COHEN and WOLF P.C.
ATTORNEYS AT LAW

JULIE D. KOHLER

PLEASE REPLY TO: Bridgeport
WRITER'S DIRECT DIAL: (203) 337-4157
E-Mail Address: jkohler@cohenandwolf.com

February 27, 2014

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

Re: Notice of Exempt Modification
Crown Castle/T-Mobile co-location
Site ID CT11118C
56 Norfield Road, Weston

Dear Attorney Bachman:

This office represents T-Mobile Northeast LLC ("T-Mobile") and has been retained to file exempt modification filings with the Connecticut Siting Council on its behalf.

In this case, Crown Castle owns the existing monopole telecommunications tower and related facility at 56 Norfield Road, Weston Connecticut (Latitude 41.20236152/Latitude:-73.3796159). T-Mobile intends to replace three existing antennas and add three antennas and related equipment at this existing telecommunications facility in Weston ("Weston Facility"). Please accept this letter as notification, pursuant to R.C.S.A. § 16-50j-73, of construction which constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to the Weston First Selectman, Gayle Weinstein. The Town of Weston also owns the property.

The existing Weston Facility consists of a 192 foot tall monopole tower.[1] T-Mobile plans to replace three existing antennas, add three new antennas and replace three TMAs (tower mounted amplifiers) at a centerline of approximately 170 feet. (See the plans revised to February 26, 2014 attached hereto as Exhibit A). T-Mobile will also install an equipment cabinet, install fiber and coax cable and reuse existing coax cables. The existing Weston Facility is structurally capable of supporting T-Mobile's proposed modifications, as indicated in the structural analysis dated February 20, 2014 (stamped February 21, 2014) and attached hereto as Exhibit B.

[1] While the online docket for the Connecticut Siting Council does not provide a docket or petition number for the approval of this structure, it does reference this structure in connection with several co-location requests, the most recent being EM-SPRINT-157-130701.

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

1. The proposed modification will not increase the height of the tower. T-Mobile's replacement and additional antennas will be installed at a centerline of approximately 170 feet, merely replacing existing antennas located at the same elevation. The enclosed tower drawing confirms that the proposed modification will not increase the height of the tower.

2. The proposed modifications will not require an extension of the site boundaries. T-Mobile's equipment will be located entirely within the existing compound area.

3. The proposed modification to the Weston Facility will not increase the noise levels at the existing facility by six decibels or more.

4. The operation of the replacement antennas will not increase the total radio frequency (RF) power density, measured at the base of the tower, to a level at or above the applicable standard. According to a Radio Frequency Emissions Analysis Report prepared by EBI dated February 27, 2014, T-Mobile's operations would add 0.388% of the FCC Standard. Therefore, the calculated "worst case" power density for the planned combined operation at the site including all of the proposed antennas would be 34.058% of the FCC Standard as calculated for a mixed frequency site as evidenced by the engineering exhibit attached hereto as Exhibit C.

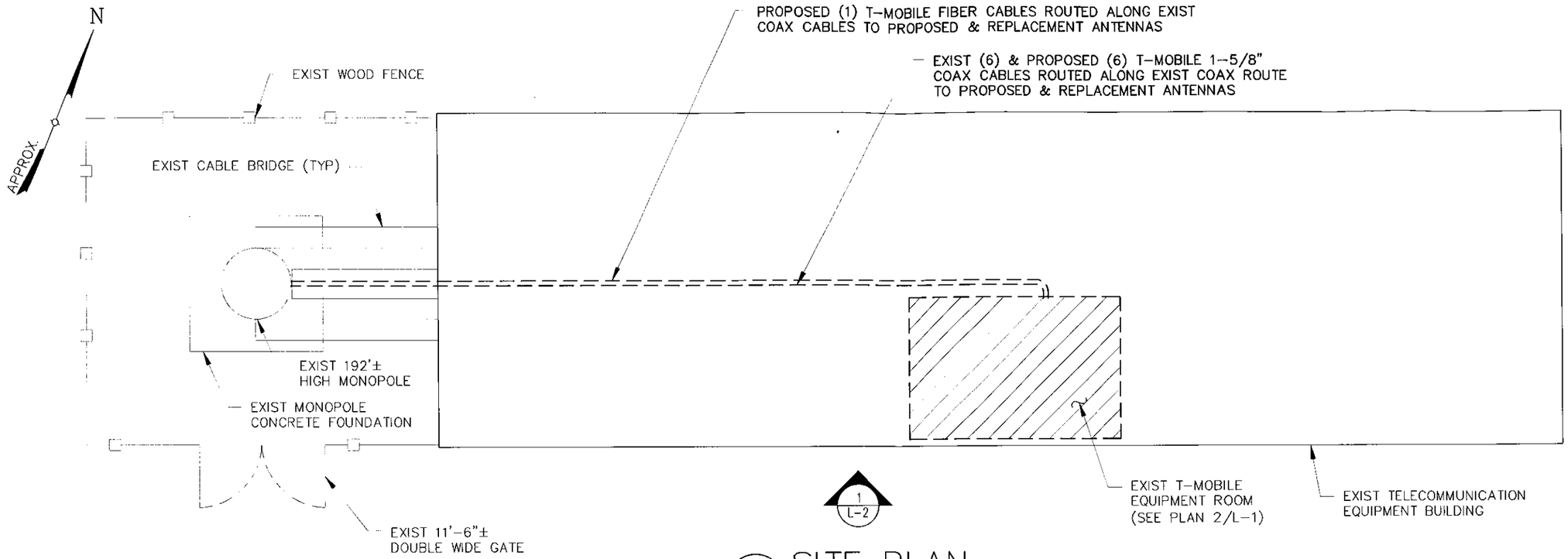
For the foregoing reasons, T-Mobile respectfully submits that the proposed replacement antennas and equipment at the Weston Facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2). Upon acknowledgement by the Council of this proposed exempt modification, T-Mobile shall commence construction approximately sixty days from the date of the Council's notice of acknowledgement.

Sincerely,

Julie D. Kohler, Esq.

cc: Town of Weston, First Selectman Gayle Weinstein
Crown Castle
Halene Fujimoto, HPC Wireless

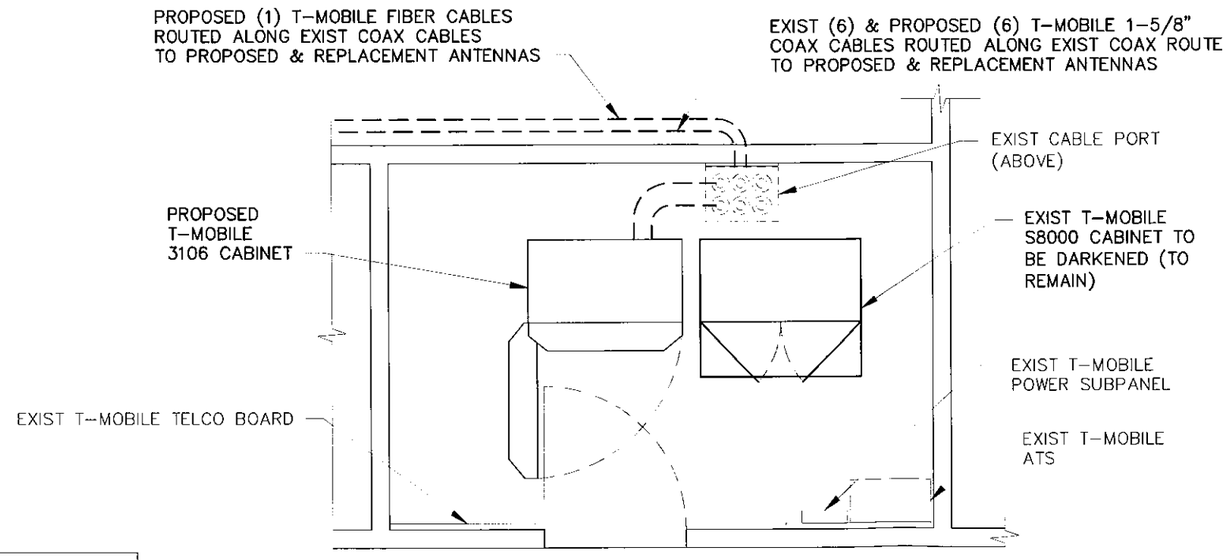
EXHIBIT A



1/L-2

1/L-1 SITE PLAN

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



1/L-2 EQUIPMENT PLAN

SCALE: 1/4" = 1'-0"

STRUCTURAL NOTE:
EXIST MOUNTS AND MONOPOLE TO BE VERIFIED FOR STRUCTURAL SUITABILITY BY A STATE LICENSED P.E.

CONFIGURATION
2C

0 1 2 3
ORIGINAL SIZE IN INCHES

TECTONIC
• PLANNING • SURVEYING
• ENGINEERING • CONSTRUCTION MANAGEMENT
TECTONIC Engineering & Surveying Consultants P.C.
1279 Route 300
Newburgh, NY 12550
Phone: (845) 567-6656
Fax: (845) 567-8703

T-Mobile

35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002

APPROVALS

T-MOBILE	
LANDLORD	
RF	
CONSTRUCTION	

PROJECT NUMBER	DESIGNED BY
6644.CT11118C	JQ

REV	DATE	REVISION	DRAWN BY
0	02/26/14	FOR COMMENT	MP

ISSUED BY	DATE

SITE INFORMATION

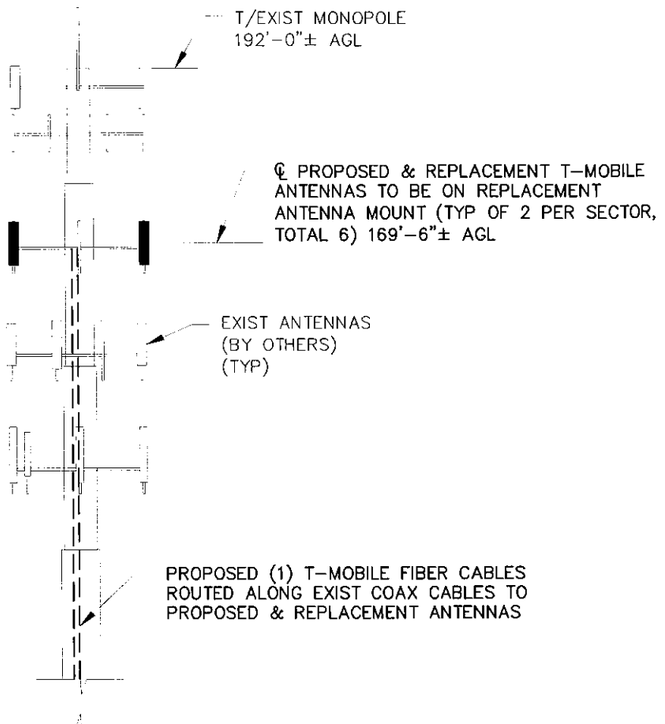
CT11118C
WESTON/RT-57/NORFIELD R
56 NORFIELD RD.
(TOWN HALL)
WESTON, CT 06883

SHEET TITLE

SITE PLAN

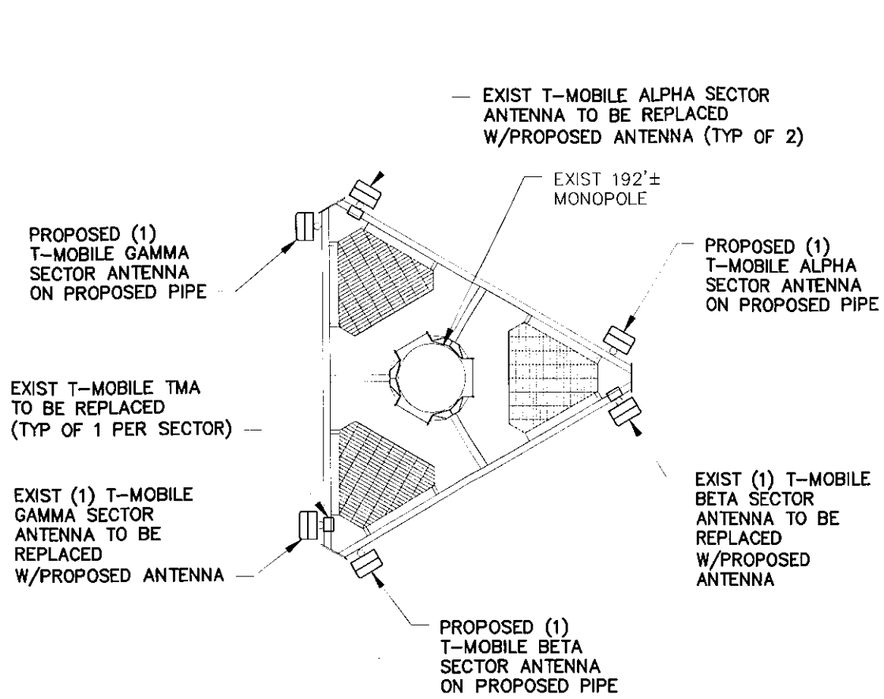
SHEET NUMBER

L-1



1 / L-2 ELEVATION

SCALE: 1/16" = 1'-0"



2 / L-2 ANTENNA PLAN

SCALE: 3/16" = 1'-0"

STRUCTURAL NOTE:
EXIST MOUNTS AND MONOPOLE TO BE VERIFIED FOR STRUCTURAL SUITABILITY BY A STATE LICENSED P.E.

CONFIGURATION
2C

0 1 2 3
ORIGINAL SIZE IN INCHES

TECTONIC
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T-Mobile
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002

APPROVALS

T-MOBILE		
LANDLORD		
RF		
CONSTRUCTION		

PROJECT NUMBER	DESIGNED BY
6644.CT1118C	JQ

REV	DATE	REVISION	DRAWN BY
0	02/26/14	FOR COMMENT	MP

ISSUED BY | DATE

SITE INFORMATION
CT11118C
WESTON/RT-57/NORFIELD R
56 NORFIELD RD.
(TOWN HALL)
WESTON, CT 06883

SHEET TITLE
ELEVATION & ANTENNA PLAN

SHEET NUMBER
L-2

EXHIBIT B

PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street • Suite 600 • Columbus, Ohio 43215-3708

Date: **February 20, 2014**

Sean Dempsey
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277

Paul J Ford and Company
250 E. Broad Street, Suite 600
Columbus, OH 43215
614.221.6679
jwoolley@pjfweb.com

Subject: **Structural Analysis Report**

Carrier Designation:	***T-Mobile* Co-Locate**	
	Carrier Site Number:	CT11118C
	Carrier Site Name:	Weston/Rt-57/Norfeld R
Crown Castle Designation:	**Crown Castle BU Number:**	829046
	Crown Castle Site Name:	Weston/ Rt-57/ Norfield R
	Crown Castle JDE Job Number:	259657
	Crown Castle Work Order Number:	713408
	Crown Castle Application Number:	216339 Rev. 2
Engineering Firm Designation:	**Paul J Ford and Company Project Number:**	37513-0787 R6
Site Data:	**56 Norfield Rd. (Town Hall), Weston, Fairfield County, CT**	
	Latitude *41° 12' 8.4"*, Longitude *-73° 22' 46.6"*	
	190 Foot - Monopole Tower	

Dear Sean Dempsey,

Paul J Ford and Company is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 618436, in accordance with application 216339, revision 2.

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:

LC4.7: Existing + Reserved + Proposed Equipment w/ Proposed Modifications **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

The structural analysis was performed for this tower in accordance with the requirements the 2005 Connecticut State Building Code of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 85 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

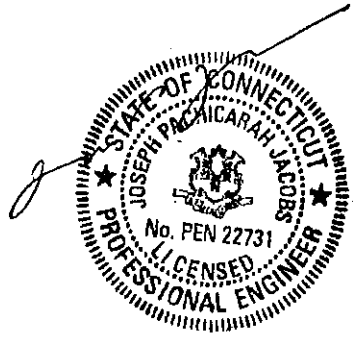
All modifications and equipment proposed in this report shall be installed in accordance with the referenced drawings for the determined available structural capacity to be effective.

