4545 East River Road, Suite 320
West Henrietta, NY 14586

January 3rd, 2020

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

RE: **Notice of Exempt Modification for Verizon**
Crown Castle Site ID#: 803175
167 Coccomo CIR, New Britain, CT 06051
Lat: 41° -41' 11.80"/ Long: -72° -45' 27.80"

Dear Ms. Bachman:

Verizon currently maintains twelve (12) total antennas at the 145-foot mount on the existing 188-foot monopole tower, located at 167 Coccomo Circle in New Britain. Crown Castle owns both the tower and the property. Verizon now intends to replace three (3) existing antennas with three (3) new antennas.

Tower modifications:

- Remove three (3) 700 LTE antennas
- Add three (3) CBRS antennas
- Add three (3) CBRS RRHs

Ground modifications:

- None

Melanie A. Bachman

This facility was approved by the City of New Britain on May 30th, 2002. This approval was given without conditions.

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.S.C.A. § 16-50j-73, a copy of this letter is being sent to Honorable Erin E. Stewart, Mayor, City of New Britain, as well as Mr. Steven P. Schiller, City Planner for the City of New Britain.

Additionally:

1. The proposed modifications will not result in an increase in the height of the existing tower.
2. The proposed modifications will not require the extension of the site boundary.
3. The proposed modification 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 Communication Commission safety standard.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The existing structure and its foundation can support the proposed loading.

For the foregoing reasons, Verizon respectfully submits that the proposed modifications to the above-reference telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2). Please send approval/rejection letter to my attention at the address listed below.

Sincerely,

Richard Zajac
Network Real Estate Specialist
4545 East River Road, Suite 320
Rochester, NY 14586
585-445-5896
richard.zajac@crowncastle.com

Melanie A. Bachman

cc:

The Honorable Erin E. Stewart, Mayor
City of New Britain
27 West Main Street
New Britain, CT 06051
860.826.3300

Steven P. Schiller, City Planner
Planning and Zoning Dept.
City of New Britain
27 West Main Street
New Britain, CT 06051
860.826.3432

ORIGIN ID:ONHA (585) 445-5896
RICHARD ZAJAC
CROWN CASTLE
4545 EAST RIVER ROAD
SUITE 320
WEST HENRIETTA, NY 14568
UNITED STATES US

SHIP DATE: 03JAN20
ACTWGT: 1.00 LB
CAD: 104924194/INET4160

BILL SENDER

TO **THE HONORABLE ERIN STEWART, MAYOR**
CITY OF NEW BRITAIN
27 WEST MAIN STREET

NEW BRITAIN CT 06051
(860) 826-3300 REF: 1765.6680
INV:
PO: DEPT:

567J2/18DD/05A2

FedEx Express

J192119091901uv

TRK# 0201 **7773 8660 4462**

MON - 06 JAN 3:00P
STANDARD OVERNIGHT

DSR
06051
BDL
CT-US

XE BDLA

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

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

ORIGIN ID:ONHA (585) 445-5896
RICHARD ZAJAC
CROWN CASTLE
4545 EAST RIVER ROAD
SUITE 320
WEST HENRIETTA, NY 14568
UNITED STATES US

SHIP DATE: 03JAN20
ACTWGT: 1.00 LB
CAD: 104924194/INET4160

BILL SENDER

TO **STEVEN SCHILLER, CITY PLANNER**
CITY OF NEW BRITAIN
27 WEST MAIN STREET
PLANNING AND ZONING DEPT
NEW BRITAIN CT 06051
(860) 826-3432 REF: 1734.7680
INV:
PO: DEPT:

567J2/18DD/05A2

FedEx Express

J192119091901uv

TRK# 0201 **7773 8662 7680**

MON - 06 JAN 3:00P
STANDARD OVERNIGHT

DSR
06051

XE BDLA CT-US **BDL**

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

Exhibit A

Original Facility Approval

B

City of New Britain
Building Department

Date Issued 5/30/02

BUILDING PERMIT — CERTIFICATE OF OCCUPANCY

1/9/01
Date 5/17/01

Permit No. B1779 & B2093

Applicant Crown Castle Atlantic, LLC Address 703 Hebron Ave, Glastonbury, CT

Permit To _____ (____) Story _____ No. of Dwelling Units _____
(Type of Improvement) (No.) (Proposed Use)

At (Location) 167 LESTER STREET Zoning District I2
(No.) (Street)

Subdivision _____ Lot _____ Block _____ Lot Size _____

Building is to be _____ Ft. wide by _____ Ft. long by _____ Ft. in height and shall conform in construction

To Type _____ Use Group _____ Basement Walls or Foundation _____
(Type)

Remarks: 190' telecommunication tower per plan and 1999 State Building Code, B1779.
Area or Volume Install 12'x30' panelized land site steel frame shelter, 40 KW Diesel generator and 12 panel antennas approved by Siting Council 4/27/01, B2093.
(Cubic/Square Feet)

Owner John & Helen Balavender
30 Biltmore St. NB, CT
Address _____

_____
(Building Inspector)

To be posted on premises — See reverse side for conditions of certificate.

Exhibit B

Property Card

167 COCCOMO CIR

Location	167 COCCOMO CIR	**Mblu**	A5D/ 22/ / /
Acct#	15950167	**Owner**	CROWN ATLANTIC COMPANY LLC
Assessment	$58,380	**Appraisal**	$83,400
PID	10590	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$47,400	$36,000	$83,400
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$33,180	$25,200	$58,380

Owner of Record

Owner	CROWN ATLANTIC COMPANY LLC	**Sale Price**	$90,000
Co-Owner		**Certificate**	
Address	4017 WASHINGTON RD PMB 353 MCMURRAY, PA 15317	**Book & Page**	1359/0428
		Sale Date	02/13/2001

Ownership History

Ownership History				
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Sale Date**
CROWN ATLANTIC COMPANY LLC	$90,000		1359/0428	02/13/2001
BALAVENDER JOHN S +	$44,000		1284/0180	08/26/1998
	$0		1281/0173	07/15/1998
	$0		0770/0808	10/29/1981
CLARA MARY DOUCETTE	$0		0725/0121	03/02/1977

Building Information

Building 1 : Section 1

Year Built:	1918
Living Area:	624
Replacement Cost:	$105,398

Building Percent Good: 45

Replacement Cost Less Depreciation: $47,400

Building Attributes	
Field	**Description**
Style	Conventional
Model	Residential
Grade	C
Stories	1 1/4 Stories
Occupancy	1
Exterior Wall 1	Aluminum Sidin
Exterior Wall 2	
Roof Structure	Gable
Roof Cover	Asphalt Shingl
Interior Wall 1	Plaster
Interior Wall 2	
Interior Flr 1	Carpet
Interior Flr 2	
Central Heat Sys	Yes
Heat Type	99
AC Type	None
Total Bedrooms	2 Bedrooms
Total Full Baths	1
Total Half Baths	0
Total Xtra Fixtrs	0
Total Rooms	4
Bath Style	Average
Kitchen Style	Average
Num Kitchens	
Whirlpool Tub	
Fireplaces	
Usrfld 104	
Rec Room Finish	
Rec Room Qual	
Usrfld 107	
Bsmt Garages	
Fireplaces	
Usrfld 108	
Usrfld 101	
Usrfld 102	
Bldg Nbhd	104A

Building Photo

(http://images.vgsi.com/photos/NewBritainCTPhotos//\00\02\86\

Building Layout

(http://images.vgsi.com/photos/NewBritainCTPhotos//Sketches/1

Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
BAS	First Floor	624	624
EAU	Attic, Expansion, Unfinished	624	0
FEP	Enclosed Porch	66	0
FOP	Open Porch	50	0
URB	Unfin Raised Basement	624	0
		1,988	624

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code	1010
Description	Single Family
Zone	I2
Neighborhood	104
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	0.32
Depth	
Assessed Value	$25,200
Appraised Value	$36,000

Outbuildings

Outbuildings	Legend
No Data for Outbuildings	

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2018	$47,400	$36,000	$83,400
2017	$47,400	$36,000	$83,400
2016	$39,900	$32,800	$72,700

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2018	$33,180	$25,200	$58,380
2017	$33,180	$25,200	$58,380
2016	$27,930	$22,960	$50,890

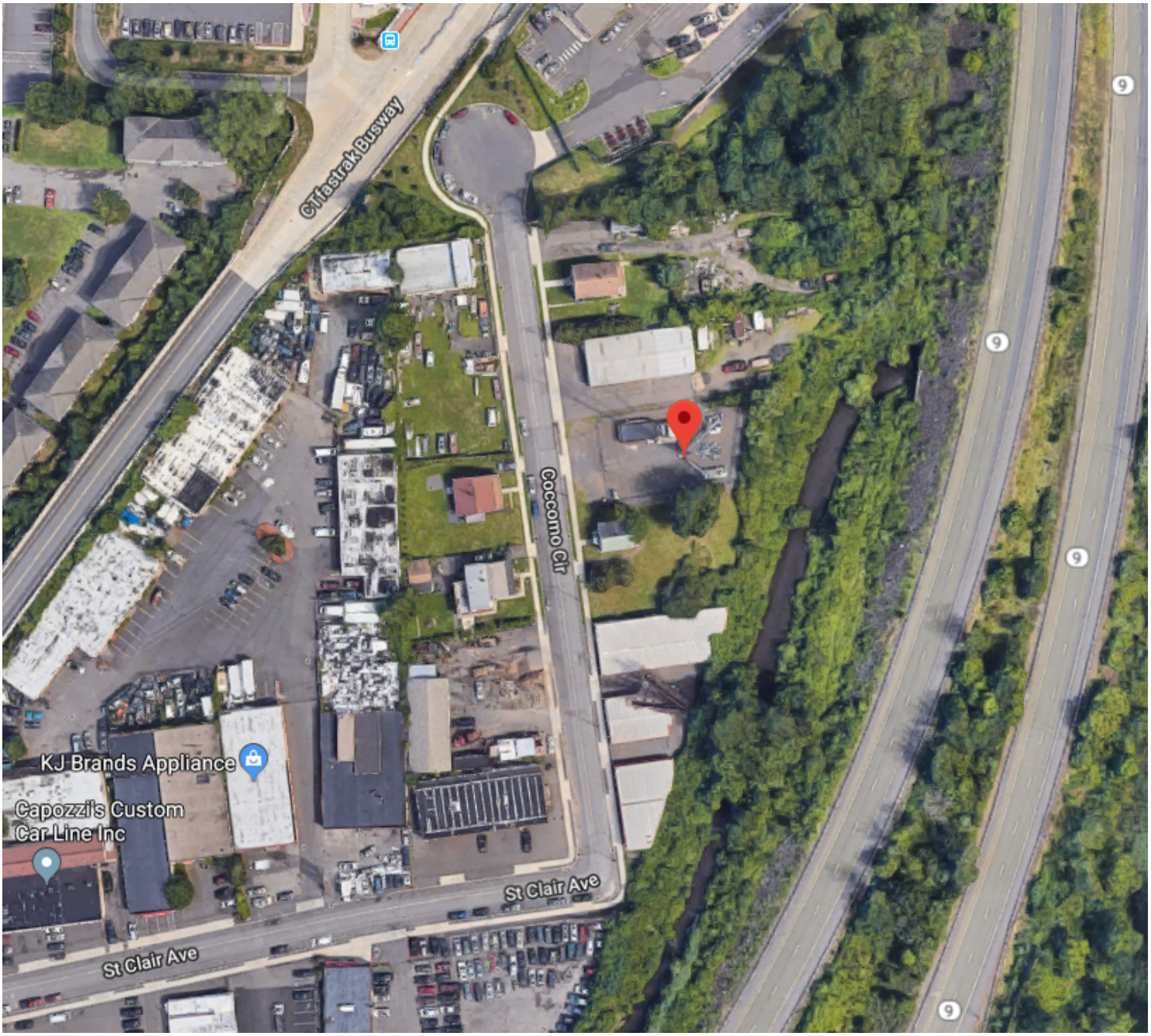

CTfastrak Busway
Coccomo Cir
KJ Brands Appliance
Capozzi's Custom Car Line Inc
St Clair Ave
St Clair Ave
9
9
9
9

Exhibit C

Construction Drawings

verizon

NEW BRITAIN 3 CT
167 COCCOMO [LESTER ST]
NEW BRITAIN, CT 06051

PROJECT SUMMARY

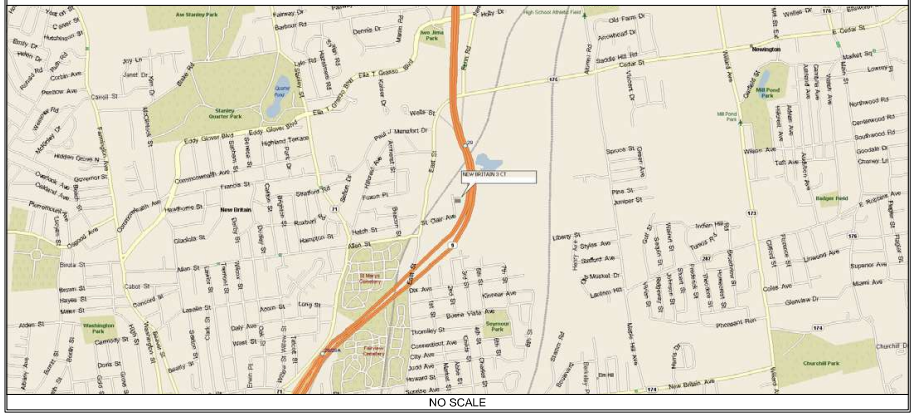
SITE NAME:	NEW BRITAIN 3 CT
SITE ADDRESS:	167 COCCOMO [LESTER ST] NEW BRITAIN, CT 06051
TOWER OWNER:	CROWN CASTLE 2000 CORPORATE DR CANONSBURG, PA 15317
BU NUMBER:	803175
MAP NUMBER:	A5D
LOT NUMBER:	23
CUSTOMER/APPLICANT:	VERIZON WIRELESS 400 FRIEBERG PARKWAY WESTBOROUGH, MA 01581
CONTACT:	DAN MYZYRI (617) 945-7288
NAD83	
LATITUDE:	41° 41' 11.80" N
LONGITUDE:	72° 45' 27.80" W
ELEVATION:	90'
CURRENT ZONING:	I2
A&E FIRM:	B+T GROUP 1717 S. BOULDER, SUITE 300 TULSA, OK 74119 STEVE THORNHILL (918) 587-4630
OCCUPANCY TYPE:	UNMANNED
A.D.A. COMPLIANCE:	FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION.

CODE COMPLIANCE

ALL WORK SHALL BE PERFORMED AND MATERIALS INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES:

CODE TYPE	CODE
BUILDING	2018 CT SBC
STRUCTURAL	2018 CT SBC
MECHANICAL	2018 CT SBC
ELECTRICAL	NEC 2017

LOCATION MAP



NO SCALE

DRIVING DIRECTIONS

DEPART FROM BRADLEY INTERNATIONAL ON TERMINAL RD. ROAD NAME CHANGES TO BRADLEY FIELD CONNECTOR. ROAD NAME CHANGES TO CT-20 [BRADLEY FIELD CONNECTOR]. TAKE RAMP ONTO I-91 [RICHARD P HORAN MEMORIAL HWY]. AT EXIT 28, TAKE RAMP ONTO US-5 [CT-15]. KEEP STRAIGHT ONTO RAMP. ROAD NAME CHANGES TO US-5 [CT-15]. KEEP RIGHT ONTO RAMP. TURN LEFT ONTO CT-175 [E CEDAR ST]. KEEP STRAIGHT ONTO CT-175 [CEDAR ST]. KEEP STRAIGHT ONTO CT-175 [EAST ST]. TURN LEFT ONTO ST CLAIR AVE [SAINT CLAIRE AVE]. ROAD NAME CHANGES TO LESTER ST. TURN RIGHT ONTO ACCESS ROAD AND ARRIVE AT NEW BRITAIN 3 CT.

DRAWING INDEX

SHEET #	SHEET DESCRIPTION	REV. #
T-1	TITLE SHEET	1
A-1	COMPOUND PLAN AND TOWER ELEVATION	1
A-2	EQUIPMENT DETAILS	1

A/E DOCUMENT REVIEW STATUS

TITLE	SIGNATURE	DATE
OWNER:		
R.F. ENGINEER:		
CONSTRUCTION MGR.:		
LEASING & ZONING:		
VERIZON WIRELESS:		

THE FOLLOWING PARTIES HEREBY APPROVE AND ACCEPT THESE DOCUMENTS AND AUTHORIZE THE CONTRACTOR TO PROCEED WITH THE CONSTRUCTION DESCRIBED HEREIN. ALL DOCUMENTS ARE SUBJECT TO REVIEW BY THE LOCAL BUILDING DEPARTMENT AND MAY IMPOSE CHANGES OR MODIFICATIONS.

DO NOT SCALE DRAWINGS

ALL DRAWINGS CONTAINED HEREIN ARE FORMATTED FOR 11x17. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

CALL CONNECTICUT ONE CALL
(800) 922-4455
CALL 3 WORKING DAYS
BEFORE YOU DIG!

811

B+T GRP

verizon
400 FRIBERG PARKWAY
WESTBOROUGH, MA 01581
PH: (508) 330-3300

NEW BRITAIN 3 CT
167 COCCOMO [LESTER ST]
NEW BRITAIN, CT 06051
EXISTING MONOPOLE

PROJECT NO:	85519.003.01
CHECKED BY:	RMC

ISSUED FOR:

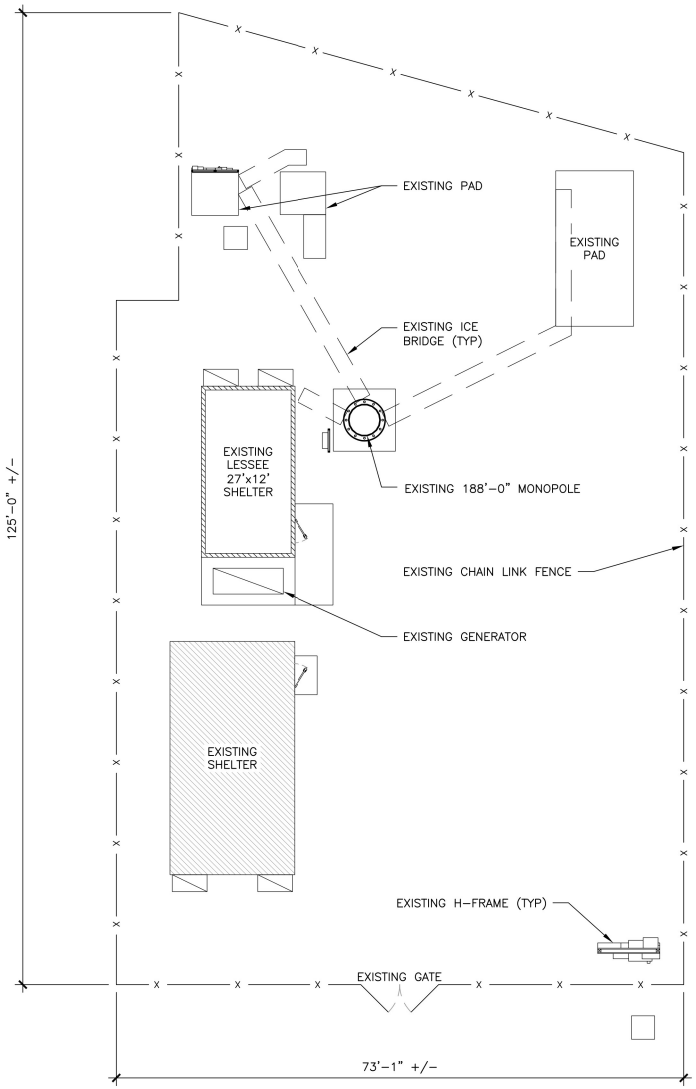
REV	DATE	DRWN	DESCRIPTION
0	11/4/19	STH	CONSTRUCTION
1	11/19/19	STH	ADDRESS UPDATE

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/20

STATE OF CONNECTICUT
31627
LICENSED
PROFESSIONAL ENGINEER

11/19/19

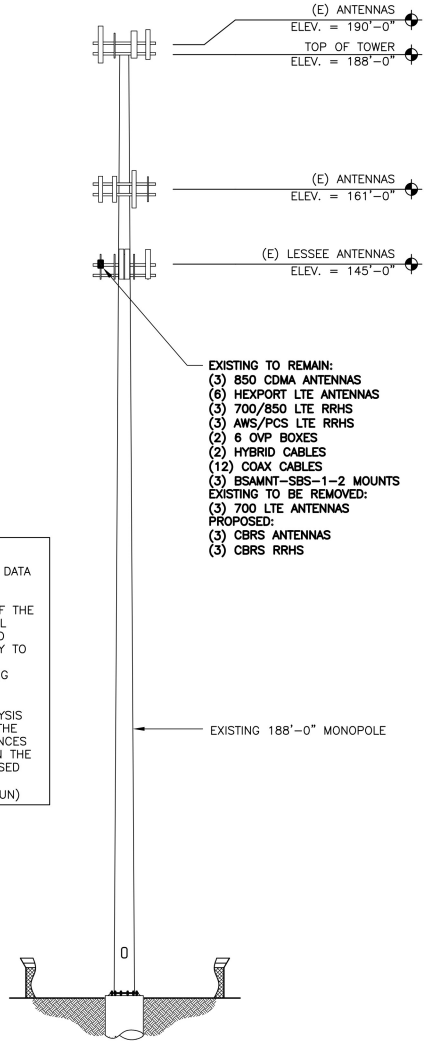
SHEET NUMBER:	REVISION:
T-1	1



1 COMPOUND PLAN
SCALE: 0' 8' 16' 32' 48'

N

NOTES:
1. CONTRACTOR TO VERIFY EXACT COAX AND ANTENNA INSTALLATION AND ANTENNA HEIGHT WITH LATEST RF DATA SHEETS PRIOR TO INSTALLATION.
2. STRUCTURAL ANALYSIS DONE BY OTHERS.
3. VERIZON SHALL PROVIDE A STRUCTURAL ANALYSIS OF THE TOWER PREPARED BY A LICENSED STATE STRUCTURAL ENGINEER CERTIFYING THAT THE EXISTING TOWER AND PROPOSED IMPROVEMENTS HAVE SUFFICIENT CAPACITY TO SUPPORT ALL NEW WORK THAT WILL BE DONE IN COMPLIANCE WITH THE CURRENT EDITION OF BUILDING CODES AND EIA/TIA CRITERIA. THE CONTRACTOR IS RESPONSIBLE TO CONFIRM THAT ANY AND ALL IMPROVEMENTS REQUIRED BY THE STRUCTURAL ANALYSIS CERTIFICATION ARE PROPERLY INSTALLED PRIOR TO THE ADDITION OF ANTENNAS, SUPPORTS AND APPURTENANCES PROPOSED ON THESE DRAWING OTHERWISE NOTED IN THE STRUCTURAL ANALYSIS.CAP AND WEATHERPROFF UNUSED ANTENNA PORTS.
4. ESTIMATED HYBRIFLEX CABLE LENGTH: 195' (EACH RUN)



2 FINAL TOWER ELEVATION
SCALE: 0' 4' 8' 16' 32'

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verizon

400 FRIBERG PARKWAY
WESTBOROUGH, MA 01581
PH: (508) 330-3300

NEW BRITAIN 3 CT

167 COCCOMO [LESTER ST]
NEW BRITAIN, CT 06051

EXISTING MONOPOLE

PROJECT NO:	85519.003.01
CHECKED BY:	RMC

ISSUED FOR:

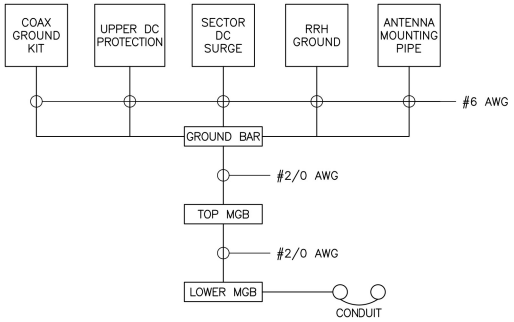
REV	DATE	DRWN	DESCRIPTION
0	11/4/19	STH	CONSTRUCTION
1	11/19/19	STH	ADDRESS UPDATE

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/20

11/19/19

SHEET NUMBER:	REVISION:
A-1	1

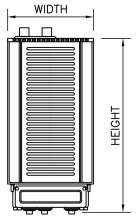
NOTE:
1. INSTALL ALL EQUIPMENT, MOUNTING BRACKETS AND HARDWARE ACCORDING WITH MANUFACTURE'S RECOMMENDATIONS.
2. GROUND DISTRIBUTION BOXES, MOUNTING PIPES AND RRHs IN ACCORDANCE WITH MANUFACTURE'S RECOMMENDATIONS.
3. INSTALLED EQUIPMENT AND MOUNTING BRACKETS SHALL NOT INTERFERE WITH CLIMBING ACCESS NOR ANT INSTALLED SAFETY DEVICES.
4. EQUIPMENT TO BE INSTALLED AT VERIZON'S RAD. CENTER IN ACCORDANCE WITH TOWER STRUCTURAL ANALYSIS (ANALYSIS BY OTHERS).



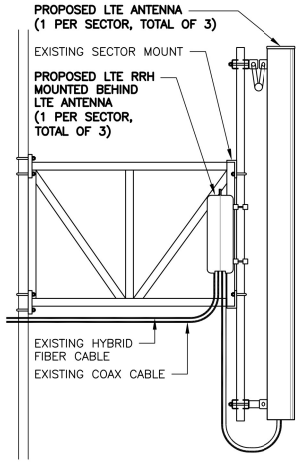
NOTE:
1. BOND ANTENNA GROUNDING KIT CABLES TO TOP CIBE.
2. BOND ANTENNA GROUNDING KIT CABLE TO BOTTOM CIBE.
3. TYPICAL FOR ALL SECTORS.

