4 | -.065 | 10 | -.007 | 1 | -1.858e-05 | 1 | 0 | 1 | -8.707e-03 | 7 |
| 1149 | N624A | max | .011 | 3 | .012 | 4 | .008 | 2 | 2.922e-03 | 10 | 0 | 1 | -7.959e-04 | 4 |
| 1150 | | min | -.008 | 4 | -.064 | 10 | -.006 | 1 | 8.793e-06 | 1 | 0 | 1 | -8.419e-03 | 7 |
| 1151 | N625A | max | .011 | 3 | .011 | 4 | .009 | 2 | 2.892e-03 | 10 | 0 | 1 | -7.163e-04 | 4 |
| 1152 | | min | -.007 | 4 | -.064 | 10 | -.006 | 1 | -2.354e-05 | 1 | 0 | 1 | -7.965e-03 | 7 |
| 1153 | N626 | max | .011 | 3 | .01 | 4 | .009 | 2 | 2.791e-03 | 10 | 0 | 1 | -5.999e-04 | 4 |
| 1154 | | min | -.007 | 4 | -.064 | 10 | -.006 | 1 | -8.227e-05 | 1 | 0 | 1 | -7.39e-03 | 7 |
| 1155 | N627 | max | .011 | 3 | .008 | 4 | .008 | 2 | 3.02e-03 | 10 | 5.195e-04 | 4 | -1.61e-03 | 4 |
| 1156 | | min | -.008 | 4 | -.09 | 10 | -.007 | 1 | -1.766e-04 | 1 | -1.735e-04 | 3 | -1.083e-02 | 7 |
| 1157 | N628 | max | .011 | 3 | .008 | 4 | .008 | 2 | 2.7e-03 | 10 | 5.671e-04 | 4 | -1.395e-03 | 4 |
| 1158 | | min | -.007 | 4 | -.087 | 10 | -.007 | 1 | -2.914e-04 | 1 | -2.102e-04 | 3 | -9.991e-03 | 7 |
| 1159 | N629 | max | .011 | 3 | .007 | 4 | .008 | 2 | 2.429e-03 | 10 | 5.743e-04 | 4 | -1.189e-03 | 4 |
| 1160 | | min | -.007 | 4 | -.084 | 10 | -.007 | 1 | -3.89e-04 | 1 | -2.221e-04 | 3 | -9.176e-03 | 7 |
| 1161 | N630 | max | .011 | 3 | .015 | 4 | .01 | 2 | 5.326e-03 | 6 | 0 | 1 | -5.429e-05 | 4 |
| 1162 | | min | -.008 | 4 | -.021 | 3 | -.006 | 1 | 1.262e-03 | 1 | 0 | 1 | -5.992e-03 | 7 |
| 1163 | N631 | max | .011 | 3 | .012 | 4 | .01 | 2 | 5.417e-03 | 6 | 0 | 1 | 1.448e-04 | 4 |
| 1164 | | min | -.007 | 4 | -.023 | 10 | -.006 | 1 | 1.248e-03 | 1 | 0 | 1 | -4.99e-03 | 7 |
| 1165 | N632 | max | .011 | 3 | .009 | 4 | .01 | 2 | 5.352e-03 | 6 | 0 | 1 | 3.535e-04 | 4 |
| 1166 | | min | -.006 | 4 | -.029 | 10 | -.006 | 1 | 1.182e-03 | 1 | 0 | 1 | -4.154e-03 | 10 |
| 1167 | N633 | max | .011 | 3 | .013 | 4 | .01 | 2 | 4.325e-03 | 6 | 0 | 1 | -6.37e-05 | 4 |
| 1168 | | min | -.007 | 4 | -.033 | 10 | -.006 | 1 | 7.587e-04 | 1 | 0 | 1 | -5.799e-03 | 7 |
| 1169 | N634 | max | .011 | 3 | .01 | 4 | .01 | 2 | 4.336e-03 | 6 | 0 | 1 | 1.201e-04 | 4 |
| 1170 | | min | -.006 | 4 | -.037 | 10 | -.006 | 1 | 7.286e-04 | 1 | 0 | 1 | -4.879e-03 | 7 |
| 1171 | N635 | max | .01 | 3 | .008 | 4 | .01 | 2 | 4.167e-03 | 6 | 0 | 1 | 3.09e-04 | 4 |
| 1172 | | min | -.005 | 4 | -.041 | 10 | -.006 | 1 | 6.327e-04 | 1 | 0 | 1 | -4.143e-03 | 10 |
| 1173 | N636 | max | .01 | 3 | .006 | 4 | .01 | 2 | 3.83e-03 | 6 | 0 | 1 | 4.812e-04 | 4 |
| 1174 | | min | -.005 | 4 | -.044 | 10 | -.006 | 1 | 4.735e-04 | 1 | 0 | 1 | -3.446e-03 | 10 |
| 1175 | N637 | max | .011 | 3 | .011 | 4 | .009 | 2 | 3.395e-03 | 6 | 0 | 1 | -1.725e-04 | 4 |
| 1176 | | min | -.007 | 4 | -.048 | 10 | -.006 | 1 | 2.882e-04 | 1 | 0 | 1 | -5.962e-03 | 7 |
| 1177 | N638 | max | .01 | 3 | .009 | 4 | .009 | 2 | 3.28e-03 | 6 | 0 | 1 | 6.66e-06 | 4 |
| 1178 | | min | -.006 | 4 | -.05 | 10 | -.006 | 1 | 2.239e-04 | 1 | 0 | 1 | -5.1e-03 | 7 |
| 1179 | N639 | max | .01 | 3 | .007 | 4 | .01 | 2 | 3.101e-03 | 10 | 0 | 1 | 1.975e-04 | 4 |
| 1180 | | min | -.005 | 4 | -.052 | 10 | -.006 | 1 | 1.302e-04 | 1 | 0 | 1 | -4.385e-03 | 10 |
| 1181 | N640 | max | .01 | 10 | .006 | 4 | .01 | 2 | 2.896e-03 | 10 | 0 | 1 | 3.82e-04 | 4 |
| 1182 | | min | -.004 | 4 | -.054 | 10 | -.006 | 1 | 3.894e-06 | 1 | 0 | 1 | -3.68e-03 | 10 |
| 1183 | N641 | max | .01 | 3 | .008 | 4 | .009 | 2 | 2.633e-03 | 10 | 0 | 1 | -4.176e-04 | 4 |
| 1184 | | min | -.006 | 4 | -.063 | 10 | -.006 | 1 | -1.564e-04 | 1 | 0 | 1 | -6.57e-03 | 7 |
| 1185 | N642 | max | .01 | 3 | .007 | 4 | .009 | 2 | 2.461e-03 | 10 | 0 | 1 | -2.148e-04 | 4 |
| 1186 | | min | -.005 | 4 | -.063 | 10 | -.006 | 1 | -2.396e-04 | 1 | 0 | 1 | -5.676e-03 | 7 |

## *Envelope Joint Displacements (Continued)*

| | Joint | | X [in] | LC | Y [in] | LC | Z [in] | LC | X Rotation [... | LC | Y Rotation [... | LC | Z Rotation [... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1187 | N643 | max | .01 | 10 | .006 | 4 | .009 | 2 | 2.288e-03 | 10 | 0 | 1 | -1.188e-06 | 4 |
| 1188 | | min | -.004 | 4 | -.062 | 10 | -.006 | 1 | -3.282e-04 | 1 | 0 | 1 | -4.881e-03 | 10 |
| 1189 | N644 | max | .01 | 10 | .005 | 4 | .009 | 2 | 2.132e-03 | 10 | 0 | 1 | 2.122e-04 | 4 |
| 1190 | | min | -.004 | 4 | -.062 | 10 | -.006 | 1 | -4.137e-04 | 1 | 0 | 1 | -4.127e-03 | 10 |
| 1191 | N645 | max | .01 | 3 | .006 | 4 | .009 | 2 | 1.979e-03 | 10 | 5.651e-04 | 4 | -7.518e-04 | 4 |
| 1192 | | min | -.005 | 4 | -.078 | 10 | -.006 | 1 | -5.559e-04 | 1 | -2.401e-04 | 3 | -7.428e-03 | 7 |
| 1193 | N646 | max | .01 | 3 | .006 | 4 | .009 | 2 | 1.812e-03 | 10 | 5.498e-04 | 4 | -5.18e-04 | 4 |
| 1194 | | min | -.005 | 4 | -.076 | 10 | -.006 | 1 | -6.214e-04 | 1 | -2.483e-04 | 3 | -6.486e-03 | 7 |
| 1195 | N647 | max | .01 | 10 | .005 | 4 | .009 | 2 | 1.702e-03 | 10 | 5.244e-04 | 4 | -2.889e-04 | 4 |
| 1196 | | min | -.004 | 4 | -.073 | 10 | -.006 | 1 | -6.678e-04 | 1 | -2.541e-04 | 3 | -5.592e-03 | 10 |
| 1197 | N648 | max | .01 | 10 | .004 | 4 | .01 | 2 | 4.402e-03 | 6 | 0 | 1 | 7.333e-04 | 4 |
| 1198 | | min | -.004 | 4 | -.039 | 10 | -.006 | 1 | 7.27e-04 | 1 | 0 | 1 | -2.541e-03 | 10 |
| 1199 | N649 | max | .01 | 10 | .002 | 4 | .01 | 2 | 3.38e-03 | 10 | 0 | 1 | 7.598e-04 | 4 |
| 1200 | | min | -.004 | 4 | -.043 | 10 | -.006 | 1 | 2.344e-04 | 1 | 0 | 1 | -2.154e-03 | 10 |
| 1201 | N650 | max | .01 | 10 | 0 | 4 | .01 | 2 | 1.83e-03 | 10 | 1.955e-04 | 4 | 5.099e-04 | 4 |
| 1202 | | min | -.003 | 4 | -.046 | 10 | -.006 | 1 | -6.048e-04 | 1 | -1.928e-04 | 3 | -2.677e-03 | 10 |
| 1203 | N651 | max | .01 | 10 | .004 | 4 | .01 | 2 | 3.401e-03 | 10 | 0 | 1 | 6.109e-04 | 4 |
| 1204 | | min | -.004 | 4 | -.047 | 10 | -.006 | 1 | 2.726e-04 | 1 | 0 | 1 | -2.834e-03 | 10 |
| 1205 | N652 | max | .01 | 10 | .002 | 4 | .01 | 2 | 2.825e-03 | 10 | 0 | 1 | 6.417e-04 | 4 |
| 1206 | | min | -.003 | 4 | -.05 | 10 | -.006 | 1 | -5.985e-05 | 1 | 0 | 1 | -2.538e-03 | 10 |
| 1207 | N653 | max | .011 | 10 | .001 | 4 | .01 | 2 | 1.856e-03 | 10 | 2.181e-04 | 4 | 5.205e-04 | 4 |
| 1208 | | min | -.003 | 4 | -.051 | 10 | -.006 | 1 | -6.099e-04 | 1 | -2.154e-04 | 3 | -2.695e-03 | 10 |
| 1209 | N655 | max | .01 | 10 | .004 | 4 | .01 | 2 | 2.68e-03 | 10 | 0 | 1 | 5.48e-04 | 4 |
| 1210 | | min | -.003 | 4 | -.055 | 10 | -.006 | 1 | -1.262e-04 | 1 | 0 | 1 | -3.031e-03 | 10 |
| 1211 | N656 | max | .01 | 10 | .003 | 4 | .01 | 2 | 2.338e-03 | 10 | 0 | 1 | 6.011e-04 | 4 |
| 1212 | | min | -.003 | 4 | -.056 | 10 | -.006 | 1 | -3.388e-04 | 1 | 0 | 1 | -2.697e-03 | 10 |
| 1213 | N657 | max | .011 | 10 | .002 | 4 | .01 | 2 | 1.878e-03 | 10 | 2.327e-04 | 4 | 5.296e-04 | 4 |
| 1214 | | min | -.002 | 4 | -.057 | 10 | -.006 | 1 | -6.11e-04 | 1 | -2.299e-04 | 3 | -2.703e-03 | 10 |
| 1215 | N659 | max | .01 | 10 | .004 | 4 | .01 | 2 | 2.011e-03 | 10 | 0 | 1 | 4.157e-04 | 4 |
| 1216 | | min | -.003 | 4 | -.062 | 10 | -.006 | 1 | -4.928e-04 | 1 | 0 | 1 | -3.395e-03 | 10 |
| 1217 | N660 | max | .01 | 10 | .003 | 4 | .01 | 2 | 1.991e-03 | 10 | 0 | 1 | 5.566e-04 | 4 |
| 1218 | | min | -.003 | 4 | -.063 | 10 | -.006 | 1 | -5.223e-04 | 1 | 0 | 1 | -2.884e-03 | 10 |
| 1219 | N661 | max | .011 | 10 | .002 | 4 | .01 | 2 | 1.895e-03 | 10 | 2.403e-04 | 4 | 5.383e-04 | 4 |
| 1220 | | min | -.002 | 4 | -.063 | 10 | -.006 | 1 | -6.14e-04 | 1 | -2.376e-04 | 3 | -2.705e-03 | 10 |
| 1221 | N663 | max | .01 | 10 | .004 | 4 | .009 | 2 | 1.668e-03 | 10 | 4.313e-04 | 4 | 1.489e-04 | 4 |
| 1222 | | min | -.003 | 4 | -.07 | 10 | -.006 | 1 | -6.948e-04 | 1 | -2.52e-04 | 3 | -4.095e-03 | 10 |
| 1223 | N664 | max | .011 | 10 | .004 | 4 | .009 | 2 | 1.754e-03 | 10 | 3.874e-04 | 4 | 3.533e-04 | 4 |
| 1224 | | min | -.002 | 4 | -.069 | 10 | -.006 | 1 | -6.704e-04 | 1 | -2.394e-04 | 3 | -3.386e-03 | 10 |
| 1225 | N665 | max | .011 | 10 | .003 | 4 | .01 | 2 | 1.909e-03 | 10 | 2.426e-04 | 4 | 5.469e-04 | 4 |
| 1226 | | min | -.002 | 4 | -.069 | 10 | -.006 | 1 | -6.197e-04 | 1 | -2.399e-04 | 3 | -2.701e-03 | 10 |
| 1227 | N666 | max | .014 | 3 | .113 | 8 | .01 | 2 | 2.316e-03 | 10 | 0 | 1 | -1.864e-03 | 4 |
| 1228 | | min | -.019 | 4 | .025 | 3 | -.006 | 1 | -9.376e-05 | 3 | 0 | 1 | -1.427e-02 | 7 |
| 1229 | N667 | max | .014 | 3 | .119 | 8 | .01 | 2 | 1.881e-03 | 10 | 0 | 1 | -1.787e-03 | 4 |
| 1230 | | min | -.019 | 4 | .029 | 3 | -.006 | 1 | -4.543e-04 | 3 | 0 | 1 | -1.401e-02 | 7 |
| 1231 | N668 | max | .014 | 3 | .124 | 8 | .01 | 2 | 1.325e-03 | 10 | 0 | 1 | -1.646e-03 | 4 |
| 1232 | | min | -.019 | 4 | .031 | 3 | -.006 | 1 | -9.108e-04 | 3 | 0 | 1 | -1.353e-02 | 7 |
| 1233 | N669 | max | .014 | 3 | .097 | 8 | .01 | 2 | 2.415e-03 | 10 | 0 | 1 | -1.846e-03 | 4 |
| 1234 | | min | -.019 | 4 | .013 | 3 | -.006 | 1 | -1.515e-04 | 3 | 0 | 1 | -1.417e-02 | 7 |
| 1235 | N670 | max | .014 | 3 | .103 | 8 | .01 | 2 | 2.134e-03 | 10 | 0 | 1 | -1.779e-03 | 4 |
| 1236 | | min | -.019 | 4 | .015 | 3 | -.006 | 1 | -3.957e-04 | 3 | 0 | 1 | -1.394e-02 | 7 |
| 1237 | N671 | max | .014 | 3 | .107 | 8 | .01 | 2 | 1.753e-03 | 10 | 0 | 1 | -1.648e-03 | 4 |
| 1238 | | min | -.019 | 4 | .018 | 3 | -.006 | 1 | -7.2e-04 | 3 | 0 | 1 | -1.35e-02 | 7 |

## Envelope Joint Displacements (Continued)

| | Joint | | X [in] | LC | Y [in] | LC | Z [in] | LC | X Rotation [... | LC | Y Rotation [... | LC | Z Rotation [... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1239 | N672 | max | .014 | 3 | .112 | 8 | .01 | 2 | 1.259e-03 | 10 | 0 | 1 | -1.433e-03 | 4 |
| 1240 | | min | -.02 | 4 | .02 | 3 | -.006 | 1 | -1.136e-03 | 3 | 0 | 1 | -1.277e-02 | 7 |
| 1241 | N673 | max | .014 | 3 | .081 | 8 | .01 | 2 | 2.413e-03 | 10 | 0 | 1 | -1.896e-03 | 4 |
| 1242 | | min | -.019 | 4 | 0 | 3 | -.006 | 1 | -2.752e-04 | 3 | 0 | 1 | -1.43e-02 | 7 |
| 1243 | N674 | max | .014 | 3 | .086 | 8 | .01 | 2 | 2.247e-03 | 10 | 0 | 1 | -1.876e-03 | 4 |
| 1244 | | min | -.019 | 4 | .002 | 3 | -.006 | 1 | -4.351e-04 | 3 | 0 | 1 | -1.423e-02 | 7 |
| 1245 | N675 | max | .014 | 3 | .091 | 8 | .01 | 2 | 2.044e-03 | 10 | 0 | 1 | -1.797e-03 | 4 |
| 1246 | | min | -.02 | 4 | .005 | 3 | -.006 | 1 | -6.27e-04 | 3 | 0 | 1 | -1.395e-02 | 7 |
| 1247 | N676 | max | .014 | 3 | .096 | 8 | .01 | 2 | 1.708e-03 | 10 | 0 | 1 | -1.645e-03 | 4 |
| 1248 | | min | -.02 | 4 | .007 | 3 | -.006 | 1 | -9.212e-04 | 3 | 0 | 1 | -1.344e-02 | 7 |
| 1249 | N677 | max | .014 | 3 | .065 | 8 | .01 | 2 | 2.323e-03 | 10 | 0 | 1 | -1.931e-03 | 4 |
| 1250 | | min | -.019 | 4 | -.013 | 3 | -.006 | 1 | -4.515e-04 | 3 | 0 | 1 | -1.439e-02 | 7 |
| 1251 | N678 | max | .014 | 3 | .07 | 8 | .01 | 2 | 2.244e-03 | 10 | 0 | 1 | -1.959e-03 | 4 |
| 1252 | | min | -.019 | 4 | -.011 | 3 | -.006 | 1 | -5.444e-04 | 3 | 0 | 1 | -1.447e-02 | 7 |
| 1253 | N679 | max | .014 | 3 | .074 | 8 | .01 | 2 | 2.101e-03 | 10 | 0 | 1 | -1.958e-03 | 4 |
| 1254 | | min | -.02 | 4 | -.009 | 3 | -.006 | 1 | -6.879e-04 | 3 | 0 | 1 | -1.445e-02 | 7 |
| 1255 | N680 | max | .014 | 3 | .079 | 8 | .01 | 2 | 2.031e-03 | 10 | 0 | 1 | -1.9e-03 | 4 |
| 1256 | | min | -.02 | 4 | -.006 | 3 | -.006 | 1 | -7.826e-04 | 3 | 0 | 1 | -1.422e-02 | 7 |
| 1257 | N681 | max | .014 | 3 | .054 | 4 | .009 | 2 | 2.273e-03 | 10 | 3.33e-04 | 8 | -1.89e-03 | 4 |
| 1258 | | min | -.019 | 4 | -.026 | 3 | -.007 | 1 | -5.766e-04 | 3 | -2.573e-05 | 3 | -1.42e-02 | 7 |
| 1259 | N682 | max | .014 | 3 | .056 | 4 | .01 | 2 | 2.175e-03 | 10 | 3.197e-04 | 8 | -1.918e-03 | 4 |
| 1260 | | min | -.02 | 4 | -.024 | 3 | -.007 | 1 | -6.788e-04 | 3 | -3.271e-05 | 3 | -1.428e-02 | 7 |
| 1261 | N683 | max | .014 | 3 | .058 | 4 | .01 | 2 | 2.293e-03 | 10 | 2.891e-04 | 8 | -1.948e-03 | 4 |
| 1262 | | min | -.02 | 4 | -.022 | 3 | -.007 | 1 | -6.236e-04 | 3 | -4.276e-05 | 3 | -1.437e-02 | 7 |
| 1263 | N684 | max | .014 | 3 | .131 | 8 | .01 | 2 | 5.9e-04 | 4 | 0 | 1 | -1.116e-03 | 4 |
| 1264 | | min | -.02 | 4 | .035 | 3 | -.006 | 1 | -2.237e-03 | 7 | 0 | 1 | -1.17e-02 | 7 |
| 1265 | N685 | max | .014 | 3 | .132 | 8 | .01 | 2 | 1.845e-04 | 4 | 0 | 1 | -7.899e-04 | 4 |
| 1266 | | min | -.02 | 4 | .036 | 3 | -.006 | 1 | -3.693e-03 | 7 | 0 | 1 | -1.051e-02 | 7 |
| 1267 | N686 | max | .014 | 3 | .115 | 8 | .01 | 2 | 8.915e-04 | 4 | 0 | 1 | -1.154e-03 | 4 |
| 1268 | | min | -.02 | 4 | .022 | 3 | -.006 | 1 | -1.681e-03 | 3 | 0 | 1 | -1.181e-02 | 7 |
| 1269 | N687 | max | .014 | 3 | .117 | 8 | .01 | 2 | 5.459e-04 | 4 | 0 | 1 | -7.265e-04 | 4 |
| 1270 | | min | -.02 | 4 | .023 | 3 | -.006 | 1 | -2.41e-03 | 7 | 0 | 1 | -1.04e-02 | 7 |
| 1271 | N688 | max | .014 | 3 | .1 | 8 | .01 | 2 | 1.21e-03 | 10 | 0 | 1 | -1.374e-03 | 4 |
| 1272 | | min | -.02 | 4 | .009 | 3 | -.006 | 1 | -1.338e-03 | 3 | 0 | 1 | -1.252e-02 | 7 |
| 1273 | N689 | max | .014 | 3 | .102 | 8 | .01 | 2 | 7.818e-04 | 4 | 0 | 1 | -1.09e-03 | 4 |
| 1274 | | min | -.02 | 4 | .01 | 3 | -.006 | 1 | -2.035e-03 | 3 | 0 | 1 | -1.158e-02 | 7 |
| 1275 | N690 | max | .014 | 3 | .083 | 8 | .01 | 2 | 1.598e-03 | 10 | 0 | 1 | -1.733e-03 | 4 |
| 1276 | | min | -.02 | 4 | -.005 | 3 | -.006 | 1 | -1.14e-03 | 3 | 0 | 1 | -1.362e-02 | 7 |
| 1277 | N691 | max | .014 | 3 | .087 | 8 | .01 | 2 | 9.42e-04 | 4 | 0 | 1 | -1.356e-03 | 4 |
| 1278 | | min | -.02 | 4 | -.003 | 3 | -.006 | 1 | -1.691e-03 | 3 | 0 | 1 | -1.234e-02 | 7 |
| 1279 | N692 | max | .014 | 3 | .066 | 8 | .01 | 2 | 2.634e-03 | 10 | 2.498e-04 | 4 | -1.904e-03 | 4 |
| 1280 | | min | -.02 | 4 | -.018 | 3 | -.007 | 1 | -4.373e-04 | 3 | -7.342e-05 | 3 | -1.415e-02 | 7 |
| 1281 | N693 | max | .014 | 3 | .071 | 8 | .01 | 2 | 1.545e-03 | 10 | 2.692e-04 | 10 | -1.375e-03 | 4 |
| 1282 | | min | -.021 | 4 | -.017 | 3 | -.007 | 1 | -1.251e-03 | 3 | -5.151e-05 | 3 | -1.235e-02 | 7 |
| 1283 | N694 | max | .02 | 3 | -.002 | 2 | .004 | 2 | -2.521e-03 | 2 | -5.481e-05 | 4 | 7.96e-04 | 4 |
| 1284 | | min | -.02 | 4 | -.077 | 5 | -.008 | 1 | -9.585e-03 | 5 | -4.155e-04 | 6 | -3.332e-03 | 3 |
| 1285 | N695 | max | .02 | 3 | .005 | 2 | .004 | 2 | -1.816e-03 | 2 | 0 | 1 | 1.066e-03 | 4 |
| 1286 | | min | -.02 | 4 | -.049 | 5 | -.008 | 1 | -7.876e-03 | 5 | 0 | 1 | -2.378e-03 | 3 |
| 1287 | N696 | max | .012 | 3 | .016 | 4 | .008 | 2 | 3.247e-03 | 10 | 8.575e-04 | 4 | -1.162e-03 | 4 |
| 1288 | | min | -.01 | 4 | -.073 | 10 | -.007 | 1 | 1.323e-04 | 1 | -3.684e-04 | 3 | -1.022e-02 | 7 |
| 1289 | N697 | max | .012 | 3 | .021 | 4 | .009 | 2 | 2.936e-03 | 10 | 0 | 1 | -9.312e-04 | 4 |
| 1290 | | min | -.011 | 4 | -.052 | 3 | -.007 | 1 | 2.631e-04 | 1 | 0 | 1 | -9.744e-03 | 7 |

## Envelope Joint Displacements (Continued)

| | Joint | | X [in] | LC | Y [in] | LC | Z [in] | LC | X Rotation [... | LC | Y Rotation [... | LC | Z Rotation [... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1291 | N698 | max | .012 | 3 | .02 | 4 | .009 | 2 | 2.879e-03 | 10 | 0 | 1 | -7.689e-04 | 4 |
| 1292 | | min | -.011 | 4 | -.05 | 3 | -.007 | 1 | 2.862e-04 | 1 | 0 | 1 | -9.143e-03 | 7 |
| 1293 | N699 | max | .012 | 3 | .016 | 4 | .008 | 2 | 2.787e-03 | 10 | 0 | 1 | -1.098e-03 | 4 |
| 1294 | | min | -.01 | 4 | -.062 | 3 | -.007 | 1 | 7.57e-05 | 1 | 0 | 1 | -9.951e-03 | 7 |
| 1295 | N700 | max | .012 | 3 | .012 | 4 | .008 | 2 | 1.845e-03 | 10 | 1.006e-04 | 7 | -1.281e-03 | 4 |
| 1296 | | min | -.009 | 4 | -.082 | 10 | -.007 | 1 | -1.765e-04 | 3 | 1.745e-05 | 12 | -1.034e-02 | 7 |
| 1297 | N701 | max | .012 | 3 | .018 | 4 | .008 | 2 | 2.731e-03 | 10 | 0 | 1 | -9.531e-04 | 4 |
| 1298 | | min | -.011 | 4 | -.062 | 3 | -.007 | 1 | 1.355e-04 | 1 | 0 | 1 | -9.654e-03 | 7 |
| 1299 | N702 | max | .013 | 3 | .024 | 4 | .009 | 2 | 3.398e-03 | 6 | 0 | 1 | -9.013e-04 | 4 |
| 1300 | | min | -.012 | 4 | -.037 | 3 | -.006 | 1 | 5.532e-04 | 1 | 0 | 1 | -9.835e-03 | 7 |
| 1301 | N703 | max | .013 | 3 | .023 | 4 | .009 | 2 | 3.085e-03 | 10 | 0 | 1 | -8.722e-04 | 4 |
| 1302 | | min | -.012 | 4 | -.045 | 3 | -.007 | 1 | 3.897e-04 | 1 | 0 | 1 | -9.746e-03 | 7 |
| 1303 | N704 | max | .013 | 3 | .021 | 4 | .008 | 2 | 2.902e-03 | 10 | 0 | 1 | -9.927e-04 | 4 |
| 1304 | | min | -.012 | 4 | -.056 | 3 | -.007 | 1 | 2.171e-04 | 1 | 0 | 1 | -1.004e-02 | 7 |
| 1305 | N705 | max | .013 | 3 | .019 | 4 | .008 | 2 | 2.466e-03 | 10 | 3.027e-04 | 8 | -1.057e-03 | 4 |
| 1306 | | min | -.011 | 4 | -.067 | 3 | -.007 | 1 | 7.95e-05 | 1 | -4.285e-05 | 3 | -1.008e-02 | 7 |
| 1307 | N706 | max | .02 | 3 | -.003 | 2 | .005 | 2 | -2.886e-03 | 2 | -3.773e-05 | 4 | 8.281e-04 | 4 |
| 1308 | | min | -.02 | 4 | -.081 | 5 | -.008 | 1 | -1.045e-02 | 5 | -4.041e-04 | 7 | -3.469e-03 | 3 |
| 1309 | N707 | max | .02 | 3 | .002 | 2 | .004 | 2 | -2.139e-03 | 2 | 0 | 1 | 1.017e-03 | 4 |
| 1310 | | min | -.02 | 4 | -.061 | 5 | -.008 | 1 | -8.608e-03 | 5 | 0 | 1 | -2.791e-03 | 3 |
| 1311 | N708 | max | .02 | 3 | .002 | 2 | .004 | 2 | -2.124e-03 | 2 | 0 | 1 | 9.975e-04 | 4 |
| 1312 | | min | -.02 | 4 | -.063 | 5 | -.008 | 1 | -8.647e-03 | 5 | 0 | 1 | -2.809e-03 | 3 |
| 1313 | N709 | max | .019 | 3 | .006 | 2 | .004 | 2 | -1.822e-03 | 2 | 0 | 1 | 9.599e-04 | 4 |
| 1314 | | min | -.02 | 4 | -.044 | 1 | -.008 | 1 | -7.853e-03 | 5 | 0 | 1 | -2.31e-03 | 3 |
| 1315 | N710 | max | .02 | 3 | -.001 | 2 | .004 | 2 | -2.176e-03 | 2 | -5.309e-05 | 4 | 7.782e-04 | 4 |
| 1316 | | min | -.02 | 4 | -.074 | 5 | -.008 | 1 | -8.768e-03 | 5 | -4.107e-04 | 6 | -3.187e-03 | 3 |
| 1317 | N711 | max | .02 | 3 | .003 | 2 | .004 | 2 | -1.852e-03 | 2 | 0 | 1 | 1.044e-03 | 4 |
| 1318 | | min | -.02 | 4 | -.057 | 5 | -.008 | 1 | -8.022e-03 | 5 | 0 | 1 | -2.573e-03 | 3 |
| 1319 | N712 | max | .019 | 3 | .006 | 2 | .004 | 2 | -1.656e-03 | 2 | 0 | 1 | 1.089e-03 | 4 |
| 1320 | | min | -.02 | 4 | -.043 | 1 | -.008 | 1 | -7.525e-03 | 5 | 0 | 1 | -2.09e-03 | 3 |
| 1321 | N713 | max | .019 | 3 | .009 | 2 | .004 | 2 | -1.801e-03 | 2 | 0 | 1 | 1.146e-03 | 4 |
| 1322 | | min | -.02 | 4 | -.036 | 1 | -.008 | 1 | -7.908e-03 | 5 | 0 | 1 | -1.791e-03 | 3 |
| 1323 | N714 | max | .015 | 3 | .073 | 8 | .011 | 2 | -1.331e-03 | 4 | -7.011e-05 | 3 | 3.416e-04 | 4 |
| 1324 | | min | -.021 | 4 | -.017 | 3 | -.006 | 1 | -8.306e-03 | 7 | -3.915e-04 | 8 | -6.93e-03 | 7 |
| 1325 | N715 | max | .014 | 3 | .132 | 8 | .009 | 2 | -3.958e-04 | 4 | -3.803e-05 | 1 | -2.316e-04 | 4 |
| 1326 | | min | -.021 | 4 | .036 | 3 | -.006 | 1 | -5.116e-03 | 7 | -3.058e-04 | 6 | -8.853e-03 | 7 |
| 1327 | N716 | max | .014 | 3 | .117 | 8 | .01 | 2 | -3.853e-04 | 4 | -3.013e-05 | 1 | -1.837e-04 | 4 |
| 1328 | | min | -.021 | 4 | .023 | 3 | -.006 | 1 | -4.993e-03 | 7 | -2.715e-04 | 6 | -8.691e-03 | 7 |
| 1329 | N717 | max | .014 | 3 | .102 | 8 | .01 | 2 | -3.698e-04 | 4 | 7.235e-05 | 4 | -2.292e-04 | 4 |
| 1330 | | min | -.021 | 4 | .01 | 3 | -.006 | 1 | -5.252e-03 | 7 | -2.278e-04 | 3 | -8.739e-03 | 7 |
| 1331 | N718 | max | .014 | 3 | .087 | 8 | .01 | 2 | -8.622e-04 | 4 | 1.475e-04 | 4 | 8.033e-05 | 4 |
| 1332 | | min | -.021 | 4 | -.004 | 3 | -.006 | 1 | -6.798e-03 | 7 | -2.961e-04 | 3 | -7.694e-03 | 7 |
| 1333 | N719 | max | .045 | 3 | .072 | 8 | .009 | 2 | 1.703e-03 | 10 | -1.25e-03 | 4 | -5.782e-05 | 1 |
| 1334 | | min | -.018 | 4 | -.017 | 3 | -.014 | 1 | 1.001e-04 | 1 | -4.651e-03 | 7 | -9.831e-04 | 10 |
| 1335 | N720 | max | .041 | 3 | .117 | 8 | .005 | 2 | 8.772e-04 | 10 | 9.184e-05 | 4 | 1.972e-04 | 5 |
| 1336 | | min | -.02 | 4 | .023 | 3 | -.018 | 5 | -3.416e-04 | 5 | -4.85e-04 | 7 | -5.065e-04 | 10 |
| 1337 | N721 | max | .042 | 3 | .102 | 8 | .006 | 2 | 2.037e-03 | 10 | -5.592e-04 | 4 | -1.438e-04 | 4 |
| 1338 | | min | -.019 | 4 | .009 | 3 | -.017 | 1 | 2.49e-04 | 4 | -2.45e-03 | 7 | -1.176e-03 | 10 |
| 1339 | N722 | max | .043 | 3 | .087 | 8 | .007 | 2 | 1.806e-03 | 10 | -5.58e-04 | 4 | -8.708e-05 | 4 |
| 1340 | | min | -.019 | 4 | -.004 | 3 | -.016 | 1 | 1.508e-04 | 4 | -2.489e-03 | 7 | -1.043e-03 | 10 |
| 1341 | N723 | max | .039 | 3 | .073 | 8 | .001 | 2 | 3.823e-04 | 10 | 4.582e-03 | 5 | 5.107e-04 | 5 |
| 1342 | | min | -.022 | 4 | -.017 | 3 | -.027 | 5 | -8.846e-04 | 5 | 1.667e-03 | 4 | -2.207e-04 | 10 |