We at *Paul J Ford and Company* appreciate the opportunity of providing our continuing professional services to you and Crown Castle. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully submitted by:

John J. Woolley, E.I.
Structural Designer

tnxTower Report - version 6.1.4.1



FEB 2 1 2014

PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street • Suite 600 • Columbus, Ohio 43215-3708

Date: **February 20, 2014**

Sean Dempsey
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277

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Respectfully submitted by:

John J. Woolley, E.I.
Structural Designer

tnxTower Report - version 6.1.4.1

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 190 ft Monopole tower designed by PIROD MANUFACTURES INC. in January of 2000. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements the 2005 Connecticut State Building Code of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 85 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

Table 1 - Proposed Antenna and Cable Information

173.0	170.0	3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	7	1-5/8	-
		3	ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe			
		3	ericsson	KRY 112 144/1			

Table 2 - Existing and Reserved Antenna and Cable Information

190.0	193.0	1	rfs celwave	PD201-7	1	7/8	1
	190.0	3	alcatel lucent	1900MHz RRH	3	1-1/4	2
		3	alcatel lucent	800MHZ RRH			
		6	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe			
		1	tower mounts	Platform Mount [LP 403-1]	-	-	1
		1	tower mounts	Side Arm Mount [SO 102-3]			
182.0	182.0	1	tower mounts	Platform Mount [LP 403-1]	-	-	1
173.0	173.0	1	tower mounts	Platform Mount [LP 405-1]	6	1-5/8	1
	170.0	9	ericsson	AIR 21 w/ Mount Pipe	18	1-5/8	3
		3	ericsson	AIR 33 w/ Mount Pipe			
		12	rfs celwave	ATMAA1412D-1A20			
162.0	163.0	6	ericsson	RRUS-11	1 2 12	3/4 7/8 1-5/8	1
		6	powerwave technologies	7770.00 w/ Mount Pipe			
		6	powerwave technologies	LGP21401			
		3	powerwave technologies	P65-16-XLH-RR w/ Mount Pipe			
		3	powerwave technologies	TT19-08BP111-001			
		1	raycap	DC6-48-60-18-8F			
	162.0	1	tower mounts	Platform Mount [LP 403-1]			

151.0	151.0	3	alcatel lucent	RRH2X40-AWS	-	-	2
		1	tower mounts	Pipe Mount [PM 601-3]			
150.0	150.0	6	antel	BXA-171063-12CF-EDIN-X w/ Mount Pipe	1	1-5/8	2
		1	rfs celwave	DB-T1-6Z-8AB-0Z			
		2	antel	LPA-80080/6CF w/ Mount Pipe	12	1-5/8	1
		4	decibel	DB846F65ZAXY w/ Mount Pipe			
		2	andrew	LNX-6514DS-T4M w/ Mount Pipe			
		1	powerwave technologies	P65-16-XL-R w/ Mount Pipe			
		6	rfs celwave	FD9R6004/2C-3L			
		1	tower mounts	Platform Mount [LP 403-1]			
125.0	130.0	1	rfs celwave	PD128-1	1	1/2	1
		1	rfs celwave	PD201-1	1	7/8	
	125.0	1	tower mounts	Side Arm Mount [SO 701-3]			
110.0	115.0	2	rfs celwave	PD128-1	2	1/2	1
	110.0	1	tower mounts	Side Arm Mount [SO 701-3]			
95.0	100.0	2	rfs celwave	PD128-1	2	7/8	1
	95.0	1	tower mounts	Side Arm Mount [SO 701-3]			
80.0	85.0	1	decibel	DB222	2	1/2	1
		1	rfs celwave	PD128-1			
	80.0	1	tower mounts	Side Arm Mount [SO 701-3]			

Notes:
1) Existing Equipment
2) Reserved Equipment
3) Equipment To Be Removed

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

4-GEOTECHNICAL REPORTS	Arcnet, A99.506-247B, 10/15/1999	3529916	CCISITES
4-POST-MODIFICATION INSPECTION	Sabre, 61801, 11/19/2012	3673725	CCISITES
4-TOWER MANUFACTURER DRAWINGS	PiRod, A-116331, 1/5/2000	3529917	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	TEP, 1/25/2012	3667108	CCISITES
FABRICATION DRAWINGS	Sabre, 61801-MR, 8/2/2012	-	SABRE
4-TOWER PROPOSED REINFORCEMENT DESIGN/DRAWINGS/DATA	PJF, 37513-0787 BP, 4/15/2013	3801440	CCISITES

3.1) Analysis Method

tnxTower (version 6.1.4.1), 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) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
4) Monopole has been reinforced in conformance with the referenced modification drawings.
5) Monopole will be reinforced in conformance with the referenced proposed modification drawings.
6) The rock anchors have been analyzed assuming reinforced concrete-type action in the interaction between the rock anchors and the rock.
7) The existing anchor brackets have been welded through their chamfer region. This analysis assumes no damage to the weld from the pole shaft to the base plate has occurred and that the weld is complete and effective.
8) In accordance with discussions with CCI Corporate Engineering: Based on the assumption that the monopole manufacturer (ROHN/PiRod) has designed the flange plates at splices to adequately develop the full capacity of the unreinforced shaft section using unpublished and/or proprietary methodologies, we are assuming that if our analysis shows that both the existing shaft and the existing flange bolts are at a usage capacity of 105% or less, then the existing flange plates are at a usage capacity of 105% or less and no additional analysis of the flange plate is required.

This analysis may be affected if any assumptions are not valid or have been made in error. Paul J Ford and Company should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

L1	190 - 180	Pole	30" x 0.375"	1	-4.966	1166.570	8.1	Pass
L2	180 - 160	Pole	36" x 0.375"	2	-12.835	1325.678	29.1	Pass
L3	160 - 140	Pole	42" x 0.375"	3	-19.293	1484.549	58.6	Pass
L4	140 - 120	Pole	P48x3/8	4	-24.356	1643.282	82.9	Pass
L5	120 - 113.33	Pole	P54x3/8	5	-26.148	1801.923	77.8	Pass
L6	113.33 - 103	Pole	RPS 54" x 0.49054"	6	-29.817	2350.759	73.2	Pass
L7	103 - 100	Pole	RPS 54" x 0.49054"	7	-30.827	2350.759	77.2	Pass
L8	100 - 85.5	Pole	RPS 60" x 0.47803"	8	-36.259	2493.470	82.7	Pass
L9	85.5 - 84	Pole	RPS 60" x 0.55603"	9	-36.872	2896.062	72.9	Pass
L10	84 - 80	Pole	RPS 60" x 0.50354"	10	-38.388	2625.597	85.1	Pass
L11	80 - 60	Pole	RPS 60" x 0.57817"	11	-47.168	3211.717	90.2	Pass
L12	60 - 58.5	Pole	RPS 60" x 0.70417"	12	-47.928	3764.312	71.7	Pass
L13	58.5 - 47.25	Pole	P60x5/8	13	-53.122	3682.439	90.9	Pass
L14	47.25 - 40	Pole	RPS 60" x 0.76962"	14	-57.121	4113.078	80.3	Pass
L15	40 - 32.25	Pole	RPS 60" x 0.76962"	15	-61.410	4113.078	86.7	Pass
L16	32.25 - 29.75	Pole	RPS 60" x 0.96202"	16	-63.090	5123.199	71.7	Pass
L17	29.75 - 20	Pole	RPS 60" x 0.81453"	17	-68.778	4346.166	92.0	Pass
L18	20 - 4.25	Pole	RPS 60" x 0.94201"	18	-79.229	5311.885	86.2	Pass
L19	4.25 - 0	Pole	RPS 60" x 1.08084"	19	-82.415	6074.014	78.3	Pass
							Summary	
						Pole (L17)	92.0	Pass
						Rating =	92.0	Pass

Table 5 - Tower Component Stresses vs. Capacity

1	Anchor Rods	0	85.8	Pass
1	Base Plate	0	69.8	Pass
1	Base Foundation	0	74.9	Pass
1	Flange Connection	20	75.2	Pass
1	Flange Connection	40	76.5	Pass
1	Flange Connection	60	73.6	Pass
1	Flange Connection	80	71.3	Pass
1	Flange Connection	100	60.7	Pass
1, 2	Flange Connection	120	82.9	Pass
1, 2	Flange Connection	140	58.6	Pass
1, 2	Flange Connection	160	29.1	Pass
1, 2	Flange Connection	180	8.1	Pass

Notes:
1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.
2) See assumption #8.

4.1) Recommendations

Reinforce the pole as shown in PJF job 37513-0787 BP, dated 4/15/2013.

APPENDIX A

TNXTOWER OUTPUT

Tower Input Data

There is a pole section.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

1) Tower is located in Fairfield County, Connecticut.
2) Basic wind speed of 85 mph.
3) Nominal ice thickness of 0.750 in.
4) Ice density of 56.000 pcf.
5) A wind speed of 28 mph is used in combination with ice.
6) Temperature drop of 50.000 °F.
7) Deflections calculated using a wind speed of 50 mph.
8) A non-linear (P-delta) analysis was used.
9) Pressures are calculated at each section.
10) Stress ratio used in pole design is 1.333.
11) 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	Treat Feedline Bundles As Cylinder
Consider Moments - Horizontals	Assume Legs Pinned	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Diagonals	√ Assume Rigid Index Plate	Calculate Redundant Bracing Forces
Use Moment Magnification	√ Use Clear Spans For Wind Area	Ignore Redundant Members in FEA
√ Use Code Stress Ratios	√ Use Clear Spans For KL/r	SR Leg Bolts Resist Compression
√ Use Code Safety Factors - Guys	Retension Guys To Initial Tension	All Leg Panels Have Same Allowable
Escalate Ice	√ Bypass Mast Stability Checks	Offset Girt At Foundation
Always Use Max Kz	√ Use Azimuth Dish Coefficients	√ Consider Feedline Torque
Use Special Wind Profile	√ Project Wind Area of Appurt.	Include Angle Block Shear Check
Include Bolts In Member Capacity	Autocalc Torque Arm Areas	
Leg Bolts Are At Top Of Section	SR Members Have Cut Ends	√ Include Shear-Torsion Interaction
Secondary Horizontal Braces Leg	Sort Capacity Reports By Component	Always Use Sub-Critical Flow
Use Diamond Inner Bracing (4 Sided)	Triangulate Diamond Inner Bracing	Use Top Mounted Sockets
Add IBC .6D+W Combination	Use TIA-222-G Tension Splice Capacity Exemption	

Pole Section Geometry

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L1	190.000-180.000	10.000	30" x 0.375"	A53-B-42 (42 ksi)	5.000
L2	175.000-155.000	20.000	36" x 0.375"	A53-B-42 (42 ksi)	5.000
L3	155.000-135.000	20.000	42" x 0.375"	A53-B-42 (42 ksi)	5.000
L4	135.000-115.000	20.000	P48x3/8	A53-B-42 (42 ksi)	5.000
L5	115.000-108.330	6.670	P54x3/8	A53-B-42 (42 ksi)	5.000
L6	108.330-98.000	10.330	RPS 54" x 0.49054"	Reinf 38.43 ksi (38 ksi)	5.000
L7	98.000-95.000	3.000	RPS 54" x 0.49054"	Reinf 38.43 ksi (38 ksi)	5.000
L8	95.000-80.500	14.500	RPS 60" x 0.47803"	Reinf 39.13 ksi (39 ksi)	5.000

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L9	80.500-79.000	1.500	RPS 60" x 0.55603"	Reinf 36.97 ksi (37 ksi)	5.000
L10	79.000-75.000	4.000	RPS 60" x 0.50354"	Reinf 38.43 ksi (38 ksi)	5.000
L11	75.000-55.000	20.000	RPS 60" x 0.57817"	Reinf 39.86 ksi (40 ksi)	5.000
L12	55.000-53.500	1.500	RPS 60" x 0.70417"	Reinf 35.88 ksi (36 ksi)	5.000
L13	53.500-42.250	11.250	P60x5/8	A53-B-42 (42 ksi)	5.000
L14	42.250-35.000	7.250	RPS 60" x 0.76962"	Reinf 35.91 ksi (36 ksi)	5.000
L15	35.000-27.250	7.750	RPS 60" x 0.76962"	Reinf 35.91 ksi (36 ksi)	5.000
L16	27.250-24.750	2.500	RPS 60" x 0.96202"	Reinf 35.90 ksi (36 ksi)	5.000
L17	24.750-15.000	9.750	RPS 60" x 0.81453"	Reinf 35.88 ksi (36 ksi)	5.000
L18	15.000-0.750	15.750	RPS 60" x 0.94201"	Reinf 38.00 ksi (38 ksi)	5.000
L19	0.750-3.500	4.250	RPS 60" x 1.08084"	Reinf 37.96 ksi (38 ksi)	

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
L1 190.000-180.000				1	1	1		
L2 180.000-160.000				1	1	1		
L3 160.000-140.000				1	1	1		
L4 140.000-120.000				1	1	1		
L5 120.000-113.330				1	1	1		
L6 113.330-103.000				1	1	1		
L7 103.000-100.000				1	1	1		
L8 100.000-85.500				1	1	1		
L9 85.500-84.000				1	1	1		
L10 84.000-80.000				1	1	1		
L11 80.000-60.000				1	1	1		
L12 60.000-58.500				1	1	1		
L13 58.500-47.250				1	1	1		
L14 47.250-40.000				1	1	1		
L15 40.000-				1	1	1		

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals
ft	ft^2	in					in	in
32.250								
L16 32.250-29.750				1	1	1		
L17 29.750-20.000				1	1	1		
L18 20.000-4.250				1	1	1		
L19 4.250-0.000				1	1	1		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement	Total Number		C_AA_A	Weight
				ft			ft^2/ft	klf
TYPE I(1-1/4")	C	No	Inside Pole	190.000 - 0.000	3	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
LDF7-50A(1-5/8")	C	No	Inside Pole	173.000 - 0.000	24	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
LDF5-50A(7/8")	C	No	CaAa (Out Of Face)	162.000 - 0.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.003
LDF5-50A(7/8")	C	No	CaAa (Out Of Face)	162.000 - 0.000	1	No Ice	0.109	0.000
						1/2" Ice	0.209	0.001
						1" Ice	0.309	0.003
LDF7-50A(1-5/8")	C	No	CaAa (Out Of Face)	162.000 - 0.000	2	No Ice	0.198	0.001
						1/2" Ice	0.298	0.002
						1" Ice	0.398	0.004
LDF7-50A(1-5/8")	C	No	CaAa (Out Of Face)	162.000 - 0.000	10	No Ice	0.000	0.001
						1/2" Ice	0.000	0.002
						1" Ice	0.000	0.004
9776(3/4")	C	No	CaAa (Out Of Face)	162.000 - 0.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.002
LDF7-50A(1-5/8")	C	No	Inside Pole	150.000 - 0.000	12	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
LDF5-50A(7/8")	C	No	Inside Pole	125.000 - 0.000	2	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
LDF5-50A(7/8")	C	No	Inside Pole	110.000 - 0.000	2	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
LDF5-50A(7/8")	C	No	Inside Pole	95.000 - 0.000	2	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
LDF5-50A(7/8")	C	No	Inside Pole	80.000 - 0.000	2	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
***								
1 1/4" Flat Reinforcement	C	No	CaAa (Out Of Face)	15.000 - 0.000	1	No Ice	0.208	0.000
						1/2" Ice	0.319	0.000
						1" Ice	0.431	0.000
1" Flat Reinforcement	C	No	CaAa (Out Of Face)	112.500 - 57.500	1	No Ice	0.167	0.000
						1/2" Ice	0.278	0.000
						1" Ice	0.389	0.000
1 1/4" Flat Reinforcement	C	No	CaAa (Out Of Face)	35.000 - 25.000	1	No Ice	0.208	0.000
						1/2" Ice	0.319	0.000
						1" Ice	0.431	0.000
1 1/4" Flat Reinforcement	C	No	CaAa (Out Of Face)	45.000 - 35.000	1	No Ice	0.208	0.000
						1/2" Ice	0.319	0.000

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
						1" Ice	0.431	0.000
1 1/4" Flat Reinforcement	C	No	CaAa (Out Of Face)	51.000 - 45.000	1	No Ice	0.208	0.000
						1/2" Ice	0.319	0.000
						1" Ice	0.431	0.000
1 1/4" Flat Reinforcement	C	No	CaAa (Out Of Face)	25.000 - 15.000	1	No Ice	0.208	0.000
						1/2" Ice	0.319	0.000
						1" Ice	0.431	0.000
1 1/4" Flat Reinforcement	C	No	CaAa (Out Of Face)	45.000 - 35.000	1	No Ice	0.208	0.000
						1/2" Ice	0.319	0.000
						1" Ice	0.431	0.000
1 1/4" Flat Reinforcement	C	No	CaAa (Out Of Face)	65.000 - 55.000	1	No Ice	0.208	0.000
						1/2" Ice	0.319	0.000
						1" Ice	0.431	0.000
1 1/4" Flat Reinforcement	C	No	CaAa (Out Of Face)	87.250 - 75.000	1	No Ice	0.208	0.000
						1/2" Ice	0.319	0.000
						1" Ice	0.431	0.000
HB158-1-08U8-S8J18(1-5/8)	C	No	Inside Pole	150.000 - 0.000	1	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
LDF7-50A(1-5/8")	C	No	CaAa (Out Of Face)	173.000 - 0.000	5	No Ice	0.000	0.001
						1/2" Ice	0.000	0.002
						1" Ice	0.000	0.004
LDF7-50A(1-5/8")	C	No	CaAa (Out Of Face)	173.000 - 0.000	1	No Ice	0.198	0.001
						1/2" Ice	0.298	0.002
						1" Ice	0.398	0.004
MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	C	No	CaAa (Out Of Face)	173.000 - 0.000	1	No Ice	0.163	0.001
						1/2" Ice	0.263	0.002
						1" Ice	0.362	0.004

Tower Pressure - No Ice

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	190.000-180.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.019
L2	180.000-160.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	5.697	0.393
L3	160.000-140.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	17.310	0.879
L4	140.000-120.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	17.310	0.993
L5	120.000-113.330	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	5.773	0.335
L6	113.330-103.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	10.524	0.523
L7	103.000-100.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	3.097	0.152
L8	100.000-85.500	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	15.331	0.743
L9	85.500-84.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	1.861	0.077
L10	84.000-80.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	4.962	0.206
L11	80.000-60.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000

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
		C	0.000	0.000	0.000	22.727	1.043
L12	60.000-58.500	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	1.861	0.078
L13	58.500-47.250	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	11.414	0.587
L14	47.250-40.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	8.827	0.378
L15	40.000-32.250	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	9.364	0.404
L16	32.250-29.750	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	2.685	0.130
L17	29.750-20.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	10.470	0.508
L18	20.000-4.250	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	16.913	0.821
L19	4.250-0.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	4.564	0.222

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	190.000-180.000	A	0.750	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	0.019
L2	180.000-160.000	A	0.750	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	10.497	0.695
L3	160.000-140.000	A	0.750	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	32.310	1.951
L4	140.000-120.000	A	0.750	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	32.310	2.066
L5	120.000-113.330	A	0.750	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	10.775	0.692
L6	113.330-103.000	A	0.750	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	19.855	1.077
L7	103.000-100.000	A	0.750	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	5.847	0.313
L8	100.000-85.500	A	0.750	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	28.914	1.521
L9	85.500-84.000	A	0.750	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	3.486	0.158
L10	84.000-80.000	A	0.750	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	9.295	0.420
L11	80.000-60.000	A	0.750	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	42.727	2.115
L12	60.000-58.500	A	0.750	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000

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
		C		0.000	0.000	0.000	3.486	0.159
L13	58.500-47.250	A	0.750	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	21.226	1.190
L14	47.250-40.000	A	0.750	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	16.306	0.767
L15	40.000-32.250	A	0.750	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	17.301	0.820
L16	32.250-29.750	A	0.750	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	4.976	0.264
L17	29.750-20.000	A	0.750	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	19.407	1.031
L18	20.000-4.250	A	0.750	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	31.350	1.666
L19	4.250-0.000	A	0.750	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	8.460	0.450

