

Filed by:
Elizabeth Jamieson, Site Development Specialist II - SBA Communications
134 Flanders Rd., Suite 125, Westborough, MA 01581
860.605.7808 - EJamieson@sbsite.com

January 17, 2023

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

RE: Notice of Exempt Modification
1050 Buckley Highway, Union CT 06076
Latitude: 41.999219
Longitude: -72.152397
T-Mobile Site#: CT11144C_Microwave

Dear Ms. Bachman:

T-Mobile currently maintains antennas at the 140-foot level of the existing 168-foot lattice tower at 1050 Buckley Highway, Union CT 06076. The tower is owned by SBA Towers X, LLC. The property is owned by Wayne Kemp and Kathy-Lee Kemp. T-Mobile now intends to add one (1) Microwave Dish with a new pipe mount.

Planned Modifications:

Relocate:

- (1) RFS APX16DWV-16DWVS-E-A20
- (1) Twin Style 1A PCS TMA

Install New:

- (1) Pipe Mount
- (1) Microwave Antenna
- (2) Microwave Radios
- (2) Fiber Cables for Microwave
- (2) DC Cables for Microwave

Existing to remain:

- (3) RFS-APXAARR24_43-U-NA20 Antenna 600/700/2100 MHz
- (2) RFS APX16DWV-16DWVS-E-A201900 MHz
- (3) RRU4449
- (3) RRU4415
- (2) Twin Style 1A PCS TMA
- (6) 1-5/8" Coax
- (3) Hybrid Cable
- (1) RBS 6201 Cabinet
- (1) 2416 Fiber Cabinet
- (1) Battery Cabinet
- (1) PPC Cabinet
- (1) Generac RD048 48kW AC Diesel generator

This facility was approved by Site plan approval by the Town of Union PZC, granted September 16, 1998. 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 First Selectman David D, Eaton and Mathieu J Silbermann, ZEO/ Planning and Zoning Commissioner of the Town of Union. (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,



Elizabeth Jamieson
Site Development Specialist II
SBA COMMUNICATIONS CORPORATION
134 Flanders Rd., Suite 125
Westborough, MA 01581
860.605.7808 + C
EJamieson@sbsite.com

Exhibit List

Exhibit 1	Check Copy
Exhibit 2	FedEx Labels
Exhibit 3	Property Card
Exhibit 4	Property Map
Exhibit 5	Zoning Approval Documents
Exhibit 6	Construction Drawings
Exhibit 7	Structural Analysis
Exhibit 8	Mount Analysis
Exhibit 9	EME

Attachments:**Cc:**

First Selectman David D Eaton
Union Town Hall
1043 Buckley Hwy
Union CT 06076

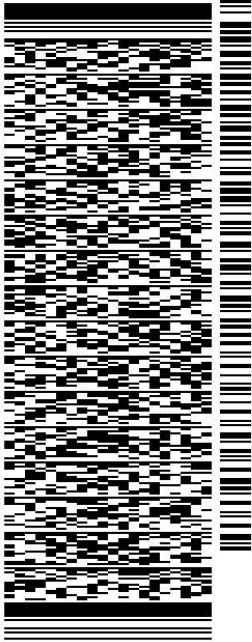
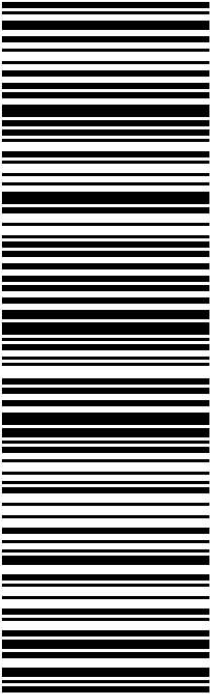
Mathieu J Silbermann, ZEO/ Planning and Zoning Commissioner
Union Town Hall
1043 Buckley Hwy
Union CT 06076

Wayne Kemp and Kathy-Lee Kemp
1050 Buckley Highway
Union, CT 06076

EXHIBIT 1

Copy of check to
be included in
original

EXHIBIT 2

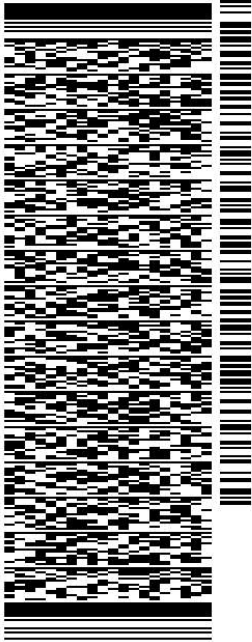
ORIGIN ID: BCTA (561) 995-7670 ELIZABETH JAMIESON 8051 CONGRESS AVE BOCA RATON, FL 33487 UNITED STATES US		SHIP DATE: 16JAN23 ACTWGT: 1.00 LB CAD: 255382542/NET4580
TO DAVIE EATON, FIRST SELECTMAN TOWN OF UNION 1043 BUCKLEY HIGHWAY		
UNION CT 06076 (860) 684-3812 REF: 10-56-92009-6089 INV/ PO: DEPT:		
		
		
581J2/D297/FE2D		
TRK# 7710 3608 4635 0201	TUE - 17 JAN 4:30P STANDARD OVERNIGHT	XE QCWA 06076 CT-US BDL
		

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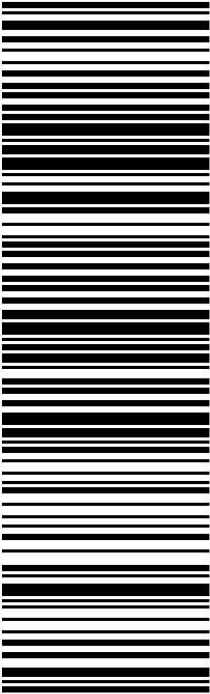
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

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](https://www.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 Service Guide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

ORIGIN ID: BCTA (561) 995-7670 ELIZABETH JAMIESON 8051 CONGRESS AVE BOCA RATON, FL 33487 UNITED STATES US		SHIP DATE: 16JAN23 ACTWGT: 1.00 LB CAD: 255382542/NET4580
TO MELANIE BACHMAN CT SITING COUNCIL 10 FRANKLIN SQUARE		BILL SENDER
NEW BRITAIN CT 06051 (860) 827-2935 REF: 10-56-92009-6089 INV/ PO: DEPT:		
		
		
J231023011101uv		
581J2/D297/FE2D		

TRK# 7710 3603 7397 0201	TUE - 17 JAN 10:30A PRIORITY OVERNIGHT
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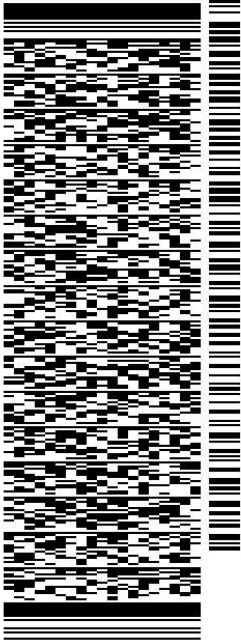
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 CT-US BDL
 06051

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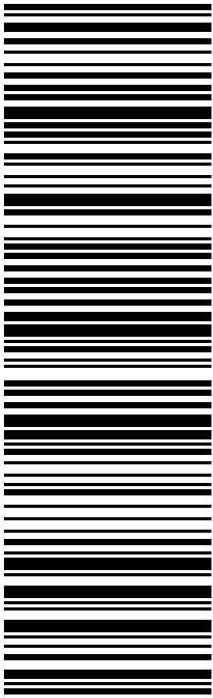
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TO KATHY LEE AND WAYNE KEMP BILL SENDER		
1050 BUCKLEY HIGHWAY		
UNION CT 06076		
(860) 614-3060 INV/ PO: DEPT:	REF: 10-56-92009-6089	
		
		
J231023011101uv		
581J2/D297/FE2D		

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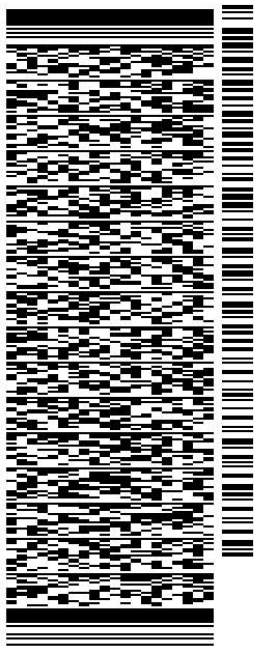
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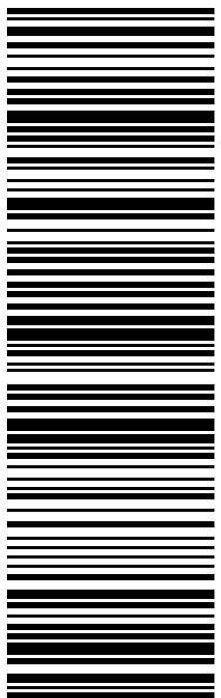
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TO MATHIEU J. SILBERMANN, CHAIR TOWN OF UNION 1043 BUCKLEY HIGHWAY		
UNION CT 06076 (860) 684-3812 INV: REF: 10-56-92009-6089 PO: DEPT:		
		
		
J231023011101uv		
581J2/D297/FE2D		

TRK# 7710 3611 0327 0201	TUE - 17 JAN 4:30P STANDARD OVERNIGHT
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XE QCWA
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EXHIBIT 3



neccog

Ashford Brooklyn Canterbury Chaplin Eastford Hampton Killingly Plainfield
Pomfret Putnam Scotland Sterling Thompson Union Voluntown Woodstock

Parcel Information:

Report Generated: 7/31/2019 11:42:39 AM

GIS ID: CT-145-13-18-000020

Assessment: \$407,340.00

Owner Name: KEMP WAYNE & KATHY LEE

Appraisal:

Street Address: 1050 BUCKLEY HIGHWAY

Mailing Address:

Land: 5.40

Buildings:

Land Value:

Improvement Value:

Total Value:

Appraised

Assessed

\$407,340.00

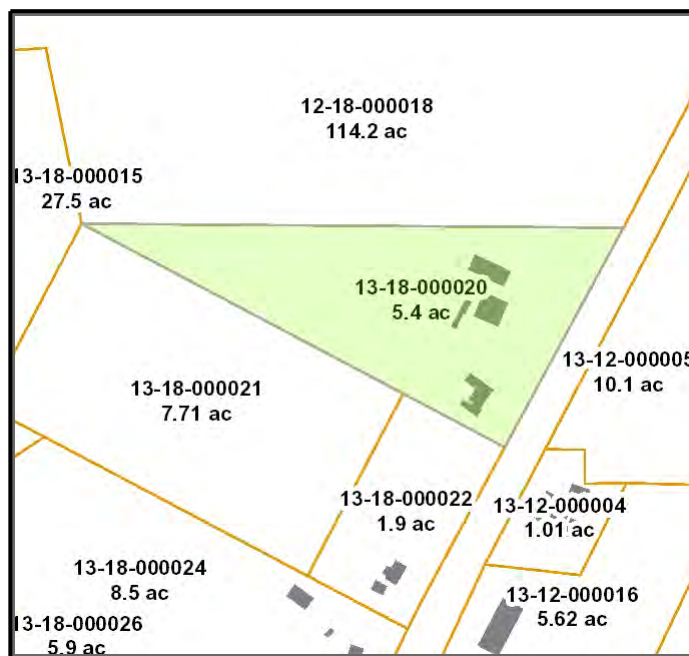
Sale Date:

Sale Price:

\$135,000

Year Built: 1959

Primary Structure Area: 1,720.00 sq. ft.



Taxlot highlighted in blue

EXHIBIT 4

1050 BUCKLEY HIGHWAY

Location	1050 BUCKLEY HIGHWAY	Mblu	13/ 18/ 020/ /
Acct#	00023000	Owner	KEMP WAYNE & KATHY LEE
Assessment	\$448,160	Appraisal	\$640,230
PID	186	Building Count	3

Current Value

Appraisal			
Valuation Year	Improvements	Land	Total
2018	\$403,770	\$236,460	\$640,230
Assessment			
Valuation Year	Improvements	Land	Total
2018	\$282,640	\$165,520	\$448,160

Owner of Record

Owner	KEMP WAYNE & KATHY LEE	Sale Price	\$135,000
Co-Owner		Certificate	
Address	1050 BUCKLEY HWY UNION, CT 06076	Book & Page	39/384
		Sale Date	11/14/1996
		Instrument	Q

Ownership History

Ownership History					
Owner	Sale Price	Certificate	Book & Page	Instrument	Sale Date
KEMP WAYNE & KATHY LEE	\$135,000		39/384	Q	11/14/1996

Building Information

Building 1 : Section 1

Year Built:	1959
Living Area:	1,720
Replacement Cost:	\$232,042
Building Percent Good:	64
Replacement Cost	
Less Depreciation:	\$148,510
Building Attributes	

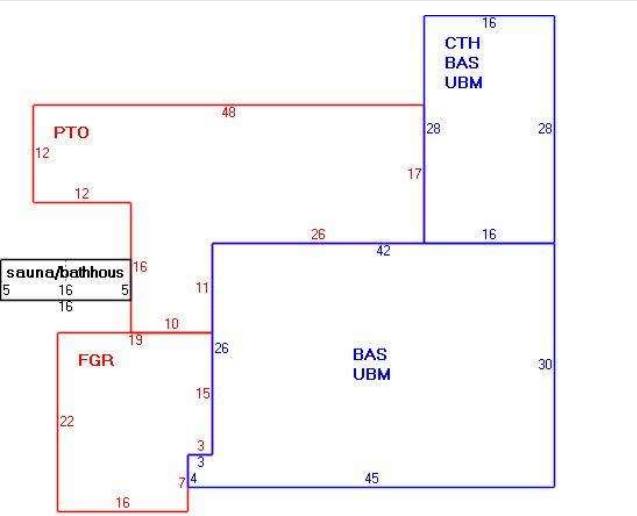
Field	Description
Style	Ranch
Model	Residential
Grade:	C+
Stories:	1 Story
Occupancy	1
Exterior Wall 1	Wood Shingle
Exterior Wall 2	
Roof Structure:	Gable or Hip
Roof Cover	Asphalt
Interior Wall 1	Drywall/Sheet
Interior Wall 2	
Interior Flr 1	Hardwood
Interior Flr 2	Quarry Tile
Heat Fuel	Oil
Heat Type:	Forced Air
AC Type:	Central
Total Bedrooms:	3 Bedrooms
Total Bthrms:	2
Total Half Baths:	0
Total Xtra Fixtrs:	
Total Rooms:	5 Rooms
Bath Style:	Modern
Kitchen Style:	Average

Building Photo



(<https://images.vgsi.com/photos/UnionCTPhotos/00\00\01\12.jpg>)

Building Layout



([ParcelSketch.ashx?pid=186&bid=186](#))

Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
BAS	First Floor	1,720	1,720
CTH	Cathedral Ceiling	448	0
FGR	Garage	397	0
PTO	Patio	866	0
UBM	Unfinished Basement	1,720	0
		5,151	1,720

Building 2 : Section 1

Year Built:	1999
Living Area:	2,200
Replacement Cost:	\$224,312
Building Percent Good:	77

Replacement Cost
Less Depreciation: \$172,720

Building Attributes : Bldg 2 of 3	
Field	Description
STYLE	Garage/Office
MODEL	Commercial
Grade	Average
Stories:	1
Occupancy	1.00
Exterior Wall 1	Vinyl Siding
Exterior Wall 2	
Roof Structure	Gable or Hip
Roof Cover	Asphalt
Interior Wall 1	Minim/Masonry
Interior Wall 2	
Interior Floor 1	Concr-Finished
Interior Floor 2	
Heating Fuel	Oil
Heating Type	Gravity Air
AC Type	None/Partial
Bldg Use	STORE/SHOP
Total Rooms	
Total Bedrms	
Total Baths	
1st Floor Use:	
Heat/AC	None
Frame Type	Wood Frame
Baths/Plumbing	Light
Ceiling/Wall	CEIL & WALLS
Rooms/Prtns	Light
Wall Height	13.00
% Comn Wall	0.00

Building 3 : Section 1

Year Built:
Living Area: 0
Replacement Cost: \$0
Building Percent Good:
Replacement Cost
Less Depreciation: \$0

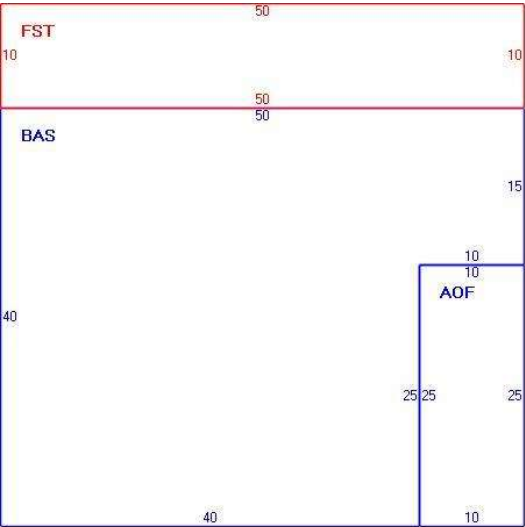
Building Attributes : Bldg 3 of 3

Building Photo



(<https://images.vgsi.com/photos/UnionCTPhotos//default.jpg>)

Building Layout



(ParcelSketch.ashx?pid=186&bid=808)

Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
BAS	First Floor	1,750	1,750
AOF	Office	250	250
FST	Finished Utility/Storage	500	200
		2,500	2,200

Field	Description
Style	Vacant Land
Model	
Grade:	
Stories:	
Occupancy	
Exterior Wall 1	
Exterior Wall 2	
Roof Structure:	
Roof Cover	
Interior Wall 1	
Interior Wall 2	
Interior Flr 1	
Interior Flr 2	
Heat Fuel	
Heat Type:	
AC Type:	
Total Bedrooms:	
Total Bthrms:	
Total Half Baths:	
Total Xtra Fixtrs:	
Total Rooms:	
Bath Style:	
Kitchen Style:	

Building Photo



(https://images.vgsi.com/photos/UnionCTPhotos//default.jpg)

Building Layout

(ParcelSketch.ashx?pid=186&bid=819)

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

Extra Features

Extra Features				Legend
Code	Description	Size	Value	Bldg #
WHL	WHIRLPOOL	1.00 UNITS	\$2,310	1
FPL1	FIREPLACE 1 ST	1.00 UNITS	\$1,450	1
SNA	SAUNA	192.00 S.F.	\$9,220	1

Land

Land Use		Land Line Valuation	
Use Code	1010	Size (Acres)	5.40
Description	Single Fam MDL-01	Frontage	0
Zone	CI	Depth	0
Neighborhood	12	Assessed Value	\$165,520
Alt Land Appr Category	No	Appraised Value	\$236,460

Outbuildings

Outbuildings

Outbuildings						<u>Legend</u>
Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
FGR2	GARAGE-GOOD			2400.00 S.F.	\$67,200	3
PAV1	PAVING-ASPHALT			3500.00 S.F.	\$2,360	2

Valuation History

Appraisal			
Valuation Year	Improvements	Land	Total
2018	\$403,770	\$236,460	\$640,230
2017	\$334,280	\$247,630	\$581,910
2013	\$334,280	\$247,630	\$581,910

Assessment			
Valuation Year	Improvements	Land	Total
2018	\$282,640	\$165,520	\$448,160
2017	\$234,000	\$173,340	\$407,340
2013	\$234,000	\$173,340	\$407,340

EXHIBIT 5

Copy Distribution:

White - Planning & Zoning Commission
Yellow - Building Inspector
Blue - Assessor
Green - Applicant

OP# 9719

Date 9-16-98

TOWN OF UNION, CONNECTICUT
OCCUPANCY/USE PERMIT

This is to certify that the Planning and Zoning Commission and/or the Building Official of the Town of Union, Connecticut, have inspected the

158' RADIO TOWER
(sized) located at 1050 BUCKLEY HWY
and permitted under Zoning Permit No. 505 issued to
WAYNE KEMP of 1050 BUCKLEY HWY

and the location and use of this structure and premises complies with the provisions of The Town of Union Zoning Regulations and substantially complies with the Connecticut Building Code.

Inspected for Connecticut Building Code Compliance

by Edward F. Staweski

Date 9-16-98

Use Group

Type of Construction

Live load 1st floor

Live load 2nd floor

Fire Grading

Inspection for Zoning Compliance by:

James Dwyer

Date Inspected 11/4/98

PLANNING AND ZONING COMMISSION
TOWN OF UNION, CONNECTICUT

James Dwyer
Chairman

Joseph Kratochvil
(Acct.) Secretary

TELEPHONE TOWER
RADIO TOWER

Copy Distribution:

White - Planning & Zoning Commission
Yellow - Building Inspector
Blue - Assessor
Green - Applicant

ZP # Nº 505
Date 6-4-97

TOWN OF UNION, CONNECTICUT

ZONING PERMIT

This is to certify that the Planning and Zoning Commission of the Town of Union, Connecticut, acting upon the application of WAYNE KEMP presently residing at 1050 BUCKLEY HIGHWAY do hereby approve and grant said applicant a Zoning Permit for:

RADIO TOWER
sized 158 feet high

to be located at the following location: 1050 BUCKLEY HIGHWAY.

Be it understood that the requirements of the Zoning Regulations of the Town of Union Connecticut be fulfilled and that before occupancy of said structure or use of such building an Occupancy/Use Permit must be obtained from the Building Inspector and the Planning & Zoning Commission.

This document is not a Building Permit but is an approval from the Zoning Board that what you propose to do complies with the Town of Union Zoning Regulations.

A BUILDING PERMIT MUST BE OBTAINED BEFORE CONSTRUCTION BEGINS. PLEASE BE SURE TO CONTACT THE BUILDING INSPECTOR BEFORE PROCEEDING WITH ANY CONSTRUCTION.

PLANNING AND ZONING COMMISSION
TOWN OF UNION, CONNECTICUT

James Dargatzis
Chairman
Deane Williams
Secretary

PLANNING AND ZONING COMMISSION

TOWN OF UNION, CONNECTICUT

Mail Address: 1024 Buckley Highway, Union, CT 06076

SPECIAL PERMIT

Description of Premises: 1052 BUCKLEY HIGHWAY
UNION CT

Nature of Special Permit: TO PERMIT THE CONSTRUCTION
OF A TELECOMMUNICATIONS
FACILITY

Applicable Regulation(s): UNION PZ SECTION 3.11

Owners of Record: WAYNE & KATHY KENT

Date Issued: JUNE 4, 1997

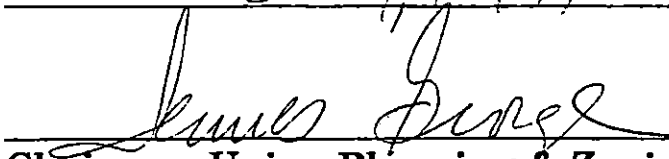
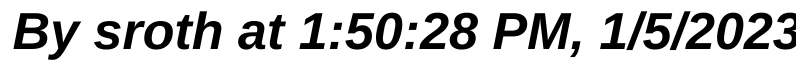

Chairman Union Planning & Zoning

EXHIBIT 6



<u>PROJECT MANAGER:</u>	<u>DATE:</u>	<u>ZONING/SITE ACQ.:</u>	<u>DATE:</u>
_____	_____	_____	_____
<u>CONSTRUCTION:</u>	<u>DATE:</u>	<u>OPERATIONS:</u>	<u>DATE:</u>
_____	_____	_____	_____
<u>RF ENGINEERING:</u>	<u>DATE:</u>	<u>TOWER OWNER:</u>	<u>DATE:</u>
_____	_____	_____	_____

<u>LOCATION</u>	<u>SPECIAL RESTRICTIONS</u>
SECTOR A:	ACCESS BY CERTIFIED CLIMBER
SECTOR B:	ACCESS BY CERTIFIED CLIMBER
SECTOR C:	ACCESS BY CERTIFIED CLIMBER
SECTOR D:	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

3. 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.
4. 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.
5. THE CONTRACTOR OR BIDDER SHALL BEAR THE RESPONSIBILITY OF NOTIFYING (IN WRITING) THE MAINPOINT 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 CLEARLY OR EXTENSIVE WORK, UNLESS DIRECTED IN WRITING OTHERWISE.
6. 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.
7. 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.
8. 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.
9. 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.
10. 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.
11. 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.
12. 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.
13. 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.
14. 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**

1050 BUCKLEY HIGHWAY
UNION, CT 06076
TOLLAND COUNTY

SITE TYPE: 168'± SELF-SUPPORT TOWER

RF DESIGN GUIDELINE: MICROWAVE

RELOCATE

- 1 PANEL ANTENNA

INSTALL:

- 1 PIPE MOUNT
- 1 MICROWAVE ANTENNA
- 2 MICROWAVE RADIOS
- 2 FIBER CABLES FOR MICROWAVE
- 2 DC CABLES FOR MICROWAVE

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 SHALL 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.

A topographic map of the Union, New Jersey area. The map shows Nipmuck State Forest, Walla Brook, and Buckley Pond. A black dot marks the 'SITE' location near a road and a bench mark (BM 1014). The map includes contour lines, a north arrow, and various geographical features like a cemetery and a sandpit.

FROM COMMERCE WAY TRAVELING NE TOWARDS N BOUNDARY RD/S WASHINGTON ST, CONTINUE ONTO S. WASHINGTON ST TO TAKE A RIGHT ONTO MA-123 EAST, TURN LEFT TO MERGE ONTO I-495 NORTH. TAKE EXIT 58 TOWARD I-90 WEST. TAKE EXIT 78 TOWARD I-84 SOUTH. TAKE EXIT 74 FOR CT-171 EAST. SITE IS LOCATED ON THE RIGHT.

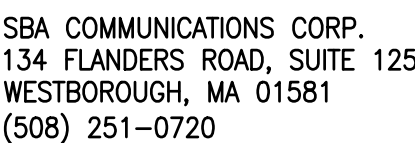
[illegible]

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.

SITE NUMBER:	CT11144C
SITE NAME:	UNION 4
SBA SITE NUMBER:	CT24369-A
SBA SITE NAME:	UNION 4, CT
SITE ADDRESS:	1050 BUCKLEY HIGHWAY UNION, CT 06076
PROPERTY OWNER:	NAVIGATOR PROPERTIES LLC. PO BOX 1160 KENNEBUNKPORT, ME 04046
TOWER OWNER:	SBA TOWERS X, LLC 8501 CONGRESS AVENUE BOCA RATON, FL 33487 PHONE: 561-226-9523
COUNTY:	TOLLAND
ZONING DISTRICT:	N/A
STRUCTURE TYPE:	SELF-SUPPORT TOWER
STRUCTURE HEIGHT:	168'±
APPLICANT:	T-MOBILE NORTHEAST LLC 15 COMMERCE WAY, SUITE B NORTON, MA 02766
ARCHITECT:	CHAPPELL ENGINEERING ASSOCIATES, LLC. 201 BOSTON POST ROAD WEST, SUITE 101 MARLBOROUGH, MA 01752
STRUCTURAL ENGINEER:	CHAPPELL ENGINEERING ASSOCIATES, LLC. 201 BOSTON POST ROAD WEST, SUITE 101 MARLBOROUGH, MA 01752
SITE CONTROL POINT:	LATITUDE: 41.999220° N41°59'57.20" LONGITUDE: -72.152280° W72°09'08.20"

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 PER-EMPTION FOR LOCAL DISCRETIONARY PERMITS (VARIANCE, SPECIAL PERMIT, SITE PLAN REVIEW, OR ADMINISTRATIVE REVIEW).

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



CHECKED BY: JMT

APPROVED BY: JMT

SUBMITTALS			
REV.	DATE	DESCRIPTION	BY
1	11/01/22	ISSUED FOR CONSTRUCTION	CWC
0	08/02/22	ISSUED FOR REVIEW	NWC

SITE NUMBER:
CT11144C

SITE ADDRESS:
1050 BUCKLEY HIGHWAY
UNION, CT 06076

SHEET TITLE

TITLE SHEET

SHEET NUMBER

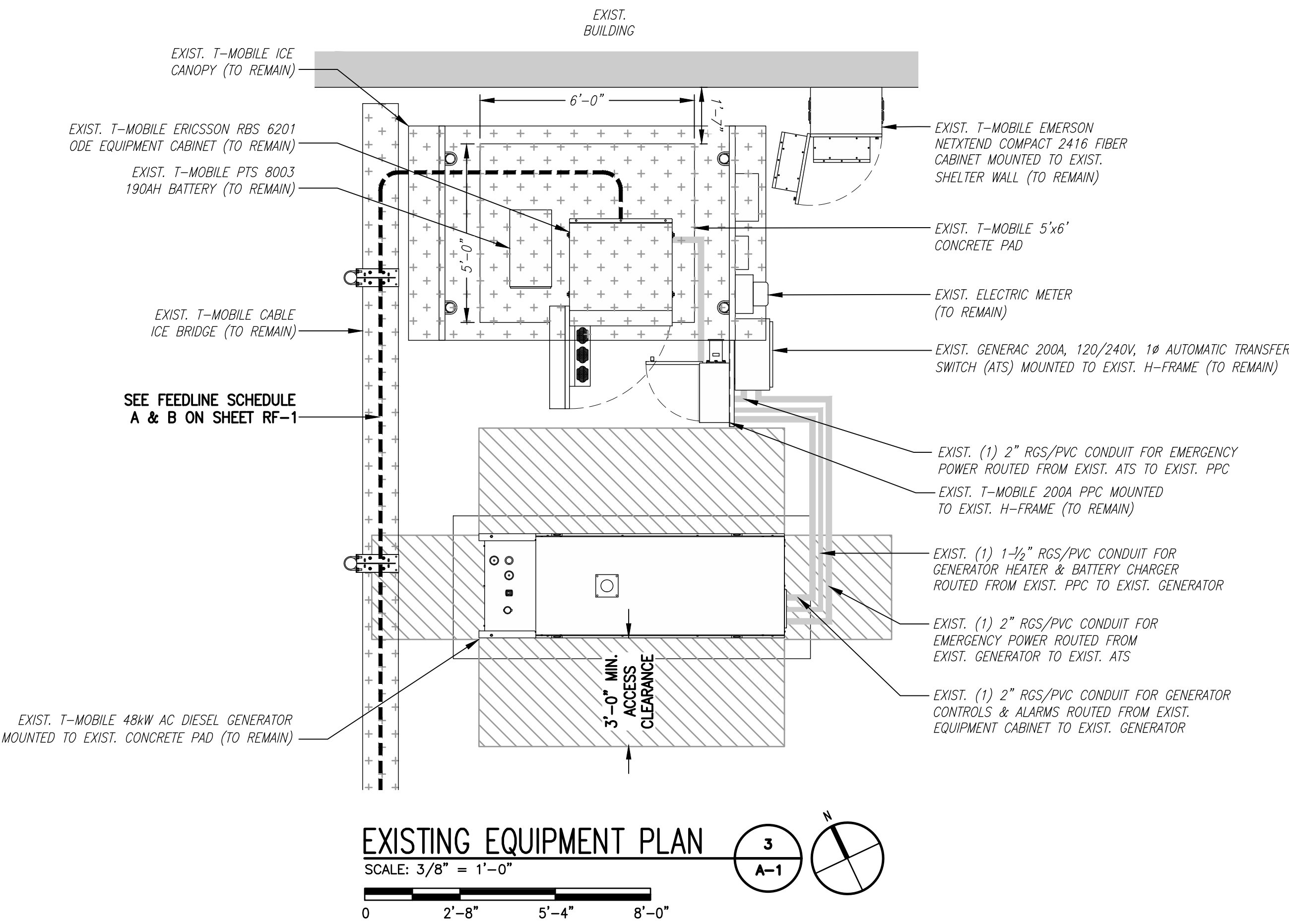
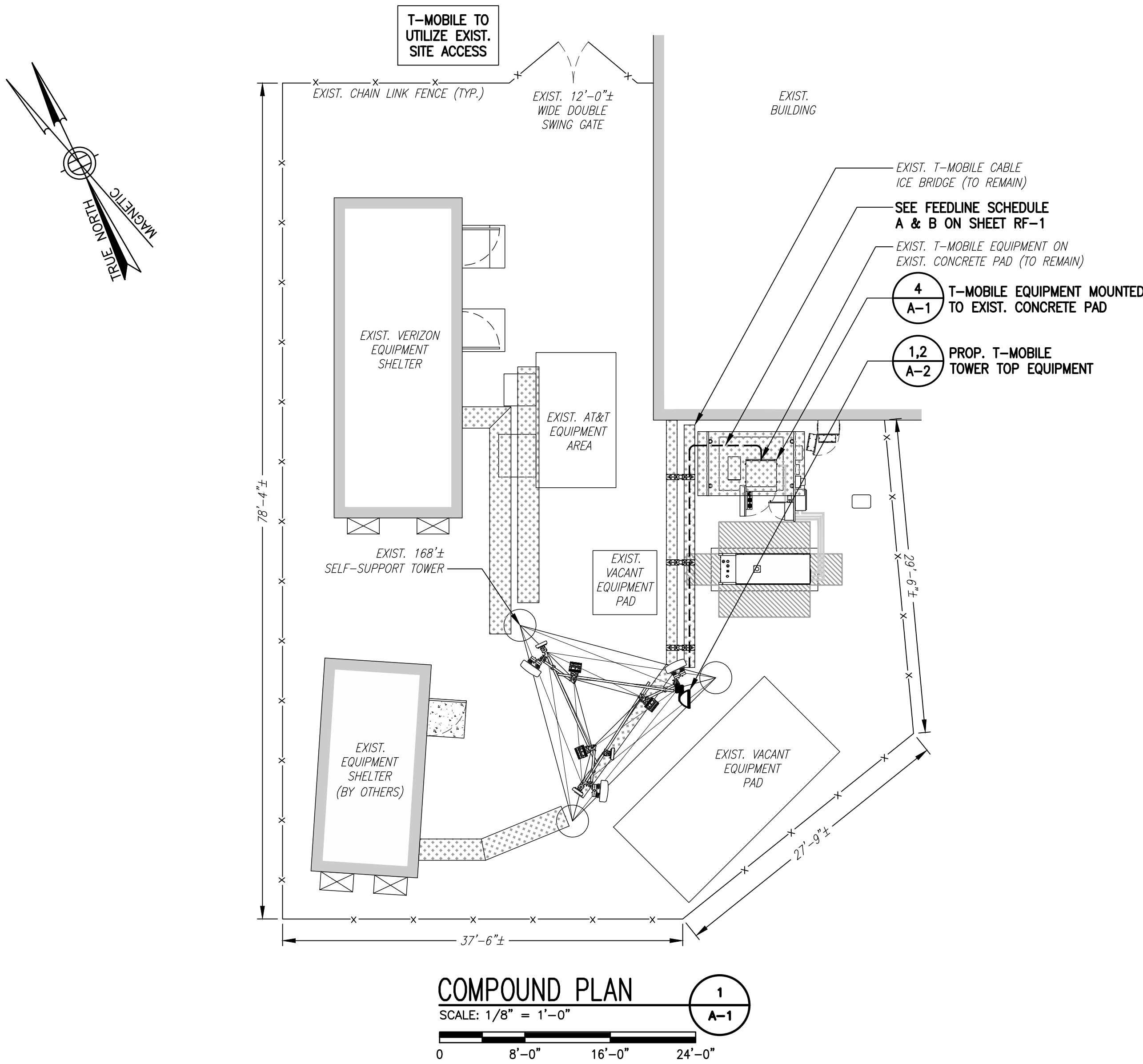
T-1

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

SPECIAL CONSTRUCTION WORK NOTE (HAND DUG UTILITY TRENCH EXCAVATION REQUIRED):
EXISTING UNDERGROUND UTILITY LOCATIONS ARE UNKNOWN. GENERAL CONTRACTOR SHALL HAND-EXCAVATE TO REQUIRED SUB-GRADE DEPTH SUFFICIENT TEST HOLES OR AS DIRECTED/REQUIRED BY SBA REGIONAL SITE MANAGER SHALL HAND-EXCAVATE ALL PROPOSED UNDERGROUND UTILITY TRENCHES. GENERAL CONTRACTOR RESPONSIBLE FOR ANY REQUIRED SPECIAL TEMPORARY PROTECTION OF EXISTING UNDERGROUND UTILITIES, PHYSICAL DAMAGE REPAIR, AND SERVICE RESTORATION.



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

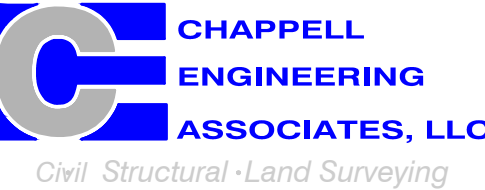


T-MOBILE NORTHEAST LLC

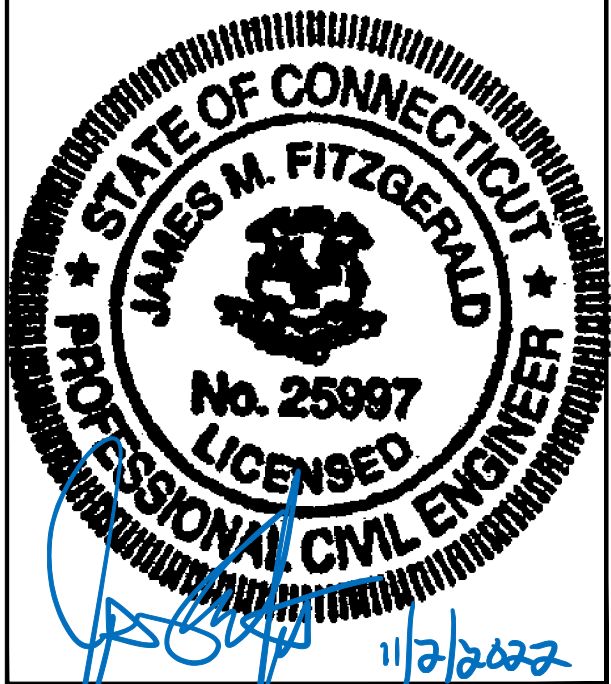
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NORTON, MA 02766
(508) 286-2700



SBA COMMUNICATIONS CORP.
134 FLANDERS ROAD, SUITE 125
WESTBOROUGH, MA 01581
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R.K. EXECUTIVE CENTRE
201 BOSTON POST ROAD WEST, SUITE 101
MARLBOROUGH, MA 01752
(508) 481-7400
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CHECKED BY: JMT

APPROVED BY: JMT

SUBMITTALS			
REV.	DATE	DESCRIPTION	BY
1	11/01/22	ISSUED FOR CONSTRUCTION	CMC
0	09/02/22	ISSUED FOR REVIEW	NWC

SITE NUMBER:
CT11144C

SITE ADDRESS:
1050 BUCKLEY HIGHWAY
UNION, CT 06076

SHEET TITLE
**COMPOUND,
EQUIPMENT PLAN
& PHOTO**

SHEET NUMBER
A-1



EXISTING TOWER PHOTO
SCALE: N.T.S.

1
A-2

TOP OF EXIST. DIPOLE ANTENNA
(HIGHEST APPURTENANCE)
EL. = 188'± AGL

ALPHA & GAMMA SECTORS
EXIST. T-MOBILE TWIN STYLE 1A PCS TMAS
MOUNTED TO EXIST. STANDOFF MOUNT
SECURED TO EXIST. SELF-SUPPORT TOWER
(1 PER SECTOR, TOTAL OF 2) (TO REMAIN)

TOP OF EXIST. SELF-SUPPORT TOWER
EL. = 168'± AGL

ALPHA & GAMMA SECTORS
EXIST. T-MOBILE RFS APX16DWV-16DWVS-E-A20
ANTENNAS MOUNTED TO EXIST. STANDOFF MOUNT
SECURED TO EXIST. SELF-SUPPORT TOWER
(1 PER SECTOR, TOTAL OF 2) (TO REMAIN)

EXIST. VERIZON ANTENNAS
EL. = 149'± AGL

TOP OF EXIST. (1) T-MOBILE ANTENNAS
EL. = 144'± AGL

PROP. (1) T-MOBILE MICROWAVE ANTENNA
EL. = 140'± AGL

EXIST. T-MOBILE (6) PANEL ANTENNAS
EL. = 140'± AGL

EXIST. SPRINT ANTENNAS
EL. = 130'± AGL

EXIST. AT&T ANTENNAS
EL. = 120'± AGL

ALL SECTORS
EXIST. T-MOBILE RFS APX16DWV-16DWVS-E-A20
ANTENNAS MOUNTED TO EXIST. STANDOFF MOUNT
SECURED TO EXIST. SELF-SUPPORT TOWER
(1 PER SECTOR, TOTAL OF 3) (TO REMAIN)

BETA SECTOR
PROP. 2" NOM. (23/8" ACTUAL O.D.) SCH. 40
GALV. STEEL PIPE MAST (6' LONG) (SITE PRO
1 P/N P272) (TOTAL OF 1) SECURED TO
EXIST. STIFF-ARMS WITH CROSSOVER PLATE
KITS (SITE PRO 1 P/N SCX1-K) (TOTAL OF 2)

NOTE:
GROUND EQUIPMENT NOT
SHOWN, FOR CLARITY.

GROUND LEVEL
EL. = 0.0' AGL

TOWER ELEVATION

SCALE: 1" = 10'-0"



2
A-2

BETA SECTOR
EXIST. RELOCATED T-MOBILE RFS
APX16DWV-16DWVS-E-A20 ANTENNA MOUNTED TO
PROP. PIPE MOUNT SECURED TO EXIST. STIFF-ARMS
ON EXIST. SELF-SUPPORT TOWER (TOTAL OF 1)

ALL SECTORS
EXIST. T-MOBILE ERICSSON RADIO 4415 B66A &
RADIO 4449 B71+B12 MOUNTED TO EXIST. PIPE
MOUNT SECURED TO EXIST. SELF-SUPPORT TOWER
(1 EACH PER SECTOR, TOTAL OF 6) (TO REMAIN)

2
A-3
PROP. CERAGON IP-20A RFU-D RADIO'S
MOUNTED TO EXIST. STANDOFF MOUNT SECURED
TO EXIST. SELF-SUPPORT TOWER (TOTAL OF 2)

1
A-3
PROP. T-MOBILE COMMSCOPE VHL2-11W/A
MICROWAVE ANTENNA MOUNTED TO EXIST.
STANDOFF MOUNT SECURED TO EXIST.
SELF-SUPPORT TOWER (TOTAL OF 1)

ALL SECTORS
EXIST. T-MOBILE STANDOFF MOUNTS
SECURED TO EXIST. SELF-SUPPORT TOWER
(1 PER SECTOR, TOTAL OF 3) (TO REMAIN)

BETA SECTOR
EXIST. RELOCATED T-MOBILE TWIN STYLE
1A PCS TMA MOUNTED TO PROP. PIPE
MOUNT SECURED TO EXIST. STIFF-ARMS ON
EXIST. SELF-SUPPORT TOWER (TOTAL OF 1)

ALL SECTORS
EXIST. T-MOBILE STANDOFF MOUNTS
SECURED TO EXIST. SELF-SUPPORT TOWER
(1 PER SECTOR, TOTAL OF 3) (TO REMAIN)

EXIST. 168'± SELF-SUPPORT TOWER

SEE FEEDLINE SCHEDULE
A & B ON SHEET RF-1

BETA SECTOR
PROP. 2" NOM. (23/8" ACTUAL O.D.) SCH. 40 GALV.
STEEL PIPE MAST (6' LONG) (SITE PRO 1 P/N P272) (TOTAL
OF 1) SECURED TO EXIST. STIFF-ARMS WITH CROSSOVER
PLATE KITS (SITE PRO 1 P/N SCX1-K) (TOTAL OF 2)

BETA SECTOR
EXIST. RELOCATED T-MOBILE TWIN STYLE 1A PCS TMA
MOUNTED TO PROP. PIPE MOUNT SECURED TO EXIST.
STIFF-ARMS ON EXIST. SELF-SUPPORT TOWER (TOTAL OF 1)

BETA SECTOR
EXIST. RELOCATED T-MOBILE RFS
APX16DWV-16DWVS-E-A20 ANTENNA MOUNTED TO
PROP. PIPE MOUNT SECURED TO EXIST. STIFF-ARMS
ON EXIST. SELF-SUPPORT TOWER (TOTAL OF 1)

ALL SECTORS
EXIST. T-MOBILE STANDOFF MOUNTS
SECURED TO EXIST. SELF-SUPPORT TOWER
(1 PER SECTOR, TOTAL OF 3) (TO REMAIN)

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

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

RAD CENTER NOTE:
T-MOBILE ANTENNA AND MOUNT RAD CENTER SHOWN IN ELEVATION
ARE ACCORDING TO STRUCTURAL ANALYSIS DONE BY OTHERS AND
MAY DIFFER FROM RAD CENTER ON RFDS PROVIDED BY T-MOBILE.



EXISTING ANTENNA PHOTO
SCALE: N.T.S.

3
A-2

EXISTING ANTENNA PLAN

SCALE: 3/8" = 1'-0"

ALPHA & GAMMA SECTORS
EXIST. T-MOBILE RFS APX16DWV-16DWVS-E-A20 ANTENNAS
MOUNTED TO EXIST. STANDOFF MOUNT SECURED TO EXIST.
SELF-SUPPORT TOWER (1 PER SECTOR, TOTAL OF 2) (TO REMAIN)

ALPHA & GAMMA SECTORS
EXIST. T-MOBILE TWIN STYLE 1A PCS TMAS MOUNTED TO
EXIST. STANDOFF MOUNT SECURED TO EXIST. SELF-SUPPORT
TOWER (1 PER SECTOR, TOTAL OF 2) (TO REMAIN)

ALL SECTORS
EXIST. T-MOBILE ERICSSON RADIO 4415 B66A &
RADIO 4449 B71+B12 MOUNTED TO EXIST. PIPE
MOUNT SECURED TO EXIST. SELF-SUPPORT TOWER
(1 EACH PER SECTOR, TOTAL OF 6) (TO REMAIN)

ALL SECTORS
EXIST. T-MOBILE STIFF-ARM BRACE
(2 PER SECTOR, TOTAL OF 6) (TO REMAIN)

EXIST. 168'± SELF-SUPPORT TOWER

ALL SECTORS
EXIST. T-MOBILE STANDOFF MOUNTS
SECURED TO EXIST. SELF-SUPPORT TOWER
(1 PER SECTOR, TOTAL OF 3) (TO REMAIN)

ALPHA & GAMMA SECTORS
EXIST. T-MOBILE TWIN STYLE 1A PCS TMAS MOUNTED TO
EXIST. STANDOFF MOUNT SECURED TO EXIST. SELF-SUPPORT
TOWER (1 PER SECTOR, TOTAL OF 2) (TO REMAIN)

ALL SECTORS
EXIST. T-MOBILE ERICSSON RADIO 4415 B66A &
RADIO 4449 B71+B12 MOUNTED TO EXIST. PIPE
MOUNT SECURED TO EXIST. SELF-SUPPORT TOWER
(1 EACH PER SECTOR, TOTAL OF 6) (TO REMAIN)

ALL SECTORS
EXIST. T-MOBILE STIFF-ARM BRACE
(2 PER SECTOR, TOTAL OF 6) (TO REMAIN)

EXIST. 168'± SELF-SUPPORT TOWER

ALL SECTORS
EXIST. T-MOBILE STANDOFF MOUNTS
SECURED TO EXIST. SELF-SUPPORT TOWER
(1 PER SECTOR, TOTAL OF 3) (TO REMAIN)

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

ANTENNA STATUS LEGEND:

EMPTY - EMPTY PIPE

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

PROPOSED ANTENNA PLAN

SCALE: 3/8" = 1'-0"

5
A-2

T-MOBILE
NORTHEAST LLC

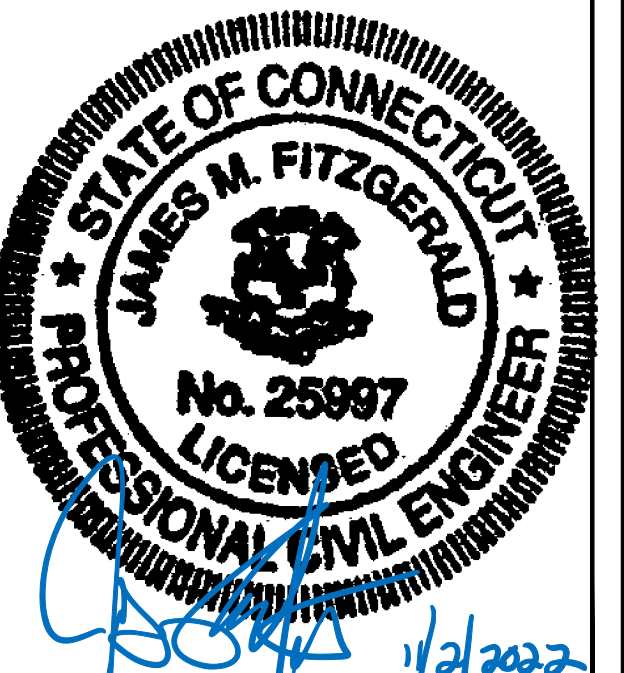
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CHECKED BY: JMT

APPROVED BY: JMT

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
1	11/01/22	ISSUED FOR CONSTRUCTION	CNC
0	09/02/22	ISSUED FOR REVIEW	NWC

SITE NUMBER:
CT11144C

SITE ADDRESS:
1050 BUCKLEY HIGHWAY
UNION, CT 06076

SHEET TITLE

TOWER ELEVATION,
ANTENNA PLANS &
PHOTOS

SHEET NUMBER

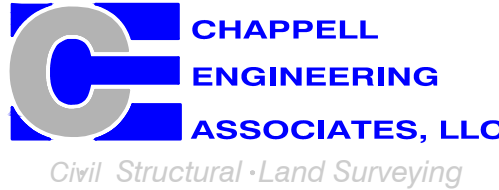
A-2

T-MOBILE
NORTHEAST LLC

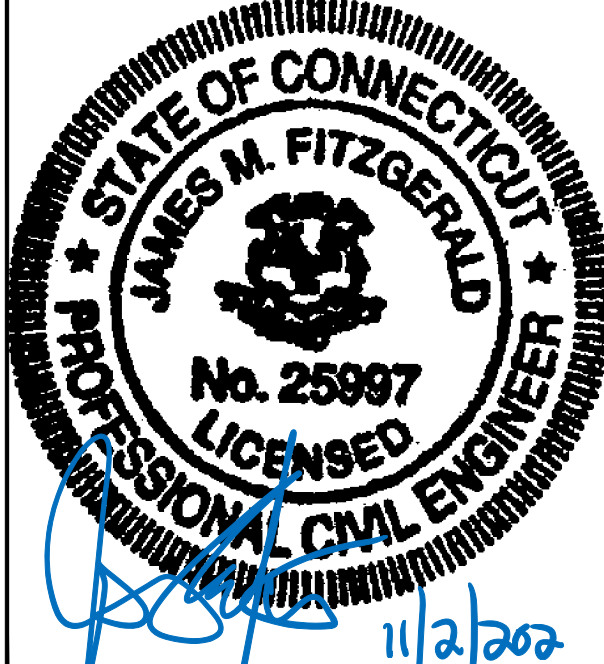
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SITE NUMBER:
CT11144C

SITE ADDRESS:
1050 BUCKLEY HIGHWAY
UNION, CT 06076

SHEET TITLE

SITE DETAILS

SHEET NUMBER

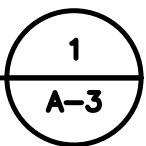
A-3



COMMSCOPE VHLP2-11W/A DISH ANTENNA
DIMENSIONS: 26"Ø x 11.4"D
WEIGHT: 46.3 LBS
TOTAL OF 1

ANTENNA DETAILS

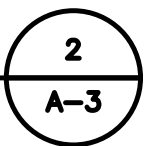
SCALE: N.T.S.