1 GROUNDING SCHEMATIC DIAGRAM
SCALE: N.T.S.

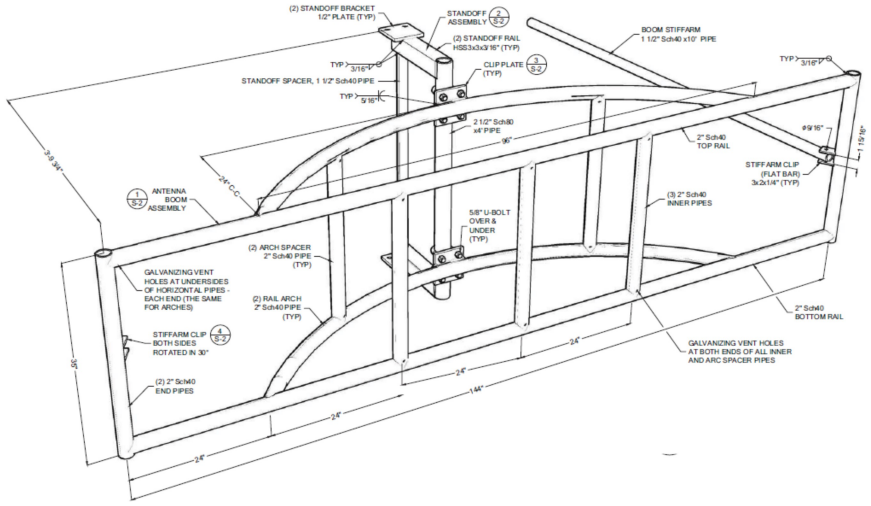
REMOTE RADIO HEAD DIMENSIONS (INCHES)				
MODEL	HEIGHT	WIDTH	DEPTH	WEIGHT
RT4401-48A (CBRS)	12.1"	8.5"	4.1"	18.6 LBS



2 RRH SPECIFICATIONS
SCALE: N.T.S.



3 ANTENNA MOUNTING DETAIL
SCALE: N.T.S.



5 SECTOR MOUNT DETAIL
SCALE: N.T.S.

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verizon

400 FRIBERG PARKWAY
WESTBOROUGH, MA 01581
PH: (508) 330-3300

NEW BRITAIN 3 CT

167 COCCOMO [LESTER ST]
NEW BRITAIN, CT 06051

EXISTING MONOPOLE

PROJECT NO:	85519.003.01
CHECKED BY:	RMC

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION
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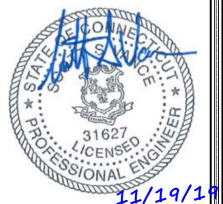
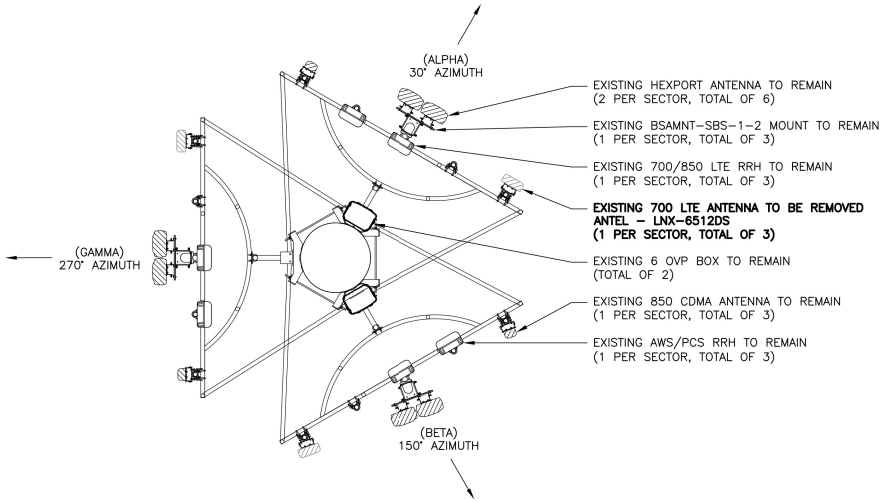
Expires 2/10/20

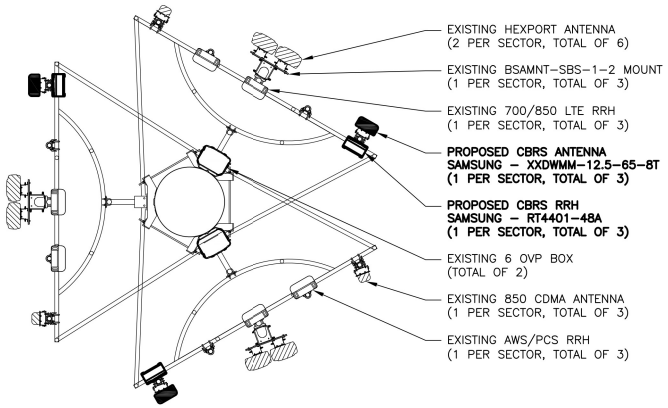


SHEET NUMBER:	REVISION:
A-2	1



1 EXISTING ANTENNA ORIENTATION
SCALE: N.T.S.

N



2 PROPOSED ANTENNA ORIENTATION
SCALE: N.T.S.

N

B+T GRP

verizon

400 FRIBERG PARKWAY
WESTBOROUGH, MA 01581
PH: (508) 330-3300

NEW BRITAIN 3 CT

167 COCCOMO [LESTER ST]
NEW BRITAIN, CT 06051

EXISTING MONOPOLE

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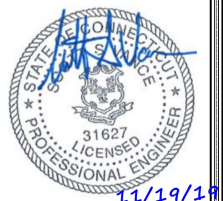


SHEET NUMBER:	REVISION:
A-3	1

Exhibit D

Structural Analysis Report

Date: **October 31, 2019**

Amanda D. Brown
Crown Castle
3530 Toringdon Way
Charlotte, NC 28277

Tower Engineering Professionals
326 Tryon Road
Raleigh, NC 27603
(919) 661-6351

Subject: **Structural Analysis Report**

Carrier Designation:	***Verizon Wireless* Co-Locate**	
	Carrier Site Number:	NG34002
	Carrier Site Name:	New Britain 3 CT
Crown Castle Designation:	**Crown Castle BU Number:**	803175
	Crown Castle Site Name:	CT New Britain 3 CAC 803175
	Crown Castle JDE Job Number:	592793
	Crown Castle Work Order Number:	1803366
	Crown Castle Order Number:	506855 Rev. 0
Engineering Firm Designation:	**TEP Project Number:**	25666.318391
Site Data:	**167 Coccomo, New Britain, Hartford County, CT 06051**	
	Latitude *41° 41' 11.80"*, Longitude *-72° 45' 27.80"*	
	188 Foot - Monopole Tower	

Dear Amanda D. Brown,

Tower Engineering Professionals is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above-mentioned tower.

The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC7: Proposed Equipment Configuration **Sufficient Capacity**

Structure Capacity	Foundation Capacity
79.7%	83.5%

This analysis utilizes an ultimate 3-second gust wind speed of 125 mph as required by the 2018 Connecticut Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Structural analysis prepared by: Evan Bosshart, EIT / JLW

Respectfully submitted by:

Aaron T. Rucker, P.E.

Electronic Copy

10/31/2019

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 188-ft monopole tower designed by Paul J. Ford and Company. All information provided to TEP was assumed to be accurate and complete.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	125 mph
Exposure Category:	C
Topographic Factor:	1.0
Ice Thickness:	2.0 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
146.0	149.0	3	Amphenol	BXA-80063-6BF-EDIN-4 w/ Mount Pipe	14	1-5/8
		6	Andrew	SBNHH-1D65B w/ Mount Pipe		
		3	Samsung Telecommunications	CBRS w/ Mount Pipe		
		3	Samsung Telecommunications	20W CBRS		
		3	Samsung Telecommunications	RFV01U-D1A		
		3	Samsung Telecommunications	RFV01U-D2A		
		3	Amor Tower Engineering	12-ft Arch Frame Mount		
	145.0	2	Raycap	RHSDC-3315-PF-48		

Table 2 - Other Considered Equipment

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
188.0	190.0	3	Kathrein	800 10121 w/ Mount Pipe	6 6 2	1-5/8 3/4 3/8
		1	CCI Antennas	OPA-65R-LCUU-H4 w/ Mount Pipe		
		2	CCI Antennas	OPA-65R-LCUU-H6 w/ Mount Pipe		
		1	Quintel Technology	QS46512-2 w/ Mount Pipe		
		2	Quintel Technology	QS66512-2 w/ Mount Pipe		
		3	Ericsson	RRUS 12		
		3	Ericsson	RRUS 32 B2		
		3	Ericsson	RRUS 32 B30		
		3	Ericsson	RRUS 32 B66		
		3	Ericsson	RRUS-11		
		6	Kathrein	860 10025		
		6	Powerwave Technologies	LGP21401		
		1	Raycap	DC6-48-60-0-8F		
		2	Raycap	DC6-48-60-18-8F		
	188.0	1	Tower Mounts	Platform Mount [LP 1201-1_KCKR-HR-1]		
161.0	161.0	3	Ericsson	AIR -32 B2A/B66AA w/ Mount Pipe	10	1-5/8
		3	Ericsson	AIR 3246 B66 w/ 8-ft Mount Pipe		
		3	Ericsson	AIR 6454 B41 w/ Mount Pipe		
		3	RFS Celwave	APXVAARR24_43-U-NA20 w/ Mount Pipe		
		3	Ericsson	RADIO 4449 B12/B71		
		3	Ericsson	RRUS 4415 B25		
		1	Tower Mounts	Platform Mount [LP 601-1]		
133.0	133.0	1	Tower Mounts	Side Arm Mount [SO 701-3]	-	-

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
Geotechnical Report	Clough, Harbour & Associates LLP	679661	CCISites
Tower Foundation Drawings	Paul J. Ford and Company	679660	CCISites
Foundation Mapping Report	Tower Engineering Professionals	679660	CCISites
Tower Manufacturer Drawings	Paul J. Ford and Company	679659	CCISites

3.1) Analysis Method

tnxTower (version 8.0.5.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1) The tower and foundation were built and maintained in accordance with the manufacturer's specification.
2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2, and the referenced drawings.
3) All tower components are in sufficient condition to carry their full design capacity.
4) Serviceability with respect to antenna twist, tilt, roll, or lateral translation, is not checked and is left to the carrier or tower owner to ensure conformance.
5) All antenna mounts and mounting hardware are structurally sufficient to carry the full design capacity requirements of appurtenance wind area and weight as provided by the original manufacturer specifications. It is the carrier's responsibility to ensure compliance to the structural limitations of the existing and/or proposed antenna mounts. TEP did not perform a site visit to verify the size, condition or capacity of the antenna mounts and did not analyze antennas supporting mounts as part of this structural analysis report.
6) When applicable, the effective projected area (EPA) of appurtenances was determined by computation fluid dynamics (CFD) testing performed by Crown Castle. TEP assumes the means and methods used to determine the EPA's yields results that follow the intent of TIA-222-H and are accurate and complete.

This analysis may be affected if any assumptions are not valid or have been made in error. Tower Engineering Professionals should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	ϕP_{allow} (K)	% Capacity	Pass / Fail
L1	188 - 137	Pole	TP32.711x22x0.25	1	-14.72	1538.67	57.6	Pass
L2	137 - 90.25	Pole	TP42.03x31.3184x0.3125	2	-24.72	2474.49	79.7	Pass
L3	90.25 - 44.5	Pole	TP51.014x40.3023x0.375	3	-38.27	3602.47	79.6	Pass
L4	44.5 - 0	Pole	TP59.61x48.8988x0.5	4	-61.10	5762.13	63.3	Pass
							Summary	
						Pole (L2)	79.7	Pass
						RATING =	**79.7**	**Pass**

Table 5 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1,2	Anchor Rods	-	74.1	Pass
1,2	Base Plate	-	67.9	Pass
1,2	Base Foundation Soil Interaction	-	83.5	Pass
1,2	Base Foundation Structural	-	51.9	Pass

Structure Rating (max from all components) =	83.5%

Notes:
1) See additional documentation in "Appendix C - Additional Calculations" for calculations supporting the % capacity listed.
2) Rating per TIA-222-H Section 15.5

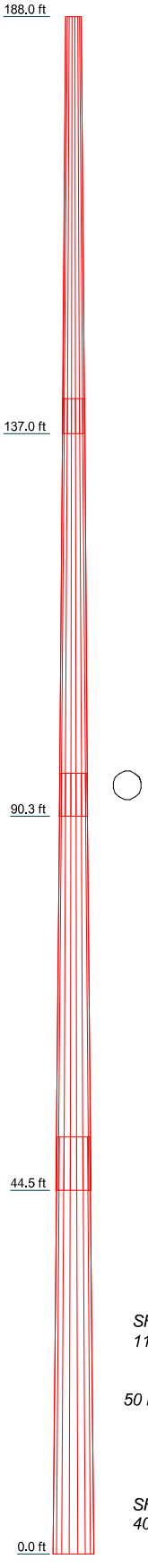
4.1) Recommendations

1) If the load differs from that described in Tables 1 and 2 of this report, the referenced drawings, or the provisions of this analysis are found to be invalid, another structural analysis should be performed.
2) The tower and its foundation have sufficient capacity to carry the proposed load configuration. No modifications are required at this time.

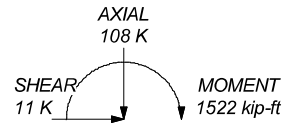
APPENDIX A

TNXTOWER OUTPUT

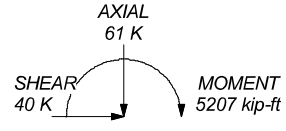
Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	51.00	18	0.2500	4.25	22.0000	32.7110	A607-65	3.7
2	51.00	18	0.3125	5.25	31.3184	42.0300		6.3
3	51.00	18	0.3750	6.50	40.3023	51.0140		9.4
4	51.00	18	0.5000		48.8988	59.6100		14.8



ALL REACTIONS ARE FACTORED



TORQUE 0 kip-ft
50 mph WIND - 2.0000 in ICE



TORQUE 0 kip-ft
REACTIONS - 125 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lighting Rod 3/4" x 8'	188	AIR 6454 B41 w/ Mount Pipe	161
800 10121 w/ Mount Pipe	188	AIR 6454 B41 w/ Mount Pipe	161
800 10121 w/ Mount Pipe	188	APXVAARR24_43-U-NA20 w/ Mount Pipe	161
800 10121 w/ Mount Pipe	188	APXVAARR24_43-U-NA20 w/ Mount Pipe	161
OPA-65R-LCUU-H6 w/ Mount Pipe	188	APXVAARR24_43-U-NA20 w/ Mount Pipe	161
OPA-65R-LCUU-H4 w/ Mount Pipe	188	RADIO 4449 B12/B71	161
OPA-65R-LCUU-H6 w/ Mount Pipe	188	RADIO 4449 B12/B71	161
QS66512-2 w/ Mount Pipe	188	RADIO 4449 B12/B71	161
QS46512-2 w/ Mount Pipe	188	RRUS 4415 B25	161
QS66512-2 w/ Mount Pipe	188	RRUS 4415 B25	161
(2) LGP21401	188	RRUS 4415 B25	161
(2) LGP21401	188	Platform Mount [LP 601-1]	161
(2) LGP21401	188	(2) SBNHH-1D65B w/ Mount Pipe	146
RRUS 32 B30	188	(2) SBNHH-1D65B w/ Mount Pipe	146
RRUS 32 B30	188	(2) SBNHH-1D65B w/ Mount Pipe	146
RRUS 32 B30	188	BXA-80063-6BF-EDIN-4 w/ Mount Pipe	146
RRUS-11	188	BXA-80063-6BF-EDIN-4 w/ Mount Pipe	146
RRUS-11	188	BXA-80063-6BF-EDIN-4 w/ Mount Pipe	146
RRUS-11	188	CBRS w/ Mount Pipe	146
DC6-48-60-18-8F	188	CBRS w/ Mount Pipe	146
DC6-48-60-18-8F	188	CBRS w/ Mount Pipe	146
DC6-48-60-0-8F	188	(2) RFV01U-D2A	146
(2) 860 10025	188	RFV01U-D2A	146
(2) 860 10025	188	RFV01U-D1A	146
(2) 860 10025	188	(2) RFV01U-D1A	146
RRUS 12	188	RHSDC-3315-PF-48	146
RRUS 12	188	RHSDC-3315-PF-48	146
RRUS 12	188	20W CBRS	146
RRUS 32 B2	188	20W CBRS	146
RRUS 32 B2	188	20W CBRS	146
RRUS 32 B2	188	(2) Side Arm Mount [SO 102-3]	146
RRUS 32 B66	188	Sector Mount [SM 801-3]	146
RRUS 32 B66	188	Side Arm Mount [SO 701-3]	133
RRUS 32 B66	188	1" Dia x 3.5-ft	100
2.4" Dia x 6-ft Pipe	188	1" Dia x 3.5-ft	100
2.4" Dia x 6-ft Pipe	188	1" Dia x 3.5-ft	100
2.4" Dia x 6-ft Pipe	188	1" Dia x 3.5-ft	70
Platform Mount [LP 1201-1_KCKR-HR-1]	188	1" Dia x 3.5-ft	70
L2x2x1/4_3ft long	188	1" Dia x 3.5-ft	70
L2x2x1/4_3ft long	188	1" Dia x 3.5-ft	40
L2x2x1/4_3ft long	188	1" Dia x 3.5-ft	40
AIR -32 B2A/B66AA w/ Mount Pipe	161	1" Dia x 3.5-ft	40
AIR -32 B2A/B66AA w/ Mount Pipe	161	1" Dia x 3.5-ft	10
AIR -32 B2A/B66AA w/ Mount Pipe	161	1" Dia x 3.5-ft	10
AIR 3246 B66 w/ 8-ft Mount Pipe	161	1" Dia x 3.5-ft	10
AIR 3246 B66 w/ 8-ft Mount Pipe	161		
AIR 3246 B66 w/ 8-ft Mount Pipe	161		
AIR 6454 B41 w/ Mount Pipe	161		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 125 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 2.00 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: 79.7%

Tower Engineering Profesisonals, Inc.

Tower Engineering Professionals, Inc.
326 Tryon Road
Raliegh, NC 27603
Phone: (919) 661-6351
FAX: (919) 661-6350

Job: *CT New Britain 3 CAC 803175 (BU 803175)*			
Project: *TEP No. 25666.318391*			
Client: Crown Castle	Drawn by: EJB	App'd:	
Code: TIA-222-H	Date: 10/31/19	Scale: NTS	
Path: C:\Users\ebosshart\Desktop\CT New Britain\803175_1803366_LC7.eri		Dwg No. E-1	

Tower Input Data

The tower is a monopole.
This tower is designed using the TIA-222-H standard.
The following design criteria apply:

Tower is located in Hartford County, Connecticut.
Tower base elevation above sea level: 88.00 ft.
Basic wind speed of 125 mph.
Risk Category II.
Exposure Category C.
Simplified Topographic Factor Procedure for wind speed-up calculations is used.
Topographic Category: 1.
Crest Height: 0.00 ft.
Nominal ice thickness of 2.0000 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.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.05.
Tower analysis based on target reliabilities in accordance with Annex S.
Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.
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

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	188.00-137.00	51.00	4.25	18	22.0000	32.7110	0.2500	1.0000	A607-65 (65 ksi)
L2	137.00-90.25	51.00	5.25	18	31.3184	42.0300	0.3125	1.2500	A607-65 (65 ksi)
L3	90.25-44.50	51.00	6.50	18	40.3023	51.0140	0.3750	1.5000	A607-65 (65 ksi)
L4	44.50-0.00	51.00		18	48.8988	59.6100	0.5000	2.0000	A607-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	22.3008	17.2586	1031.4832	7.7212	11.1760	92.2945	2064.3237	8.6310	3.4320	13.728
	33.1771	25.7578	3429.0204	11.5237	16.6172	206.3538	6862.5527	12.8813	5.3171	21.269
L2	32.6597	30.7540	3735.3228	11.0071	15.9098	234.7819	7475.5606	15.3799	4.9620	15.879
	42.6302	41.3785	9098.0688	14.8097	21.3512	426.1143	18208.1091	20.6932	6.8473	21.911
L3	41.9859	47.5235	9571.6471	14.1742	20.4736	467.5120	19155.8887	23.7663	6.4332	17.155
	51.7431	60.2731	19526.7966	17.9768	25.9151	753.4907	39079.2871	30.1423	8.3185	22.183
L4	50.9622	76.8089	22730.9630	17.1816	24.8406	915.0736	45491.8360	38.4117	7.7262	15.452
	60.4524	93.8076	41409.2395	20.9841	30.2819	1367.4593	82872.9664	46.9127	9.6114	19.223

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 188.00-137.00				1	1	1			
L2 137.00-90.25				1	1	1			
L3 90.25-44.50				1	1	1			
L4 44.50-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
*** Safety Line 3/8	C	No	Surface Ar (CaAa)	188.00 - 0.00	1	1	0.500 0.500	0.3750		0.22
*** 3/8-in Detuner Wire	A	No	Surface Ar (CaAa)	133.00 - 0.00	1	1	0.500 0.500	0.3750		0.10
3/8-in Detuner Wire	B	No	Surface Ar (CaAa)	133.00 - 0.00	1	1	0.250 0.250	0.3750		0.10
3/8-in Detuner Wire	C	No	Surface Ar (CaAa)	133.00 - 0.00	1	1	0.000 0.000	0.3750		0.10

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
*188									
LDF7-50A(1-5/8")	B	No	No	Inside Pole	188.00 - 0.00	6	No Ice	0.00	0.82
							1/2" Ice	0.00	0.82
							1" Ice	0.00	0.82
							2" Ice	0.00	0.82
FB-L98B-002-75000 (3/8")	B	No	No	Inside Pole	188.00 - 0.00	1	No Ice	0.00	0.06
							1/2" Ice	0.00	0.06
							1" Ice	0.00	0.06
							2" Ice	0.00	0.06
FB-L98B-002-75000 (3/8")	B	No	No	Inside Pole	188.00 - 0.00	1	No Ice	0.00	0.06
							1/2" Ice	0.00	0.06
							1" Ice	0.00	0.06
							2" Ice	0.00	0.06
WR-VG86ST-BRD(3/4")	B	No	No	Inside Pole	188.00 - 0.00	2	No Ice	0.00	0.58
							1/2" Ice	0.00	0.58
							1" Ice	0.00	0.58
							2" Ice	0.00	0.58
2" Flex Conduit	B	No	No	Inside Pole	188.00 - 0.00	1	No Ice	0.00	0.36
							1/2" Ice	0.00	0.36
							1" Ice	0.00	0.36
							2" Ice	0.00	0.36
2" Flex Conduit	B	No	No	Inside Pole	188.00 - 0.00	1	No Ice	0.00	0.36
							1/2" Ice	0.00	0.36
							1" Ice	0.00	0.36
							2" Ice	0.00	0.36
WR-VG86ST-BRD(3/4")	B	No	No	Inside Pole	188.00 - 0.00	4	No Ice	0.00	0.58
							1/2" Ice	0.00	0.58
							1" Ice	0.00	0.58
							2" Ice	0.00	0.58
161									
LCF158-50J(1-5/8")	C	No	No	Inside Pole	161.00 - 0.00	6	No Ice	0.00	0.92
							1/2" Ice	0.00	0.92
							1" Ice	0.00	0.92
							2" Ice	0.00	0.92
HCS 6X12 4AWG(1-5/8")	C	No	No	Inside Pole	161.00 - 0.00	4	No Ice	0.00	2.40
							1/2" Ice	0.00	2.40
							1" Ice	0.00	2.40
							2" Ice	0.00	2.40
146									
HB158-1-08U8-S8J 18(1-5/8")	C	No	No	Inside Pole	146.00 - 0.00	2	No Ice	0.00	1.30
							1/2" Ice	0.00	1.30
							1" Ice	0.00	1.30
							2" Ice	0.00	1.30
LCF158-50J(1-5/8")	C	No	No	Inside Pole	146.00 - 0.00	12	No Ice	0.00	0.92
							1/2" Ice	0.00	0.92
							1" Ice	0.00	0.92
							2" Ice	0.00	0.92

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	188.00-137.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.47
		C	0.000	0.000	1.912	0.000	0.50
L2	137.00-90.25	A	0.000	0.000	1.603	0.000	0.00
		B	0.000	0.000	1.603	0.000	0.44
		C	0.000	0.000	3.356	0.000	1.36
L3	90.25-44.50	A	0.000	0.000	1.716	0.000	0.00
		B	0.000	0.000	1.716	0.000	0.43
		C	0.000	0.000	3.431	0.000	1.33
L4	44.50-0.00	A	0.000	0.000	1.669	0.000	0.00
		B	0.000	0.000	1.669	0.000	0.42
		C	0.000	0.000	3.337	0.000	1.29

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	188.00-137.00	A	1.992	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.47
		C		0.000	0.000	22.231	0.000	0.79
L2	137.00-90.25	A	1.922	0.000	0.000	18.635	0.000	0.25
		B		0.000	0.000	18.635	0.000	0.68
		C		0.000	0.000	39.013	0.000	1.87
L3	90.25-44.50	A	1.825	0.000	0.000	19.306	0.000	0.25
		B		0.000	0.000	19.306	0.000	0.67
		C		0.000	0.000	38.611	0.000	1.82
L4	44.50-0.00	A	1.636	0.000	0.000	17.909	0.000	0.22
		B		0.000	0.000	17.909	0.000	0.63
		C		0.000	0.000	35.818	0.000	1.73

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	188.00-137.00	-0.2610	0.1507	-1.4506	0.8375
L2	137.00-90.25	0.0170	0.1446	0.0827	0.7052
L3	90.25-44.50	0.0390	0.1455	0.1948	0.7271
L4	44.50-0.00	0.0393	0.1465	0.1976	0.7375

Note: For pole sections, center of pressure calculations do not consider feed line shielding.