Feed Line/Linear Appurtenances Section Areas

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	190.000-180.000	0.000	0.000	0.000	0.000
L2	180.000-160.000	-0.338	0.195	-0.560	0.324
L3	160.000-140.000	-0.901	0.520	-1.402	0.809
L4	140.000-120.000	-0.924	0.534	-1.462	0.844
L5	120.000-113.330	-0.943	0.544	-1.513	0.874
L6	113.330-103.000	-1.079	0.623	-1.716	0.991
L7	103.000-100.000	-1.091	0.630	-1.733	1.001
L8	100.000-85.500	-1.134	0.655	-1.819	1.050
L9	85.500-84.000	-1.291	0.745	-2.026	1.170
L10	84.000-80.000	-1.291	0.745	-2.026	1.170
L11	80.000-60.000	-1.203	0.694	-1.911	1.103
L12	60.000-58.500	-1.291	0.745	-2.026	1.170
L13	58.500-47.250	-1.096	0.633	-1.748	1.009
L14	47.250-40.000	-1.272	0.734	-1.981	1.144
L15	40.000-32.250	-1.264	0.730	-1.971	1.138
L16	32.250-29.750	-1.148	0.663	-1.817	1.049
L17	29.750-20.000	-1.148	0.663	-1.817	1.049
L18	20.000-4.250	-1.148	0.663	-1.817	1.049
L19	4.250-0.000	-1.148	0.663	-1.817	1.049

Discrete Tower Loads

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
*****										
PD201-7	C	From Leg	4.000		0.000	190.000	No Ice	1.015	1.015	0.004
			0.000				1/2" Ice	1.809	1.809	0.013
			3.000					2.620	2.620	0.026

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
						1" Ice			
(2) APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	70.000	190.000	No Ice 1/2" Ice 1" Ice	8.498 9.149 9.767	6.946 8.127 9.021	0.083 0.151 0.227
(2) APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	45.000	190.000	No Ice 1/2" Ice 1" Ice	8.498 9.149 9.767	6.946 8.127 9.021	0.083 0.151 0.227
(2) APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	60.000	190.000	No Ice 1/2" Ice 1" Ice	8.498 9.149 9.767	6.946 8.127 9.021	0.083 0.151 0.227
800MHZ RRH	A	From Leg	4.000 0.000 0.000	70.000	190.000	No Ice 1/2" Ice 1" Ice	2.490 2.706 2.931	2.068 2.271 2.481	0.053 0.074 0.098
800MHZ RRH	B	From Leg	4.000 0.000 0.000	45.000	190.000	No Ice 1/2" Ice 1" Ice	2.490 2.706 2.931	2.068 2.271 2.481	0.053 0.074 0.098
800MHZ RRH	C	From Leg	4.000 0.000 0.000	60.000	190.000	No Ice 1/2" Ice 1" Ice	2.490 2.706 2.931	2.068 2.271 2.481	0.053 0.074 0.098
1900MHz RRH	A	From Leg	4.000 0.000 0.000	70.000	190.000	No Ice 1/2" Ice 1" Ice	2.907 3.145 3.391	3.801 4.065 4.337	0.044 0.075 0.110
1900MHz RRH	B	From Leg	4.000 0.000 0.000	45.000	190.000	No Ice 1/2" Ice 1" Ice	2.907 3.145 3.391	3.801 4.065 4.337	0.044 0.075 0.110
1900MHz RRH	C	From Leg	4.000 0.000 0.000	60.000	190.000	No Ice 1/2" Ice 1" Ice	2.907 3.145 3.391	3.801 4.065 4.337	0.044 0.075 0.110
Platform Mount [LP 403-1]	C	None		0.000	190.000	No Ice 1/2" Ice 1" Ice	18.850 24.300 29.750	18.850 24.300 29.750	1.500 1.797 2.093
Side Arm Mount [SO 102-3]	C	None		0.000	190.000	No Ice 1/2" Ice 1" Ice	3.000 3.480 3.960	3.000 3.480 3.960	0.081 0.111 0.141
****									
Platform Mount [LP 403-1]	C	None		0.000	182.000	No Ice 1/2" Ice 1" Ice	18.850 24.300 29.750	18.850 24.300 29.750	1.500 1.797 2.093
(4) 6' x 2" Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	182.000	No Ice 1/2" Ice 1" Ice	1.425 1.925 2.294	1.425 1.925 2.294	0.022 0.033 0.048
(4) 6' x 2" Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	182.000	No Ice 1/2" Ice 1" Ice	1.425 1.925 2.294	1.425 1.925 2.294	0.022 0.033 0.048
(4) 6' x 2" Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	182.000	No Ice 1/2" Ice 1" Ice	1.425 1.925 2.294	1.425 1.925 2.294	0.022 0.033 0.048
***									
Platform Mount [LP 405-1]	C	None		0.000	173.000	No Ice 1/2"	20.800 28.100	20.800 28.100	1.800 2.066

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
						Ice	35.400	35.400	2.332
						1" Ice			
***									
(2) 7770.00 w/ Mount Pipe	A	From Leg	4.000 0.000 1.000	0.000	162.000	No Ice 1/2" Ice 1" Ice	6.119 6.626 7.128	4.254 5.014 5.711	0.055 0.103 0.157
(2) 7770.00 w/ Mount Pipe	B	From Leg	4.000 0.000 1.000	0.000	162.000	No Ice 1/2" Ice 1" Ice	6.119 6.626 7.128	4.254 5.014 5.711	0.055 0.103 0.157
(2) 7770.00 w/ Mount Pipe	C	From Leg	4.000 0.000 1.000	0.000	162.000	No Ice 1/2" Ice 1" Ice	6.119 6.626 7.128	4.254 5.014 5.711	0.055 0.103 0.157
TT19-08BP111-001	A	From Leg	4.000 0.000 1.000	0.000	162.000	No Ice 1/2" Ice 1" Ice	0.636 0.747 0.867	0.516 0.619 0.730	0.016 0.022 0.029
TT19-08BP111-001	B	From Leg	4.000 0.000 1.000	0.000	162.000	No Ice 1/2" Ice 1" Ice	0.636 0.747 0.867	0.516 0.619 0.730	0.016 0.022 0.029
TT19-08BP111-001	C	From Leg	4.000 0.000 1.000	0.000	162.000	No Ice 1/2" Ice 1" Ice	0.636 0.747 0.867	0.516 0.619 0.730	0.016 0.022 0.029
P65-16-XLH-RR w/ Mount Pipe	A	From Leg	4.000 0.000 1.000	0.000	162.000	No Ice 1/2" Ice 1" Ice	8.637 9.290 9.910	6.362 7.538 8.427	0.079 0.144 0.218
P65-16-XLH-RR w/ Mount Pipe	B	From Leg	4.000 0.000 1.000	0.000	162.000	No Ice 1/2" Ice 1" Ice	8.637 9.290 9.910	6.362 7.538 8.427	0.079 0.144 0.218
P65-16-XLH-RR w/ Mount Pipe	C	From Leg	4.000 0.000 1.000	0.000	162.000	No Ice 1/2" Ice 1" Ice	8.637 9.290 9.910	6.362 7.538 8.427	0.079 0.144 0.218
(2) RRUS-11	A	From Leg	4.000 0.000 1.000	0.000	162.000	No Ice 1/2" Ice 1" Ice	3.249 3.491 3.741	1.373 1.551 1.738	0.048 0.068 0.092
(2) RRUS-11	B	From Leg	4.000 0.000 1.000	0.000	162.000	No Ice 1/2" Ice 1" Ice	3.249 3.491 3.741	1.373 1.551 1.738	0.048 0.068 0.092
(2) RRUS-11	C	From Leg	4.000 0.000 1.000	0.000	162.000	No Ice 1/2" Ice 1" Ice	3.249 3.491 3.741	1.373 1.551 1.738	0.048 0.068 0.092
(2) LGP21401	A	From Leg	4.000 0.000 1.000	0.000	162.000	No Ice 1/2" Ice 1" Ice	1.288 1.445 1.611	0.233 0.313 0.403	0.014 0.021 0.030
(2) LGP21401	B	From Leg	4.000 0.000 1.000	0.000	162.000	No Ice 1/2" Ice 1" Ice	1.288 1.445 1.611	0.233 0.313 0.403	0.014 0.021 0.030
(2) LGP21401	C	From Leg	4.000 0.000 1.000	0.000	162.000	No Ice 1/2" Ice 1" Ice	1.288 1.445 1.611	0.233 0.313 0.403	0.014 0.021 0.030
DC6-48-60-18-8F	C	From Leg	4.000 0.000	0.000	162.000	No Ice 1/2"	2.567 2.798	2.567 2.798	0.019 0.041

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
			1.000			Ice	3.038	3.038	0.067
						1" Ice			
Platform Mount [LP 403-1]	C	None		0.000	162.000	No Ice	18.850	18.850	1.500
						1/2" Ice	24.300	24.300	1.797
						1" Ice	29.750	29.750	2.093
6' x 2" Mount Pipe	A	From Leg	4.000 / 0.000 / 1.000	0.000	162.000	No Ice	1.425	1.425	0.022
						1/2" Ice	1.925	1.925	0.033
						1" Ice	2.294	2.294	0.048
(2) 6' x 2" Mount Pipe	B	From Leg	4.000 / 0.000 / 1.000	0.000	162.000	No Ice	1.425	1.425	0.022
						1/2" Ice	1.925	1.925	0.033
						1" Ice	2.294	2.294	0.048
(2) 6' x 2" Mount Pipe	C	From Leg	4.000 / 0.000 / 1.000	0.000	162.000	No Ice	1.425	1.425	0.022
						1/2" Ice	1.925	1.925	0.033
						1" Ice	2.294	2.294	0.048
***									
LNX-6514DS-T4M w/ Mount Pipe	A	From Leg	4.000 / 0.000 / 0.000	0.000	150.000	No Ice	8.449	6.885	0.056
						1/2" Ice	9.044	7.951	0.124
						1" Ice	9.631	8.809	0.199
LNX-6514DS-T4M w/ Mount Pipe	B	From Leg	4.000 / 0.000 / 0.000	0.000	150.000	No Ice	8.449	6.885	0.056
						1/2" Ice	9.044	7.951	0.124
						1" Ice	9.631	8.809	0.199
(2) DB846F65ZAXY w/ Mount Pipe	A	From Leg	4.000 / 0.000 / 0.000	0.000	150.000	No Ice	7.271	7.821	0.047
						1/2" Ice	7.877	9.010	0.114
						1" Ice	8.484	9.912	0.189
(2) DB846F65ZAXY w/ Mount Pipe	B	From Leg	4.000 / 0.000 / 0.000	0.000	150.000	No Ice	7.271	7.821	0.047
						1/2" Ice	7.877	9.010	0.114
						1" Ice	8.484	9.912	0.189
P65-16-XL-R w/ Mount Pipe	C	From Leg	4.000 / 0.000 / 0.000	0.000	150.000	No Ice	8.544	6.569	0.082
						1/2" Ice	9.128	7.480	0.149
						1" Ice	9.716	8.335	0.225
(2) LPA-80080/6CF w/ Mount Pipe	C	From Leg	4.000 / 0.000 / 0.000	0.000	150.000	No Ice	4.564	10.728	0.046
						1/2" Ice	5.105	11.990	0.113
						1" Ice	5.612	12.968	0.187
(2) FD9R6004/2C-3L	A	From Leg	4.000 / 0.000 / 0.000	0.000	150.000	No Ice	0.367	0.085	0.003
						1/2" Ice	0.451	0.136	0.005
						1" Ice	0.543	0.196	0.009
(2) FD9R6004/2C-3L	B	From Leg	4.000 / 0.000 / 0.000	0.000	150.000	No Ice	0.367	0.085	0.003
						1/2" Ice	0.451	0.136	0.005
						1" Ice	0.543	0.196	0.009
(2) FD9R6004/2C-3L	C	From Leg	4.000 / 0.000 / 0.000	0.000	150.000	No Ice	0.367	0.085	0.003
						1/2" Ice	0.451	0.136	0.005
						1" Ice	0.543	0.196	0.009
Platform Mount [LP 403-1]	C	None		0.000	150.000	No Ice	18.850	18.850	1.500
						1/2" Ice	24.300	24.300	1.797
						1" Ice	29.750	29.750	2.093
(2) BXA-171063-12CF-EDIN-X w/ Mount Pipe	A	From Leg	4.000 / 0.000 / 0.000	0.000	150.000	No Ice	5.029	5.289	0.041
						1/2" Ice	5.583	6.459	0.087
						1" Ice	6.103	7.348	0.140
(2) BXA-171063-12CF-EDIN-X w/ Mount Pipe	B	From Leg	4.000 / 0.000	0.000	150.000	No Ice	5.029	5.289	0.041
						1/2"	5.583	6.459	0.087

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
			0.000			Ice	6.103	7.348	0.140
						1" Ice			
DB-T1-6Z-8AB-0Z	B	From Leg	4.000	0.000	150.000	No Ice	5.600	2.333	0.044
			0.000			1/2"	5.915	2.558	0.080
			0.000			Ice	6.240	2.791	0.120
						1" Ice			
(2) BXA-171063-12CF-EDIN-X w/ Mount Pipe	C	From Leg	4.000	0.000	150.000	No Ice	5.029	5.289	0.041
			0.000			1/2"	5.583	6.459	0.087
			0.000			Ice	6.103	7.348	0.140
						1" Ice			
***									
Pipe Mount [PM 601-3]	C	None		0.000	151.000	No Ice	4.390	4.390	0.195
						1/2"	5.480	5.480	0.237
						Ice	6.570	6.570	0.280
						1" Ice			
RRH2X40-AWS	A	From Leg	0.500	0.000	151.000	No Ice	2.976	1.596	0.044
			0.000			1/2"	3.236	1.824	0.063
			0.000			Ice	3.505	2.061	0.085
						1" Ice			
RRH2X40-AWS	B	From Leg	0.500	0.000	151.000	No Ice	2.976	1.596	0.044
			0.000			1/2"	3.236	1.824	0.063
			0.000			Ice	3.505	2.061	0.085
						1" Ice			
RRH2X40-AWS	C	From Leg	0.500	0.000	151.000	No Ice	2.976	1.596	0.044
			0.000			1/2"	3.236	1.824	0.063
			0.000			Ice	3.505	2.061	0.085
						1" Ice			
****									
PD128-1	A	From Leg	4.000	0.000	125.000	No Ice	1.277	1.277	0.013
			0.000			1/2"	2.272	2.272	0.024
			5.000			Ice	3.282	3.282	0.041
						1" Ice			
PD201-1	A	From Leg	4.000	0.000	125.000	No Ice	0.628	0.628	0.004
			0.000			1/2"	1.539	1.539	0.011
			5.000			Ice	2.467	2.467	0.023
						1" Ice			
Side Arm Mount [SO 701-3]	C	None		0.000	125.000	No Ice	2.830	2.830	0.195
						1/2"	3.920	3.920	0.237
						Ice	5.010	5.010	0.279
						1" Ice			
***									
PD128-1	A	From Leg	4.000	0.000	110.000	No Ice	1.277	1.277	0.013
			0.000			1/2"	2.272	2.272	0.024
			5.000			Ice	3.282	3.282	0.041
						1" Ice			
PD128-1	A	From Leg	4.000	0.000	110.000	No Ice	1.277	1.277	0.013
			0.000			1/2"	2.272	2.272	0.024
			5.000			Ice	3.282	3.282	0.041
						1" Ice			
Side Arm Mount [SO 701-3]	C	None		0.000	110.000	No Ice	2.830	2.830	0.195
						1/2"	3.920	3.920	0.237
						Ice	5.010	5.010	0.279
						1" Ice			
***									
PD128-1	A	From Leg	4.000	0.000	95.000	No Ice	1.277	1.277	0.013
			0.000			1/2"	2.272	2.272	0.024
			5.000			Ice	3.282	3.282	0.041
						1" Ice			
PD128-1	A	From Leg	4.000	0.000	95.000	No Ice	1.277	1.277	0.013
			0.000			1/2"	2.272	2.272	0.024
			5.000			Ice	3.282	3.282	0.041
						1" Ice			
Side Arm Mount [SO 701-3]	C	None		0.000	95.000	No Ice	2.830	2.830	0.195
						1/2"	3.920	3.920	0.237
						Ice	5.010	5.010	0.279

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
						1" Ice			
***									
DB222	A	From Leg	4.000 0.000 5.000	0.000	80.000	No Ice 1/2" Ice 1" Ice	1.600 2.880 4.160	1.600 2.880 4.160	0.016 0.021 0.026
PD128-1	C	From Leg	4.000 0.000 5.000	0.000	80.000	No Ice 1/2" Ice 1" Ice	1.277 2.272 3.282	1.277 2.272 3.282	0.013 0.024 0.041
Side Arm Mount [SO 701-3]	C	None		0.000	80.000	No Ice 1/2" Ice 1" Ice	2.830 3.920 5.010	2.830 3.920 5.010	0.195 0.237 0.279
****									
*****									
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.000 0.000 -3.000	0.000	173.000	No Ice 1/2" Ice 1" Ice	6.825 7.347 7.863	5.642 6.480 7.257	0.112 0.169 0.233
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	A	From Leg	4.000 0.000 -3.000	0.000	173.000	No Ice 1/2" Ice 1" Ice	6.825 7.347 7.863	5.642 6.480 7.257	0.112 0.169 0.233
KRY 112 144/1	A	From Leg	4.000 0.000 -3.000	0.000	173.000	No Ice 1/2" Ice 1" Ice	0.408 0.497 0.594	0.204 0.273 0.351	0.011 0.014 0.019
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.000 0.000 -3.000	0.000	173.000	No Ice 1/2" Ice 1" Ice	6.825 7.347 7.863	5.642 6.480 7.257	0.112 0.169 0.233
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	B	From Leg	4.000 0.000 -3.000	0.000	173.000	No Ice 1/2" Ice 1" Ice	6.825 7.347 7.863	5.642 6.480 7.257	0.112 0.169 0.233
KRY 112 144/1	B	From Leg	4.000 0.000 -3.000	0.000	173.000	No Ice 1/2" Ice 1" Ice	0.408 0.497 0.594	0.204 0.273 0.351	0.011 0.014 0.019
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.000 0.000 -3.000	0.000	173.000	No Ice 1/2" Ice 1" Ice	6.825 7.347 7.863	5.642 6.480 7.257	0.112 0.169 0.233
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	C	From Leg	4.000 0.000 -3.000	0.000	173.000	No Ice 1/2" Ice 1" Ice	6.825 7.347 7.863	5.642 6.480 7.257	0.112 0.169 0.233
KRY 112 144/1	C	From Leg	4.000 0.000 -3.000	0.000	173.000	No Ice 1/2" Ice 1" Ice	0.408 0.497 0.594	0.204 0.273 0.351	0.011 0.014 0.019