CERAGON IP-20A IDU RFU-D
DIMENSIONS: 9.1"H x 9.2"W x 3.9"D
WEIGHT: 14.3 LBS
TOTAL OF 2

IDU DETAIL

SCALE: N.T.S.



FINAL ANTENNA CONFIGURATION								
SECTOR	ANTENNA	RAD CENTER	AZIMUTH (TRUE NORTH)	MECHANICAL DOWNTILT	ELECTRICAL DOWNTILT	BAND	TMA/RADIOS	CABLES
ALPHA	A1 RFS APX16DWV-16DWVS-E-A20	140'± AGL	-	-	-	-	TWIN STYLE 1A PCS TMA	EXIST. (6) 1/8" COAX CABLES EXIST. (3) 1/4" (9x18) HCS FIBER CABLES PROP. (2) 1/2" FIBER CABLES PROP. (2) 2Cx14AWG DC CABLES
	A2 RFS APXVAARR24_43-U-NA20	140'± AGL	-	-	-	-	ERICSSON RADIO 4415 B66A	
					-	-	ERICSSON RADIO 4449 B71+B12	
					-	-		
BETA	B1 COMMSCOPE VHLP2-11W/A	140'± AGL	115'	-	-	-	CERAGON RADIO IP-20A RFU-D	
	B2 RFS APX16DWV-16DWVS-E-A20	140'± AGL	-	-	-	-	CERAGON RADIO IP-20A RFU-D	
	B3 RFS APXVAARR24_43-U-NA20	140'± AGL	-	-	-	-	TWIN STYLE 1A PCS TMA	
					-	-	ERICSSON RADIO 4415 B66A	
GAMMA	G1 RFS APX16DWV-16DWVS-E-A20	140'± AGL	-	-	-	-	ERICSSON RADIO 4449 B71+B12	
	G2 RFS APXVAARR24_43-U-NA20	140'± AGL	-	-	-	-	TWIN STYLE 1A PCS TMA	
					-	-	ERICSSON RADIO 4415 B66A	
					-	-	ERICSSON RADIO 4449 B71+B12	
CABLE NOTE: SEE FEEDLINE SCHEDULE A & B BELOW.								

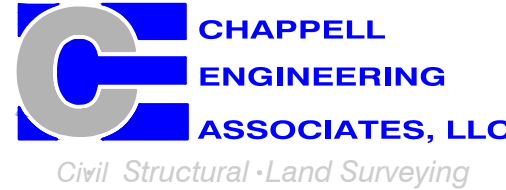
FEEDLINE SCHEDULE		
SCHEDULE	FEEDLINES	LOCATION
A	<i>EXISTING TO REMAIN:</i> (6) 1/8" COAX CABLES (3) 1/4" (9x18) HCS FIBER CABLES <i>EXISTING TO BE REMOVED:</i> NONE	ROUTED PER STRUCTURAL ANALYSIS
B	<i>PROPOSED:</i> (2) 1/2" FIBER CABLES (2) 2Cx14AWG DC CABLES	
NOTE: EXISTING T-MOBILE EQUIPMENT FEEDLINE INVENTORY BASED ON OBSERVED FIELD CONDITIONS. RFDS AND FEEDLINE LEASING ENTITLEMENTS MAY DIFFER.		

T-MOBILE
NORTHEAST LLC

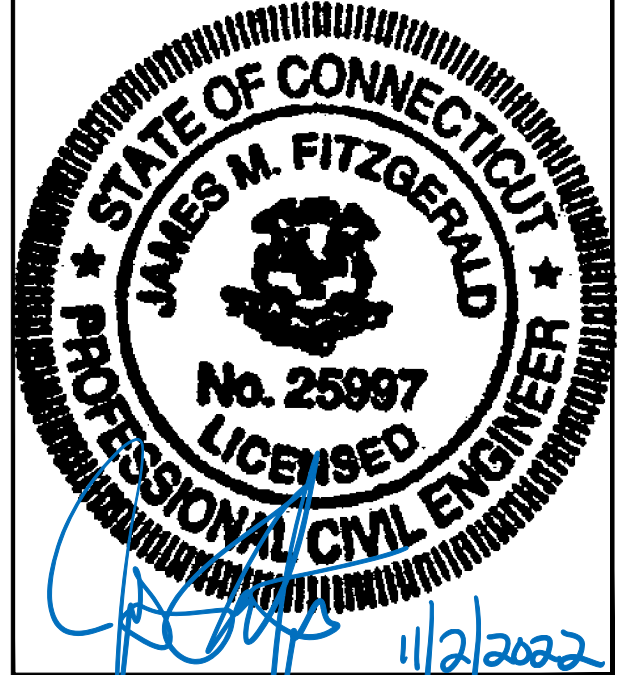
15 COMMERCE WAY, SUITE B
NORTON, MA 02766
(508) 286-2700



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



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



CHECKED BY: JMT

APPROVED BY: JMT

SUBMITTALS			
REV.	DATE	DESCRIPTION	BY
1	11/01/22	ISSUED FOR CONSTRUCTION	CMC
0	08/02/22	ISSUED FOR REVIEW	NWC

SITE NUMBER:
CT11144C

SITE ADDRESS:
1050 BUCKLEY HIGHWAY
UNION, CT 06076

SHEET TITLE

RF DATA

SHEET NUMBER

RF-1



EXISTING POWER PANEL PHOTO
SCALE: NOT TO SCALE

1
E-1

ONE LINE DIAGRAM
SCALE: NOT TO SCALE

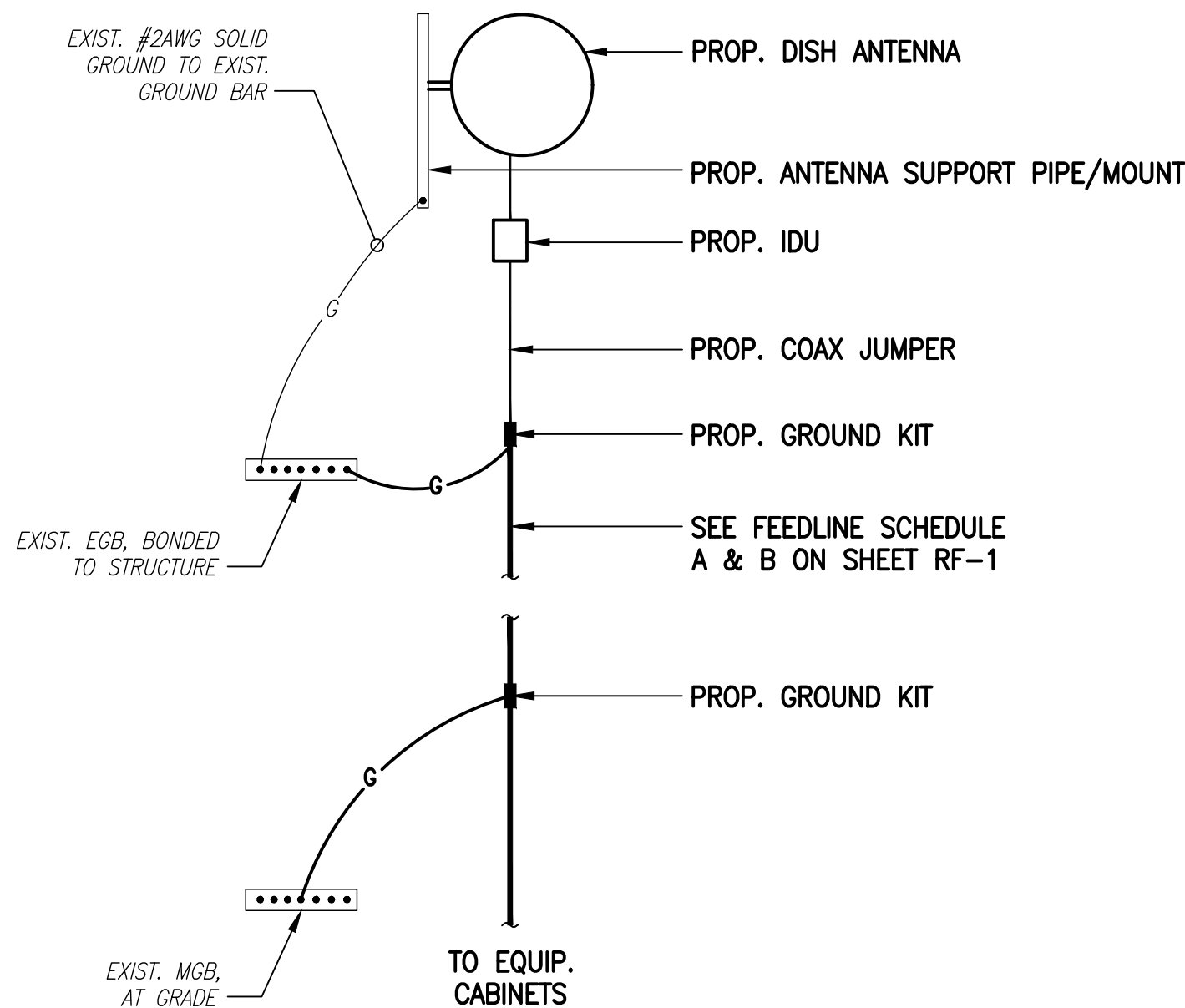
2
E-1

GROUNDING RISER DIAGRAM
SCALE: NOT TO SCALE

3
E-1

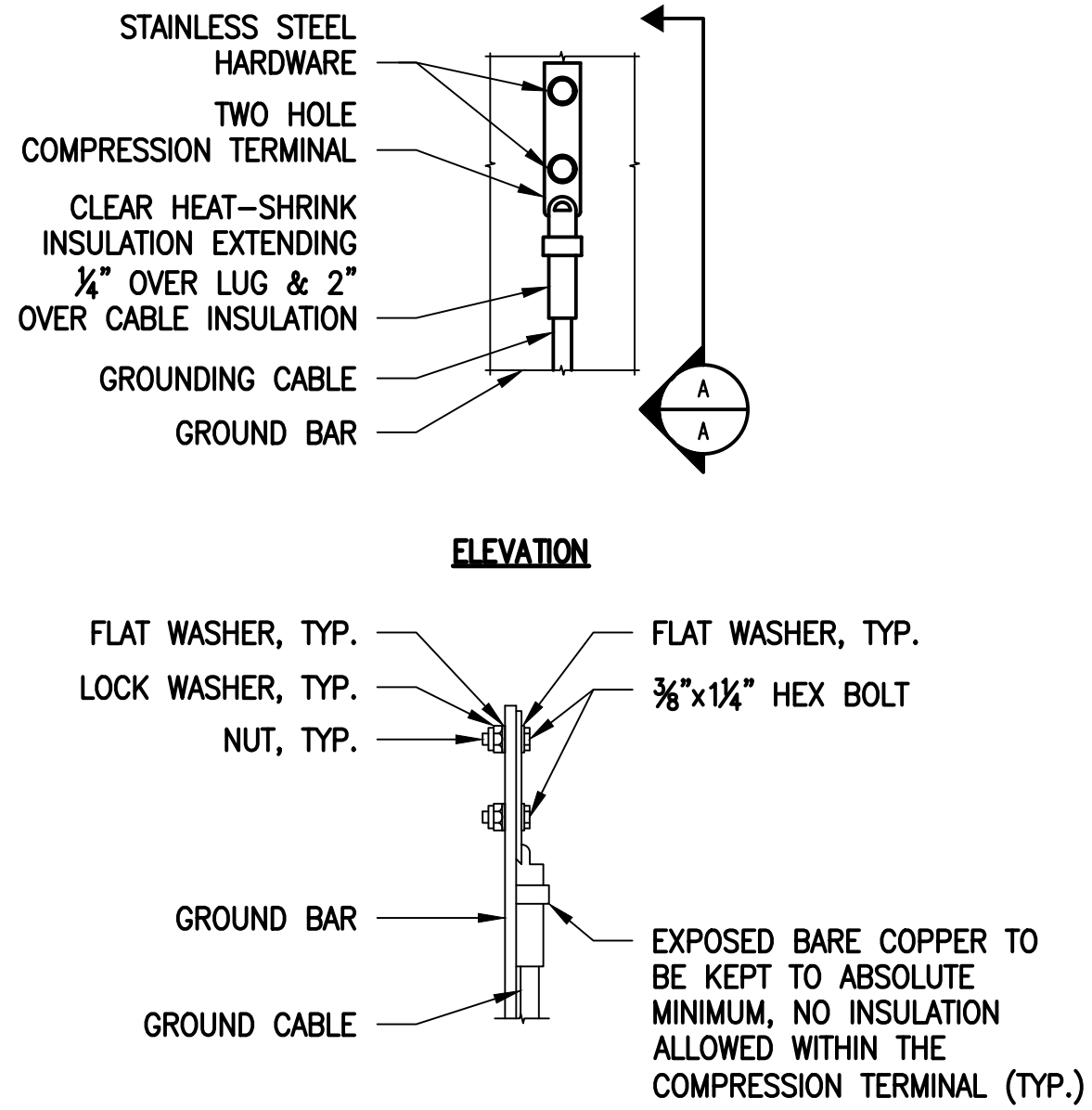
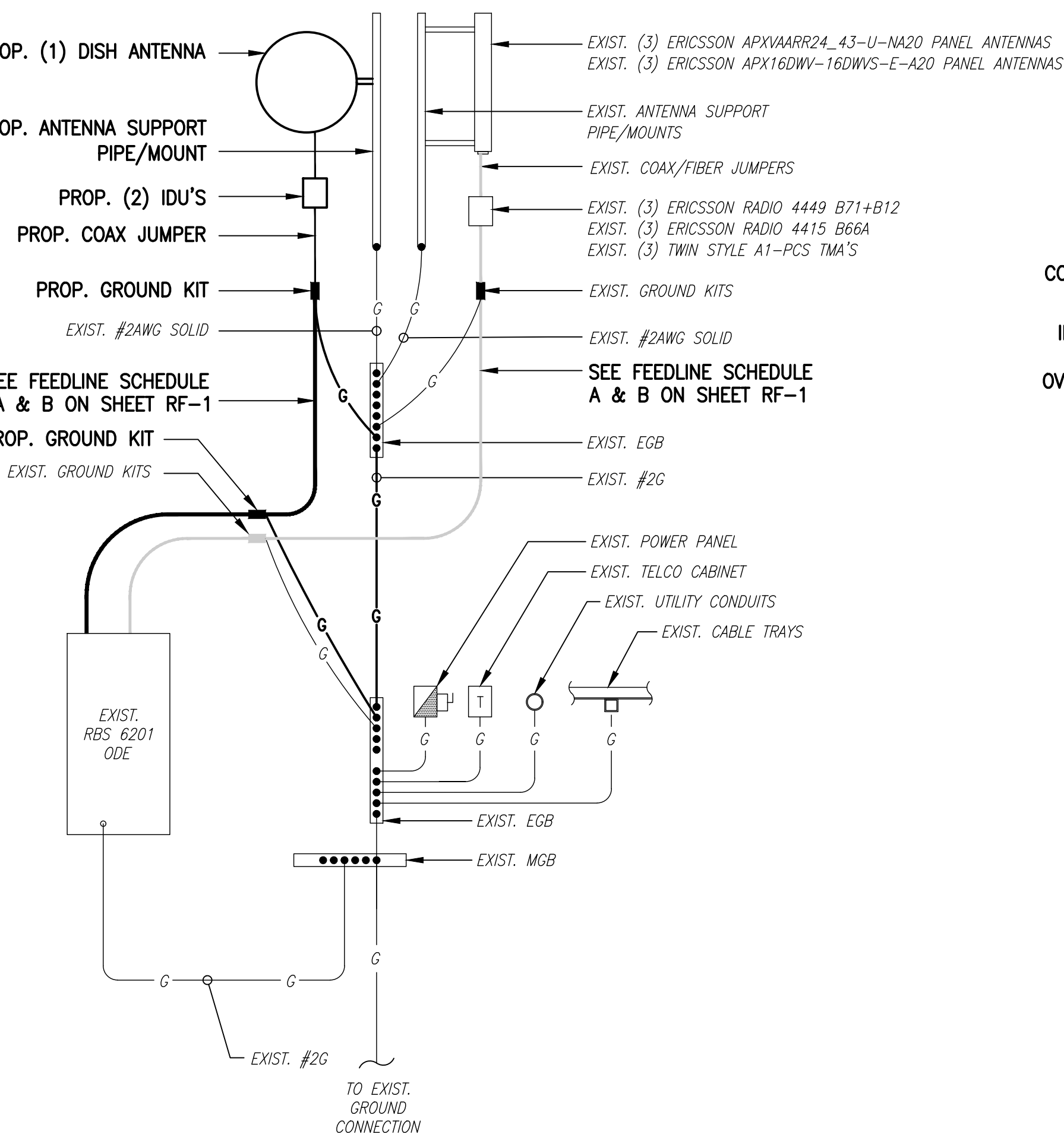
TYPICAL GROUND BAR CONNECTIONS DETAIL
SCALE: NOT TO SCALE

4
E-1



COAX CABLE CONNECTION AND GROUNDING DETAIL
SCALE: NOT TO SCALE

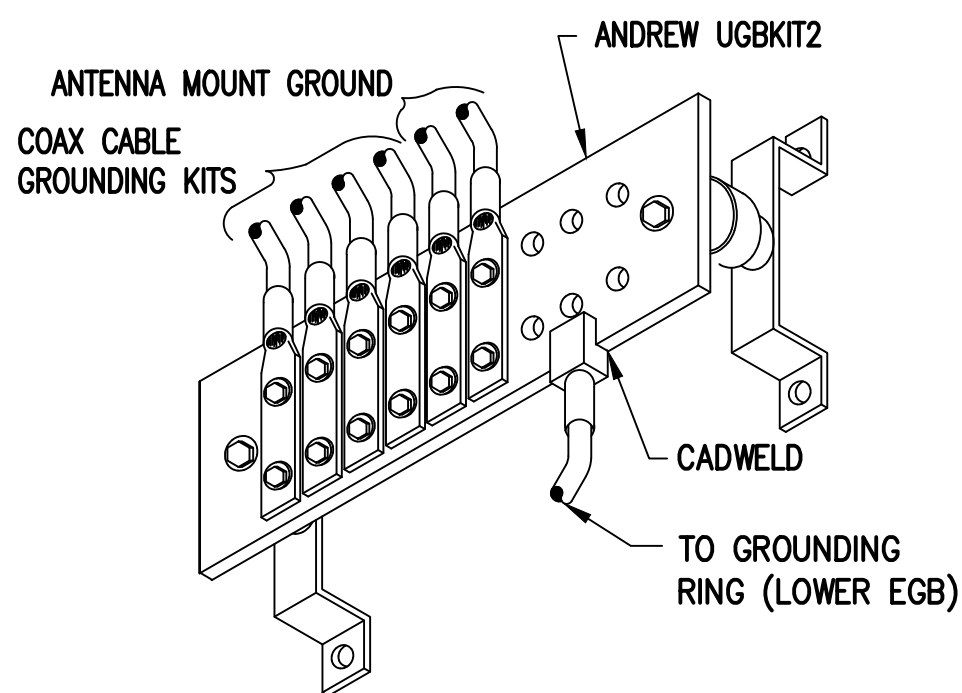
5
E-1



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

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 OHMS 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.



GROUND BAR (EGB)
SCALE: NOT TO SCALE

6
E-1

T-MOBILE NORTHEAST LLC

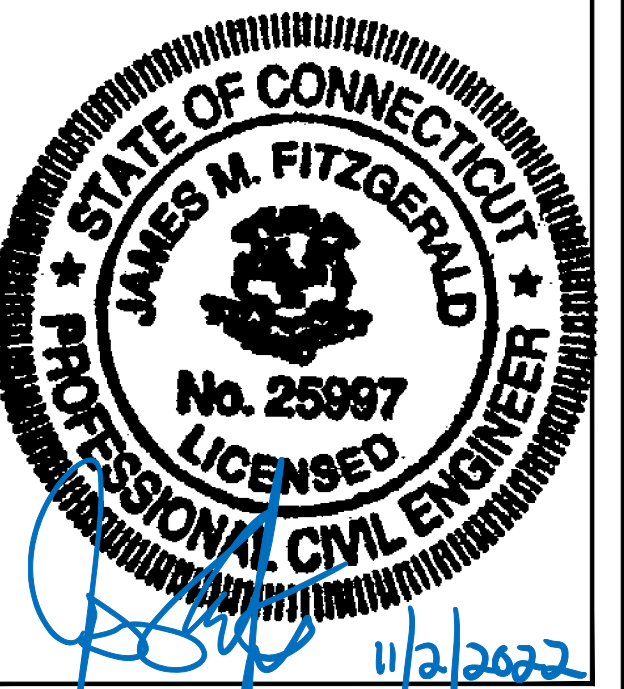
15 COMMERCE WAY, SUITE B
NORTON, MA 02766
(508) 286-2700



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



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



CHECKED BY: JMT

APPROVED BY: JMT

SUBMITTALS			
REV.	DATE	DESCRIPTION	BY
1	11/01/22	ISSUED FOR CONSTRUCTION	CNC
0	09/02/22	ISSUED FOR REVIEW	NWC

SITE NUMBER:
CT11144C

SITE ADDRESS:
1050 BUCKLEY HIGHWAY
UNION, CT 06076

SHEET TITLE

ELECTRIC & GROUNDING
DETAILS

SHEET NUMBER

E-1

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 168 ft Sabre Self Supporting Tower

Customer Name: SBA Communications Corp

Customer Site Number: CT24369-A-SBA

Customer Site Name: Union 4, CT

Carrier Name: T-Mobile (App#: 207045, V#1)

Carrier Site ID / Name: CT11144C / Union 4

Site Location: 1050 Buckley Highway

Union, Connecticut

TOLLAND County

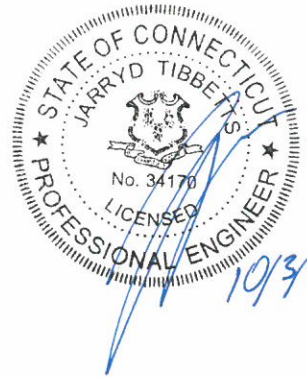
Latitude: 41.999200

Longitude: -72.152400

Analysis Result:

Max Structural Usage: 65.5% [Pass]

Report Prepared By : Saroj Dangol



NOTE: Mount for dish to be install as per placement diagram on tie back members. . Any deviations, unless explicitly approved by TES, may render this analysis invalid, if the proposed parts are not installed in accordance with this analysis.

Introduction

The purpose of this report is to summarize the analysis results on the (3) Sector Frames at 140.00' 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 TOWER ENGINEERING PROFESSIONALS dated 09/28/2022
Antenna Loading	SBA Application #: 207045, v1 dated 09/06/2022
Modification Drawings	N/A

Analysis Criteria

Wind Speed Used in the Analysis: 120 mph (3-Sec. Gust) (Ultimate Wind Speed)

Wind Speed with Ice: 49 mph (3-Sec. Gust) with 1.2" radial ice concurrent

Service Load Wind Speed: 30 mph +0" Radial ice

Standard/Codes: ANSI/TIA/EIA 222-H / 2022 IBC

Exposure Category: C

Risk Category: II

Topographic Category: 1

Crest Height (Ft): 0

Ground Elevation Factor: 0.965

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

(3) Sector Frames at 140.00' elevation

Final Antenna Configuration

- 3 RFS APX16DWV-16DWVS-E-A20
- 3 RFS APXVAALL24_43-U-NA20
- 1 Andrew VHLP2-11W/A
- 2 Ceragon RFU-D
- 3 Generic Twin Style 1A-PCS*
- 3 Ericsson 4449 B71 + B12*
- 3 Ericsson 4415 B66A*

* Equipment to be flush mounted directly to the mount members and are not shown in the placement diagram.

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

Analysis Results

Our calculations have determined that under design wind load the existing mounts will be structurally adequate to support the proposed antenna configuration. The maximum structural usage is 65.5%, which occurs in the standoff 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.



Structure: CT24369-A-SBA - Union 4, CT

Sector: **A**

10/3/2022

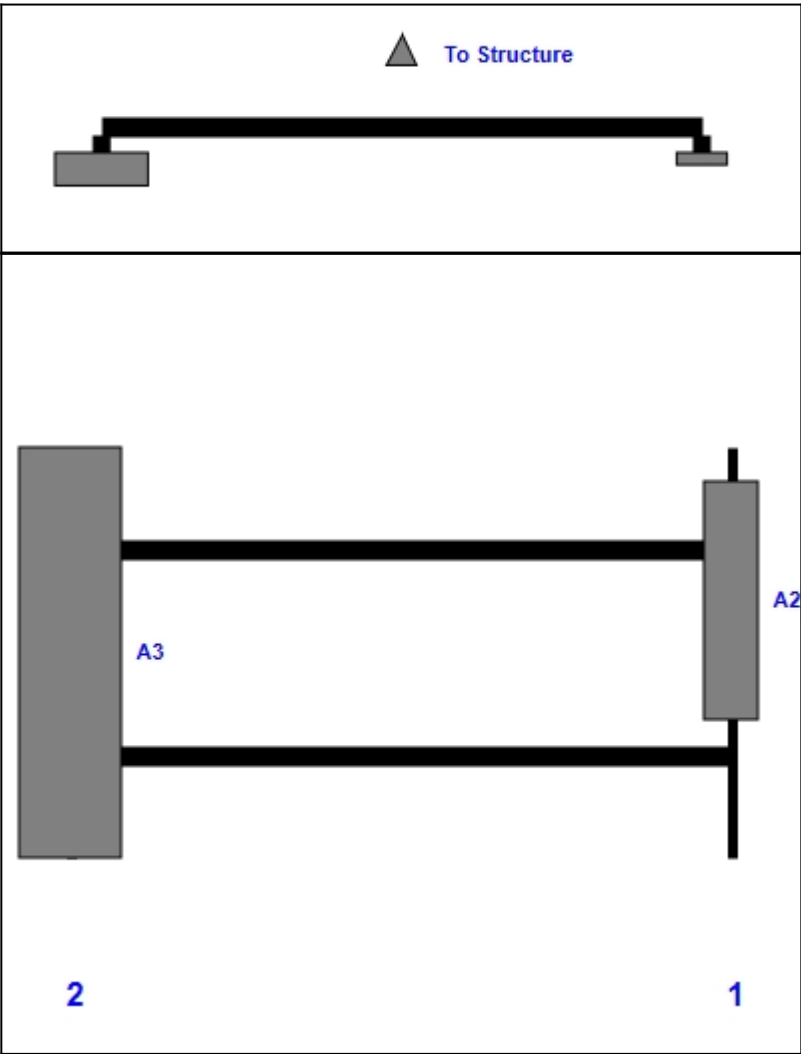


Structure Type: Self Support

Mount Elev: 140.00

Page: 1

Plan View



Front View

Looking Toward Structure

Ref #	Model	Height (in)	Width (in)	H Dist Left	Pipe #	Pipe Pos V	Pos	From Top	H Offset	Status	Validation
A2	APX16DWV-16DWVS-E-A20	55.90	13.00	155.00	1	a	Front	36.00		Retained	
A3	APXVAALL24_43-U-NA20	95.90	24.00	0.10	2	a	Front	48.00		Added	

Sector: B

10/3/2022

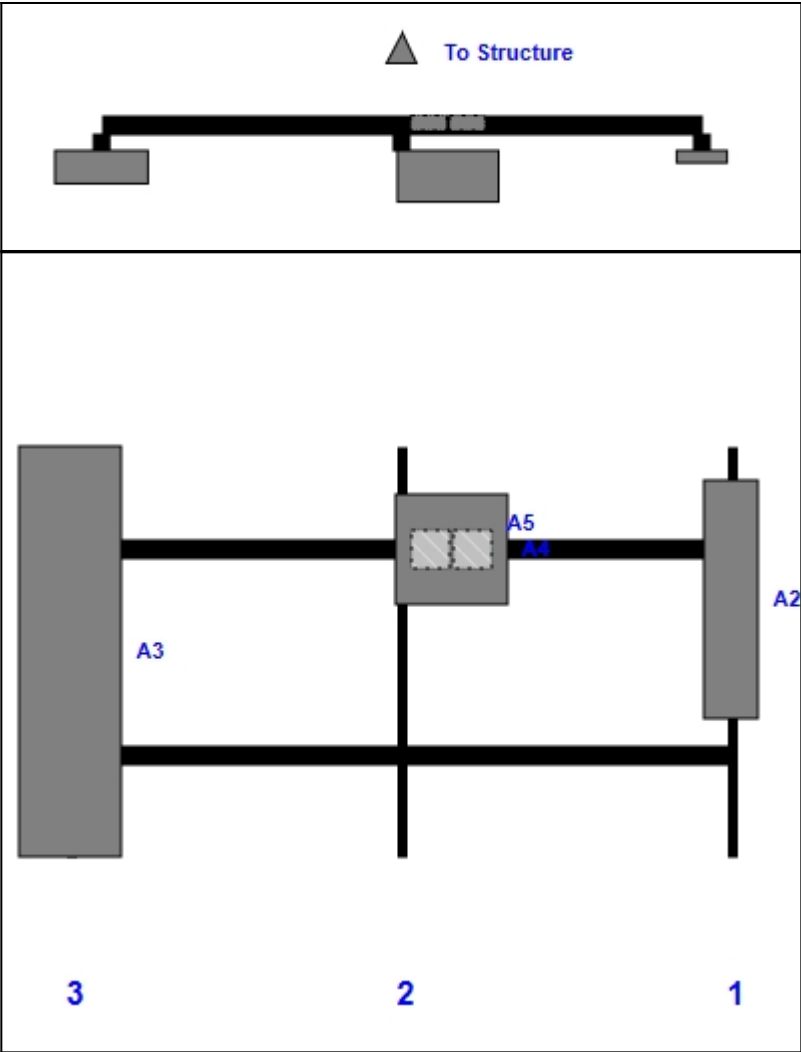


Structure Type: Self Support

Mount Elev: 140.00

Page: 2

Plan View



Ref #	Model	Height (in)	Width (in)	H Dist Left	Pipe #	Pipe Pos V	Pos	From Top	H Offset	Status	Validation
A2	APX16DWV-16DWVS-E-A20	55.90	13.00	155.00	1	a	Front	36.00		Retained	
A4	VHLP2-11W/A	26.10	26.10	77.50	2	a	Front	24.00	12.00	Added	
A5	RFU-D	9.05	9.17	77.50	2	a	Behind	24.00	7.00	Added	
A5	RFU-D	9.05	9.17	77.50	2	b	Behind	24.00	17.00	Added	
A3	APXVAALL24_43-U-NA20	95.90	24.00	0.10	3	a	Front	48.00		Added	

Structure: CT24369-A-SBA - Union 4, CT

Sector: C

10/3/2022

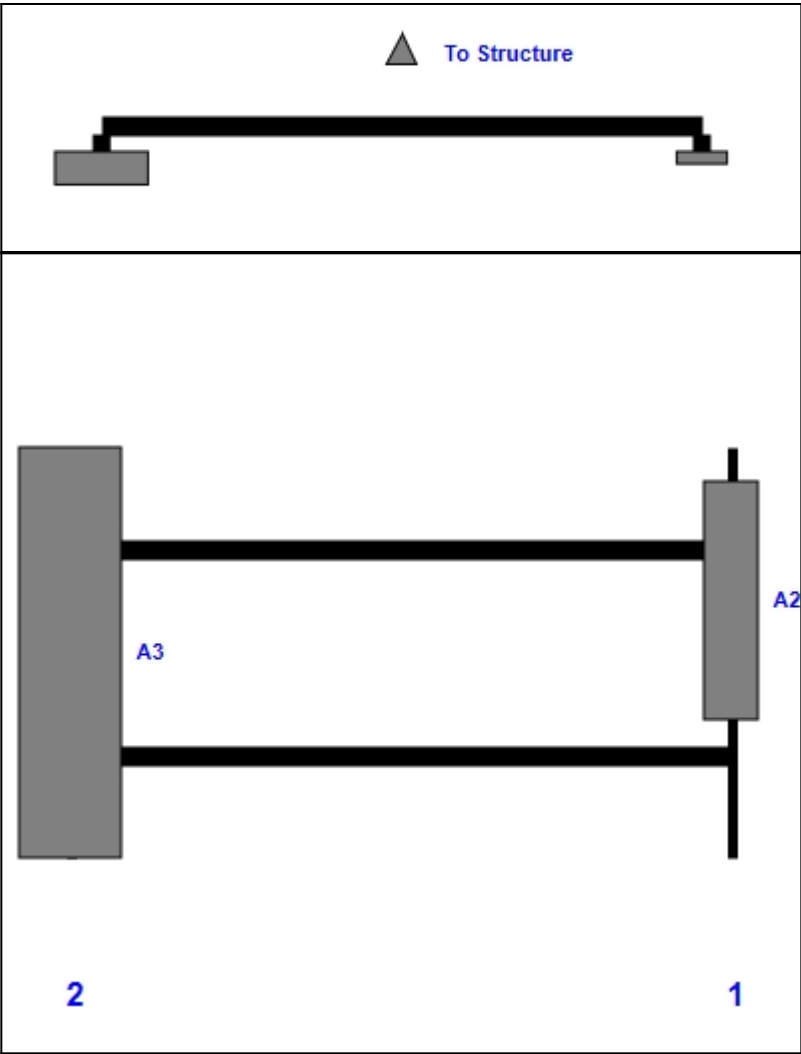


Structure Type: Self Support

Mount Elev: 140.00

Page: 3

Plan View



Front View
Looking Toward Structure

Ref #	Model	Height (in)	Width (in)	H Dist Left	Pipe #	Pipe Pos V	Pos	From Top	H Offset	Status	Validation
A2	APX16DWV-16DWVS-E-A20	55.90	13.00	155.00	1	a	Front	36.00		Retained	
A3	APXVAALL24_43-U-NA20	95.90	24.00	0.10	2	a	Front	48.00		Added	



Antenna Mount Mapping Form (PATENT PENDING)

FCC #

Tower Owner:	SBA COMMUNICATIONS
--------------	--------------------

Mapping Date:	9/28/2022
---------------	-----------

Site Name:	CT11144C
------------	----------

Tower Type:	Self Support
-------------	--------------

Site Number or ID:	CT24369-A-SBA
--------------------	---------------

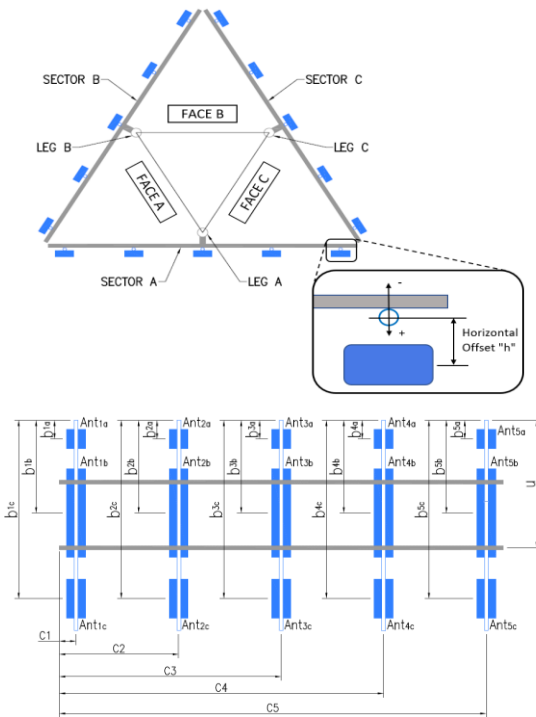
Tower Height (Ft.):	
---------------------	--

Mapping Contractor:	TOWER ENGINEERING PROFESSIONALS
---------------------	---------------------------------

Mount Elevation (Ft.):	143'-9"
------------------------	---------

This antenna mapping form is the property of TES and under **PATENT PENDING**. The formation contained herein is considered confidential in nature and is to be used only for the specific customer it was intended for. Reproduction, transmission, publication, modification or disclosure by any method is prohibited except by express written permission of TES. All means and methods are the responsibility of the contractor and the work shall be compliant with ANSI/ASSE A 10.48, OSHA, FCC, FAA and other safety requirements that may apply. TES is not warranting the usability of the safety climb as it must be assessed prior to each use in compliance with OSHA requirements.

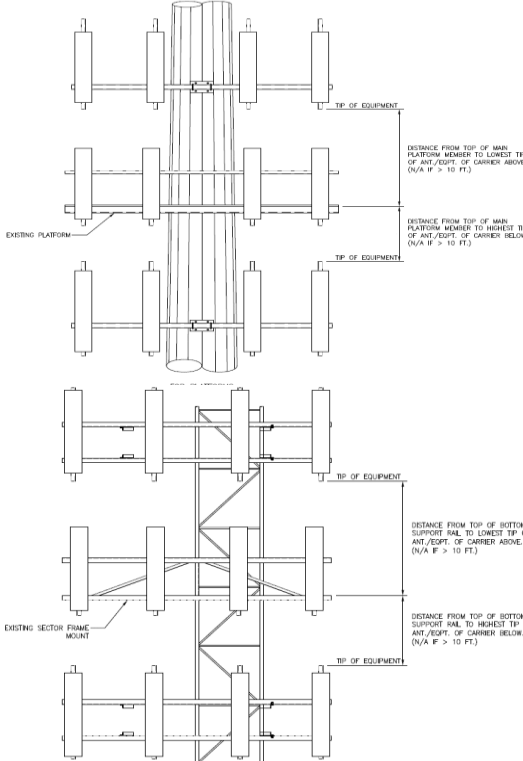
Please insert the sketches of the antenna mount from the "Sketches" tab with dimensions and members here.



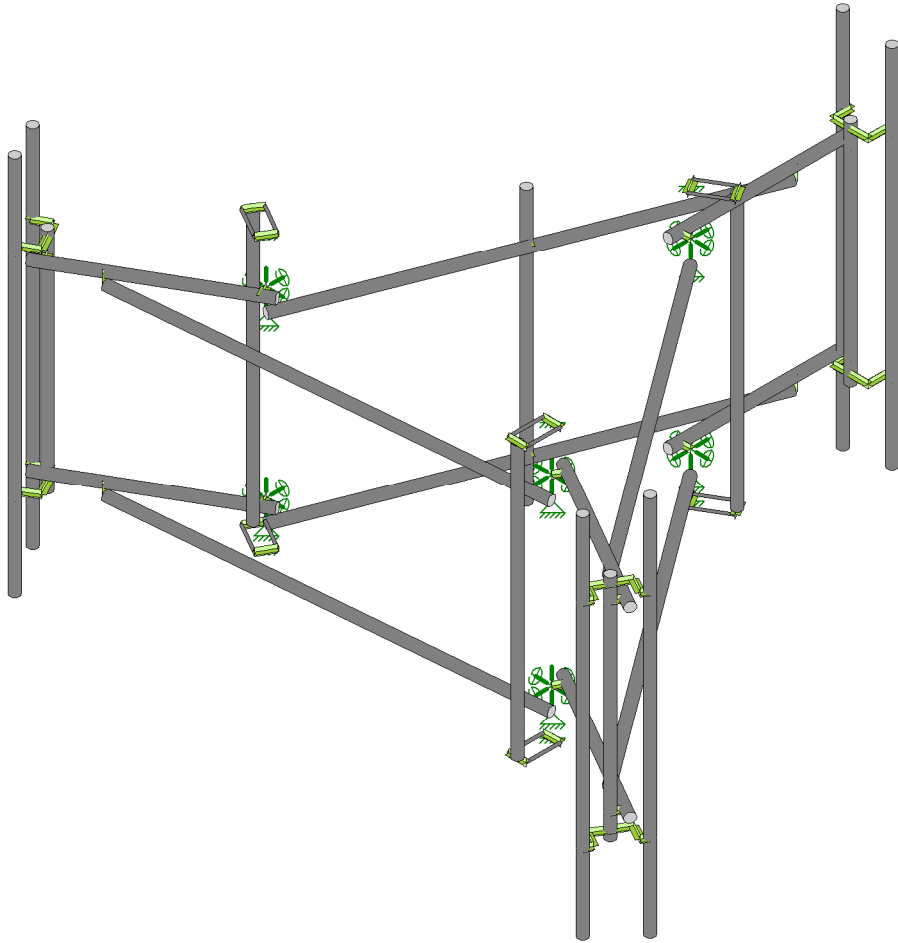
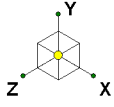
Antenna Layout (Looking Out From Tower)

Mount Pipe Configuration and Geometries [Unit = Inches]							
Sector / Position	Mount Pipe Size & Length	Vertical Offset Dimension "U"	Horizontal Offset "C1, C2, C3, etc."	Sector / Position	Mount Pipe Size & Length	Vertical Offset Dimension "U"	Horizontal Offset "C1, C2, C3, etc."
A1	2.375"Ø X .125" WALL X 96" LONG		4.25	C1	2.375"Ø X .125" WALL X 96" LONG		4.25
A2	2.875"Ø X .1875" WALL X 108" LONG		4.25	C2	2.875"Ø X .1875" WALL X 108" LONG		4.25
A3				C3			
A4				C4			
A5				C5			
A6				C6			
B1	2.375"Ø X .125" WALL X 96" LONG		4.25	D1			
B2	2.875"Ø X .1875" WALL X 108" LONG		4.25	D2			
B3				D3			
B4				D4			
B5				D5			
B6				D6			
Distance between bottom rail and mount CL elevation (dim d). Unit is inches. See 'Mount Elev Ref' tab for details. :							
Distance from top of bottom support rail to lowest tip of ant./eqpt. of Carrier above. (N/A if > 10 ft.):							
Distance from top of bottom support rail to highest tip of ant./eqpt. of Carrier below. (N/A if > 10 ft.):							
Please enter additional information or comments below.							
Tower Face Width at Mount Elev. (ft.):		6.75	Tower Leg Size or Pole Shaft Diameter at Mount Elev. (in.):				2.875

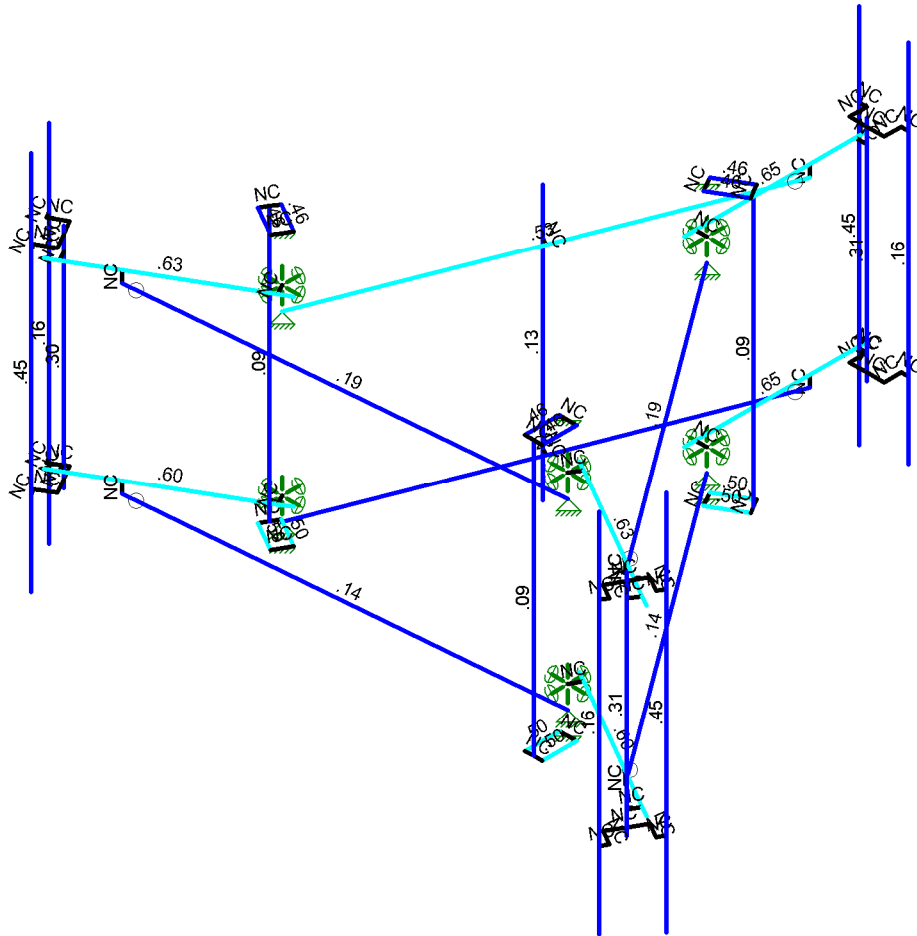
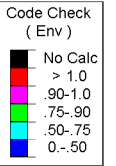
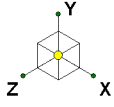
[illegible]

Mount Azimuth (Degree) for Each Sector				Tower Leg Azimuth (Degree) for Each Sector				Sector B																
Sector A:	0.00	Deg	Leg A:	0.00	Deg	Ant _{1a}																		
Sector B:	120.00	Deg	Leg B:	120.00	Deg	Ant _{1b}	N/A	13.00	3.50	56.00	#VALUE!				120.00	44, 65								
Sector C:	240.00	Deg	Leg C:	240.00	Deg	Ant _{1c}																		
Sector D:		Deg	Leg D:		Deg	Ant _{2a}																		
							Ant _{2b}	N/A	24.00	8.50	96.00	#VALUE!			120.00	45, 69								
							Ant _{2c}																	
							Ant _{3a}																	
							Ant _{3b}																	
							Ant _{3c}																	
							Ant _{4a}																	
							Ant _{4b}																	
							Ant _{4c}																	
							Ant _{5a}																	
							Ant _{5b}																	
							Ant _{5c}																	
							Ant on Standoff																	
							Ant on Standoff																	
							Ant on Tower																	
							Ant on Tower																	
Climbing Facility Information																								
Location:		Deg	Outside Face C				Ant _{3a}																	
Climbing Facility	Corrosion Type:		Good condition.				Ant _{3b}																	
	Access:		Climbing path was unobstructed.				Ant _{3c}																	
	Condition:		Good condition.				Ant _{4a}																	
							Ant _{4b}																	
							Ant _{4c}																	
							Ant _{5a}																	
							Ant _{5b}																	
							Ant _{5c}																	
							Ant on Standoff																	
							Ant on Standoff																	
							Ant on Tower																	
							Ant on Tower																	
							Sector C																	
							Ant _{1a}						Ant _{1b}	N/A	13.00	3.50	56.00	#VALUE!				240.00	51, 65	
							Ant _{1c}						Ant _{2a}											
Ant _{2b}						Ant _{2c}	N/A	24.00	8.50	96.00	#VALUE!				240.00	52, 69								
Ant _{3a}						Ant _{3b}																		
Ant _{3c}						Ant _{4a}																		
Ant _{4b}						Ant _{4c}																		
Ant _{5a}						Ant _{5b}																		
Ant _{5c}						Ant on Standoff																		
Ant on Standoff						Ant on Standoff																		
Ant on Tower						Ant on Tower																		
Ant on Tower																								
Sector D																								
Ant _{1a}						Ant _{1b}																		
Ant _{1c}						Ant _{2a}																		
Ant _{2b}						Ant _{2c}																		
Ant _{3a}						Ant _{3b}																		
Ant _{3c}						Ant _{4a}																		
Ant _{4b}						Ant _{4c}																		
Ant _{5a}						Ant _{5b}																		
Ant _{5c}						Ant on Standoff																		
Ant on Standoff						Ant on Standoff																		
Ant on Tower						Ant on Tower																		
Ant on Tower																								

Observed Safety and Structural Issues During the Mount Mapping		
Issue #	Description of Issue	Photo #



Tower Engineering Solutio...	CT24369-A-SBA_MT_LO_Loads Only_H	SK - 1
		Oct 3, 2022 at 2:49 PM
TES Project No. 133963		CT24369-A-SBA_133963_H_RISA_...