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	25	Safety Line 3/8	137.00 - 188.00	1.0000	1.0000
L1	27	3/8-in Detuner Wire	137.00 - 133.00	1.0000	1.0000
L1	28	3/8-in Detuner Wire	137.00 - 133.00	1.0000	1.0000
L1	29	3/8-in Detuner Wire	137.00 - 133.00	1.0000	1.0000
L2	25	Safety Line 3/8	90.25 - 137.00	1.0000	1.0000
L2	27	3/8-in Detuner Wire	90.25 - 133.00	1.0000	1.0000
L2	28	3/8-in Detuner Wire	90.25 - 133.00	1.0000	1.0000
L2	29	3/8-in Detuner Wire	90.25 - 133.00	1.0000	1.0000
L3	25	Safety Line 3/8	44.50 - 90.25	1.0000	1.0000
L3	27	3/8-in Detuner Wire	44.50 - 90.25	1.0000	1.0000
L3	28	3/8-in Detuner Wire	44.50 - 90.25	1.0000	1.0000
L3	29	3/8-in Detuner Wire	44.50 - 90.25	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Lighting Rod 3/4" x 8'	C	From Leg	0.00 0.00 4.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.60 1.41 2.25 3.67	0.60 1.41 2.25 3.67	0.03 0.04 0.05 0.09
188									
800 10121 w/ Mount Pipe	A	From Centroid-Face	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.60 4.00 4.42 5.29	2.95 3.34 3.74 4.59	0.07 0.11 0.17 0.30
800 10121 w/ Mount Pipe	B	From Centroid-Face	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.60 4.00 4.42 5.29	2.95 3.34 3.74 4.59	0.07 0.11 0.17 0.30
800 10121 w/ Mount Pipe	C	From Centroid-Face	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.60 4.00 4.42 5.29	2.95 3.34 3.74 4.59	0.07 0.11 0.17 0.30
OPA-65R-LCUU-H6 w/ Mount Pipe	A	From Centroid-Face	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	9.19 9.94 10.71 12.30	6.21 6.93 7.66 9.17	0.11 0.18 0.26 0.45
OPA-65R-LCUU-H4 w/ Mount Pipe	B	From Centroid-Face	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.18 6.57 6.98 7.82	4.55 5.16 5.78 7.07	0.08 0.13 0.19 0.33
OPA-65R-LCUU-H6 w/ Mount Pipe	C	From Centroid-Face	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	9.19 9.94 10.71 12.30	6.21 6.93 7.66 9.17	0.11 0.18 0.26 0.45

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
QS66512-2 w/ Mount Pipe	A	From Centroid-Face	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.04 4.42 4.82 5.63	4.18 4.57 4.97 5.79	0.14 0.21 0.29 0.48
QS46512-2 w/ Mount Pipe	B	From Centroid-Face	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.79 6.21 6.62 7.48	5.88 6.58 7.25 8.65	0.12 0.18 0.24 0.39
QS66512-2 w/ Mount Pipe	C	From Centroid-Face	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.04 4.42 4.82 5.63	4.18 4.57 4.97 5.79	0.14 0.21 0.29 0.48
(2) LGP21401	A	From Centroid-Face	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.10 1.24 1.38 1.69	0.21 0.27 0.35 0.52	0.01 0.02 0.03 0.05
(2) LGP21401	B	From Centroid-Face	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.10 1.24 1.38 1.69	0.21 0.27 0.35 0.52	0.01 0.02 0.03 0.05
(2) LGP21401	C	From Centroid-Face	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.10 1.24 1.38 1.69	0.21 0.27 0.35 0.52	0.01 0.02 0.03 0.05
RRUS 32 B30	A	From Centroid-Face	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.74 2.96 3.19 3.68	1.67 1.86 2.05 2.46	0.05 0.07 0.10 0.16
RRUS 32 B30	B	From Centroid-Face	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.74 2.96 3.19 3.68	1.67 1.86 2.05 2.46	0.05 0.07 0.10 0.16
RRUS 32 B30	C	From Centroid-Face	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.74 2.96 3.19 3.68	1.67 1.86 2.05 2.46	0.05 0.07 0.10 0.16
RRUS-11	A	From Centroid-Face	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.79 3.00 3.21 3.67	1.19 1.34 1.50 1.84	0.05 0.07 0.10 0.15
RRUS-11	B	From Centroid-Face	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.79 3.00 3.21 3.67	1.19 1.34 1.50 1.84	0.05 0.07 0.10 0.15
RRUS-11	C	From Centroid-Face	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.79 3.00 3.21 3.67	1.19 1.34 1.50 1.84	0.05 0.07 0.10 0.15
DC6-48-60-18-8F	B	From Centroid-Face	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.21 1.89 2.11 2.57	1.21 1.89 2.11 2.57	0.03 0.05 0.08 0.14
DC6-48-60-18-8F	B	From Centroid-Face	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.21 1.89 2.11 2.57	1.21 1.89 2.11 2.57	0.03 0.05 0.08 0.14
DC6-48-60-0-8F	C	From	4.00	0.0000	188.00	No Ice	2.20	2.20	0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
		Centroid-Face	0.00 2.00			1/2" Ice 1" Ice 2" Ice	2.40 2.60 3.04	2.40 2.60 3.04	0.06 0.08 0.14
(2) 860 10025	A	From Centroid-Face	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.14 0.19 0.25 0.40	0.12 0.17 0.23 0.37	0.00 0.00 0.01 0.01
(2) 860 10025	B	From Centroid-Face	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.14 0.19 0.25 0.40	0.12 0.17 0.23 0.37	0.00 0.00 0.01 0.01
(2) 860 10025	C	From Centroid-Face	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.14 0.19 0.25 0.40	0.12 0.17 0.23 0.37	0.00 0.00 0.01 0.01
RRUS 12	A	From Centroid-Face	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.15 3.36 3.59 4.07	1.29 1.44 1.60 1.95	0.06 0.08 0.11 0.17
RRUS 12	B	From Centroid-Face	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.15 3.36 3.59 4.07	1.29 1.44 1.60 1.95	0.06 0.08 0.11 0.17
RRUS 12	C	From Centroid-Face	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.15 3.36 3.59 4.07	1.29 1.44 1.60 1.95	0.06 0.08 0.11 0.17
RRUS 32 B2	A	From Centroid-Face	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.73 2.95 3.18 3.66	1.67 1.86 2.05 2.46	0.05 0.07 0.10 0.16
RRUS 32 B2	B	From Centroid-Face	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.73 2.95 3.18 3.66	1.67 1.86 2.05 2.46	0.05 0.07 0.10 0.16
RRUS 32 B2	C	From Centroid-Face	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.73 2.95 3.18 3.66	1.67 1.86 2.05 2.46	0.05 0.07 0.10 0.16
RRUS 32 B66	A	From Centroid-Face	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.74 2.96 3.19 3.68	1.67 1.86 2.05 2.46	0.05 0.07 0.10 0.16
RRUS 32 B66	B	From Centroid-Face	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.74 2.96 3.19 3.68	1.67 1.86 2.05 2.46	0.05 0.07 0.10 0.16
RRUS 32 B66	C	From Centroid-Face	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.74 2.96 3.19 3.68	1.67 1.86 2.05 2.46	0.05 0.07 0.10 0.16
2.4" Dia x 6-ft Pipe	A	From Centroid-Face	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.43 1.93 2.30 3.06	1.43 1.93 2.30 3.06	0.02 0.03 0.05 0.09
2.4" Dia x 6-ft Pipe	B	From Centroid-Face	4.00 0.00	0.0000	188.00	No Ice 1/2" Ice	1.43 1.93	1.43 1.93	0.02 0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
		ce	2.00			1" Ice	2.30	2.30	0.05
						2" Ice	3.06	3.06	0.09
2.4" Dia x 6-ft Pipe	C	From	4.00	0.0000	188.00	No Ice	1.43	1.43	0.02
		Centroid-Fa	0.00			1/2" Ice	1.93	1.93	0.03
		ce	2.00			1" Ice	2.30	2.30	0.05
						2" Ice	3.06	3.06	0.09
Platform Mount [LP 1201-1_KCKR-HR-1]	C	None		0.0000	188.00	No Ice	37.61	37.61	2.63
						1/2" Ice	45.62	45.62	3.48
						1" Ice	53.59	53.59	4.46
						2" Ice	69.65	69.65	6.85
L2x2x1/4_3ft long	A	From	4.00	0.0000	188.00	No Ice	0.88	0.88	0.01
		Centroid-Fa	0.00			1/2" Ice	1.10	1.10	0.02
		ce	2.00			1" Ice	1.33	1.33	0.02
						2" Ice	1.81	1.81	0.05
L2x2x1/4_3ft long	B	From	4.00	0.0000	188.00	No Ice	0.88	0.88	0.01
		Centroid-Fa	0.00			1/2" Ice	1.10	1.10	0.02
		ce	2.00			1" Ice	1.33	1.33	0.02
						2" Ice	1.81	1.81	0.05
L2x2x1/4_3ft long	C	From	4.00	0.0000	188.00	No Ice	0.88	0.88	0.01
		Centroid-Fa	0.00			1/2" Ice	1.10	1.10	0.02
		ce	2.00			1" Ice	1.33	1.33	0.02
						2" Ice	1.81	1.81	0.05
161									
AIR -32 B2A/B66AA w/ Mount Pipe	A	From	4.00	0.0000	161.00	No Ice	6.75	6.07	0.15
		Centroid-Fa	0.00			1/2" Ice	7.20	6.87	0.21
		ce	0.00			1" Ice	7.65	7.58	0.28
						2" Ice	8.57	9.06	0.44
AIR -32 B2A/B66AA w/ Mount Pipe	B	From	4.00	0.0000	161.00	No Ice	6.75	6.07	0.15
		Centroid-Fa	0.00			1/2" Ice	7.20	6.87	0.21
		ce	0.00			1" Ice	7.65	7.58	0.28
						2" Ice	8.57	9.06	0.44
AIR -32 B2A/B66AA w/ Mount Pipe	C	From	4.00	0.0000	161.00	No Ice	6.75	6.07	0.15
		Centroid-Fa	0.00			1/2" Ice	7.20	6.87	0.21
		ce	0.00			1" Ice	7.65	7.58	0.28
						2" Ice	8.57	9.06	0.44
AIR 3246 B66 w/ 8-ft Mount Pipe	A	From	4.00	0.0000	161.00	No Ice	8.69	7.07	0.21
		Centroid-Fa	0.00			1/2" Ice	9.42	8.27	0.29
		ce	0.00			1" Ice	10.09	9.31	0.37
						2" Ice	11.31	11.08	0.56
AIR 3246 B66 w/ 8-ft Mount Pipe	B	From	4.00	0.0000	161.00	No Ice	8.69	7.07	0.21
		Centroid-Fa	0.00			1/2" Ice	9.42	8.27	0.29
		ce	0.00			1" Ice	10.09	9.31	0.37
						2" Ice	11.31	11.08	0.56
AIR 3246 B66 w/ 8-ft Mount Pipe	C	From	4.00	0.0000	161.00	No Ice	8.69	7.07	0.21
		Centroid-Fa	0.00			1/2" Ice	9.42	8.27	0.29
		ce	0.00			1" Ice	10.09	9.31	0.37
						2" Ice	11.31	11.08	0.56
AIR 6454 B41 w/ Mount Pipe	A	From	4.00	0.0000	161.00	No Ice	6.79	3.26	0.14
		Centroid-Fa	0.00			1/2" Ice	7.18	3.76	0.19
		ce	0.00			1" Ice	7.58	4.27	0.25
						2" Ice	8.41	5.35	0.38
AIR 6454 B41 w/ Mount Pipe	B	From	4.00	0.0000	161.00	No Ice	6.79	3.26	0.14
		Centroid-Fa	0.00			1/2" Ice	7.18	3.76	0.19
		ce	0.00			1" Ice	7.58	4.27	0.25
						2" Ice	8.41	5.35	0.38
AIR 6454 B41 w/ Mount Pipe	C	From	4.00	0.0000	161.00	No Ice	6.79	3.26	0.14
		Centroid-Fa	0.00			1/2" Ice	7.18	3.76	0.19

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
		ce	0.00			1" Ice	7.58	4.27	0.25
						2" Ice	8.41	5.35	0.38
APXVAARR24_43-U-NA20 w/ Mount Pipe	A	From Centroid-Face	4.00 0.00 0.00	0.0000	161.00	No Ice 1/2" Ice 1" Ice 2" Ice	14.69 15.46 16.23 17.82	6.87 7.55 8.25 9.67	0.19 0.31 0.46 0.79
APXVAARR24_43-U-NA20 w/ Mount Pipe	B	From Centroid-Face	4.00 0.00 0.00	0.0000	161.00	No Ice 1/2" Ice 1" Ice 2" Ice	14.69 15.46 16.23 17.82	6.87 7.55 8.25 9.67	0.19 0.31 0.46 0.79
APXVAARR24_43-U-NA20 w/ Mount Pipe	C	From Centroid-Face	4.00 0.00 0.00	0.0000	161.00	No Ice 1/2" Ice 1" Ice 2" Ice	14.69 15.46 16.23 17.82	6.87 7.55 8.25 9.67	0.19 0.31 0.46 0.79
RADIO 4449 B12/B71	A	From Centroid-Face	4.00 0.00 0.00	0.0000	161.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.64 1.80 1.97 2.33	1.15 1.29 1.44 1.75	0.07 0.09 0.11 0.15
RADIO 4449 B12/B71	B	From Centroid-Face	4.00 0.00 0.00	0.0000	161.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.64 1.80 1.97 2.33	1.15 1.29 1.44 1.75	0.07 0.09 0.11 0.15
RADIO 4449 B12/B71	C	From Centroid-Face	4.00 0.00 0.00	0.0000	161.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.64 1.80 1.97 2.33	1.15 1.29 1.44 1.75	0.07 0.09 0.11 0.15
RRUS 4415 B25	A	From Centroid-Face	4.00 0.00 0.00	0.0000	161.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.64 1.80 1.97 2.33	0.68 0.79 0.91 1.18	0.04 0.06 0.07 0.11
RRUS 4415 B25	B	From Centroid-Face	4.00 0.00 0.00	0.0000	161.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.64 1.80 1.97 2.33	0.68 0.79 0.91 1.18	0.04 0.06 0.07 0.11
RRUS 4415 B25	C	From Centroid-Face	4.00 0.00 0.00	0.0000	161.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.64 1.80 1.97 2.33	0.68 0.79 0.91 1.18	0.04 0.06 0.07 0.11
Platform Mount [LP 601-1]	C	None		0.0000	161.00	No Ice 1/2" Ice 1" Ice 2" Ice	28.50 31.69 34.87 41.23	28.50 31.69 34.87 41.23	1.12 1.68 2.28 3.65
146									
(2) SBNHH-1D65B w/ Mount Pipe	A	From Leg	4.00 0.00 3.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.09 4.49 4.89 5.72	3.30 3.68 4.07 4.87	0.07 0.13 0.20 0.39
(2) SBNHH-1D65B w/ Mount Pipe	B	From Leg	4.00 0.00 3.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.09 4.49 4.89 5.72	3.30 3.68 4.07 4.87	0.07 0.13 0.20 0.39
(2) SBNHH-1D65B w/ Mount Pipe	C	From Leg	4.00 0.00 3.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.09 4.49 4.89 5.72	3.30 3.68 4.07 4.87	0.07 0.13 0.20 0.39
BXA-80063-6BF-EDIN-4 w/ Mount Pipe	A	From Leg	4.00 0.00	0.0000	146.00	No Ice 1/2" Ice	7.50 8.03	5.63 6.72	0.04 0.10

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			3.00			1" Ice	8.53	7.56	0.17
						2" Ice	9.56	9.29	0.33
BXA-80063-6BF-EDIN-4 w/ Mount Pipe	B	From Leg	4.00 0.00 3.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice	7.50 8.03 8.53	5.63 6.72 7.56	0.04 0.10 0.17
						2" Ice	9.56	9.29	0.33
BXA-80063-6BF-EDIN-4 w/ Mount Pipe	C	From Leg	4.00 0.00 3.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice	7.50 8.03 8.53	5.63 6.72 7.56	0.04 0.10 0.17
						2" Ice	9.56	9.29	0.33
CBRS w/ Mount Pipe	A	From Leg	4.00 0.00 3.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice	1.71 1.93 2.17	1.17 1.44 1.72	0.03 0.05 0.07
						2" Ice	2.66	2.35	0.13
CBRS w/ Mount Pipe	B	From Leg	4.00 0.00 3.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice	1.71 1.93 2.17	1.17 1.44 1.72	0.03 0.05 0.07
						2" Ice	2.66	2.35	0.13
CBRS w/ Mount Pipe	C	From Leg	4.00 0.00 3.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice	1.71 1.93 2.17	1.17 1.44 1.72	0.03 0.05 0.07
						2" Ice	2.66	2.35	0.13
(2) RFV01U-D2A	A	From Leg	4.00 0.00 3.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice	1.88 2.05 2.22	1.01 1.14 1.28	0.07 0.09 0.11
						2" Ice	2.60	1.59	0.15
RFV01U-D2A	B	From Leg	4.00 0.00 3.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice	1.88 2.05 2.22	1.01 1.14 1.28	0.07 0.09 0.11
						2" Ice	2.60	1.59	0.15
RFV01U-D1A	B	From Leg	4.00 0.00 3.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice	1.88 2.05 2.22	1.25 1.39 1.54	0.08 0.10 0.12
						2" Ice	2.60	1.86	0.18
(2) RFV01U-D1A	C	From Leg	4.00 0.00 3.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice	1.88 2.05 2.22	1.25 1.39 1.54	0.08 0.10 0.12
						2" Ice	2.60	1.86	0.18
RHSDC-3315-PF-48	A	From Leg	4.00 0.00 -1.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice	3.36 3.60 3.84	2.19 2.39 2.61	0.03 0.06 0.09
						2" Ice	4.34	3.05	0.17
RHSDC-3315-PF-48	C	From Leg	4.00 0.00 -1.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice	3.36 3.60 3.84	2.19 2.39 2.61	0.03 0.06 0.09
						2" Ice	4.34	3.05	0.17
20W CBRS	A	From Leg	4.00 0.00 3.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice	0.86 0.98 1.10	0.42 0.51 0.61	0.02 0.03 0.03
						2" Ice	1.37	0.83	0.06
20W CBRS	B	From Leg	4.00 0.00 3.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice	0.86 0.98 1.10	0.42 0.51 0.61	0.02 0.03 0.03
						2" Ice	1.37	0.83	0.06
20W CBRS	C	From Leg	4.00 0.00 3.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice	0.86 0.98 1.10	0.42 0.51 0.61	0.02 0.03 0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	1.37	0.83	0.06
(2) Side Arm Mount [SO 102-3]	C	None		0.0000	146.00	No Ice	3.60	3.60	0.07
						1/2" Ice	4.18	4.18	0.11
						1" Ice	4.75	4.75	0.14
						2" Ice	5.90	5.90	0.20
Sector Mount [SM 801-3]	C	None		0.0000	146.00	No Ice	20.61	20.61	0.88
						1/2" Ice	29.42	29.42	1.28
						1" Ice	38.23	38.23	1.82
						2" Ice	56.22	56.22	3.29
Detuner									
Side Arm Mount [SO 701-3]	C	None		0.0000	133.00	No Ice	3.02	3.02	0.20
						1/2" Ice	4.18	4.18	0.24
						1" Ice	5.33	5.33	0.28
						2" Ice	7.63	7.63	0.36
*****									
1" Dia x 3.5-ft	A	From Leg	1.50 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.37 0.68 0.90 1.37	0.00 0.01 0.01 0.03
1" Dia x 3.5-ft	B	From Leg	1.50 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.37 0.68 0.90 1.37	0.00 0.01 0.01 0.03
1" Dia x 3.5-ft	C	From Leg	1.50 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.37 0.68 0.90 1.37	0.00 0.01 0.01 0.03
*****									
1" Dia x 3.5-ft	A	From Leg	1.50 0.00 0.00	0.0000	70.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.37 0.68 0.90 1.37	0.00 0.01 0.01 0.03
1" Dia x 3.5-ft	B	From Leg	1.50 0.00 0.00	0.0000	70.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.37 0.68 0.90 1.37	0.00 0.01 0.01 0.03
1" Dia x 3.5-ft	C	From Leg	1.50 0.00 0.00	0.0000	70.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.37 0.68 0.90 1.37	0.00 0.01 0.01 0.03
*****									
1" Dia x 3.5-ft	A	From Leg	1.50 0.00 0.00	0.0000	40.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.37 0.68 0.90 1.37	0.00 0.01 0.01 0.03
1" Dia x 3.5-ft	B	From Leg	1.50 0.00 0.00	0.0000	40.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.37 0.68 0.90 1.37	0.00 0.01 0.01 0.03
1" Dia x 3.5-ft	C	From Leg	1.50 0.00 0.00	0.0000	40.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.37 0.68 0.90 1.37	0.00 0.01 0.01 0.03
*****									
1" Dia x 3.5-ft	A	From Leg	1.50 0.00 0.00	0.0000	10.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.37 0.68 0.90	0.00 0.01 0.01

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral ft Vert ft*	*Azimuth Adjustment °*	*Placement ft*		*C_AA_A Front ft^2*	*C_AA_A Side ft^2*	*Weight K*
						2" Ice	0.00	1.37	0.03
1" Dia x 3.5-ft	B	From Leg	1.50	0.0000	10.00	No Ice	0.00	0.37	0.00
			0.00			1/2" Ice	0.00	0.68	0.01
			0.00			1" Ice	0.00	0.90	0.01
						2" Ice	0.00	1.37	0.03
1" Dia x 3.5-ft	C	From Leg	1.50	0.0000	10.00	No Ice	0.00	0.37	0.00
			0.00			1/2" Ice	0.00	0.68	0.01
			0.00			1" Ice	0.00	0.90	0.01
						2" Ice	0.00	1.37	0.03
***									

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

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	188 - 137	Pole	Max Tension	48	0.00	-0.00	0.00
			Max. Compression	26	-44.73	0.78	-0.66
			Max. Mx	20	-14.74	656.45	1.47
			Max. My	14	-14.72	-1.42	-658.58
			Max. Vy	20	-23.84	656.45	1.47
			Max. Vx	14	23.93	-1.42	-658.58
			Max. Torque	16			0.53
L2	137 - 90.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-59.78	0.78	-1.08
			Max. Mx	20	-24.73	1873.73	2.21
			Max. My	14	-24.72	-2.19	-1879.70
			Max. Vy	20	-29.28	1873.73	2.21
			Max. Vx	14	29.36	-2.19	-1879.70
			Max. Torque	10			-0.10
L3	90.25 - 44.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-78.71	0.78	-1.56
			Max. Mx	20	-38.28	3294.13	2.91
			Max. My	14	-38.27	-2.91	-3303.80
			Max. Vy	20	-34.46	3294.13	2.91
			Max. Vx	14	34.55	-2.91	-3303.80
			Max. Torque	10			-0.10
L4	44.5 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-108.11	0.78	-2.16
			Max. Mx	20	-61.10	5193.00	3.66
			Max. My	14	-61.10	-3.69	-5206.79
			Max. Vy	20	-39.65	5193.00	3.66
			Max. Vx	14	39.73	-3.69	-5206.79
			Max. Torque	10			-0.10

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	33	108.11	-0.01	-10.87

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Max. H_x	21	45.85	39.60	0.01
	Max. H_z	3	45.85	0.01	39.68
	Max. M_x	2	5206.35	0.01	39.68
	Max. M_z	8	5192.62	-39.60	-0.01
	Max. Torsion	22	0.08	34.31	19.85
	Min. Vert	23	45.85	34.31	19.85
	Min. H_x	9	45.85	-39.60	-0.01
	Min. H_z	15	45.85	-0.01	-39.68
	Min. M_x	14	-5206.79	-0.01	-39.68
	Min. M_z	20	-5193.00	39.60	0.01
	Min. Torsion	10	-0.10	-34.31	-19.85

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	50.94	0.00	0.00	0.17	0.15	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	61.13	-0.01	-39.68	-5206.35	4.08	-0.04
0.9 Dead+1.0 Wind 0 deg - No Ice	45.85	-0.01	-39.68	-5134.28	3.95	-0.04
1.2 Dead+1.0 Wind 30 deg - No Ice	61.13	19.79	-34.36	-4506.91	-2592.84	0.01
0.9 Dead+1.0 Wind 30 deg - No Ice	45.85	19.79	-34.36	-4444.56	-2557.00	0.01
1.2 Dead+1.0 Wind 60 deg - No Ice	61.13	34.29	-19.83	-2599.76	-4494.99	0.06
0.9 Dead+1.0 Wind 60 deg - No Ice	45.85	34.29	-19.83	-2563.82	-4432.81	0.06
1.2 Dead+1.0 Wind 90 deg - No Ice	61.13	39.60	0.01	4.10	-5192.62	0.09
0.9 Dead+1.0 Wind 90 deg - No Ice	45.85	39.60	0.01	3.97	-5120.76	0.09
1.2 Dead+1.0 Wind 120 deg - No Ice	61.13	34.31	19.85	2606.89	-4498.82	0.10
0.9 Dead+1.0 Wind 120 deg - No Ice	45.85	34.31	19.85	2570.71	-4436.56	0.09
1.2 Dead+1.0 Wind 150 deg - No Ice	61.13	19.82	34.37	4511.19	-2599.53	0.07
0.9 Dead+1.0 Wind 150 deg - No Ice	45.85	19.82	34.37	4448.64	-2563.57	0.06
1.2 Dead+1.0 Wind 180 deg - No Ice	61.13	0.01	39.68	5206.79	-3.69	0.02
0.9 Dead+1.0 Wind 180 deg - No Ice	45.85	0.01	39.68	5134.61	-3.66	0.02
1.2 Dead+1.0 Wind 210 deg - No Ice	61.13	-19.79	34.36	4507.35	2593.22	-0.02
0.9 Dead+1.0 Wind 210 deg - No Ice	45.85	-19.79	34.36	4444.88	2557.29	-0.02
1.2 Dead+1.0 Wind 240 deg - No Ice	61.13	-34.29	19.83	2600.19	4495.37	-0.05
0.9 Dead+1.0 Wind 240 deg - No Ice	45.85	-34.29	19.83	2564.14	4433.09	-0.05
1.2 Dead+1.0 Wind 270 deg - No Ice	61.13	-39.60	-0.01	-3.66	5193.00	-0.07
0.9 Dead+1.0 Wind 270 deg -	45.85	-39.60	-0.01	-3.64	5121.03	-0.07