Tower Pressures - No Ice

$G_H = 1.690$

Section Elevation ft	z ft	K_z	q_z ksf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 190.000-180.000	185.000	1.636	0.030	25.000	A	0.000	25.000	25.000	100.00	0.000	0.000
					B	0.000	25.000		100.00	0.000	0.000
					C	0.000	25.000		100.00	0.000	0.000
L2 180.000-160.000	170.000	1.597	0.030	60.000	A	0.000	60.000	60.000	100.00	0.000	0.000
					B	0.000	60.000		100.00	0.000	0.000
					C	0.000	60.000		100.00	0.000	5.697
L3 160.000-140.000	150.000	1.541	0.029	70.000	A	0.000	70.000	70.000	100.00	0.000	0.000
					B	0.000	70.000		100.00	0.000	0.000
					C	0.000	70.000		100.00	0.000	17.310
L4 140.000-120.000	130.000	1.48	0.027	80.000	A	0.000	80.000	80.000	100.00	0.000	0.000
					B	0.000	80.000		100.00	0.000	0.000
					C	0.000	80.000		100.00	0.000	17.310
L5 120.000-113.330	116.665	1.434	0.027	30.015	A	0.000	30.015	30.015	100.00	0.000	0.000
					B	0.000	30.015		100.00	0.000	0.000
					C	0.000	30.015		100.00	0.000	5.773
L6 113.330-103.000	108.165	1.404	0.026	46.485	A	0.000	46.485	46.485	100.00	0.000	0.000
					B	0.000	46.485		100.00	0.000	0.000
					C	0.000	46.485		100.00	0.000	10.524
L7 103.000-100.000	101.500	1.379	0.025	13.500	A	0.000	13.500	13.500	100.00	0.000	0.000
					B	0.000	13.500		100.00	0.000	0.000
					C	0.000	13.500		100.00	0.000	3.097
L8 100.000-85.500	92.750	1.343	0.025	72.500	A	0.000	72.500	72.500	100.00	0.000	0.000
					B	0.000	72.500		100.00	0.000	0.000
					C	0.000	72.500		100.00	0.000	15.331
L9 85.500-84.000	84.750	1.309	0.024	7.500	A	0.000	7.500	7.500	100.00	0.000	0.000
					B	0.000	7.500		100.00	0.000	0.000
					C	0.000	7.500		100.00	0.000	1.861
L10 84.000-80.000	82.000	1.297	0.024	20.000	A	0.000	20.000	20.000	100.00	0.000	0.000
					B	0.000	20.000		100.00	0.000	0.000
					C	0.000	20.000		100.00	0.000	4.962
L11 80.000-60.000	70.000	1.24	0.023	100.000	A	0.000	100.000	100.000	100.00	0.000	0.000
					B	0.000	100.000		100.00	0.000	0.000
					C	0.000	100.000		100.00	0.000	22.727
L12 60.000-58.500	59.250	1.182	0.022	7.500	A	0.000	7.500	7.500	100.00	0.000	0.000
					B	0.000	7.500		100.00	0.000	0.000
					C	0.000	7.500		100.00	0.000	1.861
L13 58.500-47.250	52.875	1.144	0.021	56.250	A	0.000	56.250	56.250	100.00	0.000	0.000
					B	0.000	56.250		100.00	0.000	0.000
					C	0.000	56.250		100.00	0.000	11.414
L14 47.250-40.000	43.625	1.083	0.020	36.250	A	0.000	36.250	36.250	100.00	0.000	0.000
					B	0.000	36.250		100.00	0.000	0.000
					C	0.000	36.250		100.00	0.000	8.827
L15 40.000-32.250	36.125	1.026	0.019	38.750	A	0.000	38.750	38.750	100.00	0.000	0.000
					B	0.000	38.750		100.00	0.000	0.000
					C	0.000	38.750		100.00	0.000	9.364
L16 32.250-29.750	31.000	1	0.018	12.500	A	0.000	12.500	12.500	100.00	0.000	0.000
					B	0.000	12.500		100.00	0.000	0.000
					C	0.000	12.500		100.00	0.000	2.685
L17 29.750-20.000	24.875	1	0.018	48.750	A	0.000	48.750	48.750	100.00	0.000	0.000
					B	0.000	48.750		100.00	0.000	0.000
					C	0.000	48.750		100.00	0.000	10.470
L18 20.000-4.250	12.125	1	0.018	78.750	A	0.000	78.750	78.750	100.00	0.000	0.000
					B	0.000	78.750		100.00	0.000	0.000
					C	0.000	78.750		100.00	0.000	16.913
L19 4.250-0.000	2.125	1	0.018	21.250	A	0.000	21.250	21.250	100.00	0.000	0.000
					B	0.000	21.250		100.00	0.000	0.000
					C	0.000	21.250		100.00	0.000	4.564

Tower Pressure - With Ice

G_H = 1.690

Section Elevation ft	z ft	K_Z	q_z ksf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 190.000-180.000	185.000	1.636	0.003	0.750	26.250	A	0.000	26.250	26.250	100.00	0.000	0.000
						B	0.000	26.250		100.00	0.000	0.000
						C	0.000	26.250		100.00	0.000	0.000
L2 180.000-160.000	170.000	1.597	0.003	0.750	62.500	A	0.000	62.500	62.500	100.00	0.000	0.000
						B	0.000	62.500		100.00	0.000	0.000
						C	0.000	62.500		100.00	0.000	10.497
L3 160.000-140.000	150.000	1.541	0.003	0.750	72.500	A	0.000	72.500	72.500	100.00	0.000	0.000
						B	0.000	72.500		100.00	0.000	0.000
						C	0.000	72.500		100.00	0.000	32.310
L4 140.000-120.000	130.000	1.48	0.003	0.750	82.500	A	0.000	82.500	82.500	100.00	0.000	0.000
						B	0.000	82.500		100.00	0.000	0.000
						C	0.000	82.500		100.00	0.000	32.310
L5 120.000-113.330	116.665	1.434	0.003	0.750	30.849	A	0.000	30.849	30.849	100.00	0.000	0.000
						B	0.000	30.849		100.00	0.000	0.000
						C	0.000	30.849		100.00	0.000	10.775
L6 113.330-103.000	108.165	1.404	0.003	0.750	47.776	A	0.000	47.776	47.776	100.00	0.000	0.000
						B	0.000	47.776		100.00	0.000	0.000
						C	0.000	47.776		100.00	0.000	19.855
L7 103.000-100.000	101.500	1.379	0.003	0.750	13.875	A	0.000	13.875	13.875	100.00	0.000	0.000
						B	0.000	13.875		100.00	0.000	0.000
						C	0.000	13.875		100.00	0.000	5.847
L8 100.000-85.500	92.750	1.343	0.003	0.750	74.313	A	0.000	74.313	74.313	100.00	0.000	0.000
						B	0.000	74.313		100.00	0.000	0.000
						C	0.000	74.313		100.00	0.000	28.914
L9 85.500-84.000	84.750	1.309	0.003	0.750	7.688	A	0.000	7.688	7.688	100.00	0.000	0.000
						B	0.000	7.688		100.00	0.000	0.000
						C	0.000	7.688		100.00	0.000	3.486
L10 84.000-80.000	82.000	1.297	0.003	0.750	20.500	A	0.000	20.500	20.500	100.00	0.000	0.000
						B	0.000	20.500		100.00	0.000	0.000
						C	0.000	20.500		100.00	0.000	9.295
L11 80.000-60.000	70.000	1.24	0.003	0.750	102.500	A	0.000	102.500	102.500	100.00	0.000	0.000
						B	0.000	102.500		100.00	0.000	0.000
						C	0.000	102.500		100.00	0.000	42.727
L12 60.000-58.500	59.250	1.182	0.002	0.750	7.688	A	0.000	7.688	7.688	100.00	0.000	0.000
						B	0.000	7.688		100.00	0.000	0.000
						C	0.000	7.688		100.00	0.000	3.486
L13 58.500-47.250	52.875	1.144	0.002	0.750	57.656	A	0.000	57.656	57.656	100.00	0.000	0.000
						B	0.000	57.656		100.00	0.000	0.000
						C	0.000	57.656		100.00	0.000	21.226
L14 47.250-40.000	43.625	1.083	0.002	0.750	37.156	A	0.000	37.156	37.156	100.00	0.000	0.000
						B	0.000	37.156		100.00	0.000	0.000
						C	0.000	37.156		100.00	0.000	16.306
L15 40.000-32.250	36.125	1.026	0.002	0.750	39.719	A	0.000	39.719	39.719	100.00	0.000	0.000
						B	0.000	39.719		100.00	0.000	0.000
						C	0.000	39.719		100.00	0.000	17.301
L16 32.250-29.750	31.000	1	0.002	0.750	12.813	A	0.000	12.813	12.813	100.00	0.000	0.000
						B	0.000	12.813		100.00	0.000	0.000
						C	0.000	12.813		100.00	0.000	4.976
L17 29.750-20.000	24.875	1	0.002	0.750	49.969	A	0.000	49.969	49.969	100.00	0.000	0.000
						B	0.000	49.969		100.00	0.000	0.000
						C	0.000	49.969		100.00	0.000	19.407
L18 20.000-4.250	12.125	1	0.002	0.750	80.719	A	0.000	80.719	80.719	100.00	0.000	0.000
						B	0.000	80.719		100.00	0.000	0.000
						C	0.000	80.719		100.00	0.000	31.350
L19 4.250-0.000	2.125	1	0.002	0.750	21.781	A	0.000	21.781	21.781	100.00	0.000	0.000
						B	0.000	21.781		100.00	0.000	0.000
						C	0.000	21.781		100.00	0.000	8.460

Tower Pressure - Service

G_H = 1.690

Section Elevation ft	z ft	K_Z	q_z ksf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 190.000-180.000	185.000	1.636	0.010	25.000	A	0.000	25.000	25.000	100.00	0.000	0.000
					B	0.000	25.000		100.00	0.000	0.000
					C	0.000	25.000		100.00	0.000	0.000
L2 180.000-160.000	170.000	1.597	0.010	60.000	A	0.000	60.000	60.000	100.00	0.000	0.000
					B	0.000	60.000		100.00	0.000	0.000
					C	0.000	60.000		100.00	0.000	5.697
L3 160.000-140.000	150.000	1.541	0.010	70.000	A	0.000	70.000	70.000	100.00	0.000	0.000
					B	0.000	70.000		100.00	0.000	0.000
					C	0.000	70.000		100.00	0.000	17.310
L4 140.000-120.000	130.000	1.48	0.009	80.000	A	0.000	80.000	80.000	100.00	0.000	0.000
					B	0.000	80.000		100.00	0.000	0.000
					C	0.000	80.000		100.00	0.000	17.310
L5 120.000-113.330	116.665	1.434	0.009	30.015	A	0.000	30.015	30.015	100.00	0.000	0.000
					B	0.000	30.015		100.00	0.000	0.000
					C	0.000	30.015		100.00	0.000	5.773
L6 113.330-103.000	108.165	1.404	0.009	46.485	A	0.000	46.485	46.485	100.00	0.000	0.000
					B	0.000	46.485		100.00	0.000	0.000
					C	0.000	46.485		100.00	0.000	10.524
L7 103.000-100.000	101.500	1.379	0.009	13.500	A	0.000	13.500	13.500	100.00	0.000	0.000
					B	0.000	13.500		100.00	0.000	0.000
					C	0.000	13.500		100.00	0.000	3.097
L8 100.000-85.500	92.750	1.343	0.009	72.500	A	0.000	72.500	72.500	100.00	0.000	0.000
					B	0.000	72.500		100.00	0.000	0.000
					C	0.000	72.500		100.00	0.000	15.331
L9 85.500-84.000	84.750	1.309	0.008	7.500	A	0.000	7.500	7.500	100.00	0.000	0.000
					B	0.000	7.500		100.00	0.000	0.000
					C	0.000	7.500		100.00	0.000	1.861
L10 84.000-80.000	82.000	1.297	0.008	20.000	A	0.000	20.000	20.000	100.00	0.000	0.000
					B	0.000	20.000		100.00	0.000	0.000
					C	0.000	20.000		100.00	0.000	4.962
L11 80.000-60.000	70.000	1.24	0.008	100.000	A	0.000	100.000	100.000	100.00	0.000	0.000
					B	0.000	100.000		100.00	0.000	0.000
					C	0.000	100.000		100.00	0.000	22.727
L12 60.000-58.500	59.250	1.182	0.008	7.500	A	0.000	7.500	7.500	100.00	0.000	0.000
					B	0.000	7.500		100.00	0.000	0.000
					C	0.000	7.500		100.00	0.000	1.861
L13 58.500-47.250	52.875	1.144	0.007	56.250	A	0.000	56.250	56.250	100.00	0.000	0.000
					B	0.000	56.250		100.00	0.000	0.000
					C	0.000	56.250		100.00	0.000	11.414
L14 47.250-40.000	43.625	1.083	0.007	36.250	A	0.000	36.250	36.250	100.00	0.000	0.000
					B	0.000	36.250		100.00	0.000	0.000
					C	0.000	36.250		100.00	0.000	8.827
L15 40.000-32.250	36.125	1.026	0.007	38.750	A	0.000	38.750	38.750	100.00	0.000	0.000
					B	0.000	38.750		100.00	0.000	0.000
					C	0.000	38.750		100.00	0.000	9.364
L16 32.250-29.750	31.000	1	0.006	12.500	A	0.000	12.500	12.500	100.00	0.000	0.000
					B	0.000	12.500		100.00	0.000	0.000
					C	0.000	12.500		100.00	0.000	2.685
L17 29.750-20.000	24.875	1	0.006	48.750	A	0.000	48.750	48.750	100.00	0.000	0.000
					B	0.000	48.750		100.00	0.000	0.000
					C	0.000	48.750		100.00	0.000	10.470
L18 20.000-4.250	12.125	1	0.006	78.750	A	0.000	78.750	78.750	100.00	0.000	0.000
					B	0.000	78.750		100.00	0.000	0.000
					C	0.000	78.750		100.00	0.000	16.913
L19 4.250-0.000	2.125	1	0.006	21.250	A	0.000	21.250	21.250	100.00	0.000	0.000
					B	0.000	21.250		100.00	0.000	0.000
					C	0.000	21.250		100.00	0.000	4.564

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 30 deg - No Ice

Comb. No.	Description
4	Dead+Wind 60 deg - No Ice
5	Dead+Wind 90 deg - No Ice
6	Dead+Wind 120 deg - No Ice
7	Dead+Wind 150 deg - No Ice
8	Dead+Wind 180 deg - No Ice
9	Dead+Wind 210 deg - No Ice
10	Dead+Wind 240 deg - No Ice
11	Dead+Wind 270 deg - No Ice
12	Dead+Wind 300 deg - No Ice
13	Dead+Wind 330 deg - No Ice
14	Dead+Ice+Temp
15	Dead+Wind 0 deg+Ice+Temp
16	Dead+Wind 30 deg+Ice+Temp
17	Dead+Wind 60 deg+Ice+Temp
18	Dead+Wind 90 deg+Ice+Temp
19	Dead+Wind 120 deg+Ice+Temp
20	Dead+Wind 150 deg+Ice+Temp
21	Dead+Wind 180 deg+Ice+Temp
22	Dead+Wind 210 deg+Ice+Temp
23	Dead+Wind 240 deg+Ice+Temp
24	Dead+Wind 270 deg+Ice+Temp
25	Dead+Wind 300 deg+Ice+Temp
26	Dead+Wind 330 deg+Ice+Temp
27	Dead+Wind 0 deg - Service
28	Dead+Wind 30 deg - Service
29	Dead+Wind 60 deg - Service
30	Dead+Wind 90 deg - Service
31	Dead+Wind 120 deg - Service
32	Dead+Wind 150 deg - Service
33	Dead+Wind 180 deg - Service
34	Dead+Wind 210 deg - Service
35	Dead+Wind 240 deg - Service
36	Dead+Wind 270 deg - Service
37	Dead+Wind 300 deg - Service
38	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	190 - 180	Pole	Max Tension	11	0.000	-0.000	0.001
			Max. Compression	14	-7.675	0.100	-0.058
			Max. Mx	11	-4.971	53.919	0.486
			Max. My	8	-4.973	-0.494	-53.375
			Max. Vy	11	-7.318	53.919	0.486
			Max. Vx	8	7.264	-0.494	-53.375
			Max. Torque	9			-0.295
L2	180 - 160	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-19.589	0.924	-0.757
			Max. Mx	11	-12.844	271.287	1.322
			Max. My	8	-12.845	-1.342	-269.727
			Max. Vy	11	-17.768	271.287	1.322
			Max. Vx	8	17.715	-1.342	-269.727
			Max. Torque	13			1.172
L3	160 - 140	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-30.324	2.756	-2.393
			Max. Mx	11	-19.319	722.399	4.936
			Max. My	8	-19.311	-5.000	-721.729
			Max. Vy	11	-27.238	722.399	4.936
			Max. Vx	8	27.368	-5.000	-721.729
			Max. Torque	13			2.616
L4	140 - 120	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-37.409	5.292	-3.561
			Max. Mx	11	-24.383	1299.852	11.708
			Max. My	8	-24.375	-11.420	-1301.490
			Max. Vy	11	-30.513	1299.852	11.708