## Envelope Joint Displacements (Continued)

| | Joint | | X [in] | LC | Y [in] | LC | Z [in] | LC | X Rotation [... | LC | Y Rotation [... | LC | Z Rotation [... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1343 | N724 | max | .042 | 3 | .117 | 8 | .005 | 2 | 1.379e-03 | 10 | 6.059e-04 | 10 | 4.222e-05 | 1 |
| 1344 | | min | -.02 | 4 | .023 | 3 | -.017 | 1 | -7.313e-05 | 1 | 5.161e-05 | 2 | -7.961e-04 | 10 |
| 1345 | N725 | max | .041 | 3 | .102 | 8 | .004 | 2 | 1.932e-04 | 10 | 2.443e-03 | 5 | 6.946e-04 | 5 |
| 1346 | | min | -.02 | 4 | .01 | 3 | -.019 | 5 | -1.203e-03 | 5 | 8.389e-04 | 2 | -1.116e-04 | 10 |
| 1347 | N726 | max | .04 | 3 | .087 | 8 | .003 | 2 | 4.147e-04 | 10 | 2.477e-03 | 5 | 5.232e-04 | 5 |
| 1348 | | min | -.021 | 4 | -.004 | 3 | -.023 | 5 | -9.062e-04 | 5 | 9.003e-04 | 2 | -2.394e-04 | 10 |
| 1349 | N727 | max | -.016 | 3 | .072 | 8 | .017 | 3 | 1.572e-03 | 10 | 4.984e-03 | 7 | -5.005e-05 | 4 |
| 1350 | | min | -.048 | 8 | -.017 | 3 | -.005 | 4 | 8.669e-05 | 4 | 1.801e-03 | 4 | -9.077e-04 | 10 |
| 1351 | N728 | max | -.013 | 3 | .132 | 8 | .025 | 7 | 8.615e-04 | 10 | 6.63e-05 | 4 | 1.821e-04 | 1 |
| 1352 | | min | -.041 | 8 | .036 | 3 | 0 | 4 | -3.155e-04 | 1 | -1.811e-04 | 3 | -4.974e-04 | 10 |
| 1353 | N729 | max | -.013 | 3 | .117 | 8 | .025 | 7 | 9.761e-04 | 10 | 4.46e-04 | 8 | 1.528e-04 | 1 |
| 1354 | | min | -.041 | 8 | .023 | 3 | -.001 | 4 | -2.647e-04 | 1 | 7.967e-05 | 3 | -5.636e-04 | 10 |
| 1355 | N730 | max | -.014 | 3 | .102 | 8 | .023 | 7 | 2.052e-03 | 10 | 2.4e-03 | 5 | -1.936e-04 | 4 |
| 1356 | | min | -.042 | 8 | .009 | 3 | -.002 | 4 | 3.354e-04 | 4 | 8.876e-04 | 4 | -1.185e-03 | 10 |
| 1357 | N731 | max | -.015 | 3 | .087 | 8 | .02 | 7 | 1.785e-03 | 10 | 2.698e-03 | 5 | -1.026e-04 | 1 |
| 1358 | | min | -.045 | 8 | -.004 | 3 | -.003 | 4 | 1.777e-04 | 1 | 1.082e-03 | 4 | -1.03e-03 | 10 |
| 1359 | N732 | max | -.01 | 3 | .073 | 8 | .036 | 7 | 5.615e-04 | 10 | -1.441e-03 | 4 | 3.903e-04 | 5 |
| 1360 | | min | -.035 | 8 | -.017 | 3 | .002 | 4 | -6.76e-04 | 5 | -5.081e-03 | 7 | -3.242e-04 | 10 |
| 1361 | N733 | max | -.014 | 3 | .132 | 8 | .024 | 7 | 1.256e-03 | 10 | 1.86e-04 | 4 | 4.308e-05 | 1 |
| 1362 | | min | -.042 | 8 | .036 | 3 | -.001 | 4 | -7.462e-05 | 1 | -1.264e-04 | 3 | -7.251e-04 | 10 |
| 1363 | N734 | max | -.013 | 3 | .117 | 8 | .025 | 7 | 1.256e-03 | 10 | -4.975e-06 | 4 | 4.872e-05 | 9 |
| 1364 | | min | -.042 | 8 | .023 | 3 | -.001 | 4 | -8.439e-05 | 9 | -5.068e-04 | 7 | -7.251e-04 | 10 |
| 1365 | N735 | max | -.013 | 3 | .102 | 8 | .027 | 7 | 6.634e-05 | 10 | -5.717e-04 | 4 | 7.544e-04 | 5 |
| 1366 | | min | -.041 | 8 | .01 | 3 | 0 | 4 | -1.307e-03 | 5 | -2.491e-03 | 7 | -3.83e-05 | 10 |
| 1367 | N736 | max | -.011 | 3 | .087 | 8 | .03 | 7 | 3.86e-04 | 10 | -7.761e-04 | 4 | 5.326e-04 | 5 |
| 1368 | | min | -.038 | 8 | -.004 | 3 | 0 | 4 | -9.224e-04 | 5 | -2.782e-03 | 7 | -2.228e-04 | 10 |
| 1369 | N737 | max | -.001 | 3 | .072 | 8 | .011 | 3 | 7.527e-04 | 4 | 5.399e-04 | 4 | -8.64e-04 | 4 |
| 1370 | | min | -.03 | 8 | -.017 | 3 | -.005 | 4 | -2.131e-03 | 3 | -2.02e-04 | 3 | -1.076e-02 | 7 |
| 1371 | N738 | max | 0 | 3 | .132 | 8 | .016 | 6 | 1.219e-03 | 10 | 5.004e-04 | 8 | 9.922e-05 | 1 |
| 1372 | | min | -.026 | 8 | .036 | 3 | -.001 | 4 | -1.719e-04 | 1 | 1.478e-05 | 3 | -7.035e-04 | 10 |
| 1373 | N739 | max | 0 | 3 | .117 | 8 | .015 | 6 | 1.034e-03 | 10 | 1.256e-04 | 4 | 1.16e-04 | 1 |
| 1374 | | min | -.026 | 8 | .023 | 3 | -.002 | 4 | -2.009e-04 | 1 | -1.511e-04 | 3 | -5.967e-04 | 10 |
| 1375 | N740 | max | 0 | 3 | .102 | 8 | .015 | 6 | 1.12e-03 | 10 | 1.259e-04 | 4 | 9.667e-05 | 1 |
| 1376 | | min | -.026 | 8 | .009 | 3 | -.002 | 4 | -1.676e-04 | 1 | -1.539e-04 | 3 | -6.471e-04 | 10 |
| 1377 | N741 | max | 0 | 3 | .087 | 8 | .012 | 3 | 2.076e-03 | 10 | 3.955e-03 | 5 | -2.055e-04 | 4 |
| 1378 | | min | -.028 | 8 | -.004 | 3 | -.003 | 4 | 3.56e-04 | 4 | 1.441e-03 | 4 | -1.199e-03 | 10 |
| 1379 | N742 | max | .003 | 3 | .073 | 8 | .023 | 6 | -1.338e-03 | 4 | -6.094e-05 | 3 | 3.458e-04 | 4 |
| 1380 | | min | -.022 | 8 | -.017 | 3 | 0 | 4 | -8.328e-03 | 7 | -3.992e-04 | 8 | -6.917e-03 | 7 |
| 1381 | N743 | max | 0 | 3 | .132 | 8 | .015 | 6 | 1.076e-03 | 10 | -1.168e-04 | 4 | 1.503e-04 | 4 |
| 1382 | | min | -.026 | 8 | .036 | 3 | -.002 | 4 | -2.604e-04 | 4 | -5.095e-04 | 6 | -6.212e-04 | 10 |
| 1383 | N744 | max | 0 | 3 | .117 | 8 | .015 | 6 | 1.034e-03 | 10 | 1.256e-04 | 4 | 1.16e-04 | 1 |
| 1384 | | min | -.026 | 8 | .023 | 3 | -.002 | 4 | -2.009e-04 | 1 | -1.511e-04 | 3 | -5.967e-04 | 10 |
| 1385 | N745 | max | 0 | 3 | .102 | 8 | .015 | 6 | 1.12e-03 | 10 | 1.259e-04 | 4 | 9.667e-05 | 1 |
| 1386 | | min | -.026 | 8 | .01 | 3 | -.002 | 4 | -1.676e-04 | 1 | -1.539e-04 | 3 | -6.471e-04 | 10 |
| 1387 | N746 | max | .002 | 3 | .087 | 8 | .019 | 6 | 6.612e-05 | 10 | -1.043e-03 | 4 | 7.617e-04 | 5 |
| 1388 | | min | -.024 | 8 | -.004 | 3 | -.001 | 4 | -1.319e-03 | 5 | -4.037e-03 | 7 | -3.817e-05 | 10 |
| 1389 | N747 | max | .03 | 3 | .072 | 8 | .01 | 2 | 7.527e-04 | 4 | 5.399e-04 | 4 | -8.64e-04 | 4 |
| 1390 | | min | -.019 | 4 | -.017 | 3 | -.01 | 1 | -2.131e-03 | 3 | -2.02e-04 | 3 | -1.076e-02 | 7 |
| 1391 | N748 | max | .028 | 3 | .132 | 8 | .008 | 2 | 8.517e-04 | 10 | 3.886e-04 | 4 | 2.624e-04 | 5 |
| 1392 | | min | -.02 | 4 | .036 | 3 | -.012 | 1 | -4.546e-04 | 5 | -1.378e-04 | 3 | -4.917e-04 | 10 |
| 1393 | N749 | max | .028 | 3 | .117 | 8 | .008 | 2 | 1.024e-03 | 10 | 2.959e-04 | 4 | 1.466e-04 | 9 |
| 1394 | | min | -.02 | 4 | .023 | 3 | -.012 | 1 | -2.538e-04 | 9 | -2.812e-04 | 3 | -5.915e-04 | 10 |

## Envelope Joint Displacements (Continued)

| | Joint | | X [in] | LC | Y [in] | LC | Z [in] | LC | X Rotation [... | LC | Y Rotation [... | LC | Z Rotation [... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1395 | N750 | max | .028 | 3 | .102 | 8 | .008 | 2 | 1.124e-03 | 10 | 3.039e-04 | 10 | 1.067e-04 | 1 |
| 1396 | | min | -.02 | 4 | .009 | 3 | -.012 | 1 | -1.848e-04 | 1 | -9.465e-05 | 3 | -6.49e-04 | 10 |
| 1397 | N751 | max | .029 | 3 | .087 | 8 | .009 | 2 | 2.12e-03 | 10 | -9.545e-04 | 4 | -1.608e-04 | 4 |
| 1398 | | min | -.02 | 4 | -.004 | 3 | -.011 | 1 | 2.785e-04 | 4 | -3.666e-03 | 7 | -1.224e-03 | 10 |
| 1399 | N752 | max | .026 | 3 | .073 | 8 | .005 | 2 | -1.338e-03 | 4 | -6.094e-05 | 3 | 3.458e-04 | 4 |
| 1400 | | min | -.022 | 4 | -.017 | 3 | -.015 | 1 | -8.328e-03 | 7 | -3.992e-04 | 8 | -6.917e-03 | 7 |
| 1401 | N753 | max | .028 | 3 | .132 | 8 | .007 | 2 | 1.568e-03 | 10 | 4.351e-06 | 1 | -1.304e-05 | 1 |
| 1402 | | min | -.02 | 4 | .036 | 3 | -.012 | 1 | 2.259e-05 | 1 | -2.9e-04 | 6 | -9.054e-04 | 10 |
| 1403 | N754 | max | .028 | 3 | .117 | 8 | .007 | 2 | 1.301e-03 | 10 | 1.728e-04 | 10 | 8.19e-05 | 1 |
| 1404 | | min | -.02 | 4 | .023 | 3 | -.012 | 1 | -1.419e-04 | 1 | -1.501e-04 | 2 | -7.511e-04 | 10 |
| 1405 | N755 | max | .028 | 3 | .102 | 8 | .008 | 2 | 1.124e-03 | 10 | 3.039e-04 | 10 | 1.067e-04 | 1 |
| 1406 | | min | -.02 | 4 | .01 | 3 | -.012 | 1 | -1.848e-04 | 1 | -9.465e-05 | 3 | -6.49e-04 | 10 |
| 1407 | N756 | max | .027 | 3 | .087 | 8 | .006 | 2 | 3.176e-05 | 10 | 3.597e-03 | 5 | 7.933e-04 | 5 |
| 1408 | | min | -.021 | 4 | -.004 | 3 | -.013 | 1 | -1.374e-03 | 5 | 1.322e-03 | 2 | -1.834e-05 | 10 |
| 1409 | N760 | max | .021 | 3 | .073 | 7 | .017 | 2 | -1.75e-03 | 3 | 4.049e-04 | 6 | 6.825e-03 | 8 |
| 1410 | | min | -.015 | 4 | -.02 | 4 | -.013 | 1 | -8.296e-03 | 8 | -4.536e-05 | 1 | 2.818e-04 | 3 |
| 1411 | N761 | max | .02 | 3 | -.003 | 2 | .009 | 2 | -3.21e-03 | 2 | 7.812e-04 | 2 | 3.61e-03 | 4 |
| 1412 | | min | -.02 | 4 | -.085 | 5 | -.012 | 1 | -1.14e-02 | 5 | -2.163e-04 | 1 | -7.451e-04 | 3 |
| 1413 | N762 | max | .008 | 3 | .005 | 3 | .016 | 2 | 3.166e-03 | 6 | 2.637e-04 | 4 | 1.157e-02 | 8 |
| 1414 | | min | -.011 | 4 | -.086 | 8 | -.015 | 1 | -2.123e-04 | 1 | -8.314e-04 | 3 | 2.488e-03 | 3 |
| 1415 | N764 | max | .019 | 3 | .005 | 2 | .005 | 2 | -4.203e-04 | 2 | 0 | 1 | -3.308e-05 | 4 |
| 1416 | | min | -.018 | 4 | -.026 | 1 | -.011 | 1 | -4.912e-03 | 5 | 0 | 1 | -3.111e-03 | 7 |
| 1417 | N765 | max | .02 | 3 | .015 | 2 | .007 | 2 | -1.816e-03 | 2 | 0 | 1 | 9.388e-04 | 4 |
| 1418 | | min | -.018 | 4 | -.017 | 1 | -.012 | 1 | -8.43e-03 | 5 | 0 | 1 | -1.558e-03 | 3 |
| 1419 | N766 | max | .02 | 3 | .034 | 7 | .01 | 2 | -2.797e-03 | 2 | 0 | 1 | 1.97e-03 | 4 |
| 1420 | | min | -.017 | 4 | -.01 | 4 | -.012 | 1 | -1.079e-02 | 5 | 0 | 1 | -1.128e-03 | 3 |
| 1421 | N767 | max | .021 | 3 | .067 | 7 | .013 | 2 | -3.515e-03 | 3 | 0 | 1 | 3.2e-03 | 8 |
| 1422 | | min | -.016 | 4 | 0 | 4 | -.013 | 1 | -1.241e-02 | 5 | 0 | 1 | -7.332e-04 | 3 |
| 1423 | N768 | max | .021 | 3 | .108 | 7 | .014 | 2 | -3.654e-03 | 3 | 0 | 1 | 5.428e-03 | 8 |
| 1424 | | min | -.015 | 4 | .016 | 4 | -.013 | 1 | -1.318e-02 | 8 | 0 | 1 | -1.324e-04 | 3 |
| 1425 | N769 | max | .021 | 3 | .133 | 7 | .016 | 2 | -6.585e-04 | 3 | 2.964e-04 | 6 | 8.687e-03 | 8 |
| 1426 | | min | -.014 | 4 | .028 | 4 | -.012 | 1 | -5.195e-03 | 8 | -3.765e-05 | 1 | 9.64e-04 | 3 |
| 1427 | N770 | max | .018 | 3 | .109 | 7 | .017 | 2 | 2.29e-03 | 7 | 0 | 1 | 1.426e-02 | 8 |
| 1428 | | min | -.014 | 4 | .016 | 4 | -.012 | 1 | 1.603e-04 | 4 | 0 | 1 | 2.848e-03 | 3 |
| 1429 | N771 | max | .015 | 3 | .067 | 7 | .017 | 2 | 3.74e-03 | 6 | 0 | 1 | 1.244e-02 | 8 |
| 1430 | | min | -.013 | 4 | -.002 | 4 | -.013 | 1 | 9.218e-04 | 1 | 0 | 1 | 2.227e-03 | 3 |
| 1431 | N772 | max | .012 | 3 | .034 | 7 | .017 | 2 | 4.405e-03 | 6 | 0 | 1 | 1.003e-02 | 8 |
| 1432 | | min | -.012 | 4 | -.014 | 4 | -.013 | 1 | 1.184e-03 | 1 | 0 | 1 | 1.496e-03 | 3 |
| 1433 | N773 | max | .008 | 3 | .019 | 3 | .017 | 2 | 5.121e-03 | 6 | 0 | 1 | 6.989e-03 | 8 |
| 1434 | | min | -.011 | 4 | -.021 | 4 | -.013 | 1 | 1.273e-03 | 1 | 0 | 1 | 6.448e-04 | 3 |
| 1435 | N774 | max | .005 | 3 | .007 | 3 | .016 | 2 | 4.925e-03 | 6 | 0 | 1 | 2.88e-03 | 8 |
| 1436 | | min | -.01 | 4 | -.028 | 4 | -.012 | 1 | 9.406e-04 | 1 | 0 | 1 | -4.786e-04 | 3 |
| 1437 | N777 | max | .02 | 3 | .003 | 2 | .004 | 2 | -3.835e-04 | 2 | 3.744e-04 | 2 | 2.127e-03 | 4 |
| 1438 | | min | -.02 | 4 | -.057 | 5 | -.011 | 1 | -4.529e-03 | 5 | -1.456e-04 | 1 | -9.685e-04 | 3 |
| 1439 | N778 | max | .02 | 3 | 0 | 2 | .007 | 2 | -1.795e-03 | 2 | 4.561e-04 | 2 | 3.014e-03 | 4 |
| 1440 | | min | -.02 | 4 | -.07 | 5 | -.012 | 1 | -7.982e-03 | 5 | -1.144e-04 | 1 | -7.184e-04 | 3 |
| 1441 | N780 | max | .003 | 3 | .004 | 3 | .017 | 2 | 2.104e-03 | 9 | 2.279e-04 | 4 | 4.659e-03 | 8 |
| 1442 | | min | -.009 | 4 | -.058 | 8 | -.014 | 1 | -8.641e-04 | 1 | -4.563e-04 | 3 | 2.468e-04 | 3 |
| 1443 | N781 | max | .006 | 3 | .005 | 3 | .016 | 2 | 2.216e-03 | 9 | 2.061e-04 | 4 | 8.318e-03 | 8 |
| 1444 | | min | -.01 | 4 | -.071 | 8 | -.015 | 1 | -6.324e-04 | 1 | -5.474e-04 | 3 | 1.403e-03 | 3 |
| 1445 | N782 | max | .02 | 3 | .012 | 3 | .011 | 2 | -2.6e-03 | 2 | 5.526e-04 | 6 | 3.116e-03 | 8 |
| 1446 | | min | -.019 | 4 | -.052 | 4 | -.013 | 1 | -1.001e-02 | 5 | -8.703e-05 | 1 | -7.388e-04 | 3 |

## *Envelope Joint Displacements (Continued)*

| | Joint | | X [in] | LC | Y [in] | LC | Z [in] | LC | X Rotation [... | LC | Y Rotation [... | LC | Z Rotation [... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1447 | N783 | max | .02 | 3 | .032 | 3 | .014 | 2 | -3.035e-03 | 2 | 4.876e-04 | 6 | 4.448e-03 | 8 |
| 1448 | | min | -.017 | 4 | -.04 | 4 | -.013 | 1 | -1.11e-02 | 5 | 1.353e-05 | 1 | -4.458e-04 | 3 |
| 1449 | N784 | max | .021 | 3 | .052 | 3 | .016 | 2 | -3.501e-03 | 3 | 3.529e-04 | 6 | 6.146e-03 | 8 |
| 1450 | | min | -.016 | 4 | -.028 | 4 | -.012 | 1 | -1.242e-02 | 8 | 2.983e-05 | 1 | 1.296e-05 | 3 |
| 1451 | N785 | max | .019 | 3 | .054 | 3 | .017 | 2 | 1.698e-03 | 9 | 7.117e-05 | 4 | 1.405e-02 | 8 |
| 1452 | | min | -.014 | 4 | -.029 | 4 | -.014 | 1 | -4.23e-04 | 1 | -3.68e-04 | 3 | 2.811e-03 | 3 |
| 1453 | N786 | max | .016 | 3 | .037 | 3 | .016 | 2 | 2.184e-03 | 6 | 9.324e-05 | 4 | 1.19e-02 | 8 |
| 1454 | | min | -.013 | 4 | -.045 | 4 | -.014 | 1 | -1.615e-04 | 1 | -5.164e-04 | 7 | 2.097e-03 | 3 |
| 1455 | N787 | max | .012 | 3 | .021 | 3 | .016 | 2 | 2.739e-03 | 6 | 1.756e-04 | 4 | 1.019e-02 | 8 |
| 1456 | | min | -.012 | 4 | -.061 | 4 | -.015 | 1 | 4.099e-05 | 1 | -6.323e-04 | 3 | 1.668e-03 | 3 |
| 1457 | N788 | max | .021 | 3 | .129 | 7 | .015 | 2 | -2.572e-03 | 3 | 0 | 1 | 7.195e-03 | 8 |
| 1458 | | min | -.015 | 4 | .026 | 4 | -.012 | 1 | -1.042e-02 | 8 | 0 | 1 | 4.521e-04 | 3 |
| 1459 | N789 | max | .021 | 3 | .062 | 7 | .016 | 2 | -3.369e-03 | 3 | 2.717e-04 | 6 | 6.666e-03 | 8 |
| 1460 | | min | -.015 | 4 | -.022 | 4 | -.013 | 1 | -1.234e-02 | 8 | -6.278e-06 | 1 | 1.878e-04 | 3 |
| 1461 | N793 | max | .003 | 3 | 0 | 3 | .016 | 2 | 2.192e-03 | 9 | 2.739e-04 | 2 | 2.202e-03 | 4 |
| 1462 | | min | -.009 | 4 | -.036 | 8 | -.012 | 1 | -8.066e-04 | 1 | -2.711e-04 | 1 | -4.659e-04 | 3 |
| 1463 | N794A | max | .003 | 3 | .002 | 3 | .016 | 2 | 3.231e-03 | 6 | 0 | 1 | 2.004e-03 | 4 |
| 1464 | | min | -.009 | 4 | -.034 | 8 | -.012 | 1 | 9.431e-05 | 1 | 0 | 1 | -7.64e-04 | 3 |
| 1465 | N795A | max | .004 | 3 | .004 | 3 | .016 | 2 | 4.331e-03 | 6 | 0 | 1 | 2.305e-03 | 4 |
| 1466 | | min | -.01 | 4 | -.03 | 8 | -.012 | 1 | 6.316e-04 | 1 | 0 | 1 | -7.134e-04 | 3 |
| 1467 | N796A | max | .002 | 3 | .001 | 3 | .016 | 2 | 2.25e-03 | 9 | 2.164e-04 | 2 | 2.225e-03 | 4 |
| 1468 | | min | -.009 | 4 | -.04 | 8 | -.012 | 1 | -8.085e-04 | 1 | -2.135e-04 | 1 | -4.75e-04 | 3 |
| 1469 | N797A | max | .003 | 3 | .002 | 3 | .016 | 2 | 2.684e-03 | 9 | 0 | 1 | 2.217e-03 | 4 |
| 1470 | | min | -.009 | 4 | -.039 | 8 | -.012 | 1 | -2.12e-04 | 1 | 0 | 1 | -6.159e-04 | 3 |
| 1471 | N798A | max | .004 | 3 | .004 | 3 | .016 | 2 | 3.324e-03 | 6 | 0 | 1 | 2.444e-03 | 4 |
| 1472 | | min | -.009 | 4 | -.037 | 8 | -.012 | 1 | 1.518e-04 | 1 | 0 | 1 | -5.652e-04 | 3 |
| 1473 | N799A | max | .004 | 3 | .006 | 3 | .016 | 2 | 3.771e-03 | 6 | 0 | 1 | 3.051e-03 | 8 |
| 1474 | | min | -.01 | 4 | -.034 | 4 | -.013 | 1 | 3.743e-04 | 1 | 0 | 1 | -3.916e-04 | 3 |
| 1475 | N800A | max | .002 | 3 | .002 | 3 | .016 | 2 | 2.306e-03 | 9 | 2.051e-04 | 4 | 2.241e-03 | 4 |
| 1476 | | min | -.009 | 4 | -.045 | 8 | -.013 | 1 | -8.04e-04 | 1 | -2.049e-04 | 3 | -4.823e-04 | 3 |
| 1477 | N801A | max | .003 | 3 | .002 | 3 | .016 | 2 | 2.474e-03 | 9 | 0 | 1 | 2.312e-03 | 4 |
| 1478 | | min | -.009 | 4 | -.044 | 8 | -.013 | 1 | -5.072e-04 | 1 | 0 | 1 | -5.612e-04 | 3 |
| 1479 | N802A | max | .003 | 3 | .004 | 3 | .016 | 2 | 2.601e-03 | 9 | 0 | 1 | 2.547e-03 | 4 |
| 1480 | | min | -.009 | 4 | -.043 | 8 | -.013 | 1 | -2.703e-04 | 1 | 0 | 1 | -4.911e-04 | 3 |
| 1481 | N803A | max | .004 | 3 | .005 | 3 | .016 | 2 | 2.749e-03 | 6 | 0 | 1 | 3.323e-03 | 8 |
| 1482 | | min | -.01 | 4 | -.042 | 8 | -.013 | 1 | -1.274e-04 | 1 | 0 | 1 | -2.783e-04 | 3 |
| 1483 | N804A | max | .002 | 3 | .002 | 3 | .016 | 2 | 2.36e-03 | 9 | 2.124e-04 | 4 | 2.253e-03 | 4 |
| 1484 | | min | -.009 | 4 | -.049 | 8 | -.013 | 1 | -8.013e-04 | 1 | -2.121e-04 | 3 | -4.89e-04 | 3 |
| 1485 | N805A | max | .003 | 3 | .003 | 3 | .016 | 2 | 2.333e-03 | 9 | 0 | 1 | 2.423e-03 | 4 |
| 1486 | | min | -.009 | 4 | -.049 | 8 | -.013 | 1 | -6.969e-04 | 1 | 0 | 1 | -5.103e-04 | 3 |
| 1487 | N806A | max | .003 | 3 | .004 | 3 | .016 | 2 | 2.29e-03 | 9 | 0 | 1 | 2.966e-03 | 8 |
| 1488 | | min | -.009 | 4 | -.049 | 8 | -.013 | 1 | -6.589e-04 | 1 | 0 | 1 | -3.352e-04 | 3 |
| 1489 | N807A | max | .004 | 3 | .005 | 3 | .016 | 2 | 2.302e-03 | 9 | 0 | 1 | 3.829e-03 | 8 |
| 1490 | | min | -.009 | 4 | -.05 | 8 | -.013 | 1 | -5.689e-04 | 1 | 0 | 1 | -8.246e-05 | 3 |
| 1491 | N808A | max | .002 | 3 | .003 | 3 | .016 | 2 | 2.41e-03 | 9 | 2.146e-04 | 4 | 2.261e-03 | 4 |
| 1492 | | min | -.008 | 4 | -.054 | 8 | -.013 | 1 | -8.02e-04 | 1 | -2.143e-04 | 3 | -4.956e-04 | 3 |
| 1493 | N809A | max | .002 | 3 | .003 | 3 | .017 | 2 | 2.267e-03 | 9 | 2.122e-04 | 4 | 2.989e-03 | 8 |
| 1494 | | min | -.009 | 4 | -.055 | 8 | -.013 | 1 | -8.492e-04 | 1 | -3.595e-04 | 3 | -2.635e-04 | 3 |
| 1495 | N810A | max | .003 | 3 | .004 | 3 | .017 | 2 | 2.165e-03 | 9 | 2.243e-04 | 4 | 3.804e-03 | 8 |
| 1496 | | min | -.009 | 4 | -.056 | 8 | -.013 | 1 | -8.695e-04 | 1 | -4.025e-04 | 3 | -1.558e-05 | 3 |
| 1497 | N811A | max | .006 | 3 | .01 | 3 | .016 | 2 | 5.284e-03 | 6 | 0 | 1 | 3.931e-03 | 8 |
| 1498 | | min | -.01 | 4 | -.026 | 4 | -.012 | 1 | 1.149e-03 | 1 | 0 | 1 | -2.025e-04 | 3 |