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
No Ice						
1.2 Dead+1.0 Wind 300 deg - No Ice	61.13	-34.31	-19.85	-2606.45	4499.20	-0.08
0.9 Dead+1.0 Wind 300 deg - No Ice	45.85	-34.31	-19.85	-2570.38	4436.84	-0.08
1.2 Dead+1.0 Wind 330 deg - No Ice	61.13	-19.82	-34.37	-4510.74	2599.92	-0.07
0.9 Dead+1.0 Wind 330 deg - No Ice	45.85	-19.82	-34.37	-4448.31	2563.85	-0.07
1.2 Dead+1.0 Ice+1.0 Temp	108.11	-0.00	0.00	2.16	0.78	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	108.11	-0.01	-10.87	-1517.16	3.50	0.04
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	108.11	5.42	-9.41	-1312.30	-754.28	0.03
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	108.11	9.39	-5.43	-755.14	-1309.71	0.02
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	108.11	10.85	0.01	5.02	-1513.93	-0.00
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	108.11	9.40	5.45	764.49	-1312.25	-0.03
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	108.11	5.43	9.42	1319.78	-758.69	-0.04
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	108.11	0.01	10.87	1522.10	-1.59	-0.04
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	108.11	-5.42	9.41	1317.24	756.19	-0.04
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	108.11	-9.39	5.43	760.08	1311.61	-0.02
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	108.11	-10.85	-0.01	-0.07	1515.84	0.01
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	108.11	-9.40	-5.45	-759.55	1314.15	0.03
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	108.11	-5.43	-9.42	-1314.84	760.60	0.04
Dead+Wind 0 deg - Service	50.94	-0.00	-8.61	-1121.96	0.99	-0.01
Dead+Wind 30 deg - Service	50.94	4.29	-7.46	-971.20	-558.70	0.00
Dead+Wind 60 deg - Service	50.94	7.44	-4.30	-560.17	-968.65	0.01
Dead+Wind 90 deg - Service	50.94	8.59	0.00	1.02	-1119.00	0.02
Dead+Wind 120 deg - Service	50.94	7.44	4.31	561.98	-969.48	0.02
Dead+Wind 150 deg - Service	50.94	4.30	7.46	972.41	-560.15	0.01
Dead+Wind 180 deg - Service	50.94	0.00	8.61	1122.33	-0.68	0.01
Dead+Wind 210 deg - Service	50.94	-4.29	7.46	971.57	559.02	-0.00
Dead+Wind 240 deg - Service	50.94	-7.44	4.30	560.53	968.96	-0.01
Dead+Wind 270 deg - Service	50.94	-8.59	-0.00	-0.65	1119.32	-0.02
Dead+Wind 300 deg - Service	50.94	-7.44	-4.31	-561.61	969.80	-0.02
Dead+Wind 330 deg - Service	50.94	-4.30	-7.46	-972.04	560.46	-0.01

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-50.94	0.00	0.00	50.94	0.00	0.000%
2	-0.01	-61.13	-39.68	0.01	61.13	39.68	0.000%
3	-0.01	-45.85	-39.68	0.01	45.85	39.68	0.000%
4	19.79	-61.13	-34.36	-19.79	61.13	34.36	0.000%
5	19.79	-45.85	-34.36	-19.79	45.85	34.36	0.000%
6	34.29	-61.13	-19.83	-34.29	61.13	19.83	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
7	34.29	-45.85	-19.83	-34.29	45.85	19.83	0.000%
8	39.60	-61.13	0.01	-39.60	61.13	-0.01	0.000%
9	39.60	-45.85	0.01	-39.60	45.85	-0.01	0.000%
10	34.31	-61.13	19.85	-34.31	61.13	-19.85	0.000%
11	34.31	-45.85	19.85	-34.31	45.85	-19.85	0.000%
12	19.82	-61.13	34.37	-19.82	61.13	-34.37	0.000%
13	19.82	-45.85	34.37	-19.82	45.85	-34.37	0.000%
14	0.01	-61.13	39.68	-0.01	61.13	-39.68	0.000%
15	0.01	-45.85	39.68	-0.01	45.85	-39.68	0.000%
16	-19.79	-61.13	34.36	19.79	61.13	-34.36	0.000%
17	-19.79	-45.85	34.36	19.79	45.85	-34.36	0.000%
18	-34.29	-61.13	19.83	34.29	61.13	-19.83	0.000%
19	-34.29	-45.85	19.83	34.29	45.85	-19.83	0.000%
20	-39.60	-61.13	-0.01	39.60	61.13	0.01	0.000%
21	-39.60	-45.85	-0.01	39.60	45.85	0.01	0.000%
22	-34.31	-61.13	-19.85	34.31	61.13	19.85	0.000%
23	-34.31	-45.85	-19.85	34.31	45.85	19.85	0.000%
24	-19.82	-61.13	-34.37	19.82	61.13	34.37	0.000%
25	-19.82	-45.85	-34.37	19.82	45.85	34.37	0.000%
26	0.00	-108.11	0.00	0.00	108.11	-0.00	0.000%
27	-0.01	-108.11	-10.87	0.01	108.11	10.87	0.000%
28	5.42	-108.11	-9.41	-5.42	108.11	9.41	0.000%
29	9.39	-108.11	-5.43	-9.39	108.11	5.43	0.000%
30	10.85	-108.11	0.01	-10.85	108.11	-0.01	0.000%
31	9.40	-108.11	5.45	-9.40	108.11	-5.45	0.000%
32	5.43	-108.11	9.42	-5.43	108.11	-9.42	0.000%
33	0.01	-108.11	10.87	-0.01	108.11	-10.87	0.000%
34	-5.42	-108.11	9.41	5.42	108.11	-9.41	0.000%
35	-9.39	-108.11	5.43	9.39	108.11	-5.43	0.000%
36	-10.85	-108.11	-0.01	10.85	108.11	0.01	0.000%
37	-9.40	-108.11	-5.45	9.40	108.11	5.45	0.000%
38	-5.43	-108.11	-9.42	5.43	108.11	9.42	0.000%
39	-0.00	-50.94	-8.61	0.00	50.94	8.61	0.000%
40	4.29	-50.94	-7.46	-4.29	50.94	7.46	0.000%
41	7.44	-50.94	-4.30	-7.44	50.94	4.30	0.000%
42	8.59	-50.94	0.00	-8.59	50.94	-0.00	0.000%
43	7.44	-50.94	4.31	-7.44	50.94	-4.31	0.000%
44	4.30	-50.94	7.46	-4.30	50.94	-7.46	0.000%
45	0.00	-50.94	8.61	-0.00	50.94	-8.61	0.000%
46	-4.29	-50.94	7.46	4.29	50.94	-7.46	0.000%
47	-7.44	-50.94	4.30	7.44	50.94	-4.30	0.000%
48	-8.59	-50.94	-0.00	8.59	50.94	0.00	0.000%
49	-7.44	-50.94	-4.31	7.44	50.94	4.31	0.000%
50	-4.30	-50.94	-7.46	4.30	50.94	7.46	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00002309
3	Yes	4	0.00000001	0.00058388
4	Yes	6	0.00000001	0.00023798
5	Yes	6	0.00000001	0.00007027
6	Yes	6	0.00000001	0.00023729
7	Yes	6	0.00000001	0.00007005

8	Yes	5	0.00000001	0.00002766
9	Yes	4	0.00000001	0.00059971
10	Yes	6	0.00000001	0.00023856
11	Yes	6	0.00000001	0.00007033
12	Yes	6	0.00000001	0.00023847
13	Yes	6	0.00000001	0.00007029
14	Yes	5	0.00000001	0.00002549
15	Yes	4	0.00000001	0.00059385
16	Yes	6	0.00000001	0.00023758
17	Yes	6	0.00000001	0.00007011
18	Yes	6	0.00000001	0.00023802
19	Yes	6	0.00000001	0.00007029
20	Yes	5	0.00000001	0.00002058
21	Yes	4	0.00000001	0.00057533
22	Yes	6	0.00000001	0.00023818
23	Yes	6	0.00000001	0.00007021
24	Yes	6	0.00000001	0.00023852
25	Yes	6	0.00000001	0.00007030
26	Yes	4	0.00000001	0.00000689
27	Yes	6	0.00000001	0.00023413
28	Yes	6	0.00000001	0.00038918
29	Yes	6	0.00000001	0.00038789
30	Yes	6	0.00000001	0.00023351
31	Yes	6	0.00000001	0.00039423
32	Yes	6	0.00000001	0.00039504
33	Yes	6	0.00000001	0.00023519
34	Yes	6	0.00000001	0.00039202
35	Yes	6	0.00000001	0.00039241
36	Yes	6	0.00000001	0.00023406
37	Yes	6	0.00000001	0.00039325
38	Yes	6	0.00000001	0.00039337
39	Yes	4	0.00000001	0.00010713
40	Yes	4	0.00000001	0.00085137
41	Yes	4	0.00000001	0.00084425
42	Yes	4	0.00000001	0.00010682
43	Yes	4	0.00000001	0.00085675
44	Yes	4	0.00000001	0.00085564
45	Yes	4	0.00000001	0.00010735
46	Yes	4	0.00000001	0.00084840
47	Yes	4	0.00000001	0.00085304
48	Yes	4	0.00000001	0.00010665
49	Yes	4	0.00000001	0.00085268
50	Yes	4	0.00000001	0.00085630

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	188 - 137 (1)	TP32.711x22x0.25	51.00	0.00	0.0	25.0495	-14.72	1465.40	0.010
L2	137 - 90.25 (2)	TP42.03x31.3184x0.3125	51.00	0.00	0.0	40.2848	-24.72	2356.66	0.010
L3	90.25 - 44.5 (3)	TP51.014x40.3023x0.375	51.00	0.00	0.0	58.6481	-38.27	3430.92	0.011
L4	44.5 - 0 (4)	TP59.61x48.8988x0.5	51.00	0.00	0.0	93.8076	-61.10	5487.74	0.011

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	188 - 137 (1)	TP32.711x22x0.25	659.30	1113.48	0.592	0.00	1113.48	0.000
L2	137 - 90.25 (2)	TP42.03x31.3184x0.3125	1880.12	2281.22	0.824	0.00	2281.22	0.000
L3	90.25 - 44.5 (3)	TP51.014x40.3023x0.375	3303.93	4013.65	0.823	0.00	4013.65	0.000
L4	44.5 - 0 (4)	TP59.61x48.8988x0.5	5206.80	7974.63	0.653	0.00	7974.63	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	188 - 137 (1)	TP32.711x22x0.25	23.92	439.62	0.054	0.07	1215.38	0.000
L2	137 - 90.25 (2)	TP42.03x31.3184x0.3125	29.35	707.00	0.042	0.07	2514.68	0.000
L3	90.25 - 44.5 (3)	TP51.014x40.3023x0.375	34.54	1029.27	0.034	0.07	4441.48	0.000
L4	44.5 - 0 (4)	TP59.61x48.8988x0.5	39.73	1646.32	0.024	0.02	8522.25	0.000

Pole Interaction Design Data

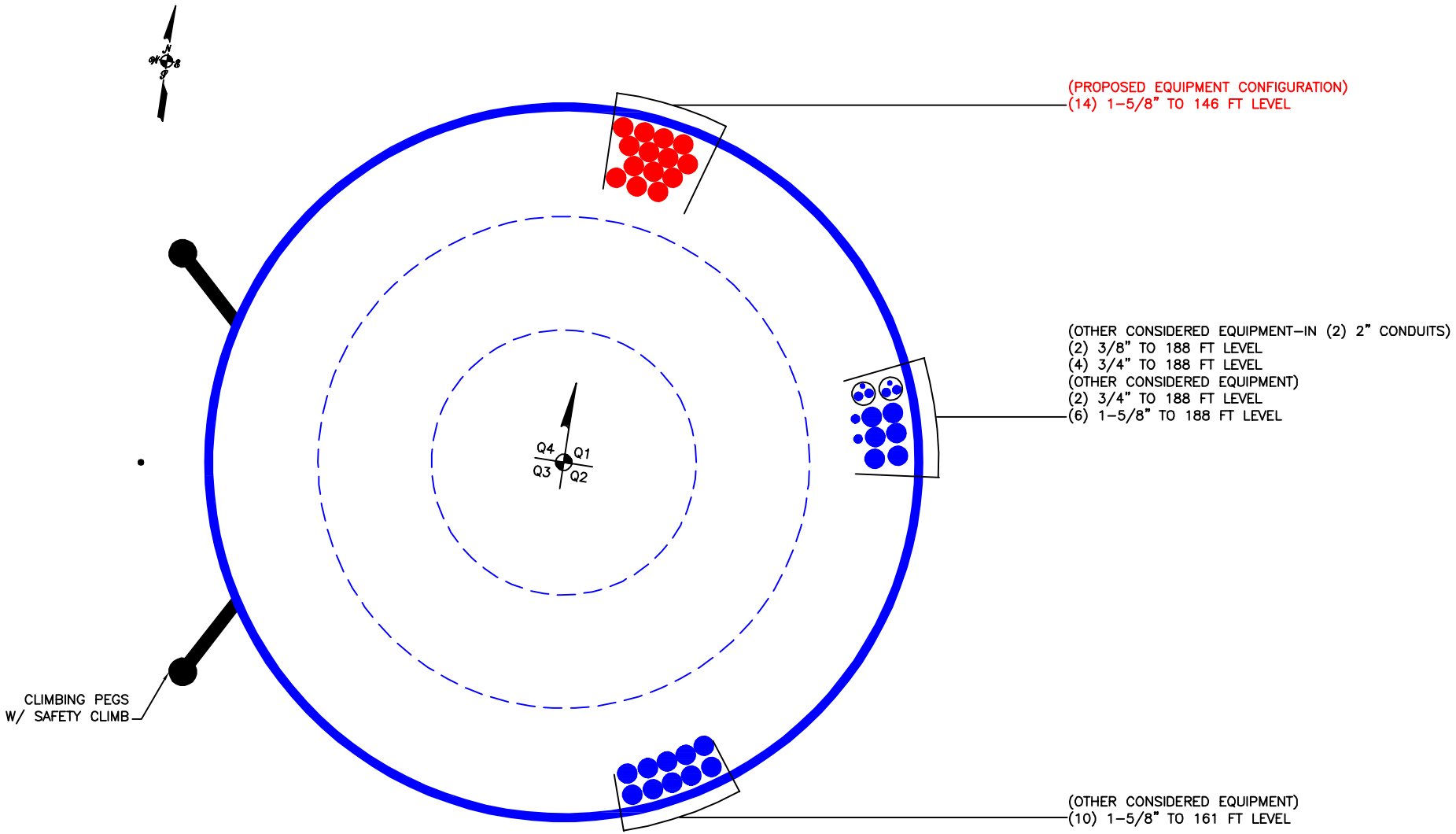
Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	188 - 137 (1)	0.010	0.592	0.000	0.054	0.000	0.605	1.050	4.8.2
L2	137 - 90.25 (2)	0.010	0.824	0.000	0.042	0.000	0.836	1.050	4.8.2
L3	90.25 - 44.5 (3)	0.011	0.823	0.000	0.034	0.000	0.835	1.050	4.8.2
L4	44.5 - 0 (4)	0.011	0.653	0.000	0.024	0.000	0.665	1.050	4.8.2

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	188 - 137	Pole	TP32.711x22x0.25	1	-14.72	1538.67	57.6	Pass
L2	137 - 90.25	Pole	TP42.03x31.3184x0.3125	2	-24.72	2474.49	79.7	Pass
L3	90.25 - 44.5	Pole	TP51.014x40.3023x0.375	3	-38.27	3602.47	79.6	Pass
L4	44.5 - 0	Pole	TP59.61x48.8988x0.5	4	-61.10	5762.13	63.3	Pass
							Summary	
						Pole (L2)	79.7	Pass
						RATING =	**79.7**	**Pass**

APPENDIX B

BASE LEVEL DRAWING


N
W
E
S
Q4
Q1
Q3
Q2
(PROPOSED EQUIPMENT CONFIGURATION)
(14) 1-5/8" TO 146 FT LEVEL
(OTHER CONSIDERED EQUIPMENT-IN (2) 2" CONDUITS)
(2) 3/8" TO 188 FT LEVEL
(4) 3/4" TO 188 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(2) 3/4" TO 188 FT LEVEL
(6) 1-5/8" TO 188 FT LEVEL
CLIMBING PEGS
W/ SAFETY CLIMB
(OTHER CONSIDERED EQUIPMENT)
(10) 1-5/8" TO 161 FT LEVEL

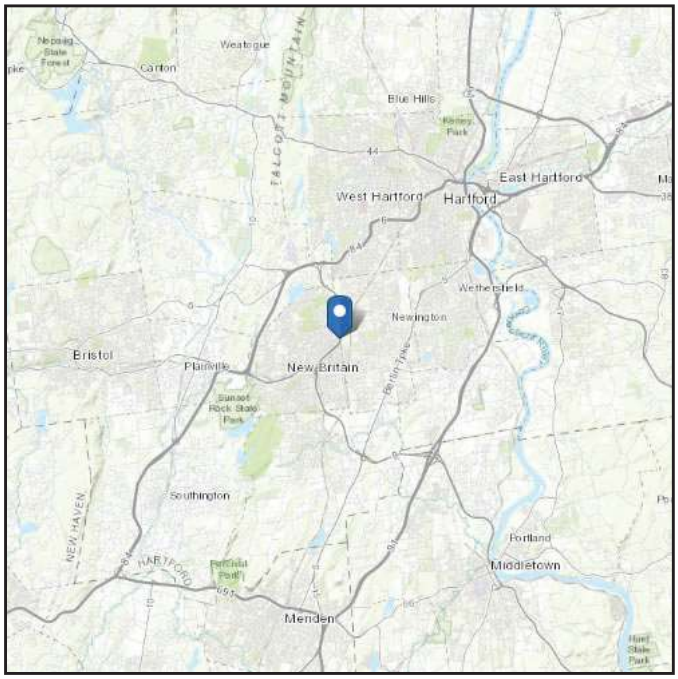
APPENDIX C

ADDITIONAL CALCULATIONS

ASCE 7 Hazards Report

Address:
No Address at This Location

Standard:	ASCE/SEI 7-10	**Elevation:**	88.33 ft (NAVD 88)
Risk Category:	II	**Latitude:**	41.686611
Soil Class:	D - Stiff Soil	**Longitude:**	-72.757722



Wind

Results:

Wind Speed:	122 Vmph	← 125mph Ultimate wind speed used per local jurisdictional requirements
10-year MRI	76 Vmph	
25-year MRI	86 Vmph	
50-year MRI	93 Vmph	
100-year MRI	100 Vmph	
Data Source:	ASCE/SEI 7-10, Fig. 26.5-1A and Figs. CC-1–CC-4, incorporating errata of March 12, 2014	
Date Accessed:	Thu Oct 31 2019	

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-10 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is in a hurricane-prone region as defined in ASCE/SEI 7-10 Section 26.2. Glazed openings need not be protected against wind-borne debris.

Mountainous terrain, gorges, ocean promontories, and special wind regions should be examined for unusual wind conditions.

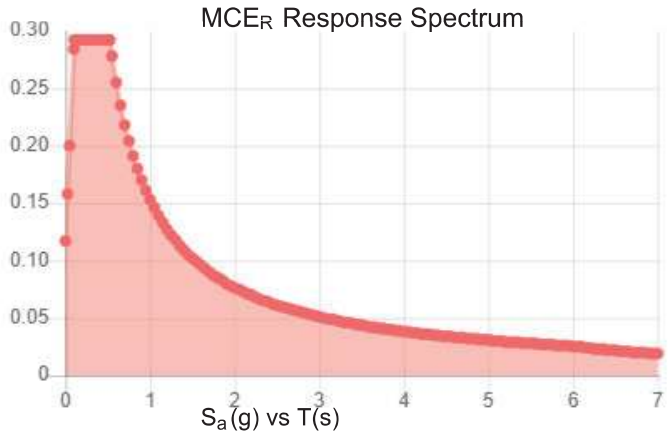
Seismic

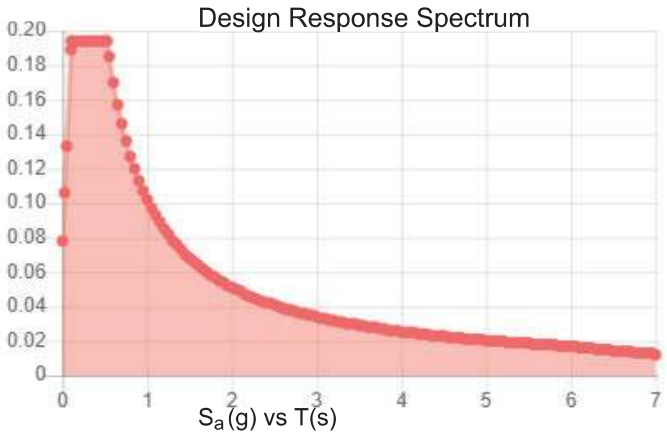
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.182	S_{DS} :	0.194
S_1 :	0.064	S_{D1} :	0.102
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.092
S_{MS} :	0.292	PGA_M :	0.148
S_{M1} :	0.153	F_{PGA} :	1.6
		I_e :	1

Seismic Design Category B





Data Accessed: Thu Oct 31 2019

Date Source: USGS Seismic Design Maps based on ASCE/SEI 7-10, incorporating Supplement 1 and errata of March 31, 2013, and ASCE/SEI 7-10 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-10 Ch. 21 are available from USGS.

Ice

Results:

Ice Thickness:	1.00 in.
Concurrent Temperature:	5 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Thu Oct 31 2019

Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 50-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

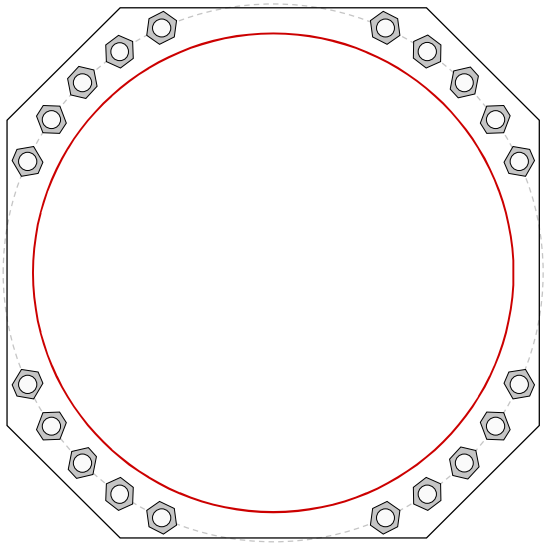
Monopole Base Plate Connection

Site Info	
BU #	803175
Site Name	New Britain 3 CAC 803
Order #	506855 Rev. 0

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	1.25

Applied Loads	
Moment (kip-ft)	5206.80
Axial Force (kips)	61.10
Shear Force (kips)	39.73

**TIA-222-H Section 15.5 Applied*



Connection Properties

Anchor Rod Data

(20) 2-1/4" ø bolts (A615-75 N; Fy=75 ksi, Fu=100 ksi) on 67" BC

Anchor Spacing: 6 in

Base Plate Data

66" OD x 3" Plate (A572-50; Fy=50 ksi, Fu=65 ksi)

Stiffener Data

N/A

Pole Data

59.61" x 0.5" 18-sided pole (A607-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

Anchor Rod Summary *(units of kips, kip-in)*

Pu_c = 189.48	ϕPn_c = 243.75	**Stress Rating**
Vu = 1.99	ϕVn = 73.13	**74.1%**
Mu = n/a	ϕMn = n/a	**Pass**

Base Plate Summary

Max Stress (ksi):	32.06	(Flexural)
Allowable Stress (ksi):	45	
Stress Rating:	**67.9%**	**Pass**

Pier and Pad Foundation

BU # :	803175
Site Name:	CT New Britain 3 C
App. Number:	506855 Rev. 0

TIA-222 Revision:	H
Tower Type:	Monopole

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

Superstructure Analysis Reactions

Compression, P_{comp}:	61	kips
Base Shear, Vu_comp:	40	kips
Moment, M_u:	5207	ft-kips
Tower Height, **H**:	188	ft
BP Dist. Above Fdn, bp_{dist}:	3.75	in

Pier Properties

Pier Shape:	Square	
Pier Diameter, **dpier**:	8	ft
Ext. Above Grade, **E**:	1.0833	ft
Pier Rebar Size, **Sc**:	11	
Pier Rebar Quantity, **mc**:	36	
Pier Tie/Spiral Size, **St**:	5	
Pier Tie/Spiral Quantity, **mt**:	12	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier}:	4	in

Pad Properties

Depth, **D**:	5.9167	ft
Pad Width, **W**:	26	ft
Pad Thickness, **T**:	3	ft
Pad Rebar Size (Bottom), **Sp**:	11	
Pad Rebar Quantity (Bottom), **mp**:	33	
Pad Clear Cover, cc_{pad}:	4	in

Material Properties

Rebar Grade, **Fy**:	60	ksi
Concrete Compressive Strength, **F'c**:	3	ksi
Dry Concrete Density, δc:	150	pcf

Soil Properties

Total Soil Unit Weight, γ:	110	pcf
Ultimate Gross Bearing, Qult:	12.000	ksf
Cohesion, **Cu**:	0.000	ksf
Friction Angle, φ:	30	degrees
SPT Blow Count, N_{blows}:		
Base Friction, μ:		
Neglected Depth, **N**:	3.33	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, **gw**:	17.75	ft

<--Toggle between Gross and Net

Foundation Analysis Checks

	Capacity	Demand	Rating*	Check
Lateral (Sliding) (kips)	221.86	40.00	**17.2%**	**Pass**
Bearing Pressure (ksf)	9.00	3.75	**41.7%**	**Pass**
*Overturning (kip*ft)*	6586.28	5499.50	**83.5%**	**Pass**
*Pier Flexure (Comp.) (kip*ft)*	9856.86	5367.00	**51.9%**	**Pass**
Pier Compression (kip)	30551.04	107.08	**0.3%**	**Pass**
*Pad Flexure (kip*ft)*	6473.47	2645.75	**38.9%**	**Pass**
Pad Shear - 1-way (kips)	766.05	396.59	**49.3%**	**Pass**
Pad Shear - 2-way (Comp) (ksi)	0.164	0.000	**0.0%**	**Pass**
*Flexural 2-way (Comp) (kip*ft)*	8464.14	3220.20	**36.2%**	**Pass**

**Rating per TIA-222-H Section 15.5*

Soil Rating*:	**83.5%**
Structural Rating*:	**51.9%**

Version 3.3.0

Exhibit E

Mount Analysis

Date: **October 29, 2019**

Darcy Tarr
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277
(704) 405-6589

Infinigy Engineering, PLLC
1033 Watervliet Shaker Road
Albany, NY 12205
518-690-0790
structural@infinigy.com

Subject:	**Mount Analysis Report**	
Carrier Designation:	**Verizon Wireless Equipment Change-Out**	
	Carrier Site Number:	NG34002
	Carrier Site Name:	NEW BRITAIN 3 CT
Crown Castle Designation:	**Crown Castle BU Number:**	803175
	Crown Castle Site Name:	CT NEW BRITAIN 3 CAC 803175
	Crown Castle JDE Job Number:	592793
	Crown Castle Order Number:	506855 Rev. 0
Engineering Firm Designation:	**Infinigy Engineering, PLLC Report Designation:** 1039-D0002-B	
Site Data:	**167 Coccomo, New Britain, Hartford County, CT, 06051** **Latitude 41°41'11.80" Longitude -72°45'27.80"**	
Structure Information:	**Tower Height & Type:**	**188.0 ft Monopole**
	Mount Elevation:	**146.0 ft**
	Mount Type:	**12.0 ft Sector Frames**

Dear Darcy Tarr,

Infinigy Engineering, PLLC is pleased to submit this **"Mount Analysis Report"** to determine the structural integrity of Verizon Wireless's antenna mounting system with the proposed appurtenance and equipment addition on the abovementioned supporting tower structure. Analysis of the existing supporting tower structure is to be completed by others and therefore is not part of this analysis. Analysis of the antenna mounting system as a tie-off point for fall protection or rigging is not part of this document.