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	8	30.643	-11.420	-1301.490
			Max. Torque	13			2.814
L5	120 - 113.33	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-39.869	6.241	-4.108
			Max. Mx	11	-26.174	1507.089	13.929
			Max. My	8	-26.167	-13.540	-1509.526
			Max. Vy	11	-31.581	1507.089	13.929
			Max. Vx	8	31.711	-13.540	-1509.526
			Max. Torque	13			2.708
L6	113.33 - 103	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-44.686	7.711	-4.549
			Max. Mx	11	-29.842	1844.674	17.509
			Max. My	8	-29.834	-16.826	-1848.188
			Max. Vy	11	-33.533	1844.674	17.509
			Max. Vx	8	33.663	-16.826	-1848.188
			Max. Torque	13			2.760
L7	103 - 100	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-45.992	8.137	-4.795
			Max. Mx	11	-30.851	1946.056	18.510
			Max. My	8	-30.844	-17.782	-1949.930
			Max. Vy	11	-34.014	1946.056	18.510
			Max. Vx	8	34.144	-17.782	-1949.930
			Max. Torque	13			2.574
L8	100 - 85.5	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-53.053	10.421	-5.688
			Max. Mx	11	-36.281	2460.353	23.463
			Max. My	8	-36.275	-22.350	-2465.783
			Max. Vy	11	-36.718	2460.353	23.463
			Max. Vx	8	36.847	-22.350	-2465.783
			Max. Torque	2			2.654
L9	85.5 - 84	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-53.824	10.654	-5.823
			Max. Mx	11	-36.894	2515.655	23.960
			Max. My	8	-36.888	-22.824	-2521.265
			Max. Vy	11	-36.974	2515.655	23.960
			Max. Vx	8	37.106	-22.824	-2521.265
			Max. Torque	2			2.681
L10	84 - 80	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-55.748	11.286	-6.187
			Max. Mx	11	-38.409	2665.002	25.287
			Max. My	8	-38.403	-24.084	-2671.088
			Max. Vy	11	-37.653	2665.002	25.287
			Max. Vx	8	37.782	-24.084	-2671.088
			Max. Torque	2			2.754
L11	80 - 60	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-66.636	14.596	-7.945
			Max. Mx	11	-47.185	3455.152	31.966
			Max. My	8	-47.180	-30.321	-3463.491
			Max. Vy	11	-40.990	3455.152	31.966
			Max. Vx	8	41.119	-30.321	-3463.491
			Max. Torque	2			3.367
L12	60 - 58.5	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-67.547	14.821	-8.074
			Max. Mx	11	-47.944	3516.833	32.462
			Max. My	8	-47.939	-30.794	-3525.351
			Max. Vy	5	41.214	-3510.110	-36.272
			Max. Vx	8	41.346	-30.794	-3525.351
			Max. Torque	2			3.392
L13	58.5 - 47.25	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-73.827	16.519	-9.055
			Max. Mx	11	-53.135	3989.127	36.177
			Max. My	8	-53.131	-34.329	-3998.987
			Max. Vy	11	-42.700	3989.127	36.177
			Max. Vx	8	42.830	-34.329	-3998.987
			Max. Torque	2			3.537
L14	47.25 - 40	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-78.530	17.613	-9.686
			Max. Mx	11	-57.133	4302.299	38.564
			Max. My	8	-57.130	-36.602	-4313.023

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	11	-43.651	4302.299	38.564
			Max. Vx	8	43.781	-36.602	-4313.023
			Max. Torque	2			3.645
L15	40 - 32.25	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-83.558	18.781	-10.360
			Max. Mx	11	-61.420	4644.348	41.110
			Max. My	8	-61.417	-39.026	-4655.994
			Max. Vy	5	44.577	-4635.799	-46.043
			Max. Vx	8	44.708	-39.026	-4655.994
			Max. Torque	2			3.753
L16	32.25 - 29.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-85.479	19.158	-10.578
			Max. Mx	11	-63.098	4756.194	41.930
			Max. My	8	-63.096	-39.807	-4768.137
			Max. Vy	5	44.862	-4747.472	-46.969
			Max. Vx	2	-44.993	49.099	4763.350
			Max. Torque	2			3.783
L17	29.75 - 20	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-92.078	20.627	-11.426
			Max. Mx	11	-68.784	5198.889	45.117
			Max. My	8	-68.782	-42.844	-5211.987
			Max. Vy	5	45.901	-5189.494	-50.571
			Max. Vx	2	-46.032	52.852	5206.805
			Max. Torque	2			3.900
L18	20 - 4.25	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-103.987	23.000	-12.797
			Max. Mx	11	-79.230	5934.940	50.229
			Max. My	8	-79.230	-47.716	-5949.893
			Max. Vy	5	47.505	-5924.465	-56.348
			Max. Vx	2	-47.635	58.870	5944.077
			Max. Torque	2			4.090
L19	4.25 - 0	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-107.567	23.640	-13.166
			Max. Mx	11	-82.415	6137.794	51.599
			Max. My	8	-82.415	-49.022	-6153.245
			Max. Vy	5	47.922	-6127.029	-57.896
			Max. Vx	2	-48.052	60.482	6147.259
			Max. Torque	2			4.141

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	14	107.567	-0.001	0.001
	Max. H_x	11	82.424	47.902	0.343
	Max. H_z	2	82.424	0.343	48.036
	Max. M_x	2	6147.259	0.343	48.036
	Max. M_z	5	6127.029	-47.907	-0.343
	Max. Torsion	2	4.141	0.343	48.036
	Min. Vert	11	82.424	47.902	0.343
	Min. H_x	5	82.424	-47.907	-0.343
	Min. H_z	8	82.424	-0.343	-48.034
	Min. M_x	8	-6153.245	-0.343	-48.034
	Min. M_z	11	-6137.794	47.902	0.343
	Min. Torsion	8	-4.140	-0.343	-48.034

Tower Mast Reaction Summary

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead Only	82.424	-0.000	0.000	3.066	5.594	0.000
Dead+Wind 0 deg - No Ice	82.424	-0.343	-48.036	-6147.259	60.482	-4.141
Dead+Wind 30 deg - No Ice	82.424	23.658	-41.431	-5296.097	-3013.500	-3.185
Dead+Wind 60 deg - No Ice	82.424	41.320	-23.722	-3024.763	-5278.489	-1.375
Dead+Wind 90 deg - No Ice	82.424	47.907	0.343	57.896	-6127.029	0.803
Dead+Wind 120 deg - No Ice	82.424	41.663	24.316	3125.849	-5333.170	2.765
Dead+Wind 150 deg - No Ice	82.424	24.252	41.773	5357.068	-3108.296	3.986
Dead+Wind 180 deg - No Ice	82.424	0.343	48.034	6153.245	-49.022	4.140
Dead+Wind 210 deg - No Ice	82.424	-23.658	41.431	5302.390	3024.958	3.184
Dead+Wind 240 deg - No Ice	82.424	-41.320	23.722	3031.056	5289.951	1.376
Dead+Wind 270 deg - No Ice	82.424	-47.902	-0.343	-51.599	6137.794	-0.802
Dead+Wind 300 deg - No Ice	82.424	-41.663	-24.316	-3119.562	5344.632	-2.765
Dead+Wind 330 deg - No Ice	82.424	-24.252	-41.773	-5350.781	3119.755	-3.987
Dead+Ice+Temp	107.567	0.001	-0.001	13.166	23.640	-0.000
Dead+Wind 0 deg+Ice+Temp	107.567	-0.036	-6.635	-843.962	29.755	-0.759
Dead+Wind 30 deg+Ice+Temp	107.567	3.278	-5.728	-726.263	-398.402	-0.665
Dead+Wind 60 deg+Ice+Temp	107.567	5.713	-3.287	-410.366	-713.351	-0.392
Dead+Wind 90 deg+Ice+Temp	107.567	6.618	0.036	19.084	-830.704	-0.015
Dead+Wind 120 deg+Ice+Temp	107.567	5.749	3.349	447.032	-719.039	0.367
Dead+Wind 150 deg+Ice+Temp	107.567	3.340	5.764	758.793	-408.225	0.650
Dead+Wind 180 deg+Ice+Temp	107.567	0.036	6.635	870.833	18.428	0.759
Dead+Wind 210 deg+Ice+Temp	107.567	-3.278	5.728	753.130	446.598	0.665
Dead+Wind 240 deg+Ice+Temp	107.567	-5.713	3.287	437.222	761.558	0.392
Dead+Wind 270 deg+Ice+Temp	107.567	-6.618	-0.036	7.757	878.915	0.015
Dead+Wind 300 deg+Ice+Temp	107.567	-5.749	-3.349	-420.190	767.222	-0.367
Dead+Wind 330 deg+Ice+Temp	107.567	-3.340	-5.764	-731.951	456.408	-0.650
Dead+Wind 0 deg - Service	82.424	-0.119	-16.619	-2125.464	24.687	-1.436
Dead+Wind 30 deg - Service	82.424	8.186	-14.335	-1831.022	-1039.276	-1.104
Dead+Wind 60 deg - Service	82.424	14.297	-8.208	-1044.868	-1823.231	-0.477
Dead+Wind 90 deg - Service	82.424	16.575	0.119	22.098	-2116.870	0.279
Dead+Wind 120 deg - Service	82.424	14.415	8.413	1083.990	-1842.180	0.959
Dead+Wind 150 deg - Service	82.424	8.391	14.453	1856.268	-1072.101	1.382
Dead+Wind 180 deg - Service	82.424	0.119	16.619	2131.760	-13.213	1.436
Dead+Wind 210 deg - Service	82.424	-8.186	14.335	1837.318	1050.751	1.104
Dead+Wind 240 deg - Service	82.424	-14.297	8.208	1051.165	1834.707	0.477
Dead+Wind 270 deg - Service	82.424	-16.575	-0.119	-15.802	2128.344	-0.279
Dead+Wind 300 deg - Service	82.424	-14.415	-8.413	-1077.693	1853.656	-0.959
Dead+Wind 330 deg - Service	82.424	-8.391	-14.453	-1849.971	1083.576	-1.383

Solution Summary

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
1	0.000	-82.424	0.000	0.000	82.424	-0.000	0.000%
2	-0.343	-82.424	-48.038	0.343	82.424	48.036	0.001%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
3	23.658	-82.424	-41.431	-23.658	82.424	41.431	0.000%
4	41.320	-82.424	-23.722	-41.320	82.424	23.722	0.000%
5	47.910	-82.424	0.343	-47.907	82.424	-0.343	0.004%
6	41.663	-82.424	24.316	-41.663	82.424	-24.316	0.000%
7	24.252	-82.424	41.773	-24.252	82.424	-41.773	0.000%
8	0.343	-82.424	48.038	-0.343	82.424	-48.034	0.004%
9	-23.658	-82.424	41.431	23.658	82.424	-41.431	0.000%
10	-41.320	-82.424	23.722	41.320	82.424	-23.722	0.000%
11	-47.910	-82.424	-0.343	47.902	82.424	0.343	0.008%
12	-41.663	-82.424	-24.316	41.663	82.424	24.316	0.000%
13	-24.252	-82.424	-41.773	24.252	82.424	41.773	0.000%
14	0.000	-107.567	0.000	-0.001	107.567	0.001	0.001%
15	-0.036	-107.567	-6.635	0.036	107.567	6.635	0.000%
16	3.278	-107.567	-5.729	-3.278	107.567	5.728	0.000%
17	5.713	-107.567	-3.287	-5.713	107.567	3.287	0.000%
18	6.618	-107.567	0.036	-6.618	107.567	-0.036	0.000%
19	5.749	-107.567	3.349	-5.749	107.567	-3.349	0.000%
20	3.340	-107.567	5.764	-3.340	107.567	-5.764	0.000%
21	0.036	-107.567	6.635	-0.036	107.567	-6.635	0.000%
22	-3.278	-107.567	5.729	3.278	107.567	-5.728	0.000%
23	-5.713	-107.567	3.287	5.713	107.567	-3.287	0.000%
24	-6.618	-107.567	-0.036	6.618	107.567	0.036	0.000%
25	-5.749	-107.567	-3.349	5.749	107.567	3.349	0.000%
26	-3.340	-107.567	-5.764	3.340	107.567	5.764	0.000%
27	-0.119	-82.424	-16.622	0.119	82.424	16.619	0.003%
28	8.186	-82.424	-14.336	-8.186	82.424	14.335	0.001%
29	14.298	-82.424	-8.208	-14.297	82.424	8.208	0.001%
30	16.578	-82.424	0.119	-16.575	82.424	-0.119	0.003%
31	14.416	-82.424	8.414	-14.415	82.424	-8.413	0.001%
32	8.392	-82.424	14.454	-8.391	82.424	-14.453	0.001%
33	0.119	-82.424	16.622	-0.119	82.424	-16.619	0.003%
34	-8.186	-82.424	14.336	8.186	82.424	-14.335	0.001%
35	-14.298	-82.424	8.208	14.297	82.424	-8.208	0.001%
36	-16.578	-82.424	-0.119	16.575	82.424	0.119	0.003%
37	-14.416	-82.424	-8.414	14.415	82.424	8.413	0.001%
38	-8.392	-82.424	-14.454	8.391	82.424	14.453	0.001%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	15	0.00000001	0.00011703
3	Yes	18	0.00000001	0.00008288
4	Yes	18	0.00000001	0.00008626
5	Yes	14	0.00005094	0.00011775
6	Yes	18	0.00000001	0.00009302
7	Yes	18	0.00000001	0.00008683
8	Yes	14	0.00005093	0.00014987
9	Yes	18	0.00000001	0.00008871
10	Yes	18	0.00000001	0.00008508
11	Yes	13	0.00011724	0.00008092
12	Yes	18	0.00000001	0.00008780
13	Yes	18	0.00000001	0.00009424
14	Yes	8	0.00000001	0.00004617
15	Yes	15	0.00000001	0.00014816
16	Yes	15	0.00000001	0.00014784
17	Yes	15	0.00000001	0.00014701
18	Yes	15	0.00000001	0.00014571
19	Yes	16	0.00000001	0.00006888
20	Yes	16	0.00000001	0.00006997
21	Yes	16	0.00000001	0.00006944
22	Yes	16	0.00000001	0.00007142
23	Yes	16	0.00000001	0.00007156
24	Yes	16	0.00000001	0.00007007

25	Yes	16	0.00000001	0.00007113
26	Yes	16	0.00000001	0.00007027
27	Yes	13	0.00011914	0.00007079
28	Yes	14	0.00000001	0.00011094
29	Yes	14	0.00000001	0.00012360
30	Yes	13	0.00011915	0.00003584
31	Yes	14	0.00000001	0.00014011
32	Yes	14	0.00000001	0.00011628
33	Yes	13	0.00011914	0.00006102
34	Yes	14	0.00000001	0.00013411
35	Yes	14	0.00000001	0.00011899
36	Yes	13	0.00011915	0.00002999
37	Yes	14	0.00000001	0.00011934
38	Yes	14	0.00000001	0.00014558

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	190 - 180	24.429	37	1.048	0.002
L2	180 - 160	22.240	37	1.041	0.002
L3	160 - 140	17.947	37	0.998	0.002
L4	140 - 120	13.923	37	0.909	0.001
L5	120 - 113.33	10.352	37	0.784	0.001
L6	113.33 - 103	9.285	37	0.743	0.001
L7	103 - 100	7.739	37	0.685	0.001
L8	100 - 85.5	7.315	37	0.665	0.001
L9	85.5 - 84	5.411	37	0.585	0.001
L10	84 - 80	5.229	37	0.577	0.001
L11	80 - 60	4.756	37	0.552	0.001
L12	60 - 58.5	2.698	37	0.425	0.000
L13	58.5 - 47.25	2.566	37	0.416	0.000
L14	47.25 - 40	1.681	37	0.334	0.000
L15	40 - 32.25	1.210	37	0.286	0.000
L16	32.25 - 29.75	0.789	37	0.231	0.000
L17	29.75 - 20	0.671	37	0.216	0.000
L18	20 - 4.25	0.303	37	0.144	0.000
L19	4.25 - 0	0.013	37	0.029	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
190.000	PD201-7	37	24.429	1.048	0.002	113725
182.000	Platform Mount [LP 403-1]	37	22.676	1.043	0.002	70960
173.000	Platform Mount [LP 405-1]	37	20.718	1.031	0.002	32460
162.000	(2) 7770.00 w/ Mount Pipe	37	18.368	1.004	0.002	19377
151.000	Pipe Mount [PM 601-3]	37	16.092	0.964	0.002	13582
150.000	LNX-6514DS-T4M w/ Mount Pipe	37	15.890	0.960	0.002	13217
125.000	PD128-1	37	11.193	0.816	0.001	8406
110.000	PD128-1	37	8.773	0.724	0.001	10138
95.000	PD128-1	37	6.631	0.636	0.001	10429
80.000	DB222	37	4.756	0.552	0.001	9747

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	190 - 180	70.495	7	3.023	0.006
L2	180 - 160	64.181	7	3.005	0.006
L3	160 - 140	51.802	13	2.881	0.005
L4	140 - 120	40.194	13	2.625	0.004
L5	120 - 113.33	29.888	13	2.263	0.003
L6	113.33 - 103	26.808	13	2.145	0.003
L7	103 - 100	22.346	13	1.977	0.002
L8	100 - 85.5	21.121	13	1.921	0.002
L9	85.5 - 84	15.626	13	1.690	0.002
L10	84 - 80	15.099	13	1.666	0.002
L11	80 - 60	13.733	13	1.595	0.002
L12	60 - 58.5	7.792	13	1.226	0.001
L13	58.5 - 47.25	7.411	13	1.200	0.001
L14	47.25 - 40	4.855	13	0.964	0.001
L15	40 - 32.25	3.493	13	0.827	0.001
L16	32.25 - 29.75	2.278	13	0.668	0.001
L17	29.75 - 20	1.939	13	0.625	0.001
L18	20 - 4.25	0.874	13	0.415	0.000
L19	4.25 - 0	0.038	13	0.085	0.000

Critical Deflection and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
190.000	PD201-7	7	70.495	3.023	0.006	39651
182.000	Platform Mount [LP 403-1]	7	65.441	3.010	0.006	24740
173.000	Platform Mount [LP 405-1]	7	59.794	2.976	0.006	11316
162.000	(2) 7770.00 w/ Mount Pipe	13	53.014	2.899	0.005	6754
151.000	Pipe Mount [PM 601-3]	13	46.450	2.783	0.005	4731
150.000	LNX-6514DS-T4M w/ Mount Pipe	13	45.867	2.770	0.005	4603
125.000	PD128-1	13	32.317	2.357	0.003	2923
110.000	PD128-1	13	25.329	2.091	0.003	3522
95.000	PD128-1	13	19.147	1.836	0.002	3621
80.000	DB222	13	13.733	1.595	0.002	3382