## *Envelope Joint Displacements (Continued)*

| | Joint | | X [in] | LC | Y [in] | LC | Z [in] | LC | X Rotation [... | LC | Y Rotation [... | LC | Z Rotation [... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1499 | N812A | max | .007 | 3 | .013 | 3 | .016 | 2 | 5.354e-03 | 6 | 0 | 1 | 4.943e-03 | 8 |
| 1500 | | min | -.011 | 4 | -.024 | 4 | -.012 | 1 | 1.24e-03 | 1 | 0 | 1 | 7.404e-05 | 3 |
| 1501 | N813A | max | .008 | 3 | .016 | 3 | .016 | 2 | 5.332e-03 | 6 | 0 | 1 | 5.931e-03 | 8 |
| 1502 | | min | -.011 | 4 | -.022 | 4 | -.012 | 1 | 1.288e-03 | 1 | 0 | 1 | 3.463e-04 | 3 |
| 1503 | N814 | max | .005 | 3 | .008 | 3 | .016 | 2 | 4.107e-03 | 6 | 0 | 1 | 3.921e-03 | 8 |
| 1504 | | min | -.01 | 4 | -.034 | 4 | -.013 | 1 | 5.535e-04 | 1 | 0 | 1 | -1.623e-04 | 3 |
| 1505 | N815A | max | .006 | 3 | .01 | 3 | .016 | 2 | 4.298e-03 | 6 | 0 | 1 | 4.853e-03 | 8 |
| 1506 | | min | -.01 | 4 | -.033 | 4 | -.013 | 1 | 6.71e-04 | 1 | 0 | 1 | 9.22e-05 | 3 |
| 1507 | N816A | max | .007 | 3 | .013 | 3 | .016 | 2 | 4.283e-03 | 6 | 0 | 1 | 5.755e-03 | 8 |
| 1508 | | min | -.011 | 4 | -.032 | 4 | -.013 | 1 | 7.187e-04 | 1 | 0 | 1 | 3.423e-04 | 3 |
| 1509 | N817 | max | .008 | 3 | .015 | 3 | .016 | 2 | 4.186e-03 | 6 | 0 | 1 | 6.526e-03 | 8 |
| 1510 | | min | -.011 | 4 | -.032 | 4 | -.013 | 1 | 7.32e-04 | 1 | 0 | 1 | 5.527e-04 | 3 |
| 1511 | N818A | max | .005 | 3 | .007 | 3 | .016 | 2 | 3.039e-03 | 6 | 0 | 1 | 4.183e-03 | 8 |
| 1512 | | min | -.01 | 4 | -.041 | 4 | -.013 | 1 | 1.248e-05 | 1 | 0 | 1 | -4.103e-05 | 3 |
| 1513 | N819A | max | .005 | 3 | .008 | 3 | .016 | 2 | 3.233e-03 | 6 | 0 | 1 | 5.069e-03 | 8 |
| 1514 | | min | -.01 | 4 | -.041 | 4 | -.013 | 1 | 1.156e-04 | 1 | 0 | 1 | 2.089e-04 | 3 |
| 1515 | N820 | max | .006 | 3 | .01 | 3 | .016 | 2 | 3.381e-03 | 6 | 0 | 1 | 5.912e-03 | 8 |
| 1516 | | min | -.011 | 4 | -.042 | 4 | -.013 | 1 | 1.956e-04 | 1 | 0 | 1 | 4.482e-04 | 3 |
| 1517 | N821A | max | .007 | 3 | .012 | 3 | .016 | 2 | 3.358e-03 | 6 | 0 | 1 | 6.768e-03 | 8 |
| 1518 | | min | -.011 | 4 | -.043 | 4 | -.014 | 1 | 2.314e-04 | 1 | 0 | 1 | 6.975e-04 | 3 |
| 1519 | N822A | max | .004 | 3 | .006 | 3 | .016 | 2 | 2.33e-03 | 9 | 0 | 1 | 4.733e-03 | 8 |
| 1520 | | min | -.01 | 4 | -.05 | 8 | -.013 | 1 | -4.757e-04 | 1 | 0 | 1 | 1.851e-04 | 3 |
| 1521 | N823 | max | .005 | 3 | .007 | 3 | .016 | 2 | 2.369e-03 | 9 | 0 | 1 | 5.636e-03 | 8 |
| 1522 | | min | -.01 | 4 | -.051 | 8 | -.014 | 1 | -3.806e-04 | 1 | 0 | 1 | 4.529e-04 | 3 |
| 1523 | N824A | max | .006 | 3 | .007 | 3 | .016 | 2 | 2.442e-03 | 6 | 0 | 1 | 6.507e-03 | 8 |
| 1524 | | min | -.01 | 4 | -.052 | 8 | -.014 | 1 | -2.987e-04 | 1 | 0 | 1 | 7.129e-04 | 3 |
| 1525 | N825A | max | .006 | 3 | .008 | 3 | .016 | 2 | 2.632e-03 | 6 | 0 | 1 | 7.216e-03 | 8 |
| 1526 | | min | -.011 | 4 | -.054 | 8 | -.014 | 1 | -2.182e-04 | 1 | 0 | 1 | 9.217e-04 | 3 |
| 1527 | N826 | max | .004 | 3 | .004 | 3 | .016 | 2 | 2.08e-03 | 9 | 2.263e-04 | 4 | 5.546e-03 | 8 |
| 1528 | | min | -.009 | 4 | -.061 | 8 | -.014 | 1 | -8.351e-04 | 1 | -4.956e-04 | 3 | 5.221e-04 | 3 |
| 1529 | N827 | max | .004 | 3 | .004 | 3 | .016 | 2 | 2.091e-03 | 9 | 2.213e-04 | 4 | 6.453e-03 | 8 |
| 1530 | | min | -.01 | 4 | -.064 | 8 | -.014 | 1 | -7.859e-04 | 1 | -5.22e-04 | 3 | 8.068e-04 | 3 |
| 1531 | N828 | max | .005 | 3 | .005 | 3 | .016 | 2 | 2.136e-03 | 9 | 2.141e-04 | 4 | 7.375e-03 | 8 |
| 1532 | | min | -.01 | 4 | -.067 | 8 | -.014 | 1 | -7.184e-04 | 1 | -5.388e-04 | 3 | 1.099e-03 | 3 |
| 1533 | N829 | max | .008 | 3 | .01 | 3 | .016 | 2 | 2.122e-03 | 6 | 0 | 1 | 8.398e-03 | 8 |
| 1534 | | min | -.011 | 4 | -.061 | 8 | -.015 | 1 | -1.916e-04 | 1 | 0 | 1 | 1.268e-03 | 3 |
| 1535 | N830 | max | .008 | 3 | .014 | 3 | .016 | 2 | 3.112e-03 | 6 | 0 | 1 | 8.077e-03 | 8 |
| 1536 | | min | -.011 | 4 | -.047 | 4 | -.014 | 1 | 1.827e-04 | 1 | 0 | 1 | 1.092e-03 | 3 |
| 1537 | N831 | max | .008 | 3 | .017 | 3 | .016 | 2 | 3.931e-03 | 6 | 0 | 1 | 7.138e-03 | 8 |
| 1538 | | min | -.011 | 4 | -.034 | 4 | -.013 | 1 | 6.607e-04 | 1 | 0 | 1 | 7.302e-04 | 3 |
| 1539 | N832 | max | .009 | 3 | .009 | 3 | .016 | 2 | 1.486e-03 | 7 | 2.319e-04 | 2 | 9.994e-03 | 8 |
| 1540 | | min | -.011 | 4 | -.077 | 8 | -.015 | 1 | -1.793e-04 | 4 | -2.984e-04 | 1 | 1.804e-03 | 3 |
| 1541 | N833 | max | .009 | 3 | .013 | 3 | .016 | 2 | 2.462e-03 | 6 | 0 | 1 | 9.398e-03 | 8 |
| 1542 | | min | -.012 | 4 | -.058 | 4 | -.015 | 1 | -3.23e-05 | 1 | 0 | 1 | 1.544e-03 | 3 |
| 1543 | N834 | max | .009 | 3 | .017 | 3 | .016 | 2 | 3.133e-03 | 6 | 0 | 1 | 8.211e-03 | 8 |
| 1544 | | min | -.012 | 4 | -.045 | 4 | -.014 | 1 | 3.224e-04 | 1 | 0 | 1 | 1.08e-03 | 3 |
| 1545 | N835 | max | .009 | 3 | .02 | 3 | .016 | 2 | 3.956e-03 | 6 | 0 | 1 | 8.104e-03 | 8 |
| 1546 | | min | -.012 | 4 | -.032 | 4 | -.013 | 1 | 7.482e-04 | 1 | 0 | 1 | 1.003e-03 | 3 |
| 1547 | N836 | max | .009 | 3 | .022 | 3 | .017 | 2 | 4.992e-03 | 6 | 0 | 1 | 7.693e-03 | 8 |
| 1548 | | min | -.012 | 4 | -.019 | 4 | -.013 | 1 | 1.296e-03 | 1 | 0 | 1 | 8.297e-04 | 3 |
| 1549 | N837 | max | .01 | 3 | .013 | 3 | .016 | 2 | 2.992e-03 | 6 | 2.202e-04 | 4 | 1.003e-02 | 8 |
| 1550 | | min | -.012 | 4 | -.069 | 4 | -.015 | 1 | 2.225e-05 | 1 | -7.282e-04 | 3 | 1.733e-03 | 3 |

## *Envelope Joint Displacements (Continued)*

| | Joint | | X [in] | LC | Y [in] | LC | Z [in] | LC | X Rotation [... | LC | Y Rotation [... | LC | Z Rotation [... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1551 | N838 | max | .01 | 3 | .017 | 3 | .016 | 2 | 2.593e-03 | 6 | 0 | 1 | 9.335e-03 | 8 |
| 1552 | | min | -.012 | 4 | -.055 | 4 | -.015 | 1 | 1.511e-04 | 1 | 0 | 1 | 1.454e-03 | 3 |
| 1553 | N839 | max | .01 | 3 | .02 | 3 | .016 | 2 | 3.144e-03 | 6 | 0 | 1 | 9.039e-03 | 8 |
| 1554 | | min | -.012 | 4 | -.042 | 4 | -.014 | 1 | 3.99e-04 | 1 | 0 | 1 | 1.302e-03 | 3 |
| 1555 | N840 | max | .01 | 3 | .023 | 3 | .016 | 2 | 3.954e-03 | 6 | 0 | 1 | 8.591e-03 | 8 |
| 1556 | | min | -.012 | 4 | -.03 | 4 | -.013 | 1 | 8.156e-04 | 1 | 0 | 1 | 1.121e-03 | 3 |
| 1557 | N841 | max | .01 | 3 | .026 | 3 | .017 | 2 | 4.797e-03 | 6 | 0 | 1 | 8.681e-03 | 8 |
| 1558 | | min | -.012 | 4 | -.017 | 4 | -.013 | 1 | 1.271e-03 | 1 | 0 | 1 | 1.117e-03 | 3 |
| 1559 | N842 | max | .011 | 3 | .017 | 3 | .016 | 2 | 2.044e-03 | 6 | 1.288e-04 | 4 | 9.902e-03 | 8 |
| 1560 | | min | -.012 | 4 | -.065 | 4 | -.015 | 1 | 3.461e-05 | 1 | -3.663e-04 | 3 | 1.637e-03 | 3 |
| 1561 | N843 | max | .011 | 3 | .02 | 3 | .016 | 2 | 2.782e-03 | 6 | 0 | 1 | 9.759e-03 | 8 |
| 1562 | | min | -.012 | 4 | -.052 | 4 | -.015 | 1 | 2.042e-04 | 1 | 0 | 1 | 1.527e-03 | 3 |
| 1563 | N844 | max | .011 | 3 | .023 | 3 | .016 | 2 | 3.228e-03 | 6 | 0 | 1 | 9.43e-03 | 8 |
| 1564 | | min | -.012 | 4 | -.04 | 4 | -.014 | 1 | 4.758e-04 | 1 | 0 | 1 | 1.387e-03 | 3 |
| 1565 | N845 | max | .011 | 3 | .026 | 3 | .016 | 2 | 3.857e-03 | 6 | 0 | 1 | 9.393e-03 | 8 |
| 1566 | | min | -.012 | 4 | -.028 | 4 | -.013 | 1 | 8.253e-04 | 1 | 0 | 1 | 1.343e-03 | 3 |
| 1567 | N846 | max | .011 | 3 | .029 | 3 | .017 | 2 | 4.612e-03 | 6 | 0 | 1 | 9.272e-03 | 8 |
| 1568 | | min | -.012 | 4 | -.015 | 4 | -.013 | 1 | 1.242e-03 | 1 | 0 | 1 | 1.278e-03 | 3 |
| 1569 | N847 | max | .012 | 3 | .024 | 3 | .016 | 2 | 2.734e-03 | 6 | 0 | 1 | 1.002e-02 | 8 |
| 1570 | | min | -.012 | 4 | -.049 | 4 | -.014 | 1 | 2.273e-04 | 1 | 0 | 1 | 1.572e-03 | 3 |
| 1571 | N848 | max | .012 | 3 | .027 | 3 | .016 | 2 | 3.206e-03 | 6 | 0 | 1 | 1.002e-02 | 8 |
| 1572 | | min | -.012 | 4 | -.037 | 4 | -.014 | 1 | 4.896e-04 | 1 | 0 | 1 | 1.539e-03 | 3 |
| 1573 | N849 | max | .012 | 3 | .029 | 3 | .016 | 2 | 3.768e-03 | 6 | 0 | 1 | 9.94e-03 | 8 |
| 1574 | | min | -.012 | 4 | -.026 | 4 | -.013 | 1 | 8.107e-04 | 1 | 0 | 1 | 1.492e-03 | 3 |
| 1575 | N850 | max | .013 | 3 | .025 | 3 | .016 | 2 | 2.177e-03 | 6 | 1.183e-04 | 4 | 1.042e-02 | 8 |
| 1576 | | min | -.013 | 4 | -.057 | 4 | -.015 | 1 | -6.242e-06 | 1 | -4.49e-04 | 3 | 1.699e-03 | 3 |
| 1577 | N851 | max | .013 | 3 | .028 | 3 | .016 | 2 | 2.769e-03 | 6 | 0 | 1 | 1.051e-02 | 8 |
| 1578 | | min | -.013 | 4 | -.045 | 4 | -.014 | 1 | 2.266e-04 | 1 | 0 | 1 | 1.688e-03 | 3 |
| 1579 | N852 | max | .013 | 3 | .03 | 3 | .016 | 2 | 3.185e-03 | 6 | 0 | 1 | 1.049e-02 | 8 |
| 1580 | | min | -.013 | 4 | -.034 | 4 | -.014 | 1 | 4.915e-04 | 1 | 0 | 1 | 1.66e-03 | 3 |
| 1581 | N853 | max | .013 | 3 | .033 | 3 | .017 | 2 | 3.699e-03 | 6 | 0 | 1 | 1.057e-02 | 8 |
| 1582 | | min | -.013 | 4 | -.022 | 4 | -.013 | 1 | 8.058e-04 | 1 | 0 | 1 | 1.667e-03 | 3 |
| 1583 | N854 | max | .013 | 3 | .043 | 7 | .017 | 2 | 4.266e-03 | 6 | 0 | 1 | 1.065e-02 | 8 |
| 1584 | | min | -.013 | 4 | -.011 | 4 | -.013 | 1 | 1.148e-03 | 1 | 0 | 1 | 1.676e-03 | 3 |
| 1585 | N855 | max | .014 | 3 | .029 | 3 | .016 | 2 | 2.477e-03 | 6 | 1.322e-04 | 4 | 1.089e-02 | 8 |
| 1586 | | min | -.013 | 4 | -.053 | 4 | -.015 | 1 | -3.082e-05 | 1 | -5.684e-04 | 3 | 1.814e-03 | 3 |
| 1587 | N856 | max | .014 | 3 | .032 | 3 | .016 | 2 | 2.659e-03 | 6 | 0 | 1 | 1.093e-02 | 8 |
| 1588 | | min | -.013 | 4 | -.042 | 4 | -.014 | 1 | 1.867e-04 | 1 | 0 | 1 | 1.8e-03 | 3 |
| 1589 | N857 | max | .014 | 3 | .034 | 3 | .016 | 2 | 3.106e-03 | 6 | 0 | 1 | 1.105e-02 | 8 |
| 1590 | | min | -.013 | 4 | -.03 | 4 | -.014 | 1 | 4.635e-04 | 1 | 0 | 1 | 1.819e-03 | 3 |
| 1591 | N858 | max | .014 | 3 | .037 | 3 | .017 | 2 | 3.604e-03 | 6 | 0 | 1 | 1.113e-02 | 8 |
| 1592 | | min | -.013 | 4 | -.019 | 4 | -.013 | 1 | 7.714e-04 | 1 | 0 | 1 | 1.832e-03 | 3 |
| 1593 | N859 | max | .014 | 3 | .051 | 7 | .017 | 2 | 4.107e-03 | 6 | 0 | 1 | 1.125e-02 | 8 |
| 1594 | | min | -.013 | 4 | -.008 | 4 | -.013 | 1 | 1.088e-03 | 1 | 0 | 1 | 1.856e-03 | 3 |
| 1595 | N860 | max | .015 | 3 | .033 | 3 | .016 | 2 | 2.039e-03 | 6 | 9.261e-05 | 4 | 1.132e-02 | 8 |
| 1596 | | min | -.013 | 4 | -.049 | 4 | -.015 | 1 | -1.383e-04 | 1 | -4.694e-04 | 7 | 1.925e-03 | 3 |
| 1597 | N861 | max | .015 | 3 | .036 | 3 | .016 | 2 | 2.581e-03 | 6 | 0 | 1 | 1.148e-02 | 8 |
| 1598 | | min | -.013 | 4 | -.038 | 4 | -.014 | 1 | 1.361e-04 | 1 | 0 | 1 | 1.956e-03 | 3 |
| 1599 | N862 | max | .015 | 3 | .038 | 3 | .016 | 2 | 2.991e-03 | 6 | 0 | 1 | 1.159e-02 | 8 |
| 1600 | | min | -.013 | 4 | -.027 | 4 | -.014 | 1 | 4.053e-04 | 1 | 0 | 1 | 1.976e-03 | 3 |
| 1601 | N863 | max | .015 | 3 | .043 | 7 | .017 | 2 | 3.452e-03 | 6 | 0 | 1 | 1.173e-02 | 8 |
| 1602 | | min | -.013 | 4 | -.016 | 4 | -.013 | 1 | 7.038e-04 | 1 | 0 | 1 | 2.011e-03 | 3 |

## *Envelope Joint Displacements (Continued)*

| | Joint | | X [in] | LC | Y [in] | LC | Z [in] | LC | X Rotation [... | LC | Y Rotation [... | LC | Z Rotation [... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1603 | N864 | max | .015 | 3 | .059 | 7 | .017 | 2 | 3.953e-03 | 6 | 0 | 1 | 1.182e-02 | 8 |
| 1604 | | min | -.013 | 4 | -.005 | 4 | -.013 | 1 | 1.023e-03 | 1 | 0 | 1 | 2.032e-03 | 3 |
| 1605 | N865 | max | .016 | 3 | .04 | 3 | .016 | 2 | 2.401e-03 | 6 | 0 | 1 | 1.2e-02 | 8 |
| 1606 | | min | -.013 | 4 | -.034 | 4 | -.014 | 1 | 4.639e-05 | 1 | 0 | 1 | 2.112e-03 | 3 |
| 1607 | N866 | max | .016 | 3 | .042 | 3 | .016 | 2 | 2.821e-03 | 6 | 0 | 1 | 1.216e-02 | 8 |
| 1608 | | min | -.013 | 4 | -.024 | 4 | -.014 | 1 | 3.207e-04 | 1 | 0 | 1 | 2.153e-03 | 3 |
| 1609 | N867 | max | .016 | 3 | .051 | 7 | .017 | 2 | 3.271e-03 | 6 | 0 | 1 | 1.23e-02 | 8 |
| 1610 | | min | -.013 | 4 | -.013 | 4 | -.013 | 1 | 6.118e-04 | 1 | 0 | 1 | 2.19e-03 | 3 |
| 1611 | N868 | max | .017 | 3 | .041 | 3 | .016 | 2 | 1.709e-03 | 6 | 6.421e-05 | 4 | 1.239e-02 | 8 |
| 1612 | | min | -.013 | 4 | -.041 | 4 | -.014 | 1 | -3.42e-04 | 1 | -4.647e-04 | 7 | 2.245e-03 | 3 |
| 1613 | N869 | max | .017 | 3 | .044 | 3 | .016 | 2 | 2.268e-03 | 6 | 0 | 1 | 1.26e-02 | 8 |
| 1614 | | min | -.013 | 4 | -.03 | 4 | -.014 | 1 | -2.768e-05 | 1 | 0 | 1 | 2.299e-03 | 3 |
| 1615 | N870 | max | .016 | 3 | .047 | 3 | .017 | 2 | 2.671e-03 | 6 | 0 | 1 | 1.273e-02 | 8 |
| 1616 | | min | -.013 | 4 | -.019 | 4 | -.013 | 1 | 2.457e-04 | 1 | 0 | 1 | 2.336e-03 | 3 |
| 1617 | N871 | max | .016 | 3 | .062 | 7 | .017 | 2 | 3.101e-03 | 6 | 0 | 1 | 1.288e-02 | 8 |
| 1618 | | min | -.013 | 4 | -.008 | 4 | -.013 | 1 | 5.367e-04 | 1 | 0 | 1 | 2.378e-03 | 3 |
| 1619 | N872 | max | .016 | 3 | .078 | 7 | .017 | 2 | 3.549e-03 | 6 | 0 | 1 | 1.307e-02 | 8 |
| 1620 | | min | -.013 | 4 | .003 | 4 | -.013 | 1 | 8.359e-04 | 1 | 0 | 1 | 2.431e-03 | 3 |
| 1621 | N873 | max | .018 | 3 | .045 | 3 | .016 | 2 | 1.886e-03 | 6 | 6.872e-05 | 4 | 1.304e-02 | 8 |
| 1622 | | min | -.014 | 4 | -.037 | 4 | -.014 | 1 | -3.14e-04 | 1 | -4.542e-04 | 7 | 2.456e-03 | 3 |
| 1623 | N874 | max | .017 | 3 | .048 | 3 | .016 | 2 | 2.041e-03 | 6 | 0 | 1 | 1.314e-02 | 8 |
| 1624 | | min | -.014 | 4 | -.026 | 4 | -.014 | 1 | -1.409e-04 | 1 | 0 | 1 | 2.478e-03 | 3 |
| 1625 | N875 | max | .017 | 3 | .057 | 7 | .017 | 2 | 2.454e-03 | 6 | 0 | 1 | 1.33e-02 | 8 |
| 1626 | | min | -.013 | 4 | -.015 | 4 | -.013 | 1 | 1.4e-04 | 1 | 0 | 1 | 2.523e-03 | 3 |
| 1627 | N876 | max | .017 | 3 | .072 | 7 | .017 | 2 | 2.889e-03 | 6 | 0 | 1 | 1.345e-02 | 8 |
| 1628 | | min | -.013 | 4 | -.004 | 4 | -.013 | 1 | 4.349e-04 | 1 | 0 | 1 | 2.569e-03 | 3 |
| 1629 | N877 | max | .017 | 3 | .088 | 7 | .017 | 2 | 3.284e-03 | 6 | 0 | 1 | 1.359e-02 | 8 |
| 1630 | | min | -.013 | 4 | .007 | 4 | -.013 | 1 | 7.12e-04 | 1 | 0 | 1 | 2.607e-03 | 3 |
| 1631 | N878 | max | .018 | 3 | .05 | 3 | .016 | 2 | 1.462e-03 | 2 | 5.094e-05 | 4 | 1.342e-02 | 8 |
| 1632 | | min | -.014 | 4 | -.033 | 4 | -.014 | 1 | -6.e-04 | 1 | -4.168e-04 | 7 | 2.588e-03 | 3 |
| 1633 | N879 | max | .018 | 3 | .052 | 3 | .017 | 2 | 1.843e-03 | 6 | 0 | 1 | 1.37e-02 | 8 |
| 1634 | | min | -.014 | 4 | -.022 | 4 | -.014 | 1 | -2.464e-04 | 1 | 0 | 1 | 2.668e-03 | 3 |
| 1635 | N880 | max | .018 | 3 | .067 | 7 | .017 | 2 | 2.208e-03 | 6 | 0 | 1 | 1.382e-02 | 8 |
| 1636 | | min | -.014 | 4 | -.011 | 4 | -.013 | 1 | 1.501e-05 | 1 | 0 | 1 | 2.704e-03 | 3 |
| 1637 | N881 | max | .018 | 3 | .083 | 7 | .017 | 2 | 2.558e-03 | 6 | 0 | 1 | 1.39e-02 | 8 |
| 1638 | | min | -.014 | 4 | 0 | 4 | -.013 | 1 | 2.743e-04 | 1 | 0 | 1 | 2.722e-03 | 3 |
| 1639 | N882 | max | .018 | 3 | .099 | 7 | .017 | 2 | 2.926e-03 | 7 | 0 | 1 | 1.407e-02 | 8 |
| 1640 | | min | -.014 | 4 | .012 | 4 | -.013 | 1 | 5.219e-04 | 4 | 0 | 1 | 2.774e-03 | 3 |
| 1641 | N883 | max | .019 | 3 | .06 | 7 | .017 | 2 | 1.589e-03 | 9 | 0 | 1 | 1.413e-02 | 8 |
| 1642 | | min | -.014 | 4 | -.018 | 4 | -.014 | 1 | -3.954e-04 | 1 | 0 | 1 | 2.824e-03 | 3 |
| 1643 | N884 | max | .019 | 3 | .076 | 7 | .017 | 2 | 1.834e-03 | 6 | 0 | 1 | 1.415e-02 | 8 |
| 1644 | | min | -.014 | 4 | -.006 | 4 | -.013 | 1 | -1.712e-04 | 1 | 0 | 1 | 2.823e-03 | 3 |
| 1645 | N885 | max | .018 | 3 | .092 | 7 | .017 | 2 | 2.112e-03 | 7 | 0 | 1 | 1.418e-02 | 8 |
| 1646 | | min | -.014 | 4 | .005 | 4 | -.013 | 1 | 1.989e-05 | 4 | 0 | 1 | 2.832e-03 | 3 |
| 1647 | N886 | max | .019 | 3 | .12 | 7 | .017 | 2 | 1.47e-03 | 3 | 0 | 1 | 1.397e-02 | 8 |
| 1648 | | min | -.014 | 4 | .022 | 4 | -.012 | 1 | -4.516e-04 | 4 | 0 | 1 | 2.767e-03 | 3 |
| 1649 | N887 | max | .019 | 3 | .129 | 7 | .017 | 2 | 8.709e-04 | 3 | 0 | 1 | 1.26e-02 | 8 |
| 1650 | | min | -.014 | 4 | .027 | 4 | -.012 | 1 | -1.45e-03 | 4 | 0 | 1 | 2.314e-03 | 3 |
| 1651 | N888 | max | .02 | 3 | .134 | 7 | .016 | 2 | -3.421e-06 | 3 | 0 | 1 | 1.028e-02 | 8 |
| 1652 | | min | -.014 | 4 | .029 | 4 | -.012 | 1 | -3.721e-03 | 8 | 0 | 1 | 1.607e-03 | 3 |
| 1653 | N889 | max | .019 | 3 | .104 | 7 | .017 | 2 | 1.538e-03 | 3 | 0 | 1 | 1.383e-02 | 8 |
| 1654 | | min | -.014 | 4 | .01 | 4 | -.013 | 1 | -3.823e-04 | 4 | 0 | 1 | 2.724e-03 | 3 |