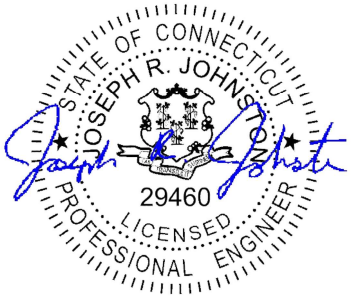
The purpose of the analysis is to determine acceptability of the mount stress level. Based on our analysis we have determined the mount stress level to be:

Sector Frames **Sufficient**

This analysis utilizes an ultimate 3-second gust wind speed of 125 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Mount analysis prepared by: Mukunda Pokharel, E.I.T.

Respectfully Submitted by:
Joe Johnston, P.E.
518-690-0790
jjohnston@infinigy.com
CT PE License No. PEN.0029460



10-29-2019

TABLE OF CONTENTS

1) INTRODUCTION

These are 12.0 ft Sector Frames, designed by Armor Tower.

2) ANALYSIS CRITERIA

Building Code:	2015 IBC / 2018 Connecticut State Building Code
TIA-222 Revision:	TIA-222-H
Risk Category:	II
Ultimate Wind Speed:	125 mph
Exposure Category:	C
Topographic Factor at Base:	1.0
Topographic Factor at Mount:	1.0
Ice Thickness:	2.0 in
Wind Speed with Ice:	50 mph
Seismic S_s:	0.181
Seismic S_1:	0.064
Live Loading Wind Speed:	30 mph
Man Live Load at End-Points:	250 lb
Man Live Load at Mount Pipes:	500 lb

Table 1 - Proposed Equipment Configuration

Mount Centerline (ft)	Antenna Centerline (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Mount / Modification Details
146.0	149.0	3	AMPHENOL	BXA-80063-6BF-EDIN-4	12.0 ft Sector Frames
		6	ANDREW	SBNHH-1D65B	
		3	SAMSUNG TELECOMMUNICATIONS	CBRS	
		3	SAMSUNG TELECOMMUNICATIONS	20W CBRS	
		3	SAMSUNG TELECOMMUNICATIONS	RFV01U-D1A	
		3	SAMSUNG TELECOMMUNICATIONS	RFV01U-D2A	
	145.0	2	Raycap	RHSDC-3315-PF-48	

3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

Document	Remarks	Reference	Source
Crown Application	Verizon Wireless Application	506855 Rev. 0	CCI Sites
Mount Manufacturer Drawings	Armor Tower	CSOTF	Infinigy

3.1) Analysis Method

RISA-3D (Version 17.0.4), a commercially available analysis software package, was used to create a three-dimensional model of the antenna mounting system and calculate member stresses for various loading cases.

Infinigy Wind Load Calculator V2.0.0 a tool internally developed by Infinigy Engineering, was used to calculate wind loading on all appurtenances, dishes and mount members for various loading cases. Selected output from the analysis is included in Appendix B "Software Input Calculations".

This analysis was performed in accordance with Crown Castle's ENG-SOW-10208 *Tower Mount Analysis* (Revision B).

3.2) Assumptions

1) The antenna mounting system was properly fabricated, installed and maintained in good condition in accordance with its original design and manufacturer's specifications.
2) The configuration of antennas, mounts, and other appurtenances are as specified in Table 1 and the referenced drawings.
3) All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.
4) Steel grades have been assumed as follows, unless noted otherwise:

Channel, Solid Round, Angle, Plate	ASTM A572 GR 50
HSS (Rectangular)	ASTM 500 GR C
Pipe	ASTM A500 GR 50
Connection Bolts	ASTM A307

This analysis may be affected if any assumptions are not valid or have been made in error. Infinigy Engineering, PLLC should be notified to determine the effect on the structural integrity of the antenna mounting system.

4) ANALYSIS RESULTS

Table 3 - Mount Component Stresses vs. Capacity (Sector Frames, All Sectors)

Notes	Component	Critical Member	Centerline (ft)	% Capacity	Pass / Fail
1	Mount Pipe(s)	MP9	146.0	35.3	Pass
	Main Horizontal(s)	M223		95.6	Pass
	Arch Frame(s)	M243		96.0	Pass
	Standoff(s)	M317		70.8	Pass
	Standoff Spacer Pipe(s)	M212		96.7	Pass
	Tieback(s)	M335		29.4	Pass
	Mount Connection(s)	--		23.8	Pass

Structure Rating (max from all components) =	96.7%

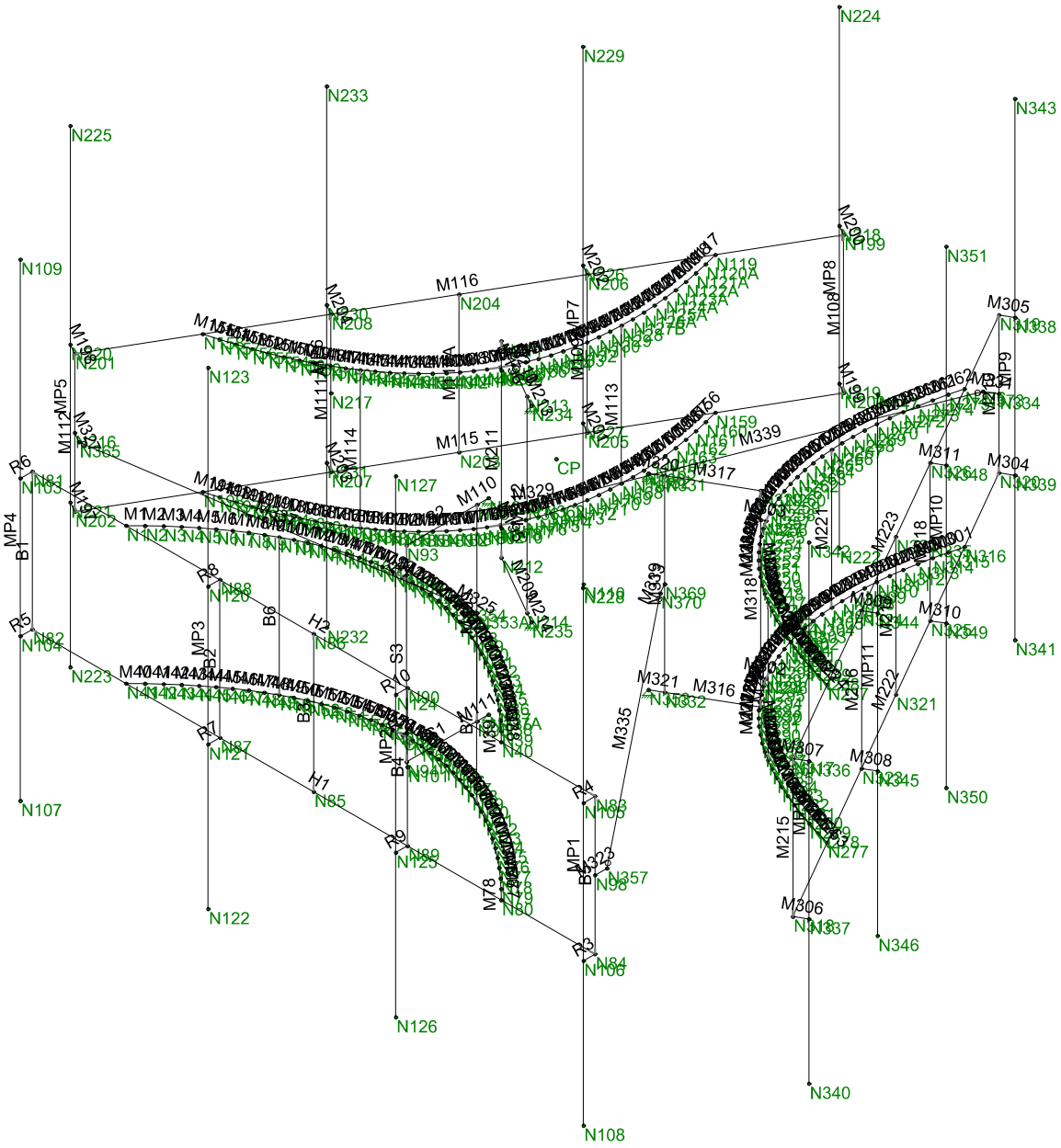
Notes:
1) See additional documentation in "Appendix C - Software Analysis Output" for calculations supporting the % capacity consumed.

4.1) Recommendations

The mount has sufficient capacity to carry the proposed loading configuration. No modifications are required at this time.

APPENDIX A

WIRE FRAME AND RENDERED MODELS



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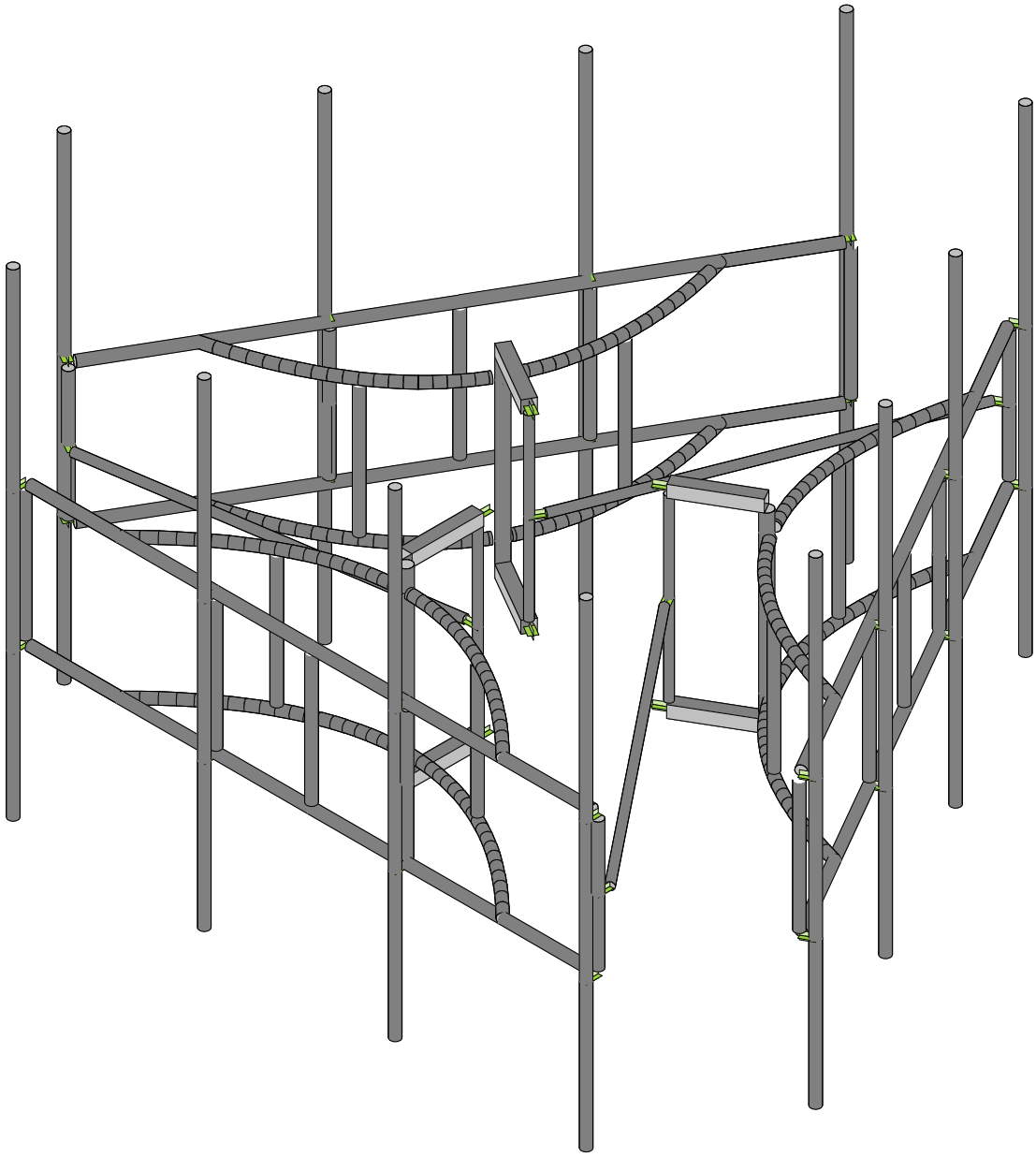

Envelope Only Solution

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APPENDIX B

SOFTWARE INPUT CALCULATIONS

Program Inputs

PROJECT INFORMATION	
Client:	Crown Castle
Carrier:	Verizon
Engineer:	Mukunda Pokharel

SITE INFORMATION		
Risk Category:	II	
Exposure Category:	C	
Topo Category:	1	
Site Class:	D - Stiff Soil	
Ground Elevation:	88.33	ft *Rev H

MOUNT INFORMATION		
Mount Type:	Sector Frames	
Num Sectors:	3	
Centerline AGL:	146.0	ft
Tower Height AGL:	188.0	ft

TOPOGRAPHIC DATA		
Topo Feature:	N/A	
Crest Height:	N/A	ft
Slope Distance:	N/A	ft
Crest Distance:	N/A	ft

FACTORS		
Directionality Fact. (K_d):	0.95	
Ground Ele. Factor (K_e):	1.00	*Rev H Only
Rooftop Speed-Up (K_s):	1.00	*Rev H Only
Topographic Factor (K_{zt}):	1.00	
Gust Effect Factor (G_h):	1.0	

CODE STANDARDS		
Building Code:	2015 IBC	
TIA Standard:	TIA-222-H	
ASCE Standard:	ASCE 7-10	

WIND AND ICE DATA		
Ultimate Wind (V_{ult}):	125	mph
Design Wind (V):	N/A	mph
Ice Wind (V_{ice}):	50	mph
Base Ice Thickness (t_i):	2	in
Flat Pressure:	103.83	psf
Round Pressure:	62.30	psf
Ice Wind Pressure:	9.97	psf

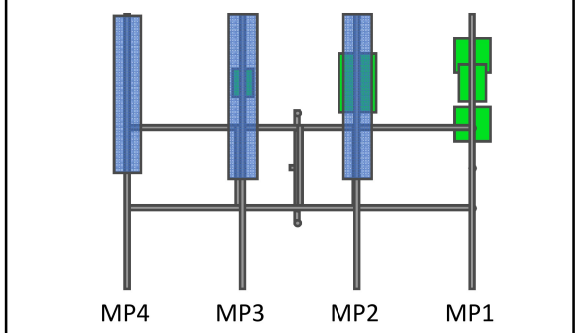
SEISMIC DATA		
Short-Period Accel. (S_s):	0.18	g
1-Second Accel. (S_1):	0.06	g
Short-Period Design (S_{DS}):	0.19	
1-Second Design (S_{D1}):	0.10	
Short-Period Coeff. (F_a):	1.60	
1-Second Coeff. (F_v):	2.40	
Amplification Factor (a_p):	1.00	
Response Mod. (R_p):	2.50	
Overstrength (Ω_o):	1.00	

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless

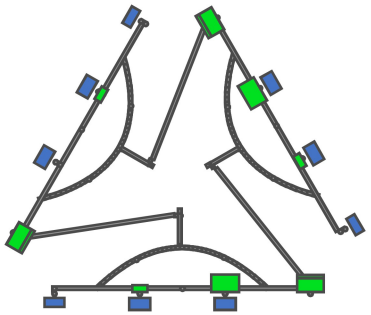
Infinigy Wind Load Calculator V2.0.0

Program Inputs

ELEVATION VIEW



PLAN VIEW



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APPURTENANCE INFORMATION

Appurtenance Name	Elevation	Qty.	K_a	q_z (psf)	EPA_N (ft^2)	EPA_T (ft^2)	Wind F_z (lbs)	Wind F_x (lbs)	Weight (lbs)	Seismic F (lbs)	Member (α sector)
AMPHENOL BXA-80063-6BF-EDIN-4	146.0	3	0.90	51.92	7.26	4.04	339.32	188.53	19.20	1.85	MP4
ANDREW SBNHH-1D65B	146.0	3	0.90	51.92	4.09	3.30	191.32	153.99	40.60	3.92	MP2
ANDREW SBNHH-1D65B	146.0	3	0.90	51.92	4.09	3.30	191.32	153.99	40.60	3.92	MP3
SAMSUNG TELECOMMUNICATIONS CBRS	146.0	3	0.90	51.92	1.53	0.75	71.67	34.88	23.14	2.23	MP1
RAYCAP RHSDC-3315- PF-48	146.0	2	0.90	51.92	3.36	2.19	157.16	102.42	32.00	3.09	MP2
SAMSUNG TELECOMMUNICATIONS 20W CBRS	146.0	3	0.90	51.92	0.86	0.42	40.05	19.64	18.64	1.80	MP3
SAMSUNG TELECOMMUNICATIONS RFV01U-D1A	146.0	3	0.90	51.92	1.88	1.25	87.61	58.41	84.40	8.15	MP1
SAMSUNG TELECOMMUNICATIONS RFV01U-D2A	146.0	3	0.90	51.92	1.88	1.01	87.61	47.31	70.30	6.79	MP1