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
L1	190 - 180 (1)	30" x 0.375"	10.000	0.000	0.0	25.075	34.901	-4.966	875.146	0.006
L2	180 - 160 (2)	36" x 0.375"	20.000	0.000	0.0	23.696	41.970	-12.835	994.507	0.013
L3	160 - 140 (3)	42" x 0.375"	20.000	0.000	0.0	22.711	49.038	-19.293	1113.690	0.017
L4	140 - 120 (4)	P48x3/8	20.000	0.000	0.0	21.972	56.107	-24.356	1232.770	0.020
L5	120 - 113.33 (5)	P54x3/8	6.670	0.000	0.0	21.397	63.175	-26.148	1351.780	0.019
L6	113.33 - 103 (6)	RPS 54" x 0.49054"	10.330	0.000	0.0	21.386	82.462	-29.817	1763.510	0.017
L7	103 - 100 (7)	RPS 54" x 0.49054"	3.000	0.000	0.0	21.386	82.462	-30.827	1763.510	0.017
L8	100 - 85.5 (8)	RPS 60" x 0.47803"	14.500	0.000	0.0	20.926	89.389	-36.259	1870.570	0.019
L9	85.5 - 84 (9)	RPS 60" x 0.55603"	1.500	0.000	0.0	20.923	103.838	-36.872	2172.590	0.017
L10	84 - 80 (10)	RPS 60" x 0.50354"	4.000	0.000	0.0	20.928	94.118	-38.388	1969.690	0.019
L11	80 - 60 (11)	RPS 60" x 0.57817"	20.000	0.000	0.0	22.323	107.932	-47.168	2409.390	0.020
L12	60 - 58.5 (12)	RPS 60" x 0.70417"	1.500	0.000	0.0	21.528	131.175	-47.928	2823.940	0.017
L13	58.5 - 47.25	P60x5/8	11.250	0.000	0.0	23.696	116.583	-53.122	2762.520	0.019

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
	(13)									
L14	47.25 - 40 (14)	RPS 60" x 0.76962"	7.250	0.000	0.0	21.546	143.209	-57.121	3085.580	0.019
L15	40 - 32.25 (15)	RPS 60" x 0.76962"	7.750	0.000	0.0	21.546	143.209	-61.410	3085.580	0.020
L16	32.25 - 29.75 (16)	RPS 60" x 0.96202"	2.500	0.000	0.0	21.540	178.429	-63.090	3843.360	0.016
L17	29.75 - 20 (17)	RPS 60" x 0.81453"	9.750	0.000	0.0	21.528	151.451	-68.778	3260.440	0.021
L18	20 - 4.25 (18)	RPS 60" x 0.94201"	15.750	0.000	0.0	22.800	174.777	-79.229	3984.910	0.020
L19	4.25 - 0 (19)	RPS 60" x 1.08084"	4.250	0.000	0.0	22.776	200.063	-82.415	4556.650	0.018

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	190 - 180 (1)	30" x 0.375"	54.220	2.549	25.075	0.102	0.000	0.000	25.075	0.000
L2	180 - 160 (2)	36" x 0.375"	272.128	8.827	23.696	0.373	0.000	0.000	23.696	0.000
L3	160 - 140 (3)	42" x 0.375"	726.728	17.242	22.711	0.759	0.000	0.000	22.711	0.000
L4	140 - 120 (4)	P48x3/8	1311.350	23.740	21.972	1.080	0.000	0.000	21.972	0.000
L5	120 - 113.33 (5)	P54x3/8	1521.092	21.701	21.397	1.014	0.000	0.000	21.397	0.000
L6	113.33 - 103 (6)	RPS 54" x 0.49054"	1862.417	20.444	21.386	0.956	0.000	0.000	21.386	0.000
L7	103 - 100 (7)	RPS 54" x 0.49054"	1964.933	21.569	21.386	1.009	0.000	0.000	21.386	0.000
L8	100 - 85.5 (8)	RPS 60" x 0.47803"	2484.617	22.594	20.926	1.080	0.000	0.000	20.926	0.000
L9	85.5 - 84 (9)	RPS 60" x 0.55603"	2540.483	19.939	20.923	0.953	0.000	0.000	20.923	0.000
L10	84 - 80 (10)	RPS 60" x 0.50354"	2691.325	23.263	20.928	1.112	0.000	0.000	20.928	0.000
L11	80 - 60 (11)	RPS 60" x 0.57817"	3488.975	26.364	22.323	1.181	0.000	0.000	22.323	0.000
L12	60 - 58.5 (12)	RPS 60" x 0.70417"	3551.225	22.172	23.681	0.936	0.000	0.000	23.681	0.000
L13	58.5 - 47.25 (13)	P60x5/8	4027.717	28.220	23.696	1.191	0.000	0.000	23.696	0.000
L14	47.25 - 40 (14)	RPS 60" x 0.76962"	4343.592	24.895	23.701	1.050	0.000	0.000	23.701	0.000
L15	40 - 32.25 (15)	RPS 60" x 0.76962"	4688.525	26.872	23.701	1.134	0.000	0.000	23.701	0.000
L16	32.25 - 29.75 (16)	RPS 60" x 0.96202"	4801.292	22.228	23.694	0.938	0.000	0.000	23.694	0.000
L17	29.75 - 20 (17)	RPS 60" x 0.81453"	5247.600	28.482	23.681	1.203	0.000	0.000	23.681	0.000
L18	20 - 4.25 (18)	RPS 60" x 0.94201"	5989.441	28.290	25.080	1.128	0.000	0.000	25.080	0.000
L19	4.25 - 0 (19)	RPS 60" x 1.08084"	6193.850	25.676	25.054	1.025	0.000	0.000	25.054	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	190 - 180 (1)	30" x 0.375"	7.351	0.421	16.800	0.025	0.070	0.002	15.644	0.000
L2	180 - 160 (2)	36" x 0.375"	17.806	0.848	16.800	0.051	1.074	0.017	11.901	0.001
L3	160 - 140 (3)	42" x 0.375"	27.579	1.125	16.800	0.067	2.609	0.031	9.619	0.003
L4	140 - 120 (4)	P48x3/8	30.919	1.102	16.800	0.066	2.613	0.024	8.021	0.003

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L5	120 - 113.33 (5)	P54x3/8	31.986	1.013	16.800	0.060	2.708	0.019	7.343	0.003
L6	113.33 - 103 (6)	RPS 54" x 0.49054"	33.938	0.823	15.372	0.054	2.524	0.014	10.272	0.001
L7	103 - 100 (7)	RPS 54" x 0.49054"	34.420	0.835	15.372	0.054	2.574	0.014	10.272	0.001
L8	100 - 85.5 (8)	RPS 60" x 0.47803"	37.122	0.831	15.652	0.053	2.483	0.011	9.190	0.001
L9	85.5 - 84 (9)	RPS 60" x 0.55603"	37.382	0.720	14.788	0.049	2.515	0.010	11.101	0.001
L10	84 - 80 (10)	RPS 60" x 0.50354"	38.057	0.809	15.372	0.053	2.600	0.011	9.807	0.001
L11	80 - 60 (11)	RPS 60" x 0.57817"	41.392	0.767	15.944	0.048	3.093	0.012	11.656	0.001
L12	60 - 58.5 (12)	RPS 60" x 0.70417"	41.620	0.635	14.352	0.044	3.122	0.010	14.352	0.001
L13	58.5 - 47.25 (13)	P60x5/8	43.102	0.739	16.800	0.044	3.289	0.012	12.848	0.001
L14	47.25 - 40 (14)	RPS 60" x 0.76962"	44.053	0.615	14.364	0.043	3.414	0.010	14.364	0.001
L15	40 - 32.25 (15)	RPS 60" x 0.76962"	44.979	0.628	14.364	0.044	3.539	0.010	14.364	0.001
L16	32.25 - 29.75 (16)	RPS 60" x 0.96202"	45.264	0.507	14.360	0.035	3.574	0.008	14.360	0.001
L17	29.75 - 20 (17)	RPS 60" x 0.81453"	46.301	0.611	14.352	0.043	3.709	0.010	14.352	0.001
L18	20 - 4.25 (18)	RPS 60" x 0.94201"	47.902	0.548	15.200	0.036	3.928	0.009	15.200	0.001
L19	4.25 - 0 (19)	RPS 60" x 1.08084"	48.318	0.483	15.184	0.032	3.987	0.008	15.184	0.001

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	190 - 180 (1)	0.006	0.102	0.000	0.025	0.000	0.108 ✔	1.333	H1-3+VT ✔
L2	180 - 160 (2)	0.013	0.373	0.000	0.051	0.001	0.388 ✔	1.333	H1-3+VT ✔
L3	160 - 140 (3)	0.017	0.759	0.000	0.067	0.003	0.781 ✔	1.333	H1-3+VT ✔
L4	140 - 120 (4)	0.020	1.080	0.000	0.066	0.003	1.105 ✔	1.333	H1-3+VT ✔
L5	120 - 113.33 (5)	0.019	1.014	0.000	0.060	0.003	1.038 ✔	1.333	H1-3+VT ✔
L6	113.33 - 103 (6)	0.017	0.956	0.000	0.054	0.001	0.976 ✔	1.333	H1-3+VT ✔
L7	103 - 100 (7)	0.017	1.009	0.000	0.054	0.001	1.029 ✔	1.333	H1-3+VT ✔
L8	100 - 85.5 (8)	0.019	1.080	0.000	0.053	0.001	1.102 ✔	1.333	H1-3+VT ✔
L9	85.5 - 84 (9)	0.017	0.953	0.000	0.049	0.001	0.972 ✔	1.333	H1-3+VT ✔
L10	84 - 80 (10)	0.019	1.112	0.000	0.053	0.001	1.134 ✔	1.333	H1-3+VT ✔
L11	80 - 60 (11)	0.020	1.181	0.000	0.048	0.001	1.203 ✔	1.333	H1-3+VT ✔
L12	60 - 58.5 (12)	0.017	0.936	0.000	0.044	0.001	0.955 ✔	1.333	H1-3+VT ✔
L13	58.5 - 47.25 (13)	0.019	1.191	0.000	0.044	0.001	1.212 ✔	1.333	H1-3+VT ✔
L14	47.25 - 40 (14)	0.019	1.050	0.000	0.043	0.001	1.071 ✔	1.333	H1-3+VT ✔
L15	40 - 32.25 (15)	0.020	1.134	0.000	0.044	0.001	1.156 ✔	1.333	H1-3+VT ✔

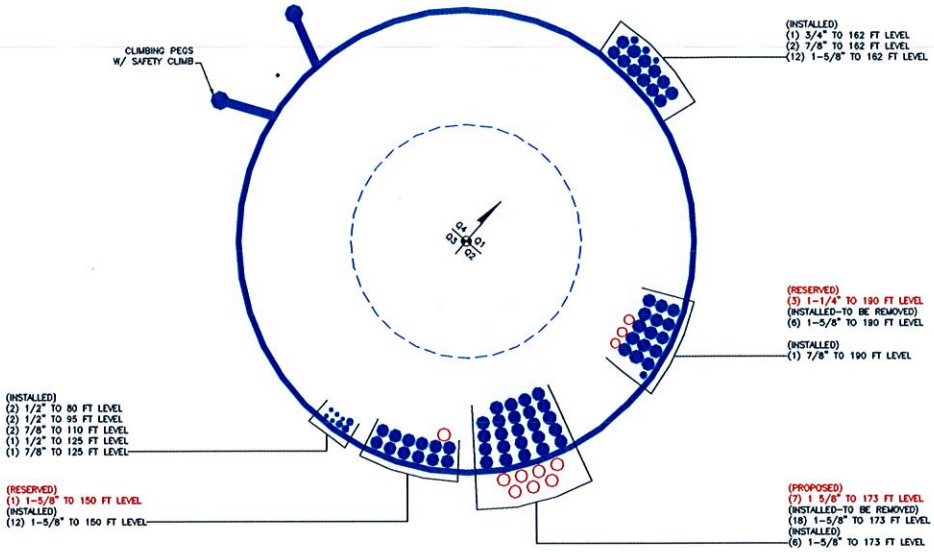
Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L16	32.25 - 29.75 (16)	0.016	0.938	0.000	0.035	0.001	0.956 ✔	1.333	H1-3+VT ✔
L17	29.75 - 20 (17)	0.021	1.203	0.000	0.043	0.001	1.226 ✔	1.333	H1-3+VT ✔
L18	20 - 4.25 (18)	0.020	1.128	0.000	0.036	0.001	1.149 ✔	1.333	H1-3+VT ✔
L19	4.25 - 0 (19)	0.018	1.025	0.000	0.032	0.001	1.044 ✔	1.333	H1-3+VT ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	190 - 180	Pole	30" x 0.375"	1	-4.966	1166.570	8.1	Pass
L2	180 - 160	Pole	36" x 0.375"	2	-12.835	1325.678	29.1	Pass
L3	160 - 140	Pole	42" x 0.375"	3	-19.293	1484.549	58.6	Pass
L4	140 - 120	Pole	P48x3/8	4	-24.356	1643.282	82.9	Pass
L5	120 - 113.33	Pole	P54x3/8	5	-26.148	1801.923	77.8	Pass
L6	113.33 - 103	Pole	RPS 54" x 0.49054"	6	-29.817	2350.759	73.2	Pass
L7	103 - 100	Pole	RPS 54" x 0.49054"	7	-30.827	2350.759	77.2	Pass
L8	100 - 85.5	Pole	RPS 60" x 0.47803"	8	-36.259	2493.470	82.7	Pass
L9	85.5 - 84	Pole	RPS 60" x 0.55603"	9	-36.872	2896.062	72.9	Pass
L10	84 - 80	Pole	RPS 60" x 0.50354"	10	-38.388	2625.597	85.1	Pass
L11	80 - 60	Pole	RPS 60" x 0.57817"	11	-47.168	3211.717	90.2	Pass
L12	60 - 58.5	Pole	RPS 60" x 0.70417"	12	-47.928	3764.312	71.7	Pass
L13	58.5 - 47.25	Pole	P60x5/8	13	-53.122	3682.439	90.9	Pass
L14	47.25 - 40	Pole	RPS 60" x 0.76962"	14	-57.121	4113.078	80.3	Pass
L15	40 - 32.25	Pole	RPS 60" x 0.76962"	15	-61.410	4113.078	86.7	Pass
L16	32.25 - 29.75	Pole	RPS 60" x 0.96202"	16	-63.090	5123.199	71.7	Pass
L17	29.75 - 20	Pole	RPS 60" x 0.81453"	17	-68.778	4346.166	92.0	Pass
L18	20 - 4.25	Pole	RPS 60" x 0.94201"	18	-79.229	5311.885	86.2	Pass
L19	4.25 - 0	Pole	RPS 60" x 1.08084"	19	-82.415	6074.014	78.3	Pass
							Summary	
						Pole (L17)	92.0	Pass
						RATING =	**92.0**	**Pass**

APPENDIX B

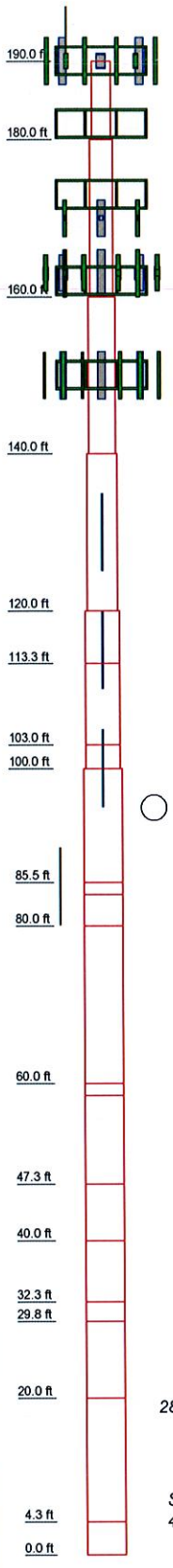
BASE LEVEL DRAWING

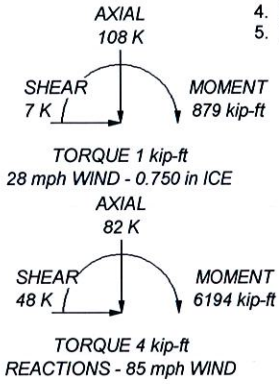

CLIMBING PEGS
W/ SAFETY CLIMB
(INSTALLED)
(1) 3/4" TO 162 FT LEVEL
(2) 7/8" TO 162 FT LEVEL
(12) 1-5/8" TO 162 FT LEVEL
(RESERVED)
(3) 1-1/4" TO 190 FT LEVEL
(INSTALLED-TO BE REMOVED)
(6) 1-5/8" TO 190 FT LEVEL
(INSTALLED)
(1) 7/8" TO 190 FT LEVEL
(INSTALLED)
(2) 1/2" TO 80 FT LEVEL
(2) 1/2" TO 95 FT LEVEL
(2) 7/8" TO 110 FT LEVEL
(1) 1/2" TO 125 FT LEVEL
(1) 7/8" TO 125 FT LEVEL
(RESERVED)
(1) 1-5/8" TO 150 FT LEVEL
(INSTALLED)
(12) 1-5/8" TO 150 FT LEVEL
(PROPOSED)
(7) 1 5/8" TO 173 FT LEVEL
(INSTALLED-TO BE REMOVED)
(18) 1-5/8" TO 173 FT LEVEL
(INSTALLED)
(6) 1-5/8" TO 173 FT LEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

Section	Size	Length (ft)	Socket Length (ft)	Grade	Weight (K)
1	30" x 0.375"	10.000	5.000	A53-B-42	1.2
2	36" x 0.375"	20.000	5.000		2.9
3	42" x 0.375"	20.000	5.000		3.3
4	P48x3/8	20.000	5.000		3.8
5	P54x3/8	6.670	5.000		1.4
6	P54x0.490	10.330	5.000	Reinf 38.43 ksi	2.9
7	RPS 54" x 0.490	3.000	5.000		0.8
8	RPS 60" x 0.562	14.500	5.000	Reinf 39.13 ksi	4.4
9	RPS 60" x 0.562	4.000	5.000		1.3
10	RPS 60" x 0.562	0.500	5.000		0.5
11	RPS 60" x 0.578	20.000	5.000	Reinf 39.86 ksi	7.3
12	RPS 60" x 0.704	1.500	5.000	Reinf 35.88 ksi	0.7
13	RPS 60" x 0.750	11.250	5.000	A53-B-42	4.5
14	RPS 60" x 0.796	7.250	5.000	Reinf 35.91 ksi	3.5
15	RPS 60" x 0.842	7.750	5.000	Reinf 35.90 ksi	3.8
16	RPS 60" x 0.888	2.500	5.000	Reinf 35.90 ksi	1.5
17	RPS 60" x 0.934	9.750	5.000	Reinf 35.90 ksi	5.0
18	RPS 60" x 0.942	15.750	5.000	Reinf 38.00 ksi	9.4
19	RPS 60" x 1.000	4.250		Reinf 37.96 ksi	2.9
					61.2