## *Envelope Joint Displacements (Continued)*

| | Joint | | X [in] | LC | Y [in] | LC | Z [in] | LC | X Rotation [... | LC | Y Rotation [... | LC | Z Rotation [... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1655 | N890 | max | .02 | 3 | .113 | 7 | .017 | 2 | 1.131e-03 | 3 | 0 | 1 | 1.269e-02 | 8 |
| 1656 | | min | -.014 | 4 | .015 | 4 | -.013 | 1 | -1.097e-03 | 4 | 0 | 1 | 2.361e-03 | 3 |
| 1657 | N891 | max | .02 | 3 | .119 | 7 | .016 | 2 | 3.995e-04 | 3 | 0 | 1 | 1.022e-02 | 8 |
| 1658 | | min | -.014 | 4 | .017 | 4 | -.012 | 1 | -2.418e-03 | 8 | 0 | 1 | 1.527e-03 | 3 |
| 1659 | N892 | max | .021 | 3 | .118 | 7 | .016 | 2 | -6.301e-04 | 3 | 2.77e-04 | 2 | 8.495e-03 | 8 |
| 1660 | | min | -.014 | 4 | .016 | 4 | -.012 | 1 | -5.065e-03 | 8 | -5.253e-05 | 1 | 8.944e-04 | 3 |
| 1661 | N893 | max | .019 | 3 | .087 | 7 | .017 | 2 | 1.549e-03 | 3 | 0 | 1 | 1.423e-02 | 8 |
| 1662 | | min | -.014 | 4 | -.002 | 4 | -.013 | 1 | -4.032e-04 | 4 | 0 | 1 | 2.872e-03 | 3 |
| 1663 | N894 | max | .02 | 3 | .097 | 7 | .017 | 2 | 1.31e-03 | 3 | 0 | 1 | 1.323e-02 | 8 |
| 1664 | | min | -.014 | 4 | .003 | 4 | -.013 | 1 | -8.401e-04 | 4 | 0 | 1 | 2.546e-03 | 3 |
| 1665 | N895 | max | .02 | 3 | .104 | 7 | .017 | 2 | 6.619e-04 | 3 | 0 | 1 | 1.141e-02 | 8 |
| 1666 | | min | -.014 | 4 | .005 | 4 | -.013 | 1 | -1.96e-03 | 4 | 0 | 1 | 1.941e-03 | 3 |
| 1667 | N896 | max | .021 | 3 | .103 | 7 | .016 | 2 | -6.592e-04 | 3 | 2.379e-04 | 4 | 8.609e-03 | 8 |
| 1668 | | min | -.014 | 4 | .004 | 4 | -.013 | 1 | -5.266e-03 | 8 | -9.584e-05 | 3 | 9.439e-04 | 3 |
| 1669 | N897 | max | .02 | 3 | .07 | 7 | .017 | 2 | 1.466e-03 | 3 | 0 | 1 | 1.44e-02 | 8 |
| 1670 | | min | -.014 | 4 | -.014 | 4 | -.013 | 1 | -5.281e-04 | 1 | 0 | 1 | 2.932e-03 | 3 |
| 1671 | N898 | max | .02 | 3 | .08 | 7 | .017 | 2 | 1.416e-03 | 3 | 0 | 1 | 1.426e-02 | 8 |
| 1672 | | min | -.014 | 4 | -.01 | 4 | -.013 | 1 | -7.261e-04 | 4 | 0 | 1 | 2.921e-03 | 3 |
| 1673 | N899C | max | .021 | 3 | .088 | 7 | .017 | 2 | 8.458e-04 | 3 | 0 | 1 | 1.217e-02 | 8 |
| 1674 | | min | -.014 | 4 | -.007 | 4 | -.013 | 1 | -1.586e-03 | 4 | 0 | 1 | 2.245e-03 | 3 |
| 1675 | N900B | max | .021 | 3 | .088 | 7 | .017 | 2 | -1.215e-03 | 3 | 3.365e-04 | 4 | 7.563e-03 | 8 |
| 1676 | | min | -.015 | 4 | -.008 | 4 | -.013 | 1 | -6.782e-03 | 8 | -1.905e-04 | 3 | 5.737e-04 | 3 |
| 1677 | N901B | max | .02 | 3 | .058 | 3 | .017 | 2 | 1.242e-03 | 3 | 5.88e-05 | 4 | 1.399e-02 | 8 |
| 1678 | | min | -.014 | 4 | -.026 | 4 | -.014 | 1 | -8.829e-04 | 4 | -3.487e-04 | 7 | 2.805e-03 | 3 |
| 1679 | N902B | max | .02 | 3 | .063 | 7 | .017 | 2 | 1.801e-03 | 6 | 1.011e-04 | 4 | 1.458e-02 | 8 |
| 1680 | | min | -.014 | 4 | -.022 | 4 | -.014 | 1 | -3.702e-04 | 1 | -3.097e-04 | 3 | 3.041e-03 | 3 |
| 1681 | N903 | max | .021 | 3 | .072 | 7 | .017 | 2 | 1.174e-03 | 3 | 8.496e-05 | 4 | 1.227e-02 | 8 |
| 1682 | | min | -.014 | 4 | -.019 | 4 | -.014 | 1 | -1.12e-03 | 4 | -2.998e-04 | 3 | 2.281e-03 | 3 |
| 1683 | N904 | max | .021 | 3 | .098 | 7 | .014 | 2 | -3.75e-03 | 3 | 0 | 1 | 4.743e-03 | 8 |
| 1684 | | min | -.015 | 4 | .013 | 4 | -.013 | 1 | -1.333e-02 | 8 | 0 | 1 | -3.391e-04 | 3 |
| 1685 | N905A | max | .021 | 3 | .088 | 7 | .014 | 2 | -3.716e-03 | 3 | 0 | 1 | 4.19e-03 | 8 |
| 1686 | | min | -.016 | 4 | .009 | 4 | -.013 | 1 | -1.314e-02 | 8 | 0 | 1 | -4.935e-04 | 3 |
| 1687 | N906A | max | .021 | 3 | .077 | 7 | .013 | 2 | -3.633e-03 | 3 | 0 | 1 | 3.688e-03 | 8 |
| 1688 | | min | -.016 | 4 | .004 | 4 | -.013 | 1 | -1.282e-02 | 8 | 0 | 1 | -6.211e-04 | 3 |
| 1689 | N907 | max | .021 | 3 | .092 | 7 | .015 | 2 | -3.613e-03 | 3 | 0 | 1 | 5.53e-03 | 8 |
| 1690 | | min | -.015 | 4 | .005 | 4 | -.012 | 1 | -1.298e-02 | 8 | 0 | 1 | -1.264e-04 | 3 |
| 1691 | N908 | max | .021 | 3 | .082 | 7 | .014 | 2 | -3.672e-03 | 3 | 0 | 1 | 4.993e-03 | 8 |
| 1692 | | min | -.016 | 4 | .002 | 4 | -.013 | 1 | -1.303e-02 | 8 | 0 | 1 | -2.812e-04 | 3 |
| 1693 | N909 | max | .021 | 3 | .072 | 7 | .014 | 2 | -3.628e-03 | 3 | 0 | 1 | 4.478e-03 | 8 |
| 1694 | | min | -.016 | 4 | -.002 | 4 | -.013 | 1 | -1.28e-02 | 8 | 0 | 1 | -4.217e-04 | 3 |
| 1695 | N910 | max | .021 | 3 | .062 | 7 | .013 | 2 | -3.537e-03 | 3 | 0 | 1 | 4.001e-03 | 8 |
| 1696 | | min | -.016 | 4 | -.006 | 4 | -.013 | 1 | -1.245e-02 | 5 | 0 | 1 | -5.412e-04 | 3 |
| 1697 | N911A | max | .021 | 3 | .051 | 7 | .013 | 2 | -3.4e-03 | 2 | 0 | 1 | 3.565e-03 | 8 |
| 1698 | | min | -.016 | 4 | -.01 | 4 | -.013 | 1 | -1.204e-02 | 5 | 0 | 1 | -6.387e-04 | 3 |
| 1699 | N912B | max | .021 | 3 | .076 | 7 | .015 | 2 | -3.606e-03 | 3 | 0 | 1 | 5.764e-03 | 8 |
| 1700 | | min | -.016 | 4 | -.006 | 4 | -.012 | 1 | -1.288e-02 | 8 | 0 | 1 | -7.126e-05 | 3 |
| 1701 | N913B | max | .021 | 3 | .066 | 7 | .015 | 2 | -3.607e-03 | 3 | 0 | 1 | 5.282e-03 | 8 |
| 1702 | | min | -.016 | 4 | -.009 | 4 | -.013 | 1 | -1.276e-02 | 8 | 0 | 1 | -2.096e-04 | 3 |
| 1703 | N914B | max | .021 | 3 | .056 | 7 | .014 | 2 | -3.543e-03 | 3 | 0 | 1 | 4.795e-03 | 8 |
| 1704 | | min | -.016 | 4 | -.013 | 4 | -.013 | 1 | -1.247e-02 | 5 | 0 | 1 | -3.418e-04 | 3 |
| 1705 | N915B | max | .021 | 3 | .046 | 7 | .014 | 2 | -3.445e-03 | 3 | 0 | 1 | 4.331e-03 | 8 |
| 1706 | | min | -.016 | 4 | -.017 | 4 | -.013 | 1 | -1.21e-02 | 5 | 0 | 1 | -4.59e-04 | 3 |

## Envelope Joint Displacements (Continued)

| | Joint | | X [in] | LC | Y [in] | LC | Z [in] | LC | X Rotation [... | LC | Y Rotation [... | LC | Z Rotation [... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1707 | N916B | max | .021 | 3 | .039 | 3 | .013 | 2 | -3.267e-03 | 2 | 0 | 1 | 3.897e-03 | 8 |
| 1708 | | min | -.017 | 4 | -.02 | 4 | -.013 | 1 | -1.17e-02 | 5 | 0 | 1 | -5.588e-04 | 3 |
| 1709 | N917A | max | .021 | 3 | .06 | 7 | .015 | 2 | -3.574e-03 | 3 | 0 | 1 | 6.015e-03 | 8 |
| 1710 | | min | -.016 | 4 | -.017 | 4 | -.012 | 1 | -1.271e-02 | 8 | 0 | 1 | -6.903e-06 | 3 |
| 1711 | N918A | max | .021 | 3 | .051 | 3 | .015 | 2 | -3.535e-03 | 3 | 0 | 1 | 5.563e-03 | 8 |
| 1712 | | min | -.016 | 4 | -.02 | 4 | -.012 | 1 | -1.247e-02 | 8 | 0 | 1 | -1.398e-04 | 3 |
| 1713 | N919A | max | .021 | 3 | .046 | 3 | .014 | 2 | -3.454e-03 | 3 | 0 | 1 | 5.094e-03 | 8 |
| 1714 | | min | -.016 | 4 | -.024 | 4 | -.013 | 1 | -1.214e-02 | 5 | 0 | 1 | -2.661e-04 | 3 |
| 1715 | N920A | max | .021 | 3 | .041 | 3 | .014 | 2 | -3.315e-03 | 2 | 0 | 1 | 4.633e-03 | 8 |
| 1716 | | min | -.017 | 4 | -.027 | 4 | -.013 | 1 | -1.177e-02 | 5 | 0 | 1 | -3.866e-04 | 3 |
| 1717 | N921A | max | .02 | 3 | .036 | 3 | .013 | 2 | -3.139e-03 | 2 | 0 | 1 | 4.207e-03 | 8 |
| 1718 | | min | -.017 | 4 | -.03 | 4 | -.013 | 1 | -1.136e-02 | 5 | 0 | 1 | -4.808e-04 | 3 |
| 1719 | N922B | max | .021 | 3 | .047 | 3 | .015 | 2 | -3.438e-03 | 3 | 3.769e-04 | 6 | 5.78e-03 | 8 |
| 1720 | | min | -.016 | 4 | -.031 | 4 | -.012 | 1 | -1.214e-02 | 8 | 4.349e-05 | 1 | -7.867e-05 | 3 |
| 1721 | N923B | max | .021 | 3 | .042 | 3 | .015 | 2 | -3.359e-03 | 2 | 4.313e-04 | 6 | 5.338e-03 | 8 |
| 1722 | | min | -.017 | 4 | -.034 | 4 | -.013 | 1 | -1.182e-02 | 5 | 3.816e-05 | 1 | -2.167e-04 | 3 |
| 1723 | N924B | max | .02 | 3 | .037 | 3 | .014 | 2 | -3.186e-03 | 2 | 4.289e-04 | 6 | 4.928e-03 | 8 |
| 1724 | | min | -.017 | 4 | -.037 | 4 | -.013 | 1 | -1.141e-02 | 5 | 4.092e-05 | 1 | -2.927e-04 | 3 |
| 1725 | N925B | max | .02 | 3 | .042 | 7 | .011 | 2 | -2.986e-03 | 2 | 0 | 1 | 2.229e-03 | 4 |
| 1726 | | min | -.017 | 4 | -.007 | 4 | -.012 | 1 | -1.117e-02 | 5 | 0 | 1 | -9.544e-04 | 3 |
| 1727 | N926B | max | .021 | 3 | .05 | 7 | .011 | 2 | -3.169e-03 | 2 | 0 | 1 | 2.462e-03 | 4 |
| 1728 | | min | -.017 | 4 | -.005 | 4 | -.013 | 1 | -1.158e-02 | 5 | 0 | 1 | -9.28e-04 | 3 |
| 1729 | N927 | max | .021 | 3 | .059 | 7 | .012 | 2 | -3.354e-03 | 2 | 0 | 1 | 2.711e-03 | 4 |
| 1730 | | min | -.016 | 4 | -.002 | 4 | -.013 | 1 | -1.2e-02 | 5 | 0 | 1 | -8.31e-04 | 3 |
| 1731 | N928 | max | .02 | 3 | .024 | 3 | .01 | 2 | -2.614e-03 | 2 | 0 | 1 | 2.315e-03 | 4 |
| 1732 | | min | -.018 | 4 | -.021 | 4 | -.012 | 1 | -1.015e-02 | 5 | 0 | 1 | -9.142e-04 | 3 |
| 1733 | N929 | max | .02 | 3 | .029 | 3 | .011 | 2 | -2.859e-03 | 2 | 0 | 1 | 2.491e-03 | 4 |
| 1734 | | min | -.017 | 4 | -.018 | 4 | -.012 | 1 | -1.082e-02 | 5 | 0 | 1 | -9.051e-04 | 3 |
| 1735 | N930 | max | .02 | 3 | .034 | 7 | .012 | 2 | -3.042e-03 | 2 | 0 | 1 | 2.713e-03 | 4 |
| 1736 | | min | -.017 | 4 | -.015 | 4 | -.013 | 1 | -1.123e-02 | 5 | 0 | 1 | -8.e-04 | 3 |
| 1737 | N931 | max | .021 | 3 | .043 | 7 | .012 | 2 | -3.226e-03 | 2 | 0 | 1 | 3.099e-03 | 8 |
| 1738 | | min | -.017 | 4 | -.013 | 4 | -.013 | 1 | -1.166e-02 | 5 | 0 | 1 | -7.38e-04 | 3 |
| 1739 | N932 | max | .02 | 3 | .02 | 3 | .011 | 2 | -2.62e-03 | 2 | 0 | 1 | 2.612e-03 | 4 |
| 1740 | | min | -.018 | 4 | -.031 | 4 | -.012 | 1 | -1.023e-02 | 5 | 0 | 1 | -7.695e-04 | 3 |
| 1741 | N933 | max | .02 | 3 | .025 | 3 | .011 | 2 | -2.738e-03 | 2 | 0 | 1 | 2.773e-03 | 8 |
| 1742 | | min | -.018 | 4 | -.028 | 4 | -.013 | 1 | -1.043e-02 | 5 | 0 | 1 | -7.456e-04 | 3 |
| 1743 | N934 | max | .02 | 3 | .03 | 3 | .012 | 2 | -2.928e-03 | 2 | 0 | 1 | 3.074e-03 | 8 |
| 1744 | | min | -.017 | 4 | -.026 | 4 | -.013 | 1 | -1.092e-02 | 5 | 0 | 1 | -7.214e-04 | 3 |
| 1745 | N935 | max | .02 | 3 | .034 | 3 | .013 | 2 | -3.094e-03 | 2 | 0 | 1 | 3.475e-03 | 8 |
| 1746 | | min | -.017 | 4 | -.023 | 4 | -.013 | 1 | -1.13e-02 | 5 | 0 | 1 | -6.408e-04 | 3 |
| 1747 | N936 | max | .02 | 3 | .016 | 3 | .011 | 2 | -2.546e-03 | 2 | 0 | 1 | 2.887e-03 | 8 |
| 1748 | | min | -.018 | 4 | -.042 | 4 | -.013 | 1 | -9.866e-03 | 5 | 0 | 1 | -7.148e-04 | 3 |
| 1749 | N937 | max | .02 | 3 | .021 | 3 | .012 | 2 | -2.7e-03 | 2 | 0 | 1 | 3.149e-03 | 8 |
| 1750 | | min | -.018 | 4 | -.039 | 4 | -.013 | 1 | -1.033e-02 | 5 | 0 | 1 | -6.657e-04 | 3 |
| 1751 | N938 | max | .02 | 3 | .026 | 3 | .012 | 2 | -2.818e-03 | 2 | 0 | 1 | 3.455e-03 | 8 |
| 1752 | | min | -.018 | 4 | -.036 | 4 | -.013 | 1 | -1.058e-02 | 5 | 0 | 1 | -6.15e-04 | 3 |
| 1753 | N939 | max | .02 | 3 | .031 | 3 | .013 | 2 | -2.983e-03 | 2 | 0 | 1 | 3.79e-03 | 8 |
| 1754 | | min | -.017 | 4 | -.033 | 4 | -.013 | 1 | -1.101e-02 | 5 | 0 | 1 | -5.733e-04 | 3 |
| 1755 | N940 | max | .02 | 3 | .017 | 3 | .012 | 2 | -2.622e-03 | 2 | 3.922e-04 | 6 | 3.543e-03 | 8 |
| 1756 | | min | -.018 | 4 | -.049 | 4 | -.013 | 1 | -9.96e-03 | 5 | -1.224e-05 | 1 | -5.03e-04 | 3 |
| 1757 | N941 | max | .02 | 3 | .022 | 3 | .013 | 2 | -2.765e-03 | 2 | 5.198e-04 | 6 | 3.677e-03 | 8 |
| 1758 | | min | -.018 | 4 | -.046 | 4 | -.013 | 1 | -1.045e-02 | 5 | -3.287e-05 | 1 | -6.153e-04 | 3 |

## *Envelope Joint Displacements (Continued)*

| | Joint | | X [in] | LC | Y [in] | LC | Z [in] | LC | X Rotation [... | LC | Y Rotation [... | LC | Z Rotation [... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1759 | N942 | max | .02 | 3 | .027 | 3 | .013 | 2 | -2.869e-03 | 2 | 4.366e-04 | 6 | 4.129e-03 | 8 |
| 1760 | | min | -.018 | 4 | -.043 | 4 | -.013 | 1 | -1.064e-02 | 5 | 1.469e-05 | 1 | -4.497e-04 | 3 |
| 1761 | N943 | max | .02 | 3 | .028 | 7 | .009 | 2 | -2.501e-03 | 2 | 0 | 1 | 1.726e-03 | 4 |
| 1762 | | min | -.017 | 4 | -.011 | 4 | -.012 | 1 | -9.964e-03 | 5 | 0 | 1 | -1.123e-03 | 3 |
| 1763 | N944 | max | .02 | 3 | .021 | 6 | .009 | 2 | -2.375e-03 | 2 | 0 | 1 | 1.464e-03 | 4 |
| 1764 | | min | -.017 | 4 | -.012 | 1 | -.012 | 1 | -9.813e-03 | 5 | 0 | 1 | -1.313e-03 | 3 |
| 1765 | N945 | max | .02 | 3 | .018 | 2 | .008 | 2 | -2.124e-03 | 2 | 0 | 1 | 1.209e-03 | 4 |
| 1766 | | min | -.018 | 4 | -.015 | 1 | -.012 | 1 | -9.201e-03 | 5 | 0 | 1 | -1.418e-03 | 3 |
| 1767 | N946 | max | .02 | 3 | .019 | 3 | .01 | 2 | -2.371e-03 | 2 | 0 | 1 | 2.192e-03 | 4 |
| 1768 | | min | -.018 | 4 | -.025 | 4 | -.012 | 1 | -9.54e-03 | 5 | 0 | 1 | -9.194e-04 | 3 |
| 1769 | N947 | max | .02 | 3 | .017 | 2 | .009 | 2 | -2.307e-03 | 2 | 0 | 1 | 1.961e-03 | 4 |
| 1770 | | min | -.018 | 4 | -.025 | 1 | -.012 | 1 | -9.557e-03 | 5 | 0 | 1 | -1.132e-03 | 3 |
| 1771 | N948 | max | .02 | 3 | .015 | 2 | .008 | 2 | -2.045e-03 | 2 | 0 | 1 | 1.772e-03 | 4 |
| 1772 | | min | -.018 | 4 | -.026 | 1 | -.012 | 1 | -8.845e-03 | 5 | 0 | 1 | -1.12e-03 | 3 |
| 1773 | N949 | max | .02 | 3 | .013 | 2 | .008 | 2 | -1.792e-03 | 2 | 0 | 1 | 1.56e-03 | 4 |
| 1774 | | min | -.018 | 4 | -.027 | 1 | -.012 | 1 | -8.212e-03 | 5 | 0 | 1 | -1.263e-03 | 3 |
| 1775 | N950 | max | .02 | 3 | .011 | 2 | .007 | 2 | -1.559e-03 | 2 | 0 | 1 | 1.345e-03 | 4 |
| 1776 | | min | -.018 | 4 | -.028 | 1 | -.012 | 1 | -7.672e-03 | 5 | 0 | 1 | -1.44e-03 | 3 |
| 1777 | N951A | max | .02 | 3 | .011 | 2 | .01 | 2 | -2.318e-03 | 2 | 0 | 1 | 2.474e-03 | 4 |
| 1778 | | min | -.019 | 4 | -.039 | 1 | -.012 | 1 | -9.485e-03 | 5 | 0 | 1 | -8.867e-04 | 3 |
| 1779 | N952C | max | .02 | 3 | .01 | 2 | .009 | 2 | -2.01e-03 | 2 | 0 | 1 | 2.361e-03 | 4 |
| 1780 | | min | -.019 | 4 | -.039 | 1 | -.012 | 1 | -8.544e-03 | 5 | 0 | 1 | -7.286e-04 | 3 |
| 1781 | N953B | max | .02 | 3 | .009 | 2 | .008 | 2 | -1.827e-03 | 2 | 0 | 1 | 2.173e-03 | 4 |
| 1782 | | min | -.019 | 4 | -.038 | 1 | -.012 | 1 | -8.12e-03 | 5 | 0 | 1 | -9.999e-04 | 3 |
| 1783 | N954B | max | .02 | 3 | .008 | 2 | .008 | 2 | -1.666e-03 | 2 | 0 | 1 | 1.978e-03 | 4 |
| 1784 | | min | -.019 | 4 | -.038 | 1 | -.012 | 1 | -7.802e-03 | 5 | 0 | 1 | -1.204e-03 | 3 |
| 1785 | N955C | max | .02 | 3 | .007 | 2 | .007 | 2 | -1.466e-03 | 2 | 0 | 1 | 1.806e-03 | 4 |
| 1786 | | min | -.019 | 4 | -.038 | 1 | -.012 | 1 | -7.357e-03 | 5 | 0 | 1 | -1.302e-03 | 3 |
| 1787 | N956C | max | .02 | 3 | .005 | 2 | .009 | 2 | -2.084e-03 | 2 | 0 | 1 | 3.215e-03 | 8 |
| 1788 | | min | -.02 | 4 | -.057 | 5 | -.012 | 1 | -8.359e-03 | 5 | 0 | 1 | -3.047e-04 | 3 |
| 1789 | N957B | max | .02 | 3 | .005 | 2 | .009 | 2 | -2.08e-03 | 2 | 0 | 1 | 2.778e-03 | 4 |
| 1790 | | min | -.02 | 4 | -.055 | 5 | -.012 | 1 | -8.55e-03 | 5 | 0 | 1 | -8.585e-04 | 3 |
| 1791 | N958A | max | .02 | 3 | .004 | 2 | .008 | 2 | -1.98e-03 | 2 | 0 | 1 | 2.631e-03 | 4 |
| 1792 | | min | -.02 | 4 | -.054 | 5 | -.012 | 1 | -8.451e-03 | 5 | 0 | 1 | -1.011e-03 | 3 |
| 1793 | N959 | max | .02 | 3 | .004 | 2 | .008 | 2 | -1.795e-03 | 2 | 0 | 1 | 2.496e-03 | 4 |
| 1794 | | min | -.02 | 4 | -.053 | 5 | -.012 | 1 | -8.067e-03 | 5 | 0 | 1 | -1.041e-03 | 3 |
| 1795 | N960A | max | .02 | 3 | .004 | 2 | .007 | 2 | -1.564e-03 | 2 | 0 | 1 | 2.365e-03 | 4 |
| 1796 | | min | -.02 | 4 | -.052 | 5 | -.012 | 1 | -7.535e-03 | 5 | 0 | 1 | -1.065e-03 | 3 |
| 1797 | N961A | max | .02 | 3 | -.002 | 2 | .009 | 2 | -2.816e-03 | 2 | 4.29e-04 | 6 | 3.471e-03 | 4 |
| 1798 | | min | -.02 | 4 | -.081 | 5 | -.012 | 1 | -1.044e-02 | 5 | -7.611e-05 | 1 | -7.189e-04 | 3 |
| 1799 | N962A | max | .02 | 3 | -.001 | 2 | .008 | 2 | -2.457e-03 | 2 | 4.538e-04 | 2 | 3.326e-03 | 4 |
| 1800 | | min | -.02 | 4 | -.077 | 5 | -.012 | 1 | -9.578e-03 | 5 | -9.727e-05 | 1 | -7.059e-04 | 3 |
| 1801 | N963A | max | .02 | 3 | 0 | 2 | .007 | 2 | -2.118e-03 | 2 | 4.584e-04 | 2 | 3.173e-03 | 4 |
| 1802 | | min | -.02 | 4 | -.073 | 5 | -.012 | 1 | -8.761e-03 | 5 | -1.067e-04 | 1 | -7.057e-04 | 3 |
| 1803 | N964A | max | .02 | 3 | .013 | 2 | .007 | 2 | -1.513e-03 | 2 | 0 | 1 | 6.082e-04 | 4 |
| 1804 | | min | -.018 | 4 | -.019 | 1 | -.012 | 1 | -7.704e-03 | 5 | 0 | 1 | -1.926e-03 | 7 |
| 1805 | N965 | max | .02 | 3 | .01 | 2 | .006 | 2 | -1.189e-03 | 2 | 0 | 1 | 3.307e-04 | 4 |
| 1806 | | min | -.018 | 4 | -.021 | 1 | -.011 | 1 | -6.906e-03 | 5 | 0 | 1 | -2.473e-03 | 7 |
| 1807 | N966A | max | .019 | 3 | .008 | 2 | .005 | 2 | -8.291e-04 | 2 | 0 | 1 | 9.508e-05 | 4 |
| 1808 | | min | -.018 | 4 | -.024 | 1 | -.011 | 1 | -5.991e-03 | 5 | 0 | 1 | -2.907e-03 | 7 |
| 1809 | N967A | max | .02 | 3 | .009 | 2 | .006 | 2 | -1.289e-03 | 2 | 0 | 1 | 1.073e-03 | 4 |
| 1810 | | min | -.018 | 4 | -.029 | 1 | -.012 | 1 | -7.034e-03 | 5 | 0 | 1 | -1.597e-03 | 3 |