APPENDIX C

SOFTWARE ANALYSIS OUTPUT

Member Primary Data

	Label	I Joint	J Joint	K Joint	Ro...	Section/Shape	Type	Design List	Material	Design Rules
1	B1	N82	N81			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
2	B2	N87	N88			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
3	B3	N85	N86			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
4	B4	N89	N90			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
5	B5	N84	N83			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
6	B6	N50	N10			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
7	B7	N70	N30			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
8	H1	N84	N82			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
9	H2	N83	N81			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
10	M1	N1	N2			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
11	M2	N2	N3			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
12	M3	N3	N4			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
13	M4	N4	N5			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
14	M5	N5	N6			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
15	M6	N6	N7			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
16	M7	N7	N8			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
17	M8	N8	N9			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
18	M9	N9	N10			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
19	M10	N10	N11			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
20	M11	N11	N12			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
21	M12	N12	N13			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
22	M13	N13	N14			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
23	M14	N14	N15			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
24	M15	N15	N16			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
25	M16	N16	N17			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
26	M17	N17	N18			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
27	M18	N18	N19			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
28	M19	N19	N100			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
29	M20	N100	N21			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
30	M21	N21	N22			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
31	M22	N22	N23			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
32	M23	N23	N24			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
33	M24	N24	N25			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
34	M25	N25	N26			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
35	M26	N26	N27			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
36	M27	N27	N28			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
37	M28	N28	N29			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
38	M29	N29	N30			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
39	M30	N30	N31			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
40	M31	N31	N32			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
41	M32	N32	N33			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
42	M33	N33	N34			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
43	M34	N34	N35			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
44	M35	N35	N36			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
45	M36	N36	N37			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
46	M37	N37	N38			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
47	M38	N38	N39			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
48	M39	N39	N40			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
49	M40	N41	N42			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
50	M41	N42	N43			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
51	M42	N43	N44			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
52	M43	N44	N45			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
53	M44	N45	N46			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
54	M45	N46	N47			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
55	M46	N47	N48			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
56	M47	N48	N49			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Ro...	Section/Shape	Type	Design List	Material	Design Rules
57	M48	N49	N50			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
58	M49	N50	N51			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
59	M50	N51	N52			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
60	M51	N52	N53			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
61	M52	N53	N54			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
62	M53	N54	N55			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
63	M54	N55	N56			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
64	M55	N56	N57			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
65	M56	N57	N58			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
66	M57	N58	N59			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
67	M58	N59	CP2			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
68	M59	CP2	N61			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
69	M60	N61	N62			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
70	M61	N62	N63			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
71	M62	N63	N64			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
72	M63	N64	N65			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
73	M64	N65	N66			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
74	M65	N66	N67			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
75	M66	N67	N68			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
76	M67	N68	N69			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
77	M68	N69	N70			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
78	M69	N70	N71			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
79	M70	N71	N72			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
80	M71	N72	N73			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
81	M72	N73	N74			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
82	M73	N74	N75			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
83	M74	N75	N76			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
84	M75	N76	N77			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
85	M76	N77	N78			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
86	M77	N78	N79			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
87	M78	N79	N80			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
88	R1	N92	CP2			RIGID	None	None	RIGID	Typical
89	R2	N91	N100			RIGID	None	None	RIGID	Typical
90	R3	N84	N106			RIGID	None	None	RIGID	Typical
91	R4	N83	N105			RIGID	None	None	RIGID	Typical
92	R5	N82	N104			RIGID	None	None	RIGID	Typical
93	R6	N81	N103			RIGID	None	None	RIGID	Typical
94	R7	N87	N121			RIGID	None	None	RIGID	Typical
95	R8	N88	N120			RIGID	None	None	RIGID	Typical
96	R9	N89	N125			RIGID	None	None	RIGID	Typical
97	R10	N90	N124			RIGID	None	None	RIGID	Typical
98	MP4	N109	N107			Mount Pipe	Column	Pipe	ASTM A500 Gr. 50	Typical
99	MP3	N123	N122			Mount Pipe	Column	Pipe	ASTM A500 Gr. 50	Typical
100	MP2	N127	N126			Mount Pipe	Column	Pipe	ASTM A500 Gr. 50	Typical
101	MP1	N110	N108			Mount Pipe	Column	Pipe	ASTM A500 Gr. 50	Typical
102	S1	N96	N94			Standoff	Beam	Tube	ASTM A500 Gr. C	Typical
103	S2	N95	N93			Standoff	Beam	Tube	ASTM A500 Gr. C	Typical
104	S3	N94	N93			Standoff Mount Pipe	Column	Pipe	ASTM A500 Gr. 50	Typical
105	M109	N95	N96			Standoff Spacer	Column	Pipe	ASTM A500 Gr. 50	Typical
106	M110	N95	N126B			RIGID	None	None	RIGID	Typical
107	M111	N96	N127A			RIGID	None	None	RIGID	Typical
108	M108	N200	N199			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
109	M109A	N205	N206			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
110	M110A	N203	N204			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
111	M111A	N207	N208			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
112	M112	N202	N201			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
113	M113	N168	N128			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Ro...	Section/Shape	Type	Design List	Material	Design Rules
114	M114	N188	N148			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
115	M115	N202	N200			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
116	M116	N201	N199			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
117	M117	N119	N120A			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
118	M118	N120A	N121A			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
119	M119	N121A	N122A			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
120	M120	N122A	N123A			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
121	M121	N123A	N124A			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
122	M122	N124A	N125A			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
123	M123	N125A	N126A			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
124	M124	N126A	N127B			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
125	M125	N127B	N128			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
126	M126	N128	N129			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
127	M127	N129	N130			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
128	M128	N130	N131			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
129	M129	N131	N132			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
130	M130	N132	N133			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
131	M131	N133	N134			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
132	M132	N134	N135			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
133	M133	N135	N136			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
134	M134	N136	N137			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
135	M135	N137	N138			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
136	M136	N138	N139			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
137	M137	N139	N140			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
138	M138	N140	N141			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
139	M139	N141	N142			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
140	M140	N142	N143			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
141	M141	N143	N144			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
142	M142	N144	N145			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
143	M143	N145	N146			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
144	M144	N146	N147			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
145	M145	N147	N148			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
146	M146	N148	N149			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
147	M147	N149	N150			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
148	M148	N150	N151			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
149	M149	N151	N152			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
150	M150	N152	N153			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
151	M151	N153	N154			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
152	M152	N154	N155			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
153	M153	N155	N156			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
154	M154	N156	N157			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
155	M155	N157	N158			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
156	M156	N159	N160			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
157	M157	N160	N161			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
158	M158	N161	N162			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
159	M159	N162	N163			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
160	M160	N163	N164			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
161	M161	N164	N165			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
162	M162	N165	N166			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
163	M163	N166	N167			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
164	M164	N167	N168			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
165	M165	N168	N169			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
166	M166	N169	N170			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
167	M167	N170	N171			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
168	M168	N171	N172			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
169	M169	N172	N173			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
170	M170	N173	N174			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Ro...	Section/Shape	Type	Design List	Material	Design Rules
171	M171	N174	N175			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
172	M172	N175	N176			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
173	M173	N176	N177			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
174	M174	N177	N178			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
175	M175	N178	N179			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
176	M176	N179	N180			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
177	M177	N180	N181			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
178	M178	N181	N182			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
179	M179	N182	N183			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
180	M180	N183	N184			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
181	M181	N184	N185			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
182	M182	N185	N186			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
183	M183	N186	N187			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
184	M184	N187	N188			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
185	M185	N188	N189			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
186	M186	N189	N190			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
187	M187	N190	N191			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
188	M188	N191	N192			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
189	M189	N192	N193			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
190	M190	N193	N194			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
191	M191	N194	N195			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
192	M192	N195	N196			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
193	M193	N196	N197			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
194	M194	N197	N198			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
195	M195	N210	N178			RIGID	None	None	RIGID	Typical
196	M196	N209	N138			RIGID	None	None	RIGID	Typical
197	M197	N202	N221			RIGID	None	None	RIGID	Typical
198	M198	N201	N220			RIGID	None	None	RIGID	Typical
199	M199	N200	N219			RIGID	None	None	RIGID	Typical
200	M200	N199	N218			RIGID	None	None	RIGID	Typical
201	M201	N205	N227			RIGID	None	None	RIGID	Typical
202	M202	N206	N226			RIGID	None	None	RIGID	Typical
203	M203	N207	N231			RIGID	None	None	RIGID	Typical
204	M204	N208	N230			RIGID	None	None	RIGID	Typical
205	M209	N214	N212			Standoff	Beam	Tube	ASTM A500 Gr. C	Typical
206	M210	N213	N211			Standoff	Beam	Tube	ASTM A500 Gr. C	Typical
207	M211	N212	N211			Standoff Mount Pipe	Column	Pipe	ASTM A500 Gr. 50	Typical
208	M212	N213	N214			Standoff Spacer	Column	Pipe	ASTM A500 Gr. 50	Typical
209	M213	N213	N234			RIGID	None	None	RIGID	Typical
210	M214	N214	N235			RIGID	None	None	RIGID	Typical
211	M215	N318	N317			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
212	M216	N323	N324			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
213	M217	N321	N322			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
214	M218	N325	N326			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
215	M219	N320	N319			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
216	M220	N286	N246			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
217	M221	N306	N266			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
218	M222	N320	N318			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
219	M223	N319	N317			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
220	M224	N237	N238			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
221	M225	N238	N239			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
222	M226	N239	N240			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
223	M227	N240	N241			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
224	M228	N241	N242			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
225	M229	N242	N243			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
226	M230	N243	N244			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
227	M231	N244	N245			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Ro...	Section/Shape	Type	Design List	Material	Design Rules
228	M232	N245	N246			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
229	M233	N246	N247			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
230	M234	N247	N248			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
231	M235	N248	N249			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
232	M236	N249	N250			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
233	M237	N250	N251			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
234	M238	N251	N252			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
235	M239	N252	N253			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
236	M240	N253	N254			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
237	M241	N254	N255			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
238	M242	N255	N256			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
239	M243	N256	N257			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
240	M244	N257	N258			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
241	M245	N258	N259			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
242	M246	N259	N260			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
243	M247	N260	N261			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
244	M248	N261	N262			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
245	M249	N262	N263			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
246	M250	N263	N264			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
247	M251	N264	N265			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
248	M252	N265	N266			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
249	M253	N266	N267			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
250	M254	N267	N268			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
251	M255	N268	N269			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
252	M256	N269	N270			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
253	M257	N270	N271			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
254	M258	N271	N272			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
255	M259	N272	N273			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
256	M260	N273	N274			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
257	M261	N274	N275			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
258	M262	N275	N276			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
259	M263	N277	N278			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
260	M264	N278	N279			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
261	M265	N279	N280			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
262	M266	N280	N281			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
263	M267	N281	N282			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
264	M268	N282	N283			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
265	M269	N283	N284			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
266	M270	N284	N285			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
267	M271	N285	N286			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
268	M272	N286	N287			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
269	M273	N287	N288			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
270	M274	N288	N289			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
271	M275	N289	N290			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
272	M276	N290	N291			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
273	M277	N291	N292			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
274	M278	N292	N293			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
275	M279	N293	N294			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
276	M280	N294	N295			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
277	M281	N295	N296			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
278	M282	N296	N297			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
279	M283	N297	N298			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
280	M284	N298	N299			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
281	M285	N299	N300			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
282	M286	N300	N301			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
283	M287	N301	N302			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
284	M288	N302	N303			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Ro...	Section/Shape	Type	Design List	Material	Design Rules
285	M289	N303	N304			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
286	M290	N304	N305			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
287	M291	N305	N306			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
288	M292	N306	N307			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
289	M293	N307	N308			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
290	M294	N308	N309			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
291	M295	N309	N310			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
292	M296	N310	N311			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
293	M297	N311	N312			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
294	M298	N312	N313			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
295	M299	N313	N314			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
296	M300	N314	N315			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
297	M301	N315	N316			Main Frame	Beam	Pipe	ASTM A500 Gr. 50	Typical
298	M302	N328	N296			RIGID	None	None	RIGID	Typical
299	M303	N327	N256			RIGID	None	None	RIGID	Typical
300	M304	N320	N339			RIGID	None	None	RIGID	Typical
301	M305	N319	N338			RIGID	None	None	RIGID	Typical
302	M306	N318	N337			RIGID	None	None	RIGID	Typical
303	M307	N317	N336			RIGID	None	None	RIGID	Typical
304	M308	N323	N345			RIGID	None	None	RIGID	Typical
305	M309	N324	N344			RIGID	None	None	RIGID	Typical
306	M310	N325	N349			RIGID	None	None	RIGID	Typical
307	M311	N326	N348			RIGID	None	None	RIGID	Typical
308	M316	N332	N330			Standoff	Beam	Tube	ASTM A500 Gr. C	Typical
309	M317	N331	N329			Standoff	Beam	Tube	ASTM A500 Gr. C	Typical
310	M318	N330	N329			Standoff Mount Pipe	Column	Pipe	ASTM A500 Gr. 50	Typical
311	M319	N331	N332			Standoff Spacer	Column	Pipe	ASTM A500 Gr. 50	Typical
312	M320	N331	N352			RIGID	None	None	RIGID	Typical
313	M321	N332	N353			RIGID	None	None	RIGID	Typical
314	M323	N98	N357			RIGID	None	None	RIGID	Typical
315	M325	N353A	N354			RIGID	None	None	RIGID	Typical
316	M327	N216	N365			RIGID	None	None	RIGID	Typical
317	M329	N361	N362			RIGID	None	None	RIGID	Typical
318	M331	N334	N373			RIGID	None	None	RIGID	Typical
319	M333	N369	N370			RIGID	None	None	RIGID	Typical
320	M335	N357	N370			Tieback	Beam	Pipe	ASTM A500 Gr. 50	Typical
321	M337	N365	N354			Tieback	Beam	Pipe	ASTM A500 Gr. 50	Typical
322	M339	N373	N362			Tieback	Beam	Pipe	ASTM A500 Gr. 50	Typical
323	MP8	N224	N222			Mount Pipe	Column	Pipe	ASTM A500 Gr. 50	Typical
324	MP7	N229	N228			Mount Pipe	Column	Pipe	ASTM A500 Gr. 50	Typical
325	MP6	N233	N232			Mount Pipe	Column	Pipe	ASTM A500 Gr. 50	Typical
326	MP5	N225	N223			Mount Pipe	Column	Pipe	ASTM A500 Gr. 50	Typical
327	MP12	N342	N340			Mount Pipe	Column	Pipe	ASTM A500 Gr. 50	Typical
328	MP11	N347	N346			Mount Pipe	Column	Pipe	ASTM A500 Gr. 50	Typical
329	MP10	N351	N350			Mount Pipe	Column	Pipe	ASTM A500 Gr. 50	Typical
330	MP9	N343	N341			Mount Pipe	Column	Pipe	ASTM A500 Gr. 50	Typical

Material Takeoff

	Material	Size	Pieces	Length[in]	Weight[LB]
1	General				
2	RIGID		42	114	0
3	Total General		42	114	0
4					
5	Hot Rolled Steel				
6	ASTM A500 Gr. 50	PIPE_1.5	6	395.4	90.319

Material Takeoff (Continued)

	Material	Size	Pieces	Length[in]	Weight[LB]
7	ASTM A500 Gr. 50	PIPE_2.0	273	3613.5	1124.085
8	ASTM A500 Gr. 50	PIPE_2.5X	3	135	86.461
9	ASTM A500 Gr. C	HSS3X3X3	6	108	62.252
10	Total HR Steel		288	4251.9	1363.117

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
1	Self Weight	DL		-1			32			
2	Wind Load AZI 0	WLZ					64			
3	Wind Load AZI 30	None					64			
4	Wind Load AZI 60	None					64			
5	Wind Load AZI 90	WLX					64			
6	Wind Load AZI 120	None					64			
7	Wind Load AZI 150	None					64			
8	Wind Load AZI 180	None					64			
9	Wind Load AZI 210	None					64			
10	Wind Load AZI 240	None					64			
11	Wind Load AZI 270	None					64			
12	Wind Load AZI 300	None					64			
13	Wind Load AZI 330	None					64			
14	Distr. Wind Load Z	WLZ						330		
15	Distr. Wind Load X	WLX						330		
16	Ice Weight	OL1					32	330		
17	Ice Wind Load AZI 0	OL2					64			
18	Ice Wind Load AZI 30	None					64			
19	Ice Wind Load AZI 60	None					64			
20	Ice Wind Load AZI 90	OL3					64			
21	Ice Wind Load AZI 120	None					64			
22	Ice Wind Load AZI 150	None					64			
23	Ice Wind Load AZI 180	None					64			
24	Ice Wind Load AZI 210	None					64			
25	Ice Wind Load AZI 240	None					64			
26	Ice Wind Load AZI 270	None					64			
27	Ice Wind Load AZI 300	None					64			
28	Ice Wind Load AZI 330	None					64			
29	Distr. Ice Wind Load Z	OL2						330		
30	Distr. Ice Wind Load X	OL3						330		
31	Seismic Load Z	ELZ			-.097		32			
32	Seismic Load X	ELX	-.097				32			
33	Service Live Loads	LL					6			
34	Maintenance Load 1	LL				1				
35	Maintenance Load 2	LL				1				
36	Maintenance Load 3	LL				1				
37	Maintenance Load 4	LL				1				
38	Maintenance Load 5	LL				1				
39	Maintenance Load 6	LL				1				
40	Maintenance Load 7	LL				1				
41	Maintenance Load 8	LL				1				
42	Maintenance Load 9	LL				1				
43	Maintenance Load 10	LL				1				
44	Maintenance Load 11	LL				1				
45	Maintenance Load 12	LL				1				

Load Combinations

	Description	...	...	...	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	...	F.....	F.....	F.....	F.....	F.....	F...
1	1.4DL	...	Y		1	1.4													
2	1.2DL + 1WL AZI 0	...	Y		1	1.2	2	1	14	1	15								
3	1.2DL + 1WL AZI 30	...	Y		1	1.2	3	1	14	.866	15	.5							
4	1.2DL + 1WL AZI 60	...	Y		1	1.2	4	1	14	.5	15	.866							
5	1.2DL + 1WL AZI 90	...	Y		1	1.2	5	1	14		15	1							
6	1.2DL + 1WL AZI 120	...	Y		1	1.2	6	1	14	-.5	15	.866							
7	1.2DL + 1WL AZI 150	...	Y		1	1.2	7	1	14	-.866	15	.5							
8	1.2DL + 1WL AZI 180	...	Y		1	1.2	8	1	14	-1	15								
9	1.2DL + 1WL AZI 210	...	Y		1	1.2	9	1	14	-.866	15	-.5							
10	1.2DL + 1WL AZI 240	...	Y		1	1.2	10	1	14	-.5	15	-.866							
11	1.2DL + 1WL AZI 270	...	Y		1	1.2	11	1	14		15	-1							
12	1.2DL + 1WL AZI 300	...	Y		1	1.2	12	1	14	.5	15	-.866							
13	1.2DL + 1WL AZI 330	...	Y		1	1.2	13	1	14	.866	15	-.5							
14	0.9DL + 1WL AZI 0	...	Y		1	.9	2	1	14	1	15								
15	0.9DL + 1WL AZI 30	...	Y		1	.9	3	1	14	.866	15	.5							
16	0.9DL + 1WL AZI 60	...	Y		1	.9	4	1	14	.5	15	.866							
17	0.9DL + 1WL AZI 90	...	Y		1	.9	5	1	14		15	1							
18	0.9DL + 1WL AZI 120	...	Y		1	.9	6	1	14	-.5	15	.866							
19	0.9DL + 1WL AZI 150	...	Y		1	.9	7	1	14	-.866	15	.5							
20	0.9DL + 1WL AZI 180	...	Y		1	.9	8	1	14	-1	15								
21	0.9DL + 1WL AZI 210	...	Y		1	.9	9	1	14	-.866	15	-.5							
22	0.9DL + 1WL AZI 240	...	Y		1	.9	10	1	14	-.5	15	-.866							
23	0.9DL + 1WL AZI 270	...	Y		1	.9	11	1	14		15	-1							
24	0.9DL + 1WL AZI 300	...	Y		1	.9	12	1	14	.5	15	-.866							
25	0.9DL + 1WL AZI 330	...	Y		1	.9	13	1	14	.866	15	-.5							
26	1.2D + 1.0Di	...	Y		1	1.2	16	1											
27	1.2D + 1.0Di +1.0Wi AZI 0	...	Y		1	1.2	16	1	17	1	29	1	30						
28	1.2D + 1.0Di +1.0Wi AZI 30	...	Y		1	1.2	16	1	18	1	29	.866	30	.5					
29	1.2D + 1.0Di +1.0Wi AZI 60	...	Y		1	1.2	16	1	19	1	29	.5	30	....					
30	1.2D + 1.0Di +1.0Wi AZI 90	...	Y		1	1.2	16	1	20	1	29		30	1					
31	1.2D + 1.0Di +1.0Wi AZI 120	...	Y		1	1.2	16	1	21	1	29	-.5	30	....					
32	1.2D + 1.0Di +1.0Wi AZI 150	...	Y		1	1.2	16	1	22	1	29	-.866	30	.5					
33	1.2D + 1.0Di +1.0Wi AZI 180	...	Y		1	1.2	16	1	23	1	29	-1	30						
34	1.2D + 1.0Di +1.0Wi AZI 210	...	Y		1	1.2	16	1	24	1	29	-.866	30	-.5					
35	1.2D + 1.0Di +1.0Wi AZI 240	...	Y		1	1.2	16	1	25	1	29	-.5	30	-....					
36	1.2D + 1.0Di +1.0Wi AZI 270	...	Y		1	1.2	16	1	26	1	29		30	-1					
37	1.2D + 1.0Di +1.0Wi AZI 300	...	Y		1	1.2	16	1	27	1	29	.5	30	-....					
38	1.2D + 1.0Di +1.0Wi AZI 330	...	Y		1	1.2	16	1	28	1	29	.866	30	-.5					
39	(1.2 + 0.2Sds)DL + 1.0E AZI 0	...	Y		1	1.239	31	1	32										
40	(1.2 + 0.2Sds)DL + 1.0E AZI 30	...	Y		1	1.239	31	.866	32	.5									
41	(1.2 + 0.2Sds)DL + 1.0E AZI 60	...	Y		1	1.239	31	.5	32	.866									
42	(1.2 + 0.2Sds)DL + 1.0E AZI 90	...	Y		1	1.239	31		32	1									
43	(1.2 + 0.2Sds)DL + 1.0E AZI 120	...	Y		1	1.239	31	-.5	32	.866									
44	(1.2 + 0.2Sds)DL + 1.0E AZI 150	...	Y		1	1.239	31	-.866	32	.5									
45	(1.2 + 0.2Sds)DL + 1.0E AZI 180	...	Y		1	1.239	31	-1	32										
46	(1.2 + 0.2Sds)DL + 1.0E AZI 210	...	Y		1	1.239	31	-.866	32	-.5									
47	(1.2 + 0.2Sds)DL + 1.0E AZI 240	...	Y		1	1.239	31	-.5	32	-.866									
48	(1.2 + 0.2Sds)DL + 1.0E AZI 270	...	Y		1	1.239	31		32	-1									
49	(1.2 + 0.2Sds)DL + 1.0E AZI 300	...	Y		1	1.239	31	.5	32	-.866									
50	(1.2 + 0.2Sds)DL + 1.0E AZI 330	...	Y		1	1.239	31	.866	32	-.5									
51	(0.9 - 0.2Sds)DL + 1.0E AZI 0	...	Y		1	.861	31	1	32										
52	(0.9 - 0.2Sds)DL + 1.0E AZI 30	...	Y		1	.861	31	.866	32	.5									
53	(0.9 - 0.2Sds)DL + 1.0E AZI 60	...	Y		1	.861	31	.5	32	.866									
54	(0.9 - 0.2Sds)DL + 1.0E AZI 90	...	Y		1	.861	31		32	1									
55	(0.9 - 0.2Sds)DL + 1.0E AZI 120	...	Y		1	.861	31	-.5	32	.866									
56	(0.9 - 0.2Sds)DL + 1.0E AZI 150	...	Y		1	.861	31	-.866	32	.5									

Load Combinations (Continued)

	Description	...	...	...	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	...	F.....	F.....	F.....	F.....	F.....	F...
57	(0.9 - 0.2Sds)DL + 1.0E AZI 180	...	Y		1	.861	31	-1	32										
58	(0.9 - 0.2Sds)DL + 1.0E AZI 210	...	Y		1	.861	31	-.866	32	-.5									
59	(0.9 - 0.2Sds)DL + 1.0E AZI 240	...	Y		1	.861	31	-.5	32	-.866									
60	(0.9 - 0.2Sds)DL + 1.0E AZI 270	...	Y		1	.861	31		32	-1									
61	(0.9 - 0.2Sds)DL + 1.0E AZI 300	...	Y		1	.861	31	.5	32	-.866									
62	(0.9 - 0.2Sds)DL + 1.0E AZI 330	...	Y		1	.861	31	.866	32	-.5									
63	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 0	...	Y		1	1	2	.23	14	.23	15		33	1.5					
64	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 30	...	Y		1	1	3	.23	14	.2	15	.115	33	1.5					
65	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 60	...	Y		1	1	4	.23	14	.115	15	.2	33	1.5					
66	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 90	...	Y		1	1	5	.23	14		15	.23	33	1.5					
67	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 1...	...	Y		1	1	6	.23	14	-.115	15	.2	33	1.5					
68	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 1...	...	Y		1	1	7	.23	14	-.2	15	.115	33	1.5					
69	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 1...	...	Y		1	1	8	.23	14	-.23	15		33	1.5					
70	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 2...	...	Y		1	1	9	.23	14	-.2	15	-.115	33	1.5					
71	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 2...	...	Y		1	1	10	.23	14	-.115	15	-.2	33	1.5					
72	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 2...	...	Y		1	1	11	.23	14		15	-.23	33	1.5					
73	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 3...	...	Y		1	1	12	.23	14	.115	15	-.2	33	1.5					
74	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 3...	...	Y		1	1	13	.23	14	.2	15	-.115	33	1.5					
75	1.2DL + 1.5LL	...	Y		1	1.2	33	1.5											
76	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) A...	...	Y		1	1.2	34	1.5	2	.058	14	.058	15						
77	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) A...	...	Y		1	1.2	34	1.5	3	.058	14	.05	15	....					
78	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) A...	...	Y		1	1.2	34	1.5	4	.058	14	.029	15	.05					
79	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) A...	...	Y		1	1.2	34	1.5	5	.058	14		15	....					
80	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) A...	...	Y		1	1.2	34	1.5	6	.058	14	-.029	15	.05					
81	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) A...	...	Y		1	1.2	34	1.5	7	.058	14	-.05	15	....					
82	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) A...	...	Y		1	1.2	34	1.5	8	.058	14	-.058	15						
83	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) A...	...	Y		1	1.2	34	1.5	9	.058	14	-.05	15	-....					
84	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) A...	...	Y		1	1.2	34	1.5	10	.058	14	-.029	15	-....					
85	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) A...	...	Y		1	1.2	34	1.5	11	.058	14		15	-....					
86	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) A...	...	Y		1	1.2	34	1.5	12	.058	14	.029	15	-....					
87	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) A...	...	Y		1	1.2	34	1.5	13	.058	14	.05	15	-....					
88	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) A...	...	Y		1	1.2	35	1.5	2	.058	14	.058	15						
89	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) A...	...	Y		1	1.2	35	1.5	3	.058	14	.05	15	....					
90	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) A...	...	Y		1	1.2	35	1.5	4	.058	14	.029	15	.05					
91	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) A...	...	Y		1	1.2	35	1.5	5	.058	14		15	....					
92	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) A...	...	Y		1	1.2	35	1.5	6	.058	14	-.029	15	.05					
93	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) A...	...	Y		1	1.2	35	1.5	7	.058	14	-.05	15	....					
94	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) A...	...	Y		1	1.2	35	1.5	8	.058	14	-.058	15						
95	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) A...	...	Y		1	1.2	35	1.5	9	.058	14	-.05	15	-....					
96	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) A...	...	Y		1	1.2	35	1.5	10	.058	14	-.029	15	-....					
97	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) A...	...	Y		1	1.2	35	1.5	11	.058	14		15	-....					
98	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) A...	...	Y		1	1.2	35	1.5	12	.058	14	.029	15	-....					
99	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) A...	...	Y		1	1.2	35	1.5	13	.058	14	.05	15	-....					
100	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) A...	...	Y		1	1.2	36	1.5	2	.058	14	.058	15						
101	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) A...	...	Y		1	1.2	36	1.5	3	.058	14	.05	15	....					
102	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) A...	...	Y		1	1.2	36	1.5	4	.058	14	.029	15	.05					
103	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) A...	...	Y		1	1.2	36	1.5	5	.058	14		15	....					
104	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) A...	...	Y		1	1.2	36	1.5	6	.058	14	-.029	15	.05					
105	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) A...	...	Y		1	1.2	36	1.5	7	.058	14	-.05	15	....					
106	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) A...	...	Y		1	1.2	36	1.5	8	.058	14	-.058	15						
107	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) A...	...	Y		1	1.2	36	1.5	9	.058	14	-.05	15	-....					
108	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) A...	...	Y		1	1.2	36	1.5	10	.058	14	-.029	15	-....					
109	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) A...	...	Y		1	1.2	36	1.5	11	.058	14		15	-....					
110	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) A...	...	Y		1	1.2	36	1.5	12	.058	14	.029	15	-....					
111	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) A...	...	Y		1	1.2	36	1.5	13	.058	14	.05	15	-....					
112	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) A...	...	Y		1	1.2	37	1.5	2	.058	14	.058	15						
113	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) A...	...	Y		1	1.2	37	1.5	3	.058	14	.05	15	....					

Load Combinations (Continued)

	Description	...	...	...	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	...	F.....	F.....	F.....	F.....	F.....	F.....	F...
114	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) A.....		Y		1	1.2	37	1.5	4	.058	14	.029	15	.05							
115	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) A.....		Y		1	1.2	37	1.5	5	.058	14		15	....							
116	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) A.....		Y		1	1.2	37	1.5	6	.058	14	-.029	15	.05							
117	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) A.....		Y		1	1.2	37	1.5	7	.058	14	-.05	15	....							
118	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) A.....		Y		1	1.2	37	1.5	8	.058	14	-.058	15								
119	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) A.....		Y		1	1.2	37	1.5	9	.058	14	-.05	15	-....							
120	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) A.....		Y		1	1.2	37	1.5	10	.058	14	-.029	15	-....							
121	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) A.....		Y		1	1.2	37	1.5	11	.058	14		15	-....							
122	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) A.....		Y		1	1.2	37	1.5	12	.058	14	.029	15	-....							
123	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) A.....		Y		1	1.2	37	1.5	13	.058	14	.05	15	-....							
124	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) A.....		Y		1	1.2	38	1.5	2	.058	14	.058	15								
125	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) A.....		Y		1	1.2	38	1.5	3	.058	14	.05	15	....							
126	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) A.....		Y		1	1.2	38	1.5	4	.058	14	.029	15	.05							
127	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) A.....		Y		1	1.2	38	1.5	5	.058	14		15	....							
128	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) A.....		Y		1	1.2	38	1.5	6	.058	14	-.029	15	.05							
129	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) A.....		Y		1	1.2	38	1.5	7	.058	14	-.05	15	....							
130	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) A.....		Y		1	1.2	38	1.5	8	.058	14	-.058	15								
131	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) A.....		Y		1	1.2	38	1.5	9	.058	14	-.05	15	-....							
132	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) A.....		Y		1	1.2	38	1.5	10	.058	14	-.029	15	-....							
133	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) A.....		Y		1	1.2	38	1.5	11	.058	14		15	-....							
134	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) A.....		Y		1	1.2	38	1.5	12	.058	14	.029	15	-....							
135	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) A.....		Y		1	1.2	38	1.5	13	.058	14	.05	15	-....							
136	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) A.....		Y		1	1.2	39	1.5	2	.058	14	.058	15								
137	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) A.....		Y		1	1.2	39	1.5	3	.058	14	.05	15	....							
138	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) A.....		Y		1	1.2	39	1.5	4	.058	14	.029	15	.05							
139	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) A.....		Y		1	1.2	39	1.5	5	.058	14		15	....							
140	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) A.....		Y		1	1.2	39	1.5	6	.058	14	-.029	15	.05							
141	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) A.....		Y		1	1.2	39	1.5	7	.058	14	-.05	15	....							
142	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) A.....		Y		1	1.2	39	1.5	8	.058	14	-.058	15								
143	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) A.....		Y		1	1.2	39	1.5	9	.058	14	-.05	15	-....							
144	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) A.....		Y		1	1.2	39	1.5	10	.058	14	-.029	15	-....							
145	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) A.....		Y		1	1.2	39	1.5	11	.058	14		15	-....							
146	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) A.....		Y		1	1.2	39	1.5	12	.058	14	.029	15	-....							
147	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) A.....		Y		1	1.2	39	1.5	13	.058	14	.05	15	-....							
148	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) A.....		Y		1	1.2	40	1.5	2	.058	14	.058	15								
149	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) A.....		Y		1	1.2	40	1.5	3	.058	14	.05	15	....							
150	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) A.....		Y		1	1.2	40	1.5	4	.058	14	.029	15	.05							
151	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) A.....		Y		1	1.2	40	1.5	5	.058	14		15	....							
152	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) A.....		Y		1	1.2	40	1.5	6	.058	14	-.029	15	.05							
153	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) A.....		Y		1	1.2	40	1.5	7	.058	14	-.05	15	....							
154	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) A.....		Y		1	1.2	40	1.5	8	.058	14	-.058	15								
155	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) A.....		Y		1	1.2	40	1.5	9	.058	14	-.05	15	-....							
156	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) A.....		Y		1	1.2	40	1.5	10	.058	14	-.029	15	-....							
157	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) A.....		Y		1	1.2	40	1.5	11	.058	14		15	-....							
158	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) A.....		Y		1	1.2	40	1.5	12	.058	14	.029	15	-....							
159	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) A.....		Y		1	1.2	40	1.5	13	.058	14	.05	15	-....							
160	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) A.....		Y		1	1.2	41	1.5	2	.058	14	.058	15								
161	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) A.....		Y		1	1.2	41	1.5	3	.058	14	.05	15	....							
162	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) A.....		Y		1	1.2	41	1.5	4	.058	14	.029	15	.05							
163	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) A.....		Y		1	1.2	41	1.5	5	.058	14		15	....							
164	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) A.....		Y		1	1.2	41	1.5	6	.058	14	-.029	15	.05							
165	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) A.....		Y		1	1.2	41	1.5	7	.058	14	-.05	15	....							
166	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) A.....		Y		1	1.2	41	1.5	8	.058	14	-.058	15								
167	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) A.....		Y		1	1.2	41	1.5	9	.058	14	-.05	15	-....							
168	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) A.....		Y		1	1.2	41	1.5	10	.058	14	-.029	15	-....							
169	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) A.....		Y		1	1.2	41	1.5	11	.058	14		15	-....							
170	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) A.....		Y		1	1.2	41	1.5	12	.058	14	.029	15	-....							