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
PD201-7	190	(2) 7770.00 w/ Mount Pipe	162
(2) APXVSPP18-C-A20 w/ Mount Pipe	190	(2) 7770.00 w/ Mount Pipe	162
(2) APXVSPP18-C-A20 w/ Mount Pipe	190	(2) 7770.00 w/ Mount Pipe	162
(2) APXVSPP18-C-A20 w/ Mount Pipe	190	TT19-08BP111-001	162
800MHZ RRH	190	TT19-08BP111-001	162
800MHZ RRH	190	TT19-08BP111-001	162
800MHZ RRH	190	P65-16-XLH-RR w/ Mount Pipe	162
1900MHz RRH	190	P65-16-XLH-RR w/ Mount Pipe	162
1900MHz RRH	190	P65-16-XLH-RR w/ Mount Pipe	162
1900MHz RRH	190	Pipe Mount [PM 601-3]	151
Platform Mount [LP 403-1]	190	RRH2X40-AWS	151
Side Arm Mount [SO 102-3]	190	RRH2X40-AWS	151
Platform Mount [LP 403-1]	182	RRH2X40-AWS	151
(4) 6' x 2" Mount Pipe	182	(2) BXA-171063-12CF-EDIN-X w/ Mount Pipe	150
(4) 6' x 2" Mount Pipe	182	Platform Mount [LP 403-1]	150
(4) 6' x 2" Mount Pipe	182	(2) BXA-171063-12CF-EDIN-X w/ Mount Pipe	150
Platform Mount [LP 405-1]	173	(2) BXA-171063-12CF-EDIN-X w/ Mount Pipe	150
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	173	DB-T1-6Z-8AB-0Z	150
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	173	LNX-6514DS-T4M w/ Mount Pipe	150
KRY 112 144/1	173	LNX-6514DS-T4M w/ Mount Pipe	150
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	173	(2) DB846F65ZAXY w/ Mount Pipe	150
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	173	(2) DB846F65ZAXY w/ Mount Pipe	150
KRY 112 144/1	173	P65-16-XL-R w/ Mount Pipe	150
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	173	(2) LPA-80080/6CF w/ Mount Pipe	150
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	173	(2) FD9R6004/2C-3L	150
KRY 112 144/1	173	(2) FD9R6004/2C-3L	150
(2) RRUS-11	162	(2) FD9R6004/2C-3L	150
(2) RRUS-11	162	PD128-1	125
(2) RRUS-11	162	PD201-1	125
(2) LGP21401	162	Side Arm Mount [SO 701-3]	125
(2) LGP21401	162	PD128-1	110
(2) LGP21401	162	PD128-1	110
DC6-48-60-18-8F	162	Side Arm Mount [SO 701-3]	110
Platform Mount [LP 403-1]	162	PD128-1	95
6' x 2" Mount Pipe	162	PD128-1	95
(2) 6' x 2" Mount Pipe	162	Side Arm Mount [SO 701-3]	95
(2) 6' x 2" Mount Pipe	162	DB222	80
		PD128-1	80
		Side Arm Mount [SO 701-3]	80

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-42	42 ksi	63 ksi	Reinf 35.88 ksi	36 ksi	45 ksi
Reinf 38.43 ksi	38 ksi	49 ksi	Reinf 35.91 ksi	36 ksi	45 ksi
Reinf 39.13 ksi	39 ksi	49 ksi	Reinf 35.90 ksi	36 ksi	45 ksi
Reinf 36.97 ksi	37 ksi	47 ksi	Reinf 38.00 ksi	38 ksi	48 ksi
Reinf 39.86 ksi	40 ksi	50 ksi	Reinf 37.96 ksi	38 ksi	48 ksi

TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 28 mph basic wind with 0.75 in ice.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 92%

Paul J Ford and Company
250 E. Broad Street, Suite 600
Columbus, OH 43215
Phone: 614.221.6679
FAX: 614.448.4105

Job:	***190' Monopole / Weston Rt-57 Norfield R***		
Project:	***PJF 37513-0787 / BU 829046***		
Client: CCI	Drawn by: John J Woolley	App'd:	
Code: TIA/EIA-222-F	Date: 02/20/14	Scale: NTS	
Path:		Dwg No. E-1	

PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street • Suite 1500 • Columbus, Ohio 43215-3708
Phone 614-221-6679 • Fax 614-448-4105 • www.PJFweb.com

v4.1 - Effective 7-3-12

Date: 2/20/2014
PJF Project: 37513-0787 R6
Client Ref.# 829046
Site Name:
Description:
Owner:
Engineer: JJW

Asymmetric Anchor Rod Analysis

Moment =	6194	k-ft	TIA Ref.	F	Location =	Base Plate		
Axial =	82.0	kips	ASIF =	1.3333	η =	N/A	for BP, Rev. G Sect. 4.9.9	
Shear =	48.0	kips	Max Ratio =	100.0%	Threads =	N/A	for FP, Rev. G	
Anchor Qty =	60							

**** For Post Installed Anchors: Check anchors for embedment, epoxy/grout bond, and capacity based on proof load. ****

Item	Nominal Anchor Dia, in	Spec	Fy, ksi	Fu, ksi	Location, degrees	Anchor Circle, in	Area Override, in^2	Area, in^2	Max Net Compression, kips	Max Net Tension, kips	Load for Capacity Calc, kips	Capacity Override, kips	Capacity, kips	Capacity Ratio
1	1.250	A687	105	150	0.0	67.00	0.00	1.23	53.04	50.94	50.94	0.00	80.99	62.9%
2	1.250	A687	105	150	6.9	67.00	0.00	1.23	53.04	50.94	50.94	0.00	80.99	62.9%
3	1.250	A687	105	150	13.8	67.00	0.00	1.23	53.04	50.94	50.94	0.00	80.99	62.9%
4	1.250	A687	105	150	20.8	67.00	0.00	1.23	53.04	50.94	50.94	0.00	80.99	62.9%
5	1.250	A687	105	150	27.7	67.00	0.00	1.23	53.04	50.94	50.94	0.00	80.99	62.9%
6	1.250	A687	105	150	34.6	67.00	0.00	1.23	53.04	50.94	50.94	0.00	80.99	62.9%
7	1.250	A687	105	150	41.5	67.00	0.00	1.23	53.04	50.94	50.94	0.00	80.99	62.9%
8	1.250	A687	105	150	48.5	67.00	0.00	1.23	53.04	50.94	50.94	0.00	80.99	62.9%
9	1.250	A687	105	150	55.4	67.00	0.00	1.23	53.04	50.94	50.94	0.00	80.99	62.9%
10	1.250	A687	105	150	62.3	67.00	0.00	1.23	53.04	50.94	50.94	0.00	80.99	62.9%
11	1.250	A687	105	150	69.2	67.00	0.00	1.23	53.04	50.94	50.94	0.00	80.99	62.9%
12	1.250	A687	105	150	76.2	67.00	0.00	1.23	53.04	50.94	50.94	0.00	80.99	62.9%
13	1.250	A687	105	150	83.1	67.00	0.00	1.23	53.04	50.94	50.94	0.00	80.99	62.9%
14	1.250	A687	105	150	90.0	67.00	0.00	1.23	53.04	50.94	50.94	0.00	80.99	62.9%
15	1.250	A687	105	150	96.9	67.00	0.00	1.23	53.04	50.94	50.94	0.00	80.99	62.9%
16	1.250	A687	105	150	103.8	67.00	0.00	1.23	53.04	50.94	50.94	0.00	80.99	62.9%
17	1.250	A687	105	150	110.8	67.00	0.00	1.23	53.04	50.94	50.94	0.00	80.99	62.9%
18	1.250	A687	105	150	117.7	67.00	0.00	1.23	53.04	50.94	50.94	0.00	80.99	62.9%
19	1.250	A687	105	150	124.6	67.00	0.00	1.23	53.04	50.94	50.94	0.00	80.99	62.9%
20	1.250	A687	105	150	131.5	67.00	0.00	1.23	53.04	50.94	50.94	0.00	80.99	62.9%
21	1.250	A687	105	150	138.5	67.00	0.00	1.23	53.04	50.94	50.94	0.00	80.99	62.9%
22	1.250	A687	105	150	145.4	67.00	0.00	1.23	53.04	50.94	50.94	0.00	80.99	62.9%
23	1.250	A687	105	150	152.3	67.00	0.00	1.23	53.04	50.94	50.94	0.00	80.99	62.9%
24	1.250	A687	105	150	159.2	67.00	0.00	1.23	53.04	50.94	50.94	0.00	80.99	62.9%
25	1.250	A687	105	150	166.2	67.00	0.00	1.23	53.04	50.94	50.94	0.00	80.99	62.9%
26	1.250	A687	105	150	173.1	67.00	0.00	1.23	53.04	50.94	50.94	0.00	80.99	62.9%
27	1.250	A687	105	150	180.0	67.00	0.00	1.23	53.04	50.94	50.94	0.00	80.99	62.9%
28	1.250	A687	105	150	186.9	67.00	0.00	1.23	53.04	50.94	50.94	0.00	80.99	62.9%
29	1.250	A687	105	150	193.8	67.00	0.00	1.23	53.04	50.94	50.94	0.00	80.99	62.9%
30	1.250	A687	105	150	200.8	67.00	0.00	1.23	53.04	50.94	50.94	0.00	80.99	62.9%
31	1.250	A687	105	150	207.7	67.00	0.00	1.23	53.04	50.94	50.94	0.00	80.99	62.9%
32	1.250	A687	105	150	214.6	67.00	0.00	1.23	53.04	50.94	50.94	0.00	80.99	62.9%
33	1.250	A687	105	150	221.5	67.00	0.00	1.23	53.04	50.94	50.94	0.00	80.99	62.9%
34	1.250	A687	105	150	228.5	67.00	0.00	1.23	53.04	50.94	50.94	0.00	80.99	62.9%
35	1.250	A687	105	150	235.4	67.00	0.00	1.23	53.04	50.94	50.94	0.00	80.99	62.9%
36	1.250	A687	105	150	242.3	67.00	0.00	1.23	53.04	50.94	50.94	0.00	80.99	62.9%
37	1.250	A687	105	150	249.2	67.00	0.00	1.23	53.04	50.94	50.94	0.00	80.99	62.9%
38	1.250	A687	105	150	256.2	67.00	0.00	1.23	53.04	50.94	50.94	0.00	80.99	62.9%
39	1.250	A687	105	150	263.1	67.00	0.00	1.23	53.04	50.94	50.94	0.00	80.99	62.9%
40	1.250	A687	105	150	270.0	67.00	0.00	1.23	53.04	50.94	50.94	0.00	80.99	62.9%
41	1.250	A687	105	150	276.9	67.00	0.00	1.23	53.04	50.94	50.94	0.00	80.99	62.9%
42	1.250	A687	105	150	283.8	67.00	0.00	1.23	53.04	50.94	50.94	0.00	80.99	62.9%
43	1.250	A687	105	150	290.8	67.00	0.00	1.23	53.04	50.94	50.94	0.00	80.99	62.9%
44	1.250	A687	105	150	297.7	67.00	0.00	1.23	53.04	50.94	50.94	0.00	80.99	62.9%
45	1.250	A687	105	150	304.6	67.00	0.00	1.23	53.04	50.94	50.94	0.00	80.99	62.9%
46	1.250	A687	105	150	311.5	67.00	0.00	1.23	53.04	50.94	50.94	0.00	80.99	62.9%
47	1.250	A687	105	150	318.5	67.00	0.00	1.23	53.04	50.94	50.94	0.00	80.99	62.9%
48	1.250	A687	105	150	325.4	67.00	0.00	1.23	53.04	50.94	50.94	0.00	80.99	62.9%
49	1.250	A687	105	150	332.3	67.00	0.00	1.23	53.04	50.94	50.94	0.00	80.99	62.9%
50	1.250	A687	105	150	339.2	67.00	0.00	1.23	53.04	50.94	50.94	0.00	80.99	62.9%
51	1.250	A687	105	150	346.2	67.00	0.00	1.23	53.04	50.94	50.94	0.00	80.99	62.9%
52	1.250	A687	105	150	353.1	67.00	0.00	1.23	53.04	50.94	50.94	0.00	80.99	62.9%
53	2.250	F1554 Gr 105	105	125	3.5	76.00	0.00	3.98	194.49	187.67	187.67	0.00	218.68	85.8%
54	2.250	F1554 Gr 105	105	125	48.5	76.00	0.00	3.98	194.49	187.67	187.67	0.00	218.68	85.8%
55	2.250	F1554 Gr 105	105	125	93.5	76.00	0.00	3.98	194.49	187.67	187.67	0.00	218.68	85.8%
56	2.250	F1554 Gr 105	105	125	138.5	76.00	0.00	3.98	194.49	187.67	187.67	0.00	218.68	85.8%
57	2.250	F1554 Gr 105	105	125	183.5	76.00	0.00	3.98	194.49	187.67	187.67	0.00	218.68	85.8%

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v4.1 - Effective 7-3-12

Date: 2/20/2014
PJF Project: 37513-0787 R6
Client Ref.# 829046
Site Name:
Description:
Owner:
Engineer: JJW

Asymmetric Anchor Rod Analysis

Moment =	6194	k-ft	TIA Ref.	F	Location =	Base Plate		
Axial =	82.0	kips	ASIF =	1.3333	η =	N/A	for BP, Rev. G Sect. 4.9.9	
Shear =	48.0	kips	Max Ratio =	100.0%	Threads =	N/A	for FP, Rev. G	
Anchor Qty =	60							

**** For Post Installed Anchors: Check anchors for embedment, epoxy/grout bond, and capacity based on proof load. ****

58	2.250	F1554 Gr 105	105	125	228.5	76.00	0.00	3.98	194.49	187.67	187.67	0.00	218.68	85.8%
59	2.250	F1554 Gr 105	105	125	273.5	76.00	0.00	3.98	194.49	187.67	187.67	0.00	218.68	85.8%
60	2.250	F1554 Gr 105	105	125	318.5	76.00	0.00	3.98	194.49	187.67	187.67	0.00	218.68	85.8%
								95.62						

Stiffened or Unstiffened, Ungrouted, Circular Base Plate - Any Rod Material

TIA Rev F

Site Data

BU#:	*829046*
Site Name:	
App #:	
Pole Manufacturer:	*Other*

Reactions		
Moment:	3773.7	ft-kips
Axial:	54.7	kips
Shear:	32	kips

Reactions adjusted to account for additional anchors

Anchor Rod Data		
Qty:	52	
Diam:	1.25	in
Rod Material:	Other	
Strength (Fu):	150	ksi
Yield (Fy):	105	ksi
Bolt Circle:	67	in

Plate Data		
Diam:	70	in
Thick:	1.25	in
Grade:	36	ksi
Single-Rod B-eff:	3.62	in

Stiffener Data (Welding at both sides)		
Config:	1	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	4.5	in
Height:	8	in
Thick:	0.625	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

Pole Data		
Diam:	60	in
Thick:	0.75	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

If No stiffeners, Criteria:	AISC ASD	<-Only Applcable to Unstiffened Cases

Anchor Rod Results

Maximum Rod Tension:	50.9 Kips	Stiffened
Allowable Tension:	81.0 Kips	Service, ASD
Anchor Rod Stress Ratio:	62.9% **Pass**	Fty*ASIF

Base Plate Results — Shear Check Only

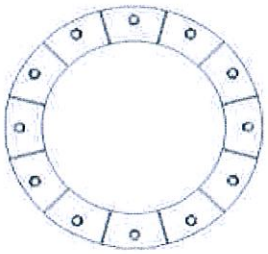
Base Plate Stress:	4.7 ksi	Stiffened
Allowable Plate Stress:	19.2 ksi	Service, ASD
Base Plate Stress Ratio:	24.6% **Pass**	0.75*Fy*ASIF
		Y.L. Length: N/A, Roark

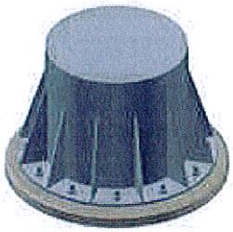
Stiffener Results

Horizontal Weld :	64.2% **Pass**
Vertical Weld:	41.3% **Pass**
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	29.0% **Pass**
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	47.9% **Pass**
Plate Comp. (AISC Bracket):	69.8% **Pass**

Pole Results

Pole Punching Shear Check:	10.1% **Pass**





* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

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v4.1 - Effective 7-3-12

Date: 2/20/2014
PJF Project: 37513-0787 R6
Client Ref.# 829046
Site Name:
Description: Flange at 20'
Owner:
Engineer: JJW

Asymmetric Bolt Analysis

Moment adjusted to account for load in Reinforcing Flat Plate on Pole Exterior

Moment =	4065	k-ft	TIA Ref.	F	Location =	Flange Plate		
Axial =	68.8	kips	ASIF =	1.3333	η =	N/A	for BP, Rev. G Sect. 4.9.9	
Shear =	46.3	kips	Max Ratio =	100.0%	Threads =	N/A	for FP, Rev. G	
Anchor Qty =	70							