## *Envelope Joint Displacements (Continued)*

| | Joint | | X [in] | LC | Y [in] | LC | Z [in] | LC | X Rotation [... | LC | Y Rotation [... | LC | Z Rotation [... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1811 | N968A | max | .02 | 3 | .008 | 2 | .006 | 2 | -9.766e-04 | 2 | 0 | 1 | 8.298e-04 | 4 |
| 1812 | | min | -.019 | 4 | -.03 | 1 | -.011 | 1 | -6.265e-03 | 5 | 0 | 1 | -1.717e-03 | 3 |
| 1813 | N969A | max | .019 | 3 | .006 | 2 | .005 | 2 | -6.305e-04 | 2 | 0 | 1 | 6.47e-04 | 4 |
| 1814 | | min | -.019 | 4 | -.031 | 1 | -.011 | 1 | -5.382e-03 | 5 | 0 | 1 | -1.897e-03 | 7 |
| 1815 | N970A | max | .019 | 3 | .005 | 2 | .004 | 2 | -2.805e-04 | 2 | 0 | 1 | 5.465e-04 | 4 |
| 1816 | | min | -.019 | 4 | -.033 | 5 | -.011 | 1 | -4.463e-03 | 5 | 0 | 1 | -2.024e-03 | 7 |
| 1817 | N971A | max | .02 | 3 | .007 | 2 | .006 | 2 | -1.187e-03 | 2 | 0 | 1 | 1.588e-03 | 4 |
| 1818 | | min | -.019 | 4 | -.038 | 1 | -.012 | 1 | -6.703e-03 | 5 | 0 | 1 | -1.393e-03 | 3 |
| 1819 | N972A | max | .02 | 3 | .006 | 2 | .006 | 2 | -8.696e-04 | 2 | 0 | 1 | 1.391e-03 | 4 |
| 1820 | | min | -.019 | 4 | -.038 | 1 | -.011 | 1 | -5.921e-03 | 5 | 0 | 1 | -1.459e-03 | 3 |
| 1821 | N973A | max | .019 | 3 | .005 | 2 | .005 | 2 | -5.292e-04 | 2 | 0 | 1 | 1.217e-03 | 4 |
| 1822 | | min | -.019 | 4 | -.039 | 5 | -.011 | 1 | -5.059e-03 | 5 | 0 | 1 | -1.509e-03 | 3 |
| 1823 | N974 | max | .019 | 3 | .004 | 2 | .004 | 2 | -1.876e-04 | 2 | 0 | 1 | 1.087e-03 | 4 |
| 1824 | | min | -.019 | 4 | -.041 | 5 | -.011 | 1 | -4.171e-03 | 5 | 0 | 1 | -1.545e-03 | 3 |
| 1825 | N975 | max | .02 | 3 | .004 | 2 | .006 | 2 | -1.241e-03 | 2 | 0 | 1 | 2.182e-03 | 4 |
| 1826 | | min | -.02 | 4 | -.051 | 5 | -.012 | 1 | -6.762e-03 | 5 | 0 | 1 | -1.095e-03 | 3 |
| 1827 | N976A | max | .02 | 3 | .004 | 2 | .006 | 2 | -8.959e-04 | 2 | 0 | 1 | 1.996e-03 | 4 |
| 1828 | | min | -.02 | 4 | -.05 | 5 | -.011 | 1 | -5.91e-03 | 5 | 0 | 1 | -1.133e-03 | 3 |
| 1829 | N977A | max | .02 | 3 | .004 | 2 | .005 | 2 | -5.395e-04 | 2 | 0 | 1 | 1.811e-03 | 4 |
| 1830 | | min | -.02 | 4 | -.05 | 5 | -.011 | 1 | -5.015e-03 | 5 | 0 | 1 | -1.181e-03 | 3 |
| 1831 | N978 | max | .02 | 3 | .004 | 2 | .004 | 2 | -1.9e-04 | 2 | 0 | 1 | 1.63e-03 | 4 |
| 1832 | | min | -.02 | 4 | -.049 | 5 | -.011 | 1 | -4.128e-03 | 5 | 0 | 1 | -1.237e-03 | 3 |
| 1833 | N979A | max | .02 | 3 | 0 | 2 | .006 | 2 | -1.416e-03 | 2 | 4.484e-04 | 2 | 2.808e-03 | 4 |
| 1834 | | min | -.02 | 4 | -.066 | 5 | -.011 | 1 | -7.062e-03 | 5 | -1.239e-04 | 1 | -7.516e-04 | 3 |
| 1835 | N980A | max | .02 | 3 | .002 | 2 | .006 | 2 | -1.054e-03 | 2 | 4.336e-04 | 2 | 2.592e-03 | 4 |
| 1836 | | min | -.02 | 4 | -.063 | 5 | -.011 | 1 | -6.177e-03 | 5 | -1.326e-04 | 1 | -8.042e-04 | 3 |
| 1837 | N981A | max | .02 | 3 | .003 | 2 | .005 | 2 | -7.086e-04 | 2 | 4.098e-04 | 2 | 2.365e-03 | 4 |
| 1838 | | min | -.02 | 4 | -.06 | 5 | -.011 | 1 | -5.331e-03 | 5 | -1.402e-04 | 1 | -8.765e-04 | 3 |
| 1839 | N982A | max | .019 | 3 | .003 | 2 | .004 | 2 | -5.14e-06 | 2 | 0 | 1 | -3.378e-05 | 4 |
| 1840 | | min | -.018 | 4 | -.029 | 5 | -.011 | 1 | -3.789e-03 | 5 | 0 | 1 | -3.052e-03 | 7 |
| 1841 | N983A | max | .019 | 3 | .002 | 2 | .003 | 2 | 3.141e-04 | 2 | 0 | 1 | 3.308e-04 | 4 |
| 1842 | | min | -.018 | 4 | -.034 | 5 | -.01 | 1 | -2.844e-03 | 5 | 0 | 1 | -2.303e-03 | 7 |
| 1843 | N984A | max | .018 | 3 | .001 | 2 | .003 | 2 | 4.103e-04 | 2 | 4.17e-04 | 4 | 1.351e-03 | 4 |
| 1844 | | min | -.018 | 4 | -.036 | 5 | -.01 | 1 | -2.464e-03 | 5 | -4.148e-04 | 3 | -1.373e-03 | 3 |
| 1845 | N985A | max | .019 | 3 | .003 | 2 | .004 | 2 | 3.183e-05 | 2 | 0 | 1 | 5.297e-04 | 4 |
| 1846 | | min | -.019 | 4 | -.036 | 5 | -.011 | 1 | -3.602e-03 | 5 | 0 | 1 | -1.99e-03 | 7 |
| 1847 | N986A | max | .019 | 3 | .002 | 2 | .003 | 2 | 2.759e-04 | 2 | 0 | 1 | 7.508e-04 | 4 |
| 1848 | | min | -.019 | 4 | -.039 | 5 | -.01 | 1 | -2.912e-03 | 5 | 0 | 1 | -1.675e-03 | 3 |
| 1849 | N987 | max | .019 | 3 | .002 | 2 | .003 | 2 | 4.183e-04 | 2 | 3.485e-04 | 4 | 1.354e-03 | 4 |
| 1850 | | min | -.019 | 4 | -.04 | 5 | -.01 | 1 | -2.485e-03 | 5 | -3.461e-04 | 3 | -1.377e-03 | 3 |
| 1851 | N989 | max | .019 | 3 | .003 | 2 | .004 | 2 | 1.266e-04 | 2 | 0 | 1 | 9.858e-04 | 4 |
| 1852 | | min | -.019 | 4 | -.043 | 5 | -.011 | 1 | -3.342e-03 | 5 | 0 | 1 | -1.567e-03 | 3 |
| 1853 | N990 | max | .019 | 3 | .003 | 2 | .003 | 2 | 3.359e-04 | 2 | 0 | 1 | 1.082e-03 | 4 |
| 1854 | | min | -.019 | 4 | -.044 | 5 | -.01 | 1 | -2.775e-03 | 5 | 0 | 1 | -1.515e-03 | 3 |
| 1855 | N991 | max | .019 | 3 | .003 | 2 | .003 | 2 | 4.242e-04 | 2 | 3.028e-04 | 4 | 1.347e-03 | 4 |
| 1856 | | min | -.019 | 4 | -.045 | 5 | -.01 | 1 | -2.499e-03 | 5 | -3.003e-04 | 3 | -1.371e-03 | 3 |
| 1857 | N993A | max | .02 | 3 | .004 | 2 | .004 | 2 | 1.396e-04 | 2 | 0 | 1 | 1.459e-03 | 4 |
| 1858 | | min | -.02 | 4 | -.049 | 5 | -.011 | 1 | -3.289e-03 | 5 | 0 | 1 | -1.307e-03 | 3 |
| 1859 | N994 | max | .02 | 3 | .003 | 2 | .003 | 2 | 3.666e-04 | 2 | 0 | 1 | 1.305e-03 | 4 |
| 1860 | | min | -.02 | 4 | -.049 | 5 | -.01 | 1 | -2.728e-03 | 5 | 0 | 1 | -1.372e-03 | 3 |
| 1861 | N995A | max | .02 | 3 | .003 | 2 | .003 | 2 | 4.284e-04 | 2 | 2.78e-04 | 4 | 1.341e-03 | 4 |
| 1862 | | min | -.02 | 4 | -.05 | 5 | -.01 | 1 | -2.507e-03 | 5 | -2.756e-04 | 3 | -1.366e-03 | 3 |

## Envelope Joint Displacements (Continued)

| | Joint | | X [in] | LC | Y [in] | LC | Z [in] | LC | X Rotation [... | LC | Y Rotation [... | LC | Z Rotation [... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1863 | N997A | max | .02 | 3 | .004 | 2 | .004 | 2 | -8.347e-05 | 2 | 3.258e-04 | 2 | 1.877e-03 | 4 |
| 1864 | | min | -.02 | 4 | -.056 | 5 | -.011 | 1 | -3.787e-03 | 5 | -1.472e-04 | 1 | -1.08e-03 | 3 |
| 1865 | N998A | max | .02 | 3 | .004 | 2 | .003 | 2 | 1.889e-04 | 2 | 2.939e-04 | 4 | 1.615e-03 | 4 |
| 1866 | | min | -.02 | 4 | -.055 | 5 | -.01 | 1 | -3.114e-03 | 5 | -1.458e-04 | 3 | -1.213e-03 | 3 |
| 1867 | N999A | max | .02 | 3 | .004 | 2 | .003 | 2 | 4.313e-04 | 2 | 2.699e-04 | 4 | 1.34e-03 | 4 |
| 1868 | | min | -.02 | 4 | -.054 | 5 | -.01 | 1 | -2.509e-03 | 5 | -2.674e-04 | 3 | -1.366e-03 | 3 |
| 1869 | N1000A | max | .021 | 3 | .114 | 7 | .015 | 2 | -3.523e-03 | 3 | 0 | 1 | 5.821e-03 | 8 |
| 1870 | | min | -.015 | 4 | .019 | 4 | -.012 | 1 | -1.288e-02 | 8 | 0 | 1 | -7.096e-06 | 3 |
| 1871 | N1001A | max | .021 | 3 | .12 | 7 | .015 | 2 | -3.31e-03 | 3 | 0 | 1 | 6.233e-03 | 8 |
| 1872 | | min | -.015 | 4 | .022 | 4 | -.012 | 1 | -1.235e-02 | 8 | 0 | 1 | 1.277e-04 | 3 |
| 1873 | N1002A | max | .021 | 3 | .125 | 7 | .015 | 2 | -2.999e-03 | 3 | 0 | 1 | 6.679e-03 | 8 |
| 1874 | | min | -.015 | 4 | .024 | 4 | -.012 | 1 | -1.154e-02 | 8 | 0 | 1 | 2.767e-04 | 3 |
| 1875 | N1003 | max | .021 | 3 | .098 | 7 | .015 | 2 | -3.52e-03 | 3 | 0 | 1 | 5.778e-03 | 8 |
| 1876 | | min | -.015 | 4 | .008 | 4 | -.012 | 1 | -1.278e-02 | 8 | 0 | 1 | -5.083e-05 | 3 |
| 1877 | N1004 | max | .021 | 3 | .103 | 7 | .015 | 2 | -3.354e-03 | 3 | 0 | 1 | 6.023e-03 | 8 |
| 1878 | | min | -.015 | 4 | .01 | 4 | -.012 | 1 | -1.239e-02 | 8 | 0 | 1 | 2.457e-05 | 3 |
| 1879 | N1005 | max | .021 | 3 | .108 | 7 | .015 | 2 | -3.095e-03 | 3 | 0 | 1 | 6.28e-03 | 8 |
| 1880 | | min | -.015 | 4 | .013 | 4 | -.012 | 1 | -1.173e-02 | 8 | 0 | 1 | 1.053e-04 | 3 |
| 1881 | N1006 | max | .021 | 3 | .113 | 7 | .015 | 2 | -2.719e-03 | 3 | 0 | 1 | 6.533e-03 | 8 |
| 1882 | | min | -.015 | 4 | .015 | 4 | -.012 | 1 | -1.076e-02 | 8 | 0 | 1 | 1.86e-04 | 3 |
| 1883 | N1007 | max | .021 | 3 | .082 | 7 | .015 | 2 | -3.565e-03 | 3 | 0 | 1 | 5.967e-03 | 8 |
| 1884 | | min | -.015 | 4 | -.003 | 4 | -.012 | 1 | -1.283e-02 | 8 | 0 | 1 | -1.184e-05 | 3 |
| 1885 | N1008 | max | .021 | 3 | .087 | 7 | .015 | 2 | -3.474e-03 | 3 | 0 | 1 | 6.152e-03 | 8 |
| 1886 | | min | -.015 | 4 | -.001 | 4 | -.012 | 1 | -1.264e-02 | 8 | 0 | 1 | 4.283e-05 | 3 |
| 1887 | N1009 | max | .021 | 3 | .092 | 7 | .016 | 2 | -3.311e-03 | 3 | 0 | 1 | 6.283e-03 | 8 |
| 1888 | | min | -.015 | 4 | 0 | 4 | -.012 | 1 | -1.226e-02 | 8 | 0 | 1 | 7.945e-05 | 3 |
| 1889 | N1010 | max | .021 | 3 | .097 | 7 | .016 | 2 | -3.039e-03 | 3 | 0 | 1 | 6.451e-03 | 8 |
| 1890 | | min | -.015 | 4 | .003 | 4 | -.012 | 1 | -1.157e-02 | 8 | 0 | 1 | 1.311e-04 | 3 |
| 1891 | N1011 | max | .021 | 3 | .065 | 7 | .016 | 2 | -3.575e-03 | 3 | 0 | 1 | 6.221e-03 | 8 |
| 1892 | | min | -.016 | 4 | -.015 | 4 | -.012 | 1 | -1.278e-02 | 8 | 0 | 1 | 5.351e-05 | 3 |
| 1893 | N1012 | max | .021 | 3 | .07 | 7 | .016 | 2 | -3.554e-03 | 3 | 0 | 1 | 6.38e-03 | 8 |
| 1894 | | min | -.015 | 4 | -.013 | 4 | -.012 | 1 | -1.279e-02 | 8 | 0 | 1 | 1.018e-04 | 3 |
| 1895 | N1013 | max | .021 | 3 | .075 | 7 | .016 | 2 | -3.486e-03 | 3 | 0 | 1 | 6.562e-03 | 8 |
| 1896 | | min | -.015 | 4 | -.011 | 4 | -.012 | 1 | -1.266e-02 | 8 | 0 | 1 | 1.597e-04 | 3 |
| 1897 | N1014 | max | .021 | 3 | .08 | 7 | .016 | 2 | -3.371e-03 | 3 | 0 | 1 | 6.56e-03 | 8 |
| 1898 | | min | -.015 | 4 | -.01 | 4 | -.013 | 1 | -1.241e-02 | 8 | 0 | 1 | 1.524e-04 | 3 |
| 1899 | N1015 | max | .021 | 3 | .055 | 3 | .016 | 2 | -3.51e-03 | 3 | 3.208e-04 | 6 | 6.272e-03 | 8 |
| 1900 | | min | -.016 | 4 | -.027 | 4 | -.012 | 1 | -1.253e-02 | 8 | 2.284e-05 | 1 | 5.563e-05 | 3 |
| 1901 | N1016 | max | .021 | 3 | .057 | 3 | .016 | 2 | -3.488e-03 | 3 | 3.082e-04 | 6 | 6.448e-03 | 8 |
| 1902 | | min | -.016 | 4 | -.025 | 4 | -.012 | 1 | -1.253e-02 | 8 | 1.383e-05 | 1 | 1.101e-04 | 3 |
| 1903 | N1017 | max | .021 | 3 | .059 | 3 | .016 | 2 | -3.516e-03 | 3 | 2.788e-04 | 6 | 6.372e-03 | 8 |
| 1904 | | min | -.016 | 4 | -.024 | 4 | -.013 | 1 | -1.268e-02 | 8 | -1.188e-06 | 1 | 7.932e-05 | 3 |
| 1905 | N1018 | max | .021 | 3 | .132 | 7 | .015 | 2 | -1.997e-03 | 3 | 0 | 1 | 7.686e-03 | 8 |
| 1906 | | min | -.014 | 4 | .028 | 4 | -.012 | 1 | -8.874e-03 | 8 | 0 | 1 | 6.206e-04 | 3 |
| 1907 | N1019 | max | .021 | 3 | .134 | 7 | .015 | 2 | -1.357e-03 | 3 | 0 | 1 | 8.347e-03 | 8 |
| 1908 | | min | -.014 | 4 | .028 | 4 | -.012 | 1 | -7.142e-03 | 8 | 0 | 1 | 8.485e-04 | 3 |
| 1909 | N1020 | max | .021 | 3 | .116 | 7 | .016 | 2 | -2.233e-03 | 3 | 0 | 1 | 6.873e-03 | 8 |
| 1910 | | min | -.015 | 4 | .016 | 4 | -.012 | 1 | -9.473e-03 | 8 | 0 | 1 | 3.022e-04 | 3 |
| 1911 | N1021 | max | .021 | 3 | .118 | 7 | .016 | 2 | -1.557e-03 | 3 | 0 | 1 | 7.195e-03 | 8 |
| 1912 | | min | -.014 | 4 | .017 | 4 | -.012 | 1 | -7.674e-03 | 8 | 0 | 1 | 4.083e-04 | 3 |
| 1913 | N1022 | max | .021 | 3 | .101 | 7 | .016 | 2 | -2.604e-03 | 3 | 0 | 1 | 6.613e-03 | 8 |
| 1914 | | min | -.015 | 4 | .004 | 4 | -.012 | 1 | -1.044e-02 | 8 | 0 | 1 | 1.832e-04 | 3 |

## *Envelope Joint Displacements (Continued)*

| | Joint | | X [in] | LC | Y [in] | LC | Z [in] | LC | X Rotation [... | LC | Y Rotation [... | LC | Z Rotation [... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1915 | N1023 | max | .021 | 3 | .103 | 7 | .016 | 2 | -2.069e-03 | 3 | 0 | 1 | 7.179e-03 | 8 |
| 1916 | | min | -.015 | 4 | .005 | 4 | -.013 | 1 | -9.033e-03 | 8 | 0 | 1 | 3.817e-04 | 3 |
| 1917 | N1024 | max | .021 | 3 | .084 | 7 | .016 | 2 | -3.051e-03 | 3 | 0 | 1 | 6.786e-03 | 8 |
| 1918 | | min | -.015 | 4 | -.008 | 4 | -.013 | 1 | -1.16e-02 | 8 | 0 | 1 | 2.348e-04 | 3 |
| 1919 | N1025 | max | .021 | 3 | .087 | 7 | .016 | 2 | -2.44e-03 | 3 | 0 | 1 | 7.016e-03 | 8 |
| 1920 | | min | -.015 | 4 | -.007 | 4 | -.013 | 1 | -1.001e-02 | 8 | 0 | 1 | 3.23e-04 | 3 |
| 1921 | N1026 | max | .021 | 3 | .067 | 7 | .017 | 2 | -3.485e-03 | 3 | 2.203e-04 | 4 | 5.904e-03 | 8 |
| 1922 | | min | -.015 | 4 | -.02 | 4 | -.013 | 1 | -1.271e-02 | 8 | -4.194e-05 | 3 | -9.279e-05 | 3 |
| 1923 | N1027 | max | .021 | 3 | .071 | 7 | .017 | 2 | -2.618e-03 | 3 | 2.573e-04 | 6 | 6.262e-03 | 8 |
| 1924 | | min | -.015 | 4 | -.019 | 4 | -.013 | 1 | -1.045e-02 | 8 | -4.255e-05 | 3 | 3.749e-05 | 3 |
| 1925 | N1028 | max | .007 | 3 | .005 | 3 | .016 | 2 | 2.445e-03 | 6 | 1.903e-04 | 4 | 9.88e-03 | 8 |
| 1926 | | min | -.011 | 4 | -.078 | 8 | -.015 | 1 | -4.539e-04 | 1 | -5.459e-04 | 3 | 1.917e-03 | 3 |
| 1927 | N1029 | max | .007 | 3 | .011 | 3 | .016 | 2 | 2.814e-03 | 6 | 0 | 1 | 7.666e-03 | 8 |
| 1928 | | min | -.011 | 4 | -.053 | 4 | -.014 | 1 | -5.49e-05 | 1 | 0 | 1 | 1.021e-03 | 3 |
| 1929 | N1030 | max | .02 | 3 | .003 | 2 | .01 | 2 | -2.616e-03 | 2 | 6.344e-04 | 2 | 3.008e-03 | 4 |
| 1930 | | min | -.02 | 4 | -.066 | 5 | -.012 | 1 | -1.002e-02 | 5 | -1.473e-04 | 1 | -8.381e-04 | 3 |
| 1931 | N1031 | max | .02 | 3 | .011 | 3 | .01 | 2 | -2.401e-03 | 2 | 0 | 1 | 2.698e-03 | 4 |
| 1932 | | min | -.019 | 4 | -.043 | 1 | -.012 | 1 | -9.568e-03 | 5 | 0 | 1 | -6.82e-04 | 3 |
| 1933 | N1032 | max | .02 | 3 | .011 | 2 | .01 | 2 | -2.252e-03 | 2 | 0 | 1 | 2.577e-03 | 4 |
| 1934 | | min | -.019 | 4 | -.041 | 1 | -.012 | 1 | -9.055e-03 | 5 | 0 | 1 | -8.013e-04 | 3 |
| 1935 | N1033 | max | .02 | 3 | .006 | 2 | .01 | 2 | -2.435e-03 | 2 | 0 | 1 | 2.982e-03 | 8 |
| 1936 | | min | -.019 | 4 | -.054 | 5 | -.012 | 1 | -9.63e-03 | 5 | 0 | 1 | -5.605e-04 | 3 |
| 1937 | N1034 | max | .02 | 3 | 0 | 2 | .01 | 2 | -2.58e-03 | 2 | 5.063e-04 | 4 | 3.942e-03 | 8 |
| 1938 | | min | -.02 | 4 | -.075 | 5 | -.012 | 1 | -9.472e-03 | 5 | -4.236e-04 | 3 | 9.313e-05 | 3 |
| 1939 | N1035 | max | .02 | 3 | .007 | 2 | .01 | 2 | -2.405e-03 | 2 | 0 | 1 | 2.884e-03 | 8 |
| 1940 | | min | -.019 | 4 | -.051 | 1 | -.012 | 1 | -9.329e-03 | 5 | 0 | 1 | -6.539e-04 | 3 |
| 1941 | N1036 | max | .02 | 3 | .017 | 3 | .01 | 2 | -2.496e-03 | 2 | 0 | 1 | 2.428e-03 | 4 |
| 1942 | | min | -.018 | 4 | -.031 | 4 | -.012 | 1 | -9.967e-03 | 5 | 0 | 1 | -8.543e-04 | 3 |
| 1943 | N1037 | max | .02 | 3 | .016 | 3 | .01 | 2 | -2.453e-03 | 2 | 0 | 1 | 2.629e-03 | 4 |
| 1944 | | min | -.018 | 4 | -.037 | 4 | -.012 | 1 | -9.666e-03 | 5 | 0 | 1 | -8.03e-04 | 3 |
| 1945 | N1038 | max | .02 | 3 | .012 | 3 | .011 | 2 | -2.486e-03 | 2 | 0 | 1 | 2.907e-03 | 8 |
| 1946 | | min | -.019 | 4 | -.046 | 4 | -.012 | 1 | -9.748e-03 | 5 | 0 | 1 | -6.352e-04 | 3 |
| 1947 | N1039 | max | .02 | 3 | .007 | 3 | .011 | 2 | -2.502e-03 | 2 | 3.875e-04 | 4 | 3.373e-03 | 8 |
| 1948 | | min | -.019 | 4 | -.056 | 5 | -.012 | 1 | -9.515e-03 | 5 | -1.427e-04 | 3 | -3.744e-04 | 3 |
| 1949 | N1040 | max | .007 | 3 | .005 | 3 | .016 | 2 | 2.775e-03 | 6 | 1.734e-04 | 4 | 1.07e-02 | 8 |
| 1950 | | min | -.011 | 4 | -.082 | 8 | -.015 | 1 | -3.429e-04 | 1 | -5.209e-04 | 3 | 2.192e-03 | 3 |
| 1951 | N1041 | max | .008 | 3 | .009 | 3 | .016 | 2 | 2.705e-03 | 6 | 0 | 1 | 8.592e-03 | 8 |
| 1952 | | min | -.011 | 4 | -.062 | 8 | -.015 | 1 | -1.776e-04 | 1 | 0 | 1 | 1.365e-03 | 3 |
| 1953 | N1042 | max | .007 | 3 | .008 | 3 | .016 | 2 | 2.699e-03 | 6 | 0 | 1 | 8.637e-03 | 8 |
| 1954 | | min | -.011 | 4 | -.064 | 8 | -.015 | 1 | -2.483e-04 | 1 | 0 | 1 | 1.41e-03 | 3 |
| 1955 | N1043 | max | .008 | 3 | .012 | 3 | .016 | 2 | 2.751e-03 | 6 | 0 | 1 | 7.674e-03 | 8 |
| 1956 | | min | -.011 | 4 | -.05 | 4 | -.014 | 1 | 3.265e-05 | 1 | 0 | 1 | 9.886e-04 | 3 |
| 1957 | N1044 | max | .006 | 3 | .005 | 3 | .016 | 2 | 2.303e-03 | 9 | 1.995e-04 | 4 | 9.087e-03 | 8 |
| 1958 | | min | -.011 | 4 | -.075 | 8 | -.015 | 1 | -5.5e-04 | 1 | -5.505e-04 | 3 | 1.655e-03 | 3 |
| 1959 | N1045 | max | .007 | 3 | .008 | 3 | .016 | 2 | 2.676e-03 | 6 | 0 | 1 | 7.916e-03 | 8 |
| 1960 | | min | -.011 | 4 | -.058 | 8 | -.014 | 1 | -2.348e-04 | 1 | 0 | 1 | 1.16e-03 | 3 |
| 1961 | N1046 | max | .007 | 3 | .011 | 3 | .016 | 2 | 2.964e-03 | 6 | 0 | 1 | 7.161e-03 | 8 |
| 1962 | | min | -.011 | 4 | -.048 | 4 | -.014 | 1 | 5.918e-05 | 1 | 0 | 1 | 8.367e-04 | 3 |
| 1963 | N1047 | max | .008 | 3 | .014 | 3 | .016 | 2 | 3.516e-03 | 6 | 0 | 1 | 7.284e-03 | 8 |
| 1964 | | min | -.011 | 4 | -.041 | 4 | -.014 | 1 | 3.68e-04 | 1 | 0 | 1 | 8.28e-04 | 3 |
| 1965 | N1048 | max | .021 | 3 | .073 | 7 | .017 | 2 | 5.909e-04 | 3 | 1.679e-04 | 4 | 1.054e-02 | 8 |
| 1966 | | min | -.014 | 4 | -.019 | 4 | -.014 | 1 | -2.015e-03 | 4 | -5.051e-04 | 3 | 1.673e-03 | 3 |