Load Combinations (Continued)

	Description	...	...	...	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	...	F.....	F.....	F.....	F.....	F.....	F...
171	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) A.....	Y			1	1.2	41	1.5	13	.058	14	.05	15	-....									
172	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) A.....	Y			1	1.2	42	1.5	2	.058	14	.058	15										
173	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) A.....	Y			1	1.2	42	1.5	3	.058	14	.05	15	....									
174	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) A.....	Y			1	1.2	42	1.5	4	.058	14	.029	15	.05									
175	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) A.....	Y			1	1.2	42	1.5	5	.058	14		15	....									
176	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) A.....	Y			1	1.2	42	1.5	6	.058	14	-.029	15	.05									
177	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) A.....	Y			1	1.2	42	1.5	7	.058	14	-.05	15	....									
178	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) A.....	Y			1	1.2	42	1.5	8	.058	14	-.058	15										
179	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) A.....	Y			1	1.2	42	1.5	9	.058	14	-.05	15	-....									
180	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) A.....	Y			1	1.2	42	1.5	10	.058	14	-.029	15	-....									
181	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) A.....	Y			1	1.2	42	1.5	11	.058	14		15	-....									
182	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) A.....	Y			1	1.2	42	1.5	12	.058	14	.029	15	-....									
183	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) A.....	Y			1	1.2	42	1.5	13	.058	14	.05	15	-....									
184	1.2DL + 1.5LM-MP10 + 1SWL (30 mph)	Y			1	1.2	43	1.5	2	.058	14	.058	15										
185	1.2DL + 1.5LM-MP10 + 1SWL (30 mph)	Y			1	1.2	43	1.5	3	.058	14	.05	15	....									
186	1.2DL + 1.5LM-MP10 + 1SWL (30 mph)	Y			1	1.2	43	1.5	4	.058	14	.029	15	.05									
187	1.2DL + 1.5LM-MP10 + 1SWL (30 mph)	Y			1	1.2	43	1.5	5	.058	14		15	....									
188	1.2DL + 1.5LM-MP10 + 1SWL (30 mph)	Y			1	1.2	43	1.5	6	.058	14	-.029	15	.05									
189	1.2DL + 1.5LM-MP10 + 1SWL (30 mph)	Y			1	1.2	43	1.5	7	.058	14	-.05	15	....									
190	1.2DL + 1.5LM-MP10 + 1SWL (30 mph)	Y			1	1.2	43	1.5	8	.058	14	-.058	15										
191	1.2DL + 1.5LM-MP10 + 1SWL (30 mph)	Y			1	1.2	43	1.5	9	.058	14	-.05	15	-....									
192	1.2DL + 1.5LM-MP10 + 1SWL (30 mph)	Y			1	1.2	43	1.5	10	.058	14	-.029	15	-....									
193	1.2DL + 1.5LM-MP10 + 1SWL (30 mph)	Y			1	1.2	43	1.5	11	.058	14		15	-....									
194	1.2DL + 1.5LM-MP10 + 1SWL (30 mph)	Y			1	1.2	43	1.5	12	.058	14	.029	15	-....									
195	1.2DL + 1.5LM-MP10 + 1SWL (30 mph)	Y			1	1.2	43	1.5	13	.058	14	.05	15	-....									
196	1.2DL + 1.5LM-MP11 + 1SWL (30 mph)	Y			1	1.2	44	1.5	2	.058	14	.058	15										
197	1.2DL + 1.5LM-MP11 + 1SWL (30 mph)	Y			1	1.2	44	1.5	3	.058	14	.05	15	....									
198	1.2DL + 1.5LM-MP11 + 1SWL (30 mph)	Y			1	1.2	44	1.5	4	.058	14	.029	15	.05									
199	1.2DL + 1.5LM-MP11 + 1SWL (30 mph)	Y			1	1.2	44	1.5	5	.058	14		15	....									
200	1.2DL + 1.5LM-MP11 + 1SWL (30 mph)	Y			1	1.2	44	1.5	6	.058	14	-.029	15	.05									
201	1.2DL + 1.5LM-MP11 + 1SWL (30 mph)	Y			1	1.2	44	1.5	7	.058	14	-.05	15	....									
202	1.2DL + 1.5LM-MP11 + 1SWL (30 mph)	Y			1	1.2	44	1.5	8	.058	14	-.058	15										
203	1.2DL + 1.5LM-MP11 + 1SWL (30 mph)	Y			1	1.2	44	1.5	9	.058	14	-.05	15	-....									
204	1.2DL + 1.5LM-MP11 + 1SWL (30 mph)	Y			1	1.2	44	1.5	10	.058	14	-.029	15	-....									
205	1.2DL + 1.5LM-MP11 + 1SWL (30 mph)	Y			1	1.2	44	1.5	11	.058	14		15	-....									
206	1.2DL + 1.5LM-MP11 + 1SWL (30 mph)	Y			1	1.2	44	1.5	12	.058	14	.029	15	-....									
207	1.2DL + 1.5LM-MP11 + 1SWL (30 mph)	Y			1	1.2	44	1.5	13	.058	14	.05	15	-....									
208	1.2DL + 1.5LM-MP12 + 1SWL (30 mph)	Y			1	1.2	45	1.5	2	.058	14	.058	15										
209	1.2DL + 1.5LM-MP12 + 1SWL (30 mph)	Y			1	1.2	45	1.5	3	.058	14	.05	15	....									
210	1.2DL + 1.5LM-MP12 + 1SWL (30 mph)	Y			1	1.2	45	1.5	4	.058	14	.029	15	.05									
211	1.2DL + 1.5LM-MP12 + 1SWL (30 mph)	Y			1	1.2	45	1.5	5	.058	14		15	....									
212	1.2DL + 1.5LM-MP12 + 1SWL (30 mph)	Y			1	1.2	45	1.5	6	.058	14	-.029	15	.05									
213	1.2DL + 1.5LM-MP12 + 1SWL (30 mph)	Y			1	1.2	45	1.5	7	.058	14	-.05	15	....									
214	1.2DL + 1.5LM-MP12 + 1SWL (30 mph)	Y			1	1.2	45	1.5	8	.058	14	-.058	15										
215	1.2DL + 1.5LM-MP12 + 1SWL (30 mph)	Y			1	1.2	45	1.5	9	.058	14	-.05	15	-....									
216	1.2DL + 1.5LM-MP12 + 1SWL (30 mph)	Y			1	1.2	45	1.5	10	.058	14	-.029	15	-....									
217	1.2DL + 1.5LM-MP12 + 1SWL (30 mph)	Y			1	1.2	45	1.5	11	.058	14		15	-....									
218	1.2DL + 1.5LM-MP12 + 1SWL (30 mph)	Y			1	1.2	45	1.5	12	.058	14	.029	15	-....									

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-in]	LC	MY [lb-in]	LC	MZ [lb-in]	LC
1	N126B	max	1777.885	15	2070.709	38	1741.598	15	0	218	0	218	0	218
2		min	-2363.034	9	-96.885	19	-4096.565	34	0	1	0	1	0	1
3	N127A	max	1541.745	113	2019.01	32	3946.002	29	0	218	0	218	0	218
4		min	-930.276	21	59.93	14	-442.197	22	0	1	0	1	0	1

Envelope Joint Reactions (Continued)

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-in]	LC	MY [lb-in]	LC	MZ [lb-in]	LC
5	N234	max	3964.505	30	1970.833	34	1571.965	37	0	218	0	218	0	218
6		min	-2510.567	23	-174.508	16	-904.782	18	0	1	0	1	0	1
7	N235	max	934.27	18	1927.806	29	940.554	22	0	218	0	218	0	218
8		min	-3790.298	37	15.986	22	-1528.62	126	0	1	0	1	0	1
9	N352	max	818.183	18	2050.219	30	3698.213	13	0	218	0	218	0	218
10		min	-2986.866	37	-74.485	24	-2488.59	19	0	1	0	1	0	1
11	N353	max	2940.032	34	1992.554	37	972.503	25	0	218	0	218	0	218
12		min	-358.845	16	63.632	18	-2872.904	33	0	1	0	1	0	1
13	Totals:	max	6425.198	17	11351.541	28	6501.001	14						
14		min	-6425.223	11	1996.464	55	-6500.976	20						

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

	Member	Shape	Code Check	Lo...	LC	Shear ...	Lo...	...	...	phi*P...	phi*P...	phi*...	phi*...	Cb	Eqn
1	M212	PIPE_1.5	.967	22.5	21	.263	22.5		8	2308...	33705	18945	18945	1.6...	H1-...
2	M243	PIPE_2.0	.960	0	2	.286	0			...	4589...	45900	32085	32085	1.0...	H1-...
3	M223	PIPE_2.0	.956	22....	2	.217	22....			...	4314...	45900	32085	32085	1.4...	H1-...
4	M116	PIPE_2.0	.954	22....	6	.201	22....			...	4314...	45900	32085	32085	1.5...	H1-...
5	M136	PIPE_2.0	.937	0	6	.272	0			...	4589...	45900	32085	32085	1.0...	H1-...
6	M244	PIPE_2.0	.917	0	2	.248	0			...	4588...	45900	32085	32085	1.0...	H1-...
7	M109	PIPE_1.5	.913	22.5	13	.280	22.5			...	2308...	33705	18945	18945	1.7...	H1-...
8	M20	PIPE_2.0	.907	0	10	.285	0			...	4589...	45900	32085	32085	1.0...	H1-...
9	M222	PIPE_2.0	.895	22....	9	.209	22....			...	4314...	45900	32085	32085	1.4...	H1-...
10	M137	PIPE_2.0	.895	0	6	.236	0			...	4588...	45900	32085	32085	1.0...	H1-...
11	H2	PIPE_2.0	.885	22....	10	.213	22....			...	4314...	45900	32085	32085	1.5...	H1-...
12	M115	PIPE_2.0	.873	22....	12	.195	22....			...	4314...	45900	32085	32085	1.4...	H1-...
13	M21	PIPE_2.0	.866	0	10	.247	0			...	4588...	45900	32085	32085	1.0...	H1-...
14	M319	PIPE_1.5	.834	22.5	17	.261	22.5		4	2308...	33705	18945	18945	1.7...	H1-...
15	H1	PIPE_2.0	.783	22....	5	.204	22....			...	4314...	45900	32085	32085	1.4...	H1-...
16	M318	PIPE_2.5X	.781	40....	2	.835	45		3	8695...	94500	79650	79650	3.1...	H3-6
17	M282	PIPE_2.0	.765	0	33	.266	0			...	4589...	45900	32085	32085	1.0...	H1-...
18	M245	PIPE_2.0	.762	0	2	.214	0			...	4588...	45900	32085	32085	1.0...	H1-...
19	M211	PIPE_2.5X	.748	40....	6	.782	45		6	8695...	94500	79650	79650	1.9...	H3-6
20	M138	PIPE_2.0	.744	0	6	.204	0			...	4588...	45900	32085	32085	1.0...	H1-...
21	M59	PIPE_2.0	.744	0	29	.262	0			...	4589...	45900	32085	32085	1.0...	H1-...
22	M175	PIPE_2.0	.735	0	37	.253	0			...	4589...	45900	32085	32085	1.0...	H1-...
23	M283	PIPE_2.0	.733	0	33	.230	0			...	4588...	45900	32085	32085	1.0...	H1-...
24	M22	PIPE_2.0	.718	0	10	.214	0			...	4588...	45900	32085	32085	1.0...	H1-...
25	M60	PIPE_2.0	.712	0	29	.228	0			...	4588...	45900	32085	32085	1.0...	H1-...
26	M317	HSS3X3X3	.708	18	3	.240	0	z		...	8351...	85050	88650	88650	1.8...	H1-...
27	M176	PIPE_2.0	.704	0	37	.219	0			...	4588...	45900	32085	32085	1.0...	H1-...
28	M242	PIPE_2.0	.700	.652	10	.236	.652			...	4589...	45900	32085	32085	1.0...	H1-...
29	S3	PIPE_2.5X	.685	40....	10	.762	45			...	8695...	94500	79650	79650	2.9...	H3-6
30	M210	HSS3X3X3	.684	18	6	.250	0	z		...	8351...	85050	88650	88650	1.7...	H1-...
31	M241	PIPE_2.0	.680	2.4...	10	.211	2.4...			...	4588...	45900	32085	32085	1.0...	H1-...
32	S2	HSS3X3X3	.666	18	10	.251	0	z		...	8351...	85050	88650	88650	1.7...	H1-...
33	M221	PIPE_2.0	.657	32.6	27	.130	32.6			...	4314...	45900	32085	32085	2.1...	H1-...
34	B7	PIPE_2.0	.657	32.6	35	.130	32.6			...	4314...	45900	32085	32085	2.2...	H1-...
35	M316	HSS3X3X3	.631	18	34	.248	0	z		...	8351...	85050	88650	88650	1.7...	H1-...
36	M19	PIPE_2.0	.628	.652	6	.233	.652			...	4589...	45900	32085	32085	1.0...	H1-...
37	M246	PIPE_2.0	.622	0	2	.185	0			...	4588...	45900	32085	32085	1.09	H1-...
38	M114	PIPE_2.0	.612	32.6	31	.120	32.6			...	4314...	45900	32085	32085	2.2...	H1-...
39	M18	PIPE_2.0	.609	2.4...	6	.208	2.4...			...	4588...	45900	32085	32085	1.08	H1-...
40	M139	PIPE_2.0	.609	0	6	.177	0			...	4588...	45900	32085	32085	1.09	H1-...
41	M135	PIPE_2.0	.609	.652	2	.220	.652			...	4589...	45900	32085	32085	1.02	H1-...
42	M240	PIPE_2.0	.608	2.49	10	.189	2.49			...	4588...	45900	32085	32085	1.0...	H1-...

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

	Member	Shape	Code Check	Lo...	LC	Shear ...	Lo...	...	...	phi*P...	phi*P...	phi*...	phi*...	Cb	Eqn
43	M284	PIPE_2.0	.607	0	33	.199	0		...	4588...	45900	32085	32085	1.0...	H1-...
44	S1	HSS3X3X3	.603	18	29	.260	0	z	...	8351...	85050	88650	88650	1.7...	H1-...
45	M262	PIPE_2.0	.600	3.4...	3	.121	0		...	4586...	45900	32085	32085	1.1...	H1-...
46	M209	HSS3X3X3	.595	18	37	.257	0	z	8	8351...	85050	88650	88650	1.7...	H1-...
47	M134	PIPE_2.0	.591	2.4...	2	.196	2.4...		...	4588...	45900	32085	32085	1.0...	H1-...
48	M61	PIPE_2.0	.588	0	29	.197	0		...	4588...	45900	32085	32085	1.0...	H1-...
49	M23	PIPE_2.0	.584	0	10	.186	0		...	4588...	45900	32085	32085	1.0...	H1-...
50	M177	PIPE_2.0	.583	0	37	.189	0		...	4588...	45900	32085	32085	1.0...	H1-...
51	M155	PIPE_2.0	.576	3.4...	6	.107	0		...	4586...	45900	32085	32085	1.1...	H1-...
52	M301	PIPE_2.0	.549	3.4...	9	.121	0		...	4586...	45900	32085	32085	1.1...	H1-...
53	M17	PIPE_2.0	.540	2.49	6	.186	2.49		...	4588...	45900	32085	32085	1.0...	H1-...
54	M239	PIPE_2.0	.538	2.5...	10	.170	2.5...		...	4588...	45900	32085	32085	1.1...	H1-...
55	M133	PIPE_2.0	.535	2.49	13	.175	2.49		...	4588...	45900	32085	32085	1.0...	H1-...
56	M39	PIPE_2.0	.534	3.4...	11	.121	0		...	4586...	45900	32085	32085	1.1...	H1-...
57	M220	PIPE_2.0	.524	32.6	33	.121	32.6		...	4314...	45900	32085	32085	2.2...	H1-...
58	B6	PIPE_2.0	.524	32.6	29	.121	32.6		...	4314...	45900	32085	32085	2.2...	H1-...
59	M194	PIPE_2.0	.519	3.4...	13	.106	0		...	4586...	45900	32085	32085	1.13	H1-...
60	M30	PIPE_2.0	.519	0	36	.152	0		...	4587...	45900	32085	32085	1.0...	H1-...
61	M253	PIPE_2.0	.517	0	28	.152	0		...	4587...	45900	32085	32085	1.07	H1-...
62	M281	PIPE_2.0	.515	.652	28	.222	.652		...	4589...	45900	32085	32085	1.0...	H1-...
63	M292	PIPE_2.0	.509	0	35	.151	0		...	4587...	45900	32085	32085	1.0...	H1-...
64	M69	PIPE_2.0	.508	0	31	.151	0		...	4587...	45900	32085	32085	1.0...	H1-...
65	M113	PIPE_2.0	.506	32.6	37	.115	32.6		...	4314...	45900	32085	32085	1.4...	H1-...
66	M174	PIPE_2.0	.500	.652	31	.213	.652		...	4589...	45900	32085	32085	1.0...	H1-...
67	M247	PIPE_2.0	.497	0	2	.162	0		...	4588...	45900	32085	32085	1.1...	H1-...
68	M280	PIPE_2.0	.497	2.4...	28	.197	2.4...		...	4588...	45900	32085	32085	1.0...	H1-...
69	M261	PIPE_2.0	.494	3.35	3	.111	0		...	4586...	45900	32085	32085	1.16	H1-...
70	M132	PIPE_2.0	.493	2.5...	13	.158	2.5...		...	4588...	45900	32085	32085	1.1...	H1-...
71	M178	PIPE_2.0	.491	0	12	.163	0		...	4588...	45900	32085	32085	1.0...	H1-...
72	M285	PIPE_2.0	.487	0	33	.172	0		...	4588...	45900	32085	32085	1.1...	H1-...
73	M140	PIPE_2.0	.487	0	6	.154	0		...	4588...	45900	32085	32085	1.1...	H1-...
74	M238	PIPE_2.0	.485	2.5...	21	.156	2.5...		...	4588...	45900	32085	32085	1.1...	H1-...
75	M146	PIPE_2.0	.483	0	32	.136	0		...	4587...	45900	32085	32085	1.0...	H1-...
76	M58	PIPE_2.0	.483	.652	36	.223	.652		...	4589...	45900	32085	32085	1.0...	H1-...
77	M78	PIPE_2.0	.483	3.4...	5	.119	0		...	4586...	45900	32085	32085	1.13	H1-...
78	M173	PIPE_2.0	.482	2.4...	31	.188	2.4...		...	4588...	45900	32085	32085	1.0...	H1-...
79	M185	PIPE_2.0	.476	0	27	.136	0		...	4587...	45900	32085	32085	1.0...	H1-...
80	M16	PIPE_2.0	.473	2.5...	6	.168	2.5...		...	4588...	45900	32085	32085	1.1...	H1-...
81	M300	PIPE_2.0	.472	3.35	9	.111	0		...	4586...	45900	32085	32085	1.1...	H1-...
82	M62	PIPE_2.0	.471	0	29	.171	0		...	4588...	45900	32085	32085	1.1...	H1-...
83	M57	PIPE_2.0	.465	2.4...	36	.198	2.4...		...	4588...	45900	32085	32085	1.0...	H1-...
84	M24	PIPE_2.0	.464	0	10	.162	0		...	4588...	45900	32085	32085	1.1...	H1-...
85	M154	PIPE_2.0	.463	3.35	6	.098	0		...	4586...	45900	32085	32085	1.1...	H1-...
86	M279	PIPE_2.0	.456	2.49	9	.176	2.49		...	4588...	45900	32085	32085	1.0...	H1-...
87	M131	PIPE_2.0	.452	2.5...	25	.144	2.5...		...	4588...	45900	32085	32085	1.1...	H1-...
88	M278	PIPE_2.0	.449	2.5...	9	.159	2.5...		...	4588...	45900	32085	32085	1.11	H1-...
89	M219	PIPE_2.0	.447	16.3	3	.212	16.3		3	4314...	45900	32085	32085	1.8...	H1-...
90	M193	PIPE_2.0	.445	3.35	13	.098	0		...	4586...	45900	32085	32085	1.1...	H1-...
91	M31	PIPE_2.0	.442	0	36	.133	0		...	4587...	45900	32085	32085	1.0...	H1-...
92	M254	PIPE_2.0	.441	0	28	.134	0		...	4587...	45900	32085	32085	1.0...	H1-...
93	M237	PIPE_2.0	.440	2.5...	21	.145	2.5...		...	4588...	45900	32085	32085	1.2...	H1-...
94	M277	PIPE_2.0	.439	2.5...	9	.146	2.5...		...	4588...	45900	32085	32085	1.1...	H1-...
95	M38	PIPE_2.0	.437	3.35	11	.111	0		...	4586...	45900	32085	32085	1.1...	H1-...
96	M293	PIPE_2.0	.434	0	35	.132	0		...	4587...	45900	32085	32085	1.0...	H1-...
97	M70	PIPE_2.0	.434	0	31	.132	0		...	4587...	45900	32085	32085	1.0...	H1-...
98	M172	PIPE_2.0	.429	2.49	13	.167	2.49		...	4588...	45900	32085	32085	1.0...	H1-...
99	M171	PIPE_2.0	.424	2.5...	13	.150	2.5...		...	4588...	45900	32085	32085	1.1...	H1-...