Member Code Checks Displayed (Enveloped)
Results for LC 1, 1.2D+1.0Wo (0 Deg)

Tower Engineering Solutio...

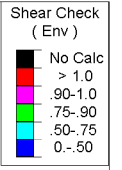
CT24369-A-SBA_MT_LO_Loads Only_H

SK - 2

Oct 3, 2022 at 2:50 PM

TES Project No. 133963

CT24369-A-SBA_133963_H_RISA_...

Page 3

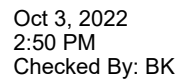


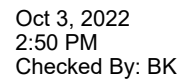
Company : Tower Engineering Solutions, LLC
 Designer :
 Job Number : TES Project No. 133963
 Model Name : CT24369-A-SBA_MT_LO_Loads Only_H

Oct 3, 2022
 2:50 PM
 Checked By: BK

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed Area(Me...	Surface(...
1	Antenna D	None					72		
2	Antenna Di	None					72		
3	Antenna Wo (0 Deg)	None					72		
4	Antenna Wo (30 Deg)	None					72		
5	Antenna Wo (60 Deg)	None					72		
6	Antenna Wo (90 Deg)	None					72		
7	Antenna Wo (120 Deg)	None					72		
8	Antenna Wo (150 Deg)	None					72		
9	Antenna Wo (180 Deg)	None					72		
10	Antenna Wo (210 Deg)	None					72		
11	Antenna Wo (240 Deg)	None					72		
12	Antenna Wo (270 Deg)	None					72		
13	Antenna Wo (300 Deg)	None					72		
14	Antenna Wo (330 Deg)	None					72		
15	Antenna Wi (0 Deg)	None					72		
16	Antenna Wi (30 Deg)	None					72		
17	Antenna Wi (60 Deg)	None					72		
18	Antenna Wi (90 Deg)	None					72		
19	Antenna Wi (120 Deg)	None					72		
20	Antenna Wi (150 Deg)	None					72		
21	Antenna Wi (180 Deg)	None					72		
22	Antenna Wi (210 Deg)	None					72		
23	Antenna Wi (240 Deg)	None					72		
24	Antenna Wi (270 Deg)	None					72		
25	Antenna Wi (300 Deg)	None					72		
26	Antenna Wi (330 Deg)	None					72		
27	Antenna Wm (0 Deg)	None					72		
28	Antenna Wm (30 Deg)	None					72		
29	Antenna Wm (60 Deg)	None					72		
30	Antenna Wm (90 Deg)	None					72		
31	Antenna Wm (120 Deg)	None					72		
32	Antenna Wm (150 Deg)	None					72		
33	Antenna Wm (180 Deg)	None					72		
34	Antenna Wm (210 Deg)	None					72		
35	Antenna Wm (240 Deg)	None					72		
36	Antenna Wm (270 Deg)	None					72		
37	Antenna Wm (300 Deg)	None					72		
38	Antenna Wm (330 Deg)	None					72		
39	Structure D	None		-1					
40	Structure Di	None						37	
41	Structure Wo (0 Deg)	None						74	
42	Structure Wo (30 Deg)	None						74	
43	Structure Wo (60 Deg)	None						74	
44	Structure Wo (90 Deg)	None						74	
45	Structure Wo (120 Deg)	None						74	
46	Structure Wo (150 Deg)	None						74	
47	Structure Wo (180 Deg)	None						74	
48	Structure Wo (210 Deg)	None						74	
49	Structure Wo (240 Deg)	None						74	
50	Structure Wo (270 Deg)	None						74	
51	Structure Wo (300 Deg)	None						74	
52	Structure Wo (330 Deg)	None						74	
53	Structure Wi (0 Deg)	None						74	





Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
1	ORIGIN	0	0	0	0	
2	N2	3.345	0	1.931237	0	
3	N3	3.345	4	1.931237	0	
4	N4	3.22	0	2.147743	0	
5	N5	3.22	4	2.147743	0	
6	N6	3.128494	0	1.806237	0	
7	N7	3.128494	4	1.806237	0	
8	N8	6.592595	0	3.806237	0	
9	N9	6.592595	4	3.806237	0	
10	N10	6.376089	0	3.681237	0	
11	N11	6.376089	4	3.681237	0	
12	N12	6.251089	0	3.897743	0	
13	N13	6.251089	4	3.897743	0	
14	N14	6.251089	4.5	3.897743	0	
15	N15	6.251089	-5	3.897743	0	
16	N16	6.251089	4.3334	3.897743	0	
17	N17	6.251089	-.334	3.897743	0	
18	N18	6.063589	4.3334	4.222503	0	
19	N19	6.063589	-.334	4.222503	0	
20	N20	6.438589	4.3334	3.572983	0	
21	N21	6.438589	-.334	3.572983	0	
22	N22	6.388348	4.3334	4.410003	0	
23	N23	6.388348	-.334	4.410003	0	
24	N24	6.763348	4.3334	3.760483	0	
25	N25	6.763348	-.334	3.760483	0	
26	N26	6.305349	4.3334	4.553763	0	
27	N27	6.305349	-.334	4.553763	0	
28	N28	6.846349	4.3334	3.616723	0	
29	N29	6.846349	-.334	3.616723	0	
30	N30	6.305348	6	4.553763	0	
31	N31	6.846348	6.1666	3.616723	0	
32	N32	6.305348	-2	4.553763	0	
33	N33	6.846348	-2.1667	3.616723	0	
34	N34	5.510064	0	3.181237	0	
35	N35	5.510064	4	3.181237	0	
36	N36	5.510064	-.25	3.181237	0	
37	N37	5.510064	3.75	3.181237	0	
38	N39	0	0	-3.862473	0	
39	N40	0	4	-3.862473	0	
40	N41	.25	0	-3.862473	0	
41	N42	.25	4	-3.862473	0	
42	N43	0	0	-3.612473	0	
43	N44	0	4	-3.612473	0	
44	N45	0	0	-7.612473	0	
45	N46	0	4	-7.612473	0	
46	N47	0	0	-7.362473	0	
47	N48	0	4	-7.362473	0	
48	N49	.25	0	-7.362473	0	
49	N50	.25	4	-7.362473	0	
50	N51	.25	4.5	-7.362473	0	
51	N52	.25	-.5	-7.362473	0	
52	N53	.25	4.3334	-7.362473	0	
53	N54	.25	-.334	-7.362473	0	
54	N55	.625	4.3334	-7.362473	0	
55	N56	.625	-.334	-7.362473	0	
56	N57	-.125	4.3334	-7.362473	0	

Joint Coordinates and Temperatures (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
57	N58	-.125	-.334	-7.362473	0	
58	N59	.625	4.3334	-7.737473	0	
59	N60	.625	-.334	-7.737473	0	
60	N61	-.125	4.3334	-7.737473	0	
61	N62	-.125	-.334	-7.737473	0	
62	N63	.791	4.3334	-7.737473	0	
63	N64	.791	-.334	-7.737473	0	
64	N65	-.291	4.3334	-7.737473	0	
65	N66	-.291	-.334	-7.737473	0	
66	N67	.791	6	-7.737473	0	
67	N68	-.291	6.1666	-7.737473	0	
68	N69	.791	-2	-7.737473	0	
69	N70	-.291	-2.1667	-7.737473	0	
70	N71	0	0	-6.362473	0	
71	N72	0	4	-6.362473	0	
72	N73	0	-.25	-6.362473	0	
73	N74	0	3.75	-6.362473	0	
74	N76	-3.345	0	1.931237	0	
75	N77	-3.345	4	1.931237	0	
76	N78	-3.47	0	1.71473	0	
77	N79	-3.47	4	1.71473	0	
78	N80	-3.128494	0	1.806237	0	
79	N81	-3.128494	4	1.806237	0	
80	N82	-6.592595	0	3.806237	0	
81	N83	-6.592595	4	3.806237	0	
82	N84	-6.376089	0	3.681237	0	
83	N85	-6.376089	4	3.681237	0	
84	N86	-6.501089	0	3.46473	0	
85	N87	-6.501089	4	3.46473	0	
86	N88	-6.501089	4.5	3.46473	0	
87	N89	-6.501089	-.5	3.46473	0	
88	N90	-6.501089	4.3334	3.46473	0	
89	N91	-6.501089	-.334	3.46473	0	
90	N92	-6.688589	4.3334	3.139971	0	
91	N93	-6.688589	-.334	3.139971	0	
92	N94	-6.313589	4.3334	3.78949	0	
93	N95	-6.313589	-.334	3.78949	0	
94	N96	-7.013348	4.3334	3.327471	0	
95	N97	-7.013348	-.334	3.327471	0	
96	N98	-6.638348	4.3334	3.97699	0	
97	N99	-6.638348	-.334	3.97699	0	
98	N100	-7.096349	4.3334	3.18371	0	
99	N101	-7.096349	-.334	3.18371	0	
100	N102	-6.555349	4.3334	4.12075	0	
101	N103	-6.555349	-.334	4.12075	0	
102	N104	-7.096348	6	3.18371	0	
103	N105	-6.555348	6.1666	4.12075	0	
104	N106	-7.096348	-2	3.18371	0	
105	N107	-6.555348	-2.1667	4.12075	0	
106	N108	-5.510064	0	3.181237	0	
107	N109	-5.510064	4	3.181237	0	
108	N110	-5.510064	-.25	3.181237	0	
109	N111	-5.510064	3.75	3.181237	0	
110	N110A	.25	-.5	-3.862473	0	
111	N111A	.25	3.5	-3.862473	0	
112	N114	-3.47	-.5	1.71473	0	
113	N115	-3.47	3.5	1.71473	0	

Joint Coordinates and Temperatures (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
114	N118	3.22	-5	2.147743	0	
115	N119	3.22	3.5	2.147743	0	
116	N116	-1.735	3.625	-2.323872	0	
117	N117	-1.735	-.375	-2.323872	0	
118	N118A	-1.908205	3.625	-2.423872	0	
119	N119A	-1.908205	-.375	-2.423872	0	
120	N120	-1.908205	4.625	-2.423872	0	
121	N121	-1.908205	-1.375	-2.423872	0	
122	N122	3.22	5	2.147743	0	
123	N123	3.22	-1	2.147743	0	
124	N124	3.0325	5	2.147743	0	
125	N125	3.0325	-1	2.147743	0	
126	N126	3.4075	5	2.147743	0	
127	N127	3.4075	-1	2.147743	0	
128	N128	3.0325	5	2.897743	0	
129	N129	3.0325	-1	2.897743	0	
130	N130	3.4075	5	2.897743	0	
131	N131	3.4075	-1	2.897743	0	
132	N132	3.22	5	2.897743	0	
133	N133	3.22	-1	2.897743	0	
134	N134	0.34375	5	-3.700094	0	
135	N135	0.34375	-1	-3.700094	0	
136	N136	0.15625	5	-4.024853	0	
137	N137	0.15625	-1	-4.024853	0	
138	N138	0.993269	5	-4.075094	0	
139	N139	0.993269	-1	-4.075094	0	
140	N140	0.805769	5	-4.399853	0	
141	N141	0.805769	-1	-4.399853	0	
142	N142	0.899519	5	-4.237473	0	
143	N143	0.899519	-1	-4.237473	0	
144	N144	-3.37625	5	1.552351	0	
145	N145	-3.37625	-1	1.552351	0	
146	N146	-3.56375	5	1.87711	0	
147	N147	-3.56375	-1	1.87711	0	
148	N148	-4.025769	5	1.177351	0	
149	N149	-4.025769	-1	1.177351	0	
150	N150	-4.213269	5	1.50211	0	
151	N151	-4.213269	-1	1.50211	0	
152	N152	-4.119519	5	1.33973	0	
153	N153	-4.119519	-1	1.33973	0	
154	N154	0.25	5	-3.862473	0	
155	N155	0.25	-1	-3.862473	0	
156	N156	-3.47	5	1.71473	0	
157	N157	-3.47	-1	1.71473	0	

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rul...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Mount Pipe	PIPE 2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
2	Tieback	PIPE 2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
3	Standoff Horizontal	PIPE 2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
4	All-Thread Conne...	0.625_All_Thread	Beam	BAR	A36 Gr.36	Typical	.226	.004	.004	.008

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (/1...	Density[k/ft^3]	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.42	29000	11154	.3	.65	.49	42	1.4	58	1.3
5	A500 Gr.46	29000	11154	.3	.65	.49	46	1.4	58	1.3
6	A53 Gr.B	29000	11154	.3	.65	.49	35	1.5	58	1.2
7	A252 Gr.2	29000	11154	.3	.65	.49	35	1.5	58	1.2
8	A252 Gr.3	29000	11154	.3	.65	.49	45	1.5	58	1.2
9	Test 50 k.s.i.	29000	11154	.3	.65	.49	50	1.5	58	1.2
10	Test 52 k.s.i.	29000	11154	.3	.65	.49	52	1.5	58	1.2

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M1	N5	N3			RIGID	None	None	RIGID	Typical
2	M2	N4	N2			RIGID	None	None	RIGID	Typical
3	M3	N13	N11			RIGID	None	None	RIGID	Typical
4	M4	N12	N10			RIGID	None	None	RIGID	Typical
5	M5	N7	N9			Standoff Horiz...	Beam	Pipe	A53 Gr.B	Typical
6	M6	N6	N8			Standoff Horiz...	Beam	Pipe	A53 Gr.B	Typical
7	MP3A	N14	N15			Mount Pipe	Beam	Pipe	A53 Gr.B	Typical
8	M8	N22	N18			RIGID	None	None	RIGID	Typical
9	M9	N18	N20			RIGID	None	None	RIGID	Typical
10	M10	N20	N24			RIGID	None	None	RIGID	Typical
11	M11	N23	N19			RIGID	None	None	RIGID	Typical
12	M12	N19	N21			RIGID	None	None	RIGID	Typical
13	M13	N21	N25			RIGID	None	None	RIGID	Typical
14	M14	N26	N22			RIGID	None	None	RIGID	Typical
15	M15	N27	N23			RIGID	None	None	RIGID	Typical
16	M16	N24	N28			RIGID	None	None	RIGID	Typical
17	M17	N25	N29			RIGID	None	None	RIGID	Typical
18	MP1A	N30	N32			Mount Pipe	Beam	Pipe	A53 Gr.B	Typical
19	MP2C	N31	N33			Mount Pipe	Beam	Pipe	A53 Gr.B	Typical
20	M20	N35	N37			RIGID	None	None	RIGID	Typical
21	M21	N34	N36			RIGID	None	None	RIGID	Typical
22	M22	N42	N40			RIGID	None	None	RIGID	Typical
23	M23	N41	N39			RIGID	None	None	RIGID	Typical
24	M24	N50	N48			RIGID	None	None	RIGID	Typical
25	M25	N49	N47			RIGID	None	None	RIGID	Typical
26	M26	N44	N46			Standoff Horiz...	Beam	Pipe	A53 Gr.B	Typical
27	M27	N43	N45			Standoff Horiz...	Beam	Pipe	A53 Gr.B	Typical
28	MP3C	N51	N52			Mount Pipe	Beam	Pipe	A53 Gr.B	Typical
29	M29	N59	N55			RIGID	None	None	RIGID	Typical
30	M30	N55	N57			RIGID	None	None	RIGID	Typical
31	M31	N57	N61			RIGID	None	None	RIGID	Typical
32	M32	N60	N56			RIGID	None	None	RIGID	Typical
33	M33	N56	N58			RIGID	None	None	RIGID	Typical
34	M34	N58	N62			RIGID	None	None	RIGID	Typical
35	M35	N63	N59			RIGID	None	None	RIGID	Typical
36	M36	N64	N60			RIGID	None	None	RIGID	Typical
37	M37	N61	N65			RIGID	None	None	RIGID	Typical
38	M38	N62	N66			RIGID	None	None	RIGID	Typical
39	MP1C	N67	N69			Mount Pipe	Beam	Pipe	A53 Gr.B	Typical
40	MP3B	N68	N70			Mount Pipe	Beam	Pipe	A53 Gr.B	Typical
41	M41	N72	N74			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
42	M42	N71	N73			RIGID	None	None	RIGID	Typical
43	M43	N79	N77			RIGID	None	None	RIGID	Typical
44	M44	N78	N76			RIGID	None	None	RIGID	Typical
45	M45	N87	N85			RIGID	None	None	RIGID	Typical
46	M46	N86	N84			RIGID	None	None	RIGID	Typical
47	M47	N81	N83			Standoff Horiz...	Beam	Pipe	A53 Gr.B	Typical
48	M48	N80	N82			Standoff Horiz...	Beam	Pipe	A53 Gr.B	Typical
49	MP4B	N88	N89			Mount Pipe	Beam	Pipe	A53 Gr.B	Typical
50	M50	N96	N92			RIGID	None	None	RIGID	Typical
51	M51	N92	N94			RIGID	None	None	RIGID	Typical
52	M52	N94	N98			RIGID	None	None	RIGID	Typical
53	M53	N97	N93			RIGID	None	None	RIGID	Typical
54	M54	N93	N95			RIGID	None	None	RIGID	Typical
55	M55	N95	N99			RIGID	None	None	RIGID	Typical
56	M56	N100	N96			RIGID	None	None	RIGID	Typical
57	M57	N101	N97			RIGID	None	None	RIGID	Typical
58	M58	N98	N102			RIGID	None	None	RIGID	Typical
59	M59	N99	N103			RIGID	None	None	RIGID	Typical
60	MP1B	N104	N106			Mount Pipe	Beam	Pipe	A53 Gr.B	Typical
61	MP2A	N105	N107			Mount Pipe	Beam	Pipe	A53 Gr.B	Typical
62	M62	N109	N111			RIGID	None	None	RIGID	Typical
63	M63	N108	N110			RIGID	None	None	RIGID	Typical
64	M64	N111A	N37			Tieback	Beam	Pipe	A53 Gr.B	Typical
65	M65	N110A	N36			Tieback	Beam	Pipe	A53 Gr.B	Typical
66	M66	N115	N74			Tieback	Beam	Pipe	A53 Gr.B	Typical
67	M67	N114	N73			Tieback	Beam	Pipe	A53 Gr.B	Typical
68	M68	N119	N111			Tieback	Beam	Pipe	A53 Gr.B	Typical
69	M69	N118	N110			Tieback	Beam	Pipe	A53 Gr.B	Typical
70	M70	N116	N118A			RIGID	None	None	RIGID	Typical
71	M71	N117	N119A			RIGID	None	None	RIGID	Typical
72	MP2B	N120	N121			Mount Pipe	Beam	Pipe	A53 Gr.B	Typical
73	M73	N124	N128			All-Thread Co...	Beam	BAR	A36 Gr.36	Typical
74	M74	N126	N130			All-Thread Co...	Beam	BAR	A36 Gr.36	Typical
75	M75	N125	N129			All-Thread Co...	Beam	BAR	A36 Gr.36	Typical
76	M76	N127	N131			All-Thread Co...	Beam	BAR	A36 Gr.36	Typical
77	M77	N124	N126			RIGID	None	None	RIGID	Typical
78	M78	N128	N130			RIGID	None	None	RIGID	Typical
79	M79	N125	N127			RIGID	None	None	RIGID	Typical
80	M80	N129	N131			RIGID	None	None	RIGID	Typical
81	MP4A	N132	N133			Mount Pipe	Beam	Pipe	A53 Gr.B	Typical
82	M82	N134	N138			All-Thread Co...	Beam	BAR	A36 Gr.36	Typical
83	M83	N136	N140			All-Thread Co...	Beam	BAR	A36 Gr.36	Typical
84	M84	N135	N139			All-Thread Co...	Beam	BAR	A36 Gr.36	Typical
85	M85	N137	N141			All-Thread Co...	Beam	BAR	A36 Gr.36	Typical
86	M86	N134	N136			RIGID	None	None	RIGID	Typical
87	M87	N138	N140			RIGID	None	None	RIGID	Typical
88	M88	N135	N137			RIGID	None	None	RIGID	Typical
89	M89	N139	N141			RIGID	None	None	RIGID	Typical
90	MP4C	N142	N143			Mount Pipe	Beam	Pipe	A53 Gr.B	Typical
91	M91	N144	N148			All-Thread Co...	Beam	BAR	A36 Gr.36	Typical
92	M92	N146	N150			All-Thread Co...	Beam	BAR	A36 Gr.36	Typical
93	M93	N145	N149			All-Thread Co...	Beam	BAR	A36 Gr.36	Typical
94	M94	N147	N151			All-Thread Co...	Beam	BAR	A36 Gr.36	Typical
95	M95	N144	N146			RIGID	None	None	RIGID	Typical
96	M96	N148	N150			RIGID	None	None	RIGID	Typical
97	M97	N145	N147			RIGID	None	None	RIGID	Typical
98	M98	N149	N151			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
99	MP5B	N152	N153			Mount Pipe	Beam	Pipe	A53 Gr.B	Typical

Member Advanced Data

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl Rat..	Analysis ...	Inactive	Seismic...
1	M1						Yes	** NA **			None
2	M2						Yes	** NA **			None
3	M3						Yes	** NA **			None
4	M4						Yes	** NA **			None
5	M5						Yes				None
6	M6						Yes				None
7	MP3A						Yes				None
8	M8						Yes	** NA **			None
9	M9						Yes	** NA **			None
10	M10						Yes	** NA **			None
11	M11						Yes	** NA **			None
12	M12						Yes	** NA **			None
13	M13						Yes	** NA **			None
14	M14						Yes	** NA **			None
15	M15						Yes	** NA **			None
16	M16						Yes	** NA **			None
17	M17						Yes	** NA **			None
18	MP1A						Yes				None
19	MP2C						Yes				None
20	M20						Yes	** NA **			None
21	M21						Yes	** NA **			None
22	M22						Yes	** NA **			None
23	M23						Yes	** NA **			None
24	M24						Yes	** NA **			None
25	M25						Yes	** NA **			None
26	M26						Yes				None
27	M27						Yes				None
28	MP3C						Yes				None
29	M29						Yes	** NA **			None
30	M30						Yes	** NA **			None
31	M31						Yes	** NA **			None
32	M32						Yes	** NA **			None
33	M33						Yes	** NA **			None
34	M34						Yes	** NA **			None
35	M35						Yes	** NA **			None
36	M36						Yes	** NA **			None
37	M37						Yes	** NA **			None
38	M38						Yes	** NA **			None
39	MP1C						Yes				None
40	MP3B						Yes				None
41	M41						Yes	** NA **			None
42	M42						Yes	** NA **			None
43	M43						Yes	** NA **			None
44	M44						Yes	** NA **			None
45	M45						Yes	** NA **			None
46	M46						Yes	** NA **			None
47	M47						Yes				None
48	M48						Yes				None
49	MP4B						Yes				None
50	M50						Yes	** NA **			None
51	M51						Yes	** NA **			None

Member Advanced Data (Continued)

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl Rat...	Analysis ...	Inactive	Seismic...
52	M52						Yes	** NA **			None
53	M53						Yes	** NA **			None
54	M54						Yes	** NA **			None
55	M55						Yes	** NA **			None
56	M56						Yes	** NA **			None
57	M57						Yes	** NA **			None
58	M58						Yes	** NA **			None
59	M59						Yes	** NA **			None
60	MP1B						Yes				None
61	MP2A						Yes				None
62	M62						Yes	** NA **			None
63	M63						Yes	** NA **			None
64	M64		BenPIN				Yes				None
65	M65		BenPIN				Yes				None
66	M66		BenPIN				Yes				None
67	M67		BenPIN				Yes				None
68	M68		BenPIN				Yes				None
69	M69		BenPIN				Yes				None
70	M70						Yes	** NA **			None
71	M71						Yes	** NA **			None
72	MP2B						Yes				None
73	M73						Yes				None
74	M74						Yes				None
75	M75						Yes				None
76	M76						Yes				None
77	M77						Yes	** NA **			None
78	M78						Yes	** NA **			None
79	M79						Yes	** NA **			None
80	M80						Yes	** NA **			None
81	MP4A						Yes				None
82	M82						Yes				None
83	M83						Yes				None
84	M84						Yes				None
85	M85						Yes				None
86	M86						Yes	** NA **			None
87	M87						Yes	** NA **			None
88	M88						Yes	** NA **			None
89	M89						Yes	** NA **			None
90	MP4C						Yes				None
91	M91						Yes				None
92	M92						Yes				None
93	M93						Yes				None
94	M94						Yes				None
95	M95						Yes	** NA **			None
96	M96						Yes	** NA **			None
97	M97						Yes	** NA **			None
98	M98						Yes	** NA **			None
99	MP5B						Yes				None

Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[ft]	Lcomp bot[ft]	L-torq...	Kyy	Kzz	Cb	Function
1	M5	Standoff Ho...	4			Lbyy						Lateral
2	M6	Standoff Ho...	4			Lbyy						Lateral
3	MP3A	Mount Pipe	5			Lbyy						Lateral
4	MP1A	Mount Pipe	8			Lbyy						Lateral

Hot Rolled Steel Design Parameters (Continued)

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[ft]	Lcomp bot[ft]	L-torq...	Kyy	Kzz	Cb	Function
5	MP2C	Mount Pipe	8.333			Lbyy						Lateral
6	M26	Standoff Ho...	4			Lbyy						Lateral
7	M27	Standoff Ho...	4			Lbyy						Lateral
8	MP3C	Mount Pipe	5			Lbyy						Lateral
9	MP1C	Mount Pipe	8			Lbyy						Lateral
10	MP3B	Mount Pipe	8.333			Lbyy						Lateral
11	M47	Standoff Ho...	4			Lbyy						Lateral
12	M48	Standoff Ho...	4			Lbyy						Lateral
13	MP4B	Mount Pipe	5			Lbyy						Lateral
14	MP1B	Mount Pipe	8			Lbyy						Lateral
15	MP2A	Mount Pipe	8.333			Lbyy						Lateral
16	M64	Tieback	8.795			Lbyy						Lateral
17	M65	Tieback	8.795			Lbyy						Lateral
18	M66	Tieback	8.795			Lbyy						Lateral
19	M67	Tieback	8.795			Lbyy						Lateral
20	M68	Tieback	8.795			Lbyy						Lateral
21	M69	Tieback	8.795			Lbyy						Lateral
22	MP2B	Mount Pipe	6			Lbyy						Lateral
23	M73	All-Thread ...	.75			Lbyy			.7	.7		Lateral
24	M74	All-Thread ...	.75			Lbyy			.7	.7		Lateral
25	M75	All-Thread ...	.75			Lbyy			.7	.7		Lateral
26	M76	All-Thread ...	.75			Lbyy			.7	.7		Lateral
27	MP4A	Mount Pipe	6			Lbyy						Lateral
28	M82	All-Thread ...	.75			Lbyy			.7	.7		Lateral
29	M83	All-Thread ...	.75			Lbyy			.7	.7		Lateral
30	M84	All-Thread ...	.75			Lbyy			.7	.7		Lateral
31	M85	All-Thread ...	.75			Lbyy			.7	.7		Lateral
32	MP4C	Mount Pipe	6			Lbyy						Lateral
33	M91	All-Thread ...	.75			Lbyy			.7	.7		Lateral
34	M92	All-Thread ...	.75			Lbyy			.7	.7		Lateral
35	M93	All-Thread ...	.75			Lbyy			.7	.7		Lateral
36	M94	All-Thread ...	.75			Lbyy			.7	.7		Lateral
37	MP5B	Mount Pipe	6			Lbyy						Lateral

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	N5	Reaction	Reaction	Reaction	Reaction		Reaction
2	N4	Reaction	Reaction	Reaction	Reaction		Reaction
3	N41	Reaction	Reaction	Reaction	Reaction		Reaction
4	N42	Reaction	Reaction	Reaction	Reaction		Reaction
5	N78	Reaction	Reaction	Reaction	Reaction		Reaction
6	N79	Reaction	Reaction	Reaction	Reaction		Reaction
7	N110A	Reaction	Reaction	Reaction			
8	N111A	Reaction	Reaction	Reaction			
9	N114	Reaction	Reaction	Reaction			
10	N115	Reaction	Reaction	Reaction			
11	N118	Reaction	Reaction	Reaction			
12	N119	Reaction	Reaction	Reaction			
13	N122	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
14	N123	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
15	N124						
16	N125						
17	N126						
18	N127						
19	N128						

Joint Boundary Conditions (Continued)

	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]
20	N129						
21	N130						
22	N131						
23	N134						
24	N135						
25	N136						
26	N137						
27	N138						
28	N139						
29	N140						
30	N141						
31	N144						
32	N145						
33	N146						
34	N147						
35	N148						
36	N149						
37	N150						
38	N151						
39	N154	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
40	N155	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
41	N156	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
42	N157	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	N5	max	1560.887	8	566.595	33	1135.57	8	.089	2	0	75	1.023	32
2		min	-1843.101	2	130.387	66	-1255.319	2	-.427	32	0	1	.171	2
3	N4	max	1634.213	9	578.803	44	1126.331	8	.071	2	0	75	1.039	44
4		min	-1327.537	3	97.26	2	-967.657	2	-.41	44	0	1	.099	2
5	N41	max	162.09	4	603.705	16	1677.155	10	1.168	16	0	75	.022	4
6		min	-176.492	10	115.82	10	-2034.156	4	.083	10	0	1	-.181	22
7	N42	max	189.396	4	595.884	17	2392.808	10	1.15	16	0	75	.064	4
8		min	-148.179	10	146.7	74	-2072.599	4	.15	10	0	1	-.187	22
9	N78	max	1491.802	6	540.136	24	893.843	1	-.121	6	0	75	.012	6
10		min	-1779.624	12	97.255	6	-710.196	7	-.656	24	0	1	-.849	24
11	N79	max	2008.676	6	536.95	13	829.176	1	-.155	69	0	75	-.008	6
12		min	-1763.848	12	130.392	70	-1011.645	7	-.644	13	0	1	-.843	24
13	N110A	max	1027.363	2	68.135	2	1429.722	2	0	75	0	75	0	75
14		min	-1025.834	8	-28.725	8	-1433.014	8	0	1	0	1	0	1
15	N111A	max	1438.886	2	87.655	2	1979.28	2	0	75	0	75	0	75
16		min	-1459.092	8	-48.327	8	-2014.928	8	0	1	0	1	0	1
17	N114	max	800.629	10	146.022	22	1629.07	4	0	75	0	75	0	75
18		min	-805.656	4	7.178	4	-1638.467	10	0	1	0	1	0	1
19	N115	max	1194.365	10	160.153	22	2477.728	4	0	75	0	75	0	75
20		min	-1216.124	4	-6.846	4	-2431.55	10	0	1	0	1	0	1
21	N118	max	1753.67	12	68.129	6	174.836	6	0	75	0	75	0	75
22		min	-1751.649	6	-28.719	12	-171.86	12	0	1	0	1	0	1
23	N119	max	2474.507	12	87.654	6	256.47	6	0	75	0	75	0	75
24		min	-2433.54	6	-48.328	12	-256.145	12	0	1	0	1	0	1
25	N122	max	83.72	10	158.046	19	95.157	1	-.022	64	.098	11	.006	10
26		min	-83.72	4	41.78	1	-150.591	7	-.059	19	-.098	3	-.006	4
27	N123	max	64.019	10	173.045	13	121.968	1	-.024	70	.07	11	.006	4
28		min	-64.019	4	52.329	7	-66.534	7	-.063	13	-.07	3	-.006	10
29	N154	max	89.088	10	158.043	15	111.802	2	.03	17	.098	7	.051	14

Envelope Joint Reactions (Continued)

Joint			X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
30		min	-137.09	4	41.779	9	-84.09	8	.008	10	-.098	11	.019	8
31	N155	max	110.691	10	173.042	21	61.213	2	.032	22	.07	7	.055	20
32		min	-62.689	4	52.327	3	-88.925	8	.009	4	-.07	11	.02	65
33	N156	max	137.089	10	158.043	23	111.803	12	.03	21	.098	3	-.019	6
34		min	-89.086	4	41.779	5	-84.091	6	.008	4	-.098	7	-.051	24
35	N157	max	62.688	10	173.042	17	61.212	12	.032	16	.07	3	-.02	75
36		min	-110.69	4	52.327	11	-88.925	6	.009	10	-.07	7	-.055	18
37	Totals:	max	4188.811	10	4680.958	24	4090.217	1						
38		min	-4188.792	4	1318.369	68	-4090.237	7						

Envelope Member Section Forces

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-...	LC	y-y Mome...	LC	z-z Mom...	LC
1	M1	1	max	165.588	2	566.595	33	1918.844	8	-.103	2	0	3	.18	14
2			min	-202.988	8	130.387	66	-2224.742	2	-1.1	32	0	1	-.057	8
3		2	max	165.588	2	566.595	33	1918.844	8	-.103	2	.12	8	.153	2
4			min	-202.988	8	130.387	66	-2224.742	2	-1.1	32	-.139	2	-.071	8
5		3	max	165.588	2	566.595	33	1918.844	8	-.103	2	.24	8	.144	2
6			min	-202.988	8	130.387	66	-2224.742	2	-1.1	32	-.278	2	-.084	8
7		4	max	165.588	2	566.595	33	1918.844	8	-.103	2	.36	8	.134	2
8			min	-202.988	8	130.387	66	-2224.742	2	-1.1	32	-.417	2	-.097	8
9		5	max	165.588	2	566.595	33	1918.844	8	-.103	2	.48	8	.125	2
10			min	-202.988	8	130.387	66	-2224.742	2	-1.1	32	-.556	2	-.111	8
11	M2	1	max	184.077	2	578.803	44	1955.765	8	-.05	2	0	2	.172	38
12			min	-171.048	8	97.26	2	-1617.312	2	-1.105	44	0	3	-.004	8
13		2	max	184.077	2	578.803	44	1955.765	8	-.05	2	.122	8	.137	14
14			min	-171.048	8	97.26	2	-1617.312	2	-1.105	44	-.101	2	-.021	8
15		3	max	184.077	2	578.803	44	1955.765	8	-.05	2	.244	8	.105	14
16			min	-171.048	8	97.26	2	-1617.312	2	-1.105	44	-.202	2	-.038	8
17		4	max	184.077	2	578.803	44	1955.765	8	-.05	2	.367	8	.093	2
18			min	-171.048	8	97.26	2	-1617.312	2	-1.105	44	-.303	2	-.054	8
19		5	max	184.077	2	578.803	44	1955.765	8	-.05	2	.489	8	.087	2
20			min	-171.048	8	97.26	2	-1617.312	2	-1.105	44	-.404	2	-.071	8
21	M3	1	max	720.43	2	-105.146	70	647.95	5	.108	2	.294	2	.059	2
22			min	-703.802	8	-529.505	25	-312.811	11	-.871	32	-.387	8	-.16	20
23		2	max	720.43	2	-105.146	70	647.95	5	.108	2	.294	2	.071	2
24			min	-703.802	8	-529.505	25	-312.811	11	-.871	32	-.364	8	-.146	8
25		3	max	720.43	2	-105.146	70	647.95	5	.108	2	.294	2	.083	2
26			min	-703.802	8	-529.505	25	-312.811	11	-.871	32	-.341	8	-.139	8
27		4	max	720.43	2	-105.146	70	647.95	5	.108	2	.294	2	.094	2
28			min	-703.802	8	-529.505	25	-312.811	11	-.871	32	-.318	8	-.132	8
29		5	max	720.43	2	-105.146	70	647.95	5	.108	2	.294	2	.106	2
30			min	-703.802	8	-529.505	25	-312.811	11	-.871	32	-.295	8	-.125	8
31	M4	1	max	431.796	2	231.286	25	290.539	4	.107	2	.465	2	.048	2
32			min	-448.418	8	-442.048	19	-625.608	10	-1.02	32	-.383	8	-.155	20
33		2	max	431.796	2	231.286	25	290.539	4	.107	2	.466	2	.055	2
34			min	-448.418	8	-442.048	19	-625.608	10	-1.02	32	-.405	8	-.128	8
35		3	max	431.796	2	231.286	25	290.539	4	.107	2	.467	2	.062	2
36			min	-448.418	8	-442.048	19	-625.608	10	-1.02	32	-.426	8	-.116	8
37		4	max	431.796	2	231.286	25	290.539	4	.107	2	.469	2	.069	2
38			min	-448.418	8	-442.048	19	-625.608	10	-1.02	32	-.447	8	-.104	8
39		5	max	431.796	2	231.286	25	290.539	4	.107	2	.47	2	.076	2
40			min	-448.418	8	-442.048	19	-625.608	10	-1.02	32	-.469	8	-.093	8
41	M5	1	max	0	75	0	75	.002	1	0	75	0	75	0	75
42			min	0	1	0	1	-.002	3	0	1	0	1	0	1
43		2	max	1919.553	8	560.014	33	203.302	8	.125	2	.63	8	.679	32

Envelope Member Section Forces (Continued)

Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-...	LC	y-y Mome...	LC	z-z Mom...	LC
44		min	-2223.832	2	127.136	66	-181.696	2	-.111	8	-.69	2	-.009	2
45		max	1919.553	8	555.849	33	212.245	8	.125	2	.838	8	.221	8
46		min	-2223.832	2	124.16	66	-190.639	2	-.111	8	-.876	2	-.155	2
47		max	312.832	11	530.312	25	729.596	2	.125	8	.823	8	.25	2
48		min	-647.955	5	107.895	70	-706.216	8	-.106	2	-.839	2	-.535	8
49		max	0	75	0	9	.006	7	0	75	0	75	0	75
50		min	0	1	-.001	7	-.007	9	0	1	0	1	0	1
51	M6	max	0	75	0	75	.001	1	0	75	0	75	0	75
52		min	0	1	0	1	-.002	3	0	1	0	1	0	1
53		max	1956.398	8	578.461	44	171.991	8	.087	2	.616	8	.679	32
54		min	-1616.484	2	93.639	2	-197.054	2	-.071	8	-.55	2	-.021	2
55		max	1956.398	8	574.296	44	180.934	8	.087	2	.792	8	.177	8
56		min	-1616.484	2	89.474	2	-205.997	2	-.071	8	-.751	2	-.129	49
57		max	628.807	10	550.027	43	440.54	2	.093	8	.814	8	.193	2
58		min	-291.774	4	71.599	49	-463.578	8	-.076	2	-.798	2	-.484	44
59		max	0	75	750	33	.006	7	0	75	0	75	0	75
60		min	0	1	0	7	-.007	9	0	1	0	1	0	1
61	MP3A	max	0	75	0	10	0	2	0	75	0	75	0	75
62		min	0	1	-.003	16	0	8	0	1	0	1	0	1
63		max	1324.132	10	247.393	32	154.097	8	.011	8	.084	2	.295	20
64		min	-1355.607	4	20.406	2	-71.196	2	-.061	14	-.199	8	.026	1
65		max	1342.538	10	247.872	32	144.373	32	.01	8	.012	2	.014	4
66		min	-1337.2	4	12.759	2	-57.951	2	-.06	14	-.012	44	-.016	34
67		max	1347.745	10	248.255	32	143.709	32	.01	8	.178	20	-.007	2
68		min	-1331.994	4	6.626	2	-47.328	2	-.06	14	-.054	2	-.326	32
69		max	0	75	.003	21	0	8	0	75	0	75	0	75
70		min	0	1	0	65	0	2	0	1	0	1	0	1
71	M8	max	137.365	12	637.837	7	201.849	2	.117	8	.078	6	.027	2
72		min	-214.133	6	-707.768	1	-199.425	8	-.173	2	-.089	12	-.251	20
73		max	137.365	12	637.837	7	201.849	2	.117	8	.069	6	.093	2
74		min	-214.133	6	-707.768	1	-199.425	8	-.173	2	-.079	12	-.254	20
75		max	137.365	12	637.837	7	201.849	2	.117	8	.065	5	.159	2
76		min	-214.133	6	-707.768	1	-199.425	8	-.173	2	-.076	11	-.304	8
77		max	137.365	12	637.837	7	201.849	2	.117	8	.074	2	.226	2
78		min	-214.133	6	-707.768	1	-199.425	8	-.173	2	-.084	8	-.363	8
79		max	137.365	12	637.837	7	201.849	2	.117	8	.093	2	.292	2
80		min	-214.133	6	-707.768	1	-199.425	8	-.173	2	-.103	8	-.423	8
81	M9	max	201.707	2	637.644	7	214.833	6	.292	2	.093	2	.173	2
82		min	-201.321	8	-707.444	1	-136.73	12	-.423	8	-.103	8	-.117	8
83		max	201.707	2	637.644	7	214.833	6	.292	2	.097	5	.306	2
84		min	-201.321	8	-707.444	1	-136.73	12	-.423	8	-.093	11	-.237	8
85		max	423.373	8	1214.002	9	304.462	10	.292	2	.37	7	.438	2
86		min	-434.69	2	-1030.338	3	-393.363	4	-.423	8	-.3	1	-.356	8
87		max	423.373	8	1214.002	9	304.462	10	.221	1	.329	7	.416	2
88		min	-434.69	2	-1030.338	3	-393.363	4	-.142	7	-.276	1	-.279	8
89		max	423.373	8	1214.002	9	304.462	10	.221	1	.296	8	.524	2
90		min	-434.69	2	-1030.338	3	-393.363	4	-.142	7	-.258	2	-.421	8
91	M10	max	305.476	10	1214.545	9	434.412	2	.524	2	.296	8	.142	7
92		min	-392.495	4	-1029.837	3	-421.718	8	-.421	8	-.258	2	-.221	1
93		max	305.476	10	1214.545	9	434.412	2	.524	2	.263	7	.208	4
94		min	-392.495	4	-1029.837	3	-421.718	8	-.421	8	-.227	1	-.304	10
95		max	305.476	10	1214.545	9	434.412	2	.524	2	.239	7	.294	4
96		min	-392.495	4	-1029.837	3	-421.718	8	-.421	8	-.202	1	-.407	10
97		max	305.476	10	1214.545	9	434.412	2	.524	2	.231	5	.38	4
98		min	-392.495	4	-1029.837	3	-421.718	8	-.421	8	-.194	11	-.51	10
99		max	305.476	10	1214.545	9	434.412	2	.524	2	.231	5	.466	4
100		min	-392.495	4	-1029.837	3	-421.718	8	-.421	8	-.193	11	-.613	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 Mom...	LC	
101	M11	1	max	135.731	23	625.577	1	103.879	1	.121	1	.069	3	.024	3
102			min	-46.443	6	-719.672	7	-104.017	7	-.164	7	-.057	9	-.267	21
103		2	max	135.731	23	625.577	1	103.879	1	.121	1	.076	2	.016	4
104			min	-46.443	6	-719.672	7	-104.017	7	-.164	7	-.063	8	-.252	22
105		3	max	135.731	23	625.577	1	103.879	1	.121	1	.085	2	.063	5
106			min	-46.443	6	-719.672	7	-104.017	7	-.164	7	-.073	8	-.245	23
107		4	max	135.731	23	625.577	1	103.879	1	.121	1	.095	2	.116	5
108			min	-46.443	6	-719.672	7	-104.017	7	-.164	7	-.082	8	-.256	11
109		5	max	135.731	23	625.577	1	103.879	1	.121	1	.104	2	.17	5
110			min	-46.443	6	-719.672	7	-104.017	7	-.164	7	-.092	8	-.301	11
111	M12	1	max	102.89	1	625.761	1	46.855	6	.17	5	.104	2	.164	7
112			min	-103.913	7	-719.594	7	-135.712	23	-.301	11	-.092	8	-.121	1
113		2	max	102.89	1	625.761	1	46.855	6	.17	5	.106	2	.299	7
114			min	-103.913	7	-719.594	7	-135.712	23	-.301	11	-.107	8	-.238	1
115		3	max	380.768	9	1211.127	3	385.652	10	.365	8	.278	7	.434	7
116			min	-369.016	3	-1032.54	9	-300.161	4	-.301	11	-.344	1	-.356	1
117		4	max	380.768	9	1211.127	3	385.652	10	.365	8	.265	7	.431	8
118			min	-369.016	3	-1032.54	9	-300.161	4	-.282	2	-.316	1	-.295	2
119		5	max	380.768	9	1211.127	3	385.652	10	.365	8	.276	8	.539	8
120			min	-369.016	3	-1032.54	9	-300.161	4	-.282	2	-.308	2	-.437	2
121	M13	1	max	386.641	10	1211.637	3	366.133	3	.539	8	.276	8	.282	2
122			min	-299.62	4	-1031.788	9	-385.579	9	-.437	2	-.308	2	-.365	8
123		2	max	386.641	10	1211.637	3	366.133	3	.539	8	.24	8	.233	1
124			min	-299.62	4	-1031.788	9	-385.579	9	-.437	2	-.274	2	-.33	7
125		3	max	386.641	10	1211.637	3	366.133	3	.539	8	.211	7	.223	11
126			min	-299.62	4	-1031.788	9	-385.579	9	-.437	2	-.247	1	-.337	5
127		4	max	386.641	10	1211.637	3	366.133	3	.539	8	.19	7	.288	10
128			min	-299.62	4	-1031.788	9	-385.579	9	-.437	2	-.227	1	-.419	4
129		5	max	386.641	10	1211.637	3	366.133	3	.539	8	.174	5	.374	10
130			min	-299.62	4	-1031.788	9	-385.579	9	-.437	2	-.212	11	-.522	4
131	M14	1	max	201.706	2	637.647	7	214.819	6	.027	2	.042	6	.083	15
132			min	-201.296	8	-707.444	1	-136.725	12	-.251	20	-.066	12	-.016	9
133		2	max	201.706	2	637.647	7	214.819	6	.027	2	.051	6	.092	14
134			min	-201.296	8	-707.444	1	-136.725	12	-.251	20	-.072	12	-.038	8
135		3	max	201.706	2	637.647	7	214.819	6	.027	2	.06	6	.115	2
136			min	-201.296	8	-707.444	1	-136.725	12	-.251	20	-.077	12	-.064	8
137		4	max	201.706	2	637.647	7	214.819	6	.027	2	.069	6	.144	2
138			min	-201.296	8	-707.444	1	-136.725	12	-.251	20	-.083	12	-.091	8
139		5	max	201.706	2	637.647	7	214.819	6	.027	2	.078	6	.173	2
140			min	-201.296	8	-707.444	1	-136.725	12	-.251	20	-.089	12	-.117	8
141	M15	1	max	102.89	1	625.761	1	46.849	6	.024	3	.065	2	.054	19
142			min	-103.932	7	-719.577	7	-135.712	23	-.267	21	-.04	8	-.017	1
143		2	max	102.89	1	625.761	1	46.849	6	.024	3	.066	2	.074	7
144			min	-103.932	7	-719.577	7	-135.712	23	-.267	21	-.044	8	-.043	1
145		3	max	102.89	1	625.761	1	46.849	6	.024	3	.066	2	.104	7
146			min	-103.932	7	-719.577	7	-135.712	23	-.267	21	-.048	9	-.069	1
147		4	max	102.89	1	625.761	1	46.849	6	.024	3	.067	3	.134	7
148			min	-103.932	7	-719.577	7	-135.712	23	-.267	21	-.052	9	-.095	1
149		5	max	102.89	1	625.761	1	46.849	6	.024	3	.069	3	.164	7
150			min	-103.932	7	-719.577	7	-135.712	23	-.267	21	-.057	9	-.121	1
151	M16	1	max	423.363	8	1214.007	9	304.471	10	.613	10	.231	5	.524	2
152			min	-434.653	2	-1030.338	3	-393.368	4	-.466	4	-.193	11	-.421	8
153		2	max	423.363	8	1214.007	9	304.471	10	.613	10	.217	5	.548	2
154			min	-434.653	2	-1030.338	3	-393.368	4	-.466	4	-.183	11	-.453	8
155		3	max	423.363	8	1214.007	9	304.471	10	.613	10	.203	5	.572	2
156			min	-434.653	2	-1030.338	3	-393.368	4	-.466	4	-.172	11	-.484	8
157		4	max	423.363	8	1214.007	9	304.471	10	.613	10	.189	5	.6	3

Envelope Member Section Forces (Continued)

Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-...	LC	y-y Mome...	LC	z-z Mom...	LC	
158		min	-434.653	2	-1030.338	3	-393.368	4	-.466	4	-.161	11	-.519	9	
159		max	423.363	8	1214.007	9	304.471	10	.613	10	.175	5	.643	3	
160		min	-434.653	2	-1030.338	3	-393.368	4	-.466	4	-.151	11	-.57	9	
161	M17	1	max	380.709	9	1211.126	3	385.662	10	.522	4	.174	5	.539	8
162		min	-368.994	3	-1032.548	9	-300.165	4	-.374	10	-.212	11	-.437	2	
163		2	max	380.709	9	1211.126	3	385.662	10	.522	4	.166	7	.563	8
164		min	-368.994	3	-1032.548	9	-300.165	4	-.374	10	-.201	1	-.469	2	
165		3	max	380.709	9	1211.126	3	385.662	10	.522	4	.163	7	.587	8
166		min	-368.994	3	-1032.548	9	-300.165	4	-.374	10	-.194	1	-.5	2	
167		4	max	380.709	9	1211.126	3	385.662	10	.522	4	.16	7	.611	8
168		min	-368.994	3	-1032.548	9	-300.165	4	-.374	10	-.188	1	-.532	2	
169		5	max	380.709	9	1211.126	3	385.662	10	.522	4	.157	7	.635	8
170		min	-368.994	3	-1032.548	9	-300.165	4	-.374	10	-.182	1	-.563	2	
171	MP1A	1	max	0	75	-.002	10	.028	2	0	75	0	75	0	75
172		min	0	1	-.153	16	-.043	20	0	1	0	1	0	1	1
173		2	max	670.249	7	111.014	17	105.322	7	.002	7	.097	2	.215	18
174		min	-675.017	1	-4.825	11	-68.666	1	-.039	13	-.162	8	.008	12	12
175		3	max	678.579	7	106.358	18	85.696	7	.002	7	.032	7	.012	8
176		min	-666.687	1	5.942	12	-49.04	1	-.039	13	-.022	1	-.012	2	2
177		4	max	711.329	7	119.937	21	104.042	1	.04	8	.095	33	.013	2
178		min	-633.937	1	-45.106	2	-67.386	7	-.065	2	-.027	3	-.219	21	21
179		5	max	0	75	.028	21	.006	8	0	75	0	75	0	75
180		min	0	1	.002	66	-.005	2	0	1	0	1	0	1	1
181	MP2C	1	max	235.646	24	362.365	9	311.073	2	.156	7	.088	24	.153	24
182		min	52.64	64	-362.597	3	-311.051	8	-.156	1	.02	64	.034	64	64
183		2	max	1111.962	3	129.243	17	76.237	8	.011	8	.063	2	.263	17
184		min	-1132.016	9	8.543	11	-40.866	2	-.041	14	-.137	8	.028	11	11
185		3	max	1120.639	3	124.188	19	59.781	32	.011	8	.009	10	.012	4
186		min	-1123.339	9	23.512	12	-23.161	2	-.041	14	-.009	4	-.012	10	10
187		4	max	1129.316	3	128.379	21	58.675	32	.011	8	.123	32	-.05	2
188		min	-1114.662	9	18.061	2	-5.457	2	-.041	14	-.033	2	-.261	21	21
189		5	max	0	75	.651	21	.04	11	0	75	0	75	0	75
190		min	0	1	-.072	4	-.1	17	0	1	0	1	0	1	1
191	M20	1	max	51.025	2	1475.325	2	1916.369	2	0	2	.488	8	.369	2
192		min	-84.938	8	-1495.048	8	-1951.267	8	0	9	-.479	2	-.374	8	8
193		2	max	51.025	2	1475.325	2	1916.369	2	0	2	.366	8	.277	2
194		min	-84.938	8	-1495.048	8	-1951.267	8	0	9	-.359	2	-.28	8	8
195		3	max	51.025	2	1475.325	2	1916.369	2	0	2	.244	8	.184	2
196		min	-84.938	8	-1495.048	8	-1951.267	8	0	9	-.24	2	-.187	8	8
197		4	max	51.025	2	1475.325	2	1916.369	2	0	2	.122	8	.092	2
198		min	-84.938	8	-1495.048	8	-1951.267	8	0	9	-.12	2	-.093	8	8
199		5	max	51.025	2	1475.325	2	1916.369	2	0	2	0	8	0	8
200		min	-84.938	8	-1495.048	8	-1951.267	8	0	9	0	2	0	9	9
201	M21	1	max	31.506	2	1063.806	2	1366.708	2	0	3	.342	8	.266	2
202		min	-65.346	8	-1061.888	8	-1369.554	8	0	7	-.342	2	-.265	8	8
203		2	max	31.506	2	1063.806	2	1366.708	2	0	3	.257	8	.199	2
204		min	-65.346	8	-1061.888	8	-1369.554	8	0	7	-.256	2	-.199	8	8
205		3	max	31.506	2	1063.806	2	1366.708	2	0	3	.171	8	.133	2
206		min	-65.346	8	-1061.888	8	-1369.554	8	0	7	-.171	2	-.133	8	8
207		4	max	31.506	2	1063.806	2	1366.708	2	0	3	.086	8	.066	2
208		min	-65.346	8	-1061.888	8	-1369.554	8	0	7	-.085	2	-.066	8	8
209		5	max	31.506	2	1063.806	2	1366.708	2	0	3	0	9	0	21
210		min	-65.346	8	-1061.888	8	-1369.554	8	0	7	0	8	0	33	33
211	M22	1	max	148.179	10	595.884	17	2071.921	4	-.15	10	0	22	.187	22
212		min	-189.396	4	146.7	74	-2393.658	10	-1.15	16	0	4	-.064	4	4
213		2	max	148.179	10	595.884	17	2071.921	4	-.15	10	.129	4	.165	10
214		min	-189.396	4	146.7	74	-2393.658	10	-1.15	16	-.15	10	-.078	4	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 Mom...	LC	
215	3	max	148.179	10	595.884	17	2071.921	4	-1.15	10	.259	4	.153	10	
216		min	-189.396	4	146.7	74	-2393.658	10	-1.15	16	-.299	10	-.092	4	
217	4	max	148.179	10	595.884	17	2071.921	4	-1.15	10	.388	4	.142	10	
218		min	-189.396	4	146.7	74	-2393.658	10	-1.15	16	-.449	10	-.106	4	
219	5	max	148.179	10	595.884	17	2071.921	4	-1.15	10	.518	4	.13	10	
220		min	-189.396	4	146.7	74	-2393.658	10	-1.15	16	-.598	10	-.12	4	
221	M23	1	max	176.492	10	603.705	16	2033.559	4	-.083	10	0	.181	22	
222		min	-162.09	4	115.82	10	-1677.963	10	-1.168	16	0	1	-.022	4	
223	2	max	176.492	10	603.705	16	2033.559	4	-.083	10	.127	4	.146	22	
224		min	-162.09	4	115.82	10	-1677.963	10	-1.168	16	-.105	10	-.041	4	
225	3	max	176.492	10	603.705	16	2033.559	4	-.083	10	.254	4	.124	10	
226		min	-162.09	4	115.82	10	-1677.963	10	-1.168	16	-.21	10	-.059	4	
227	4	max	176.492	10	603.705	16	2033.559	4	-.083	10	.381	4	.117	10	
228		min	-162.09	4	115.82	10	-1677.963	10	-1.168	16	-.315	10	-.078	4	
229	5	max	176.492	10	603.705	16	2033.559	4	-.083	10	.508	4	.11	10	
230		min	-162.09	4	115.82	10	-1677.963	10	-1.168	16	-.419	10	-.097	4	
231	M24	1	max	729.279	10	-104.281	4	653.984	1	.098	10	.284	10	.058	10
232		min	-715.714	4	-453.52	22	-303.647	7	-.854	16	-.38	4	-.181	16	
233	2	max	729.279	10	-104.281	4	653.984	1	.098	10	.285	10	.07	10	
234		min	-715.714	4	-453.52	22	-303.647	7	-.854	16	-.356	4	-.154	16	
235	3	max	729.279	10	-104.281	4	653.984	1	.098	10	.285	10	.082	10	
236		min	-715.714	4	-453.52	22	-303.647	7	-.854	16	-.333	4	-.147	4	
237	4	max	729.279	10	-104.281	4	653.984	1	.098	10	.286	10	.094	10	
238		min	-715.714	4	-453.52	22	-303.647	7	-.854	16	-.309	4	-.14	4	
239	5	max	729.279	10	-104.281	4	653.984	1	.098	10	.287	10	.106	10	
240		min	-715.714	4	-453.52	22	-303.647	7	-.854	16	-.285	4	-.134	4	
241	M25	1	max	422.745	10	-102.685	10	285.344	12	.093	10	.474	10	.086	10
242		min	-436.234	4	-438.092	16	-636.092	6	-.85	16	-.39	4	-.18	4	
243	2	max	422.745	10	-102.685	10	285.344	12	.093	10	.475	10	.092	10	
244		min	-436.234	4	-438.092	16	-636.092	6	-.85	16	-.412	4	-.168	4	
245	3	max	422.745	10	-102.685	10	285.344	12	.093	10	.476	10	.099	10	
246		min	-436.234	4	-438.092	16	-636.092	6	-.85	16	-.434	4	-.156	4	
247	4	max	422.745	10	-102.685	10	285.344	12	.093	10	.477	10	.105	10	
248		min	-436.234	4	-438.092	16	-636.092	6	-.85	16	-.456	4	-.144	4	
249	5	max	422.745	10	-102.685	10	285.344	12	.093	10	.477	10	.111	10	
250		min	-436.234	4	-438.092	16	-636.092	6	-.85	16	-.478	4	-.132	4	
251	M26	1	max	0	75	0	75	.002	9	0	75	0	75	75	
252		min	0	1	0	1	-.002	11	0	1	0	1	0	1	
253	2	max	2072.599	4	585.095	17	188.524	4	.13	10	.657	4	.71	16	
254		min	-2392.809	10	143.404	74	-165.114	10	-.12	4	-.72	10	.013	10	
255	3	max	2072.599	4	574.558	17	197.466	4	.13	10	.85	4	.23	4	
256		min	-2392.809	10	140.428	74	-174.057	10	-.12	4	-.89	10	-.167	10	
257	4	max	303.658	7	461.322	22	738.303	10	.134	4	.822	4	.247	10	
258		min	-653.986	1	107.6	4	-717.772	4	-.106	10	-.838	10	-.566	4	
259	5	max	0	75	0	5	.006	3	0	75	0	75	0	75	
260		min	0	1	-.001	3	-.007	5	0	1	0	1	0	1	
261	M27	1	max	0	75	0	75	.001	9	0	75	0	75	75	
262		min	0	1	0	1	-.002	11	0	1	0	1	0	1	
263	2	max	2034.156	4	601.043	16	162.391	4	.11	10	.628	4	.714	16	
264		min	-1677.155	10	111.843	10	-189.673	10	-.097	4	-.56	10	-.002	10	
265	3	max	2034.156	4	590.506	16	171.334	4	.11	10	.795	4	.171	4	
266		min	-1677.155	10	107.678	10	-198.615	10	-.097	4	-.754	10	-.112	10	
267	4	max	639.274	6	452.846	16	431.59	10	.132	4	.815	4	.173	10	
268		min	-286.581	12	107.568	10	-451.666	4	-.111	10	-.799	10	-.513	16	
269	5	max	0	75	.001	5	.006	3	0	75	0	75	0	75	
270		min	0	1	0	3	-.007	5	0	1	0	1	0	1	
271	MP3C	1	max	0	75	.001	22	.003	15	0	75	0	75	75	

Envelope Member Section Forces (Continued)

Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-...	LC	y-y Mome...	LC	z-z Mom...	LC
272		min	0	1	0	4	0	9	0	1	0	1	0	1
273		max	1327.675	6	74.156	4	14.537	10	.014	4	.367	16	.096	4
274		min	-1364.173	12	-77.428	10	-288.16	16	-.062	22	-.015	10	-.09	10
275		max	1346.081	6	58.86	4	14.537	10	.013	4	.013	12	.005	4
276		min	-1345.767	12	-62.133	10	-288.16	16	-.06	22	-.016	6	-.01	10
277		max	1351.287	6	46.594	4	14.537	10	.013	4	.016	10	.06	10
278		min	-1340.56	12	-49.867	10	-288.16	16	-.06	22	-.363	16	-.061	4
279		max	0	75	0	4	0	11	0	75	0	75	0	75
280		min	0	1	-.001	22	-.003	17	0	1	0	1	0	1
281	M29	max	135.849	8	634.08	3	203.415	10	.121	4	.078	2	.026	10
282		min	-215.939	2	-700.761	9	-201.719	4	-.175	10	-.088	8	-.263	16
283		max	135.849	8	634.08	3	203.415	10	.121	4	.069	2	.091	10
284		min	-215.939	2	-700.761	9	-201.719	4	-.175	10	-.079	8	-.265	16
285		max	135.849	8	634.08	3	203.415	10	.121	4	.065	1	.156	10
286		min	-215.939	2	-700.761	9	-201.719	4	-.175	10	-.075	7	-.309	4
287		max	135.849	8	634.08	3	203.415	10	.121	4	.072	10	.221	10
288		min	-215.939	2	-700.761	9	-201.719	4	-.175	10	-.082	4	-.368	4
289		max	135.849	8	634.08	3	203.415	10	.121	4	.091	10	.286	10
290		min	-215.939	2	-700.761	9	-201.719	4	-.175	10	-.101	4	-.427	4
291	M30	max	203.278	10	633.897	3	216.648	2	.286	10	.091	10	.175	10
292		min	-203.69	4	-700.414	9	-135.217	8	-.427	4	-.101	4	-.121	4
293		max	203.278	10	633.897	3	216.648	2	.286	10	.097	1	.305	10
294		min	-203.69	4	-700.414	9	-135.217	8	-.427	4	-.092	7	-.239	4
295		max	425.613	4	1198.972	5	302.629	6	.286	10	.37	3	.435	10
296		min	-436.386	10	-1014.634	11	-394.839	12	-.427	4	-.298	9	-.356	4
297		max	425.613	4	1198.972	5	302.629	6	.224	7	.328	3	.418	10
298		min	-436.386	10	-1014.634	11	-394.839	12	-.14	1	-.274	9	-.279	4
299		max	425.613	4	1198.972	5	302.629	6	.224	7	.295	4	.523	10
300		min	-436.386	10	-1014.634	11	-394.839	12	-.14	1	-.256	10	-.418	4
301	M31	max	303.7	6	1199.58	5	436.046	10	.523	10	.295	4	.14	1
302		min	-393.946	12	-1014.089	11	-423.887	4	-.418	4	-.256	10	-.224	7
303		max	303.7	6	1199.58	5	436.046	10	.523	10	.262	3	.207	12
304		min	-393.946	12	-1014.089	11	-423.887	4	-.418	4	-.226	9	-.31	6
305		max	303.7	6	1199.58	5	436.046	10	.523	10	.238	3	.292	12
306		min	-393.946	12	-1014.089	11	-423.887	4	-.418	4	-.2	9	-.413	6
307		max	303.7	6	1199.58	5	436.046	10	.523	10	.231	1	.377	12
308		min	-393.946	12	-1014.089	11	-423.887	4	-.418	4	-.194	7	-.515	6
309		max	303.7	6	1199.58	5	436.046	10	.523	10	.232	1	.462	12
310		min	-393.946	12	-1014.089	11	-423.887	4	-.418	4	-.193	7	-.618	6
311	M32	max	140.329	19	618.562	9	103.309	9	.118	9	.071	11	.023	11
312		min	-44.653	2	-715.889	3	-102.24	3	-.159	3	-.06	5	-.279	17
313		max	140.329	19	618.562	9	103.309	9	.118	9	.079	10	.015	12
314		min	-44.653	2	-715.889	3	-102.24	3	-.159	3	-.066	4	-.262	18
315		max	140.329	19	618.562	9	103.309	9	.118	9	.088	10	.061	1
316		min	-44.653	2	-715.889	3	-102.24	3	-.159	3	-.075	4	-.255	18
317		max	140.329	19	618.562	9	103.309	9	.118	9	.097	10	.115	1
318		min	-44.653	2	-715.889	3	-102.24	3	-.159	3	-.085	4	-.262	7
319		max	140.329	19	618.562	9	103.309	9	.118	9	.106	10	.17	1
320		min	-44.653	2	-715.889	3	-102.24	3	-.159	3	-.094	4	-.307	7
321	M33	max	102.318	9	618.758	9	45.06	2	.17	1	.106	10	.159	3
322		min	-102.089	3	-715.801	3	-140.32	19	-.307	7	-.094	4	-.118	9
323		max	102.318	9	618.758	9	45.06	2	.17	1	.108	10	.293	3
324		min	-102.089	3	-715.801	3	-140.32	19	-.307	7	-.11	4	-.234	9
325		max	378.441	5	1195.317	11	387.411	6	.363	4	.278	3	.427	3
326		min	-367.401	11	-1017.624	5	-298.718	12	-.307	7	-.346	9	-.35	9
327		max	378.441	5	1195.317	11	387.411	6	.363	4	.266	3	.442	4
328		min	-367.401	11	-1017.624	5	-298.718	12	-.271	10	-.318	9	-.306	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 Mom...	LC	
329	5	max	378.441	5	1195.317	11	387.411	6	.363	4	.277	4	.548	4	
330		min	-367.401	11	-1017.624	5	-298.718	12	-.271	10	-.31	10	-.444	10	
331	M34	1	max	388.415	6	1195.866	11	364.513	11	.548	4	.277	4	.271	10
332		min	-298.169	12	-1016.806	5	-383.328	5	-.444	10	-.31	10	-.363	4	
333		2	max	388.415	6	1195.866	11	364.513	11	.548	4	.241	4	.225	9
334		min	-298.169	12	-1016.806	5	-383.328	5	-.444	10	-.276	10	-.33	3	
335		3	max	388.415	6	1195.866	11	364.513	11	.548	4	.212	3	.22	7
336		min	-298.169	12	-1016.806	5	-383.328	5	-.444	10	-.249	9	-.34	1	
337		4	max	388.415	6	1195.866	11	364.513	11	.548	4	.191	3	.284	6
338		min	-298.169	12	-1016.806	5	-383.328	5	-.444	10	-.229	9	-.423	12	
339		5	max	388.415	6	1195.866	11	364.513	11	.548	4	.173	1	.37	6
340		min	-298.169	12	-1016.806	5	-383.328	5	-.444	10	-.211	7	-.525	12	
341	M35	1	max	203.278	10	633.896	3	216.65	2	.026	10	.042	2	.08	23
342		min	-203.705	4	-700.414	9	-135.22	8	-.263	16	-.066	8	-.021	5	
343		2	max	203.278	10	633.896	3	216.65	2	.026	10	.051	2	.089	10
344		min	-203.705	4	-700.414	9	-135.22	8	-.263	16	-.072	8	-.043	4	
345		3	max	203.278	10	633.896	3	216.65	2	.026	10	.06	2	.117	10
346		min	-203.705	4	-700.414	9	-135.22	8	-.263	16	-.077	8	-.069	4	
347		4	max	203.278	10	633.896	3	216.65	2	.026	10	.069	2	.146	10
348		min	-203.705	4	-700.414	9	-135.22	8	-.263	16	-.083	8	-.095	4	
349		5	max	203.278	10	633.896	3	216.65	2	.026	10	.078	2	.175	10
350		min	-203.705	4	-700.414	9	-135.22	8	-.263	16	-.088	8	-.121	4	
351	M36	1	max	102.31	9	618.759	9	45.059	2	.023	11	.068	10	.049	15
352		min	-102.112	3	-715.801	3	-140.32	19	-.279	17	-.043	4	-.015	9	
353		2	max	102.31	9	618.759	9	45.059	2	.023	11	.068	10	.07	3
354		min	-102.112	3	-715.801	3	-140.32	19	-.279	17	-.046	4	-.041	9	
355		3	max	102.31	9	618.759	9	45.059	2	.023	11	.069	10	.1	3
356		min	-102.112	3	-715.801	3	-140.32	19	-.279	17	-.05	5	-.067	9	
357		4	max	102.31	9	618.759	9	45.059	2	.023	11	.07	11	.129	3
358		min	-102.112	3	-715.801	3	-140.32	19	-.279	17	-.055	5	-.093	9	
359		5	max	102.31	9	618.759	9	45.059	2	.023	11	.071	11	.159	3
360		min	-102.112	3	-715.801	3	-140.32	19	-.279	17	-.06	5	-.118	9	
361	M37	1	max	425.659	4	1198.976	5	302.629	6	.618	6	.232	1	.523	10
362		min	-436.401	10	-1014.633	11	-394.839	12	-.462	12	-.193	7	-.418	4	
363		2	max	425.659	4	1198.976	5	302.629	6	.618	6	.217	1	.547	10
364		min	-436.401	10	-1014.633	11	-394.839	12	-.462	12	-.183	7	-.449	4	
365		3	max	425.659	4	1198.976	5	302.629	6	.618	6	.203	1	.57	10
366		min	-436.401	10	-1014.633	11	-394.839	12	-.462	12	-.173	7	-.48	4	
367		4	max	425.659	4	1198.976	5	302.629	6	.618	6	.189	1	.597	11
368		min	-436.401	10	-1014.633	11	-394.839	12	-.462	12	-.162	7	-.515	5	
369		5	max	425.659	4	1198.976	5	302.629	6	.618	6	.175	1	.639	11
370		min	-436.401	10	-1014.633	11	-394.839	12	-.462	12	-.152	7	-.564	5	
371	M38	1	max	378.448	5	1195.317	11	387.41	6	.525	12	.173	1	.548	4
372		min	-367.401	11	-1017.621	5	-298.718	12	-.37	6	-.211	7	-.444	10	
373		2	max	378.448	5	1195.317	11	387.41	6	.525	12	.167	3	.571	4
374		min	-367.401	11	-1017.621	5	-298.718	12	-.37	6	-.202	9	-.475	10	
375		3	max	378.448	5	1195.317	11	387.41	6	.525	12	.164	3	.594	4
376		min	-367.401	11	-1017.621	5	-298.718	12	-.37	6	-.196	9	-.506	10	
377		4	max	378.448	5	1195.317	11	387.41	6	.525	12	.162	3	.618	4
378		min	-367.401	11	-1017.621	5	-298.718	12	-.37	6	-.19	9	-.537	10	
379		5	max	378.448	5	1195.317	11	387.41	6	.525	12	.159	3	.641	4
380		min	-367.401	11	-1017.621	5	-298.718	12	-.37	6	-.184	9	-.567	10	
381	MP1C	1	max	0	75	.068	22	.154	15	0	75	0	75	0	75
382		min	0	1	-.027	4	0	9	0	1	0	1	0	1	1
383		2	max	666.472	3	72.413	4	24.996	9	.003	3	.252	15	.096	4
384		min	-668.005	9	-73.408	10	-132.772	14	-.039	21	-.035	9	-.107	10	
385		3	max	674.802	3	52.787	4	15.183	9	.003	3	.012	8	.022	9

Envelope Member Section Forces (Continued)

Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-...	LC	y-y Mome...	LC	z-z Mom...	LC
386		min	-659.675	9	-53.782	10	-129.007	15	-.039	21	-.017	2	-.031	3
387		max	707.552	3	84.594	9	27.871	2	.043	4	.02	11	.045	15
388		min	-626.925	9	-85.433	3	-133.598	17	-.068	10	-.236	17	.001	9
389		max	0	75	.004	4	0	11	0	75	0	75	0	75
390		min	0	1	-.014	22	-.027	17	0	1	0	1	0	1
391	MP3B	max	235.646	24	362.613	11	311.065	12	.156	1	.088	24	-.034	75
392		min	52.64	64	-362.481	5	-310.869	6	-.156	7	.02	64	-.153	13
393		max	1096.199	11	47.01	4	-1.196	8	.013	4	.296	15	.073	4
394		min	-1117.04	5	-56.33	10	-144.457	14	-.041	22	.012	9	-.092	10
395		max	1104.876	11	26.566	4	-12.787	9	.013	4	.015	12	.005	9
396		min	-1108.363	5	-35.886	10	-140.064	16	-.041	22	-.015	6	-.005	3
397		max	1113.554	11	6.123	4	-14.983	10	.013	4	-.031	10	.057	10
398		min	-1099.686	5	-18.018	18	-140.966	17	-.041	22	-.291	16	-.038	4
399		max	0	75	.041	11	.077	12	0	75	0	75	0	75
400		min	0	1	-.385	17	-.55	18	0	1	0	1	0	1
401	M41	max	25.094	10	913.282	10	2434.566	4	0	16	.596	10	.236	10
402		min	-115.784	16	-940.573	4	-2398.935	10	0	10	-.601	4	-.253	4
403		max	25.094	10	913.282	10	2434.566	4	0	16	.446	10	.179	10
404		min	-115.784	16	-940.573	4	-2398.935	10	0	10	-.449	4	-.194	4
405		max	25.094	10	913.282	10	2434.566	4	0	16	.296	10	.122	10
406		min	-115.784	16	-940.573	4	-2398.935	10	0	10	-.297	4	-.136	4
407		max	25.094	10	913.282	10	2434.566	4	0	16	.147	10	.065	10
408		min	-115.784	16	-940.573	4	-2398.935	10	0	10	-.144	4	-.077	4
409		max	25.094	10	913.282	10	2434.566	4	0	16	.013	16	.008	10
410		min	-115.784	16	-940.573	4	-2398.935	10	0	10	-.003	10	-.03	16
411	M42	max	4.239	10	635.016	10	1670.646	4	.002	4	.391	10	.221	10
412		min	-123.52	16	-633.881	4	-1671.095	10	-.002	10	-.387	4	-.229	4
413		max	4.239	10	635.016	10	1670.646	4	.002	4	.286	10	.182	10
414		min	-123.52	16	-633.881	4	-1671.095	10	-.002	10	-.283	4	-.189	4
415		max	4.239	10	635.016	10	1670.646	4	.002	4	.182	10	.142	10
416		min	-123.52	16	-633.881	4	-1671.095	10	-.002	10	-.179	4	-.15	4
417		max	4.239	10	635.016	10	1670.646	4	.002	4	.078	10	.102	10
418		min	-123.52	16	-633.881	4	-1671.095	10	-.002	10	-.074	4	-.11	4
419		max	4.239	10	635.016	10	1670.646	4	.002	4	.03	4	.063	10
420		min	-123.52	16	-633.881	4	-1671.095	10	-.002	10	-.027	10	-.07	4
421	M43	max	165.575	6	536.95	13	1918.821	12	-.103	6	0	61	.18	18
422		min	-202.972	12	130.392	70	-2224.733	6	-1.051	24	0	1	-.057	12
423		max	165.575	6	536.95	13	1918.821	12	-.103	6	.12	12	.153	6
424		min	-202.972	12	130.392	70	-2224.733	6	-1.051	24	-.139	6	-.071	12
425		max	165.575	6	536.95	13	1918.821	12	-.103	6	.24	12	.144	6
426		min	-202.972	12	130.392	70	-2224.733	6	-1.051	24	-.278	6	-.084	12
427		max	165.575	6	536.95	13	1918.821	12	-.103	6	.36	12	.134	6
428		min	-202.972	12	130.392	70	-2224.733	6	-1.051	24	-.417	6	-.097	12
429		max	165.575	6	536.95	13	1918.821	12	-.103	6	.48	12	.125	6
430		min	-202.972	12	130.392	70	-2224.733	6	-1.051	24	-.556	6	-.111	12
431	M44	max	184.07	6	540.136	24	1955.554	12	-.05	6	0	7	.168	18
432		min	-171.034	12	97.255	6	-1617.139	6	-1.064	24	0	1	-.004	12
433		max	184.07	6	540.136	24	1955.554	12	-.05	6	.122	12	.137	18
434		min	-171.034	12	97.255	6	-1617.139	6	-1.064	24	-.101	6	-.021	12
435		max	184.07	6	540.136	24	1955.554	12	-.05	6	.244	12	.105	18
436		min	-171.034	12	97.255	6	-1617.139	6	-1.064	24	-.202	6	-.038	12
437		max	184.07	6	540.136	24	1955.554	12	-.05	6	.367	12	.093	6
438		min	-171.034	12	97.255	6	-1617.139	6	-1.064	24	-.303	6	-.054	12
439		max	184.07	6	540.136	24	1955.554	12	-.05	6	.489	12	.087	6
440		min	-171.034	12	97.255	6	-1617.139	6	-1.064	24	-.404	6	-.071	12
441	M45	max	720.446	6	-105.147	74	647.953	9	.108	6	.293	6	.059	6
442		min	-703.823	12	-447.269	17	-312.807	3	-.808	24	-.387	12	-.16	24

Envelope Member Section Forces (Continued)

Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-...	LC	y-y Mome...	LC	z-z Mom...	LC	
443	2	max	720.446	6	-105.147	74	647.953	9	.108	6	.294	6	.071	6	
444		min	-703.823	12	-447.269	17	-312.807	3	-.808	24	-.364	12	-.146	12	
445	3	max	720.446	6	-105.147	74	647.953	9	.108	6	.294	6	.083	6	
446		min	-703.823	12	-447.269	17	-312.807	3	-.808	24	-.341	12	-.139	12	
447	4	max	720.446	6	-105.147	74	647.953	9	.108	6	.294	6	.094	6	
448		min	-703.823	12	-447.269	17	-312.807	3	-.808	24	-.318	12	-.132	12	
449	5	max	720.446	6	-105.147	74	647.953	9	.108	6	.294	6	.106	6	
450		min	-703.823	12	-447.269	17	-312.807	3	-.808	24	-.295	12	-.125	12	
451	M46	1	max	431.698	6	-105.968	68	290.54	8	.107	6	.465	6	.048	6
452		min	-448.35	12	-442.064	23	-625.632	2	-.808	24	-.383	12	-.155	24	
453	2	max	431.698	6	-105.968	68	290.54	8	.107	6	.466	6	.055	6	
454		min	-448.35	12	-442.064	23	-625.632	2	-.808	24	-.405	12	-.128	12	
455	3	max	431.698	6	-105.968	68	290.54	8	.107	6	.467	6	.062	6	
456		min	-448.35	12	-442.064	23	-625.632	2	-.808	24	-.426	12	-.116	12	
457	4	max	431.698	6	-105.968	68	290.54	8	.107	6	.469	6	.069	6	
458		min	-448.35	12	-442.064	23	-625.632	2	-.808	24	-.447	12	-.104	12	
459	5	max	431.698	6	-105.968	68	290.54	8	.107	6	.47	6	.076	6	
460		min	-448.35	12	-442.064	23	-625.632	2	-.808	24	-.469	12	-.093	12	
461	M47	1	max	0	75	0	75	.002	5	0	75	0	75	0	75
462		min	0	1	0	1	-.002	7	0	1	0	1	0	1	1
463	2	max	1919.53	12	526.098	13	203.287	12	.125	6	.63	12	.656	24	
464		min	-2223.824	6	127.141	70	-181.683	6	-.111	12	-.69	6	-.009	6	
465	3	max	1919.53	12	515.561	13	212.23	12	.125	6	.838	12	.221	12	
466		min	-2223.824	6	124.165	70	-190.625	6	-.111	12	-.876	6	-.155	6	
467	4	max	312.827	3	455.576	17	729.606	6	.125	12	.823	12	.249	6	
468		min	-647.958	9	107.896	74	-706.227	12	-.106	6	-.839	6	-.535	12	
469	5	max	0	75	0	1	.006	11	0	75	0	75	0	75	
470		min	0	1	-.001	11	-.007	1	0	1	0	1	0	1	
471	M48	1	max	0	75	0	75	.001	5	0	75	0	75	0	75
472		min	0	1	0	1	-.002	7	0	1	0	1	0	1	1
473	2	max	1956.185	12	536.508	24	171.981	12	.087	6	.616	12	.659	24	
474		min	-1616.311	6	93.634	6	-197.046	6	-.071	12	-.55	6	-.021	6	
475	3	max	1956.185	12	525.971	24	180.924	12	.087	6	.792	12	.177	12	
476		min	-1616.311	6	89.469	6	-205.988	6	-.071	12	-.751	6	-.113	6	
477	4	max	628.83	2	455.926	23	440.466	6	.093	12	.814	12	.193	6	
478		min	-291.774	8	109.135	68	-463.483	12	-.076	6	-.798	6	-.475	12	
479	5	max	0	75	.001	1	.006	11	0	75	0	75	0	75	
480		min	0	1	0	11	-.007	1	0	1	0	1	0	1	
481	MP4B	1	max	0	75	.002	24	0	1	0	75	0	75	0	75
482		min	0	1	0	6	-.002	19	0	1	0	1	0	1	1
483	2	max	1324.139	2	51.451	6	139.832	20	.011	12	-.029	2	.06	6	
484		min	-1355.608	8	-243.322	24	24.51	2	-.061	18	-.166	20	-.312	24	
485	3	max	1342.545	2	43.804	6	137.678	24	.01	12	.011	1	.014	2	
486		min	-1337.202	8	-238.607	24	31.815	69	-.06	18	-.014	7	-.008	8	
487	4	max	1347.751	2	37.671	6	141.389	24	.01	12	.17	13	.303	24	
488		min	-1331.995	8	-236.465	24	29.375	7	-.06	18	.03	7	-.043	6	
489	5	max	0	75	0	6	.002	18	0	75	0	75	0	75	
490		min	0	1	-.002	24	0	12	0	1	0	1	0	1	
491	M50	1	max	137.371	4	637.823	11	201.834	6	.117	12	.078	10	.027	6
492		min	-214.146	10	-707.763	5	-199.413	12	-.173	6	-.089	4	-.251	24	
493	2	max	137.371	4	637.823	11	201.834	6	.117	12	.069	10	.093	6	
494		min	-214.146	10	-707.763	5	-199.413	12	-.173	6	-.079	4	-.254	24	
495	3	max	137.371	4	637.823	11	201.834	6	.117	12	.065	9	.159	6	
496		min	-214.146	10	-707.763	5	-199.413	12	-.173	6	-.076	3	-.304	12	
497	4	max	137.371	4	637.823	11	201.834	6	.117	12	.074	6	.226	6	
498		min	-214.146	10	-707.763	5	-199.413	12	-.173	6	-.084	12	-.363	12	
499	5	max	137.371	4	637.823	11	201.834	6	.117	12	.093	6	.292	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 Mom...	LC	
500		min	-214.146	10	-707.763	5	-199.413	12	-.173	6	-.103	12	-.423	12	
501	M51	1	max	201.69	6	637.63	11	214.837	10	.292	6	.093	6	.173	6
502		min	-201.305	12	-707.439	5	-136.731	4	-.423	12	-.103	12	-.117	12	
503		2	max	201.69	6	637.63	11	214.837	10	.292	6	.097	9	.306	6
504		min	-201.305	12	-707.439	5	-136.731	4	-.423	12	-.093	3	-.237	12	
505		3	max	423.414	12	1214.013	1	304.463	2	.292	6	.37	11	.438	6
506		min	-434.695	6	-1030.336	7	-393.367	8	-.423	12	-.3	5	-.356	12	
507		4	max	423.414	12	1214.013	1	304.463	2	.221	5	.329	11	.416	6
508		min	-434.695	6	-1030.336	7	-393.367	8	-.142	11	-.276	5	-.279	12	
509		5	max	423.414	12	1214.013	1	304.463	2	.221	5	.296	12	.524	6
510		min	-434.695	6	-1030.336	7	-393.367	8	-.142	11	-.258	6	-.421	12	
511	M52	1	max	305.477	2	1214.553	1	434.424	6	.524	6	.296	12	.142	11
512		min	-392.495	8	-1029.835	7	-421.724	12	-.421	12	-.258	6	-.221	5	
513		2	max	305.477	2	1214.553	1	434.424	6	.524	6	.263	11	.208	8
514		min	-392.495	8	-1029.835	7	-421.724	12	-.421	12	-.227	5	-.304	2	
515		3	max	305.477	2	1214.553	1	434.424	6	.524	6	.239	11	.294	8
516		min	-392.495	8	-1029.835	7	-421.724	12	-.421	12	-.202	5	-.407	2	
517		4	max	305.477	2	1214.553	1	434.424	6	.524	6	.231	9	.38	8
518		min	-392.495	8	-1029.835	7	-421.724	12	-.421	12	-.194	3	-.51	2	
519		5	max	305.477	2	1214.553	1	434.424	6	.524	6	.231	9	.466	8
520		min	-392.495	8	-1029.835	7	-421.724	12	-.421	12	-.193	3	-.613	2	
521	M53	1	max	135.738	15	625.572	5	103.86	5	.121	5	.069	7	.024	7
522		min	-46.435	10	-719.661	11	-103.99	11	-.164	11	-.057	1	-.267	13	
523		2	max	135.738	15	625.572	5	103.86	5	.121	5	.076	6	.016	8
524		min	-46.435	10	-719.661	11	-103.99	11	-.164	11	-.063	12	-.252	14	
525		3	max	135.738	15	625.572	5	103.86	5	.121	5	.085	6	.063	9
526		min	-46.435	10	-719.661	11	-103.99	11	-.164	11	-.073	12	-.245	15	
527		4	max	135.738	15	625.572	5	103.86	5	.121	5	.095	6	.116	9
528		min	-46.435	10	-719.661	11	-103.99	11	-.164	11	-.082	12	-.256	3	
529		5	max	135.738	15	625.572	5	103.86	5	.121	5	.104	6	.17	9
530		min	-46.435	10	-719.661	11	-103.99	11	-.164	11	-.092	12	-.301	3	
531	M54	1	max	102.887	5	625.756	5	46.848	10	.17	9	.104	6	.164	11
532		min	-103.904	11	-719.59	11	-135.729	15	-.301	3	-.092	12	-.121	5	
533		2	max	102.887	5	625.756	5	46.848	10	.17	9	.106	6	.299	11
534		min	-103.904	11	-719.59	11	-135.729	15	-.301	3	-.107	12	-.238	5	
535		3	max	380.712	1	1211.126	7	385.653	2	.365	12	.278	11	.434	11
536		min	-368.99	7	-1032.528	1	-300.16	8	-.301	3	-.344	5	-.356	5	
537		4	max	380.712	1	1211.126	7	385.653	2	.365	12	.265	11	.431	12
538		min	-368.99	7	-1032.528	1	-300.16	8	-.282	6	-.316	5	-.295	6	
539		5	max	380.712	1	1211.126	7	385.653	2	.365	12	.276	12	.539	12
540		min	-368.99	7	-1032.528	1	-300.16	8	-.282	6	-.308	6	-.437	6	
541	M55	1	max	386.634	2	1211.637	7	366.096	7	.539	12	.276	12	.282	6
542		min	-299.617	8	-1031.775	1	-385.525	1	-.437	6	-.308	6	-.365	12	
543		2	max	386.634	2	1211.637	7	366.096	7	.539	12	.24	12	.233	5
544		min	-299.617	8	-1031.775	1	-385.525	1	-.437	6	-.274	6	-.33	11	
545		3	max	386.634	2	1211.637	7	366.096	7	.539	12	.211	11	.223	3
546		min	-299.617	8	-1031.775	1	-385.525	1	-.437	6	-.247	5	-.337	9	
547		4	max	386.634	2	1211.637	7	366.096	7	.539	12	.19	11	.288	2
548		min	-299.617	8	-1031.775	1	-385.525	1	-.437	6	-.227	5	-.419	8	
549		5	max	386.634	2	1211.637	7	366.096	7	.539	12	.174	9	.374	2
550		min	-299.617	8	-1031.775	1	-385.525	1	-.437	6	-.212	3	-.522	8	
551	M56	1	max	201.691	6	637.644	11	214.824	10	.027	6	.042	10	.083	19
552		min	-201.321	12	-707.439	5	-136.734	4	-.251	24	-.066	4	-.016	1	
553		2	max	201.691	6	637.644	11	214.824	10	.027	6	.051	10	.092	18
554		min	-201.321	12	-707.439	5	-136.734	4	-.251	24	-.072	4	-.038	12	
555		3	max	201.691	6	637.644	11	214.824	10	.027	6	.06	10	.115	6
556		min	-201.321	12	-707.439	5	-136.734	4	-.251	24	-.077	4	-.064	12	

Envelope Member Section Forces (Continued)

Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-...	LC	y-y Mome...	LC	z-z Mom...	LC	
557	4	max	201.691	6	637.644	11	214.824	10	.027	6	.069	10	.144	6	
558		min	-201.321	12	-707.439	5	-136.734	4	-.251	24	-.083	4	-.091	12	
559	5	max	201.691	6	637.644	11	214.824	10	.027	6	.078	10	.173	6	
560		min	-201.321	12	-707.439	5	-136.734	4	-.251	24	-.089	4	-.117	12	
561	M57	1	max	102.886	5	625.756	5	46.849	10	.024	7	.065	6	.054	23
562		min	-103.876	11	-719.591	11	-135.732	15	-.267	13	-.04	12	-.017	5	
563	2	max	102.886	5	625.756	5	46.849	10	.024	7	.066	6	.074	11	
564		min	-103.876	11	-719.591	11	-135.732	15	-.267	13	-.044	12	-.043	5	
565	3	max	102.886	5	625.756	5	46.849	10	.024	7	.066	6	.104	11	
566		min	-103.876	11	-719.591	11	-135.732	15	-.267	13	-.048	1	-.069	5	
567	4	max	102.886	5	625.756	5	46.849	10	.024	7	.067	7	.134	11	
568		min	-103.876	11	-719.591	11	-135.732	15	-.267	13	-.052	1	-.095	5	
569	5	max	102.886	5	625.756	5	46.849	10	.024	7	.069	7	.164	11	
570		min	-103.876	11	-719.591	11	-135.732	15	-.267	13	-.057	1	-.121	5	
571	M58	1	max	423.403	12	1214.006	1	304.458	2	.613	2	.231	9	.524	6
572		min	-434.699	6	-1030.336	7	-393.364	8	-.466	8	-.193	3	-.421	12	
573	2	max	423.403	12	1214.006	1	304.458	2	.613	2	.217	9	.548	6	
574		min	-434.699	6	-1030.336	7	-393.364	8	-.466	8	-.183	3	-.453	12	
575	3	max	423.403	12	1214.006	1	304.458	2	.613	2	.203	9	.572	6	
576		min	-434.699	6	-1030.336	7	-393.364	8	-.466	8	-.172	3	-.484	12	
577	4	max	423.403	12	1214.006	1	304.458	2	.613	2	.189	9	.6	7	
578		min	-434.699	6	-1030.336	7	-393.364	8	-.466	8	-.161	3	-.519	1	
579	5	max	423.403	12	1214.006	1	304.458	2	.613	2	.175	9	.643	7	
580		min	-434.699	6	-1030.336	7	-393.364	8	-.466	8	-.151	3	-.57	1	
581	M59	1	max	380.699	1	1211.125	7	385.658	2	.522	8	.174	9	.539	12
582		min	-368.978	7	-1032.539	1	-300.163	8	-.374	2	-.212	3	-.437	6	
583	2	max	380.699	1	1211.125	7	385.658	2	.522	8	.166	11	.563	12	
584		min	-368.978	7	-1032.539	1	-300.163	8	-.374	2	-.201	5	-.469	6	
585	3	max	380.699	1	1211.125	7	385.658	2	.522	8	.163	11	.587	12	
586		min	-368.978	7	-1032.539	1	-300.163	8	-.374	2	-.194	5	-.5	6	
587	4	max	380.699	1	1211.125	7	385.658	2	.522	8	.16	11	.611	12	
588		min	-368.978	7	-1032.539	1	-300.163	8	-.374	2	-.188	5	-.532	6	
589	5	max	380.699	1	1211.125	7	385.658	2	.522	8	.158	11	.635	12	
590		min	-368.978	7	-1032.539	1	-300.163	8	-.374	2	-.182	5	-.563	6	
591	MP1B	1	max	0	75	.11	.007	1	0	75	0	75	0	75	
592		min	0	1	-.016	5	-.124	19	0	1	0	1	0	1	
593	2	max	670.24	11	54.555	5	71.809	19	.002	11	.004	1	.076	5	
594		min	-675.012	5	-.120	11	-18.627	12	-.039	17	-.141	19	-.206	23	
595	3	max	678.57	11	37.558	5	65.221	18	.002	11	.019	6	.025	11	
596		min	-666.682	5	-109.337	23	-1.631	12	-.039	17	-.024	12	-.016	5	
597	4	max	711.32	11	47.462	10	111.664	12	.04	12	.154	24	.173	13	
598		min	-633.932	5	-113.147	16	-71.495	6	-.065	6	-.002	6	-.028	7	
599	5	max	0	75	.002	6	.024	18	0	75	0	75	0	75	
600		min	0	1	-.018	24	0	12	0	1	0	1	0	1	
601	MP2A	1	max	235.646	24	208.057	11	418.484	1	.156	11	-.039	75	0	75
602		min	52.64	64	-207.961	5	-418.695	7	-.156	3	-.177	13	0	1	
603	2	max	1111.96	7	22.458	5	89.082	19	.011	12	-.008	1	.03	5	
604		min	-1132.015	1	-116.985	23	-4.936	1	-.041	18	-.177	19	-.236	23	
605	3	max	1120.637	7	5.914	6	81.693	19	.011	12	.006	5	.014	2	
606		min	-1123.338	1	-111.254	24	15.508	1	-.041	18	-.006	11	-.014	8	
607	4	max	1129.314	7	-4.308	6	85.808	13	.011	12	.17	13	.229	24	
608		min	-1114.661	1	-108.141	13	16.788	7	-.041	18	.039	70	-.004	6	
609	5	max	0	75	.064	8	.603	13	0	75	0	75	0	75	
610		min	0	1	-.279	14	-.068	7	0	1	0	1	0	1	
611	M62	1	max	51.025	6	2437.351	12	319.483	6	0	.08	12	.609	12	
612		min	-84.961	12	-2397.278	6	-319.114	12	0	12	-.08	6	-.599	6	
613	2	max	51.025	6	2437.351	12	319.483	6	0	5	.06	12	.457	12	

Envelope Member Section Forces (Continued)

Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-...	LC	y-y Mome...	LC	z-z Mom...	LC	
614		min	-84.961	12	-2397.278	6	-319.114	12	0	12	-.06	6	-.449	6	
615	3	max	51.025	6	2437.351	12	319.483	6	0	5	.04	12	.305	12	
616		min	-84.961	12	-2397.278	6	-319.114	12	0	12	-.04	6	-.3	6	
617	4	max	51.025	6	2437.351	12	319.483	6	0	5	.02	12	.152	12	
618		min	-84.961	12	-2397.278	6	-319.114	12	0	12	-.02	6	-.15	6	
619	5	max	51.025	6	2437.351	12	319.483	6	0	5	0	22	0	22	
620		min	-84.961	12	-2397.278	6	-319.114	12	0	12	0	14	0	2	
621	M63	1	max	31.5	6	1716.736	12	237.905	6	0	6	.059	12	.429	12
622		min	-65.353	12	-1715.297	6	-234.814	12	0	11	-.059	6	-.429	6	
623	2	max	31.5	6	1716.736	12	237.905	6	0	6	.044	12	.322	12	
624		min	-65.353	12	-1715.297	6	-234.814	12	0	11	-.045	6	-.322	6	
625	3	max	31.5	6	1716.736	12	237.905	6	0	6	.029	12	.215	12	
626		min	-65.353	12	-1715.297	6	-234.814	12	0	11	-.03	6	-.214	6	
627	4	max	31.5	6	1716.736	12	237.905	6	0	6	.015	12	.107	12	
628		min	-65.353	12	-1715.297	6	-234.814	12	0	11	-.015	6	-.107	6	
629	5	max	31.5	6	1716.736	12	237.905	6	0	6	0	22	0	10	
630		min	-65.353	12	-1715.297	6	-234.814	12	0	11	0	1	0	18	
631	M64	1	max	2448.329	2	46.487	16	42.259	3	0	75	0	75	0	75
632		min	-2487.847	8	13.034	75	-42.259	9	0	1	0	1	0	1	
633	2	max	2440.881	2	23.243	16	21.13	3	0	75	.07	3	-.021	75	
634		min	-2480.92	8	6.517	75	-21.13	9	0	1	-.07	9	-.077	16	
635	3	max	2433.433	2	0	75	0	75	0	75	.093	3	-.029	75	
636		min	-2473.993	8	0	1	0	1	0	1	-.093	9	-.102	16	
637	4	max	2425.986	2	-6.517	75	21.13	9	0	75	.07	3	-.021	75	
638		min	-2467.066	8	-23.243	16	-21.13	3	0	1	-.07	9	-.077	16	
639	5	max	2418.538	2	-13.034	75	42.259	9	0	75	0	75	0	75	
640		min	-2460.138	8	-46.487	16	-42.259	3	0	1	0	1	0	1	
641	M65	1	max	1761.492	2	46.487	16	42.259	3	0	75	0	75	0	75
642		min	-1762.093	8	13.034	75	-42.259	9	0	1	0	1	0	1	
643	2	max	1754.044	2	23.243	16	21.13	3	0	75	.07	3	-.021	75	
644		min	-1755.166	8	6.517	75	-21.13	9	0	1	-.07	9	-.077	16	
645	3	max	1746.596	2	0	75	0	75	0	75	.093	3	-.029	75	
646		min	-1748.239	8	0	1	0	1	0	1	-.093	9	-.102	16	
647	4	max	1739.148	2	-6.517	75	21.13	9	0	75	.07	3	-.021	75	
648		min	-1741.312	8	-23.243	16	-21.13	3	0	1	-.07	9	-.077	16	
649	5	max	1731.7	2	-13.034	75	42.259	9	0	75	0	75	0	75	
650		min	-1734.385	8	-46.487	16	-42.259	3	0	1	0	1	0	1	
651	M66	1	max	2707.848	10	149.671	23	165.649	11	0	75	0	75	0	75
652		min	-2755.649	4	38.674	71	-129.786	5	0	1	0	1	0	1	
653	2	max	2700.401	10	126.487	23	146.145	10	0	75	.341	11	-.078	71	
654		min	-2748.722	4	32.157	71	-108.657	5	0	1	-.262	5	-.304	23	
655	3	max	2692.953	10	103.303	23	129.408	10	.033	16	.643	10	-.141	71	
656		min	-2741.795	4	-31.073	8	-87.527	5	-.009	10	-.478	5	-.556	23	
657	4	max	2571.684	10	-14.77	4	69.568	5	.033	16	.262	10	-.043	4	
658		min	-2617.775	4	-85.194	22	-110.649	10	-.009	10	-.176	5	-.213	22	
659	5	max	2564.236	10	-24.128	4	90.698	5	.033	16	0	75	0	75	
660		min	-2610.848	4	-108.278	22	-127.386	10	-.009	10	0	1	0	1	
661	M67	1	max	1823.503	10	137.659	22	105.572	11	0	75	0	75	0	75
662		min	-1813.864	4	36.166	75	-97.114	5	0	1	0	1	0	1	
663	2	max	1816.056	10	114.575	22	84.442	11	0	75	.209	11	-.072	75	
664		min	-1806.936	4	29.612	75	-75.984	5	0	1	-.19	5	-.277	22	
665	3	max	1808.608	10	91.491	22	65.797	10	.077	4	.371	11	-.13	75	
666		min	-1801.548	4	23.055	64	-54.855	5	-.068	10	-.334	5	-.504	22	
667	4	max	1792.895	10	-24	69	58.117	5	.077	4	.171	11	-.06	69	
668		min	-1794.621	4	-94.902	23	-67.32	10	-.068	10	-.151	5	-.234	23	
669	5	max	1785.447	10	-30.526	69	79.247	5	.077	4	0	75	0	75	
670		min	-1787.694	4	-118.086	23	-88.236	11	-.068	10	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 Mom...	LC	
671	M68	1	max	2448.319	6	46.487	20	42.259	7	0	75	0	75	0	75
			min	-2487.829	12	13.034	67	-42.259	1	0	1	0	1	0	1
673	2	max	2440.871	6	23.243	20	21.13	7	0	75	.07	7	-.021	67	
674		min	-2480.902	12	6.517	67	-21.13	1	0	1	-.07	1	-.077	20	
675	3	max	2433.424	6	0	75	0	75	0	75	.093	7	-.029	67	
676		min	-2473.974	12	0	1	0	1	0	1	-.093	1	-.102	20	
677	4	max	2425.976	6	-6.517	67	21.13	1	0	75	.07	7	-.021	67	
678		min	-2467.047	12	-23.243	20	-21.13	7	0	1	-.07	1	-.077	20	
679	5	max	2418.528	6	-13.034	67	42.259	1	0	75	0	75	0	75	
680		min	-2460.12	12	-46.487	20	-42.259	7	0	1	0	1	0	1	
681	M69	1	max	1761.282	6	46.487	20	42.259	7	0	75	0	75	0	75
682			min	-1761.817	12	13.034	67	-42.259	1	0	1	0	1	0	1
683	2	max	1753.834	6	23.243	20	21.13	7	0	75	.07	7	-.021	67	
684		min	-1754.89	12	6.517	67	-21.13	1	0	1	-.07	1	-.077	20	
685	3	max	1746.386	6	0	75	0	75	0	75	.093	7	-.029	67	
686		min	-1747.963	12	0	1	0	1	0	1	-.093	1	-.102	20	
687	4	max	1738.939	6	-6.517	67	21.13	1	0	75	.07	7	-.021	67	
688		min	-1741.036	12	-23.243	20	-21.13	7	0	1	-.07	1	-.077	20	
689	5	max	1731.491	6	-13.034	67	42.259	1	0	75	0	75	0	75	
690		min	-1734.109	12	-46.487	20	-42.259	7	0	1	0	1	0	1	
691	M70	1	max	160.078	5	157.818	16	196.202	9	.219	15	.175	11	.007	10
692			min	-172.078	11	41.039	67	-200.195	3	-.041	9	-.172	5	-.058	16
693	2	max	160.078	5	157.818	16	196.202	9	.219	15	.176	11	.004	10	
694		min	-172.078	11	41.039	67	-200.195	3	-.041	9	-.174	5	-.066	16	
695	3	max	160.078	5	157.818	16	196.202	9	.219	15	.177	11	.001	10	
696		min	-172.078	11	41.039	67	-200.195	3	-.041	9	-.175	5	-.073	16	
697	4	max	160.078	5	157.818	16	196.202	9	.219	15	.178	11	-.002	10	
698		min	-172.078	11	41.039	67	-200.195	3	-.041	9	-.176	5	-.081	16	
699	5	max	160.078	5	157.818	16	196.202	9	.219	15	.183	10	-.005	10	
700		min	-172.078	11	41.039	67	-200.195	3	-.041	9	-.181	4	-.089	16	
701	M71	1	max	108.785	5	157.542	22	57.861	8	.101	17	.078	11	.066	10
702			min	-96.804	11	40.881	73	-54.758	2	-.009	11	-.081	5	-.082	4
703	2	max	108.785	5	157.542	22	57.861	8	.101	17	.077	11	.063	10	
704		min	-96.804	11	40.881	73	-54.758	2	-.009	11	-.08	5	-.085	4	
705	3	max	108.785	5	157.542	22	57.861	8	.101	17	.076	11	.06	10	
706		min	-96.804	11	40.881	73	-54.758	2	-.009	11	-.078	5	-.088	4	
707	4	max	108.785	5	157.542	22	57.861	8	.101	17	.075	11	.057	10	
708		min	-96.804	11	40.881	73	-54.758	2	-.009	11	-.077	5	-.091	4	
709	5	max	108.785	5	157.542	22	57.861	8	.101	17	.075	11	.055	10	
710		min	-96.804	11	40.881	73	-54.758	2	-.009	11	-.076	5	-.094	4	
711	MP2B	1	max	0	75	.013	22	.01	21	0	75	0	75	0	75
712			min	0	1	0	5	0	3	0	1	0	1	0	1
713	2	max	-36.578	67	187.666	4	138.282	8	.181	4	.219	16	.078	10	
714		min	-141.993	16	-193.6	10	-149.453	2	-.183	10	0	10	-.05	4	
715	3	max	125.947	22	63.304	10	48.39	11	.075	11	.019	6	.091	10	
716		min	31.959	73	-69.238	4	-58.802	5	-.076	5	-.095	24	-.103	4	
717	4	max	141.753	22	78.024	10	55.75	11	.075	11	.006	11	.012	3	
718		min	36.422	73	-83.958	4	-66.162	5	-.076	5	-.117	17	-.015	10	
719	5	max	0	75	.005	4	0	5	0	75	0	75	0	75	
720		min	0	1	-.015	22	-.014	23	0	1	0	1	0	1	
721	M73	1	max	190.695	11	79.138	18	41.818	4	.002	10	.016	10	.03	18
722			min	-218.138	5	20.354	12	-41.818	10	-.002	4	-.016	4	.01	12
723	2	max	190.549	11	78.326	18	41.429	4	.002	10	.008	10	.015	17	
724		min	-217.992	5	20.181	12	-41.429	10	-.002	4	-.008	4	.006	74	
725	3	max	190.403	11	77.514	18	41.04	4	.002	10	0	11	.003	1	
726		min	-217.847	5	20.008	12	-41.04	10	-.002	4	0	3	-.002	7	
727	4	max	190.257	11	76.703	18	40.651	4	.002	10	.008	4	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 Mom...	LC	
728		min	-217.701	5	19.836	12	-40.651	10	-.002	4	-.008	10	-.014	19	
729		max	190.112	11	75.891	18	40.262	4	.002	10	.015	4	-.005	1	
730		min	-217.555	5	19.663	12	-40.262	10	-.002	4	-.015	10	-.028	18	
731	M74	1	max	190.695	3	79.138	20	41.818	4	.002	10	.016	10	.03	20
732		min	-218.138	9	20.354	2	-41.818	10	-.002	4	-.016	4	.01	2	
733		2	max	190.549	3	78.326	20	41.429	4	.002	10	.008	10	.015	21
734		min	-217.992	9	20.181	2	-41.429	10	-.002	4	-.008	4	.006	66	
735		3	max	190.403	3	77.514	20	41.04	4	.002	10	0	11	.003	1
736		min	-217.847	9	20.008	2	-41.04	10	-.002	4	0	3	-.002	7	
737		4	max	190.257	3	76.703	20	40.651	4	.002	10	.008	4	0	1
738		min	-217.701	9	19.836	2	-40.651	10	-.002	4	-.008	10	-.014	19	
739		5	max	190.111	3	75.891	20	40.262	4	.002	10	.015	4	-.005	1
740		min	-217.555	9	19.663	2	-40.262	10	-.002	4	-.015	10	-.028	20	
741	M75	1	max	157.011	11	87.081	24	32.041	4	.002	4	.012	10	.032	24
742		min	-129.138	5	25.201	6	-32.041	10	-.002	10	-.012	4	.011	6	
743		2	max	156.865	11	86.269	24	31.652	4	.002	4	.006	10	.015	24
744		min	-128.992	5	25.028	6	-31.652	10	-.002	10	-.006	4	.006	68	
745		3	max	156.719	11	85.457	24	31.263	4	.002	4	0	12	.002	7
746		min	-128.846	5	24.856	6	-31.263	10	-.002	10	0	2	-.003	1	
747		4	max	156.573	11	84.646	24	30.874	4	.002	4	.006	4	-.002	7
748		min	-128.7	5	24.683	6	-30.874	10	-.002	10	-.006	10	-.017	13	
749		5	max	156.427	11	83.834	24	30.485	4	.002	4	.012	4	-.007	7
750		min	-128.554	5	24.51	6	-30.485	10	-.002	10	-.012	10	-.032	24	
751	M76	1	max	157.011	3	87.081	14	32.041	4	.002	4	.012	10	.032	14
752		min	-129.138	9	25.201	8	-32.041	10	-.002	10	-.012	4	.011	8	
753		2	max	156.865	3	86.269	14	31.652	4	.002	4	.006	10	.015	14
754		min	-128.992	9	25.028	8	-31.652	10	-.002	10	-.006	4	.006	72	
755		3	max	156.719	3	85.457	14	31.263	4	.002	4	0	12	.002	7
756		min	-128.846	9	24.856	8	-31.263	10	-.002	10	0	2	-.003	1	
757		4	max	156.573	3	84.646	14	30.874	4	.002	4	.006	4	-.002	7
758		min	-128.7	9	24.683	8	-30.874	10	-.002	10	-.006	10	-.017	13	
759		5	max	156.427	3	83.834	14	30.485	4	.002	4	.012	4	-.007	7
760		min	-128.554	9	24.51	8	-30.485	10	-.002	10	-.012	10	-.032	14	
761	M77	1	max	42.402	4	-19.855	12	218.138	5	.03	18	.016	4	.002	4
762		min	-41.318	10	-79.507	18	-190.695	11	.01	12	-.016	10	-.002	10	
763		2	max	42.402	4	-19.855	12	218.138	5	.03	18	.036	5	.008	17
764		min	-41.318	10	-79.507	18	-190.695	11	.01	12	-.033	11	0	12	
765		3	max	42.402	10	79.507	20	218.138	5	.03	18	.056	9	.015	20
766		min	0	1	-79.507	18	-218.138	9	-.03	20	-.051	11	.004	1	
767		4	max	42.402	10	79.507	20	190.695	3	-.01	2	.036	9	.008	21
768		min	-41.318	4	19.855	2	-218.138	9	-.03	20	-.033	3	0	2	
769		5	max	42.402	10	79.507	20	190.695	3	-.01	2	.016	10	.002	10
770		min	-41.318	4	19.855	2	-218.138	9	-.03	20	-.016	4	-.002	4	
771	M78	1	max	39.761	10	76.262	18	190.106	11	.028	18	.015	4	.002	10
772		min	-40.844	4	19.203	12	-217.56	5	.005	1	-.015	10	-.002	4	
773		2	max	39.761	10	76.262	18	190.106	11	.028	18	.005	12	0	12
774		min	-40.844	4	19.203	12	-217.56	5	.005	1	-.008	6	-.007	17	
775		3	max	0	70	76.262	18	217.56	9	.028	18	.021	12	-.004	1
776		min	-40.844	4	-76.262	20	-217.56	5	-.028	20	-.027	6	-.015	20	
777		4	max	39.759	4	-19.203	2	217.56	9	-.005	1	.005	2	0	2
778		min	-40.844	10	-76.262	20	-190.106	3	-.028	20	-.008	8	-.007	21	
779		5	max	39.759	4	-19.203	2	217.56	9	-.005	1	.015	10	.002	4
780		min	-40.844	10	-76.262	20	-190.106	3	-.028	20	-.015	4	-.002	10	
781	M79	1	max	32.289	4	-25.539	6	129.138	5	.032	24	.012	4	.002	10
782		min	-31.73	10	-86.758	24	-157.011	11	.011	6	-.012	10	-.002	4	
783		2	max	32.289	4	-25.539	6	129.138	5	.032	24	.024	5	.008	23
784		min	-31.73	10	-86.758	24	-157.011	11	.011	6	-.026	11	.001	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 Mom...	LC	
785	3	max	32.289	4	86.758	14	157.011	3	.032	24	.036	5	.017	24	
786		min	0	1	-86.758	24	-157.011	11	-.032	14	-.041	3	.005	7	
787	4	max	32.289	10	86.758	14	157.011	3	-.011	8	.024	9	.008	15	
788		min	-31.73	4	25.539	8	-129.138	9	-.032	14	-.026	3	.001	8	
789	5	max	32.289	10	86.758	14	157.011	3	-.011	8	.012	10	.002	4	
790		min	-31.73	4	25.539	8	-129.138	9	-.032	14	-.012	4	-.002	10	
791	M80	1	max	30.17	10	83.509	24	156.424	11	.032	24	.012	4	.002	4
792		min	-30.729	4	24.816	6	-128.557	5	.007	7	-.012	10	-.002	10	
793	2	max	30.17	10	83.509	24	156.424	11	.032	24	.006	12	-.001	6	
794		min	-30.729	4	24.816	6	-128.557	5	.007	7	-.003	6	-.008	23	
795	3	max	0	70	83.509	24	156.424	11	.032	24	.019	12	-.005	7	
796		min	-30.731	10	-83.509	14	-156.424	3	-.032	14	-.014	6	-.016	24	
797	4	max	30.169	4	-24.816	8	128.557	9	-.007	7	.006	2	-.001	8	
798		min	-30.731	10	-83.509	14	-156.424	3	-.032	14	-.003	8	-.008	15	
799	5	max	30.169	4	-24.816	8	128.557	9	-.007	7	.012	10	.002	10	
800		min	-30.731	10	-83.509	14	-156.424	3	-.032	14	-.012	4	-.002	4	
801	MP4A	1	max	-40.397	1	80.605	4	150.591	7	.038	5	-.009	1	.006	4
802		min	-151.55	19	-80.605	10	-95.157	1	-.038	9	-.057	19	-.006	10	
803	2	max	54.651	1	18.687	4	55.084	19	.002	6	.059	7	.08	10	
804		min	-23.236	7	-18.687	10	.959	1	-.002	8	-.167	1	-.08	4	
805	3	max	60.898	1	5.192	5	49.764	19	.002	6	.13	7	.097	10	
806		min	-16.989	7	-5.192	9	15.678	1	-.002	8	-.154	1	-.097	4	
807	4	max	150.746	13	47.209	11	107.248	1	.024	11	.103	7	.075	11	
808		min	44.699	7	-47.209	3	-51.814	7	-.024	3	-.118	1	-.075	3	
809	5	max	166.552	13	60.906	10	121.968	1	.024	11	.065	13	.006	4	
810		min	50.946	7	-60.906	4	-66.534	7	-.024	3	.015	7	-.006	10	
811	M82	1	max	190.695	7	79.136	14	41.818	12	.002	6	.016	6	.03	14
812		min	-218.138	1	20.353	8	-41.818	6	-.002	12	-.016	12	.01	8	
813	2	max	190.549	7	78.325	14	41.428	12	.002	6	.008	6	.015	13	
814		min	-217.992	1	20.18	8	-41.428	6	-.002	12	-.008	12	.006	70	
815	3	max	190.403	7	77.513	14	41.039	12	.002	6	0	7	.003	9	
816		min	-217.846	1	20.008	8	-41.039	6	-.002	12	0	11	-.002	3	
817	4	max	190.257	7	76.701	14	40.65	12	.002	6	.008	12	0	9	
818		min	-217.7	1	19.835	8	-40.65	6	-.002	12	-.008	6	-.014	15	
819	5	max	190.111	7	75.89	14	40.261	12	.002	6	.015	12	-.005	9	
820		min	-217.554	1	19.662	8	-40.261	6	-.002	12	-.015	6	-.028	14	
821	M83	1	max	190.696	11	79.136	16	41.818	12	.002	6	.016	6	.03	16
822		min	-218.139	5	20.353	10	-41.818	6	-.002	12	-.016	12	.01	10	
823	2	max	190.55	11	78.325	16	41.428	12	.002	6	.008	6	.015	17	
824		min	-217.993	5	20.18	10	-41.428	6	-.002	12	-.008	12	.006	74	
825	3	max	190.404	11	77.513	16	41.039	12	.002	6	0	7	.003	9	
826		min	-217.847	5	20.008	10	-41.039	6	-.002	12	0	11	-.002	3	
827	4	max	190.258	11	76.701	16	40.65	12	.002	6	.008	12	0	9	
828		min	-217.701	5	19.835	10	-40.65	6	-.002	12	-.008	6	-.014	15	
829	5	max	190.112	11	75.89	16	40.261	12	.002	6	.015	12	-.005	9	
830		min	-217.555	5	19.662	10	-40.261	6	-.002	12	-.015	6	-.028	16	
831	M84	1	max	157.012	7	87.079	20	32.042	12	.002	12	.012	6	.032	20
832		min	-129.139	1	25.2	2	-32.042	6	-.002	6	-.012	12	.011	2	
833	2	max	156.866	7	86.268	20	31.653	12	.002	12	.006	6	.015	20	
834		min	-128.993	1	25.028	2	-31.653	6	-.002	6	-.006	12	.006	64	
835	3	max	156.72	7	85.456	20	31.264	12	.002	12	0	8	.002	3	
836		min	-128.847	1	24.855	2	-31.264	6	-.002	6	0	10	-.003	9	
837	4	max	156.574	7	84.644	20	30.874	12	.002	12	.006	12	-.002	3	
838		min	-128.701	1	24.682	2	-30.874	6	-.002	6	-.006	6	-.017	21	
839	5	max	156.428	7	83.833	20	30.485	12	.002	12	.012	12	-.007	3	
840		min	-128.555	1	24.509	2	-30.485	6	-.002	6	-.012	6	-.032	20	
841	M85	1	max	157.012	11	87.079	22	32.042	12	.002	12	.012	6	.032	22

Envelope Member Section Forces (Continued)

Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-...	LC	y-y Mome...	LC	z-z Mom...	LC
842		min	-129.139	5	25.2	4	-32.042	6	-.002	6	-.012	12	.011	4
843		max	156.866	11	86.268	22	31.653	12	.002	12	.006	6	.015	22
844		min	-128.993	5	25.028	4	-31.653	6	-.002	6	-.006	12	.006	68
845		max	156.72	11	85.456	22	31.264	12	.002	12	0	8	.002	3
846		min	-128.847	5	24.855	4	-31.264	6	-.002	6	0	10	-.003	9
847		max	156.574	11	84.644	22	30.874	12	.002	12	.006	12	-.002	3
848		min	-128.702	5	24.682	4	-30.874	6	-.002	6	-.006	6	-.017	21
849		max	156.428	11	83.833	22	30.485	12	.002	12	.012	12	-.007	3
850		min	-128.556	5	24.509	4	-30.485	6	-.002	6	-.012	6	-.032	22
851	M86	max	42.402	12	-19.855	8	218.138	1	.03	14	.016	12	.002	12
852		min	-41.317	6	-79.506	14	-190.695	7	.01	8	-.016	6	-.002	6
853		max	42.402	12	-19.855	8	218.138	1	.03	14	.036	1	.008	13
854		min	-41.317	6	-79.506	14	-190.695	7	.01	8	-.033	7	0	8
855		max	42.402	12	79.506	16	218.138	1	.03	14	.056	5	.015	16
856		min	0	66	-79.506	14	-218.139	5	-.03	16	-.051	11	.004	9
857		max	42.402	6	79.506	16	190.696	11	-.01	10	.036	5	.008	17
858		min	-41.317	12	19.855	10	-218.139	5	-.03	16	-.033	11	0	10
859		max	42.402	6	79.506	16	190.696	11	-.01	10	.016	6	.002	6
860		min	-41.317	12	19.855	10	-218.139	5	-.03	16	-.016	12	-.002	12
861	M87	max	39.761	6	76.262	14	190.106	7	.028	14	.015	12	.002	6
862		min	-40.846	12	19.202	8	-217.558	1	.005	9	-.015	6	-.002	12
863		max	39.761	6	76.262	14	190.106	7	.028	14	.005	8	0	8
864		min	-40.846	12	19.202	8	-217.558	1	.005	9	-.008	2	-.007	13
865		max	0	15	76.262	14	217.559	5	.028	14	.021	8	-.004	9
866		min	-40.846	12	-76.262	16	-217.558	1	-.028	16	-.027	2	-.015	14
867		max	39.76	12	-19.203	10	217.559	5	-.005	9	.005	10	0	10
868		min	-40.844	6	-76.262	16	-190.105	11	-.028	16	-.008	4	-.007	17
869		max	39.76	12	-19.203	10	217.559	5	-.005	9	.015	6	.002	12
870		min	-40.844	6	-76.262	16	-190.105	11	-.028	16	-.015	12	-.002	6
871	M88	max	32.289	12	-25.538	2	129.139	1	.032	20	.012	12	.002	6
872		min	-31.73	6	-86.757	20	-157.012	7	.011	2	-.012	6	-.002	12
873		max	32.289	12	-25.538	2	129.139	1	.032	20	.024	1	.008	19
874		min	-31.73	6	-86.757	20	-157.012	7	.011	2	-.026	7	.001	2
875		max	32.289	6	86.757	22	157.012	11	.032	20	.036	5	.017	20
876		min	0	72	-86.757	20	-157.012	7	-.032	22	-.041	11	.005	3
877		max	32.289	6	86.757	22	157.012	11	-.011	4	.024	5	.008	23
878		min	-31.73	12	25.538	4	-129.139	5	-.032	22	-.026	11	.001	4
879		max	32.289	6	86.757	22	157.012	11	-.011	4	.012	6	.002	12
880		min	-31.73	12	25.538	4	-129.139	5	-.032	22	-.012	12	-.002	6
881	M89	max	30.174	6	83.509	20	156.425	7	.032	20	.012	12	.002	12
882		min	-30.732	12	24.816	2	-128.558	1	.007	3	-.012	6	-.002	6
883		max	30.174	6	83.509	20	156.425	7	.032	20	.006	8	-.001	2
884		min	-30.732	12	24.816	2	-128.558	1	.007	3	-.003	2	-.008	19
885		max	0	21	83.509	20	156.425	7	.032	20	.019	8	-.005	3
886		min	-30.732	12	-83.507	22	-156.424	11	-.032	22	-.014	2	-.016	20
887		max	30.173	12	-24.816	4	128.558	5	-.007	3	.006	10	-.001	4
888		min	-30.732	6	-83.507	22	-156.424	11	-.032	22	-.003	4	-.008	23
889		max	30.173	12	-24.816	4	128.558	5	-.007	3	.012	6	.002	6
890		min	-30.732	6	-83.507	22	-156.424	11	-.032	22	-.012	12	-.002	12
891	MP4C	max	-40.398	9	136.312	4	83.413	8	.038	1	.029	14	.049	15
892		min	-151.551	15	-88.307	10	-111.129	2	-.038	5	.003	8	.008	9
893		max	54.65	9	48.746	4	7.579	8	.002	2	.12	8	.152	10
894		min	-23.237	3	-.742	10	-35.294	2	-.002	4	-.067	2	-.059	4
895		max	60.897	9	43.097	15	-5.169	8	.002	2	.122	8	.142	10
896		min	-16.989	3	13.577	9	-25.547	14	-.002	4	-.11	2	-.121	4
897		max	150.744	21	95.194	10	47.789	2	.024	7	.094	8	.109	10
898		min	44.698	3	-47.19	4	-75.504	8	-.024	11	-.087	2	-.096	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 Mom...	LC	
899	5	max	166.55	21	109.913	10	60.536	2	.024	7	-.006	2	-.013	3	
900		min	50.946	3	-61.909	4	-88.251	8	-.024	11	-.033	20	-.056	21	
901	M91	1	max	190.694	3	79.136	22	41.818	8	.002	2	.016	2	.03	22
902		min	-218.137	9	20.353	4	-41.818	2	-.002	8	-.016	8	.01	4	
903		2	max	190.548	3	78.325	22	41.428	8	.002	2	.008	2	.015	21
904		min	-217.991	9	20.18	4	-41.428	2	-.002	8	-.008	8	.006	66	
905		3	max	190.402	3	77.513	22	41.039	8	.002	2	0	3	.003	5
906		min	-217.845	9	20.008	4	-41.039	2	-.002	8	0	7	-.002	11	
907		4	max	190.256	3	76.701	22	40.65	8	.002	2	.008	8	0	5
908		min	-217.699	9	19.835	4	-40.65	2	-.002	8	-.008	2	-.014	23	
909		5	max	190.11	3	75.89	22	40.261	8	.002	2	.015	8	-.005	5
910		min	-217.553	9	19.662	4	-40.261	2	-.002	8	-.015	2	-.028	22	
911	M92	1	max	190.696	7	79.136	24	41.818	8	.002	2	.016	2	.03	24
912		min	-218.139	1	20.353	6	-41.818	2	-.002	8	-.016	8	.01	6	
913		2	max	190.55	7	78.325	24	41.428	8	.002	2	.008	2	.015	13
914		min	-217.993	1	20.18	6	-41.428	2	-.002	8	-.008	8	.006	70	
915		3	max	190.404	7	77.513	24	41.039	8	.002	2	0	3	.003	5
916		min	-217.847	1	20.008	6	-41.039	2	-.002	8	0	7	-.002	11	
917		4	max	190.258	7	76.701	24	40.65	8	.002	2	.008	8	0	5
918		min	-217.701	1	19.835	6	-40.65	2	-.002	8	-.008	2	-.014	23	
919		5	max	190.112	7	75.89	24	40.261	8	.002	2	.015	8	-.005	5
920		min	-217.555	1	19.662	6	-40.261	2	-.002	8	-.015	2	-.028	24	
921	M93	1	max	157.011	3	87.079	16	32.041	8	.002	8	.012	2	.032	16
922		min	-129.138	9	25.2	10	-32.041	2	-.002	2	-.012	8	.011	10	
923		2	max	156.865	3	86.268	16	31.652	8	.002	8	.006	2	.015	16
924		min	-128.992	9	25.028	10	-31.652	2	-.002	2	-.006	8	.006	72	
925		3	max	156.719	3	85.456	16	31.263	8	.002	8	0	4	.002	11
926		min	-128.846	9	24.855	10	-31.263	2	-.002	2	0	6	-.003	5	
927		4	max	156.573	3	84.644	16	30.874	8	.002	8	.006	8	-.002	11
928		min	-128.7	9	24.682	10	-30.874	2	-.002	2	-.006	2	-.017	17	
929		5	max	156.427	3	83.833	16	30.485	8	.002	8	.012	8	-.007	11
930		min	-128.554	9	24.509	10	-30.485	2	-.002	2	-.012	2	-.032	16	
931	M94	1	max	157.012	7	87.079	18	32.041	8	.002	8	.012	2	.032	18
932		min	-129.139	1	25.2	12	-32.041	2	-.002	2	-.012	8	.011	12	
933		2	max	156.866	7	86.268	18	31.652	8	.002	8	.006	2	.015	18
934		min	-128.993	1	25.028	12	-31.652	2	-.002	2	-.006	8	.006	64	
935		3	max	156.72	7	85.456	18	31.263	8	.002	8	0	4	.002	11
936		min	-128.847	1	24.855	12	-31.263	2	-.002	2	0	6	-.003	5	
937		4	max	156.574	7	84.644	18	30.874	8	.002	8	.006	8	-.002	11
938		min	-128.701	1	24.682	12	-30.874	2	-.002	2	-.006	2	-.017	17	
939		5	max	156.428	7	83.833	18	30.485	8	.002	8	.012	8	-.007	11
940		min	-128.555	1	24.509	12	-30.485	2	-.002	2	-.012	2	-.032	18	
941	M95	1	max	42.402	8	-19.855	4	218.137	9	.03	22	.016	8	.002	8
942		min	-41.318	2	-79.506	22	-190.694	3	.01	4	-.016	2	-.002	2	
943		2	max	42.402	8	-19.855	4	218.137	9	.03	22	.036	9	.008	21
944		min	-41.318	2	-79.506	22	-190.694	3	.01	4	-.033	3	0	4	
945		3	max	42.402	2	79.506	24	218.137	9	.03	22	.056	1	.015	24
946		min	0	74	-79.506	22	-218.139	1	-.03	24	-.051	7	.004	5	
947		4	max	42.402	2	79.506	24	190.696	7	-.01	6	.036	1	.008	13
948		min	-41.318	8	19.855	6	-218.139	1	-.03	24	-.033	7	0	6	
949		5	max	42.402	2	79.506	24	190.696	7	-.01	6	.016	2	.002	2
950		min	-41.318	8	19.855	6	-218.139	1	-.03	24	-.016	8	-.002	8	
951	M96	1	max	39.762	2	76.262	22	190.105	3	.028	22	.015	8	.002	2
952		min	-40.844	8	19.203	4	-217.559	9	.005	5	-.015	2	-.002	8	
953		2	max	39.762	2	76.262	22	190.105	3	.028	22	.005	4	0	4
954		min	-40.844	8	19.203	4	-217.559	9	.005	5	-.008	10	-.007	21	
955		3	max	0	17	76.262	22	217.56	1	.028	22	.021	6	-.004	5

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-...	LC	y-y Mome...	LC	z-z Mom...	LC
956			min	-40.846	2	-76.261	24	-217.559	9	-.028	24	-.027	12	-.015	22
957		4	max	39.763	8	-19.203	6	217.56	1	-.005	5	.005	6	0	6
958			min	-40.846	2	-76.261	24	-190.105	7	-.028	24	-.008	12	-.007	13
959		5	max	39.763	8	-19.203	6	217.56	1	-.005	5	.015	2	.002	8
960			min	-40.846	2	-76.261	24	-190.105	7	-.028	24	-.015	8	-.002	2
961	M97	1	max	32.289	8	-25.538	10	129.138	9	.032	16	.012	8	.002	2
962			min	-31.73	2	-86.757	16	-157.011	3	.011	10	-.012	2	-.002	8
963		2	max	32.289	8	-25.538	10	129.138	9	.032	16	.024	9	.008	15
964			min	-31.73	2	-86.757	16	-157.011	3	.011	10	-.026	3	.001	10
965		3	max	32.289	8	86.757	18	157.012	7	.032	16	.036	1	.017	18
966			min	0	68	-86.757	16	-157.011	3	-.032	18	-.041	7	.005	11
967		4	max	32.289	2	86.757	18	157.012	7	-.011	12	.024	1	.008	19
968			min	-31.73	8	25.538	12	-129.139	1	-.032	18	-.026	7	.001	12
969		5	max	32.289	2	86.757	18	157.012	7	-.011	12	.012	2	.002	8
970			min	-31.73	8	25.538	12	-129.139	1	-.032	18	-.012	8	-.002	2
971	M98	1	max	30.173	2	83.508	16	156.425	3	.032	16	.012	8	.002	8
972			min	-30.732	8	24.816	10	-128.557	9	.007	11	-.012	2	-.002	2
973		2	max	30.173	2	83.508	16	156.425	3	.032	16	.006	4	-.001	10
974			min	-30.732	8	24.816	10	-128.557	9	.007	11	-.003	10	-.008	15
975		3	max	0	11	83.508	16	156.425	3	.032	16	.019	6	-.005	11
976			min	-30.733	2	-83.508	18	-156.425	7	-.032	18	-.014	12	-.016	18
977		4	max	30.173	8	-24.816	12	128.558	1	-.007	11	.006	6	-.001	12
978			min	-30.733	2	-83.508	18	-156.425	7	-.032	18	-.003	12	-.008	19
979		5	max	30.173	8	-24.816	12	128.558	1	-.007	11	.012	2	.002	2
980			min	-30.733	2	-83.508	18	-156.425	7	-.032	18	-.012	8	-.002	8
981	MP5B	1	max	-40.398	5	88.307	4	83.413	6	.038	9	.029	24	-.008	5
982			min	-151.551	23	-136.312	10	-111.129	12	-.038	1	.003	6	-.049	23
983		2	max	54.65	5	.742	4	7.579	6	.002	10	.12	6	.059	10
984			min	-23.237	11	-48.746	10	-35.294	12	-.002	12	-.067	12	-.152	4
985		3	max	60.897	5	-13.577	5	-5.169	6	.002	10	.122	6	.121	10
986			min	-16.989	11	-43.097	23	-25.547	24	-.002	12	-.11	12	-.142	4
987		4	max	150.744	17	47.19	10	47.789	12	.024	3	.094	6	.096	10
988			min	44.698	11	-95.194	4	-75.504	6	-.024	7	-.087	12	-.109	4
989		5	max	166.55	17	61.909	10	60.536	12	.024	3	-.006	12	.056	17
990			min	50.946	11	-109.913	4	-88.251	6	-.024	7	-.033	18	.013	11

Envelope AISC 15th(360-16): LRFD Steel Code Checks

	Member	Shape	Code Check	Loc[ft]	LC	Shea...	Loc.....	LC	phi*Pn...	phi*Pn...	phi*Mn...	phi*Mn.....	Eqn
1	M27	PIPE_2.0	.655	.25	16	.131	2.75	4	26521...	32130	1.872	1.872	... H1-1b
2	M26	PIPE_2.0	.647	2.75	4	.158	2.75	10	26521...	32130	1.872	1.872	... H1-1b
3	M5	PIPE_2.0	.635	2.75	8	.154	2.75	2	26521...	32130	1.872	1.872	... H1-1b
4	M47	PIPE_2.0	.635	2.75	12	.154	2.75	6	26521...	32130	1.872	1.872	... H1-1b
5	M6	PIPE_2.0	.603	.25	44	.108	2.75	8	26521...	32130	1.872	1.872	... H1-1b
6	M48	PIPE_2.0	.598	.25	24	.108	2.75	12	26521...	32130	1.872	1.872	... H1-1b
7	M66	PIPE_2.0	.532	4.397	10	.030	4.397	16	12710...	32130	1.872	1.872	... H1-1a
8	M75	0.625 All...	.500	.75	24	.055	0	11	6507.7...	7310.7...	.065	.065	... H1-1b
9	M76	0.625 All...	.500	.75	14	.055	0	3	6507.7...	7310.7...	.065	.065	... H1-1b
10	M94	0.625 All...	.500	.75	18	.055	0	7	6507.7...	7310.7...	.065	.065	... H1-1b
11	M84	0.625 All...	.500	.75	20	.055	0	7	6507.7...	7310.7...	.065	.065	... H1-1b
12	M85	0.625 All...	.500	.75	22	.055	0	11	6507.7...	7310.7...	.065	.065	... H1-1b
13	M93	0.625 All...	.500	.75	16	.055	0	3	6507.7...	7310.7...	.065	.065	... H1-1b
14	M74	0.625 All...	.462	0	20	.053	0	9	6507.7...	7310.7...	.065	.065	... H1-1b
15	M73	0.625 All...	.462	0	18	.053	0	5	6507.7...	7310.7...	.065	.065	... H1-1b
16	M92	0.625 All...	.462	0	24	.053	0	1	6507.7...	7310.7...	.065	.065	... H1-1b
17	M82	0.625 All...	.462	0	14	.053	0	1	6507.7...	7310.7...	.065	.065	... H1-1b

Envelope AISC 15th(360-16): LRFD Steel Code Checks (Continued)

Member	Shape	Code Check	Loc[ft]	LC	Shea...	Loc.....	LC	phi*Pn...	phi*Pn...	phi*Mn...	phi*Mn.....	Eqn
18	M91	0.625_All...	.462	0	22	.053	0	9	6507.7...	7310.7...	.065	.065 ... H1-1b
19	M83	0.625_All...	.462	0	16	.053	0	5	6507.7...	7310.7...	.065	.065 ... H1-1b
20	MP3B	PIPE 2.0	.449	1.823	11	.120	1.823	1	13973...	32130	1.872	1.872 ... H1-1b
21	MP2A	PIPE 2.0	.449	1.823	7	.120	1.823	9	13973...	32130	1.872	1.872 ... H1-1b
22	MP2C	PIPE 2.0	.449	1.823	3	.120	1.823	5	13973...	32130	1.872	1.872 ... H1-1b
23	MP3A	PIPE 2.0	.313	4.479	32	.306	.469	8	23808...	32130	1.872	1.872 ... H1-1b
24	MP3C	PIPE 2.0	.310	.521	16	.305	.469	4	23808...	32130	1.872	1.872 ... H1-1b
25	MP4B	PIPE 2.0	.296	.521	24	.306	.469	12	23808...	32130	1.872	1.872 ... H1-1b
26	M67	PIPE 2.0	.290	4.397	10	.054	8.795	4	12710...	32130	1.872	1.872 ... H1-1b
27	M64	PIPE 2.0	.193	0	2	.005	0	15	12710...	32130	1.872	1.872 ... H1-1b*
28	M68	PIPE 2.0	.193	0	6	.005	0	19	12710...	32130	1.872	1.872 ... H1-1b*
29	MP1C	PIPE 2.0	.162	1.667	15	.049	6.333	10	14916...	32130	1.872	1.872 ... H1-1b
30	MP1B	PIPE 2.0	.156	1.667	23	.048	6.333	6	14916...	32130	1.872	1.872 ... H1-1b
31	MP1A	PIPE 2.0	.156	1.667	19	.048	6.333	2	14916...	32130	1.872	1.872 ... H1-1b
32	M65	PIPE 2.0	.139	0	2	.005	0	15	12710...	32130	1.872	1.872 ... H1-1b*
33	M69	PIPE 2.0	.139	0	6	.005	0	19	12710...	32130	1.872	1.872 ... H1-1b*
34	MP2B	PIPE 2.0	.129	1	15	.131	1	10	20866...	32130	1.872	1.872 ... H1-1b
35	MP4A	PIPE 2.0	.094	4	1	.034	0	9	20866...	32130	1.872	1.872 1 H1-1b
36	MP4C	PIPE 2.0	.094	4	9	.034	0	5	20866...	32130	1.872	1.872 ... H1-1b
37	MP5B	PIPE 2.0	.094	4	5	.034	0	9	20866...	32130	1.872	1.872 ... H1-1b

EXHIBIT 7

STRUCTURAL ANALYSIS REPORT

168' Modified Self Support Tower

1050 Buckley Highway
Union, CT 06076
41.9992 N, 72.1524 W

SBA Site Name: Union 4, CT
SBA Site ID: CT24369-A

T-Mobile Site Name: Union 4
T-Mobile Site ID: CT11144C
Application ID: 207045, v1

GPD Project Number: 2022778.24369.04

Analysis Results

Tower Components	88.4%	Sufficient
Foundation	84.7%	Sufficient
Net Change in Tower Stress Ratio	- 10.5%	As compared to the Previous Structural Analysis detailed on Page 2

T-Mobile Mount Replacement

Net Change in Tower Stress Ratio due to Mount Replacement	N/A
---	-----

T-Mobile Antenna Rotation Results (60 MPH 3-Second Gust)

Antenna	Centerline (Ft.)	Sway (Deg.)	Twist (Deg.)
VHLP2-11W/A	140	0.2491	0.0165

October 7, 2022

Respectfully submitted by:



10/7/2022

Christopher J. Scheks, P.E.
Connecticut P.E. #: 0030026

Analysis Criteria

The purpose of this analysis is to verify whether the existing modified self-support tower is structurally capable of carrying the proposed antenna, dish, and feedline loads as specified by T-Mobile to SBA. This report was commissioned by Mr. Mark Luther of SBA.

The existing structure and its foundations have been analyzed per the following requirements:

Governing Code(s)	TIA-222-H & 2022 Connecticut State Building Code
Wind Speed	118 MPH 3-Second Gust
Wind Speed w/ Ice	50 MPH 3-Second Gust
Radial Ice Thickness	1.5"
Risk Category	II
Exposure Category	B
Topographic Category	1

Analysis Method

tnxTower (Version 8.1.1.0), a commercially available software program, was used to create a three-dimensional model of the tower and calculate member stresses for various dead, live, wind and ice load cases. Selected output from the analysis is included in the appendices of this report.

Tower Description

The existing 168' modified self-support tower is located in Union, CT. The original tower design load was unknown at the time of this analysis. However, the tower design and loading were taken from the following documents:

Documents Provided

Document Type	Remarks	Source
Tower Mapping	TEP Project #: 263470.515260 Dated: 05/05/2021	SBA
Foundation Mapping	TEP Project #: 263470.515260 Dated: 05/05/2021	SBA
Geotechnical Report	Dr. Clarence Welti Dated: 05/24/2002	SBA
Boring Log Review	GPD Project #: 2021778.24369.01 Dated: 10/29/2021	SBA
TIA Inspection	FDH Job #: PR-004780 Dated: 11/04/2020	SBA
Previous Structural Analysis	GPD Project #: 2022778.24369.03 Dated: 09/13/2022	SBA
T-Mobile Mount Analysis	TES Project #: 133963 Dated: 10/03/2022	SBA
Application Amendment	SBA Application #: 207045, v1 Dated: 08/29/2022	SBA

Tower Materials (Assumed)

Structural Components	Material Strength
Legs	ASTM A572 (50 KSI Yield Strength)
Bracing Members	ASTM A36 (36 KSI Yield Strength)
Member Bolts	A325X
Anchor Rods	ASTM F1554 Gr 105

Tower Loading

The following data shows the major loading that the tower supports. All existing, leased, and proposed loading information was provided by SBA or taken from the previous structural analysis.

Existing/Leased Loading

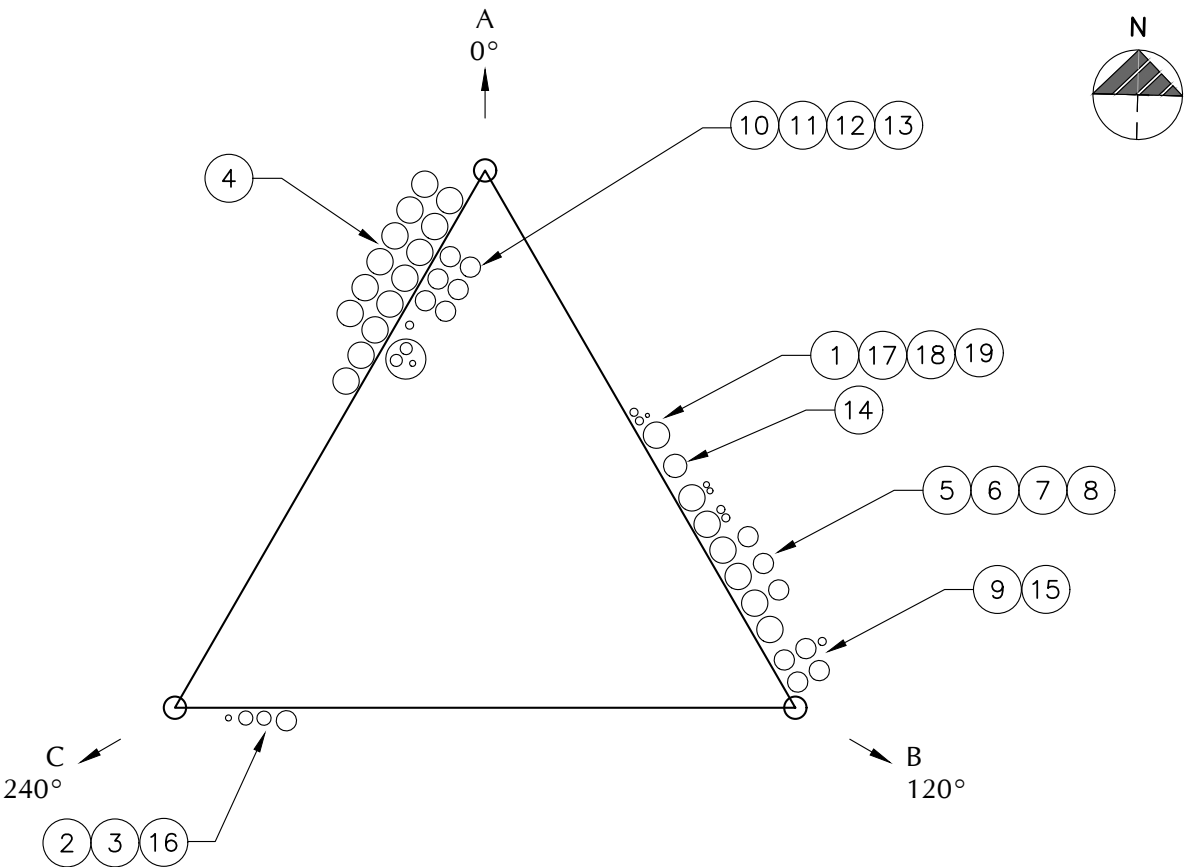
Carrier	Mounting Level (ft)	Center Line Elevation (ft)	# of Antennas	Antenna Manufact.	Antenna/Mount Model	# of Coax	Coax Size (in)	Note
Tolland County Mutual Aid	168.0	178.0	1		20' Dipole	1	1-5/8	
		174.0	1		8' Omni	1	1-1/4	
		173.0	1		6' Dipole	1	7/8	
		170.0	1		6' Yagi	1	7/8	
Abandoned	154.0	154.0	3		Standoff	-	-	
Verizon	149.0	150.0	6	Commscope	SBNHH-1D65B	12 2	1-5/8 1-5/8 Hybrid	
			4	Antel	WPA-80063/4CF			
			2	Antel	WPA-80080/4CF			
			3	Samsung	VZS01			
			3	Commscope	BSAMNT-SBS-1-2			
			3	Samsung	RFV01U-D2A			
			3	Samsung	RFV01U-D1A			
			2		OVP Box			
T-Mobile	140.0	140.0	3		Sector Mount	6 3	1-5/8 Coax 1-1/4 Hybrid	
			3	RFS	APX16DWV-16DWVS-E-A20			
			3	RFS	APXVAALL24 43-U-NA20			
			3	Ericsson	Radio4449 B71+B12			
			3	Ericsson	Radio4415 B66A			
			3		Twin Style A1-PCS TMA			
Sprint	130.0	130.0	3	Commscope	NNVV-65B-R4	4	1-1/4	
			3	RFS	APXV9TM14-ALU-I20			
			3	Alcatel Lucent	TD-RRH8x20-25			
			3	Alcatel Lucent	RRH2x50-800			
			3	Alcatel Lucent	RRH4x45-1900			
			3		Sector Mount			
AT&T	120.0	120.0	3	Powerwave	7770.00	6 1 2 1	1-1/4 1/2 RET 3/4 DC 5/16 Fiber	
			2	Powerwave	P65-17-XL-R			
			1	KMW	AM-X-CD-16-65-00T			
			3	Ericsson	RRUS11			
			3	Powerwave	LGP214nn			
			3		RET			
			1	Raycap	DC6-48-60-18-8F			
			3		Sector Mounts			
Dish Wireless	105.0	105.0	3	JMA Wireless	MX08FRO665-21	1	1.6 Hybrid	
			3	Fujitsu	TA08025-B605			
			3	Fujitsu	TA08025-B604			
			1	Raycap	RDIDC-9181-PF-48			
			3	Commscope	MTC3975083 Sector Mount			
Abandoned	87.0	87.0	1		Sector Mount	-	-	
Sprint	82.0	82.0	1		GPS	1	1/2	
Tolland County Mutual Aid	71.0	71.0	1		12' Dipole	1	3/8	
			1		Pipe Mount			
Landowner	68.0	68.0	1		Flood Light	1	1/2	
	62.0	62.0	1		Flood Light	1	1/2	
	23.0	23.0	1		Camera	1	1/4	

Final Proposed Loading Configuration

Carrier	Mounting Level (ft)	Center Line Elevation (ft)	# of Antennas	Antenna Manufact.	Antenna/Mount Model	# of Coax	Coax Size (in)	Note
T-Mobile	140.0	140.0	3	RFS	APX16DWV-16DWVS-E-A20	6 3 2 2	1-5/8 Coax 1-1/4 Hybrid 0.325 DC 1/2 Fiber	1
			3	RFS	APXVAALL24 43-U-NA20			
			1	Commscope	VHLP2-11W/A			
			2	Ceragon	RFU-D			
			1		Pipe Mount			
			3	Ericsson	Radio4449 B71+B12			
			3	Ericsson	Radio4415 B66A			
			3		Twin Style A1-PCS TMA			
			3		Sector Mount			

Notes:

- 1) This loading represents T-Mobile's final configuration on the tower. See the next page for the proposed feedline layout.