## *Envelope Joint Displacements (Continued)*

| | Joint | | X [in] | LC | Y [in] | LC | Z [in] | LC | X Rotation [... | LC | Y Rotation [... | LC | Z Rotation [... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1967 | N1049 | max | .02 | 3 | .133 | 7 | .016 | 2 | -4.291e-04 | 3 | 1.178e-04 | 4 | 8.745e-03 | 8 |
| 1968 | | min | -.014 | 4 | .028 | 4 | -.012 | 1 | -5.019e-03 | 8 | -3.846e-04 | 3 | 1.107e-03 | 3 |
| 1969 | N1050 | max | .021 | 3 | .118 | 7 | .016 | 2 | -3.989e-04 | 3 | 1.254e-04 | 4 | 8.559e-03 | 8 |
| 1970 | | min | -.014 | 4 | .016 | 4 | -.012 | 1 | -4.94e-03 | 8 | -3.562e-04 | 3 | 1.065e-03 | 3 |
| 1971 | N1051 | max | .021 | 3 | .103 | 7 | .016 | 2 | -5.086e-04 | 3 | 1.181e-04 | 4 | 8.812e-03 | 8 |
| 1972 | | min | -.014 | 4 | .004 | 4 | -.013 | 1 | -4.84e-03 | 8 | -2.726e-04 | 3 | 1.046e-03 | 3 |
| 1973 | N1052 | max | .021 | 3 | .088 | 7 | .017 | 2 | 7.508e-05 | 3 | 2.048e-04 | 2 | 9.622e-03 | 8 |
| 1974 | | min | -.014 | 4 | -.007 | 4 | -.013 | 1 | -3.172e-03 | 8 | -3.535e-04 | 1 | 1.36e-03 | 3 |
| 1975 | N1053 | max | .02 | 3 | .073 | 7 | .009 | 2 | -8.045e-05 | 12 | -1.6e-03 | 2 | -4.645e-05 | 12 |
| 1976 | | min | -.037 | 4 | -.02 | 4 | -.03 | 1 | -9.204e-04 | 5 | -4.594e-03 | 5 | -5.314e-04 | 5 |
| 1977 | N1054 | max | .017 | 3 | .118 | 7 | .012 | 2 | 4.48e-04 | 12 | 5.437e-05 | 2 | 2.586e-04 | 12 |
| 1978 | | min | -.039 | 4 | .016 | 4 | -.025 | 1 | -7.487e-05 | 1 | -4.763e-04 | 5 | -4.322e-05 | 1 |
| 1979 | N1055 | max | .017 | 3 | .103 | 7 | .012 | 2 | -2.072e-04 | 12 | -7.263e-04 | 2 | -1.196e-04 | 12 |
| 1980 | | min | -.039 | 4 | .004 | 4 | -.026 | 1 | -1.269e-03 | 5 | -2.422e-03 | 5 | -7.328e-04 | 5 |
| 1981 | N1056 | max | .018 | 3 | .088 | 7 | .011 | 2 | -7.772e-05 | 12 | -7.498e-04 | 2 | -4.487e-05 | 12 |
| 1982 | | min | -.038 | 4 | -.008 | 4 | -.028 | 1 | -9.719e-04 | 5 | -2.456e-03 | 5 | -5.612e-04 | 5 |
| 1983 | N1057 | max | .015 | 3 | .073 | 7 | .017 | 2 | 8.754e-04 | 6 | 4.639e-03 | 8 | 5.054e-04 | 6 |
| 1984 | | min | -.042 | 4 | -.019 | 4 | -.022 | 1 | 1.294e-04 | 1 | 1.415e-03 | 3 | 7.471e-05 | 1 |
| 1985 | N1058 | max | .017 | 3 | .118 | 7 | .012 | 2 | 1.292e-04 | 12 | 5.504e-04 | 8 | 7.46e-05 | 12 |
| 1986 | | min | -.038 | 4 | .016 | 4 | -.025 | 1 | -4.192e-04 | 5 | -1.387e-04 | 3 | -2.42e-04 | 5 |
| 1987 | N1059 | max | .017 | 3 | .103 | 7 | .013 | 2 | 1.188e-03 | 6 | 2.483e-03 | 8 | 6.86e-04 | 6 |
| 1988 | | min | -.039 | 4 | .004 | 4 | -.025 | 1 | 2.809e-04 | 1 | 6.034e-04 | 3 | 1.622e-04 | 1 |
| 1989 | N1060 | max | .016 | 3 | .088 | 7 | .015 | 2 | 8.867e-04 | 6 | 2.524e-03 | 8 | 5.119e-04 | 6 |
| 1990 | | min | -.04 | 4 | -.007 | 4 | -.024 | 1 | 2.169e-04 | 1 | 6.259e-04 | 3 | 1.253e-04 | 1 |
| 1991 | N1061 | max | .036 | 7 | .073 | 7 | .036 | 6 | 4.601e-05 | 12 | 5.033e-03 | 8 | 2.656e-05 | 12 |
| 1992 | | min | .007 | 4 | -.02 | 4 | .004 | 3 | -7.118e-04 | 5 | 1.617e-03 | 3 | -4.11e-04 | 5 |
| 1993 | N1062 | max | .042 | 7 | .133 | 7 | .025 | 6 | 3.864e-04 | 12 | 9.197e-05 | 4 | 2.231e-04 | 12 |
| 1994 | | min | .01 | 4 | .028 | 4 | 0 | 1 | -6.012e-05 | 1 | -2.067e-04 | 3 | -3.471e-05 | 1 |
| 1995 | N1063 | max | .042 | 7 | .118 | 7 | .025 | 6 | 3.493e-04 | 12 | 4.59e-04 | 8 | 2.017e-04 | 12 |
| 1996 | | min | .01 | 4 | .016 | 4 | 0 | 1 | -8.715e-05 | 1 | 3.672e-06 | 3 | -5.032e-05 | 1 |
| 1997 | N1064 | max | .041 | 7 | .103 | 7 | .027 | 6 | -2.586e-04 | 12 | 2.438e-03 | 8 | -1.493e-04 | 12 |
| 1998 | | min | .01 | 4 | .004 | 4 | 0 | 3 | -1.347e-03 | 5 | 6.498e-04 | 3 | -7.779e-04 | 5 |
| 1999 | N1065 | max | .039 | 7 | .088 | 7 | .031 | 6 | -8.782e-05 | 12 | 2.735e-03 | 8 | -5.07e-05 | 12 |
| 2000 | | min | .008 | 4 | -.008 | 4 | .002 | 3 | -9.748e-04 | 5 | 8.567e-04 | 3 | -5.628e-04 | 5 |
| 2001 | N1066 | max | .048 | 7 | .073 | 7 | .016 | 2 | 6.599e-04 | 6 | -1.754e-03 | 2 | 3.81e-04 | 6 |
| 2002 | | min | .013 | 4 | -.019 | 4 | -.005 | 1 | 1.327e-04 | 1 | -5.034e-03 | 5 | 7.66e-05 | 1 |
| 2003 | N1067 | max | .042 | 7 | .133 | 7 | .026 | 6 | 2.006e-04 | 12 | 1.631e-04 | 2 | 1.158e-04 | 12 |
| 2004 | | min | .01 | 4 | .028 | 4 | 0 | 1 | -3.172e-04 | 5 | -1.034e-04 | 1 | -1.831e-04 | 5 |
| 2005 | N1068 | max | .042 | 7 | .118 | 7 | .026 | 6 | 2.321e-04 | 12 | -4.079e-05 | 2 | 1.34e-04 | 12 |
| 2006 | | min | .01 | 4 | .016 | 4 | 0 | 1 | -2.635e-04 | 1 | -5.007e-04 | 5 | -1.522e-04 | 1 |
| 2007 | N1069 | max | .043 | 7 | .103 | 7 | .024 | 6 | 1.293e-03 | 6 | -7.421e-04 | 2 | 7.464e-04 | 6 |
| 2008 | | min | .01 | 4 | .004 | 4 | 0 | 1 | 4.145e-04 | 1 | -2.464e-03 | 5 | 2.393e-04 | 1 |
| 2009 | N1070 | max | .045 | 7 | .088 | 7 | .02 | 6 | 9.152e-04 | 6 | -9.484e-04 | 2 | 5.284e-04 | 6 |
| 2010 | | min | .011 | 4 | -.007 | 4 | -.003 | 1 | 1.868e-04 | 1 | -2.756e-03 | 5 | 1.079e-04 | 1 |
| 2011 | N1071 | max | .023 | 7 | .073 | 7 | .023 | 6 | -1.758e-03 | 3 | 4.095e-04 | 6 | 6.812e-03 | 8 |
| 2012 | | min | -.004 | 4 | -.02 | 4 | -.004 | 1 | -8.318e-03 | 8 | -4.049e-05 | 1 | 2.771e-04 | 3 |
| 2013 | N1072 | max | .027 | 7 | .133 | 7 | .018 | 2 | 1.615e-04 | 12 | 4.925e-04 | 6 | 9.323e-05 | 12 |
| 2014 | | min | -.002 | 4 | .028 | 4 | -.006 | 1 | -2.082e-04 | 1 | 4.186e-05 | 1 | -1.202e-04 | 1 |
| 2015 | N1073 | max | .026 | 7 | .118 | 7 | .018 | 2 | 2.953e-04 | 12 | 1.189e-04 | 4 | 1.705e-04 | 12 |
| 2016 | | min | -.002 | 4 | .016 | 4 | -.006 | 1 | -1.781e-04 | 1 | -1.44e-04 | 3 | -1.028e-04 | 1 |
| 2017 | N1074 | max | .027 | 7 | .103 | 7 | .018 | 2 | 2.898e-04 | 12 | 1.144e-04 | 4 | 1.674e-04 | 12 |
| 2018 | | min | -.002 | 4 | .004 | 4 | -.006 | 1 | -1.72e-04 | 1 | -1.423e-04 | 3 | -9.927e-05 | 1 |

## *Envelope Joint Displacements (Continued)*

| | Joint | | X [in] | LC | Y [in] | LC | Z [in] | LC | X Rotation [... | LC | Y Rotation [... | LC | Z Rotation [... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2019 | N1075 | max | .025 | 7 | .088 | 7 | .02 | 2 | -2.499e-04 | 12 | 4.006e-03 | 8 | -1.443e-04 | 12 |
| 2020 | | min | -.003 | 4 | -.008 | 4 | -.005 | 1 | -1.359e-03 | 5 | 1.172e-03 | 3 | -7.848e-04 | 5 |
| 2021 | N1076 | max | .031 | 7 | .073 | 7 | .016 | 2 | 5.987e-04 | 3 | 1.664e-04 | 4 | 1.055e-02 | 8 |
| 2022 | | min | 0 | 4 | -.019 | 4 | -.01 | 1 | -2.005e-03 | 4 | -5.082e-04 | 3 | 1.678e-03 | 3 |
| 2023 | N1077 | max | .026 | 7 | .133 | 7 | .018 | 2 | 4.113e-04 | 12 | 6.555e-06 | 4 | 2.375e-04 | 12 |
| 2024 | | min | -.002 | 4 | .028 | 4 | -.006 | 1 | -1.47e-04 | 1 | -5.326e-04 | 7 | -8.488e-05 | 1 |
| 2025 | N1078 | max | .026 | 7 | .118 | 7 | .018 | 2 | 2.953e-04 | 12 | 1.189e-04 | 4 | 1.705e-04 | 12 |
| 2026 | | min | -.002 | 4 | .016 | 4 | -.006 | 1 | -1.781e-04 | 1 | -1.44e-04 | 3 | -1.028e-04 | 1 |
| 2027 | N1079 | max | .026 | 7 | .103 | 7 | .018 | 2 | 2.898e-04 | 12 | 1.144e-04 | 4 | 1.674e-04 | 12 |
| 2028 | | min | -.002 | 4 | .004 | 4 | -.006 | 1 | -1.72e-04 | 1 | -1.423e-04 | 3 | -9.927e-05 | 1 |
| 2029 | N1080 | max | .028 | 7 | .088 | 7 | .017 | 2 | 1.31e-03 | 6 | -1.268e-03 | 2 | 7.562e-04 | 6 |
| 2030 | | min | -.001 | 4 | -.007 | 4 | -.008 | 1 | 3.876e-04 | 1 | -4.003e-03 | 5 | 2.238e-04 | 1 |
| 2031 | N1081 | max | .021 | 3 | .073 | 7 | .013 | 2 | -1.758e-03 | 3 | 4.095e-04 | 6 | 6.812e-03 | 8 |
| 2032 | | min | -.025 | 4 | -.02 | 4 | -.022 | 1 | -8.318e-03 | 8 | -4.049e-05 | 1 | 2.771e-04 | 3 |
| 2033 | N1082 | max | .019 | 3 | .133 | 7 | .014 | 2 | 4.997e-04 | 12 | 3.205e-04 | 2 | 2.885e-04 | 12 |
| 2034 | | min | -.026 | 4 | .028 | 4 | -.019 | 1 | -2.018e-06 | 1 | -6.861e-05 | 1 | -1.165e-06 | 1 |
| 2035 | N1083 | max | .019 | 3 | .118 | 7 | .014 | 2 | 3.945e-04 | 12 | 2.207e-04 | 2 | 2.277e-04 | 12 |
| 2036 | | min | -.027 | 4 | .016 | 4 | -.019 | 1 | -1.556e-04 | 1 | -2.049e-04 | 1 | -8.982e-05 | 1 |
| 2037 | N1084 | max | .019 | 3 | .103 | 7 | .014 | 2 | 2.892e-04 | 12 | 2.591e-04 | 4 | 1.67e-04 | 12 |
| 2038 | | min | -.027 | 4 | .004 | 4 | -.019 | 1 | -1.926e-04 | 1 | -2.132e-04 | 3 | -1.112e-04 | 1 |
| 2039 | N1085 | max | .02 | 3 | .088 | 7 | .014 | 2 | -2.794e-04 | 12 | -1.223e-03 | 2 | -1.613e-04 | 12 |
| 2040 | | min | -.026 | 4 | -.008 | 4 | -.021 | 1 | -1.423e-03 | 5 | -3.623e-03 | 5 | -8.217e-04 | 5 |
| 2041 | N1086 | max | .018 | 3 | .073 | 7 | .017 | 2 | 5.987e-04 | 3 | 1.664e-04 | 4 | 1.055e-02 | 8 |
| 2042 | | min | -.028 | 4 | -.019 | 4 | -.017 | 1 | -2.005e-03 | 4 | -5.082e-04 | 3 | 1.678e-03 | 3 |
| 2043 | N1087 | max | .018 | 3 | .133 | 7 | .014 | 2 | 6.949e-05 | 12 | 1.779e-04 | 4 | 4.012e-05 | 12 |
| 2044 | | min | -.026 | 4 | .028 | 4 | -.019 | 1 | -5.675e-04 | 5 | -4.343e-04 | 3 | -3.277e-04 | 5 |
| 2045 | N1088 | max | .019 | 3 | .118 | 7 | .014 | 2 | 1.802e-04 | 12 | 3.223e-04 | 4 | 1.04e-04 | 12 |
| 2046 | | min | -.026 | 4 | .016 | 4 | -.019 | 1 | -2.833e-04 | 5 | -3.337e-04 | 3 | -1.636e-04 | 5 |
| 2047 | N1089 | max | .019 | 3 | .103 | 7 | .015 | 2 | 2.892e-04 | 12 | 2.591e-04 | 4 | 1.67e-04 | 12 |
| 2048 | | min | -.026 | 4 | .004 | 4 | -.019 | 1 | -1.926e-04 | 1 | -2.132e-04 | 3 | -1.112e-04 | 1 |
| 2049 | N1090 | max | .018 | 3 | .088 | 7 | .016 | 2 | 1.354e-03 | 6 | 3.64e-03 | 8 | 7.815e-04 | 6 |
| 2050 | | min | -.027 | 4 | -.007 | 4 | -.018 | 1 | 3.706e-04 | 1 | 1.073e-03 | 3 | 2.14e-04 | 1 |
| 2051 | N1066A | max | -.003 | 3 | .005 | 1 | .031 | 2 | 9.057e-03 | 6 | 7.972e-04 | 6 | 2.228e-03 | 6 |
| 2052 | | min | -.021 | 8 | -.108 | 9 | -.012 | 1 | 9.461e-04 | 1 | 6.181e-05 | 1 | 2.328e-04 | 1 |
| 2053 | N1067A | max | .025 | 10 | 0 | 1 | .027 | 10 | 9.196e-03 | 10 | -2.181e-04 | 4 | -2.827e-04 | 1 |
| 2054 | | min | .002 | 4 | -.108 | 10 | -.006 | 1 | 1.149e-03 | 1 | -8.448e-04 | 10 | -2.262e-03 | 10 |
| 2055 | N1068A | max | -.003 | 3 | .02 | 1 | .029 | 2 | 9.114e-03 | 6 | 2.842e-04 | 9 | 2.242e-03 | 6 |
| 2056 | | min | -.02 | 8 | -.09 | 9 | -.014 | 1 | 7.943e-04 | 1 | -1.778e-04 | 10 | 1.954e-04 | 1 |
| 2057 | N1069A | max | -.003 | 3 | .037 | 1 | .031 | 2 | 1.071e-02 | 6 | 1.188e-04 | 9 | 2.634e-03 | 6 |
| 2058 | | min | -.02 | 8 | -.071 | 9 | -.015 | 1 | 1.02e-03 | 1 | -5.514e-04 | 10 | 2.509e-04 | 1 |
| 2059 | N1070A | max | -.003 | 3 | .054 | 1 | .033 | 2 | 1.262e-02 | 6 | 1.417e-04 | 9 | 3.104e-03 | 6 |
| 2060 | | min | -.02 | 8 | -.052 | 9 | -.016 | 1 | 1.419e-03 | 1 | -4.116e-04 | 10 | 3.492e-04 | 1 |
| 2061 | N1071A | max | .023 | 10 | .052 | 1 | .032 | 2 | 1.265e-02 | 6 | 3.353e-04 | 2 | -3.629e-04 | 1 |
| 2062 | | min | .003 | 1 | -.035 | 9 | -.015 | 1 | 1.475e-03 | 1 | -2.263e-04 | 1 | -3.111e-03 | 6 |
| 2063 | N1072A | max | .024 | 10 | .035 | 1 | .028 | 2 | 1.07e-02 | 6 | 4.963e-04 | 2 | -2.763e-04 | 1 |
| 2064 | | min | .003 | 4 | -.042 | 2 | -.013 | 1 | 1.123e-03 | 1 | -2.811e-04 | 1 | -2.632e-03 | 6 |
| 2065 | N1073A | max | .024 | 10 | .017 | 1 | .025 | 2 | 9.044e-03 | 6 | 2.529e-04 | 2 | -2.398e-04 | 1 |
| 2066 | | min | .002 | 4 | -.069 | 10 | -.01 | 1 | 9.746e-04 | 1 | -3.957e-04 | 1 | -2.225e-03 | 6 |
| 2067 | N1074A | max | -.003 | 3 | .062 | 5 | .033 | 2 | 1.265e-02 | 6 | 4.66e-04 | 5 | 3.112e-03 | 6 |
| 2068 | | min | -.02 | 8 | -.042 | 9 | -.016 | 1 | 1.382e-03 | 1 | 1.236e-04 | 3 | 3.399e-04 | 1 |
| 2069 | N1075A | max | .025 | 10 | .005 | 1 | .025 | 10 | 9.501e-03 | 10 | -8.362e-05 | 2 | -2.959e-04 | 1 |
| 2070 | | min | .002 | 4 | -.098 | 10 | -.007 | 1 | 1.203e-03 | 1 | -8.654e-04 | 10 | -2.337e-03 | 10 |

## *Envelope Joint Displacements (Continued)*

| | Joint | | X [in] | LC | Y [in] | LC | Z [in] | LC | X Rotation [... | LC | Y Rotation [... | LC | Z Rotation [... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2071 | N1076A | max | .024 | 10 | .009 | 1 | .025 | 2 | 9.303e-03 | 10 | -5.053e-05 | 2 | -2.855e-04 | 1 |
| 2072 | | min | .002 | 4 | -.089 | 10 | -.008 | 1 | 1.16e-03 | 1 | -6.2e-04 | 10 | -2.289e-03 | 10 |
| 2073 | N1077A | max | .024 | 10 | .013 | 1 | .025 | 2 | 8.946e-03 | 10 | 1.629e-04 | 2 | -2.468e-04 | 1 |
| 2074 | | min | .002 | 4 | -.079 | 10 | -.009 | 1 | 1.003e-03 | 1 | -5.764e-04 | 1 | -2.201e-03 | 10 |
| 2075 | N1078A | max | .024 | 10 | .021 | 1 | .026 | 2 | 9.282e-03 | 6 | 3.696e-04 | 2 | -2.335e-04 | 1 |
| 2076 | | min | .002 | 4 | -.059 | 10 | -.011 | 1 | 9.491e-04 | 1 | -4.391e-04 | 1 | -2.283e-03 | 6 |
| 2077 | N1079A | max | .024 | 10 | .026 | 1 | .026 | 2 | 9.704e-03 | 6 | 4.165e-04 | 2 | -2.435e-04 | 1 |
| 2078 | | min | .002 | 4 | -.05 | 2 | -.012 | 1 | 9.897e-04 | 1 | -3.392e-04 | 1 | -2.387e-03 | 6 |
| 2079 | N1080A | max | .024 | 10 | .03 | 1 | .027 | 2 | 1.015e-02 | 6 | 4.764e-04 | 2 | -2.554e-04 | 1 |
| 2080 | | min | .002 | 4 | -.046 | 2 | -.012 | 1 | 1.038e-03 | 1 | -3.454e-04 | 1 | -2.498e-03 | 6 |
| 2081 | N1081A | max | .024 | 10 | .039 | 1 | .029 | 2 | 1.124e-02 | 6 | 5.167e-04 | 2 | -2.985e-04 | 1 |
| 2082 | | min | .003 | 4 | -.039 | 9 | -.013 | 1 | 1.213e-03 | 1 | -2.665e-04 | 1 | -2.765e-03 | 6 |
| 2083 | N1082A | max | .023 | 10 | .043 | 1 | .03 | 2 | 1.179e-02 | 6 | 4.981e-04 | 2 | -3.238e-04 | 1 |
| 2084 | | min | .003 | 1 | -.038 | 9 | -.014 | 1 | 1.316e-03 | 1 | -2.254e-04 | 1 | -2.902e-03 | 6 |
| 2085 | N1083A | max | .023 | 10 | .048 | 1 | .031 | 2 | 1.229e-02 | 6 | 4.554e-04 | 2 | -3.475e-04 | 1 |
| 2086 | | min | .003 | 1 | -.037 | 9 | -.014 | 1 | 1.413e-03 | 1 | -2.181e-04 | 1 | -3.024e-03 | 6 |
| 2087 | N1084A | max | .023 | 10 | .057 | 1 | .032 | 2 | 1.282e-02 | 6 | 1.427e-04 | 2 | -3.706e-04 | 1 |
| 2088 | | min | .002 | 1 | -.034 | 9 | -.015 | 1 | 1.506e-03 | 1 | -3.252e-04 | 10 | -3.154e-03 | 6 |
| 2089 | N1085A | max | .023 | 10 | .062 | 5 | .032 | 2 | 1.247e-02 | 6 | -6.515e-05 | 2 | -3.382e-04 | 1 |
| 2090 | | min | .002 | 1 | -.033 | 9 | -.016 | 1 | 1.375e-03 | 1 | -5.182e-04 | 5 | -3.067e-03 | 6 |
| 2091 | N1086A | max | .023 | 10 | .072 | 5 | .032 | 2 | 1.346e-02 | 6 | -2.871e-04 | 2 | -4.093e-04 | 1 |
| 2092 | | min | .002 | 1 | -.032 | 9 | -.016 | 1 | 1.664e-03 | 1 | -8.991e-04 | 5 | -3.313e-03 | 6 |
| 2093 | N1087A | max | -.003 | 3 | .05 | 1 | .033 | 2 | 1.226e-02 | 6 | 1.086e-04 | 9 | 3.016e-03 | 6 |
| 2094 | | min | -.02 | 8 | -.057 | 9 | -.016 | 1 | 1.346e-03 | 1 | -5.515e-04 | 10 | 3.311e-04 | 1 |
| 2095 | N1088A | max | -.003 | 3 | .045 | 1 | .032 | 2 | 1.178e-02 | 6 | 9.362e-05 | 9 | 2.898e-03 | 6 |
| 2096 | | min | -.02 | 8 | -.062 | 9 | -.016 | 1 | 1.241e-03 | 1 | -6.056e-04 | 10 | 3.052e-04 | 1 |
| 2097 | N1089A | max | -.003 | 3 | .041 | 1 | .031 | 2 | 1.125e-02 | 6 | 1.124e-04 | 9 | 2.767e-03 | 6 |
| 2098 | | min | -.02 | 8 | -.066 | 9 | -.016 | 1 | 1.129e-03 | 1 | -5.912e-04 | 10 | 2.779e-04 | 1 |
| 2099 | N1090A | max | -.003 | 3 | .024 | 1 | .029 | 2 | 9.375e-03 | 6 | 2.664e-04 | 9 | 2.307e-03 | 6 |
| 2100 | | min | -.02 | 8 | -.085 | 9 | -.014 | 1 | 8.118e-04 | 1 | -2.813e-04 | 10 | 1.997e-04 | 1 |
| 2101 | N1091 | max | -.003 | 3 | .029 | 1 | .03 | 2 | 9.733e-03 | 6 | 1.746e-04 | 9 | 2.395e-03 | 6 |
| 2102 | | min | -.02 | 8 | -.081 | 9 | -.015 | 1 | 8.457e-04 | 1 | -4.03e-04 | 10 | 2.081e-04 | 1 |
| 2103 | N1092 | max | -.003 | 3 | .033 | 1 | .03 | 2 | 1.02e-02 | 6 | 1.719e-04 | 1 | 2.51e-03 | 6 |
| 2104 | | min | -.02 | 8 | -.076 | 9 | -.015 | 1 | 9.307e-04 | 1 | -4.741e-04 | 10 | 2.29e-04 | 1 |
| 2105 | N1093 | max | -.003 | 3 | .056 | 1 | .033 | 2 | 1.273e-02 | 6 | 1.799e-04 | 9 | 3.131e-03 | 6 |
| 2106 | | min | -.02 | 8 | -.049 | 9 | -.016 | 1 | 1.439e-03 | 1 | -2.919e-04 | 10 | 3.539e-04 | 1 |
| 2107 | N1094 | max | -.003 | 3 | .058 | 1 | .033 | 2 | 1.276e-02 | 6 | 2.22e-04 | 9 | 3.139e-03 | 6 |
| 2108 | | min | -.02 | 8 | -.047 | 9 | -.016 | 1 | 1.436e-03 | 1 | -1.512e-04 | 10 | 3.532e-04 | 1 |
| 2109 | N1095 | max | -.003 | 3 | .06 | 1 | .033 | 2 | 1.274e-02 | 6 | 3.437e-04 | 5 | 3.134e-03 | 6 |
| 2110 | | min | -.02 | 8 | -.045 | 9 | -.016 | 1 | 1.418e-03 | 1 | 9.194e-06 | 10 | 3.49e-04 | 1 |
| 2111 | N1096 | max | -.003 | 3 | .067 | 5 | .033 | 2 | 1.271e-02 | 6 | 5.692e-04 | 5 | 3.127e-03 | 6 |
| 2112 | | min | -.019 | 8 | -.04 | 9 | -.016 | 1 | 1.39e-03 | 1 | 1.818e-04 | 3 | 3.42e-04 | 1 |
| 2113 | N1097 | max | -.003 | 3 | .072 | 5 | .033 | 2 | 1.36e-02 | 6 | 7.527e-04 | 8 | 3.345e-03 | 6 |
| 2114 | | min | -.019 | 8 | -.038 | 9 | -.017 | 1 | 1.672e-03 | 1 | 2.617e-04 | 3 | 4.113e-04 | 1 |
| 2115 | N1098 | max | -.003 | 3 | .012 | 1 | .03 | 2 | 9.217e-03 | 6 | 5.571e-04 | 8 | 2.268e-03 | 6 |
| 2116 | | min | -.02 | 8 | -.099 | 9 | -.013 | 1 | 9.595e-04 | 1 | 1.331e-04 | 3 | 2.36e-04 | 1 |
| 2117 | N1099 | max | -.003 | 3 | .009 | 1 | .03 | 2 | 9.272e-03 | 6 | 8.407e-04 | 5 | 2.281e-03 | 6 |
| 2118 | | min | -.021 | 8 | -.103 | 9 | -.012 | 1 | 9.274e-04 | 1 | 2.332e-04 | 2 | 2.282e-04 | 1 |
| 2119 | N1100 | max | -.003 | 3 | .016 | 1 | .029 | 2 | 9.008e-03 | 6 | 4.688e-04 | 9 | 2.216e-03 | 6 |
| 2120 | | min | -.02 | 8 | -.095 | 9 | -.014 | 1 | 8.225e-04 | 1 | 2.67e-05 | 2 | 2.023e-04 | 1 |
| 2121 | N1136 | max | .033 | 7 | .009 | 4 | .012 | 2 | -2.135e-04 | 4 | 7.779e-04 | 8 | -7.359e-04 | 4 |
| 2122 | | min | -.005 | 4 | -.093 | 10 | -.007 | 1 | -2.613e-03 | 7 | 2.301e-04 | 3 | -9.008e-03 | 7 |

## Envelope Joint Displacements (Continued)

| | Joint | | X [in] | LC | Y [in] | LC | Z [in] | LC | X Rotation [... | LC | Y Rotation [... | LC | Z Rotation [... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2123 | N1137 | max | .029 | 3 | -.004 | 2 | -.002 | 2 | -1.02e-03 | 4 | 6.749e-06 | 4 | -1.063e-03 | 4 |
| 2124 | | min | -.021 | 4 | -.085 | 5 | -.03 | 5 | -6.255e-03 | 7 | -8.162e-04 | 7 | -6.518e-03 | 7 |
| 2125 | N1138 | max | .031 | 3 | .023 | 4 | .012 | 2 | -1.661e-04 | 4 | 4.695e-04 | 4 | -5.726e-04 | 4 |
| 2126 | | min | -.01 | 4 | -.063 | 3 | -.006 | 1 | -2.631e-03 | 7 | -3.026e-04 | 3 | -9.067e-03 | 7 |
| 2127 | N1139 | max | .034 | 3 | .038 | 4 | .013 | 2 | -2.321e-04 | 4 | 2.898e-04 | 4 | -8.002e-04 | 4 |
| 2128 | | min | -.013 | 4 | -.045 | 3 | -.007 | 1 | -3.088e-03 | 7 | -4.949e-04 | 3 | -1.065e-02 | 7 |
| 2129 | N1140 | max | .037 | 3 | .052 | 4 | .013 | 2 | -3.654e-04 | 4 | 2.025e-04 | 4 | -1.26e-03 | 4 |
| 2130 | | min | -.015 | 4 | -.028 | 3 | -.007 | 1 | -3.634e-03 | 7 | -3.155e-04 | 3 | -1.253e-02 | 7 |
| 2131 | N1141 | max | .029 | 3 | .049 | 4 | 0 | 2 | -1.112e-03 | 4 | 3.008e-04 | 10 | -1.158e-03 | 4 |
| 2132 | | min | -.022 | 4 | -.025 | 3 | -.029 | 5 | -9.022e-03 | 7 | -3.936e-05 | 4 | -9.401e-03 | 7 |
| 2133 | N1142 | max | .028 | 3 | .03 | 4 | 0 | 2 | -9.509e-04 | 4 | 4.157e-04 | 10 | -9.909e-04 | 4 |
| 2134 | | min | -.022 | 4 | -.038 | 3 | -.028 | 5 | -7.613e-03 | 7 | -3.603e-05 | 4 | -7.933e-03 | 7 |
| 2135 | N1143 | max | .027 | 3 | .011 | 4 | 0 | 2 | -8.948e-04 | 4 | 6.982e-05 | 10 | -9.324e-04 | 4 |
| 2136 | | min | -.021 | 4 | -.051 | 3 | -.027 | 5 | -6.423e-03 | 7 | -1.048e-04 | 6 | -6.693e-03 | 7 |
| 2137 | N1144 | max | .038 | 3 | .062 | 8 | .013 | 2 | -3.663e-04 | 4 | 5.119e-04 | 10 | -1.263e-03 | 4 |
| 2138 | | min | -.016 | 4 | -.02 | 3 | -.007 | 1 | -3.641e-03 | 7 | 3.351e-05 | 3 | -1.255e-02 | 7 |
| 2139 | N1145 | max | .028 | 3 | -.001 | 2 | -.002 | 2 | -1.012e-03 | 4 | -2.831e-04 | 4 | -1.055e-03 | 4 |
| 2140 | | min | -.021 | 4 | -.075 | 5 | -.029 | 5 | -6.493e-03 | 7 | -8.081e-04 | 6 | -6.766e-03 | 7 |
| 2141 | N1146 | max | .027 | 3 | .002 | 4 | -.001 | 2 | -1.024e-03 | 4 | -6.036e-05 | 4 | -1.068e-03 | 4 |
| 2142 | | min | -.021 | 4 | -.066 | 5 | -.028 | 5 | -6.428e-03 | 7 | -5.185e-04 | 7 | -6.698e-03 | 7 |
| 2143 | N1147 | max | .027 | 3 | .006 | 4 | 0 | 2 | -9.002e-04 | 4 | -1.126e-04 | 10 | -9.38e-04 | 4 |
| 2144 | | min | -.021 | 4 | -.056 | 7 | -.028 | 5 | -6.295e-03 | 7 | -4.14e-04 | 6 | -6.559e-03 | 7 |
| 2145 | N1148 | max | .027 | 3 | .016 | 4 | 0 | 2 | -8.636e-04 | 4 | 1.684e-04 | 10 | -8.998e-04 | 4 |
| 2146 | | min | -.022 | 4 | -.048 | 3 | -.027 | 5 | -6.595e-03 | 7 | -1.3e-04 | 4 | -6.872e-03 | 7 |
| 2147 | N1149 | max | .027 | 3 | .02 | 4 | 0 | 2 | -8.886e-04 | 4 | 2.779e-04 | 10 | -9.259e-04 | 4 |
| 2148 | | min | -.022 | 4 | -.045 | 3 | -.027 | 5 | -6.897e-03 | 7 | -4.865e-05 | 4 | -7.187e-03 | 7 |
| 2149 | N1150 | max | .027 | 3 | .025 | 4 | 0 | 2 | -9.056e-04 | 4 | 3.476e-04 | 10 | -9.437e-04 | 4 |
| 2150 | | min | -.022 | 4 | -.041 | 3 | -.028 | 5 | -7.222e-03 | 7 | -8.024e-05 | 4 | -7.525e-03 | 7 |
| 2151 | N1151 | max | .028 | 3 | .035 | 4 | 0 | 2 | -9.94e-04 | 4 | 4.574e-04 | 10 | -1.036e-03 | 4 |
| 2152 | | min | -.022 | 4 | -.035 | 3 | -.028 | 5 | -8.003e-03 | 7 | -4.261e-05 | 4 | -8.339e-03 | 7 |
| 2153 | N1152 | max | .028 | 3 | .04 | 4 | 0 | 2 | -1.046e-03 | 4 | 4.702e-04 | 10 | -1.09e-03 | 4 |
| 2154 | | min | -.022 | 4 | -.032 | 3 | -.029 | 5 | -8.405e-03 | 7 | -1.794e-05 | 4 | -8.759e-03 | 7 |
| 2155 | N1153 | max | .029 | 3 | .044 | 4 | 0 | 2 | -1.091e-03 | 4 | 4.345e-04 | 10 | -1.137e-03 | 4 |
| 2156 | | min | -.022 | 4 | -.028 | 3 | -.029 | 5 | -8.766e-03 | 7 | -2.322e-05 | 4 | -9.134e-03 | 7 |
| 2157 | N1154 | max | .029 | 3 | .054 | 4 | 0 | 2 | -1.11e-03 | 4 | 5.83e-05 | 10 | -1.156e-03 | 4 |
| 2158 | | min | -.022 | 4 | -.022 | 3 | -.029 | 5 | -9.152e-03 | 7 | -2.153e-04 | 6 | -9.537e-03 | 7 |
| 2159 | N1155 | max | .029 | 3 | .062 | 8 | 0 | 2 | -9.984e-04 | 4 | -1.34e-04 | 4 | -1.04e-03 | 4 |
| 2160 | | min | -.022 | 4 | -.019 | 3 | -.029 | 5 | -8.903e-03 | 7 | -5.074e-04 | 6 | -9.277e-03 | 7 |
| 2161 | N1156 | max | .028 | 3 | .071 | 8 | 0 | 2 | -1.202e-03 | 4 | -2.488e-04 | 4 | -1.252e-03 | 4 |
| 2162 | | min | -.022 | 4 | -.016 | 3 | -.028 | 5 | -9.616e-03 | 7 | -8.999e-04 | 7 | -1.002e-02 | 7 |
| 2163 | N1157 | max | .037 | 3 | .049 | 4 | .013 | 2 | -3.386e-04 | 4 | 2.017e-04 | 4 | -1.167e-03 | 4 |
| 2164 | | min | -.014 | 4 | -.033 | 3 | -.007 | 1 | -3.532e-03 | 7 | -4.252e-04 | 3 | -1.217e-02 | 7 |
| 2165 | N1158 | max | .036 | 3 | .045 | 4 | .013 | 2 | -3.033e-04 | 4 | 2.073e-04 | 4 | -1.045e-03 | 4 |
| 2166 | | min | -.014 | 4 | -.037 | 3 | -.007 | 1 | -3.395e-03 | 7 | -4.727e-04 | 3 | -1.17e-02 | 7 |
| 2167 | N1159 | max | .035 | 3 | .041 | 4 | .013 | 2 | -2.67e-04 | 4 | 2.692e-04 | 4 | -9.204e-04 | 4 |
| 2168 | | min | -.013 | 4 | -.041 | 3 | -.007 | 1 | -3.242e-03 | 7 | -5.078e-04 | 3 | -1.118e-02 | 7 |
| 2169 | N1160 | max | .031 | 3 | .026 | 4 | .012 | 2 | -1.691e-04 | 4 | 5.316e-04 | 4 | -5.83e-04 | 4 |
| 2170 | | min | -.011 | 4 | -.059 | 3 | -.007 | 1 | -2.706e-03 | 7 | -4.497e-04 | 3 | -9.328e-03 | 7 |
| 2171 | N1161 | max | .032 | 3 | .03 | 4 | .013 | 2 | -1.793e-04 | 4 | 3.824e-04 | 4 | -6.179e-04 | 4 |
| 2172 | | min | -.011 | 4 | -.054 | 3 | -.007 | 1 | -2.809e-03 | 7 | -4.484e-04 | 3 | -9.682e-03 | 7 |
| 2173 | N1162 | max | .033 | 3 | .034 | 4 | .013 | 2 | -2.038e-04 | 4 | 3.889e-04 | 4 | -7.025e-04 | 4 |
| 2174 | | min | -.012 | 4 | -.05 | 3 | -.007 | 1 | -2.944e-03 | 7 | -5.073e-04 | 3 | -1.015e-02 | 7 |