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

	Member	Shape	Code Check	Lo...	LC	Shear ...	Lo...	...	...	phi*P...	phi*P...	phi*...	phi*...	Cb	Eqn
100	M276	PIPE_2.0	.424	2.5...	9	.137	2.5...		...	4588...	45900	32085	32085	1.2...	H1-...
101	M15	PIPE_2.0	.423	2.5...	17	.154	2.5...		...	4588...	45900	32085	32085	1.1...	H1-...
102	M130	PIPE_2.0	.421	2.5...	24	.134	2.5...		...	4588...	45900	32085	32085	1.2...	H1-...
103	M112	PIPE_2.0	.420	16.3	25	.209	16.3	6		4314...	45900	32085	32085	1.7...	H1-...
104	M170	PIPE_2.0	.418	2.5...	12	.137	2.5...		...	4588...	45900	32085	32085	1.2...	H1-...
105	M77	PIPE_2.0	.413	3.35	5	.110	0		...	4586...	45900	32085	32085	1.1...	H1-...
106	M147	PIPE_2.0	.412	0	32	.119	0		...	4587...	45900	32085	32085	1.0...	H1-...
107	M179	PIPE_2.0	.412	0	12	.142	0		...	4588...	45900	32085	32085	1.1...	H1-...
108	M169	PIPE_2.0	.408	2.5...	12	.128	2.5...		...	4588...	45900	32085	32085	2.0...	H1-...
109	M186	PIPE_2.0	.407	0	27	.118	0		...	4587...	45900	32085	32085	1.0...	H1-...
110	M260	PIPE_2.0	.407	3.2...	21	.104	0		...	4587...	45900	32085	32085	1.21	H1-...
111	M271	PIPE_2.0	.405	2.8...	33	.142	2.8...		...	4587...	45900	32085	32085	1.0...	H1-...
112	M275	PIPE_2.0	.405	2.6...	9	.131	2.6...		...	4588...	45900	32085	32085	1.5...	H1-...
113	M299	PIPE_2.0	.403	3.2...	9	.105	0		...	4587...	45900	32085	32085	1.3...	H1-...
114	M286	PIPE_2.0	.401	0	8	.151	0		...	4588...	45900	32085	32085	1.1...	H1-...
115	M48	PIPE_2.0	.400	2.8...	29	.140	2.8...		...	4587...	45900	32085	32085	1.0...	H1-...
116	M164	PIPE_2.0	.396	2.8...	37	.133	2.8...		...	4587...	45900	32085	32085	1.0...	H1-...
117	M129	PIPE_2.0	.395	2.6...	24	.128	2.6...		...	4588...	45900	32085	32085	1.4...	H1-...
118	M236	PIPE_2.0	.395	2.6...	21	.138	2.6...		...	4588...	45900	32085	32085	1.5...	H1-...
119	M168	PIPE_2.0	.393	2.6...	12	.123	2.6...		...	4588...	45900	32085	32085	1.4...	H1-...
120	M56	PIPE_2.0	.392	2.49	5	.176	2.49		...	4588...	45900	32085	32085	1.0...	H1-...
121	B5	PIPE_2.0	.391	16.3	11	.190	16.3		...	4314...	45900	32085	32085	1.6...	H1-...
122	M55	PIPE_2.0	.387	2.5...	5	.159	2.5...		...	4588...	45900	32085	32085	1.1...	H1-...
123	M248	PIPE_2.0	.386	0	2	.144	0		...	4588...	45900	32085	32085	1.16	H1-...
124	M232	PIPE_2.0	.382	2.8...	27	.145	2.8...		...	4587...	45900	32085	32085	1.0...	H1-...
125	M14	PIPE_2.0	.382	2.5...	17	.143	2.5...		...	4588...	45900	32085	32085	1.2...	H1-...
126	M9	PIPE_2.0	.382	2.8...	34	.146	2.8...		...	4587...	45900	32085	32085	1.0...	H1-...
127	M274	PIPE_2.0	.381	2.6...	9	.130	2.6...		...	4588...	45900	32085	32085	1.7...	H1-...
128	M153	PIPE_2.0	.380	3.2...	24	.091	0		...	4587...	45900	32085	32085	2.1...	H1-...
129	M141	PIPE_2.0	.380	0	6	.137	0		...	4588...	45900	32085	32085	1.16	H1-...
130	M192	PIPE_2.0	.379	3.2...	13	.092	0		...	4587...	45900	32085	32085	1.3...	H1-...
131	M54	PIPE_2.0	.379	2.5...	5	.146	2.5...		...	4588...	45900	32085	32085	1.1...	H1-...
132	M125	PIPE_2.0	.376	2.8...	30	.138	2.8...		...	4587...	45900	32085	32085	1.0...	H1-...
133	M167	PIPE_2.0	.373	2.6...	12	.121	2.6...		...	4588...	45900	32085	32085	1.2...	H1-...
134	M128	PIPE_2.0	.368	2.6...	24	.125	2.6...		...	4588...	45900	32085	32085	1.9...	H1-...
135	M63	PIPE_2.0	.366	0	4	.149	0		...	4588...	45900	32085	32085	1.1...	H1-...
136	M53	PIPE_2.0	.366	2.5...	5	.136	2.5...		...	4588...	45900	32085	32085	1.2...	H1-...
137	M32	PIPE_2.0	.364	0	35	.119	0		...	4587...	45900	32085	32085	1.1...	H1-...
138	M255	PIPE_2.0	.364	0	37	.120	0		...	4587...	45900	32085	32085	1.1...	H1-...
139	M235	PIPE_2.0	.362	2.6...	20	.135	2.6...		...	4588...	45900	32085	32085	1.9...	H1-...
140	M294	PIPE_2.0	.362	0	28	.118	0		...	4587...	45900	32085	32085	1.1...	H1-...
141	M71	PIPE_2.0	.359	0	36	.118	0		...	4587...	45900	32085	32085	1.1...	H1-...
142	M25	PIPE_2.0	.357	0	10	.145	0		...	4588...	45900	32085	32085	1.1...	H1-...
143	M37	PIPE_2.0	.354	3.2...	17	.104	0		...	4587...	45900	32085	32085	1.2...	H1-...
144	MP9	PIPE_2.0	.353	48...	10	.051	48...		...	9836...	45900	32085	32085	3.09	H1-...
145	M273	PIPE_2.0	.353	2.7...	9	.132	2.7...		...	4588...	45900	32085	32085	1.2...	H1-...
146	M13	PIPE_2.0	.353	2.6...	16	.137	2.6...		...	4588...	45900	32085	32085	1.5...	H1-...
147	M76	PIPE_2.0	.350	3.2...	5	.103	0		...	4587...	45900	32085	32085	1.3...	H1-...
148	M52	PIPE_2.0	.350	2.6...	5	.131	2.6...		...	4588...	45900	32085	32085	1.4...	H1-...
149	M259	PIPE_2.0	.349	3.1...	9	.100	0		...	4587...	45900	32085	32085	1.3...	H1-...
150	M166	PIPE_2.0	.347	2.7...	12	.123	2.7...		...	4588...	45900	32085	32085	1.1...	H1-...
151	M298	PIPE_2.0	.343	3.1...	21	.100	0		...	4587...	45900	32085	32085	2.1...	H1-...
152	M180	PIPE_2.0	.343	0	12	.125	0		...	4588...	45900	32085	32085	1.1...	H1-...
153	M148	PIPE_2.0	.339	0	31	.105	0		...	4587...	45900	32085	32085	1.1...	H1-...
154	M127	PIPE_2.0	.339	2.7...	24	.125	2.7...		...	4588...	45900	32085	32085	1.2...	H1-...
155	M270	PIPE_2.0	.338	2.89	33	.129	2.89		...	4587...	45900	32085	32085	1.1...	H1-...
156	M187	PIPE_2.0	.337	0	31	.105	0		...	4587...	45900	32085	32085	1.1...	H1-...

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

	Member	Shape	Code Check	Lo...	LC	Shear ...	Lo...	...	...	phi*P...	phi*P...	phi*...	phi*...	Cb	Eqn
157	M287	PIPE_2.0	.335	0	8	.134	0		...	4588...	45900	32085	32085	1.1...	H1-...
158	M234	PIPE_2.0	.334	2.7...	2	.136	2.7...		...	4588...	45900	32085	32085	1.7...	H1-...
159	M47	PIPE_2.0	.334	2.89	29	.128	2.89		...	4587...	45900	32085	32085	1.1...	H1-...
160	M339	PIPE_1.5	.332	42....	3	.050	0		...	8785...	33705	18945	18945	1.1...	H1-...
161	M163	PIPE_2.0	.331	2.89	37	.122	2.89		...	4587...	45900	32085	32085	1.1...	H1-...
162	M51	PIPE_2.0	.331	2.6...	5	.129	2.6...		...	4588...	45900	32085	32085	2.06	H1-...
163	M263	PIPE_2.0	.330	0	34	.127	3.4...		...	4586...	45900	32085	32085	1.1...	H1-...
164	MP5	PIPE_2.0	.329	48....	13	.052	48....	4	...	9836...	45900	32085	32085	1.8...	H1-...
165	M12	PIPE_2.0	.329	2.6...	16	.134	2.6...		...	4588...	45900	32085	32085	1.7...	H1-...
166	M152	PIPE_2.0	.326	3.1...	13	.087	0		...	4587...	45900	32085	32085	1.3...	H1-...
167	M337	PIPE_1.5	.324	42....	7	.050	0		...	8785...	33705	18945	18945	1.1...	H1-...
168	M40	PIPE_2.0	.322	0	30	.125	3.4...		...	4586...	45900	32085	32085	1.1...	H1-...
169	M191	PIPE_2.0	.321	3.1...	25	.088	0		...	4587...	45900	32085	32085	2.2...	H1-...
170	M272	PIPE_2.0	.321	2.7...	9	.138	2.7...		...	4587...	45900	32085	32085	1.1...	H1-...
171	M8	PIPE_2.0	.321	2.89	34	.133	2.89		...	4587...	45900	32085	32085	1.1...	H1-...
172	M231	PIPE_2.0	.321	2.89	38	.132	2.89		...	4587...	45900	32085	32085	1.1...	H1-...
173	M165	PIPE_2.0	.317	2.7...	12	.129	2.7...		...	4587...	45900	32085	32085	1.1...	H1-...
174	M124	PIPE_2.0	.316	2.89	30	.125	2.89		...	4587...	45900	32085	32085	1.1...	H1-...
175	M156	PIPE_2.0	.315	0	37	.119	3.4...		...	4586...	45900	32085	32085	1.1...	H1-...
176	M126	PIPE_2.0	.312	2.7...	6	.129	2.7...		...	4587...	45900	32085	32085	1.2...	H1-...
177	M50	PIPE_2.0	.310	2.7...	4	.131	2.7...		...	4588...	45900	32085	32085	1.1...	H1-...
178	MP1	PIPE_2.0	.310	48....	6	.051	48....		...	9836...	45900	32085	32085	2.1...	H1-...
179	M233	PIPE_2.0	.309	2.7...	2	.140	2.7...		...	4587...	45900	32085	32085	1.2...	H1-...
180	M11	PIPE_2.0	.307	2.7...	10	.135	2.7...		...	4588...	45900	32085	32085	2.0...	H1-...
181	M258	PIPE_2.0	.305	3.1...	10	.099	0		...	4587...	45900	32085	32085	1.1...	H1-...
182	M64	PIPE_2.0	.304	0	4	.132	0		...	4588...	45900	32085	32085	1.1...	H1-...
183	M224	PIPE_2.0	.303	0	28	.128	3.4...		...	4586...	45900	32085	32085	1.1...	H1-...
184	M36	PIPE_2.0	.303	3.1...	5	.100	0		...	4587...	45900	32085	32085	1.3...	H1-...
185	M1	PIPE_2.0	.301	0	30	.127	3.4...		...	4586...	45900	32085	32085	1.1...	H1-...
186	M249	PIPE_2.0	.299	0	20	.132	0		...	4588...	45900	32085	32085	1.0...	H1-...
187	M142	PIPE_2.0	.298	0	24	.125	0		...	4588...	45900	32085	32085	1.0...	H1-...
188	M75	PIPE_2.0	.297	3.1...	17	.100	0		...	4587...	45900	32085	32085	2.2...	H1-...
189	M297	PIPE_2.0	.295	3.1...	21	.099	0		...	4587...	45900	32085	32085	1.4...	H1-...
190	M335	PIPE_1.5	.294	41....	11	.051	86....		...	8785...	33705	18945	18945	1.1...	H1-...
191	M291	PIPE_2.0	.293	2.7...	29	.115	0		...	4588...	45900	32085	32085	1.1...	H1-...
192	M252	PIPE_2.0	.293	2.7...	36	.126	0		...	4588...	45900	32085	32085	1.1...	H1-...
193	M256	PIPE_2.0	.293	0	36	.109	0		...	4587...	45900	32085	32085	1.1...	H1-...
194	M29	PIPE_2.0	.293	2.7...	32	.127	0		...	4588...	45900	32085	32085	1.1...	H1-...
195	M117	PIPE_2.0	.292	0	11	.121	3.4...		...	4586...	45900	32085	32085	1.0...	H1-...
196	M68	PIPE_2.0	.291	2.7...	37	.115	0		...	4588...	45900	32085	32085	1.1...	H1-...
197	M295	PIPE_2.0	.291	0	29	.108	0		...	4587...	45900	32085	32085	1.15	H1-...
198	M33	PIPE_2.0	.289	0	33	.109	0		...	4587...	45900	32085	32085	1.1...	H1-...
199	M72	PIPE_2.0	.287	0	36	.108	0		...	4587...	45900	32085	32085	1.1...	H1-...
200	M49	PIPE_2.0	.287	0	30	.137	2.7...		...	4587...	45900	32085	32085	1.16	H1-...
201	M10	PIPE_2.0	.286	2.7...	10	.139	2.7...		...	4587...	45900	32085	32085	1.1...	H1-...
202	MP8	PIPE_2.0	.285	47.5	4	.070	48....	4	...	9836...	45900	32085	32085	2.7...	H1-...
203	MP4	PIPE_2.0	.285	47.5	8	.071	48....	8	...	9836...	45900	32085	32085	3.0...	H1-...
204	MP12	PIPE_2.0	.285	47.5	12	.071	48....		...	9836...	45900	32085	32085	2.6...	H1-...
205	M181	PIPE_2.0	.284	0	12	.114	0		...	4588...	45900	32085	32085	1.2...	H1-...
206	M151	PIPE_2.0	.281	3.1...	13	.086	0		...	4587...	45900	32085	32085	1.1...	H1-...
207	M288	PIPE_2.0	.279	0	9	.122	0		...	4588...	45900	32085	32085	1.2...	H1-...
208	M257	PIPE_2.0	.276	3.03	10	.102	0		...	4587...	45900	32085	32085	1.1...	H1-...
209	M190	PIPE_2.0	.275	3.1...	25	.087	0		...	4587...	45900	32085	32085	1.3...	H1-...
210	M26	PIPE_2.0	.272	0	16	.132	0		...	4588...	45900	32085	32085	1.0...	H1-...
211	M188	PIPE_2.0	.272	0	32	.095	0		...	4587...	45900	32085	32085	1.1...	H1-...
212	M145	PIPE_2.0	.271	2.7...	28	.119	0		...	4588...	45900	32085	32085	1.1...	H1-...
213	M184	PIPE_2.0	.271	2.7...	33	.107	0		...	4588...	45900	32085	32085	1.1...	H1-...

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

	Member	Shape	Code Check	Lo...	LC	Shear ...	Lo...	...	...	phi*P...	phi*P...	phi*...	phi*...	Cb	Eqn
214	M149	PIPE_2.0	.270	0	28	.095	0		...	4587...	45900	32085	32085	1.1...	H1-...
215	MP2	PIPE_2.0	.269	47.5	8	.070	48....	9	...	9836...	45900	32085	32085	3.7...	H1-...
216	MP10	PIPE_2.0	.269	47.5	12	.069	48....		...	9836...	45900	32085	32085	2.98	H1-...
217	M269	PIPE_2.0	.268	2.9...	33	.121	2.9...		...	4587...	45900	32085	32085	1.1...	H1-...
218	M46	PIPE_2.0	.265	2.9...	29	.120	2.9...		...	4587...	45900	32085	32085	1.1...	H1-...
219	M35	PIPE_2.0	.264	3.1...	6	.099	0		...	4587...	45900	32085	32085	1.1...	H1-...
220	M162	PIPE_2.0	.264	2.9...	37	.113	2.9...		...	4587...	45900	32085	32085	1.1...	H1-...
221	M250	PIPE_2.0	.258	0	21	.125	0		...	4588...	45900	32085	32085	1.1	H1-...
222	M7	PIPE_2.0	.257	2.9...	34	.123	2.9...		...	4587...	45900	32085	32085	1.14	H1-...
223	M230	PIPE_2.0	.257	2.9...	38	.123	2.9...		...	4587...	45900	32085	32085	1.14	H1-...
224	M296	PIPE_2.0	.255	3.03	21	.102	0		...	4587...	45900	32085	32085	1.2	H1-...
225	M123	PIPE_2.0	.255	2.9...	30	.117	2.9...		...	4587...	45900	32085	32085	1.1...	H1-...
226	M74	PIPE_2.0	.253	3.1...	17	.099	0		...	4587...	45900	32085	32085	1.3...	H1-...
227	M65	PIPE_2.0	.250	0	4	.120	0		...	4588...	45900	32085	32085	1.2...	H1-...
228	M143	PIPE_2.0	.246	0	24	.118	0		...	4588...	45900	32085	32085	1.1...	H1-...
229	M150	PIPE_2.0	.244	3.03	13	.089	0		...	4587...	45900	32085	32085	1.1...	H1-...
230	M34	PIPE_2.0	.240	3.03	6	.102	0		...	4587...	45900	32085	32085	1.1...	H1-...
231	M264	PIPE_2.0	.239	0	34	.120	3.35		...	4586...	45900	32085	32085	1.1...	H1-...
232	M189	PIPE_2.0	.237	3.03	25	.089	0		...	4587...	45900	32085	32085	1.1...	H1-...
233	M289	PIPE_2.0	.236	0	9	.114	0		...	4588...	45900	32085	32085	1.5...	H1-...
234	M182	PIPE_2.0	.235	0	12	.107	0		...	4588...	45900	32085	32085	1.7...	H1-...
235	M41	PIPE_2.0	.235	0	30	.118	3.35		...	4586...	45900	32085	32085	1.1...	H1-...
236	M251	PIPE_2.0	.231	0	9	.123	0		...	4588...	45900	32085	32085	1.14	H1-...
237	M157	PIPE_2.0	.227	0	38	.112	3.35		...	4586...	45900	32085	32085	1.1...	H1-...
238	M225	PIPE_2.0	.227	0	34	.121	3.35		...	4586...	45900	32085	32085	1.1...	H1-...
239	M2	PIPE_2.0	.224	0	30	.121	3.35		...	4586...	45900	32085	32085	1.17	H1-...
240	M290	PIPE_2.0	.224	2.6...	29	.112	0		...	4588...	45900	32085	32085	1.2...	H1-...
241	M27	PIPE_2.0	.224	0	17	.125	0		...	4588...	45900	32085	32085	1.2...	H1-...
242	M73	PIPE_2.0	.218	3.03	17	.101	0		...	4587...	45900	32085	32085	1.1...	H1-...
243	M28	PIPE_2.0	.218	2.6...	32	.123	0		...	4588...	45900	32085	32085	1.3...	H1-...
244	M67	PIPE_2.0	.218	2.6...	37	.112	0		...	4588...	45900	32085	32085	1.2...	H1-...
245	M144	PIPE_2.0	.217	0	13	.116	0		...	4588...	45900	32085	32085	1.1...	H1-...
246	M118	PIPE_2.0	.214	0	38	.114	3.35		...	4586...	45900	32085	32085	1.1...	H1-...
247	M183	PIPE_2.0	.207	2.6...	32	.105	0		...	4588...	45900	32085	32085	1.2...	H1-...
248	M66	PIPE_2.0	.206	0	4	.114	0		...	4588...	45900	32085	32085	1.8...	H1-...
249	MP3	PIPE_2.0	.204	47.5	8	.052	48....		...	9836...	45900	32085	32085	3.0...	H1-...
250	MP11	PIPE_2.0	.204	47.5	12	.052	48....		...	9836...	45900	32085	32085	2.7...	H1-...
251	MP7	PIPE_2.0	.204	47.5	4	.042	48....		...	9836...	45900	32085	32085	2.7...	H1-...
252	M268	PIPE_2.0	.196	3.03	33	.115	3.03		...	4587...	45900	32085	32085	1.2...	H1-...
253	M161	PIPE_2.0	.194	3.03	37	.108	3.03		...	4587...	45900	32085	32085	1.2...	H1-...
254	M45	PIPE_2.0	.194	3.03	29	.114	3.03		...	4587...	45900	32085	32085	1.2...	H1-...
255	M6	PIPE_2.0	.193	3.03	34	.117	3.03		...	4587...	45900	32085	32085	1.2...	H1-...
256	M229	PIPE_2.0	.192	3.03	38	.117	3.03		...	4587...	45900	32085	32085	1.2...	H1-...
257	M122	PIPE_2.0	.191	3.03	30	.111	3.03		...	4587...	45900	32085	32085	1.2...	H1-...
258	MP6	PIPE_2.0	.180	47.5	4	.059	48....	5	...	9836...	45900	32085	32085	2.6...	H1-...
259	M226	PIPE_2.0	.153	0	34	.116	3.2...		...	4587...	45900	32085	32085	1.2...	H1-...
260	M265	PIPE_2.0	.152	0	34	.115	3.2...		...	4587...	45900	32085	32085	1.2...	H1-...
261	M3	PIPE_2.0	.150	0	30	.116	3.2...		...	4587...	45900	32085	32085	1.2...	H1-...
262	M42	PIPE_2.0	.150	0	30	.114	3.2...		...	4587...	45900	32085	32085	1.2...	H1-...
263	B1	PIPE_2.0	.150	32.6	80	.066	32.6	8	...	4314...	45900	32085	32085	2.27	H1-...
264	M215	PIPE_2.0	.150	32.6	180	.066	32.6		...	4314...	45900	32085	32085	2.2...	H1-...
265	M108	PIPE_2.0	.150	32.6	124	.066	32.6	4	...	4314...	45900	32085	32085	2.2...	H1-...
266	M158	PIPE_2.0	.144	0	38	.107	3.2...		...	4587...	45900	32085	32085	1.2...	H1-...
267	M119	PIPE_2.0	.144	0	38	.110	3.2...		...	4587...	45900	32085	32085	1.2...	H1-...
268	M5	PIPE_2.0	.136	3.1...	8	.114	3.1...		...	4587...	45900	32085	32085	1.1...	H1-...
269	M228	PIPE_2.0	.130	3.1...	12	.114	3.1...		...	4587...	45900	32085	32085	1.1...	H1-...
270	M121	PIPE_2.0	.127	3.1...	30	.108	3.1...		...	4587...	45900	32085	32085	1.4...	H1-...

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

	Member	Shape	Code Check	Lo...	LC	Shear ...	Lo...	...	...	phi*P...	phi*P...	phi*...	phi*...	Cb	Eqn
271	M267	PIPE_2.0	.122	3.1...	33	.112	3.1...		...	4587...	45900	32085	32085	1.5...	H1-...
272	M160	PIPE_2.0	.122	3.1...	37	.105	3.1...		...	4587...	45900	32085	32085	1.4...	H1-...
273	M44	PIPE_2.0	.121	3.1...	29	.111	3.1...		...	4587...	45900	32085	32085	1.52	H1-...
274	M4	PIPE_2.0	.108	3.1...	8	.114	3.1...		...	4587...	45900	32085	32085	1.2...	H1-...
275	M227	PIPE_2.0	.104	3.1...	12	.114	3.1...		...	4587...	45900	32085	32085	1.2...	H1-...
276	M218	PIPE_2.0	.093	32.6	12	.071	32.6		...	4314...	45900	32085	32085	2.2...	H1-...
277	B4	PIPE_2.0	.093	32.6	8	.071	32.6		9	4314...	45900	32085	32085	2.2...	H1-...
278	M120	PIPE_2.0	.091	3.1...	4	.108	3.1...		...	4587...	45900	32085	32085	1.1...	H1-...
279	M111A	PIPE_2.0	.089	32.6	163	.065	32.6		...	4314...	45900	32085	32085	2.2...	H1-...
280	M266	PIPE_2.0	.084	0	29	.112	3.1...		...	4587...	45900	32085	32085	1.8...	H1-...
281	M43	PIPE_2.0	.081	0	38	.111	3.1...		...	4587...	45900	32085	32085	1.9...	H1-...
282	M159	PIPE_2.0	.077	0	33	.105	3.1...		...	4587...	45900	32085	32085	1.9...	H1-...
283	B3	PIPE_2.0	.073	32.6	102	.040	32.6		...	4314...	45900	32085	32085	2.2...	H1-...
284	M217	PIPE_2.0	.073	32.6	202	.040	32.6		...	4314...	45900	32085	32085	2.2...	H1-...
285	B2	PIPE_2.0	.073	32.6	33	.052	32.6		...	4314...	45900	32085	32085	2.2...	H1-...
286	M216	PIPE_2.0	.073	32.6	37	.052	32.6		...	4314...	45900	32085	32085	2.3...	H1-...
287	M109A	PIPE_2.0	.069	32.6	4	.042	32.6		...	4314...	45900	32085	32085	2.2...	H1-...
288	M110A	PIPE_2.0	.069	32.6	158	.039	32.6		...	4314...	45900	32085	32085	2.2...	H1-...

APPENDIX D

ADDITIONAL CALCUATIONS

Additional Calculations

PROJECT DATA	
Site Name:	CT NEW BRITAIN 3 CAC 803175
Site Number:	803175
Job Code:	1039-D0002-B

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless

Steel Bolt Calculator V2.0.0

BOLT INFORMATION		
Code:	LRFD	
Bolt Diameter	3/4	in
Bolt Grade:	A307	
Threads Excluded?:	N	
Yield Strength (F_{yb})	36.0	ksi
Ultimate Strength (F_{ub})	60.0	ksi
Threads/in (n)	10	
Gross Area (A_{gb})	0.442 in²	in^2
Net Area (A_{nb})	0.334 in²	in^2
Applied Axial:	941.32	lbs
Applied Shear	2125.15	lbs

BOLT CAPCITIES				
	Ult Load / Bolt	Factored Load (ϕ=0.75)	# of Bolts	Factor Joint Capacity
Axial (lb)	20067.6	15050.7	1	15050.7
Shear(lb)	11928.2	8946.2	1	8946.2

INTERACTION CHECK	
T /ϕT_n	6.3%
V /ϕVn	23.8%
≤1.0	6.0%
Result	OK

Exhibit F

Power Density/RF Emissions Report

Site Name: New Britain 3, CT
Cumulative Power Density

Operator	Operating Frequency	Number of Trans.	ERP Per Trans.	Total ERP	Distance to Target	Calculated Power Density	Maximum Permissible Exposure*	Fraction of MPE
	(MHz)		(watts)	(watts)	(feet)	(mW/cm^2)	(mW/cm^2)	(%)
VZW CBRS	3600	1	50	50	145	0.0009	1.0	0.09%
VZW PCS	1970	1	6375	6230	145	0.1066	1.0	10.66%
VZW Cellular LTE	869	1	1630	1660	145	0.0284	0.579333333	4.90%
VZW Cellular	869	3	389	1167	145	0.0200	0.579333333	3.45%
VZW AWS	2145	1	6310	6255	145	0.1070	1.0	10.70%
VZW 700	746	1	2750	2790	145	0.0477	0.497333333	9.60%

Total Percentage of Maximum Permissible Exposure 39.38%

*Guidelines adopted by the FCC on August 1, 1996, 47 CFR Section 1.13101 based on NCRP Report 86, 1986 and generally on ANSI/IEEE C95.1-1992

MHz = Megahertz
mW/cm^2 = milliwatts per square centimeter
ERP = Effective Radiated Power

Absolute worst case maximum values used, including the following assumptions:
1. closest accessible point is distance from antenna to base of pole;
2. continuous transmission from all available channels at full power for indefinite time period; and,
3. all RF energy is assumed to be directed solely to the base of the pole.