Final Proposed Coax Layout

#	CARRIER	SIZE	QTY.	ELEVATION	FACE	NOTES
1	Tolland County	1-5/8"	1	168.0'	B	
2	Tolland County	1-1/4"	1	168.0'	C	
3	Tolland County	7/8"	2	168.0'	C	
4	Verizon	1-5/8"	14	149.0'	A	(2) Hybrid
5	T-Mobile	1-1/4"	3	140.0'	B	Hybrid
6	T-Mobile	1-5/8"	6	140.0'	B	
7	T-Mobile	0.325"	2	140.0'	B	Proposed DC Power
8	T-Mobile	1/2"	2	140.0'	B	Proposed Fiber
9	Sprint	1-1/4"	4	130.0'	B	
10	AT&T	1-1/4"	6	120.0'	A	
11	AT&T	1/2"	1	120.0'	A	RET
12	AT&T	5/16"	1	120.0'	A	Fiber
13	AT&T	3/4"	2	120.0'	A	DC Power
14	Dish Wireless	1.6"	1	105.0'	B	Hybrid
15	Sprint	1/2"	1	82.0'	B	
16	Tolland County	3/8"	1	71.0'	C	
17	Landowner	1/2"	1	68.0'	B	
18	Landowner	1/2"	1	62.0'	B	
19	Landowner	1/4"	1	23.0'	B	

Tower Section Results

Capacity Summary of Structural Components

Notes	Component	% Capacity	Pass / Fail
	Legs	88.4	Pass
	Diagonals	73.6	Pass
	Horizontals	33.2	Pass
	Member Bolts	74.0	Pass
	Anchor Rods	49.9	Pass
	Tower Base Foundation	84.7	Pass

Conclusions & Recommendations

The designs of the tower and its foundations are sufficient to support the proposed loading configuration and will not require modification.

Assumptions

This structural analysis is based on the theoretical capacity of the members and is not a condition assessment of the tower. This analysis is from information supplied, and therefore, its results are based on and are as accurate as that supplied data. GPD has made no independent determination, nor is it required to, of its accuracy. The following assumptions were made for this structural analysis.

- 1) Tower and structures were built in accordance with the manufacturer's specifications.
- 2) The tower and structures have been maintained in accordance with the manufacturer's specification.
- 3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in the Existing/Reserved Loading and Proposed Loading Tables, and the specified documents.
- 4) All mounts, if applicable, are considered adequate to support the loading. No actual analysis of the mount(s) is performed. This analysis is limited to analyzing the tower only.
- 5) Mount sizes, weights, and manufacturers are best estimates based on photos provided and determined without the benefit of a site visit by GPD.
- 6) All member connections and foundation steel reinforcing are assumed designed to meet or exceed the load carrying capacity of the connected member and surrounding soils respectively unless otherwise specified in this report.
- 7) The existing feedline layout has been based upon the previous structural analysis and site photos.
- 8) Tower leg azimuths were estimated with the use of satellite imagery software.
- 9) The proposed feedline shall be installed as illustrated in order for the results of this analysis to be valid.

If any of these assumptions are not valid or have been made in error, this analysis may be affected, and GPD should be allowed to review any new information to determine its effect on the structural integrity of the tower.

Disclaimer of Warranties

GPD has not performed a site visit to the tower to verify the member sizes or antenna/coax loading. If the existing conditions are not as represented on the tower elevation contained in this report, we should be contacted immediately to evaluate the significance of the discrepancy. This is not a condition assessment of the tower or foundation. This report does not replace a full tower inspection. The tower and foundations are assumed to have been properly fabricated, erected, maintained, in good condition, twist free, and plumb.

The engineering services rendered by GPD in connection with this Structural Analysis are limited to a computer analysis of the tower structure and theoretical capacity of its main structural members. No allowance was made for any damaged, bent, missing, loose, or rusted members (above and below ground). No allowance was made for loose bolts or cracked welds.

This analysis is limited to the designated maximum wind and seismic conditions per the governing tower standards and code. Wind forces resulting in tower vibrations near the structure's resonant frequencies were not considered in this analysis and are outside the scope of this analysis. Lateral loading from any dynamic response was not evaluated under a time-domain based fatigue analysis.

GPD does not analyze the fabrication of the structure (including welding). It is not possible to have all the very detailed information needed to perform a thorough analysis of every structural sub-component and connection of an existing tower. GPD provides a limited scope of service in that we cannot verify the adequacy of every weld, plate connection detail, etc. The purpose of this report is to assess the capability of adding appurtenances usually accompanied by transmission lines to the structure.

It is the owner's responsibility to determine the amount of ice accumulation in excess of the code specified amount, if any, that should be considered in the structural analysis.

The attached sketches are a schematic representation of the analyzed tower. If any material is fabricated from these sketches, the contractor shall be responsible for field verifying the existing conditions, proper fit, and clearance in the field. Any mentions of structural modifications are reasonable estimates and should not be used as a precise construction document. Precise modification drawings are obtainable from GPD, but are beyond the scope of this report.

Miscellaneous items such as antenna mounts, etc., have not been designed or detailed as a part of our work. We recommend that material of adequate size and strength be purchased from a reputable tower manufacturer.

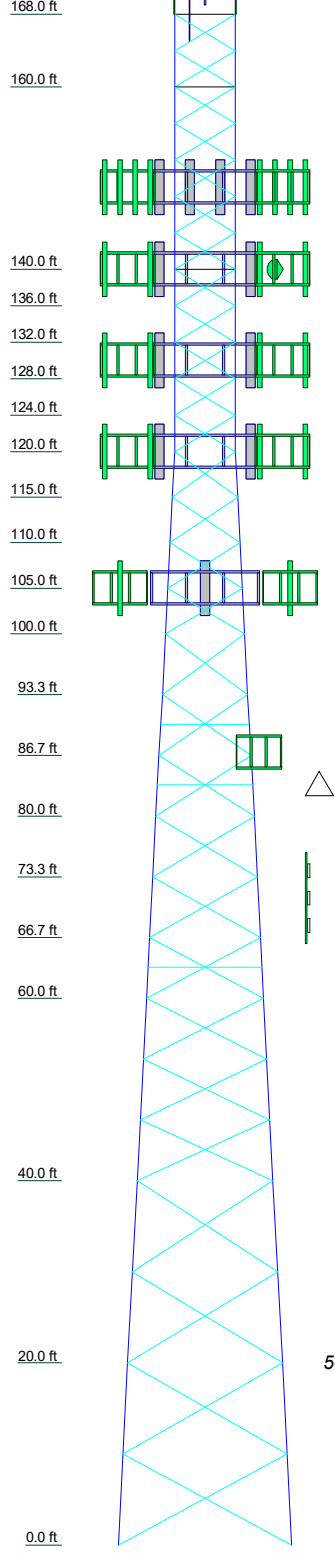
Towers are designed to carry gravity, wind, and ice loads. All members, legs, diagonals, struts, and redundant members provide structural stability to the tower with little redundancy. Absence or removal of a member can trigger catastrophic failure unless a substitute is provided before any removal. Legs carry axial loads and derive their strength from shorter unbraced lengths by the presence of redundant members and their connection to the diagonals with bolts or welds. If the bolts or welds are removed without providing any substitute to the frame, the leg is subjected to a higher unbraced length that immediately reduces its load carrying capacity. If a diagonal is also removed in addition to the connection, the unbraced length of the leg is greatly increased, jeopardizing its load carrying capacity. Failure of one leg can result in a tower collapse because there is no redundancy. Redundant members and diagonals are critical to the stability of the tower.

GPD makes no warranties, expressed and/or implied, in connection with this report and disclaims any liability arising from material, fabrication, and erection of this tower. GPD will not be responsible whatsoever for, or on account of, consequential or incidental damages sustained by any person, firm, or organization as a result of any data or conclusions contained in this report. The maximum liability of GPD pursuant to this report will be limited to the total fee received for preparation for this report.



TNX TOWER OUTPUT

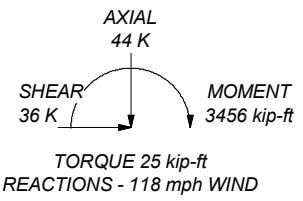
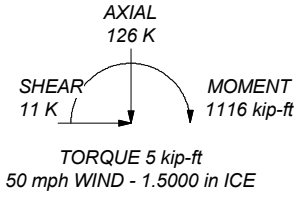
Section	T18	T19	T20	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18	T19	T20
Legs	P5 X-STR	P6 X-STR	P6 X-STR	P5 X-STR	P5 X-STR	P3.5 X-STR	P4 X-STR	L2 1/2x2 1/2x1/4	L3x3x1/4	L3x3x1/4	L2 1/2x2 1/2x3/16	L2 1/2x2 1/2x1/4	L2 1/2x2 1/2x3/16	L2 1/2x2 1/2x3/16	L2 1/2x2 1/2x3/16	L2 1/2x2 1/2x3/16	L2 1/2x2 1/2x3/16	L2 1/2x2 1/2x3/16	L2 1/2x2 1/2x3/16	L2 1/2x2 1/2x3/16	L2 1/2x2 1/2x3/16	L2 1/2x2 1/2x3/16	L2 1/2x2 1/2x3/16
Leg Grade	A572-50	A572-50	A572-50	A572-50	A572-50	A572-50	A572-50	A572-50	A572-50	A572-50	A572-50	A572-50	A572-50	A572-50	A572-50	A572-50	A572-50	A572-50	A572-50	A572-50	A572-50	A572-50	A572-50
Diagonals	L3x3x1/4	L3x3x1/4	L3x3x1/4	L3x3x1/4	L3x3x1/4	L3x3x1/4	L3x3x1/4	L3x3x1/4	L3x3x1/4	L3x3x1/4	L3x3x1/4	L3x3x1/4	L3x3x1/4	L3x3x1/4	L3x3x1/4	L3x3x1/4	L3x3x1/4	L3x3x1/4	L3x3x1/4	L3x3x1/4	L3x3x1/4	L3x3x1/4	L3x3x1/4
Diagonal Grade	A36	A36	A36	A36	A36	A36	A36	A36	A36	A36	A36	A36	A36	A36	A36	A36	A36	A36	A36	A36	A36	A36	A36
Top Girts	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Sec. Horizontals	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Face Width (ft)	14.89	16.945	16.945	12.835	12.15	11.465	10.78	10.095	9.41	8.725	8.04	7.355	6.665	6.075	5.485	4.895	4.305	3.715	3.125	2.535	1.945	1.355	0.765
# Panels @ (ft)	4 @ 10	4 @ 10	4 @ 10	9 @ 6.66667	9 @ 6.66667	9 @ 6.66667	9 @ 6.66667	9 @ 6.66667	9 @ 6.66667	9 @ 6.66667	9 @ 6.66667	9 @ 6.66667	9 @ 6.66667	9 @ 6.66667	9 @ 6.66667	9 @ 6.66667	9 @ 6.66667	9 @ 6.66667	9 @ 6.66667	9 @ 6.66667	9 @ 6.66667	9 @ 6.66667	9 @ 6.66667
Weight (K)	16.8	3.3	3.3	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7



ALL REACTIONS
ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 225 K
SHEAR: 23 K

UPLIFT: -190 K
SHEAR: 20 K



SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	P 2-1/2 STD w/ Split P 3 X-STR (GPD)	C	L2x2x3/16
B	P 3 STD w/ Split P 3-1/2 STD (GPD)		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A53-B-35	35 ksi	63 ksi
A36	36 ksi	58 ksi			

TOWER DESIGN NOTES

1. Tower is located in Tolland County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 118 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.50 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 88.4%



GPD
520 South Main Street Suite 2531
Akron, Ohio 44311
Phone: (330) 572-2222
FAX: (330) 572-3722

Job:	CT24369-A ; Union 4, CT		
Project:	2022778.24369.04		
Client:	SBA	Drawn by:	TDeak
Code:	TIA-222-H	Date:	10/07/22
Path:		Scale:	NTS
		Dwg No.	E-1

<i>tnxTower</i> GPD 520 South Main Street Suite 2531 Akron, Ohio 44311 Phone: (330) 572-2222 FAX: (330) 572-3722	Job CT24369-A ; Union 4, CT	Page 1 of 39
	Project 2022778.24369.04	Date 08:23:23 10/07/22
	Client SBA	Designed by TDeak

Tower Input Data

The main tower is a 3x free standing tower with an overall height of 168.00 ft above the ground line.

The base of the tower is set at an elevation of 0.00 ft above the ground line.

The face width of the tower is 6.67 ft at the top and 19.00 ft at the base.

This tower is designed using the TIA-222-H standard.

The following design criteria apply:

Tower is located in Tolland County, Connecticut.

Tower base elevation above sea level: 988.00 ft.

Basic wind speed of 118 mph.

Risk Category II.

Exposure Category B.

Simplified Topographic Factor Procedure for wind speed-up calculations is used.

Topographic Category: 1.

Crest Height: 0.00 ft.

Nominal ice thickness of 1.5000 in.

Ice thickness is considered to increase with height.

Ice density of 56 pcf.

A wind speed of 50 mph is used in combination with ice.

Temperature drop of 50 °F.

Deflections calculated using a wind speed of 60 mph.

Pressures are calculated at each section.

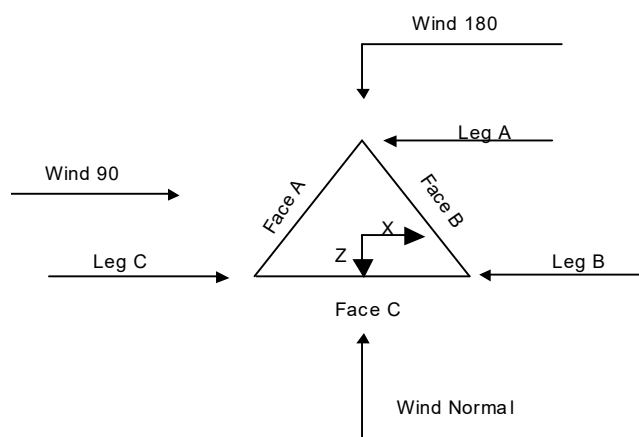
Stress ratio used in tower member design is 1.

Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs	Distribute Leg Loads As Uniform	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Horizontals	Assume Legs Pinned	√ Calculate Redundant Bracing Forces
Consider Moments - Diagonals	√ Assume Rigid Index Plate	Ignore Redundant Members in FEA
Use Moment Magnification	√ Use Clear Spans For Wind Area	SR Leg Bolts Resist Compression
√ Use Code Stress Ratios	√ Use Clear Spans For KL/r	All Leg Panels Have Same Allowable
√ Use Code Safety Factors - Guys	Retension Guys To Initial Tension	Offset Girt At Foundation
Escalate Ice	√ Bypass Mast Stability Checks	√ Consider Feed Line Torque
Always Use Max Kz	√ Use Azimuth Dish Coefficients	√ Include Angle Block Shear Check
Use Special Wind Profile	√ Project Wind Area of Appurt.	Use TIA-222-H Bracing Resist. Exemption
√ Include Bolts In Member Capacity	Autocalc Torque Arm Areas	Use TIA-222-H Tension Splice Exemption
Leg Bolts Are At Top Of Section	Add IBC .6D+W Combination	Poles
√ Secondary Horizontal Braces Leg	√ Sort Capacity Reports By Component	Include Shear-Torsion Interaction
Use Diamond Inner Bracing (4 Sided)	Triangulate Diamond Inner Bracing	Always Use Sub-Critical Flow
SR Members Have Cut Ends	Treat Feed Line Bundles As Cylinder	Use Top Mounted Sockets
SR Members Are Concentric	Ignore KL/ry For 60 Deg. Angle Legs	Pole Without Linear Attachments
		Pole With Shroud Or No Appurtenances
		Outside and Inside Corner Radii Are
		Known

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Triangular Tower

Tower Section Geometry

<i>Tower Section</i>	<i>Tower Elevation</i>	<i>Assembly Database</i>	<i>Description</i>	<i>Section Width</i>	<i>Number of Sections</i>	<i>Section Length</i>
	<i>ft</i>			<i>ft</i>		<i>ft</i>
T1	168.00-160.00			6.67	1	8.00
T2	160.00-140.00			6.67	1	20.00
T3	140.00-136.00			6.67	1	4.00
T4	136.00-132.00			6.67	1	4.00
T5	132.00-128.00			6.67	1	4.00
T6	128.00-124.00			6.67	1	4.00
T7	124.00-120.00			6.67	1	4.00
T8	120.00-115.00			6.67	1	5.00
T9	115.00-110.00			7.18	1	5.00
T10	110.00-105.00			7.70	1	5.00
T11	105.00-100.00			8.21	1	5.00
T12	100.00-93.33			8.73	1	6.67
T13	93.33-86.67			9.41	1	6.67
T14	86.67-80.00			10.10	1	6.67
T15	80.00-73.33			10.78	1	6.67
T16	73.33-66.67			11.47	1	6.67
T17	66.67-60.00			12.15	1	6.67
T18	60.00-40.00			12.84	1	20.00
T19	40.00-20.00			14.89	1	20.00
T20	20.00-0.00			16.95	1	20.00

Tower Section Geometry (cont'd)

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<i>Tower Section</i>	<i>Tower Elevation</i>	<i>Diagonal Spacing</i>	<i>Bracing Type</i>	<i>Has K Brace End Panels</i>	<i>Has Horizontals</i>	<i>Top Girt Offset</i>	<i>Bottom Girt Offset</i>
	<i>ft</i>	<i>ft</i>				<i>in</i>	<i>in</i>
T1	168.00-160.00	4.00	X Brace	No	No	0.0000	0.0000
T2	160.00-140.00	4.00	X Brace	No	No	0.0000	0.0000
T3	140.00-136.00	4.00	X Brace	No	No	0.0000	0.0000
T4	136.00-132.00	4.00	X Brace	No	No	0.0000	0.0000
T5	132.00-128.00	4.00	X Brace	No	No	0.0000	0.0000
T6	128.00-124.00	4.00	X Brace	No	No	0.0000	0.0000
T7	124.00-120.00	4.00	X Brace	No	No	0.0000	0.0000
T8	120.00-115.00	5.00	X Brace	No	No	0.0000	0.0000
T9	115.00-110.00	5.00	X Brace	No	No	0.0000	0.0000
T10	110.00-105.00	5.00	X Brace	No	No	0.0000	0.0000
T11	105.00-100.00	5.00	X Brace	No	No	0.0000	0.0000
T12	100.00-93.33	6.67	X Brace	No	No	0.0000	0.0000
T13	93.33-86.67	6.67	X Brace	No	Yes	0.0000	0.0000
T14	86.67-80.00	6.67	X Brace	No	Yes	0.0000	0.0000
T15	80.00-73.33	6.67	X Brace	No	No	0.0000	0.0000
T16	73.33-66.67	6.67	X Brace	No	No	0.0000	0.0000
T17	66.67-60.00	6.67	X Brace	No	Yes	0.0000	0.0000
T18	60.00-40.00	6.67	X Brace	No	No	0.0000	0.0000
T19	40.00-20.00	10.00	X Brace	No	No	0.0000	0.0000
T20	20.00-0.00	10.00	X Brace	No	No	0.0000	0.0000

Tower Section Geometry (cont'd)

<i>Tower Elevation</i>	<i>Leg Type</i>	<i>Leg Size</i>	<i>Leg Grade</i>	<i>Diagonal Type</i>	<i>Diagonal Size</i>	<i>Diagonal Grade</i>
<i>ft</i>						
T1 168.00-160.00	Pipe	P2.5 STD	A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T2 160.00-140.00	Pipe	P2.5 STD	A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T3 140.00-136.00	Pipe	P2.5 STD	A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T4 136.00-132.00	Pipe	P2.5 STD	A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T5 132.00-128.00	Pipe	P2.5 STD	A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T6 128.00-124.00	Pipe	P2.5 STD	A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T7 124.00-120.00	Arbitrary Shape	P 2-1/2 STD w/ Split P 3 X-STR (GPD)	A53-B-35 (35 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T8 120.00-115.00	Arbitrary Shape	P 3 STD w/ Split P 3-1/2 STD (GPD)	A53-B-35 (35 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T9 115.00-110.00	Arbitrary Shape	P 3 STD w/ Split P 3-1/2 STD (GPD)	A53-B-35 (35 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T10 110.00-105.00	Arbitrary Shape	P 3 STD w/ Split P 3-1/2 STD (GPD)	A53-B-35 (35 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T11 105.00-100.00	Arbitrary Shape	P 3 STD w/ Split P 3-1/2 STD (GPD)	A53-B-35 (35 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T12 100.00-93.33	Pipe	P3.5 X-STR	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T13 93.33-86.67	Pipe	P3.5 X-STR	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T14 86.67-80.00	Pipe	P3.5 X-STR	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T15 80.00-73.33	Pipe	P4 X-STR	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)

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<i>Tower Elevation</i> <i>ft</i>	<i>Leg Type</i>	<i>Leg Size</i>	<i>Leg Grade</i>	<i>Diagonal Type</i>	<i>Diagonal Size</i>	<i>Diagonal Grade</i>
T16 73.33-66.67	Pipe	P4 X-STR	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)
T17 66.67-60.00	Pipe	P4 X-STR	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)
T18 60.00-40.00	Pipe	P5 X-STR	A572-50 (50 ksi)	Equal Angle	L3x3x1/4	A36 (36 ksi)
T19 40.00-20.00	Pipe	P6 X-STR	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)
T20 20.00-0.00	Pipe	P6 X-STR	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)

Tower Section Geometry (cont'd)

<i>Tower Elevation</i> <i>ft</i>	<i>Top Girt Type</i>	<i>Top Girt Size</i>	<i>Top Girt Grade</i>	<i>Bottom Girt Type</i>	<i>Bottom Girt Size</i>	<i>Bottom Girt Grade</i>
T1 168.00-160.00	Equal Angle	L2x2x3/16	A36 (36 ksi)	Equal Angle		A36 (36 ksi)
T2 160.00-140.00	Equal Angle	L2x2x3/16	A36 (36 ksi)	Equal Angle		A36 (36 ksi)
T3 140.00-136.00	Equal Angle	L2x2x3/16	A36 (36 ksi)	Equal Angle		A36 (36 ksi)

Tower Section Geometry (cont'd)

<i>Tower Elevation</i> <i>ft</i>	<i>Secondary Horizontal Type</i>	<i>Secondary Horizontal Size</i>	<i>Secondary Horizontal Grade</i>	<i>Inner Bracing Type</i>	<i>Inner Bracing Size</i>	<i>Inner Bracing Grade</i>
T13 93.33-86.67	Equal Angle	L2x2x3/16	A36 (36 ksi)	Equal Angle		A36 (36 ksi)
T14 86.67-80.00	Equal Angle	L2x2x3/16	A36 (36 ksi)	Equal Angle		A36 (36 ksi)
T17 66.67-60.00	Equal Angle	L2x2x3/16	A36 (36 ksi)	Equal Angle		A36 (36 ksi)

Tower Section Geometry (cont'd)

<i>Tower Elevation</i> <i>ft</i>	<i>Gusset Area</i> <i>(per face)</i> <i>ft²</i>	<i>Gusset Thickness</i> <i>in</i>	<i>Gusset Grade</i>	<i>Adjust. Factor</i> <i>A_f</i>	<i>Adjust. Factor</i> <i>A_r</i>	<i>Weight Mult.</i>	<i>Double Angle</i> <i>Stitch Bolt</i> <i>Spacing</i> <i>Diagonals</i> <i>in</i>	<i>Double Angle</i> <i>Stitch Bolt</i> <i>Spacing</i> <i>Horizontals</i> <i>in</i>	<i>Double Angle</i> <i>Stitch Bolt</i> <i>Spacing</i> <i>Redundants</i> <i>in</i>
T1 168.00-160.00	0.00	0.2500	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T2 160.00-140.00	0.00	0.2500	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000

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Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T13 93.33-86.67	Flange	0.7500 A325N	0	0.6250 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	2
T14 86.67-80.00	Flange	0.8750 A325N	4	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	2
T15 80.00-73.33	Flange	0.7500 A325N	0	0.6250 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T16 73.33-66.67	Flange	0.7500 A325N	0	0.6250 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.7500 A325N	1
T17 66.67-60.00	Flange	0.8750 A325N	4	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	2
T18 60.00-40.00	Flange	1.0000 A325N	4	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T19 40.00-20.00	Flange	1.0000 A325N	6	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T20 20.00-0.00	Flange	0.7500 A325N	0	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
Safety Line 3/8	C	No	No	Ar (CaAa)	168.00 - 2.00	0.0000	0.5	1	1	0.3750	0.3750		0.22
Climbing Pegs	A	No	No	Ar (CaAa)	6.00 - 0.00	0.0000	0.5	1	1	0.2500	0.1500		0.31
Climbing Pegs	B	No	No	Ar (CaAa)	6.00 - 0.00	0.0000	0.5	1	1	0.2500	0.1500		0.31
Climbing Pegs	C	No	No	Ar (CaAa)	168.00 - 0.00	0.0000	0.5	1	1	0.2500	0.1500		0.31
Feedline Ladder (Af)	A	No	No	Af (CaAa)	120.00 - 8.00	0.0000	0.4	1	1	3.0000	3.0000		8.40
Feedline Ladder (Af)	A	No	No	Af (CaAa)	149.00 - 120.00	0.0000	0	1	1	3.0000	3.0000		8.40
LDF7-50A (1-5/8 FOAM)	A	No	No	Ar (CaAa)	120.00 - 8.00	0.0000	0.4	14	8	0.5000	1.9800		0.82
LDF7-50A (1-5/8 FOAM)	A	No	No	Ar (CaAa)	149.00 - 120.00	0.0000	0	14	8	0.5000	1.9800		0.82
Feedline Ladder (Af)	A	No	No	Af (CaAa)	120.00 - 8.00	-1.0000	0.4	1	1	3.0000	3.0000		8.40
LDF6-50A (1-1/4 FOAM)	A	No	No	Ar (CaAa)	120.00 - 8.00	-1.0000	0.4	6	3	0.5000	1.5500		0.66
1/2" RET Cable	A	No	No	Ar (CaAa)	120.00 - 8.00	-1.0000	0.36	1	1	0.5000	0.5000		0.15
3" Rigid Conduit	A	No	No	Ar (CaAa)	120.00 - 8.00	-1.0000	0.35	1	1	3.0000	3.0000		0.50
3/4" DC Power Line	A	No	No	Ar (CaAa)	120.00 - 8.00	-1.0000	0.35	2	2	0.5000	0.7500		0.33
5/16" Fiber Cable	A	No	No	Ar (CaAa)	120.00 - 8.00	-1.0000	0.35	1	1	0.3125	0.3125		0.00
Feedline Ladder (Af)	B	No	No	Af (CaAa)	120.00 - 8.00	0.0000	0.35	1	1	3.0000	3.0000		8.40
Feedline Ladder (Af)	B	No	No	Af (CaAa)	140.00 - 120.00	0.0000	0	1	1	3.0000	3.0000		8.40
LDF7-50A	B	No	No	Ar (CaAa)	120.00 -	0.0000	0.35	6	6	0.5000	1.9800		0.82

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Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
(1-5/8 FOAM)					8.00								
LDF7-50A	B	No	No	Ar (CaAa)	140.00 - 120.00	0.0000	0	6	6	0.5000	1.9800		0.82
(1-5/8 FOAM)					8.00								
1-1/4" Hybrid	B	No	No	Ar (CaAa)	120.00 - 8.00	2.0000	0.35	3	3	0.5000	1.2500		0.66
1-1/4" Hybrid	B	No	No	Ar (CaAa)	140.00 - 120.00	2.0000	0	3	3	0.5000	1.2500		0.66
1/2" Fiber Cable	B	No	No	Ar (CaAa)	120.00 - 8.00	2.0000	0.3	2	2	0.6300	0.5000		0.15
1/2" Fiber Cable	B	No	No	Ar (CaAa)	140.00 - 120.00	2.0000	0	2	2	0.6300	0.5000		0.15
0.325" DC Power	B	No	No	Ar (CaAa)	120.00 - 8.00	2.0000	0.32	2	2	0.4400	0.3250		0.08
0.325" DC Power	B	No	No	Ar (CaAa)	140.00 - 120.00	2.0000	0	2	2	0.4400	0.3250		0.08
LDF6-50A	B	No	No	Ar (CaAa)	130.00 - 8.00	0.0000	0.41	4	2	0.5000	1.5500		0.66
(1-1/4 FOAM)					8.00								
LDF4-50A	B	No	No	Ar (CaAa)	82.00 - 8.00	3.0000	0.41	1	1	0.6300	0.6300		0.15
(1/2 FOAM)					8.00								
LDF7-50A	B	No	No	Ar (CaAa)	120.00 - 8.00	0.0000	0.28	1	1	1.0000	1.9800		0.82
(1-5/8 FOAM)					8.00								
LDF7-50A	B	No	No	Ar (CaAa)	168.00 - 120.00	0.0000	0	1	1	1.0000	1.9800		0.82
(1-5/8 FOAM)					8.00								
LDF4-50A	B	No	No	Ar (CaAa)	62.00 - 8.00	0.0000	0.27	2	2	0.6300	0.6300		0.15
(1/2 FOAM)					8.00								
LDF4-50A	B	No	No	Ar (CaAa)	68.00 - 62.00	0.0000	0.27	1	1	0.6300	0.6300		0.15
(1/2 FOAM)					8.00								
LDF1-50A	B	No	No	Ar (CaAa)	23.00 - 8.00	1.0000	0.27	1	1	0.3500	0.3500		0.06
(1/4 FOAM)					8.00								
CU12PSM9P6 XXX(1-1/2)	B	No	No	Ar (CaAa)	105.00 - 8.00	0.0000	0.3	1	1	1.0000	1.6000		2.35
Feedline Ladder (Af)	C	No	No	Af (CaAa)	120.00 - 8.00	0.0000	0.4	1	1	3.0000	3.0000		8.40
Feedline Ladder (Af)	C	No	No	Af (CaAa)	168.00 - 120.00	0.0000	0	1	1	3.0000	3.0000		8.40
LDF6-50A	C	No	No	Ar (CaAa)	120.00 - 8.00	0.0000	0.41	1	1	1.0000	1.5500		0.66
(1-1/4 FOAM)					8.00								
LDF6-50A	C	No	No	Ar (CaAa)	168.00 - 120.00	0.0000	0	1	1	1.0000	1.5500		0.66
(1-1/4 FOAM)					8.00								
LDF5-50A	C	No	No	Ar (CaAa)	120.00 - 8.00	0.0000	0.43	2	2	0.5000	1.0900		0.33
(7/8 FOAM)					8.00								
LDF5-50A	C	No	No	Ar (CaAa)	168.00 - 120.00	0.0000	0	2	2	0.5000	1.0900		0.33
(7/8 FOAM)					8.00								
LDF2-50A	C	No	No	Ar (CaAa)	71.00 - 8.00	0.0000	0.44	1	1	0.4400	0.4400		0.08
(3/8 FOAM)					8.00								

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
T1	168.00-160.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	1.584	0.000	0.01
		C	0.000	0.000	7.404	0.000	0.08
T2	160.00-140.00	A	0.000	0.000	29.448	0.000	0.18
		B	0.000	0.000	3.960	0.000	0.02

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<i>Tower Section</i>	<i>Tower Elevation ft</i>	<i>Face</i>	<i>A_R</i> <i>ft²</i>	<i>A_F</i> <i>ft²</i>	<i>C_AA_A</i> <i>In Face ft²</i>	<i>C_AA_A</i> <i>Out Face ft²</i>	<i>Weight K</i>
T3	140.00-136.00	C	0.000	0.000	18.510	0.000	0.20
		A	0.000	0.000	13.088	0.000	0.08
		B	0.000	0.000	9.704	0.000	0.07
T4	136.00-132.00	C	0.000	0.000	3.702	0.000	0.04
		A	0.000	0.000	13.088	0.000	0.08
		B	0.000	0.000	9.704	0.000	0.07
T5	132.00-128.00	C	0.000	0.000	3.702	0.000	0.04
		A	0.000	0.000	13.088	0.000	0.08
		B	0.000	0.000	10.944	0.000	0.07
T6	128.00-124.00	C	0.000	0.000	3.702	0.000	0.04
		A	0.000	0.000	13.088	0.000	0.08
		B	0.000	0.000	12.184	0.000	0.08
T7	124.00-120.00	C	0.000	0.000	3.702	0.000	0.04
		A	0.000	0.000	13.088	0.000	0.08
		B	0.000	0.000	12.184	0.000	0.08
T8	120.00-115.00	C	0.000	0.000	3.702	0.000	0.04
		A	0.000	0.000	26.166	0.000	0.17
		B	0.000	0.000	15.230	0.000	0.10
T9	115.00-110.00	C	0.000	0.000	4.628	0.000	0.05
		A	0.000	0.000	26.166	0.000	0.17
		B	0.000	0.000	15.230	0.000	0.10
T10	110.00-105.00	C	0.000	0.000	4.628	0.000	0.05
		A	0.000	0.000	26.166	0.000	0.17
		B	0.000	0.000	15.230	0.000	0.10
T11	105.00-100.00	C	0.000	0.000	4.628	0.000	0.05
		A	0.000	0.000	26.166	0.000	0.17
		B	0.000	0.000	16.030	0.000	0.11
T12	100.00-93.33	C	0.000	0.000	4.628	0.000	0.05
		A	0.000	0.000	34.888	0.000	0.22
		B	0.000	0.000	21.373	0.000	0.14
T13	93.33-86.67	C	0.000	0.000	6.170	0.000	0.07
		A	0.000	0.000	34.888	0.000	0.22
		B	0.000	0.000	21.373	0.000	0.14
T14	86.67-80.00	C	0.000	0.000	6.170	0.000	0.07
		A	0.000	0.000	34.888	0.000	0.22
		B	0.000	0.000	21.499	0.000	0.14
T15	80.00-73.33	C	0.000	0.000	6.170	0.000	0.07
		A	0.000	0.000	34.888	0.000	0.22
		B	0.000	0.000	21.793	0.000	0.14
T16	73.33-66.67	C	0.000	0.000	6.170	0.000	0.07
		A	0.000	0.000	34.888	0.000	0.22
		B	0.000	0.000	21.877	0.000	0.14
T17	66.67-60.00	C	0.000	0.000	6.361	0.000	0.07
		A	0.000	0.000	34.888	0.000	0.22
		B	0.000	0.000	22.339	0.000	0.15
T18	60.00-40.00	C	0.000	0.000	6.463	0.000	0.07
		A	0.000	0.000	104.665	0.000	0.67
		B	0.000	0.000	67.900	0.000	0.44
T19	40.00-20.00	C	0.000	0.000	19.390	0.000	0.21
		A	0.000	0.000	104.665	0.000	0.67
		B	0.000	0.000	68.005	0.000	0.44
T20	20.00-0.00	C	0.000	0.000	19.390	0.000	0.21
		A	0.000	0.000	62.889	0.000	0.40
		B	0.000	0.000	41.250	0.000	0.27
		C	0.000	0.000	11.979	0.000	0.13

Feed Line/Linear Appurtenances Section Areas - With Ice

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<i>Tower Section</i>	<i>Tower Elevation ft</i>	<i>Face or Leg</i>	<i>Ice Thickness in</i>	<i>A_R ft²</i>	<i>A_F ft²</i>	<i>C_AA_A In Face ft²</i>	<i>C_AA_A Out Face ft²</i>	<i>Weight K</i>
T1	168.00-160.00	A	1.761	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	4.401	0.000	0.07
		C		0.000	0.000	24.658	0.000	0.38
T2	160.00-140.00	A	1.745	0.000	0.000	34.838	0.000	0.71
		B		0.000	0.000	10.941	0.000	0.18
		C		0.000	0.000	61.285	0.000	0.94
T3	140.00-136.00	A	1.731	0.000	0.000	15.454	0.000	0.31
		B		0.000	0.000	25.807	0.000	0.35
		C		0.000	0.000	12.190	0.000	0.19
T4	136.00-132.00	A	1.726	0.000	0.000	15.443	0.000	0.31
		B		0.000	0.000	25.771	0.000	0.35
		C		0.000	0.000	12.167	0.000	0.19
T5	132.00-128.00	A	1.720	0.000	0.000	15.432	0.000	0.31
		B		0.000	0.000	28.224	0.000	0.39
		C		0.000	0.000	12.143	0.000	0.18
T6	128.00-124.00	A	1.715	0.000	0.000	15.421	0.000	0.31
		B		0.000	0.000	30.668	0.000	0.42
		C		0.000	0.000	12.118	0.000	0.18
T7	124.00-120.00	A	1.710	0.000	0.000	15.410	0.000	0.31
		B		0.000	0.000	30.621	0.000	0.42
		C		0.000	0.000	12.093	0.000	0.18
T8	120.00-115.00	A	1.703	0.000	0.000	41.883	0.000	0.73
		B		0.000	0.000	38.209	0.000	0.52
		C		0.000	0.000	15.079	0.000	0.23
T9	115.00-110.00	A	1.696	0.000	0.000	41.808	0.000	0.73
		B		0.000	0.000	38.131	0.000	0.52
		C		0.000	0.000	15.037	0.000	0.23
T10	110.00-105.00	A	1.688	0.000	0.000	41.730	0.000	0.73
		B		0.000	0.000	38.050	0.000	0.51
		C		0.000	0.000	14.993	0.000	0.23
T11	105.00-100.00	A	1.680	0.000	0.000	41.649	0.000	0.73
		B		0.000	0.000	40.445	0.000	0.56
		C		0.000	0.000	14.946	0.000	0.22
T12	100.00-93.33	A	1.670	0.000	0.000	55.400	0.000	0.96
		B		0.000	0.000	53.776	0.000	0.74
		C		0.000	0.000	19.853	0.000	0.30
T13	93.33-86.67	A	1.658	0.000	0.000	55.240	0.000	0.96
		B		0.000	0.000	53.593	0.000	0.73
		C		0.000	0.000	19.762	0.000	0.29
T14	86.67-80.00	A	1.646	0.000	0.000	55.069	0.000	0.95
		B		0.000	0.000	54.182	0.000	0.74
		C		0.000	0.000	19.665	0.000	0.29
T15	80.00-73.33	A	1.632	0.000	0.000	54.885	0.000	0.94
		B		0.000	0.000	55.783	0.000	0.75
		C		0.000	0.000	19.560	0.000	0.29
T16	73.33-66.67	A	1.617	0.000	0.000	54.686	0.000	0.94
		B		0.000	0.000	55.999	0.000	0.75
		C		0.000	0.000	21.039	0.000	0.30
T17	66.67-60.00	A	1.601	0.000	0.000	54.470	0.000	0.93
		B		0.000	0.000	58.470	0.000	0.77
		C		0.000	0.000	21.752	0.000	0.31
T18	60.00-40.00	A	1.564	0.000	0.000	161.900	0.000	2.73
		B		0.000	0.000	179.597	0.000	2.29
		C		0.000	0.000	64.245	0.000	0.91
T19	40.00-20.00	A	1.486	0.000	0.000	158.759	0.000	2.62
		B		0.000	0.000	176.147	0.000	2.19
		C		0.000	0.000	62.144	0.000	0.85
T20	20.00-0.00	A	1.331	0.000	0.000	93.204	0.000	1.46
		B		0.000	0.000	105.105	0.000	1.22
		C		0.000	0.000	38.857	0.000	0.49

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Feed Line Center of Pressure

Section	Elevation	CP _X	CP _Z	CP _X Ice	CP _Z Ice
	ft	in	in	in	in
T1	168.00-160.00	0.3633	2.9963	-1.6106	5.1254
T2	160.00-140.00	-1.9689	0.3070	-3.4857	3.3074
T3	140.00-136.00	-0.4163	-3.7412	-0.3022	-1.5718
T4	136.00-132.00	-0.4691	-4.0955	-0.3615	-1.8435
T5	132.00-128.00	0.6278	-3.5861	0.7053	-1.3894
T6	128.00-124.00	1.6639	-3.1020	1.7143	-0.9584
T7	124.00-120.00	1.6306	-3.0427	1.6997	-0.9547
T8	120.00-115.00	2.8857	-9.5652	1.8599	-5.2376
T9	115.00-110.00	3.0317	-10.1165	1.9480	-5.5547
T10	110.00-105.00	3.1733	-10.6547	2.0334	-5.8646
T11	105.00-100.00	3.9164	-10.8557	3.1073	-5.7549
T12	100.00-93.33	4.0778	-11.3853	3.2996	-6.1664
T13	93.33-86.67	3.9415	-11.2821	3.2465	-6.1783
T14	86.67-80.00	4.1056	-11.8274	3.3866	-6.5073
T15	80.00-73.33	4.6297	-13.1503	3.7689	-7.2422
T16	73.33-66.67	4.6963	-13.5778	3.3350	-7.0121
T17	66.67-60.00	4.5967	-12.8583	3.5910	-6.3039
T18	60.00-40.00	5.1928	-13.9528	4.3037	-6.9686
T19	40.00-20.00	5.8661	-15.7685	4.8862	-8.1424
T20	20.00-0.00	4.2890	-12.4134	3.1049	-6.5160

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
T1	1	Safety Line 3/8	160.00 - 168.00	0.6000	0.5611
T1	5	Climbing Pegs	160.00 - 168.00	0.6000	0.5611
T1	32	LDF7-50A (1-5/8 FOAM)	160.00 - 168.00	0.6000	0.5611
T1	39	Feedline Ladder (Af)	160.00 - 168.00	0.6000	0.5611
T1	41	LDF6-50A (1-1/4 FOAM)	160.00 - 168.00	0.6000	0.5611
T1	43	LDF5-50A (7/8 FOAM)	160.00 - 168.00	0.6000	0.5611
T2	1	Safety Line 3/8	140.00 - 160.00	0.6000	0.5939
T2	5	Climbing Pegs	140.00 - 160.00	0.6000	0.5939
T2	8	Feedline Ladder (Af)	140.00 - 149.00	0.6000	0.5939
T2	10	LDF7-50A (1-5/8 FOAM)	140.00 - 149.00	0.6000	0.5939
T2	32	LDF7-50A (1-5/8 FOAM)	140.00 - 160.00	0.6000	0.5939
T2	39	Feedline Ladder (Af)	140.00 -	0.6000	0.5939

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<i>Tower Section</i>	<i>Feed Line Record No.</i>	<i>Description</i>	<i>Feed Line Segment Elev.</i>	<i>K_a No Ice</i>	<i>K_a Ice</i>
			160.00		
T2	41	LDF6-50A (1-1/4 FOAM)	140.00 -	0.6000	0.5939
			160.00		
T2	43	LDF5-50A (7/8 FOAM)	140.00 -	0.6000	0.5939
			160.00		
T3	1	Safety Line 3/8	136.00 -	0.6000	0.5145
			140.00		
T3	5	Climbing Pegs	136.00 -	0.6000	0.5145
			140.00		
T3	8	Feedline Ladder (Af)	136.00 -	0.6000	0.5145
			140.00		
T3	10	LDF7-50A (1-5/8 FOAM)	136.00 -	0.6000	0.5145
			140.00		
T3	20	Feedline Ladder (Af)	136.00 -	0.6000	0.5145
			140.00		
T3	22	LDF7-50A (1-5/8 FOAM)	136.00 -	0.6000	0.5145
			140.00		
T3	24	1-1/4" Hybrid	136.00 -	0.0000	0.0000
			140.00		
T3	26	1/2" Fiber Cable	136.00 -	0.6000	0.5145
			140.00		
T3	28	0.325" DC Power	136.00 -	0.6000	0.5145
			140.00		
T3	32	LDF7-50A (1-5/8 FOAM)	136.00 -	0.6000	0.5145
			140.00		
T3	39	Feedline Ladder (Af)	136.00 -	0.6000	0.5145
			140.00		
T3	41	LDF6-50A (1-1/4 FOAM)	136.00 -	0.6000	0.5145
			140.00		
T3	43	LDF5-50A (7/8 FOAM)	136.00 -	0.6000	0.5145
			140.00		
T4	1	Safety Line 3/8	132.00 -	0.6000	0.6000
			136.00		
T4	5	Climbing Pegs	132.00 -	0.6000	0.6000
			136.00		
T4	8	Feedline Ladder (Af)	132.00 -	0.6000	0.6000
			136.00		
T4	10	LDF7-50A (1-5/8 FOAM)	132.00 -	0.6000	0.6000
			136.00		
T4	20	Feedline Ladder (Af)	132.00 -	0.6000	0.6000
			136.00		
T4	22	LDF7-50A (1-5/8 FOAM)	132.00 -	0.6000	0.6000
			136.00		
T4	24	1-1/4" Hybrid	132.00 -	0.0000	0.0000
			136.00		
T4	26	1/2" Fiber Cable	132.00 -	0.6000	0.6000
			136.00		
T4	28	0.325" DC Power	132.00 -	0.6000	0.6000
			136.00		
T4	32	LDF7-50A (1-5/8 FOAM)	132.00 -	0.6000	0.6000
			136.00		
T4	39	Feedline Ladder (Af)	132.00 -	0.6000	0.6000
			136.00		
T4	41	LDF6-50A (1-1/4 FOAM)	132.00 -	0.6000	0.6000
			136.00		
T4	43	LDF5-50A (7/8 FOAM)	132.00 -	0.6000	0.6000
			136.00		
T5	1	Safety Line 3/8	128.00 -	0.6000	0.6000
			132.00		
T5	5	Climbing Pegs	128.00 -	0.6000	0.6000
			132.00		
T5	8	Feedline Ladder (Af)	128.00 -	0.6000	0.6000

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<i>Tower Section</i>	<i>Feed Line Record No.</i>	<i>Description</i>	<i>Feed Line Segment Elev.</i>	<i>K_a No Ice</i>	<i>K_a Ice</i>
T5	10	LDF7-50A (1-5/8 FOAM)	132.00 128.00 - 132.00	0.6000	0.6000
T5	20	Feedline Ladder (Af)	128.00 - 132.00	0.6000	0.6000
T5	22	LDF7-50A (1-5/8 FOAM)	128.00 - 132.00	0.6000	0.6000
T5	24	1-1/4" Hybrid	128.00 - 132.00	0.0000	0.0000
T5	26	1/2" Fiber Cable	128.00 - 132.00	0.6000	0.6000
T5	28	0.325" DC Power	128.00 - 132.00	0.6000	0.6000
T5	29	LDF6-50A (1-1/4 FOAM)	128.00 - 130.00	0.6000	0.6000
T5	32	LDF7-50A (1-5/8 FOAM)	128.00 - 132.00	0.6000	0.6000
T5	39	Feedline Ladder (Af)	128.00 - 132.00	0.6000	0.6000
T5	41	LDF6-50A (1-1/4 FOAM)	128.00 - 132.00	0.6000	0.6000
T5	43	LDF5-50A (7/8 FOAM)	128.00 - 132.00	0.6000	0.6000
T6	1	Safety Line 3/8	124.00 - 128.00	0.6000	0.6000
T6	5	Climbing Pegs	124.00 - 128.00	0.6000	0.6000
T6	8	Feedline Ladder (Af)	124.00 - 128.00	0.6000	0.6000
T6	10	LDF7-50A (1-5/8 FOAM)	124.00 - 128.00	0.6000	0.6000
T6	20	Feedline Ladder (Af)	124.00 - 128.00	0.6000	0.6000
T6	22	LDF7-50A (1-5/8 FOAM)	124.00 - 128.00	0.6000	0.6000
T6	24	1-1/4" Hybrid	124.00 - 128.00	0.0000	0.0000
T6	26	1/2" Fiber Cable	124.00 - 128.00	0.6000	0.6000
T6	28	0.325" DC Power	124.00 - 128.00	0.6000	0.6000
T6	29	LDF6-50A (1-1/4 FOAM)	124.00 - 128.00	0.6000	0.6000
T6	32	LDF7-50A (1-5/8 FOAM)	124.00 - 128.00	0.6000	0.6000
T6	39	Feedline Ladder (Af)	124.00 - 128.00	0.6000	0.6000
T6	41	LDF6-50A (1-1/4 FOAM)	124.00 - 128.00	0.6000	0.6000
T6	43	LDF5-50A (7/8 FOAM)	124.00 - 128.00	0.6000	0.6000
T7	1	Safety Line 3/8	120.00 - 124.00	0.6000	0.6000
T7	5	Climbing Pegs	120.00 - 124.00	0.6000	0.6000
T7	8	Feedline Ladder (Af)	120.00 - 124.00	0.6000	0.6000
T7	10	LDF7-50A (1-5/8 FOAM)	120.00 - 124.00	0.6000	0.6000
T7	20	Feedline Ladder (Af)	120.00 - 124.00	0.6000	0.6000
T7	22	LDF7-50A (1-5/8 FOAM)	120.00 -	0.6000	0.6000