## Envelope Joint Displacements (Continued)

| | Joint | | X [in] | LC | Y [in] | LC | Z [in] | LC | X Rotation [... | LC | Y Rotation [... | LC | Z Rotation [... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2175 | N1163 | max | .038 | 3 | .054 | 4 | .013 | 2 | -3.739e-04 | 4 | 2.382e-04 | 10 | -1.289e-03 | 4 |
| 2176 | | min | -.015 | 4 | -.026 | 3 | -.007 | 1 | -3.665e-03 | 7 | -2.413e-04 | 3 | -1.263e-02 | 7 |
| 2177 | N1164 | max | .038 | 3 | .056 | 4 | .013 | 2 | -3.763e-04 | 4 | 3.283e-04 | 10 | -1.297e-03 | 4 |
| 2178 | | min | -.015 | 4 | -.024 | 3 | -.008 | 1 | -3.674e-03 | 7 | -1.495e-04 | 3 | -1.266e-02 | 7 |
| 2179 | N1165 | max | .038 | 3 | .058 | 4 | .013 | 2 | -3.743e-04 | 4 | 4.322e-04 | 10 | -1.29e-03 | 4 |
| 2180 | | min | -.015 | 4 | -.022 | 3 | -.008 | 1 | -3.667e-03 | 7 | -4.966e-05 | 3 | -1.264e-02 | 7 |
| 2181 | N1166 | max | .038 | 3 | .066 | 8 | .013 | 2 | -3.696e-04 | 4 | 5.975e-04 | 8 | -1.274e-03 | 4 |
| 2182 | | min | -.016 | 4 | -.018 | 3 | -.007 | 1 | -3.658e-03 | 7 | 1.009e-04 | 3 | -1.261e-02 | 7 |
| 2183 | N1167 | max | .038 | 3 | .071 | 8 | .013 | 2 | -4.475e-04 | 4 | 7.796e-04 | 8 | -1.542e-03 | 4 |
| 2184 | | min | -.016 | 4 | -.016 | 3 | -.007 | 1 | -3.913e-03 | 7 | 2.028e-04 | 3 | -1.349e-02 | 7 |
| 2185 | N1168 | max | .03 | 7 | .016 | 4 | .012 | 2 | -2.178e-04 | 4 | 6.054e-04 | 10 | -7.508e-04 | 4 |
| 2186 | | min | -.007 | 4 | -.073 | 10 | -.007 | 1 | -2.659e-03 | 7 | 1.417e-05 | 3 | -9.165e-03 | 7 |
| 2187 | N1169 | max | .031 | 7 | .012 | 4 | .012 | 2 | -2.319e-04 | 4 | 8.981e-04 | 8 | -7.993e-04 | 4 |
| 2188 | | min | -.006 | 4 | -.083 | 10 | -.007 | 1 | -2.671e-03 | 7 | -9.209e-05 | 3 | -9.205e-03 | 7 |
| 2189 | N1170 | max | .03 | 3 | .019 | 4 | .012 | 2 | -1.809e-04 | 4 | 7.246e-04 | 4 | -6.236e-04 | 4 |
| 2190 | | min | -.009 | 4 | -.067 | 3 | -.007 | 1 | -2.599e-03 | 7 | -2.783e-04 | 3 | -8.957e-03 | 7 |
| 2191 | N1206 | max | .02 | 3 | -.003 | 2 | .002 | 2 | -1.245e-03 | 3 | 8.232e-04 | 8 | 6.63e-03 | 8 |
| 2192 | | min | -.029 | 4 | -.085 | 5 | -.031 | 5 | -6.363e-03 | 8 | -2.631e-05 | 3 | 1.298e-03 | 3 |
| 2193 | N1207 | max | .003 | 3 | .005 | 3 | .02 | 2 | -3.619e-04 | 3 | -1.141e-04 | 2 | 8.706e-03 | 8 |
| 2194 | | min | -.032 | 8 | -.086 | 8 | -.016 | 1 | -2.526e-03 | 8 | -7.916e-04 | 7 | 1.247e-03 | 3 |
| 2195 | N1208 | max | .021 | 3 | .012 | 3 | .005 | 2 | -1.129e-03 | 3 | 3.309e-04 | 2 | 6.674e-03 | 8 |
| 2196 | | min | -.026 | 4 | -.053 | 4 | -.028 | 5 | -6.405e-03 | 8 | -1.632e-04 | 1 | 1.176e-03 | 3 |
| 2197 | N1209 | max | .021 | 3 | .032 | 3 | .006 | 2 | -1.332e-03 | 3 | 9.926e-05 | 2 | 7.855e-03 | 8 |
| 2198 | | min | -.027 | 4 | -.04 | 4 | -.029 | 5 | -7.538e-03 | 8 | -3.033e-04 | 1 | 1.388e-03 | 3 |
| 2199 | N1210 | max | .021 | 3 | .052 | 3 | .007 | 2 | -1.642e-03 | 3 | 7.101e-05 | 2 | 9.275e-03 | 8 |
| 2200 | | min | -.028 | 4 | -.028 | 4 | -.03 | 5 | -8.901e-03 | 8 | -1.829e-04 | 1 | 1.71e-03 | 3 |
| 2201 | N1211 | max | .012 | 3 | .054 | 3 | .02 | 2 | -6.111e-04 | 3 | 3.219e-04 | 4 | 1.241e-02 | 8 |
| 2202 | | min | -.035 | 4 | -.029 | 4 | -.015 | 1 | -3.601e-03 | 8 | -2.126e-04 | 3 | 2.106e-03 | 3 |
| 2203 | N1212 | max | .011 | 3 | .037 | 3 | .021 | 2 | -4.361e-04 | 3 | 4.855e-04 | 4 | 1.053e-02 | 8 |
| 2204 | | min | -.032 | 4 | -.045 | 4 | -.015 | 1 | -3.054e-03 | 8 | -2.701e-04 | 3 | 1.503e-03 | 3 |
| 2205 | N1213 | max | .008 | 3 | .021 | 3 | .021 | 2 | -3.319e-04 | 3 | 3.198e-04 | 4 | 8.927e-03 | 8 |
| 2206 | | min | -.029 | 8 | -.061 | 4 | -.015 | 1 | -2.59e-03 | 8 | -4.621e-04 | 3 | 1.144e-03 | 3 |
| 2207 | N1214 | max | .021 | 3 | .062 | 7 | .007 | 2 | -1.599e-03 | 3 | 4.834e-04 | 6 | 9.3e-03 | 8 |
| 2208 | | min | -.028 | 4 | -.022 | 4 | -.03 | 5 | -8.925e-03 | 8 | 7.636e-05 | 1 | 1.666e-03 | 3 |
| 2209 | N1215 | max | .004 | 3 | .009 | 3 | .021 | 2 | -3.964e-04 | 3 | 4.46e-05 | 4 | 9.012e-03 | 8 |
| 2210 | | min | -.031 | 8 | -.077 | 8 | -.015 | 1 | -2.615e-03 | 8 | -8.665e-04 | 7 | 1.366e-03 | 3 |
| 2211 | N1216 | max | .005 | 3 | .013 | 3 | .021 | 2 | -3.735e-04 | 3 | 7.469e-05 | 4 | 8.939e-03 | 8 |
| 2212 | | min | -.03 | 8 | -.069 | 4 | -.015 | 1 | -2.593e-03 | 8 | -5.689e-04 | 3 | 1.287e-03 | 3 |
| 2213 | N1217 | max | .007 | 3 | .017 | 3 | .021 | 2 | -3.365e-04 | 3 | 2.444e-04 | 4 | 8.748e-03 | 8 |
| 2214 | | min | -.029 | 8 | -.065 | 4 | -.015 | 1 | -2.538e-03 | 8 | -6.573e-04 | 3 | 1.16e-03 | 3 |
| 2215 | N1218 | max | .009 | 3 | .025 | 3 | .021 | 2 | -3.381e-04 | 3 | 4.066e-04 | 4 | 9.155e-03 | 8 |
| 2216 | | min | -.029 | 4 | -.057 | 4 | -.015 | 1 | -2.656e-03 | 8 | -4.758e-04 | 3 | 1.165e-03 | 3 |
| 2217 | N1219 | max | .009 | 3 | .029 | 3 | .021 | 2 | -3.625e-04 | 3 | 4.389e-04 | 4 | 9.565e-03 | 8 |
| 2218 | | min | -.03 | 4 | -.053 | 4 | -.015 | 1 | -2.775e-03 | 8 | -3.613e-04 | 3 | 1.249e-03 | 3 |
| 2219 | N1220 | max | .01 | 3 | .033 | 3 | .021 | 2 | -3.939e-04 | 3 | 4.779e-04 | 4 | 9.999e-03 | 8 |
| 2220 | | min | -.031 | 4 | -.049 | 4 | -.015 | 1 | -2.901e-03 | 8 | -3.466e-04 | 3 | 1.358e-03 | 3 |
| 2221 | N1221 | max | .011 | 3 | .041 | 3 | .021 | 2 | -4.814e-04 | 3 | 4.934e-04 | 4 | 1.105e-02 | 8 |
| 2222 | | min | -.033 | 4 | -.041 | 4 | -.015 | 1 | -3.206e-03 | 8 | -2.43e-04 | 3 | 1.659e-03 | 3 |
| 2223 | N1222 | max | .011 | 3 | .045 | 3 | .02 | 2 | -5.303e-04 | 3 | 4.704e-04 | 4 | 1.159e-02 | 8 |
| 2224 | | min | -.034 | 4 | -.037 | 4 | -.015 | 1 | -3.363e-03 | 8 | -1.974e-04 | 3 | 1.828e-03 | 3 |
| 2225 | N1223 | max | .012 | 3 | .05 | 3 | .02 | 2 | -5.769e-04 | 3 | 4.29e-04 | 4 | 1.207e-02 | 8 |
| 2226 | | min | -.034 | 4 | -.033 | 4 | -.015 | 1 | -3.503e-03 | 8 | -1.913e-04 | 3 | 1.988e-03 | 3 |

## *Envelope Joint Displacements (Continued)*

| | Joint | | X [in] | LC | Y [in] | LC | Z [in] | LC | X Rotation [... | LC | Y Rotation [... | LC | Z Rotation [... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2227 | N1224 | max | .013 | 3 | .058 | 3 | .02 | 2 | -6.322e-04 | 3 | 1.562e-04 | 4 | 1.258e-02 | 8 |
| 2228 | | min | -.036 | 4 | -.026 | 4 | -.015 | 1 | -3.649e-03 | 8 | -2.928e-04 | 3 | 2.179e-03 | 3 |
| 2229 | N1225 | max | .013 | 3 | .062 | 7 | .02 | 2 | -5.974e-04 | 3 | -1.743e-05 | 4 | 1.223e-02 | 8 |
| 2230 | | min | -.036 | 4 | -.022 | 4 | -.015 | 1 | -3.547e-03 | 8 | -5.315e-04 | 7 | 2.059e-03 | 3 |
| 2231 | N1226 | max | .014 | 3 | .072 | 7 | .02 | 2 | -6.959e-04 | 3 | -2.184e-04 | 4 | 1.32e-02 | 8 |
| 2232 | | min | -.035 | 4 | -.019 | 4 | -.015 | 1 | -3.831e-03 | 8 | -9.158e-04 | 7 | 2.399e-03 | 3 |
| 2233 | N1227 | max | .021 | 3 | .047 | 3 | .006 | 2 | -1.588e-03 | 3 | 3.719e-05 | 2 | 9.008e-03 | 8 |
| 2234 | | min | -.028 | 4 | -.031 | 4 | -.03 | 5 | -8.645e-03 | 8 | -2.595e-04 | 1 | 1.655e-03 | 3 |
| 2235 | N1228 | max | .021 | 3 | .042 | 3 | .006 | 2 | -1.508e-03 | 3 | 2.939e-05 | 2 | 8.65e-03 | 8 |
| 2236 | | min | -.027 | 4 | -.034 | 4 | -.03 | 5 | -8.301e-03 | 8 | -3.217e-04 | 5 | 1.571e-03 | 3 |
| 2237 | N1229 | max | .021 | 3 | .037 | 3 | .006 | 2 | -1.42e-03 | 3 | 7.316e-05 | 2 | 8.254e-03 | 8 |
| 2238 | | min | -.027 | 4 | -.037 | 4 | -.029 | 5 | -7.921e-03 | 8 | -3.147e-04 | 5 | 1.479e-03 | 3 |
| 2239 | N1230 | max | .021 | 3 | .017 | 3 | .005 | 2 | -1.149e-03 | 3 | 3.321e-04 | 2 | 6.868e-03 | 8 |
| 2240 | | min | -.026 | 4 | -.049 | 4 | -.028 | 5 | -6.591e-03 | 8 | -2.499e-04 | 1 | 1.198e-03 | 3 |
| 2241 | N1231 | max | .021 | 3 | .022 | 3 | .006 | 2 | -1.185e-03 | 3 | 2.036e-04 | 2 | 7.133e-03 | 8 |
| 2242 | | min | -.026 | 4 | -.046 | 4 | -.028 | 5 | -6.845e-03 | 8 | -2.688e-04 | 1 | 1.234e-03 | 3 |
| 2243 | N1232 | max | .021 | 3 | .027 | 3 | .006 | 2 | -1.257e-03 | 3 | 1.832e-04 | 2 | 7.48e-03 | 8 |
| 2244 | | min | -.027 | 4 | -.043 | 4 | -.029 | 5 | -7.178e-03 | 8 | -3.01e-04 | 1 | 1.31e-03 | 3 |
| 2245 | N1233 | max | .021 | 3 | .055 | 3 | .007 | 2 | -1.653e-03 | 3 | 1.179e-04 | 2 | 9.356e-03 | 8 |
| 2246 | | min | -.028 | 4 | -.027 | 4 | -.03 | 5 | -8.978e-03 | 8 | -1.266e-04 | 1 | 1.723e-03 | 3 |
| 2247 | N1234 | max | .021 | 3 | .057 | 3 | .007 | 2 | -1.648e-03 | 3 | 1.973e-04 | 6 | 9.381e-03 | 8 |
| 2248 | | min | -.028 | 4 | -.025 | 4 | -.03 | 5 | -9.003e-03 | 8 | -5.906e-05 | 1 | 1.717e-03 | 3 |
| 2249 | N1235 | max | .021 | 3 | .059 | 3 | .007 | 2 | -1.631e-03 | 3 | 3.553e-04 | 6 | 9.365e-03 | 8 |
| 2250 | | min | -.028 | 4 | -.024 | 4 | -.03 | 5 | -8.987e-03 | 8 | 1.613e-05 | 1 | 1.699e-03 | 3 |
| 2251 | N1236 | max | .021 | 3 | .067 | 7 | .007 | 2 | -1.606e-03 | 3 | 5.905e-04 | 6 | 9.345e-03 | 8 |
| 2252 | | min | -.028 | 4 | -.021 | 4 | -.029 | 5 | -8.968e-03 | 8 | 1.27e-04 | 1 | 1.673e-03 | 3 |
| 2253 | N1237 | max | .021 | 3 | .072 | 7 | .007 | 2 | -1.83e-03 | 3 | 7.754e-04 | 6 | 1.e-02 | 8 |
| 2254 | | min | -.027 | 4 | -.019 | 4 | -.029 | 5 | -9.599e-03 | 8 | 2.057e-04 | 3 | 1.907e-03 | 3 |
| 2255 | N1238 | max | .021 | 3 | .003 | 2 | .004 | 2 | -1.251e-03 | 3 | 5.736e-04 | 8 | 6.75e-03 | 8 |
| 2256 | | min | -.027 | 4 | -.066 | 5 | -.029 | 5 | -6.478e-03 | 8 | 5.488e-05 | 3 | 1.303e-03 | 3 |
| 2257 | N1239 | max | .021 | 3 | 0 | 2 | .003 | 2 | -1.207e-03 | 3 | 8.658e-04 | 6 | 6.796e-03 | 8 |
| 2258 | | min | -.028 | 4 | -.075 | 5 | -.03 | 5 | -6.522e-03 | 8 | 4.909e-05 | 1 | 1.258e-03 | 3 |
| 2259 | N1240 | max | .021 | 3 | .007 | 3 | .004 | 2 | -1.137e-03 | 3 | 5.481e-04 | 2 | 6.598e-03 | 8 |
| 2260 | | min | -.027 | 4 | -.056 | 5 | -.029 | 5 | -6.332e-03 | 8 | -1.02e-04 | 1 | 1.185e-03 | 3 |
| 2261 | N1171 | max | .073 | 3 | -.164 | 2 | .032 | 3 | -5.221e-03 | 2 | 2.773e-03 | 4 | 5.785e-03 | 4 |
| 2262 | | min | -.073 | 4 | -.617 | 5 | -.031 | 4 | -2.026e-02 | 5 | -2.855e-03 | 3 | -4.926e-03 | 3 |
| 2263 | N1172 | max | .073 | 3 | -.168 | 2 | .03 | 4 | -5.575e-03 | 4 | 1.976e-03 | 4 | 5.177e-03 | 4 |
| 2264 | | min | -.073 | 4 | -.605 | 5 | -.029 | 3 | -1.814e-02 | 7 | -1.906e-03 | 3 | -4.482e-03 | 3 |
| 2265 | N1175 | max | .005 | 10 | -.17 | 1 | .078 | 2 | 1.172e-02 | 6 | 3.018e-03 | 2 | 1.708e-02 | 8 |
| 2266 | | min | -.004 | 4 | -.615 | 6 | -.079 | 1 | -1.858e-03 | 1 | -3.116e-03 | 1 | 4.549e-03 | 3 |
| 2267 | N1176 | max | .056 | 2 | -.157 | 3 | .045 | 2 | 1.012e-02 | 6 | 1.883e-03 | 2 | 1.562e-02 | 8 |
| 2268 | | min | -.056 | 1 | -.607 | 8 | -.046 | 1 | 4.42e-04 | 1 | -1.826e-03 | 1 | 3.2e-03 | 3 |
| 2269 | N1179 | max | .046 | 3 | -.13 | 4 | .021 | 2 | 1.106e-02 | 10 | 1.971e-03 | 3 | -9.579e-04 | 4 |
| 2270 | | min | -.047 | 4 | -.628 | 10 | -.021 | 1 | 8.123e-04 | 1 | -2.066e-03 | 4 | -1.864e-02 | 7 |
| 2271 | N1180 | max | .005 | 2 | -.167 | 4 | .041 | 2 | 1.191e-02 | 10 | 1.069e-03 | 1 | -3.95e-03 | 4 |
| 2272 | | min | -.006 | 1 | -.653 | 10 | -.041 | 1 | -5.229e-04 | 1 | -1.003e-03 | 4 | -1.699e-02 | 10 |
| 2273 | N1143B | max | .005 | 2 | .002 | 3 | .009 | 2 | 2.41e-03 | 9 | 2.146e-04 | 4 | 2.261e-03 | 4 |
| 2274 | | min | -.005 | 1 | -.054 | 8 | -.01 | 1 | -8.019e-04 | 1 | -2.143e-04 | 3 | -4.955e-04 | 3 |
| 2275 | N1144B | max | .001 | 1 | .002 | 4 | .003 | 2 | 1.909e-03 | 10 | 2.426e-04 | 4 | 5.469e-04 | 4 |
| 2276 | | min | -.002 | 2 | -.071 | 10 | -.003 | 1 | -6.196e-04 | 1 | -2.399e-04 | 3 | -2.701e-03 | 10 |
| 2277 | N1145B | max | .073 | 3 | -.167 | 2 | .011 | 2 | -5.577e-03 | 2 | 1.125e-02 | 3 | 5.543e-03 | 4 |
| 2278 | | min | -.073 | 4 | -.611 | 5 | -.012 | 1 | -1.841e-02 | 5 | -1.12e-02 | 4 | -4.676e-03 | 3 |

## Envelope Joint Displacements (Continued)

| | Joint | | X [in] | LC | Y [in] | LC | Z [in] | LC | X Rotation [... | LC | Y Rotation [... | LC | Z Rotation [... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2279 | N1174 | max | .017 | 3 | .008 | 2 | .001 | 6 | 4.304e-04 | 2 | 2.708e-04 | 4 | 1.34e-03 | 4 |
| 2280 | | min | -.017 | 4 | -.078 | 5 | 0 | 1 | -2.511e-03 | 5 | -2.683e-04 | 3 | -1.366e-03 | 3 |
| 2281 | N1172B | max | 0 | 7 | 0 | 10 | 0 | 2 | 0 | 9 | 0 | 2 | 0 | 8 |
| 2282 | | min | 0 | 4 | 0 | 8 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 3 |
| 2283 | N1173A | max | .006 | 2 | .005 | 3 | .01 | 2 | 2.41e-03 | 9 | 2.144e-04 | 4 | 2.262e-03 | 4 |
| 2284 | | min | -.005 | 1 | -.077 | 8 | -.011 | 1 | -8.015e-04 | 1 | -2.141e-04 | 3 | -4.948e-04 | 3 |
| 2285 | N1174A | max | 0 | 3 | 0 | 4 | 0 | 2 | 0 | 10 | 0 | 1 | 0 | 4 |
| 2286 | | min | 0 | 8 | 0 | 10 | 0 | 1 | 0 | 1 | 0 | 2 | 0 | 10 |
| 2287 | N1175A | max | .002 | 4 | .005 | 4 | .004 | 3 | 1.909e-03 | 10 | 2.424e-04 | 4 | 5.461e-04 | 4 |
| 2288 | | min | -.002 | 3 | -.101 | 10 | -.005 | 4 | -6.192e-04 | 1 | -2.397e-04 | 3 | -2.702e-03 | 10 |
| 2289 | N1172A | max | .017 | 3 | .001 | 2 | .002 | 2 | 4.103e-04 | 2 | 4.17e-04 | 4 | 1.351e-03 | 4 |
| 2290 | | min | -.017 | 4 | -.036 | 5 | -.007 | 1 | -2.464e-03 | 5 | -4.148e-04 | 3 | -1.373e-03 | 3 |
| 2291 | N1173 | max | .018 | 3 | .002 | 2 | .002 | 2 | 4.183e-04 | 2 | 3.485e-04 | 4 | 1.354e-03 | 4 |
| 2292 | | min | -.018 | 4 | -.041 | 5 | -.007 | 1 | -2.485e-03 | 5 | -3.461e-04 | 3 | -1.377e-03 | 3 |
| 2293 | N1174B | max | .018 | 3 | .003 | 2 | .002 | 2 | 4.242e-04 | 2 | 3.028e-04 | 4 | 1.347e-03 | 4 |
| 2294 | | min | -.018 | 4 | -.045 | 5 | -.008 | 1 | -2.499e-03 | 5 | -3.003e-04 | 3 | -1.371e-03 | 3 |
| 2295 | N1175B | max | .018 | 3 | .003 | 2 | .002 | 2 | 4.284e-04 | 2 | 2.78e-04 | 4 | 1.341e-03 | 4 |
| 2296 | | min | -.018 | 4 | -.05 | 5 | -.008 | 1 | -2.507e-03 | 5 | -2.756e-04 | 3 | -1.366e-03 | 3 |
| 2297 | N1176A | max | .019 | 3 | .004 | 2 | .002 | 2 | 4.313e-04 | 2 | 2.699e-04 | 4 | 1.34e-03 | 4 |
| 2298 | | min | -.019 | 4 | -.054 | 5 | -.008 | 1 | -2.509e-03 | 5 | -2.674e-04 | 3 | -1.366e-03 | 3 |
| 2299 | N1197 | max | .002 | 2 | 0 | 3 | .014 | 2 | 2.192e-03 | 9 | 2.739e-04 | 2 | 2.202e-03 | 4 |
| 2300 | | min | -.007 | 1 | -.036 | 8 | -.011 | 1 | -8.066e-04 | 1 | -2.711e-04 | 1 | -4.659e-04 | 3 |
| 2301 | N1198 | max | .002 | 2 | 0 | 3 | .014 | 2 | 2.25e-03 | 9 | 2.164e-04 | 2 | 2.225e-03 | 4 |
| 2302 | | min | -.007 | 1 | -.04 | 8 | -.011 | 1 | -8.085e-04 | 1 | -2.135e-04 | 1 | -4.75e-04 | 3 |
| 2303 | N1199 | max | .002 | 2 | 0 | 3 | .014 | 2 | 2.306e-03 | 9 | 2.051e-04 | 4 | 2.241e-03 | 4 |
| 2304 | | min | -.007 | 1 | -.045 | 8 | -.012 | 1 | -8.04e-04 | 1 | -2.049e-04 | 3 | -4.823e-04 | 3 |
| 2305 | N1200 | max | .002 | 2 | .001 | 3 | .014 | 2 | 2.36e-03 | 9 | 2.124e-04 | 4 | 2.253e-03 | 4 |
| 2306 | | min | -.007 | 1 | -.049 | 8 | -.012 | 1 | -8.013e-04 | 1 | -2.121e-04 | 3 | -4.89e-04 | 3 |
| 2307 | N1201 | max | .003 | 2 | .002 | 3 | .015 | 2 | 2.41e-03 | 9 | 2.146e-04 | 4 | 2.261e-03 | 4 |
| 2308 | | min | -.007 | 1 | -.054 | 8 | -.012 | 1 | -8.02e-04 | 1 | -2.143e-04 | 3 | -4.956e-04 | 3 |
| 2309 | N1222A | max | .008 | 10 | 0 | 4 | .009 | 2 | 1.83e-03 | 10 | 1.955e-04 | 4 | 5.099e-04 | 4 |
| 2310 | | min | -.002 | 4 | -.046 | 10 | -.006 | 1 | -6.048e-04 | 1 | -1.928e-04 | 3 | -2.677e-03 | 10 |
| 2311 | N1223A | max | .008 | 10 | 0 | 4 | .008 | 2 | 1.856e-03 | 10 | 2.181e-04 | 4 | 5.205e-04 | 4 |
| 2312 | | min | -.002 | 4 | -.052 | 10 | -.006 | 1 | -6.099e-04 | 1 | -2.154e-04 | 3 | -2.695e-03 | 10 |
| 2313 | N1224A | max | .008 | 10 | .001 | 4 | .008 | 2 | 1.878e-03 | 10 | 2.327e-04 | 4 | 5.296e-04 | 4 |
| 2314 | | min | -.002 | 4 | -.058 | 10 | -.006 | 1 | -6.11e-04 | 1 | -2.299e-04 | 3 | -2.703e-03 | 10 |
| 2315 | N1225A | max | .008 | 10 | .002 | 4 | .008 | 2 | 1.895e-03 | 10 | 2.403e-04 | 4 | 5.383e-04 | 4 |
| 2316 | | min | -.001 | 4 | -.064 | 10 | -.006 | 1 | -6.14e-04 | 1 | -2.376e-04 | 3 | -2.705e-03 | 10 |
| 2317 | N1226A | max | .008 | 10 | .002 | 4 | .008 | 2 | 1.909e-03 | 10 | 2.426e-04 | 4 | 5.469e-04 | 4 |
| 2318 | | min | -.001 | 4 | -.07 | 10 | -.005 | 1 | -6.197e-04 | 1 | -2.399e-04 | 3 | -2.701e-03 | 10 |
| 2319 | N1160A | max | .005 | 3 | -.192 | 4 | .045 | 2 | 1.192e-02 | 10 | 1.131e-03 | 1 | -3.93e-03 | 4 |
| 2320 | | min | -.005 | 4 | -.742 | 10 | -.046 | 1 | -6.109e-04 | 1 | -1.05e-03 | 2 | -1.716e-02 | 10 |
| 2321 | N1161A | max | .004 | 10 | -.02 | 1 | .015 | 2 | 1.074e-02 | 10 | 6.892e-04 | 3 | -3.645e-03 | 4 |
| 2322 | | min | -.005 | 4 | -.224 | 10 | -.014 | 1 | 3.968e-04 | 1 | -7.604e-04 | 4 | -1.277e-02 | 10 |
| 2323 | N1162A | max | .005 | 10 | -.012 | 1 | .021 | 2 | 1.098e-02 | 6 | 1.054e-03 | 2 | 1.241e-02 | 8 |
| 2324 | | min | -.004 | 1 | -.2 | 6 | -.02 | 1 | -2.529e-04 | 1 | -1.003e-03 | 1 | 4.039e-03 | 3 |
| 2325 | N1163A | max | .005 | 10 | -.229 | 1 | .115 | 2 | 1.23e-02 | 2 | 3.831e-03 | 2 | 1.774e-02 | 8 |
| 2326 | | min | -.004 | 4 | -.809 | 8 | -.117 | 1 | -2.981e-03 | 1 | -3.929e-03 | 1 | 4.205e-03 | 3 |
| 2327 | N1164A | max | -.045 | 3 | -.229 | 1 | 1.003 | 2 | 2.205e-02 | 2 | 3.831e-03 | 2 | 1.872e-02 | 8 |
| 2328 | | min | -.85 | 8 | -.809 | 8 | -.576 | 1 | -1.271e-02 | 1 | -3.929e-03 | 1 | -6.52e-05 | 3 |
| 2329 | N1165A | max | .661 | 8 | -.229 | 1 | -.123 | 1 | 1.12e-02 | 6 | 3.831e-03 | 2 | 1.733e-02 | 8 |
| 2330 | | min | .215 | 3 | -.809 | 8 | -.411 | 6 | 1.076e-03 | 1 | -3.929e-03 | 1 | 5.918e-03 | 3 |

## Envelope Joint Displacements (Continued)

| | Joint | | X [in] | LC | Y [in] | LC | Z [in] | LC | X Rotation [... | LC | Y Rotation [... | LC | Z Rotation [... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2331 | N1166A | max | .523 | 10 | -.192 | 4 | .357 | 10 | 1.185e-02 | 10 | 1.131e-03 | 1 | -2.038e-03 | 4 |
| 2332 | | min | .073 | 4 | -.743 | 10 | -.137 | 1 | -4.17e-03 | 1 | -1.05e-03 | 2 | -1.738e-02 | 10 |
| 2333 | N1167A | max | .387 | 10 | -.02 | 1 | .322 | 10 | 1.093e-02 | 2 | 6.892e-04 | 3 | -1.949e-03 | 4 |
| 2334 | | min | .07 | 4 | -.224 | 10 | -.07 | 1 | -2.979e-03 | 1 | -7.604e-04 | 4 | -1.277e-02 | 10 |
| 2335 | N1168A | max | -.082 | 3 | -.012 | 1 | .364 | 2 | 1.251e-02 | 2 | 1.054e-03 | 2 | 1.283e-02 | 8 |
| 2336 | | min | -.382 | 8 | -.201 | 6 | -.096 | 1 | -3.629e-03 | 1 | -1.003e-03 | 1 | 2.343e-03 | 3 |
| 2337 | N1169A | max | -.213 | 4 | -.192 | 4 | -.085 | 1 | 1.202e-02 | 10 | 1.131e-03 | 1 | -5.212e-03 | 4 |
| 2338 | | min | -.716 | 10 | -.742 | 10 | -.503 | 10 | 1.281e-03 | 1 | -1.05e-03 | 2 | -1.715e-02 | 10 |
| 2339 | N1170A | max | -.185 | 9 | -.02 | 1 | -.095 | 1 | 1.084e-02 | 10 | 6.892e-04 | 3 | -4.326e-03 | 1 |
| 2340 | | min | -.532 | 10 | -.224 | 10 | -.45 | 10 | 2.28e-03 | 1 | -7.604e-04 | 4 | -1.276e-02 | 10 |
| 2341 | N1171A | max | .519 | 6 | -.012 | 1 | -.074 | 1 | 1.049e-02 | 6 | 1.054e-03 | 2 | 1.233e-02 | 6 |
| 2342 | | min | .171 | 1 | -.201 | 6 | -.439 | 6 | 1.631e-03 | 1 | -1.003e-03 | 1 | 4.165e-03 | 1 |
| 2343 | N1172C | max | 1.066 | 3 | -.17 | 4 | .575 | 2 | 1.336e-02 | 2 | 2.606e-03 | 3 | 8.577e-03 | 4 |
| 2344 | | min | -.354 | 4 | -.819 | 7 | -.196 | 1 | -5.117e-03 | 1 | -2.702e-03 | 4 | -2.412e-02 | 3 |
| 2345 | N1173B | max | -.17 | 4 | -.17 | 4 | -.113 | 1 | 1.136e-02 | 10 | 2.606e-03 | 3 | -3.457e-03 | 4 |
| 2346 | | min | -.695 | 7 | -.819 | 7 | -.428 | 10 | 2.679e-03 | 1 | -2.702e-03 | 4 | -1.845e-02 | 7 |
| 2347 | N1174C | max | .287 | 3 | -.193 | 2 | -.121 | 2 | -3.536e-03 | 2 | 2.029e-03 | 4 | 8.563e-03 | 4 |
| 2348 | | min | -.308 | 4 | -.684 | 5 | -.556 | 5 | -1.867e-02 | 5 | -1.959e-03 | 3 | -7.85e-03 | 3 |
| 2349 | N1175C | max | .215 | 3 | -.029 | 4 | -.099 | 2 | -2.914e-03 | 2 | 1.353e-03 | 4 | 5.448e-03 | 4 |
| 2350 | | min | -.162 | 4 | -.195 | 7 | -.472 | 5 | -1.582e-02 | 5 | -1.42e-03 | 3 | -7.186e-03 | 3 |
| 2351 | N1176B | max | .489 | 7 | -.008 | 4 | .204 | 10 | 6.678e-03 | 10 | 5.502e-04 | 1 | 1.205e-03 | 4 |
| 2352 | | min | -.022 | 4 | -.202 | 7 | -.03 | 1 | -1.352e-03 | 1 | -4.863e-04 | 2 | -1.638e-02 | 7 |
| 2353 | N1177 | max | .08 | 4 | -.193 | 2 | .757 | 7 | -5.584e-03 | 4 | 2.029e-03 | 4 | 3.529e-03 | 4 |
| 2354 | | min | -.051 | 3 | -.684 | 5 | .266 | 4 | -1.814e-02 | 7 | -1.959e-03 | 3 | -2.817e-03 | 3 |
| 2355 | N1178 | max | .019 | 4 | -.029 | 4 | .648 | 7 | -4.271e-03 | 4 | 1.353e-03 | 4 | 7.57e-04 | 4 |
| 2356 | | min | -.09 | 3 | -.195 | 7 | .179 | 4 | -1.543e-02 | 7 | -1.42e-03 | 3 | -2.493e-03 | 3 |
| 2357 | N1179A | max | -.147 | 4 | -.008 | 4 | -.06 | 3 | 6.885e-03 | 10 | 5.502e-04 | 1 | -3.481e-03 | 4 |
| 2358 | | min | -.641 | 7 | -.202 | 7 | -.286 | 10 | 1.573e-03 | 3 | -4.863e-04 | 2 | -1.525e-02 | 7 |
| 2359 | N1180A | max | .673 | 3 | -.215 | 2 | -.016 | 2 | 6.948e-04 | 2 | 3.41e-03 | 4 | 1.534e-02 | 4 |
| 2360 | | min | -.701 | 4 | -.812 | 5 | -1.001 | 5 | -2.201e-02 | 5 | -3.489e-03 | 3 | -1.472e-02 | 3 |
| 2361 | N1181 | max | .05 | 4 | -.215 | 2 | .774 | 5 | -7.014e-03 | 3 | 3.41e-03 | 4 | 3.282e-03 | 4 |
| 2362 | | min | -.026 | 3 | -.812 | 5 | .271 | 2 | -2.038e-02 | 8 | -3.489e-03 | 3 | -2.663e-03 | 3 |
| 2363 | N1182 | max | -.002 | 3 | -.179 | 3 | .334 | 2 | 1.069e-02 | 6 | 1.903e-03 | 2 | 1.638e-02 | 8 |
| 2364 | | min | -.489 | 8 | -.687 | 8 | -.086 | 1 | -1.82e-03 | 1 | -1.846e-03 | 1 | -1.605e-04 | 3 |
| 2365 | N1183 | max | -.02 | 3 | -.019 | 3 | .197 | 6 | 6.636e-03 | 6 | 1.324e-03 | 2 | 1.521e-02 | 8 |
| 2366 | | min | -.454 | 8 | -.197 | 8 | -.049 | 1 | -1.573e-03 | 1 | -1.399e-03 | 1 | 1.33e-04 | 3 |
| 2367 | N1184 | max | .15 | 3 | -.033 | 3 | -.084 | 2 | -2.589e-03 | 2 | 1.134e-03 | 4 | 7.569e-03 | 4 |
| 2368 | | min | -.225 | 4 | -.197 | 8 | -.494 | 5 | -1.651e-02 | 5 | -1.077e-03 | 3 | -5.111e-03 | 3 |
| 2369 | N1185 | max | .638 | 5 | -.179 | 3 | -.118 | 1 | 9.743e-03 | 6 | 1.903e-03 | 2 | 1.543e-02 | 5 |
| 2370 | | min | .214 | 3 | -.687 | 8 | -.403 | 6 | 1.851e-03 | 1 | -1.846e-03 | 1 | 4.317e-03 | 2 |
| 2371 | N1186 | max | .599 | 5 | -.019 | 3 | -.08 | 4 | 5.87e-03 | 7 | 1.324e-03 | 2 | 1.431e-02 | 5 |
| 2372 | | min | .195 | 2 | -.197 | 8 | -.249 | 7 | 1.974e-03 | 1 | -1.399e-03 | 1 | 4.457e-03 | 2 |
| 2373 | N1187 | max | .121 | 5 | -.033 | 3 | .669 | 8 | -4.919e-03 | 3 | 1.134e-03 | 4 | 2.906e-03 | 5 |
| 2374 | | min | -.006 | 3 | -.197 | 8 | .206 | 3 | -1.593e-02 | 8 | -1.077e-03 | 3 | -4.203e-04 | 3 |
| 2375 | N1188 | max | .015 | 3 | -.008 | 4 | .008 | 2 | 6.803e-03 | 10 | 5.502e-04 | 1 | -1.75e-03 | 4 |
| 2376 | | min | -.014 | 4 | -.202 | 7 | -.01 | 1 | 7.652e-04 | 1 | -4.863e-04 | 2 | -1.573e-02 | 7 |
| 2377 | N1189 | max | .066 | 3 | -.17 | 4 | .031 | 2 | 1.123e-02 | 10 | 2.606e-03 | 3 | 1.338e-05 | 4 |
| 2378 | | min | -.068 | 4 | -.818 | 7 | -.03 | 1 | 3.785e-04 | 1 | -2.702e-03 | 4 | -1.911e-02 | 7 |
| 2379 | N1190 | max | .028 | 3 | -.028 | 4 | .008 | 2 | -4.274e-03 | 4 | 1.353e-03 | 4 | 2.491e-03 | 4 |
| 2380 | | min | -.027 | 4 | -.195 | 7 | -.008 | 1 | -1.546e-02 | 7 | -1.42e-03 | 3 | -4.229e-03 | 3 |
| 2381 | N1191 | max | .081 | 3 | -.193 | 2 | .031 | 4 | -5.588e-03 | 4 | 2.029e-03 | 4 | 5.279e-03 | 4 |
| 2382 | | min | -.081 | 4 | -.684 | 5 | -.03 | 3 | -1.818e-02 | 7 | -1.959e-03 | 3 | -4.566e-03 | 3 |

## Envelope Joint Displacements (Continued)

| | Joint | | X [in] | LC | Y [in] | LC | Z [in] | LC | X Rotation [... | LC | Y Rotation [... | LC | Z Rotation [... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2383 | N1192 | max | .025 | 3 | -.033 | 3 | .013 | 2 | -4.704e-03 | 2 | 1.134e-03 | 4 | 4.611e-03 | 4 |
| 2384 | | min | -.026 | 4 | -.197 | 8 | -.014 | 1 | -1.601e-02 | 5 | -1.077e-03 | 3 | -2.154e-03 | 3 |
| 2385 | N1193 | max | .105 | 3 | -.215 | 2 | .044 | 3 | -4.789e-03 | 2 | 3.41e-03 | 4 | 6.759e-03 | 4 |
| 2386 | | min | -.104 | 4 | -.811 | 5 | -.043 | 4 | -2.085e-02 | 5 | -3.489e-03 | 3 | -6.139e-03 | 3 |
| 2387 | N1194 | max | .013 | 3 | -.019 | 3 | .02 | 2 | 6.152e-03 | 6 | 1.324e-03 | 2 | 1.457e-02 | 8 |
| 2388 | | min | -.014 | 4 | -.197 | 8 | -.022 | 1 | 5.437e-04 | 1 | -1.399e-03 | 1 | 3.088e-03 | 3 |
| 2389 | N1195 | max | .061 | 2 | -.179 | 3 | .052 | 2 | 1.016e-02 | 6 | 1.903e-03 | 2 | 1.565e-02 | 8 |
| 2390 | | min | -.06 | 1 | -.687 | 8 | -.052 | 1 | 4.172e-04 | 1 | -1.846e-03 | 1 | 3.116e-03 | 3 |
| 2391 | N1196 | max | .005 | 10 | .067 | 5 | .011 | 2 | 1.017e-02 | 6 | 4.149e-04 | 5 | 3.85e-03 | 6 |
| 2392 | | min | -.004 | 1 | -.041 | 9 | -.018 | 1 | 3.98e-04 | 1 | -1.752e-05 | 2 | 1.091e-03 | 1 |
| 2393 | N1200A | max | .004 | 10 | .068 | 5 | .011 | 2 | 1.012e-02 | 6 | 1.501e-04 | 2 | -3.002e-04 | 9 |
| 2394 | | min | -.004 | 1 | -.035 | 9 | -.018 | 1 | 4.312e-04 | 1 | -4.919e-04 | 1 | -4.524e-03 | 10 |
| 2395 | N1203 | max | .014 | 3 | .067 | 8 | .01 | 2 | 7.527e-04 | 4 | 5.399e-04 | 4 | -8.64e-04 | 4 |
| 2396 | | min | -.02 | 4 | -.02 | 3 | -.007 | 1 | -2.131e-03 | 3 | -2.02e-04 | 3 | -1.076e-02 | 7 |
| 2397 | N1204 | max | .015 | 3 | .067 | 8 | .01 | 2 | -1.338e-03 | 4 | -6.094e-05 | 3 | 3.458e-04 | 4 |
| 2398 | | min | -.021 | 4 | -.019 | 3 | -.006 | 1 | -8.328e-03 | 7 | -3.992e-04 | 8 | -6.917e-03 | 7 |
| 2399 | N1210A | max | .021 | 3 | .067 | 7 | .017 | 2 | -1.758e-03 | 3 | 4.095e-04 | 6 | 6.812e-03 | 8 |
| 2400 | | min | -.015 | 4 | -.022 | 4 | -.013 | 1 | -8.318e-03 | 8 | -4.049e-05 | 1 | 2.771e-04 | 3 |
| 2401 | N1211A | max | .021 | 3 | .068 | 7 | .017 | 2 | 5.987e-04 | 3 | 1.664e-04 | 4 | 1.055e-02 | 8 |
| 2402 | | min | -.014 | 4 | -.022 | 4 | -.014 | 1 | -2.005e-03 | 4 | -5.082e-04 | 3 | 1.678e-03 | 3 |

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

| | Member | Shape | Code Check | Loc[ft] | LC | Shear... | Loc[ft] | Dir | LC | phi*Pnc... | phi*Pnt ... | phi*Mn ... | phi*Mn ... | Cb | Eqn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | M69A | PL3/8x4 | .594 | .565 | 2 | .054 | .565 | y | 9 | 44539.... | 48600 | .38 | 4.05 | 1... | H1-1b |
| 2 | M65 | PL3/8x4 | .540 | .565 | 4 | .051 | .565 | y | 5 | 44539.... | 48600 | .38 | 4.05 | 1... | H1-1b |
| 3 | M55C | PL3/8x4 | .529 | 0 | 1 | .229 | .225 | y | 2 | 47933.... | 48600 | .38 | 4.05 | 1... | H1-1b |
| 4 | M8 | PL3/8x4 | .459 | 0 | 3 | .183 | .225 | y | 4 | 47933.... | 48600 | .38 | 4.05 | 1... | H1-1b |
| 5 | M67 | PL3/8x4 | .447 | .565 | 3 | .066 | 0 | y | 10 | 44539.... | 48600 | .38 | 4.05 | 1... | H1-1b |
| 6 | M64 | PL3/8x4 | .417 | .225 | 2 | .139 | .225 | y | 1 | 47933.... | 48600 | .38 | 4.05 | 1... | H1-1b |
| 7 | M58B | PL3/8x4 | .405 | 0 | 4 | .217 | .225 | y | 3 | 47933.... | 48600 | .38 | 4.05 | 1... | H1-1b |
| 8 | M7 | PL3/8x4 | .401 | 1.992 | 10 | .310 | 3.542 | y | 7 | 48392.... | 48600 | .38 | 4.05 | 2... | H1-1b |
| 9 | M66 | PL3/8x4 | .397 | .225 | 4 | .145 | .225 | y | 3 | 47933.... | 48600 | .38 | 4.05 | 1... | H1-1b |
| 10 | M5 | PL3/8x4 | .394 | 2.258 | 9 | .309 | 3.542 | y | 8 | 48392.... | 48600 | .38 | 4.05 | 2... | H1-1b |
| 11 | MP4A | PIPE 2.5 | .392 | 3.792 | 2 | .030 | 3.792 | | 2 | 33961.... | 50715 | 3.596 | 3.596 | 1... | H1-1b |
| 12 | M9 | PL3/8x4 | .371 | 1.992 | 7 | .308 | 3.542 | y | 7 | 48392.... | 48600 | .38 | 4.05 | 2... | H1-1b |
| 13 | MP4C | PIPE 2.5 | .355 | 3.792 | 3 | .029 | 3.792 | | 3 | 33961.... | 50715 | 3.596 | 3.596 | 1... | H1-1b |
| 14 | MP4B | PIPE 2.5 | .354 | 3.792 | 4 | .029 | 3.792 | | 4 | 33961.... | 50715 | 3.596 | 3.596 | 1... | H1-1b |
| 15 | M54B | PIPE 3.0 | .329 | 4.067 | 10 | .128 | 1.162 | | 3 | 53085.... | 65205 | 5.749 | 5.749 | 1... | H1-1b |
| 16 | M10 | L2x2x4 | .318 | 0 | 1 | .023 | 2.916 | y | 1 | 25500.22 | 30585.6 | .691 | 1.577 | 2... | H2-1 |
| 17 | M16 | PIPE 3.0 | .311 | 2.131 | 10 | .107 | 2.066 | | 10 | 53085.35 | 65205 | 5.749 | 5.749 | 1... | H1-1b |
| 18 | M68A | PL3/8x4 | .304 | .225 | 3 | .104 | .225 | y | 2 | 47933.... | 48600 | .38 | 4.05 | 1... | H1-1b |
| 19 | M69 | PIPE 3.0 | .296 | 2.131 | 6 | .093 | 2.131 | | 2 | 53085.35 | 65205 | 5.749 | 5.749 | 1... | H1-1b |
| 20 | M15 | L2x2x4 | .295 | 0 | 2 | .023 | 2.916 | z | 2 | 25500.22 | 30585.6 | .691 | 1.577 | 2... | H2-1 |
| 21 | M55B | PIPE 3.0 | .292 | 2.131 | 8 | .097 | 2.131 | | 4 | 53085.35 | 65205 | 5.749 | 5.749 | 1... | H1-1b |
| 22 | M14 | L2x2x4 | .292 | 0 | 3 | .022 | 2.916 | y | 3 | 25500.22 | 30585.6 | .691 | 1.577 | 2... | H2-1 |
| 23 | M1 | PIPE 3.0 | .287 | 4.132 | 8 | .154 | 1.162 | | 2 | 53085.... | 65205 | 5.749 | 5.749 | 1... | H1-1b |
| 24 | M68 | PIPE 3.0 | .286 | 4.067 | 7 | .129 | 1.162 | | 4 | 53085.... | 65205 | 5.749 | 5.749 | 1... | H1-1b |
| 25 | M13 | L2x2x4 | .282 | 0 | 4 | .023 | 2.916 | z | 4 | 25500.22 | 30585.6 | .691 | 1.577 | 2... | H2-1 |
| 26 | M66A | HSS4x4x4 | .257 | 0 | 10 | .060 | 0 | y | 10 | 115885... | 139518 | 16.181 | 16.181 | 2... | H1-1b |
| 27 | M12 | L2x2x4 | .235 | 0 | 4 | .017 | 2.916 | y | 4 | 25500.22 | 30585.6 | .691 | 1.577 | 2... | H2-1 |

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

| | Member | Shape | Code Check | Loc[ft] | LC | Shear... | Loc[ft] | Dir | LC | phi*Pnc... | phi*Pnt ... | phi*Mn ... | phi*Mn ... | Cb | Eqn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 28 | M65A | HSS4x4x4 | .215 | 0 | 6 | .085 | 0 | y | 9 | 115885... | 139518 | 16.181 | 16.181 | 2... | H1-1b |
| 29 | M36 | HSS4x4x4 | .215 | 0 | 8 | .092 | 0 | z | 3 | 115885... | 139518 | 16.181 | 16.181 | 2... | H1-1b |
| 30 | M11 | L2x2x4 | .210 | 0 | 3 | .019 | 0 | z | 3 | 25500.22 | 30585.6 | .691 | 1.577 | 2... | H2-1 |
| 31 | MP1A | PIPE_2.0 | .169 | 2.5 | 2 | .016 | 2.5 | | 2 | 20866.... | 32130 | 1.872 | 1.872 | 1... | H1-1b |
| 32 | MP1B | PIPE_2.0 | .162 | 2.5 | 4 | .017 | 2.5 | | 4 | 20866.... | 32130 | 1.872 | 1.872 | 2... | H1-1b |
| 33 | MP1C | PIPE_2.0 | .162 | 2.5 | 4 | .017 | 2.5 | | 4 | 20866.... | 32130 | 1.872 | 1.872 | 2... | H1-1b |
| 34 | MP3A | PIPE_2.0 | .152 | 2.5 | 2 | .014 | 2.5 | | 2 | 20866.... | 32130 | 1.872 | 1.872 | 1... | H1-1b |
| 35 | MP2A | PIPE_2.0 | .152 | 2.5 | 2 | .014 | 2.5 | | 2 | 20866.... | 32130 | 1.872 | 1.872 | 1... | H1-1b |
| 36 | MP3C | PIPE_2.0 | .134 | 2.5 | 3 | .013 | 2.5 | | 3 | 20866.... | 32130 | 1.872 | 1.872 | 1... | H1-1b |
| 37 | MP2B | PIPE_2.0 | .134 | 2.5 | 4 | .013 | 2.5 | | 4 | 20866.... | 32130 | 1.872 | 1.872 | 1... | H1-1b |
| 38 | MP3B | PIPE_2.0 | .134 | 2.5 | 4 | .013 | 2.5 | | 4 | 20866.... | 32130 | 1.872 | 1.872 | 1... | H1-1b |
| 39 | MP2C | PIPE_2.0 | .134 | 2.5 | 3 | .013 | 2.5 | | 3 | 20866.... | 32130 | 1.872 | 1.872 | 1... | H1-1b |

# EXHIBIT 9

# Radio Frequency Emissions Analysis Report

**T-MOBILE** Existing Facility

## Site ID: CT11472A

Rt2 _Colchester-Bozrah
29 Mahoney Road
Colchester, CT 06415

**June 12, 2019**

**Transcom Engineering Project Number: 737001-0097**

| Site Compliance Summary | |
|---|---|
| Compliance Status: | **COMPLIANT** |
| Site total MPE% of FCC general population allowable limit: | **9.34 %** |

June 12, 2019

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

Emissions Analysis for Site: **CT11472A – Rt2 _Colchester-Bozrah**

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

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

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

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

Population exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 600 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 Mahoney Road, Colchester, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-MOBILE is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

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

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

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

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

*Table 1: Channel Data Table*

The following antennas listed in *Table 2* were used in the modeling for transmission in the 600 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 APXVAARR18_43-C-NA20 | 177 |
| A | 2 | EMS RR90-17-XXDP | 177 |
| B | 1 | RFS APXVAARR18_43-C-NA20 | 177 |
| B | 2 | EMS RR90-17-XXDP | 177 |
| C | 1 | RFS APXVAARR18_43-C-NA20 | 177 |
| C | 2 | EMS RR90-17-XXDP | 177 |

*Table 2: Antenna Data*

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

Cable losses were factored in the calculations for this site. Since all **1900 MHz (PCS)** & **2100 MHz (AWS)** radios are ground mounted the following cable loss values were used. For each ground mounted **1900 MHz (PCS)** radio there was **2.32 dB** of cable loss calculated into the system gains / losses for this site. For each ground mounted **2100 MHz (AWS)** radio there was **2.45 dB** of cable loss calculated into the system gains / losses for this site. These values were calculated based upon the manufacturers specifications for **190 feet** of **1-1/4"** coax.

## 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 APXVAARR18_43-C-NA20 | 1900 MHz (PCS) / 2100 MHz (AWS) / 600 MHz / 700 MHz | 15.85 / 17.15 / 12.85 / 13.55 | 11 | 415 | 9,934.25 | 1.63 |
| Antenna A2 | EMS RR90-17-XXDP | Dormant | N/A | 0 | 0 | 0.00 | 0.00 |
| | | | | | | Sector A Composite MPE% | **1.63** |
| Antenna B1 | RFS APXVAARR18_43-C-NA20 | 1900 MHz (PCS) / 2100 MHz (AWS) / 600 MHz / 700 MHz | 15.85 / 17.15 / 12.85 / 13.55 | 11 | 415 | 9,934.25 | 1.63 |
| Antenna B2 | EMS RR90-17-XXDP | Dormant | N/A | 0 | 0 | 0.00 | 0.00 |
| | | | | | | Sector B Composite MPE% | **1.63** |
| Antenna C1 | RFS APXVAARR18_43-C-NA20 | 1900 MHz (PCS) / 2100 MHz (AWS) / 600 MHz / 700 MHz | 15.85 / 17.15 / 12.85 / 13.55 | 11 | 415 | 9,934.25 | 1.63 |
| Antenna C2 | EMS RR90-17-XXDP | Dormant | N/A | 0 | 0 | 0.00 | 0.00 |
| | | | | | | Sector C Composite MPE% | **1.63** |

*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 | **1.63 %** |
| AT&T | 5.75 % |
| Verizon Wireless | 1.96 % |
| **Site Total MPE %:** | **9.34 %** |

*Table 4: All Carrier MPE Contributions*

| | |
|---|---|
| T-MOBILE Sector A Total: | 1.63 % |
| T-MOBILE Sector B Total: | 1.63 % |
| T-MOBILE Sector C Total: | 1.63 % |
| | |
| Site Total: | 9.34 % |

*Table 5: Site MPE Summary*

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

| T-MOBILE _ Frequency Band / Technology Max Power Values (Per Sector) | # Channels | Watts ERP (Per Channel) | Height (feet) | Total Power Density ($\mu W/cm^2$) | Frequency (MHz) | Allowable MPE ($\mu W/cm^2$) | Calculated % MPE |
|---|---|---|---|---|---|---|---|
| T-Mobile 1900 MHz (PCS) LTE | 4 | 901.70 | 177 | 4.43 | 1900 MHz (PCS) | 1000 | 0.44% |
| T-Mobile 2100 MHz (AWS) LTE | 2 | 1,770.73 | 177 | 4.35 | 2100 MHz (AWS) | 1000 | 0.44% |
| T-Mobile 1900 MHz (PCS) GSM | 1 | 338.14 | 177 | 0.42 | 1900 MHz (PCS) | 1000 | 0.04% |
| T-Mobile 600 MHz LTE / 5G NR | 2 | 771.01 | 177 | 1.90 | 600 MHz | 400 | 0.47% |
| T-Mobile 700 MHz LTE | 2 | 452.93 | 177 | 1.11 | 700 MHz | 467 | 0.24% |
| | | | | | | **Total:** | **1.63%** |

*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: | 1.63 % |
| Sector B: | 1.63 % |
| Sector C: | 1.63 % |
| T-MOBILE Maximum Total (per sector): | 1.63 % |
| | |
| Site Total: | 9.34 % |
| | |
| Site Compliance Status: | **COMPLIANT** |

The anticipated composite MPE value for this site assuming all carriers present is **9.34 %** 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
RF Engineering Director
**Transcom Engineering, Inc**
PO Box 1048
Sterling, MA 01564