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<i>Tower Section</i>	<i>Feed Line Record No.</i>	<i>Description</i>	<i>Feed Line Segment Elev.</i>	<i>K_a No Ice</i>	<i>K_a Ice</i>
T7	24	1-1/4" Hybrid	124.00 120.00 - 124.00	0.0000	0.0000
T7	26	1/2" Fiber Cable	120.00 - 124.00	0.6000	0.6000
T7	28	0.325" DC Power	120.00 - 124.00	0.6000	0.6000
T7	29	LDF6-50A (1-1/4 FOAM)	120.00 - 124.00	0.6000	0.6000
T7	32	LDF7-50A (1-5/8 FOAM)	120.00 - 124.00	0.6000	0.6000
T7	39	Feedline Ladder (Af)	120.00 - 124.00	0.6000	0.6000
T7	41	LDF6-50A (1-1/4 FOAM)	120.00 - 124.00	0.6000	0.6000
T7	43	LDF5-50A (7/8 FOAM)	120.00 - 124.00	0.6000	0.6000
T8	1	Safety Line 3/8	115.00 - 120.00	0.6000	0.6000
T8	5	Climbing Pegs	115.00 - 120.00	0.6000	0.6000
T8	7	Feedline Ladder (Af)	115.00 - 120.00	0.6000	0.6000
T8	9	LDF7-50A (1-5/8 FOAM)	115.00 - 120.00	0.6000	0.6000
T8	12	Feedline Ladder (Af)	115.00 - 120.00	0.6000	0.6000
T8	13	LDF6-50A (1-1/4 FOAM)	115.00 - 120.00	0.6000	0.6000
T8	14	1/2" RET Cable	115.00 - 120.00	0.0000	0.0000
T8	15	3" Rigid Conduit	115.00 - 120.00	0.6000	0.6000
T8	16	3/4" DC Power Line	115.00 - 120.00	0.0000	0.0000
T8	17	5/16" Fiber Cable	115.00 - 120.00	0.0000	0.0000
T8	19	Feedline Ladder (Af)	115.00 - 120.00	0.6000	0.6000
T8	21	LDF7-50A (1-5/8 FOAM)	115.00 - 120.00	0.6000	0.6000
T8	23	1-1/4" Hybrid	115.00 - 120.00	0.0000	0.0000
T8	25	1/2" Fiber Cable	115.00 - 120.00	0.6000	0.6000
T8	27	0.325" DC Power	115.00 - 120.00	0.6000	0.6000
T8	29	LDF6-50A (1-1/4 FOAM)	115.00 - 120.00	0.6000	0.6000
T8	31	LDF7-50A (1-5/8 FOAM)	115.00 - 120.00	0.6000	0.6000
T8	38	Feedline Ladder (Af)	115.00 - 120.00	0.6000	0.6000
T8	40	LDF6-50A (1-1/4 FOAM)	115.00 - 120.00	0.6000	0.6000
T8	42	LDF5-50A (7/8 FOAM)	115.00 - 120.00	0.6000	0.6000
T9	1	Safety Line 3/8	110.00 - 115.00	0.6000	0.6000
T9	5	Climbing Pegs	110.00 - 115.00	0.6000	0.6000
T9	7	Feedline Ladder (Af)	110.00 -	0.6000	0.6000

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<i>Tower Section</i>	<i>Feed Line Record No.</i>	<i>Description</i>	<i>Feed Line Segment Elev.</i>	<i>K_a No Ice</i>	<i>K_a Ice</i>
T9	9	LDF7-50A (1-5/8 FOAM)	115.00 110.00 -	0.6000	0.6000
T9	12	Feedline Ladder (Af)	115.00 110.00 -	0.6000	0.6000
T9	13	LDF6-50A (1-1/4 FOAM)	115.00 110.00 -	0.6000	0.6000
T9	14	1/2" RET Cable	115.00 110.00 -	0.0000	0.0000
T9	15	3" Rigid Conduit	115.00 110.00 -	0.6000	0.6000
T9	16	3/4" DC Power Line	115.00 110.00 -	0.0000	0.0000
T9	17	5/16" Fiber Cable	115.00 110.00 -	0.0000	0.0000
T9	19	Feedline Ladder (Af)	115.00 110.00 -	0.6000	0.6000
T9	21	LDF7-50A (1-5/8 FOAM)	115.00 110.00 -	0.6000	0.6000
T9	23	1-1/4" Hybrid	115.00 110.00 -	0.0000	0.0000
T9	25	1/2" Fiber Cable	115.00 110.00 -	0.6000	0.6000
T9	27	0.325" DC Power	115.00 110.00 -	0.6000	0.6000
T9	29	LDF6-50A (1-1/4 FOAM)	115.00 110.00 -	0.6000	0.6000
T9	31	LDF7-50A (1-5/8 FOAM)	115.00 110.00 -	0.6000	0.6000
T9	38	Feedline Ladder (Af)	115.00 110.00 -	0.6000	0.6000
T9	40	LDF6-50A (1-1/4 FOAM)	115.00 110.00 -	0.6000	0.6000
T9	42	LDF5-50A (7/8 FOAM)	115.00 110.00 -	0.6000	0.6000
T10	1	Safety Line 3/8	105.00 - 110.00	0.6000	0.6000
T10	5	Climbing Pegs	105.00 - 110.00	0.6000	0.6000
T10	7	Feedline Ladder (Af)	105.00 - 110.00	0.6000	0.6000
T10	9	LDF7-50A (1-5/8 FOAM)	105.00 - 110.00	0.6000	0.6000
T10	12	Feedline Ladder (Af)	105.00 - 110.00	0.6000	0.6000
T10	13	LDF6-50A (1-1/4 FOAM)	105.00 - 110.00	0.6000	0.6000
T10	14	1/2" RET Cable	105.00 - 110.00	0.0000	0.0000
T10	15	3" Rigid Conduit	105.00 - 110.00	0.6000	0.6000
T10	16	3/4" DC Power Line	105.00 - 110.00	0.0000	0.0000
T10	17	5/16" Fiber Cable	105.00 - 110.00	0.0000	0.0000
T10	19	Feedline Ladder (Af)	105.00 - 110.00	0.6000	0.6000
T10	21	LDF7-50A (1-5/8 FOAM)	105.00 - 110.00	0.6000	0.6000
T10	23	1-1/4" Hybrid	105.00 - 110.00	0.0000	0.0000
T10	25	1/2" Fiber Cable	105.00 -	0.6000	0.6000

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<i>Tower Section</i>	<i>Feed Line Record No.</i>	<i>Description</i>	<i>Feed Line Segment Elev.</i>	<i>K_a No Ice</i>	<i>K_a Ice</i>
T10	27	0.325" DC Power	110.00 105.00 - 110.00	0.6000	0.6000
T10	29	LDF6-50A (1-1/4 FOAM)	105.00 - 110.00	0.6000	0.6000
T10	31	LDF7-50A (1-5/8 FOAM)	105.00 - 110.00	0.6000	0.6000
T10	38	Feedline Ladder (Af)	105.00 - 110.00	0.6000	0.6000
T10	40	LDF6-50A (1-1/4 FOAM)	105.00 - 110.00	0.6000	0.6000
T10	42	LDF5-50A (7/8 FOAM)	105.00 - 110.00	0.6000	0.6000
T11	1	Safety Line 3/8	100.00 - 105.00	0.6000	0.6000
T11	5	Climbing Pegs	100.00 - 105.00	0.6000	0.6000
T11	7	Feedline Ladder (Af)	100.00 - 105.00	0.6000	0.6000
T11	9	LDF7-50A (1-5/8 FOAM)	100.00 - 105.00	0.6000	0.6000
T11	12	Feedline Ladder (Af)	100.00 - 105.00	0.6000	0.6000
T11	13	LDF6-50A (1-1/4 FOAM)	100.00 - 105.00	0.6000	0.6000
T11	14	1/2" RET Cable	100.00 - 105.00	0.0000	0.0000
T11	15	3" Rigid Conduit	100.00 - 105.00	0.6000	0.6000
T11	16	3/4" DC Power Line	100.00 - 105.00	0.0000	0.0000
T11	17	5/16" Fiber Cable	100.00 - 105.00	0.0000	0.0000
T11	19	Feedline Ladder (Af)	100.00 - 105.00	0.6000	0.6000
T11	21	LDF7-50A (1-5/8 FOAM)	100.00 - 105.00	0.6000	0.6000
T11	23	1-1/4" Hybrid	100.00 - 105.00	0.0000	0.0000
T11	25	1/2" Fiber Cable	100.00 - 105.00	0.6000	0.6000
T11	27	0.325" DC Power	100.00 - 105.00	0.6000	0.6000
T11	29	LDF6-50A (1-1/4 FOAM)	100.00 - 105.00	0.6000	0.6000
T11	31	LDF7-50A (1-5/8 FOAM)	100.00 - 105.00	0.6000	0.6000
T11	36	CU12PSM9P6XXX(1-1/2)	100.00 - 105.00	0.6000	0.6000
T11	38	Feedline Ladder (Af)	100.00 - 105.00	0.6000	0.6000
T11	40	LDF6-50A (1-1/4 FOAM)	100.00 - 105.00	0.6000	0.6000
T11	42	LDF5-50A (7/8 FOAM)	100.00 - 105.00	0.6000	0.6000
T12	1	Safety Line 3/8	93.33 - 100.00	0.6000	0.6000
T12	5	Climbing Pegs	93.33 - 100.00	0.6000	0.6000
T12	7	Feedline Ladder (Af)	93.33 - 100.00	0.6000	0.6000
T12	9	LDF7-50A (1-5/8 FOAM)	93.33 - 100.00	0.6000	0.6000
T12	12	Feedline Ladder (Af)	93.33 - 100.00	0.6000	0.6000
T12	13	LDF6-50A (1-1/4 FOAM)	93.33 - 100.00	0.6000	0.6000
T12	14	1/2" RET Cable	93.33 - 100.00	0.0000	0.0000

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<i>Tower Section</i>	<i>Feed Line Record No.</i>	<i>Description</i>	<i>Feed Line Segment Elev.</i>	<i>K_a No Ice</i>	<i>K_a Ice</i>
T12	15	3" Rigid Conduit	93.33 - 100.00	0.6000	0.6000
T12	16	3/4" DC Power Line	93.33 - 100.00	0.0000	0.0000
T12	17	5/16" Fiber Cable	93.33 - 100.00	0.0000	0.0000
T12	19	Feedline Ladder (Af)	93.33 - 100.00	0.6000	0.6000
T12	21	LDF7-50A (1-5/8 FOAM)	93.33 - 100.00	0.6000	0.6000
T12	23	1-1/4" Hybrid	93.33 - 100.00	0.0000	0.0000
T12	25	1/2" Fiber Cable	93.33 - 100.00	0.6000	0.6000
T12	27	0.325" DC Power	93.33 - 100.00	0.6000	0.6000
T12	29	LDF6-50A (1-1/4 FOAM)	93.33 - 100.00	0.6000	0.6000
T12	31	LDF7-50A (1-5/8 FOAM)	93.33 - 100.00	0.6000	0.6000
T12	36	CU12PSM9P6XXX(1-1/2)	93.33 - 100.00	0.6000	0.6000
T12	38	Feedline Ladder (Af)	93.33 - 100.00	0.6000	0.6000
T12	40	LDF6-50A (1-1/4 FOAM)	93.33 - 100.00	0.6000	0.6000
T12	42	LDF5-50A (7/8 FOAM)	93.33 - 100.00	0.6000	0.6000
T13	1	Safety Line 3/8	86.67 - 93.33	0.6000	0.6000
T13	5	Climbing Pegs	86.67 - 93.33	0.6000	0.6000
T13	7	Feedline Ladder (Af)	86.67 - 93.33	0.6000	0.6000
T13	9	LDF7-50A (1-5/8 FOAM)	86.67 - 93.33	0.6000	0.6000
T13	12	Feedline Ladder (Af)	86.67 - 93.33	0.6000	0.6000
T13	13	LDF6-50A (1-1/4 FOAM)	86.67 - 93.33	0.6000	0.6000
T13	14	1/2" RET Cable	86.67 - 93.33	0.0000	0.0000
T13	15	3" Rigid Conduit	86.67 - 93.33	0.6000	0.6000
T13	16	3/4" DC Power Line	86.67 - 93.33	0.0000	0.0000
T13	17	5/16" Fiber Cable	86.67 - 93.33	0.0000	0.0000
T13	19	Feedline Ladder (Af)	86.67 - 93.33	0.6000	0.6000
T13	21	LDF7-50A (1-5/8 FOAM)	86.67 - 93.33	0.6000	0.6000
T13	23	1-1/4" Hybrid	86.67 - 93.33	0.0000	0.0000
T13	25	1/2" Fiber Cable	86.67 - 93.33	0.6000	0.6000
T13	27	0.325" DC Power	86.67 - 93.33	0.6000	0.6000
T13	29	LDF6-50A (1-1/4 FOAM)	86.67 - 93.33	0.6000	0.6000
T13	31	LDF7-50A (1-5/8 FOAM)	86.67 - 93.33	0.6000	0.6000
T13	36	CU12PSM9P6XXX(1-1/2)	86.67 - 93.33	0.6000	0.6000
T13	38	Feedline Ladder (Af)	86.67 - 93.33	0.6000	0.6000
T13	40	LDF6-50A (1-1/4 FOAM)	86.67 - 93.33	0.6000	0.6000
T13	42	LDF5-50A (7/8 FOAM)	86.67 - 93.33	0.6000	0.6000
T14	1	Safety Line 3/8	80.00 - 86.67	0.6000	0.6000
T14	5	Climbing Pegs	80.00 - 86.67	0.6000	0.6000
T14	7	Feedline Ladder (Af)	80.00 - 86.67	0.6000	0.6000
T14	9	LDF7-50A (1-5/8 FOAM)	80.00 - 86.67	0.6000	0.6000
T14	12	Feedline Ladder (Af)	80.00 - 86.67	0.6000	0.6000
T14	13	LDF6-50A (1-1/4 FOAM)	80.00 - 86.67	0.6000	0.6000
T14	14	1/2" RET Cable	80.00 - 86.67	0.0000	0.0000
T14	15	3" Rigid Conduit	80.00 - 86.67	0.6000	0.6000
T14	16	3/4" DC Power Line	80.00 - 86.67	0.0000	0.0000
T14	17	5/16" Fiber Cable	80.00 - 86.67	0.0000	0.0000
T14	19	Feedline Ladder (Af)	80.00 - 86.67	0.6000	0.6000
T14	21	LDF7-50A (1-5/8 FOAM)	80.00 - 86.67	0.6000	0.6000
T14	23	1-1/4" Hybrid	80.00 - 86.67	0.0000	0.0000
T14	25	1/2" Fiber Cable	80.00 - 86.67	0.6000	0.6000
T14	27	0.325" DC Power	80.00 - 86.67	0.6000	0.6000
T14	29	LDF6-50A (1-1/4 FOAM)	80.00 - 86.67	0.6000	0.6000
T14	30	LDF4-50A (1/2 FOAM)	80.00 - 82.00	0.0000	0.0000
T14	31	LDF7-50A (1-5/8 FOAM)	80.00 - 86.67	0.6000	0.6000
T14	36	CU12PSM9P6XXX(1-1/2)	80.00 - 86.67	0.6000	0.6000
T14	38	Feedline Ladder (Af)	80.00 - 86.67	0.6000	0.6000
T14	40	LDF6-50A (1-1/4 FOAM)	80.00 - 86.67	0.6000	0.6000
T14	42	LDF5-50A (7/8 FOAM)	80.00 - 86.67	0.6000	0.6000
T15	1	Safety Line 3/8	73.33 - 80.00	0.6000	0.6000
T15	5	Climbing Pegs	73.33 - 80.00	0.6000	0.6000
T15	7	Feedline Ladder (Af)	73.33 - 80.00	0.6000	0.6000
T15	9	LDF7-50A (1-5/8 FOAM)	73.33 - 80.00	0.6000	0.6000
T15	12	Feedline Ladder (Af)	73.33 - 80.00	0.6000	0.6000

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<i>Tower Section</i>	<i>Feed Line Record No.</i>	<i>Description</i>	<i>Feed Line Segment Elev.</i>	<i>K_a No Ice</i>	<i>K_a Ice</i>
T15	13	LDF6-50A (1-1/4 FOAM)	73.33 - 80.00	0.6000	0.6000
T15	14	1/2" RET Cable	73.33 - 80.00	0.0000	0.0000
T15	15	3" Rigid Conduit	73.33 - 80.00	0.6000	0.6000
T15	16	3/4" DC Power Line	73.33 - 80.00	0.0000	0.0000
T15	17	5/16" Fiber Cable	73.33 - 80.00	0.0000	0.0000
T15	19	Feedline Ladder (Af)	73.33 - 80.00	0.6000	0.6000
T15	21	LDF7-50A (1-5/8 FOAM)	73.33 - 80.00	0.6000	0.6000
T15	23	1-1/4" Hybrid	73.33 - 80.00	0.0000	0.0000
T15	25	1/2" Fiber Cable	73.33 - 80.00	0.6000	0.6000
T15	27	0.325" DC Power	73.33 - 80.00	0.6000	0.6000
T15	29	LDF6-50A (1-1/4 FOAM)	73.33 - 80.00	0.6000	0.6000
T15	30	LDF4-50A (1/2 FOAM)	73.33 - 80.00	0.0000	0.0000
T15	31	LDF7-50A (1-5/8 FOAM)	73.33 - 80.00	0.6000	0.6000
T15	36	CU12PSM9P6XXX(1-1/2)	73.33 - 80.00	0.6000	0.6000
T15	38	Feedline Ladder (Af)	73.33 - 80.00	0.6000	0.6000
T15	40	LDF6-50A (1-1/4 FOAM)	73.33 - 80.00	0.6000	0.6000
T15	42	LDF5-50A (7/8 FOAM)	73.33 - 80.00	0.6000	0.6000
T16	1	Safety Line 3/8	66.67 - 73.33	0.6000	0.6000
T16	5	Climbing Pegs	66.67 - 73.33	0.6000	0.6000
T16	7	Feedline Ladder (Af)	66.67 - 73.33	0.6000	0.6000
T16	9	LDF7-50A (1-5/8 FOAM)	66.67 - 73.33	0.6000	0.6000
T16	12	Feedline Ladder (Af)	66.67 - 73.33	0.6000	0.6000
T16	13	LDF6-50A (1-1/4 FOAM)	66.67 - 73.33	0.6000	0.6000
T16	14	1/2" RET Cable	66.67 - 73.33	0.0000	0.0000
T16	15	3" Rigid Conduit	66.67 - 73.33	0.6000	0.6000
T16	16	3/4" DC Power Line	66.67 - 73.33	0.0000	0.0000
T16	17	5/16" Fiber Cable	66.67 - 73.33	0.0000	0.0000
T16	19	Feedline Ladder (Af)	66.67 - 73.33	0.6000	0.6000
T16	21	LDF7-50A (1-5/8 FOAM)	66.67 - 73.33	0.6000	0.6000
T16	23	1-1/4" Hybrid	66.67 - 73.33	0.0000	0.0000
T16	25	1/2" Fiber Cable	66.67 - 73.33	0.6000	0.6000
T16	27	0.325" DC Power	66.67 - 73.33	0.6000	0.6000
T16	29	LDF6-50A (1-1/4 FOAM)	66.67 - 73.33	0.6000	0.6000
T16	30	LDF4-50A (1/2 FOAM)	66.67 - 73.33	0.0000	0.0000
T16	31	LDF7-50A (1-5/8 FOAM)	66.67 - 73.33	0.6000	0.6000
T16	34	LDF4-50A (1/2 FOAM)	66.67 - 68.00	0.6000	0.6000
T16	36	CU12PSM9P6XXX(1-1/2)	66.67 - 73.33	0.6000	0.6000
T16	38	Feedline Ladder (Af)	66.67 - 73.33	0.6000	0.6000
T16	40	LDF6-50A (1-1/4 FOAM)	66.67 - 73.33	0.6000	0.6000
T16	42	LDF5-50A (7/8 FOAM)	66.67 - 73.33	0.6000	0.6000
T16	44	LDF2-50A (3/8 FOAM)	66.67 - 71.00	0.6000	0.6000
T17	1	Safety Line 3/8	60.00 - 66.67	0.6000	0.6000
T17	5	Climbing Pegs	60.00 - 66.67	0.6000	0.6000
T17	7	Feedline Ladder (Af)	60.00 - 66.67	0.6000	0.6000
T17	9	LDF7-50A (1-5/8 FOAM)	60.00 - 66.67	0.6000	0.6000
T17	12	Feedline Ladder (Af)	60.00 - 66.67	0.6000	0.6000
T17	13	LDF6-50A (1-1/4 FOAM)	60.00 - 66.67	0.6000	0.6000
T17	14	1/2" RET Cable	60.00 - 66.67	0.0000	0.0000
T17	15	3" Rigid Conduit	60.00 - 66.67	0.6000	0.6000
T17	16	3/4" DC Power Line	60.00 - 66.67	0.0000	0.0000
T17	17	5/16" Fiber Cable	60.00 - 66.67	0.0000	0.0000
T17	19	Feedline Ladder (Af)	60.00 - 66.67	0.6000	0.6000
T17	21	LDF7-50A (1-5/8 FOAM)	60.00 - 66.67	0.6000	0.6000
T17	23	1-1/4" Hybrid	60.00 - 66.67	0.0000	0.0000
T17	25	1/2" Fiber Cable	60.00 - 66.67	0.6000	0.6000
T17	27	0.325" DC Power	60.00 - 66.67	0.6000	0.6000
T17	29	LDF6-50A (1-1/4 FOAM)	60.00 - 66.67	0.6000	0.6000
T17	30	LDF4-50A (1/2 FOAM)	60.00 - 66.67	0.0000	0.0000
T17	31	LDF7-50A (1-5/8 FOAM)	60.00 - 66.67	0.6000	0.6000
T17	33	LDF4-50A (1/2 FOAM)	60.00 - 62.00	0.6000	0.6000
T17	34	LDF4-50A (1/2 FOAM)	62.00 - 66.67	0.6000	0.6000
T17	36	CU12PSM9P6XXX(1-1/2)	60.00 - 66.67	0.6000	0.6000

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<i>Tower Section</i>	<i>Feed Line Record No.</i>	<i>Description</i>	<i>Feed Line Segment Elev.</i>	<i>K_a No Ice</i>	<i>K_a Ice</i>
T17	38	Feedline Ladder (Af)	60.00 - 66.67	0.6000	0.6000
T17	40	LDF6-50A (1-1/4 FOAM)	60.00 - 66.67	0.6000	0.6000
T17	42	LDF5-50A (7/8 FOAM)	60.00 - 66.67	0.6000	0.6000
T17	44	LDF2-50A (3/8 FOAM)	60.00 - 66.67	0.6000	0.6000
T18	1	Safety Line 3/8	40.00 - 60.00	0.6000	0.6000
T18	5	Climbing Pegs	40.00 - 60.00	0.6000	0.6000
T18	7	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T18	9	LDF7-50A (1-5/8 FOAM)	40.00 - 60.00	0.6000	0.6000
T18	12	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T18	13	LDF6-50A (1-1/4 FOAM)	40.00 - 60.00	0.6000	0.6000
T18	14	1/2" RET Cable	40.00 - 60.00	0.0000	0.0000
T18	15	3" Rigid Conduit	40.00 - 60.00	0.6000	0.6000
T18	16	3/4" DC Power Line	40.00 - 60.00	0.0000	0.0000
T18	17	5/16" Fiber Cable	40.00 - 60.00	0.0000	0.0000
T18	19	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T18	21	LDF7-50A (1-5/8 FOAM)	40.00 - 60.00	0.6000	0.6000
T18	23	1-1/4" Hybrid	40.00 - 60.00	0.0000	0.0000
T18	25	1/2" Fiber Cable	40.00 - 60.00	0.6000	0.6000
T18	27	0.325" DC Power	40.00 - 60.00	0.6000	0.6000
T18	29	LDF6-50A (1-1/4 FOAM)	40.00 - 60.00	0.6000	0.6000
T18	30	LDF4-50A (1/2 FOAM)	40.00 - 60.00	0.0000	0.0000
T18	31	LDF7-50A (1-5/8 FOAM)	40.00 - 60.00	0.6000	0.6000
T18	33	LDF4-50A (1/2 FOAM)	40.00 - 60.00	0.6000	0.6000
T18	36	CU12PSM9P6XXX(1-1/2)	40.00 - 60.00	0.6000	0.6000
T18	38	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T18	40	LDF6-50A (1-1/4 FOAM)	40.00 - 60.00	0.6000	0.6000
T18	42	LDF5-50A (7/8 FOAM)	40.00 - 60.00	0.6000	0.6000
T18	44	LDF2-50A (3/8 FOAM)	40.00 - 60.00	0.6000	0.6000
T19	1	Safety Line 3/8	20.00 - 40.00	0.6000	0.6000
T19	5	Climbing Pegs	20.00 - 40.00	0.6000	0.6000
T19	7	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T19	9	LDF7-50A (1-5/8 FOAM)	20.00 - 40.00	0.6000	0.6000
T19	12	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T19	13	LDF6-50A (1-1/4 FOAM)	20.00 - 40.00	0.6000	0.6000
T19	14	1/2" RET Cable	20.00 - 40.00	0.0000	0.0000
T19	15	3" Rigid Conduit	20.00 - 40.00	0.6000	0.6000
T19	16	3/4" DC Power Line	20.00 - 40.00	0.0000	0.0000
T19	17	5/16" Fiber Cable	20.00 - 40.00	0.0000	0.0000
T19	19	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T19	21	LDF7-50A (1-5/8 FOAM)	20.00 - 40.00	0.6000	0.6000
T19	23	1-1/4" Hybrid	20.00 - 40.00	0.0000	0.0000
T19	25	1/2" Fiber Cable	20.00 - 40.00	0.6000	0.6000
T19	27	0.325" DC Power	20.00 - 40.00	0.6000	0.6000
T19	29	LDF6-50A (1-1/4 FOAM)	20.00 - 40.00	0.6000	0.6000
T19	30	LDF4-50A (1/2 FOAM)	20.00 - 40.00	0.0000	0.0000
T19	31	LDF7-50A (1-5/8 FOAM)	20.00 - 40.00	0.6000	0.6000
T19	33	LDF4-50A (1/2 FOAM)	20.00 - 40.00	0.6000	0.6000
T19	35	LDF1-50A (1/4 FOAM)	20.00 - 23.00	0.0000	0.0000
T19	36	CU12PSM9P6XXX(1-1/2)	20.00 - 40.00	0.6000	0.6000
T19	38	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T19	40	LDF6-50A (1-1/4 FOAM)	20.00 - 40.00	0.6000	0.6000
T19	42	LDF5-50A (7/8 FOAM)	20.00 - 40.00	0.6000	0.6000
T19	44	LDF2-50A (3/8 FOAM)	20.00 - 40.00	0.6000	0.6000
T20	1	Safety Line 3/8	2.00 - 20.00	0.6000	0.6000
T20	3	Climbing Pegs	0.00 - 6.00	0.6000	0.6000
T20	4	Climbing Pegs	0.00 - 6.00	0.6000	0.6000
T20	5	Climbing Pegs	0.00 - 20.00	0.6000	0.6000
T20	7	Feedline Ladder (Af)	8.00 - 20.00	0.6000	0.6000
T20	9	LDF7-50A (1-5/8 FOAM)	8.00 - 20.00	0.6000	0.6000
T20	12	Feedline Ladder (Af)	8.00 - 20.00	0.6000	0.6000
T20	13	LDF6-50A (1-1/4 FOAM)	8.00 - 20.00	0.6000	0.6000
T20	14	1/2" RET Cable	8.00 - 20.00	0.0000	0.0000

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Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
T20	15	3" Rigid Conduit	8.00 - 20.00	0.6000	0.6000
T20	16	3/4" DC Power Line	8.00 - 20.00	0.0000	0.0000
T20	17	5/16" Fiber Cable	8.00 - 20.00	0.0000	0.0000
T20	19	Feedline Ladder (Af)	8.00 - 20.00	0.6000	0.6000
T20	21	LDF7-50A (1-5/8 FOAM)	8.00 - 20.00	0.6000	0.6000
T20	23	1-1/4" Hybrid	8.00 - 20.00	0.0000	0.0000
T20	25	1/2" Fiber Cable	8.00 - 20.00	0.6000	0.6000
T20	27	0.325" DC Power	8.00 - 20.00	0.6000	0.6000
T20	29	LDF6-50A (1-1/4 FOAM)	8.00 - 20.00	0.6000	0.6000
T20	30	LDF4-50A (1/2 FOAM)	8.00 - 20.00	0.0000	0.0000
T20	31	LDF7-50A (1-5/8 FOAM)	8.00 - 20.00	0.6000	0.6000
T20	33	LDF4-50A (1/2 FOAM)	8.00 - 20.00	0.6000	0.6000
T20	35	LDF1-50A (1/4 FOAM)	8.00 - 20.00	0.0000	0.0000
T20	36	CU12PSM9P6XXX(1-1/2)	8.00 - 20.00	0.6000	0.6000
T20	38	Feedline Ladder (Af)	8.00 - 20.00	0.6000	0.6000
T20	40	LDF6-50A (1-1/4 FOAM)	8.00 - 20.00	0.6000	0.6000
T20	42	LDF5-50A (7/8 FOAM)	8.00 - 20.00	0.6000	0.6000
T20	44	LDF2-50A (3/8 FOAM)	8.00 - 20.00	0.6000	0.6000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
20' Dipole	B	From Leg	0.00	0.0000	168.00	No Ice	4.00	4.00	0.04
			0.00			1/2" Ice	6.03	6.03	0.07
			10.00			1" Ice	8.07	8.07	0.11
						2" Ice	12.20	12.20	0.24
8' Omni	A	From Leg	0.00	0.0000	168.00	No Ice	1.60	1.60	0.02
			0.00			1/2" Ice	2.42	2.42	0.03
			6.00			1" Ice	3.24	3.24	0.05
						2" Ice	4.23	4.23	0.10
4' x 2" Mount Pipe	A	From Leg	0.00	0.0000	168.00	No Ice	0.79	0.79	0.03
			0.00			1/2" Ice	1.03	1.03	0.04
			2.00			1" Ice	1.28	1.28	0.04
						2" Ice	1.81	1.81	0.07
6' Dipole	C	From Leg	0.00	0.0000	168.00	No Ice	1.77	1.77	0.01
			0.00			1/2" Ice	2.13	2.13	0.03
			5.00			1" Ice	2.50	2.50	0.04
						2" Ice	3.27	3.27	0.09
6' Yagi	A	From Face	0.00	0.0000	168.00	No Ice	1.20	1.20	0.03
			0.00			1/2" Ice	1.80	1.80	0.04
			2.00			1" Ice	2.17	2.17	0.05
						2" Ice	2.93	2.93	0.09
3' x 2" Mount Pipe	A	From Face	0.00	0.0000	168.00	No Ice	0.58	0.58	0.01
			0.00			1/2" Ice	0.77	0.77	0.02
			2.00			1" Ice	0.97	0.97	0.02
						2" Ice	1.39	1.39	0.05
3' Standoff (3) [SO 302-3]	C	None		0.0000	154.00	No Ice	4.94	4.94	0.17
						1/2" Ice	7.56	7.56	0.25
						1" Ice	10.33	10.33	0.37

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<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz Lateral Vert ft ft ft</i>	<i>Azimuth Adjustment °</i>	<i>Placement ft</i>	<i>C_{AA} Front ft²</i>	<i>C_{AA} Side ft²</i>	<i>Weight K</i>
Sector Mount (3) [SM 505-3]	C	None		0.0000	149.00	2" Ice 16.68 No Ice 31.66 1/2" Ice 44.64 1" Ice 57.44 2" Ice 82.68	16.68 31.66 44.64 57.44 82.68	0.70 1.73 2.36 3.19 5.45
(2) SBNHH-1D65B w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	149.00	2" Ice 8.53 No Ice 9.19 1/2" Ice 9.82 1" Ice 11.02 2" Ice 11.02	8.53 7.24 8.52 9.66 11.59	0.09 0.16 0.24 0.42 0.42
(2) SBNHH-1D65B w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	149.00	No Ice 8.53 1/2" Ice 9.19 1" Ice 9.82 2" Ice 11.02	7.24 8.52 9.66 11.59	0.09 0.16 0.24 0.42
(2) SBNHH-1D65B w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	149.00	No Ice 8.53 1/2" Ice 9.19 1" Ice 9.82 2" Ice 11.02	7.24 8.52 9.66 11.59	0.09 0.16 0.24 0.42
(2) WPA-80063/4CF	A	From Leg	4.00 0.00 1.00	0.0000	149.00	No Ice 4.92 1/2" Ice 5.24 1" Ice 5.57 2" Ice 6.25	2.02 2.31 2.62 3.24	0.01 0.04 0.07 0.15
(2) WPA-80063/4CF	B	From Leg	4.00 0.00 1.00	0.0000	149.00	No Ice 4.92 1/2" Ice 5.24 1" Ice 5.57 2" Ice 6.25	2.02 2.31 2.62 3.24	0.01 0.04 0.07 0.15
(2) WPA-80080/4CF	C	From Leg	4.00 0.00 1.00	0.0000	149.00	No Ice 4.71 1/2" Ice 5.03 1" Ice 5.35 2" Ice 6.02	2.25 2.55 2.85 3.49	0.01 0.04 0.07 0.15
VZS01 w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	149.00	No Ice 4.95 1/2" Ice 5.31 1" Ice 5.67 2" Ice 6.43	2.74 3.21 3.69 4.71	0.10 0.14 0.19 0.30
VZS01 w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	149.00	No Ice 4.95 1/2" Ice 5.31 1" Ice 5.67 2" Ice 6.43	2.74 3.21 3.69 4.71	0.10 0.14 0.19 0.30
VZS01 w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	149.00	No Ice 4.95 1/2" Ice 5.31 1" Ice 5.67 2" Ice 6.43	2.74 3.21 3.69 4.71	0.10 0.14 0.19 0.30
BSAMNT-SBS-1-2	A	From Leg	4.00 0.00 1.00	0.0000	149.00	No Ice 0.00 1/2" Ice 0.00 1" Ice 0.00 2" Ice 0.00	0.00 0.03 0.08 0.19	0.03 0.03 0.03 0.03
BSAMNT-SBS-1-2	B	From Leg	4.00 0.00 1.00	0.0000	149.00	No Ice 0.00 1/2" Ice 0.00 1" Ice 0.00 2" Ice 0.00	0.00 0.03 0.08 0.19	0.03 0.03 0.03 0.03
BSAMNT-SBS-1-2	C	From Leg	4.00 0.00 1.00	0.0000	149.00	No Ice 0.00 1/2" Ice 0.00 1" Ice 0.00 2" Ice 0.00	0.00 0.03 0.08 0.19	0.03 0.03 0.03 0.03
RFV01U-D2A	A	From Leg	4.00 0.00 1.00	0.0000	149.00	No Ice 1.88 1/2" Ice 2.05 1" Ice 2.22 2" Ice 2.60	1.01 1.14 1.28 1.59	0.07 0.09 0.11 0.16

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<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz Lateral Vert ft ft ft</i>	<i>Azimuth Adjustment °</i>	<i>Placement ft</i>		<i>C_{AA} Front ft²</i>	<i>C_{AA} Side ft²</i>	<i>Weight K</i>
RFV01U-D2A	B	From Leg	4.00 0.00 1.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.88 2.05 2.22 2.60	1.01 1.14 1.28 1.59	0.07 0.09 0.11 0.16
RFV01U-D2A	C	From Leg	4.00 0.00 1.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.88 2.05 2.22 2.60	1.01 1.14 1.28 1.59	0.07 0.09 0.11 0.16
RFV01U-D1A	A	From Leg	4.00 0.00 1.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.88 2.05 2.22 2.60	1.25 1.39 1.54 1.86	0.08 0.10 0.12 0.18
RFV01U-D1A	B	From Leg	4.00 0.00 1.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.88 2.05 2.22 2.60	1.25 1.39 1.54 1.86	0.08 0.10 0.12 0.18
RFV01U-D1A	C	From Leg	4.00 0.00 1.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.88 2.05 2.22 2.60	1.25 1.39 1.54 1.86	0.08 0.10 0.12 0.18
OVP Box	A	From Leg	4.00 0.00 1.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.35 1.50 1.65 1.98	0.85 0.97 1.10 1.37	0.01 0.02 0.04 0.08
OVP Box	C	From Leg	4.00 0.00 1.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.35 1.50 1.65 1.98	0.85 0.97 1.10 1.37	0.01 0.02 0.04 0.08
Sector Mount (3)	C	None		0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice	15.00 22.19 29.38 43.76	15.00 22.19 29.38 43.76	0.80 1.14 1.60 2.87
3' x 3" Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.68 0.87 1.07 1.50	0.68 0.87 1.07 1.50	0.02 0.02 0.03 0.06
APX16DWV-16DWVS-E-A 20 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice	7.00 7.39 7.80 8.62	3.55 4.22 4.90 6.31	0.06 0.11 0.16 0.30
APX16DWV-16DWVS-E-A 20 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice	7.00 7.39 7.80 8.62	3.55 4.22 4.90 6.31	0.06 0.11 0.16 0.30
APX16DWV-16DWVS-E-A 20 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice	7.00 7.39 7.80 8.62	3.55 4.22 4.90 6.31	0.06 0.11 0.16 0.30
APXVAALL24_43-U-NA20 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice	20.24 20.89 21.55 22.88	10.63 12.06 13.34 15.56	0.18 0.31 0.46 0.78
APXVAALL24_43-U-NA20 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice	20.24 20.89 21.55 22.88	10.63 12.06 13.34 15.56	0.18 0.31 0.46 0.78
APXVAALL24_43-U-NA20	C	From Leg	4.00	0.0000	140.00	No Ice	20.24	10.63	0.18

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<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz Lateral Vert ft ft ft</i>	<i>Azimuth Adjustment °</i>	<i>Placement ft</i>	<i>C_{AA} Front ft²</i>	<i>C_{AA} Side ft²</i>	<i>Weight K</i>
w/ Mount Pipe			0.00 0.00			1/2" Ice 20.89 1" Ice 21.55 2" Ice 22.88	12.06 13.34 15.56	0.31 0.46 0.78
(2) RFU-D	B	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 0.69 1/2" Ice 0.80 1" Ice 0.91 2" Ice 1.16	0.29 0.37 0.45 0.64	0.01 0.02 0.03 0.05
RADIO 4449 B71+B12	A	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1.63 1/2" Ice 1.79 1" Ice 1.95 2" Ice 2.31	1.01 1.14 1.27 1.57	0.07 0.09 0.11 0.15
RADIO 4449 B71+B12	B	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1.63 1/2" Ice 1.79 1" Ice 1.95 2" Ice 2.31	1.01 1.14 1.27 1.57	0.07 0.09 0.11 0.15
RADIO 4449 B71+B12	C	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1.63 1/2" Ice 1.79 1" Ice 1.95 2" Ice 2.31	1.01 1.14 1.27 1.57	0.07 0.09 0.11 0.15
RADIO 4415 B66A	A	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1.86 1/2" Ice 2.03 1" Ice 2.20 2" Ice 2.58	0.87 1.00 1.13 1.43	0.05 0.06 0.08 0.12
RADIO 4415 B66A	B	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1.86 1/2" Ice 2.03 1" Ice 2.20 2" Ice 2.58	0.87 1.00 1.13 1.43	0.05 0.06 0.08 0.12
RADIO 4415 B66A	C	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1.86 1/2" Ice 2.03 1" Ice 2.20 2" Ice 2.58	0.87 1.00 1.13 1.43	0.05 0.06 0.08 0.12
Twin Style A1-PCS TMA	A	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 0.73 1/2" Ice 0.84 1" Ice 0.96 2" Ice 1.21	0.25 0.32 0.40 0.58	0.01 0.01 0.02 0.04
Twin Style A1-PCS TMA	B	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 0.73 1/2" Ice 0.84 1" Ice 0.96 2" Ice 1.21	0.25 0.32 0.40 0.58	0.01 0.01 0.02 0.04
Twin Style A1-PCS TMA	C	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 0.73 1/2" Ice 0.84 1" Ice 0.96 2" Ice 1.21	0.25 0.32 0.40 0.58	0.01 0.01 0.02 0.04
Sector Mount (3) [SM 201-3]	C	None		0.0000	130.00	No Ice 24.76 1/2" Ice 33.89 1" Ice 43.00 2" Ice 61.44	24.76 33.89 43.00 61.44	1.08 1.52 2.10 3.64
NNVV-65B-R4	A	From Leg	2.00 0.00 0.00	0.0000	130.00	No Ice 12.27 1/2" Ice 12.77 1" Ice 13.27 2" Ice 14.29	5.75 6.21 6.67 7.62	0.08 0.15 0.23 0.41
NNVV-65B-R4	B	From Leg	2.00 0.00 0.00	0.0000	130.00	No Ice 12.27 1/2" Ice 12.77 1" Ice 13.27 2" Ice 14.29	5.75 6.21 6.67 7.62	0.08 0.15 0.23 0.41
NNVV-65B-R4	C	From Leg	2.00 0.00	0.0000	130.00	No Ice 12.27 1/2" Ice 12.77	5.75 6.21	0.08 0.15

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<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz Lateral Vert ft ft ft</i>	<i>Azimuth Adjustment °</i>	<i>Placement ft</i>	<i>C_{AA} Front ft²</i>	<i>C_{AA} Side ft²</i>	<i>Weight K</i>
			0.00			1" Ice	13.27	0.23
						2" Ice	14.29	0.41
APXV9TM14-ALU-I20	A	From Leg	2.00	0.0000	130.00	No Ice	6.34	0.06
			0.00			1/2" Ice	6.72	0.09
			0.00			1" Ice	7.10	0.14
APXV9TM14-ALU-I20	B	From Leg	2.00	0.0000	130.00	2" Ice	7.88	0.24
			0.00			No Ice	6.34	0.06
			0.00			1/2" Ice	6.72	0.09
			0.00			1" Ice	7.10	0.14
APXV9TM14-ALU-I20	C	From Leg	2.00	0.0000	130.00	2" Ice	7.88	0.24
			0.00			No Ice	6.34	0.06
			0.00			1/2" Ice	6.72	0.09
			0.00			1" Ice	7.10	0.14
TD-RRH8x20-25	A	From Leg	2.00	0.0000	130.00	2" Ice	7.88	0.24
			0.00			No Ice	3.70	0.07
			0.00			1/2" Ice	3.95	0.09
TD-RRH8x20-25	B	From Leg	2.00	0.0000	130.00	1" Ice	4.20	0.12
			0.00			2" Ice	4.72	0.18
			0.00			No Ice	3.70	0.07
TD-RRH8x20-25	C	From Leg	2.00	0.0000	130.00	1/2" Ice	3.95	0.09
			0.00			1" Ice	4.20	0.12
			0.00			2" Ice	4.72	0.18
RRH2X50-800	A	From Leg	2.00	0.0000	130.00	No Ice	3.70	0.07
			0.00			1/2" Ice	3.95	0.09
			0.00			1" Ice	4.20	0.12
RRH2X50-800	B	From Leg	2.00	0.0000	130.00	2" Ice	4.72	0.18
			0.00			No Ice	1.70	0.05
			0.00			1/2" Ice	1.86	0.07
			0.00			1" Ice	2.03	0.09
RRH2X50-800	C	From Leg	2.00	0.0000	130.00	2" Ice	2.40	0.14
			0.00			No Ice	1.70	0.05
			0.00			1/2" Ice	1.86	0.07
			0.00			1" Ice	2.03	0.09
RRH4X45-1900	A	From Leg	2.00	0.0000	130.00	2" Ice	2.40	0.14
			0.00			No Ice	2.31	0.06
			0.00			1/2" Ice	2.52	0.08
RRH4X45-1900	B	From Leg	2.00	0.0000	130.00	1" Ice	2.73	0.11
			0.00			2" Ice	3.17	0.18
			0.00			No Ice	2.31	0.06
RRH4X45-1900	C	From Leg	2.00	0.0000	130.00	1/2" Ice	2.52	0.08
			0.00			1" Ice	2.73	0.11
			0.00			2" Ice	3.17	0.18
Sector Mount (3) [SM 401-3]	C	None		0.0000	120.00	No Ice	17.82	0.80
						1/2" Ice	25.01	1.14
						1" Ice	32.11	1.60
						2" Ice	46.16	2.87
7770.00	A	From Leg	3.00	0.0000	120.00	No Ice	5.51	0.04
			0.00			1/2" Ice	5.87	0.07
			0.00			1" Ice	6.23	0.11

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<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz Lateral Vert ft ft ft</i>	<i>Azimuth Adjustment °</i>	<i>Placement ft</i>	<i>C_{AA} Front ft²</i>	<i>C_{AA} Side ft²</i>	<i>Weight K</i>
7770.00	B	From Leg	3.00 0.00 0.00	0.0000	120.00	2" Ice 6.99 No Ice 5.51 1/2" Ice 5.87 1" Ice 6.23 2" Ice 6.99	4.35 2.93 3.27 3.63 4.35	0.20 0.04 0.07 0.11 0.20
7770.00	C	From Leg	3.00 0.00 0.00	0.0000	120.00	2" Ice 6.99 No Ice 5.51 1/2" Ice 5.87 1" Ice 6.23 2" Ice 6.99	4.35 2.93 3.27 3.63 4.35	0.20 0.04 0.07 0.11 0.20
P65-17-XL-R	A	From Leg	3.00 0.00 0.00	0.0000	120.00	2" Ice 6.99 No Ice 11.47 1/2" Ice 12.08 1" Ice 12.71 2" Ice 13.95	4.35 6.80 7.38 7.98 9.18	0.20 0.06 0.12 0.19 0.35
P65-17-XL-R	B	From Leg	3.00 0.00 0.00	0.0000	120.00	2" Ice 13.95 No Ice 11.47 1/2" Ice 12.08 1" Ice 12.71 2" Ice 13.95	9.18 6.80 7.38 7.98 9.18	0.35 0.06 0.12 0.19 0.35
AM-X-CD-16-65-00T	C	From Leg	3.00 0.00 0.00	0.0000	120.00	2" Ice 13.95 No Ice 8.02 1/2" Ice 8.48 1" Ice 8.94 2" Ice 9.89	9.18 4.64 5.09 5.54 6.47	0.35 0.05 0.09 0.15 0.27
RRUS11	A	From Leg	3.00 0.00 0.00	0.0000	120.00	2" Ice 9.89 No Ice 3.15 1/2" Ice 3.37 1" Ice 3.61 2" Ice 4.10	6.47 1.46 1.63 1.81 2.20	0.27 0.06 0.08 0.10 0.17
RRUS11	B	From Leg	3.00 0.00 0.00	0.0000	120.00	2" Ice 4.10 No Ice 3.15 1/2" Ice 3.37 1" Ice 3.61 2" Ice 4.10	2.20 1.46 1.63 1.81 2.20	0.17 0.06 0.08 0.10 0.17
RRUS11	C	From Leg	3.00 0.00 0.00	0.0000	120.00	2" Ice 4.10 No Ice 3.15 1/2" Ice 3.37 1" Ice 3.61 2" Ice 4.10	2.20 1.46 1.63 1.81 2.20	0.17 0.06 0.08 0.10 0.17
LGP214nn TMA	A	From Leg	3.00 0.00 0.00	0.0000	120.00	2" Ice 4.10 No Ice 1.10 1/2" Ice 1.24 1" Ice 1.38 2" Ice 1.69	2.20 0.35 0.44 0.54 0.77	0.17 0.01 0.02 0.03 0.05
LGP214nn TMA	B	From Leg	3.00 0.00 0.00	0.0000	120.00	2" Ice 1.69 No Ice 1.10 1/2" Ice 1.24 1" Ice 1.38 2" Ice 1.69	0.77 0.35 0.44 0.54 0.77	0.05 0.01 0.02 0.03 0.05
LGP214nn TMA	C	From Leg	3.00 0.00 0.00	0.0000	120.00	2" Ice 1.69 No Ice 1.10 1/2" Ice 1.24 1" Ice 1.38 2" Ice 1.69	0.77 0.35 0.44 0.54 0.77	0.05 0.01 0.02 0.03 0.05
RET	A	From Leg	3.00 0.00 0.00	0.0000	120.00	2" Ice 1.69 No Ice 0.21 1/2" Ice 0.27 1" Ice 0.33 2" Ice 0.49	0.77 0.13 0.17 0.23 0.36	0.05 0.00 0.00 0.01 0.02
RET	B	From Leg	3.00 0.00 0.00	0.0000	120.00	2" Ice 0.49 No Ice 0.21 1/2" Ice 0.27 1" Ice 0.33 2" Ice 0.49	0.36 0.13 0.17 0.23 0.36	0.02 0.00 0.00 0.01 0.02
RET	C	From Leg	3.00 0.00 0.00	0.0000	120.00	2" Ice 0.49 No Ice 0.21 1/2" Ice 0.27 1" Ice 0.33 2" Ice 0.49	0.36 0.13 0.17 0.23 0.36	0.02 0.00 0.00 0.01 0.02

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<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz Lateral Vert ft ft ft</i>	<i>Azimuth Adjustment °</i>	<i>Placement ft</i>		<i>C_{AA} Front ft²</i>	<i>C_{AA} Side ft²</i>	<i>Weight K</i>
DC6-48-60-18-8F Surge Suppression Unit	A	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.92 1.46 1.64 2.04	0.92 1.46 1.64 2.04	0.02 0.04 0.06 0.11
MTC3975083 Sector Mounts (3)	C	None		0.0000	105.00	No Ice 1/2" Ice 1" Ice 2" Ice	21.04 32.63 44.22 67.40	21.04 32.63 44.22 67.40	1.38 2.00 2.62 3.86
MX08FRO665-21	A	From Leg	3.00 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice 1" Ice 2" Ice	12.49 12.99 13.49 14.52	5.87 6.32 6.79 7.74	0.08 0.16 0.24 0.42
MX08FRO665-21	B	From Leg	3.00 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice 1" Ice 2" Ice	12.49 12.99 13.49 14.52	5.87 6.32 6.79 7.74	0.08 0.16 0.24 0.42
MX08FRO665-21	C	From Leg	3.00 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice 1" Ice 2" Ice	12.49 12.99 13.49 14.52	5.87 6.32 6.79 7.74	0.08 0.16 0.24 0.42
TA08025-B605	A	From Leg	3.00 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.96 2.14 2.32 2.71	1.13 1.27 1.41 1.72	0.08 0.09 0.11 0.16
TA08025-B605	B	From Leg	3.00 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.96 2.14 2.32 2.71	1.13 1.27 1.41 1.72	0.08 0.09 0.11 0.16
TA08025-B605	C	From Leg	3.00 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.96 2.14 2.32 2.71	1.13 1.27 1.41 1.72	0.08 0.09 0.11 0.16
TA08025-B604	A	From Leg	3.00 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.96 2.14 2.32 2.71	0.98 1.11 1.25 1.55	0.06 0.08 0.10 0.15
TA08025-B604	B	From Leg	3.00 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.96 2.14 2.32 2.71	0.98 1.11 1.25 1.55	0.06 0.08 0.10 0.15
TA08025-B604	C	From Leg	3.00 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.96 2.14 2.32 2.71	0.98 1.11 1.25 1.55	0.06 0.08 0.10 0.15
RDIDC-9181-PF-48	A	From Leg	3.00 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.56 2.76 2.97 3.40	1.34 1.49 1.66 2.01	0.02 0.04 0.07 0.12
(2) 6.5' Horizontal Mount Pipe	B	From Leg	1.00 0.00 0.00	0.0000	87.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.14 1.76 2.14 2.90	0.01 0.04 0.09 0.21	0.02 0.03 0.04 0.08
(2) 4' x 2" Mount Pipe	B	From Leg	1.00 0.00 0.00	0.0000	87.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.79 1.03 1.28 1.81	0.79 1.03 1.28 1.81	0.03 0.04 0.04 0.07
GPS	C	From Leg	0.00	0.0000	82.00	No Ice	0.12	0.12	0.00

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<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz Lateral Vert ft ft ft</i>	<i>Azimuth Adjustment °</i>	<i>Placement ft</i>	<i>C_{AA} Front ft²</i>	<i>C_{AA} Side ft²</i>	<i>Weight K</i>
			0.00			1/2" Ice	0.21	0.00
			0.00			1" Ice	0.28	0.01
						2" Ice	0.44	0.02
12' Dipole	B	From Leg	6.00	0.0000	71.00	No Ice	2.40	0.03
			0.00			1/2" Ice	3.63	0.04
			0.00			1" Ice	4.87	0.07
						2" Ice	7.35	0.15
8' x 2" Horizontal Mount Pipe	B	From Leg	3.00	0.0000	71.00	No Ice	1.90	0.04
			0.00			1/2" Ice	2.45	0.05
			0.00			1" Ice	3.01	0.08
						2" Ice	4.15	0.15
Flood Light (15"x 12"x 6")	B	From Leg	0.50	0.0000	68.00	No Ice	1.50	0.02
			0.00			1/2" Ice	1.65	0.03
			0.00			1" Ice	1.81	0.05
						2" Ice	2.16	0.08
Flood Light (15"x 12"x 6")	A	From Leg	0.50	0.0000	68.00	No Ice	1.50	0.02
			0.00			1/2" Ice	1.65	0.03
			0.00			1" Ice	1.81	0.05
						2" Ice	2.16	0.08
Camera	A	From Leg	0.50	0.0000	68.00	No Ice	0.11	0.00
			0.00			1/2" Ice	0.16	0.00
			0.00			1" Ice	0.21	0.01
						2" Ice	0.34	0.01
L3x3x3/16 (7' Horizontal)	A	From Face	0.00	0.0000	102.50	No Ice	2.10	0.03
			0.00			1/2" Ice	2.59	0.05
			0.00			1" Ice	3.08	0.07
						2" Ice	4.09	0.14
L3x3x3/16 (7' Horizontal)	B	From Face	0.00	0.0000	102.50	No Ice	2.10	0.03
			0.00			1/2" Ice	2.59	0.05
			0.00			1" Ice	3.08	0.07
						2" Ice	4.09	0.14
L3x3x3/16 (7' Horizontal)	C	From Face	0.00	0.0000	102.50	No Ice	2.10	0.03
			0.00			1/2" Ice	2.59	0.05
			0.00			1" Ice	3.08	0.07
						2" Ice	4.09	0.14
L3x3x3/16 (11.5' Long) Horizontal	A	From Face	0.00	0.0000	70.00	No Ice	3.45	0.04
			0.00			1/2" Ice	4.24	0.06
			0.00			1" Ice	5.03	0.09
						2" Ice	6.64	0.18
L3x3x3/16 (11.5' Long) Horizontal	B	From Face	0.00	0.0000	70.00	No Ice	3.45	0.04
			0.00			1/2" Ice	4.24	0.06
			0.00			1" Ice	5.03	0.09
						2" Ice	6.64	0.18
L3x3x3/16 (11.5' Long) Horizontal	C	From Face	0.00	0.0000	0.00	No Ice	3.45	0.04
			0.00			1/2" Ice	4.24	0.06
			0.00			1" Ice	5.03	0.09
						2" Ice	6.64	0.18

Dishes

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Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft	Aperture Area ft²	Weight K	
VHLP2-11W/A	B	Paraboloid w/Radome	From Leg	4.00	-5.0000		140.00	2.17	No Ice	3.44	0.05
				0.00					1/2" Ice	3.72	0.06
				0.00					1" Ice	4.00	0.08
									2" Ice	4.55	0.13

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 60 deg - No Ice
7	0.9 Dead+1.0 Wind 60 deg - No Ice
8	1.2 Dead+1.0 Wind 90 deg - No Ice
9	0.9 Dead+1.0 Wind 90 deg - No Ice
10	1.2 Dead+1.0 Wind 120 deg - No Ice
11	0.9 Dead+1.0 Wind 120 deg - No Ice
12	1.2 Dead+1.0 Wind 150 deg - No Ice
13	0.9 Dead+1.0 Wind 150 deg - No Ice
14	1.2 Dead+1.0 Wind 180 deg - No Ice
15	0.9 Dead+1.0 Wind 180 deg - No Ice
16	1.2 Dead+1.0 Wind 210 deg - No Ice
17	0.9 Dead+1.0 Wind 210 deg - No Ice
18	1.2 Dead+1.0 Wind 240 deg - No Ice
19	0.9 Dead+1.0 Wind 240 deg - No Ice
20	1.2 Dead+1.0 Wind 270 deg - No Ice
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice
25	0.9 Dead+1.0 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service

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<i>Comb. No.</i>	<i>Description</i>
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Tower Deflections - Service Wind

<i>Section No.</i>	<i>Elevation ft</i>	<i>Horz. Deflection in</i>	<i>Gov. Load Comb.</i>	<i>Tilt °</i>	<i>Twist °</i>
T1	168 - 160	4.882	43	0.2580	0.0160
T2	160 - 140	4.449	43	0.2576	0.0160
T3	140 - 136	3.372	43	0.2491	0.0165
T4	136 - 132	3.160	43	0.2439	0.0167
T5	132 - 128	2.954	43	0.2367	0.0168
T6	128 - 124	2.754	43	0.2275	0.0170
T7	124 - 120	2.561	43	0.2157	0.0170
T8	120 - 115	2.379	43	0.2080	0.0171
T9	115 - 110	2.157	43	0.1985	0.0169
T10	110 - 105	1.949	43	0.1883	0.0164
T11	105 - 100	1.751	43	0.1776	0.0158
T12	100 - 93.3333	1.562	43	0.1664	0.0149
T13	93.3333 - 86.6667	1.332	43	0.1511	0.0138
T14	86.6667 - 80	1.124	43	0.1354	0.0126
T15	80 - 73.3333	0.937	43	0.1192	0.0113
T16	73.3333 - 66.6667	0.774	43	0.1053	0.0103
T17	66.6667 - 60	0.629	43	0.0912	0.0092
T18	60 - 40	0.505	43	0.0770	0.0080
T19	40 - 20	0.227	43	0.0458	0.0049
T20	20 - 0	0.066	43	0.0229	0.0024

Critical Deflections and Radius of Curvature - Service Wind

<i>Elevation ft</i>	<i>Appurtenance</i>	<i>Gov. Load Comb.</i>	<i>Deflection in</i>	<i>Tilt °</i>	<i>Twist °</i>	<i>Radius of Curvature ft</i>
168.00	20' Dipole	43	4.882	0.2580	0.0160	Inf
154.00	3' Standoff (3) [SO 302-3]	43	4.124	0.2570	0.0161	494718
149.00	Sector Mount (3) [SM 505-3]	43	3.855	0.2556	0.0162	281379
140.00	VHLP2-11W/A	43	3.372	0.2491	0.0165	79890
130.00	Sector Mount (3) [SM 201-3]	43	2.854	0.2325	0.0169	31673
120.00	Sector Mount (3) [SM 401-3]	43	2.379	0.2080	0.0171	34634
105.00	MTC3975083 Sector Mounts (3)	43	1.751	0.1776	0.0158	31999
102.50	L3x3x3/16 (7' Horizontal)	43	1.655	0.1720	0.0153	25793
87.00	(2) 6.5' Horizontal Mount Pipe	43	1.134	0.1362	0.0127	25317
82.00	GPS	43	0.991	0.1239	0.0117	22513
71.00	12' Dipole	43	0.721	0.1005	0.0099	28740
70.00	L3x3x3/16 (11.5' Long) Horizontal	43	0.699	0.0984	0.0097	27836
68.00	Flood Light (15"x 12"x 6")	43	0.657	0.0941	0.0094	26247
0.00	L3x3x3/16 (11.5' Long) Horizontal	0	0.000	0.0000	0.0000	166035

Maximum Tower Deflections - Design Wind

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Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	168 - 160	18.872	11	0.9972	0.0618
T2	160 - 140	17.200	11	0.9956	0.0618
T3	140 - 136	13.038	11	0.9625	0.0638
T4	136 - 132	12.220	11	0.9423	0.0644
T5	132 - 128	11.424	11	0.9149	0.0649
T6	128 - 124	10.650	11	0.8794	0.0654
T7	124 - 120	9.904	11	0.8339	0.0657
T8	120 - 115	9.198	11	0.8045	0.0661
T9	115 - 110	8.343	11	0.7675	0.0652
T10	110 - 105	7.536	11	0.7282	0.0634
T11	105 - 100	6.770	11	0.6869	0.0608
T12	100 - 93.3333	6.040	11	0.6434	0.0575
T13	93.3333 - 86.6667	5.150	11	0.5844	0.0534
T14	86.6667 - 80	4.345	11	0.5235	0.0488
T15	80 - 73.3333	3.624	11	0.4608	0.0438
T16	73.3333 - 66.6667	2.992	11	0.4072	0.0397
T17	66.6667 - 60	2.433	11	0.3526	0.0354
T18	60 - 40	1.952	11	0.2977	0.0309
T19	40 - 20	0.876	11	0.1770	0.0189
T20	20 - 0	0.253	11	0.0885	0.0093

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
168.00	20' Dipole	11	18.872	0.9972	0.0618	Inf
154.00	3' Standoff (3) [SO 302-3]	11	15.946	0.9929	0.0621	132076
149.00	Sector Mount (3) [SM 505-3]	11	14.903	0.9874	0.0626	75293
140.00	VHLP2-11W/A	11	13.038	0.9625	0.0638	20707
130.00	Sector Mount (3) [SM 201-3]	11	11.034	0.8988	0.0652	8242
120.00	Sector Mount (3) [SM 401-3]	11	9.198	0.8045	0.0661	8975
105.00	MTC3975083 Sector Mounts (3)	11	6.770	0.6869	0.0608	8270
102.50	L3x3x3/16 (7' Horizontal)	11	6.399	0.6653	0.0592	6663
87.00	(2) 6.5' Horizontal Mount Pipe	11	4.384	0.5267	0.0490	6541
82.00	GPS	11	3.831	0.4789	0.0452	5824
71.00	12' Dipole	11	2.788	0.3885	0.0383	7432
70.00	L3x3x3/16 (11.5' Long) Horizontal	11	2.704	0.3803	0.0376	7201
68.00	Flood Light (15"x 12"x 6")	11	2.539	0.3638	0.0363	6795
0.00	L3x3x3/16 (11.5' Long) Horizontal	0	0.000	0.0000	0.0000	42888

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load Allowable	Allowable Ratio	Criteria
T1	168	Leg	A325N	0.6250	4	0.18	20.34	0.009	1	Bolt Tension
		Diagonal	A325N	0.6250	1	0.34	6.53	0.051	1	Member Block Shear
		Top Girt	A325N	0.6250	1	0.04	6.53	0.006	1	Member Block

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Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load Allowable	Allowable Ratio	Criteria
T2	160	Leg	A325N	0.6250	4	2.37	20.34	0.117	1	Shear
		Diagonal	A325N	0.6250	1	2.22	6.53	0.340	1	Bolt Tension
		Top Girt	A325N	0.6250	1	0.24	6.53	0.036	1	Member Block Shear
T3	140	Diagonal	A325N	0.6250	1	3.25	6.53	0.497	1	Member Block Shear
		Top Girt	A325N	0.6250	1	0.36	6.53	0.055	1	Member Block Shear
T4	136	Diagonal	A325N	0.6250	1	3.46	6.53	0.530	1	Member Block Shear
T5	132	Diagonal	A325N	0.6250	1	4.03	6.53	0.617	1	Member Block Shear
T6	128	Diagonal	A325N	0.6250	1	4.75	6.53	0.728	1	Member Block Shear
T7	124	Leg	A325N	0.7500	4	10.26	30.10	0.341	1	Bolt Tension
		Diagonal	A325N	0.6250	1	4.80	6.53	0.736	1	Member Block Shear
T8	120	Diagonal	A325N	0.6250	1	3.91	6.53	0.599	1	Member Block Shear
T9	115	Diagonal	A325N	0.6250	1	4.06	6.53	0.623	1	Member Block Shear
T10	110	Diagonal	A325N	0.6250	1	3.89	6.53	0.596	1	Member Block Shear
T11	105	Leg	A325N	0.8750	4	17.94	41.56	0.432	1	Bolt Tension
		Diagonal	A325N	0.6250	1	4.45	6.53	0.682	1	Member Block Shear
T12	100	Diagonal	A325N	0.6250	1	4.87	8.48	0.574	1	Member Bearing
T13	93.3333	Diagonal	A325N	0.6250	1	4.99	8.48	0.589	1	Member Bearing
		Secondary	A325N	0.6250	2	0.92	6.17	0.149	1	Member Block Shear
T14	86.6667	Horizontal								
		Leg	A325N	0.8750	4	24.47	41.56	0.589	1	Bolt Tension
		Diagonal	A325N	0.6250	1	5.04	8.48	0.594	1	Member Bearing
		Secondary	A325N	0.6250	2	1.00	6.17	0.163	1	Member Block Shear
T15	80	Horizontal								
		Diagonal	A325N	0.6250	1	5.03	11.31	0.445	1	Member Bearing
T16	73.3333	Diagonal	A325N	0.6250	1	5.16	11.31	0.456	1	Member Bearing
T17	66.6667	Leg	A325N	0.8750	4	30.77	41.56	0.740	1	Bolt Tension
		Diagonal	A325N	0.6250	1	5.33	11.31	0.471	1	Member Bearing
		Secondary	A325N	0.6250	2	1.25	6.17	0.203	1	Member Block Shear
T18	60	Horizontal								
		Leg	A325N	1.0000	4	36.62	54.52	0.672	1	Bolt Tension
		Diagonal	A325N	0.6250	1	5.66	11.31	0.501	1	Member Bearing
T19	40	Leg	A325N	1.0000	6	27.66	54.52	0.507	1	Bolt Tension
		Diagonal	A325N	0.7500	1	6.36	14.36	0.443	1	Member Bearing
T20	20	Diagonal	A325N	0.7500	1	6.74	14.36	0.469	1	Member Bearing

Compression Checks

Leg Design Data (Compression)

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Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T1	168 - 160	P2.5 STD	8.00	4.00	50.6 K=1.00	1.7072	-1.28	63.72	0.020 ¹
T2	160 - 140	P2.5 STD	20.00	4.00	50.6 K=1.00	1.7072	-13.72	63.72	0.215 ¹
T3	140 - 136	P2.5 STD	4.00	4.00	50.6 K=1.00	1.7072	-19.70	63.72	0.309 ¹
T4	136 - 132	P2.5 STD	4.00	4.00	50.6 K=1.00	1.7072	-26.19	63.72	0.411 ¹
T5	132 - 128	P2.5 STD	4.00	4.00	50.6 K=1.00	1.7072	-33.64	63.72	0.528 ¹
T6	128 - 124	P2.5 STD	4.00	4.00	50.6 K=1.00	1.7072	-42.23	63.72	0.663 ¹
T7	124 - 120	P 2-1/2 STD w/ Split P 3 X-STR (GPD)	4.00	4.00	52.2 K=1.00	3.2120	-50.82	88.02	0.577 ¹
T8	120 - 115	P 3 STD w/ Split P 3-1/2 STD (GPD)	5.01	5.01	52.7 K=1.00	3.5682	-59.91	97.49	0.615 ¹
T9	115 - 110	P 3 STD w/ Split P 3-1/2 STD (GPD)	5.01	5.01	52.7 K=1.00	3.5682	-69.43	97.49	0.712 ¹
T10	110 - 105	P 3 STD w/ Split P 3-1/2 STD (GPD)	5.01	5.01	52.7 K=1.00	3.5682	-76.78	97.49	0.788 ¹
T11	105 - 100	P 3 STD w/ Split P 3-1/2 STD (GPD)	5.01	5.01	52.7 K=1.00	3.5682	-86.15	97.49	0.884 ¹
T12	100 - 93.3333	P3.5 X-STR	6.68	6.68	61.3 K=1.00	3.6784	-95.43	125.72	0.759 ¹
T13	93.3333 - 86.6667	P3.5 X-STR	6.68	3.46	31.7 K=1.00	3.6784	-105.87	153.77	0.688 ¹
T14	86.6667 - 80	P3.5 X-STR	6.68	3.45	31.7 K=1.00	3.6784	-115.76	153.82	0.753 ¹
T15	80 - 73.3333	P4 X-STR	6.68	6.68	54.3 K=1.00	4.4074	-126.03	159.91	0.788 ¹
T16	73.3333 - 66.6667	P4 X-STR	6.68	6.68	54.3 K=1.00	4.4074	-135.61	159.91	0.848 ¹
T17	66.6667 - 60	P4 X-STR	6.68	3.43	27.9 K=1.00	4.4074	-144.57	187.38	0.772 ¹
T18	60 - 40	P5 X-STR	20.04	6.68	43.6 K=1.00	6.1114	-171.88	239.35	0.718 ¹
T19	40 - 20	P6 X-STR	20.04	10.02	54.8 K=1.00	8.4049	-195.15	303.74	0.642 ¹
T20	20 - 0	P6 X-STR	20.04	10.02	54.8 K=1.00	8.4049	-218.88	303.74	0.721 ¹

¹ P_u / φP_n controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T1	168 - 160	L2x2x3/16	7.78	3.63	112.9 K=1.02	0.7148	-0.34	15.41	0.022 ¹
T2	160 - 140	L2x2x3/16	7.78	3.63	112.9 K=1.02	0.7148	-2.26	15.41	0.147 ¹
T3	140 - 136	L2x2x3/16	7.78	3.63	112.9 K=1.02	0.7148	-3.34	15.41	0.217 ¹
T4	136 - 132	L2x2x3/16	7.78	3.63	112.9 K=1.02	0.7148	-3.38	15.41	0.219 ¹

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Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T5	132 - 128	L2x2x3/16	7.78	3.63	112.9 K=1.02	0.7148	-4.11	15.41	0.267 ¹
T6	128 - 124	L2x2x3/16	7.78	3.63	112.9 K=1.02	0.7148	-4.67	15.41	0.303 ¹
T7	124 - 120	L2x2x3/16	7.78	3.60	112.3 K=1.02	0.7148	-4.92	15.54	0.316 ¹
T8	120 - 115	L2x2x3/16	8.54	4.11	125.1 K=1.00	0.7148	-4.27	13.07	0.326 ¹
T9	115 - 110	L2x2x3/16	8.97	4.32	131.6 K=1.00	0.7148	-3.91	11.82	0.331 ¹
T10	110 - 105	L2x2x3/16	9.40	4.53	138.1 K=1.00	0.7148	-4.14	10.72	0.386 ¹
T11	105 - 100	L2x2x3/16	9.84	4.75	144.9 K=1.00	0.7148	-4.41	9.75	0.452 ¹
T12	100 - 93.3333	L2 1/2x2 1/2x3/16	11.26	5.51	133.5 K=1.00	0.9020	-4.95	14.48	0.342 ¹
T13	93.3333 - 86.6667	L2 1/2x2 1/2x3/16	11.81	5.79	140.3 K=1.00	0.9020	-5.18	13.11	0.395 ¹
T14	86.6667 - 80	L2 1/2x2 1/2x3/16	12.39	6.07	147.2 K=1.00	0.9020	-5.42	11.91	0.455 ¹
T15	80 - 73.3333	L2 1/2x2 1/2x1/4	12.97	6.34	155.0 K=1.00	1.1900	-5.02	14.18	0.354 ¹
T16	73.3333 - 66.6667	L2 1/2x2 1/2x1/4	13.56	6.64	162.2 K=1.00	1.1900	-5.26	12.95	0.406 ¹
T17	66.6667 - 60	L2 1/2x2 1/2x1/4	14.16	6.94	169.5 K=1.00	1.1900	-5.77	11.85	0.487 ¹
T18	60 - 40	L3x3x1/4	16.00	7.81	158.2 K=1.00	1.4375	-5.71	16.44	0.348 ¹
T19	40 - 20	L3 1/2x3 1/2x1/4	19.24	9.45	163.4 K=1.00	1.6900	-6.82	18.11	0.377 ¹
T20	20 - 0	L3 1/2x3 1/2x1/4	21.02	10.34	178.8 K=1.00	1.6900	-7.32	15.13	0.484 ¹

¹ P_u / φP_n controls

Secondary Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T13	93.3333 - 86.6667	L2x2x3/16	9.74	4.51	133.2 K=0.97	0.7148	-1.84	11.53	0.159 ¹
T14	86.6667 - 80	L2x2x3/16	10.43	4.85	141.2 K=0.96	0.7148	-2.01	10.26	0.196 ¹
T17	66.6667 - 60	L2x2x3/16	12.48	5.86	164.6 K=0.92	0.7148	-2.51	7.55	0.332 ¹

¹ P_u / φP_n controls

Top Girt Design Data (Compression)

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Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T1	168 - 160	L2x2x3/16	6.67	6.19	188.6 K=1.00	0.7148	-0.08	5.75	0.013 ¹
T2	160 - 140	L2x2x3/16	6.67	6.19	188.6 K=1.00	0.7148	-0.24	5.75	0.041 ¹
T3	140 - 136	L2x2x3/16	6.67	6.19	188.6 K=1.00	0.7148	-0.34	5.75	0.059 ¹

¹ P_u / φP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T1	168 - 160	P2.5 STD	8.00	4.00	50.6	1.7072	0.73	76.83	0.010 ¹
T2	160 - 140	P2.5 STD	20.00	4.00	50.6	1.7072	9.50	76.83	0.124 ¹
T3	140 - 136	P2.5 STD	4.00	4.00	50.6	1.7072	14.14	76.83	0.184 ¹
T4	136 - 132	P2.5 STD	4.00	4.00	50.6	1.7072	19.28	76.83	0.251 ¹
T5	132 - 128	P2.5 STD	4.00	4.00	50.6	1.7072	25.57	76.83	0.333 ¹
T6	128 - 124	P2.5 STD	4.00	4.00	50.6	1.7072	32.85	76.83	0.428 ¹
T7	124 - 120	P 2-1/2 STD w/ Split P 3 X-STR (GPD)	4.00	4.00	52.2	3.2120	41.04	101.18	0.406 ¹
T8	120 - 115	P 3 STD w/ Split P 3-1/2 STD (GPD)	5.01	5.01	52.7	3.5682	49.09	112.40	0.437 ¹
T9	115 - 110	P 3 STD w/ Split P 3-1/2 STD (GPD)	5.01	5.01	52.7	3.5682	57.13	112.40	0.508 ¹
T10	110 - 105	P 3 STD w/ Split P 3-1/2 STD (GPD)	5.01	5.01	52.7	3.5682	64.16	112.40	0.571 ¹
T11	105 - 100	P 3 STD w/ Split P 3-1/2 STD (GPD)	5.01	5.01	52.7	3.5682	71.76	112.40	0.638 ¹
T12	100 - 93.3333	P3.5 X-STR	6.68	6.68	61.3	3.6784	79.75	165.53	0.482 ¹
T13	93.3333 - 86.6667	P3.5 X-STR	6.68	3.22	29.6	3.6784	89.12	165.53	0.538 ¹
T14	86.6667 - 80	P3.5 X-STR	6.68	3.23	29.7	3.6784	97.98	165.53	0.592 ¹
T15	80 - 73.3333	P4 X-STR	6.68	6.68	54.3	4.4074	106.98	198.34	0.539 ¹
T16	73.3333 - 66.6667	P4 X-STR	6.68	6.68	54.3	4.4074	115.34	198.34	0.582 ¹
T17	66.6667 - 60	P4 X-STR	6.68	3.25	26.4	4.4074	123.15	198.34	0.621 ¹
T18	60 - 40	P5 X-STR	20.04	6.68	43.6	6.1114	146.46	275.01	0.533 ¹
T19	40 - 20	P6 X-STR	20.04	10.02	54.8	8.4049	165.94	378.22	0.439 ¹
T20	20 - 0	P6 X-STR	20.04	10.02	54.8	8.4049	185.63	378.22	0.491 ¹

¹ P_u / φP_n controls

Diagonal Design Data (Tension)

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Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T1	168 - 160	L2x2x3/16	7.78	3.63	72.9	0.4307	0.34	18.73	0.018 ¹
T2	160 - 140	L2x2x3/16	7.78	3.63	72.9	0.4307	2.22	18.73	0.118 ¹
T3	140 - 136	L2x2x3/16	7.78	3.63	72.9	0.4307	3.25	18.73	0.173 ¹
T4	136 - 132	L2x2x3/16	7.78	3.63	72.9	0.4307	3.46	18.73	0.185 ¹
T5	132 - 128	L2x2x3/16	7.78	3.63	72.9	0.4307	4.03	18.73	0.215 ¹
T6	128 - 124	L2x2x3/16	7.78	3.63	72.9	0.4307	4.75	18.73	0.254 ¹
T7	124 - 120	L2x2x3/16	7.78	3.60	72.3	0.4307	4.80	18.73	0.256 ¹
T8	120 - 115	L2x2x3/16	8.54	4.11	82.1	0.4307	3.91	18.73	0.209 ¹
T9	115 - 110	L2x2x3/16	8.97	4.32	86.2	0.4307	4.06	18.73	0.217 ¹
T10	110 - 105	L2x2x3/16	9.40	4.53	90.5	0.4307	3.89	18.73	0.208 ¹
T11	105 - 100	L2x2x3/16	9.84	4.75	94.7	0.4307	4.45	18.73	0.238 ¹
T12	100 - 93.3333	L2 1/2x2 1/2x3/16	11.26	5.51	86.9	0.5710	4.87	24.84	0.196 ¹
T13	93.3333 - 86.6667	L2 1/2x2 1/2x3/16	11.81	5.79	91.2	0.5710	4.99	24.84	0.201 ¹
T14	86.6667 - 80	L2 1/2x2 1/2x3/16	12.39	6.07	95.6	0.5710	5.04	24.84	0.203 ¹
T15	80 - 73.3333	L2 1/2x2 1/2x1/4	12.97	6.34	100.9	0.7519	5.03	32.71	0.154 ¹
T16	73.3333 - 66.6667	L2 1/2x2 1/2x1/4	13.56	6.64	105.5	0.7519	5.16	32.71	0.158 ¹
T17	66.6667 - 60	L2 1/2x2 1/2x1/4	14.16	6.94	110.2	0.7519	5.33	32.71	0.163 ¹
T18	60 - 40	L3x3x1/4	16.00	7.81	102.4	0.9375	5.66	40.78	0.139 ¹
T19	40 - 20	L3 1/2x3 1/2x1/4	19.24	9.45	105.6	1.1034	6.36	48.00	0.132 ¹
T20	20 - 0	L3 1/2x3 1/2x1/4	21.02	10.34	115.5	1.1034	6.74	48.00	0.140 ¹

¹ P_u / φP_n controls

Secondary Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T13	93.3333 - 86.6667	L2x2x3/16	9.74	4.51	182.9	0.4307	1.84	18.73	0.098 ¹
T14	86.6667 - 80	L2x2x3/16	10.43	4.85	196.2	0.4307	2.01	18.73	0.107 ¹
T17	66.6667 - 60	L2x2x3/16	12.48	5.86	235.4	0.4307	2.51	18.73	0.134 ¹

¹ P_u / φP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T1	168 - 160	L2x2x3/16	6.67	6.19	125.0	0.4307	0.04	18.73	0.002 ¹
T2	160 - 140	L2x2x3/16	6.67	6.19	125.0	0.4307	0.24	18.73	0.013 ¹
T3	140 - 136	L2x2x3/16	6.67	6.19	125.0	0.4307	0.36	18.73	0.019 ¹

¹ P_u / φP_n controls

<i>tnxTower</i> GPD 520 South Main Street Suite 2531 Akron, Ohio 44311 Phone: (330) 572-2222 FAX: (330) 572-3722	Job	CT24369-A ; Union 4, CT	Page	39 of 39
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	Client	SBA	Designed by	TDeak

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
	66.6667						45.6 (b)	
T17	66.6667 - 60	Diagonal	L2 1/2x2 1/2x1/4	195	-5.77	11.85	48.7	Pass
T18	60 - 40	Diagonal	L3x3x1/4	207	-5.71	16.44	34.8	Pass
							50.1 (b)	
T19	40 - 20	Diagonal	L3 1/2x3 1/2x1/4	228	-6.82	18.11	37.7	Pass
							44.3 (b)	
T20	20 - 0	Diagonal	L3 1/2x3 1/2x1/4	243	-7.32	15.13	48.4	Pass
T13	93.3333 - 86.6667	Secondary Horizontal	L2x2x3/16	157	-1.84	11.53	15.9	Pass
T14	86.6667 - 80	Secondary Horizontal	L2x2x3/16	169	-2.01	10.26	19.6	Pass
T17	66.6667 - 60	Secondary Horizontal	L2x2x3/16	199	-2.51	7.55	33.2	Pass
T1	168 - 160	Top Girt	L2x2x3/16	4	-0.08	5.75	1.3	Pass
T2	160 - 140	Top Girt	L2x2x3/16	22	-0.24	5.75	4.1	Pass
T3	140 - 136	Top Girt	L2x2x3/16	58	-0.34	5.75	5.9	Pass

Summary	ELC:	Proposed
Leg (T11)	88.4	Pass
Diagonal (T7)	73.6	Pass
Secondary Horizontal (T17)	33.2	Pass
Top Girt (T3)	5.9	Pass
Bolt Checks	74.0	Pass
Rating =	88.4	Pass

ADDITIONAL CALCULATIONS

BUILT-UP MEMBER ANALYSIS
CT24369-A ; Union 4, CT
2022778.24369.04

Steel Specification	AISC 15th (Teal Book)
Analysis Method	LRFD
ASD	1
Max Capacity	100%
Number of Sections	2

Existing Member														Modification Member										X-X Axis														Built-Up Member														Member Analysis										TNS Input	
Elevation	Pipe	r_x (in)	Area (in ²)	I_x (in ⁴)	r_y (in)	a/r_x	Split Pipe	r_x (in)	Area (in ²)	I_x (in ⁴)	r_y (in)	a/r_x	Connectors	K	L_u (in)	a (in)	h (in)	r_x (in)	$(R_u/r_{allow})_x$	r_y (in)	r_u (in)	ϕ	$(R_u/r_u)_y$	K_y	r_{u1} (in)	$0.75(R_u/r_{allow})_y$	$(a/r_{allow})_y$	R_u/r_{allow}	Design met?	$(R_u/r_u)_x$	K Multiplier	r_x (in)																															
120'-124"	P 2-1/2 STD	50	1.70	1.53	0.947	12.67	P 3 X 5TR	35	1.53	0.37	0.498	24.11	Welds	1	48	12	1.01	0.520	52.18	0.498	0.498	1.03	52.18	1.00	1.283	39.34	24.11	38.01	Yes	52.18	1.0000	35																															
100'-120"	P 3 STD	50	2.23	3.02	1.564	10.31	P 3-1/2 STD	35	1.34	0.46	0.383	20.37	Welds	1	60	12	1.18	1.140	52.64	0.583	0.583	1.03	52.64	1.00	1.442	39.48	20.37	41.60	Yes	52.64	1.0000	35																															

Existing Member														Modification Member														Y-Y Axis													
																												Built-Up Member													
Elevation	Pipe	r_x (in)	Area (in ²)	I_x (in ⁴)	r_y (in)	a/r_y	Split Pipe	r_x (in)	Area (in ²)	I_x (in ⁴)	r_y (in)	a/r_y	Connections	K	L_u (in)	a (in)	h (in)	r_x (in)	$(R_u/r_{allow})_x$	r_y (in)	r_u (in)	ϕ	$(R_u/r_u)_y$	K_y	r_{u1} (in)	$0.75(R_u/r_{allow})_y$	$(a/r_{allow})_y$	R_u/r_{allow}	Design met?	$(R_u/r_u)_x$	K Multiplier	r_x (in)									
120'-124"	P 2-1/2 STD	50	1.70	1.53	0.947	12.67	P 3 X 5TR	35	1.53	1.35	1.136	10.56	Welds	1	48	12	0	1.060	46.34	0.498	0.947	0.00	46.34	0.88	1.428	34.60	24.11	33.60	Yes	46.34	0.881	35									
100'-120"	P 3 STD	50	2.23	3.02	1.564	10.31	P 3-1/2 STD	35	1.34	2.39	1.337	8.98	Welds	1	60	12	0	1.231	48.72	0.583	1.164	0.00	48.72	0.93	1.558	36.54	20.37	38.50	Yes	48.72	0.9256	35									

Summary				
Elevation	Modified Member	Stiffness Only	K	r_x (in)
120'-124"	P 2-1/2 STD w/ Split P 3 X 5TR	No	1.0000	35
100'-120"	P 3 STD w/ Split P 3-1/2 STD	No	1.0000	35

Reinforcement Termination				
Design Force (k)	Weld Type	Weld Size (1/16 in)	$D_{min,max}$ (1/16 in)	Weld L_{min} (in)
46.33	Filler	3	3.00	6
41.30	Filler	3	3.00	5

Capacity Summary					
Compression (k)	Tension (k)	ϕP_n (k) - Buckling	ϕP_n (k) - Choking	ϕP_n (k) - Tension	Controlling
58.92	41.04	88.01	N/A	N/A	Buckling
86.15	71.76	97.54	N/A	N/A	Buckling
Apply TIA-222-H Section 15.5f			No		



Self-Support Anchor Rod Analysis - TIA-222-H-1
CT24369-A ; Union 4, CT
2022778.24369.04

General Info	
Apply TIA-222-H Section 15.5	No
Modified Anchor Rods	No
Leg Eccentricity	No
Overstrength	No
Max Capacity	100%

Tower Reactions		
Compression, P_u =	225.00	kips
Compression Shear, V_u =	23.00	kips
Uplift, P_u =	190.00	kips
Uplift Shear, V_u =	20.00	kips
Number of Tower Legs =	3	
Tower Axial Force =	126.00	kips

Anchor Rods		
Number of Anchor Rods, n =	6	
Anchor Rod Grade =	A354-BC	
Anchor Rod Diameter, d =	1	in
Bolt Circle Diameter, BC =	9	in
Rod Clear Span, l_{ar} =	0	in
Is grout present?	Yes	
Yield Strength, F_y =	109	ksi
Tensile Strength, F_u =	125	ksi
Rod Compression, P_{uc} =	37.50	kips
Rod Shear, V_u =	3.83	kips
Rod Moment, M_u =	0.00	k-in
Rod Tension, P_{ut} =	31.67	kips
Rod Shear, V_u =	3.33	kips
Rod Moment, M_u =	0.00	k-in

Anchor Rod Results		
$\phi_t R_{nt}$ =	56.81	kips
$\phi_c R_{nc}$ =	77.05	kips
$\phi_c R_{nb}$ =	77.05	kips
$\phi_v R_{nv}$ =	36.82	kips
$\phi_c R_{nvc}$ =	34.67	kips
$\phi_t M_n$ =	16.35	k-in
Tension Interaction	31.9%	OK
Compression Interaction	49.9%	OK

Pier and Pad Foundation

Site ID: CT24369-A
 Site Name: Union 4, CT
 Application ID: 207045, v1

TIA-222 Revision: H
 Tower Type: Self Support

Top & Bot. Pad Rein. Different?: ☐
 Block Foundation?: ☐
 Rectangular Pad?: ☐

Superstructure Analysis Reactions		
Compression, P_{comp} :	225	kips
Compression Shear, V_{u_comp} :	23	kips
Uplift, P_{uplift} :	190	kips
Uplift Shear, V_{u_uplift} :	20	kips
Tower Height, H :	168	ft
Base Face Width, BW :	19	ft
BP Dist. Above Fdn, bp_{dist} :	2	in

Pier Properties		
Pier Shape:	Circular	
Pier Diameter, $dpier$:	3	ft
Ext. Above Grade, E :	1	ft
Pier Rebar Size, Sc :	8	
Pier Rebar Quantity, mc :	12	
Pier Tie/Spiral Size, St :	4	
Pier Tie/Spiral Quantity, mt :	11	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier} :	3	in

Pad Properties		
Depth, D :	12	ft
Pad Width, W_1 :	7.25	ft
Pad Thickness, T :	2	ft
Pad Rebar Size (Bottom dir. 2), Sp_2 :	8	
Pad Rebar Quantity (Bottom dir. 2), mp_2 :	10	
Pad Clear Cover, cc_{pad} :	3	in

Material Properties		
Rebar Grade, F_y :	60	ksi
Concrete Compressive Strength, F'_c :	4	ksi
Dry Concrete Density, δc :	150	pcf

Soil Properties		
Total Soil Unit Weight, γ :	125	pcf
Ultimate Net Bearing, Q_{net} :	15.000	ksf
Cohesion, C_u :		ksf
Friction Angle, ϕ :	34	degrees
SPT Blow Count, N_{blows} :		
Base Friction, μ :	0.4	
Neglected Depth, N :	3.50	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, gw :	N/A	ft

Foundation Analysis Checks				
	Capacity	Demand	Rating	Check
<i>Uplift (kips)</i>	224.43	190.00	84.7%	Pass
<i>Lateral (Sliding) (kips)</i>	96.54	20.00	20.7%	Pass
<i>Bearing Pressure (ksf)</i>	12.38	6.21	50.1%	Pass
<i>Pier Flexure (Comp.) (kip*ft)</i>	767.30	253.00	33.0%	Pass
<i>Pier Flexure (Tension) (kip*ft)</i>	411.98	220.00	53.4%	Pass
<i>Pier Compression (kip)</i>	2078.62	239.00	11.5%	Pass
<i>Pad Flexure (kip*ft)</i>	664.74	71.13	10.7%	Pass
<i>Pad Shear - 1-way (kips)</i>	160.94	15.75	9.8%	Pass
<i>Pad Shear - 2-way (Comp) (ksi)</i>	0.190	0.042	22.3%	Pass
<i>Flexural 2-way (Comp) (kip*ft)</i>	1329.48	151.80	11.4%	Pass
<i>Pad Shear - 2-way (Uplift) (ksi)</i>	0.190	0.069	36.3%	Pass
<i>Flexural 2-way (Tension) (kip*ft)</i>	1329.48	132.00	9.9%	Pass

Structural Rating:	53.4%
Soil Rating:	84.7%

<--Toggle between Gross and Net

EXHIBIT 9



EBI Consulting

environmental | engineering | due diligence

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

T-Mobile Existing Facility

Site ID: CT11144C

Union/ I-84 X73-74/Cemet I
1050 Buckley Highway
Union, Connecticut 06076

January 12, 2023

EBI Project Number: 6223000133

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	13.93%



January 12, 2023

T-Mobile

Attn: Jason Overbey, RF Manager

35 Griffin Road South

Bloomfield, Connecticut 06002

Emissions Analysis for Site: CT11144C - Union/ I-84 X73-74/Cemetl

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **1050 Buckley Highway** in **Union, Connecticut** for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

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

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

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

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The general population exposure limits for the 600 MHz and 700 MHz frequency bands are approximately $400 \mu\text{W}/\text{cm}^2$ and $467 \mu\text{W}/\text{cm}^2$, respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 11 GHz frequency bands is $1000 \mu\text{W}/\text{cm}^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.



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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at 1050 Buckley Highway in Union, Connecticut using the equipment information listed below. Modeling of the antennas and associated equipment was completed using RoofMaster™ software, which is a widely-used predictive modeling program that has been developed to predict RF power density values for rooftop and tower telecommunications sites produced by vertical collinear antennas that are typically used in the cellular, PCS, paging and other communications services. Using the computational methods set forth in Federal Communications (FCC) Office of Engineering & Technology (OET) Bulletin 65, "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields" (OET-65), RoofMaster™ calculates predicted power density in a scalable grid based on the contributions of all RF sources characterized in the study scenario. At each grid location, the cumulative power density is expressed as a percentage of the FCC limits. Manufacturer antenna pattern data is utilized in these calculations. RoofMaster™ models consist of the Far Field model as specified in OET-65 and an implementation of the OET-65 Cylindrical Model (Sula9). The models utilize several operational specifications for different types of antennas to produce a plot of spatially-averaged power densities that can be expressed as a percentage of the applicable exposure limit.

Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was focused at the base of the tower. For this report, the sample point is the top of a 6-foot person standing at the base of the tower.

For all calculations, telecommunications equipment was modeled using the following assumptions:

- 1) 1 LTE channel (600 MHz Band) was considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.
- 2) 1 LTE channel (700 MHz Band) was considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.
- 3) 1 GSM channel (PCS Band - 1900 MHz) was considered for each sector of the proposed installation. These Channels have a transmit power of 10 Watts per Channel.
- 4) 1 LTE channel (PCS Band - 1900 MHz) was considered for each sector of the proposed installation. These Channels have a transmit power of 120/160 Watts per Channel.
- 5) 1 LTE channel (AWS Band – 2100 MHz) was considered for each sector of the proposed installation. These Channels have a transmit power of 120/160 Watts per Channel.
- 6) 1 microwave backhaul channel (11 GHz) was considered for the proposed facility. This channel has a transmit power of 0.631 Watt².
- 7) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
- 8) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 9) The antennas used in this modeling are the RFS APX16DWV-16DWVS-E-A20 02DT 1900 for the 1900 MHz / 1900 MHz channel(s), the RFS APXVAALL24_43-U-NA20 02DT 600 for the 600 MHz / 700 MHz / 2100 MHz channel(s) in Sector A, the COMMScope VHLP2-11 11000 for the 11000 MHz channel(s), the RFS APX16DWV-16DWVS-E-A20 02DT 1900 for the 1900 MHz / 1900 MHz channel(s), the RFS APXVAALL24_43-U-NA20 02DT 600 for the 600 MHz / 700 MHz / 2100 MHz channel(s) in Sector B, the RFS APX16DWV-16DWVS-E-A20 02DT 1900 for the 1900 MHz / 1900 MHz channel(s), the RFS APXVAALL24_43-U-NA20 02DT 600 for the 600 MHz / 700 MHz / 2100 MHz channel(s) in Sector C. Modeling



also included calculations for the proposed 11 GHz microwave backhaul antenna. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

- I0) The antenna mounting height centerline of the proposed antennas (both microwave and panel antennas) is 140 feet above ground level (AGL).
- I1) Emissions values for additional carriers were calculated in Far Field utilizing the antenna models provided in the structural analysis.
- I2) All calculations were done with respect to uncontrolled / general population threshold limits.



T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	RFS APX16DWV-16DWVS-E-A20 02DT 1900	Make / Model:	COMMScope VHLP2-11 11000	Make / Model:	RFS APX16DWV-16DWVS-E-A20 02DT 1900
Frequency Bands:	1900 MHz / 1900 MHz	Frequency Bands:	11000 MHz	Frequency Bands:	1900 MHz / 1900 MHz
Gain:	16.25 dBd / 16.25 dBd	Gain:	32.35 dBd	Gain:	16.25 dBd / 16.25 dBd
Height (AGL):	140 feet	Height (AGL):	140 feet	Height (AGL):	140 feet
Channel Count:	2	Channel Count:	1	Channel Count:	2
Total TX Power (W):	130.00 Watts	Total TX Power (W):	0.63 Watts	Total TX Power (W):	130.00 Watts
ERP (W):	2,769.77	ERP (W):	1,083.93	ERP (W):	2,769.77
Antenna A1 MPE %:	0.55%	Antenna B1 MPE %:	0.22%	Antenna C1 MPE %:	0.55%
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	RFS APXVAALL24_43-U-NA20 02DT 600	Make / Model:	RFS APX16DWV-16DWVS-E-A20 02DT 1900	Make / Model:	RFS APXVAALL24_43-U-NA20 02DT 600
Frequency Bands:	600 MHz / 700 MHz / 2100 MHz	Frequency Bands:	1900 MHz / 1900 MHz	Frequency Bands:	600 MHz / 700 MHz / 2100 MHz
Gain:	12.95 dBd / 13.65 dBd / 16.45 dBd	Gain:	16.25 dBd / 16.25 dBd	Gain:	12.95 dBd / 13.65 dBd / 16.45 dBd
Height (AGL):	140 feet	Height (AGL):	140 feet	Height (AGL):	140 feet
Channel Count:	3	Channel Count:	2	Channel Count:	3
Total TX Power (W):	200.00 Watts	Total TX Power (W):	130.00 Watts	Total TX Power (W):	200.00 Watts
ERP (W):	6,093.58	ERP (W):	2,769.77	ERP (W):	6,093.58
Antenna A2 MPE %:	1.61%	Antenna B2 MPE %:	0.55%	Antenna C2 MPE %:	1.61%
Antenna #:	3	Antenna #:	3	Antenna #:	3
Make / Model:	N/A	Make / Model:	RFS APXVAALL24_43-U-NA20 02DT 600	Make / Model:	N/A
Frequency Bands:		Frequency Bands:	600 MHz / 700 MHz / 2100 MHz	Frequency Bands:	
Gain:		Gain:	12.95 dBd / 13.65 dBd / 16.45 dBd	Gain:	
Height (AGL):		Height (AGL):	140 feet	Height (AGL):	
Channel Count:		Channel Count:	3	Channel Count:	
Total TX Power (W):		Total TX Power (W):	200.00 Watts	Total TX Power (W):	
ERP (W):		ERP (W):	6,093.58	ERP (W):	
Antenna A3 MPE %:		Antenna B3 MPE %:	1.61%	Antenna C3 MPE %:	



Site Composite MPE %	
Carrier	MPE %
T-Mobile (Combined Sectors):	0.05%
Tolland County Mutual Aid	0.44%
Verizon	11.99%
Sprint	0.13%
AT&T	0.54%
Dish	0.78%
Site Total MPE % :	13.93%

T-Mobile MPE % Per Sector	
T-Mobile Sector A Total:	0.03%
T-Mobile Sector B Total:	0.05%
T-Mobile Sector C Total:	0.03%
T-Mobile Total MPE % :	0.05%

T-Mobile Maximum MPE Power Values (Sector B)

T-Mobile Frequency Band / Technology (Sector B)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu\text{W}/\text{cm}^2$)	Frequency (MHz)	Allowable MPE ($\mu\text{W}/\text{cm}^2$)	Calculated % MPE
T-Mobile 11000 MHz MW	1	1083.926914	140	2.170235907	11000 MHz MW	1000.0	0.22%
T-Mobile 1900 MHz GSM	1	213.0590568	140	0.42658634	1900 MHz GSM	1000.0	0.04%
T-Mobile 1900 MHz LTE	1	2556.708681	140	5.119036083	1900 MHz LTE	1000.0	0.51%
T-Mobile 600 MHz LTE	1	689.5408364	140	1.380597034	600 MHz LTE	400.0	0.35%
T-Mobile 700 MHz LTE	1	810.1398427	140	1.62206008	700 MHz LTE	467.0	0.35%
T-Mobile 2100 MHz LTE	1	4593.89692	140	9.197889563	2100 MHz LTE	1000.0	0.92%
						T-Mobile Total:	0.05%

- NOTE: Total T-Mobile MPE values reflect all T-Mobile antennas as reported by RoofMaster™ combined modeling.
- NOTE: Totals may vary by approximately 0.01% due to summation of remainders in calculations.



Summary

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

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

T-Mobile Sector	Power Density Value (%)
Sector A:	0.03%
Sector B:	0.05%
Sector C:	0.03%
T-Mobile Maximum MPE % (Sector B):	0.05%
T-Mobile Combined Sectors MPE %:	0.05%
Site Total:	13.93%
Site Compliance Status:	COMPLIANT

The anticipated composite MPE value for this site assuming all carriers present is **13.93%** 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 or documents available on the Connecticut Siting Council website.

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.