**** For Flange Plates: Prying action is not considered in the bolt loads. ****

Item	Nominal Bolt Dia, in	Spec	Fy, ksi	Fu, ksi	Location, degrees	Bolt Circle, in	Area Override, in^2	Area, in^2	Max Net Compression, kips	Max Net Tension, kips	Load for Capacity Calc, kips	Capacity Override, kips	Capacity, kips	Capacity Ratio
1	1.250	A325	81	105	0.0	53.00	0.00	1.23	34.06	32.74	32.74	0.00	71.99	45.5%
2	1.250	A325	81	105	11.3	53.00	0.00	1.23	34.06	32.74	32.74	0.00	71.99	45.5%
3	1.250	A325	81	105	22.5	53.00	0.00	1.23	34.06	32.74	32.74	0.00	71.99	45.5%
4	1.250	A325	81	105	33.8	53.00	0.00	1.23	34.06	32.74	32.74	0.00	71.99	45.5%
5	1.250	A325	81	105	45.0	53.00	0.00	1.23	34.06	32.74	32.74	0.00	71.99	45.5%
6	1.250	A325	81	105	56.3	53.00	0.00	1.23	34.06	32.74	32.74	0.00	71.99	45.5%
7	1.250	A325	81	105	67.5	53.00	0.00	1.23	34.06	32.74	32.74	0.00	71.99	45.5%
8	1.250	A325	81	105	78.8	53.00	0.00	1.23	34.06	32.74	32.74	0.00	71.99	45.5%
9	1.250	A325	81	105	90.0	53.00	0.00	1.23	34.06	32.74	32.74	0.00	71.99	45.5%
10	1.250	A325	81	105	101.3	53.00	0.00	1.23	34.06	32.74	32.74	0.00	71.99	45.5%
11	1.250	A325	81	105	112.5	53.00	0.00	1.23	34.06	32.74	32.74	0.00	71.99	45.5%
12	1.250	A325	81	105	123.8	53.00	0.00	1.23	34.06	32.74	32.74	0.00	71.99	45.5%
13	1.250	A325	81	105	135.0	53.00	0.00	1.23	34.06	32.74	32.74	0.00	71.99	45.5%
14	1.250	A325	81	105	146.3	53.00	0.00	1.23	34.06	32.74	32.74	0.00	71.99	45.5%
15	1.250	A325	81	105	157.5	53.00	0.00	1.23	34.06	32.74	32.74	0.00	71.99	45.5%
16	1.250	A325	81	105	168.8	53.00	0.00	1.23	34.06	32.74	32.74	0.00	71.99	45.5%
17	1.250	A325	81	105	180.0	53.00	0.00	1.23	34.06	32.74	32.74	0.00	71.99	45.5%
18	1.250	A325	81	105	191.3	53.00	0.00	1.23	34.06	32.74	32.74	0.00	71.99	45.5%
19	1.250	A325	81	105	202.5	53.00	0.00	1.23	34.06	32.74	32.74	0.00	71.99	45.5%
20	1.250	A325	81	105	213.8	53.00	0.00	1.23	34.06	32.74	32.74	0.00	71.99	45.5%
21	1.250	A325	81	105	225.0	53.00	0.00	1.23	34.06	32.74	32.74	0.00	71.99	45.5%
22	1.250	A325	81	105	236.3	53.00	0.00	1.23	34.06	32.74	32.74	0.00	71.99	45.5%
23	1.250	A325	81	105	247.5	53.00	0.00	1.23	34.06	32.74	32.74	0.00	71.99	45.5%
24	1.250	A325	81	105	258.8	53.00	0.00	1.23	34.06	32.74	32.74	0.00	71.99	45.5%
25	1.250	A325	81	105	270.0	53.00	0.00	1.23	34.06	32.74	32.74	0.00	71.99	45.5%
26	1.250	A325	81	105	281.3	53.00	0.00	1.23	34.06	32.74	32.74	0.00	71.99	45.5%
27	1.250	A325	81	105	292.5	53.00	0.00	1.23	34.06	32.74	32.74	0.00	71.99	45.5%
28	1.250	A325	81	105	303.8	53.00	0.00	1.23	34.06	32.74	32.74	0.00	71.99	45.5%
29	1.250	A325	81	105	315.0	53.00	0.00	1.23	34.06	32.74	32.74	0.00	71.99	45.5%
30	1.250	A325	81	105	326.3	53.00	0.00	1.23	34.06	32.74	32.74	0.00	71.99	45.5%
31	1.250	A325	81	105	337.5	53.00	0.00	1.23	34.06	32.74	32.74	0.00	71.99	45.5%
32	1.250	A325	81	105	348.8	53.00	0.00	1.23	34.06	32.74	32.74	0.00	71.99	45.5%
33	1.250	A325	81	105	0.0	47.00	0.00	1.23	30.28	28.96	28.96	0.00	71.99	40.2%
34	1.250	A325	81	105	11.3	47.00	0.00	1.23	30.28	28.96	28.96	0.00	71.99	40.2%
35	1.250	A325	81	105	22.5	47.00	0.00	1.23	30.28	28.96	28.96	0.00	71.99	40.2%
36	1.250	A325	81	105	33.8	47.00	0.00	1.23	30.28	28.96	28.96	0.00	71.99	40.2%
37	1.250	A325	81	105	45.0	47.00	0.00	1.23	30.28	28.96	28.96	0.00	71.99	40.2%
38	1.250	A325	81	105	56.3	47.00	0.00	1.23	30.28	28.96	28.96	0.00	71.99	40.2%
39	1.250	A325	81	105	67.5	47.00	0.00	1.23	30.28	28.96	28.96	0.00	71.99	40.2%
40	1.250	A325	81	105	78.8	47.00	0.00	1.23	30.28	28.96	28.96	0.00	71.99	40.2%
41	1.250	A325	81	105	90.0	47.00	0.00	1.23	30.28	28.96	28.96	0.00	71.99	40.2%
42	1.250	A325	81	105	101.3	47.00	0.00	1.23	30.28	28.96	28.96	0.00	71.99	40.2%
43	1.250	A325	81	105	112.5	47.00	0.00	1.23	30.28	28.96	28.96	0.00	71.99	40.2%
44	1.250	A325	81	105	123.8	47.00	0.00	1.23	30.28	28.96	28.96	0.00	71.99	40.2%
45	1.250	A325	81	105	135.0	47.00	0.00	1.23	30.28	28.96	28.96	0.00	71.99	40.2%
46	1.250	A325	81	105	146.3	47.00	0.00	1.23	30.28	28.96	28.96	0.00	71.99	40.2%
47	1.250	A325	81	105	157.5	47.00	0.00	1.23	30.28	28.96	28.96	0.00	71.99	40.2%
48	1.250	A325	81	105	168.8	47.00	0.00	1.23	30.28	28.96	28.96	0.00	71.99	40.2%
49	1.250	A325	81	105	180.0	47.00	0.00	1.23	30.28	28.96	28.96	0.00	71.99	40.2%
50	1.250	A325	81	105	191.3	47.00	0.00	1.23	30.28	28.96	28.96	0.00	71.99	40.2%
51	1.250	A325	81	105	202.5	47.00	0.00	1.23	30.28	28.96	28.96	0.00	71.99	40.2%
52	1.250	A325	81	105	213.8	47.00	0.00	1.23	30.28	28.96	28.96	0.00	71.99	40.2%
53	1.250	A325	81	105	225.0	47.00	0.00	1.23	30.28	28.96	28.96	0.00	71.99	40.2%
54	1.250	A325	81	105	236.3	47.00	0.00	1.23	30.28	28.96	28.96	0.00	71.99	40.2%
55	1.250	A325	81	105	247.5	47.00	0.00	1.23	30.28	28.96	28.96	0.00	71.99	40.2%
56	1.250	A325	81	105	258.8	47.00	0.00	1.23	30.28	28.96	28.96	0.00	71.99	40.2%
57	1.250	A325	81	105	270.0	47.00	0.00	1.23	30.28	28.96	28.96	0.00	71.99	40.2%

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Date: 2/20/2014
PJF Project: 37513-0787 R6
Client Ref.# 829046
Site Name:
Description: Flange at 20'
Owner:
Engineer: JJW

Asymmetric Bolt Analysis

Moment adjusted to account for load in Reinforcing Flat Plate on Pole Exterior

Moment =	4065	k-ft	TIA Ref.	F	Location =	Flange Plate	
Axial =	68.8	kips	ASIF =	1.3333	η =	N/A	for BP, Rev. G Sect. 4.9.9
Shear =	46.3	kips	Max Ratio =	100.0%	Threads =	N/A	for FP, Rev. G
Anchor Qty =	70						

**** For Flange Plates: Prying action is not considered in the bolt loads. ****

58	1.250	A325	81	105	281.3	47.00	0.00	1.23	30.28	28.96	28.96	0.00	71.99	40.2%
59	1.250	A325	81	105	292.5	47.00	0.00	1.23	30.28	28.96	28.96	0.00	71.99	40.2%
60	1.250	A325	81	105	303.8	47.00	0.00	1.23	30.28	28.96	28.96	0.00	71.99	40.2%
61	1.250	A325	81	105	315.0	47.00	0.00	1.23	30.28	28.96	28.96	0.00	71.99	40.2%
62	1.250	A325	81	105	326.3	47.00	0.00	1.23	30.28	28.96	28.96	0.00	71.99	40.2%
63	1.250	A325	81	105	337.5	47.00	0.00	1.23	30.28	28.96	28.96	0.00	71.99	40.2%
64	1.250	A325	81	105	348.8	47.00	0.00	1.23	30.28	28.96	28.96	0.00	71.99	40.2%
65	0.000	Sabre 6.5 x 1.25	65	80	0.0	61.25	8.13	8.13	259.96	251.18	259.96	345.86	345.86	75.2%
66	0.000	Sabre 6.5 x 1.25	65	80	60.0	61.25	8.13	8.13	259.96	251.18	259.96	345.86	345.86	75.2%
67	0.000	Sabre 6.5 x 1.25	65	80	120.0	61.25	8.13	8.13	259.96	251.18	259.96	345.86	345.86	75.2%
68	0.000	Sabre 6.5 x 1.25	65	80	180.0	61.25	8.13	8.13	259.96	251.18	259.96	345.86	345.86	75.2%
69	0.000	Sabre 6.5 x 1.25	65	80	240.0	61.25	8.13	8.13	259.96	251.18	259.96	345.86	345.86	75.2%
70	0.000	Sabre 6.5 x 1.25	65	80	300.0	61.25	8.13	8.13	259.96	251.18	259.96	345.86	345.86	75.2%
								127.29						

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev F

Site Data	20' Flange
BU#:	829046
Site Name:	
App #:	

Manufacturer:	Other

Bolt Data			
Qty:	32		
Diam:	1.25	Bolt Fu:	105
Bolt Material:	A325	Bolt Fy:	81
N/A:	100	<-- Disregard	Bolt Fty:
N/A:	75	<-- Disregard	44.00
Circle:	50	in	

Plate Data		
Plate Outer Diam:	58.75	in
Plate Inner Diam:	41	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	5.77	in

Stiffener Data (Welding at Both Sides)		
Config:	1	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	7	in
Height:	10	in
Thick:	0.625	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

Pole Data		
Pole OuterDiam:	60	in
Thick:	0.625	in
Pole Inner Diam:	58.75	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi

Stress Increase Factor		
ASIF:	1.333	

Reactions		
Moment:	2108.3	ft-kips
Axial:	68.8	kips
Shear:	46.3	kips
Exterior Flange Run, T+Q:	0	kips

Reactions adjusted to account for flange jumps

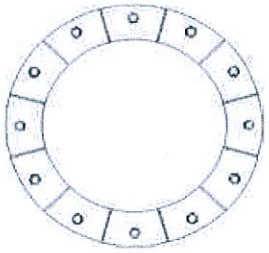
Elevation: 20 feet

PLATE CHECK ONLY

Interior Flange Plate Results	Flexural Check
Controlling Bolt Axial Force:	65.4 Kips, Ext. C= Interior C
Plate Stress:	26.6 ksi
Allowable Plate Stress:	36.0 ksi
Plate Stress Ratio:	74.0% **Pass**

Stiffener Results	
Horizontal Weld :	41.4% **Pass**
Vertical Weld:	36.2% **Pass**
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	24.7% **Pass**
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	29.2% **Pass**
Plate Comp. (AISC Bracket):	59.7% **Pass**

Pole Results	
Pole Punching Shear Check:	11.7% **Pass**



* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

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v4.1 - Effective 7-3-12

Date: 2/20/2014
PJF Project: 37513-0787 R6
Client Ref.# 829046
Site Name:
Description: Flange at 40'
Owner:
Engineer: JJW

Asymmetric Bolt Analysis

Moment adjusted to account for load in Reinforcing Flat Plate on Pole Exterior

Moment =	3553	k-ft	TIA Ref.	F	Location =	Flange Plate		
Axial =	57.1	kips	ASIF =	1.3333	η =	N/A	for BP, Rev. G Sect. 4.9.9	
Shear =	44.1	kips	Max Ratio =	100.0%	Threads =	N/A	for FP, Rev. G	
Anchor Qty =	70							

**** For Flange Plates: Prying action is not considered in the bolt loads. ****

Item	Nominal Bolt Dia, in	Spec	Fy, ksi	Fu, ksi	Location, degrees	Bolt Circle, in	Area Override, in²	Area, in²	Max Net Compression, kips	Max Net Tension, kips	Load for Capacity Calc, kips	Capacity Override, kips	Capacity, kips	Capacity Ratio
1	1.250	A325	81	105	0.0	53.00	0.00	1.23	34.12	32.90	32.90	0.00	71.99	45.7%
2	1.250	A325	81	105	11.3	53.00	0.00	1.23	34.12	32.90	32.90	0.00	71.99	45.7%
3	1.250	A325	81	105	22.5	53.00	0.00	1.23	34.12	32.90	32.90	0.00	71.99	45.7%
4	1.250	A325	81	105	33.8	53.00	0.00	1.23	34.12	32.90	32.90	0.00	71.99	45.7%
5	1.250	A325	81	105	45.0	53.00	0.00	1.23	34.12	32.90	32.90	0.00	71.99	45.7%
6	1.250	A325	81	105	56.3	53.00	0.00	1.23	34.12	32.90	32.90	0.00	71.99	45.7%
7	1.250	A325	81	105	67.5	53.00	0.00	1.23	34.12	32.90	32.90	0.00	71.99	45.7%
8	1.250	A325	81	105	78.8	53.00	0.00	1.23	34.12	32.90	32.90	0.00	71.99	45.7%
9	1.250	A325	81	105	90.0	53.00	0.00	1.23	34.12	32.90	32.90	0.00	71.99	45.7%
10	1.250	A325	81	105	101.3	53.00	0.00	1.23	34.12	32.90	32.90	0.00	71.99	45.7%
11	1.250	A325	81	105	112.5	53.00	0.00	1.23	34.12	32.90	32.90	0.00	71.99	45.7%
12	1.250	A325	81	105	123.8	53.00	0.00	1.23	34.12	32.90	32.90	0.00	71.99	45.7%
13	1.250	A325	81	105	135.0	53.00	0.00	1.23	34.12	32.90	32.90	0.00	71.99	45.7%
14	1.250	A325	81	105	146.3	53.00	0.00	1.23	34.12	32.90	32.90	0.00	71.99	45.7%
15	1.250	A325	81	105	157.5	53.00	0.00	1.23	34.12	32.90	32.90	0.00	71.99	45.7%
16	1.250	A325	81	105	168.8	53.00	0.00	1.23	34.12	32.90	32.90	0.00	71.99	45.7%
17	1.250	A325	81	105	180.0	53.00	0.00	1.23	34.12	32.90	32.90	0.00	71.99	45.7%
18	1.250	A325	81	105	191.3	53.00	0.00	1.23	34.12	32.90	32.90	0.00	71.99	45.7%
19	1.250	A325	81	105	202.5	53.00	0.00	1.23	34.12	32.90	32.90	0.00	71.99	45.7%
20	1.250	A325	81	105	213.8	53.00	0.00	1.23	34.12	32.90	32.90	0.00	71.99	45.7%
21	1.250	A325	81	105	225.0	53.00	0.00	1.23	34.12	32.90	32.90	0.00	71.99	45.7%
22	1.250	A325	81	105	236.3	53.00	0.00	1.23	34.12	32.90	32.90	0.00	71.99	45.7%
23	1.250	A325	81	105	247.5	53.00	0.00	1.23	34.12	32.90	32.90	0.00	71.99	45.7%
24	1.250	A325	81	105	258.8	53.00	0.00	1.23	34.12	32.90	32.90	0.00	71.99	45.7%
25	1.250	A325	81	105	270.0	53.00	0.00	1.23	34.12	32.90	32.90	0.00	71.99	45.7%
26	1.250	A325	81	105	281.3	53.00	0.00	1.23	34.12	32.90	32.90	0.00	71.99	45.7%
27	1.250	A325	81	105	292.5	53.00	0.00	1.23	34.12	32.90	32.90	0.00	71.99	45.7%
28	1.250	A325	81	105	303.8	53.00	0.00	1.23	34.12	32.90	32.90	0.00	71.99	45.7%
29	1.250	A325	81	105	315.0	53.00	0.00	1.23	34.12	32.90	32.90	0.00	71.99	45.7%
30	1.250	A325	81	105	326.3	53.00	0.00	1.23	34.12	32.90	32.90	0.00	71.99	45.7%
31	1.250	A325	81	105	337.5	53.00	0.00	1.23	34.12	32.90	32.90	0.00	71.99	45.7%
32	1.250	A325	81	105	348.8	53.00	0.00	1.23	34.12	32.90	32.90	0.00	71.99	45.7%
33	1.250	A325	81	105	0.0	47.00	0.00	1.23	30.33	29.11	29.11	0.00	71.99	40.4%
34	1.250	A325	81	105	11.3	47.00	0.00	1.23	30.33	29.11	29.11	0.00	71.99	40.4%
35	1.250	A325	81	105	22.5	47.00	0.00	1.23	30.33	29.11	29.11	0.00	71.99	40.4%
36	1.250	A325	81	105	33.8	47.00	0.00	1.23	30.33	29.11	29.11	0.00	71.99	40.4%
37	1.250	A325	81	105	45.0	47.00	0.00	1.23	30.33	29.11	29.11	0.00	71.99	40.4%
38	1.250	A325	81	105	56.3	47.00	0.00	1.23	30.33	29.11	29.11	0.00	71.99	40.4%
39	1.250	A325	81	105	67.5	47.00	0.00	1.23	30.33	29.11	29.11	0.00	71.99	40.4%
40	1.250	A325	81	105	78.8	47.00	0.00	1.23	30.33	29.11	29.11	0.00	71.99	40.4%
41	1.250	A325	81	105	90.0	47.00	0.00	1.23	30.33	29.11	29.11	0.00	71.99	40.4%
42	1.250	A325	81	105	101.3	47.00	0.00	1.23	30.33	29.11	29.11	0.00	71.99	40.4%
43	1.250	A325	81	105	112.5	47.00	0.00	1.23	30.33	29.11	29.11	0.00	71.99	40.4%
44	1.250	A325	81	105	123.8	47.00	0.00	1.23	30.33	29.11	29.11	0.00	71.99	40.4%
45	1.250	A325	81	105	135.0	47.00	0.00	1.23	30.33	29.11	29.11	0.00	71.99	40.4%
46	1.250	A325	81	105	146.3	47.00	0.00	1.23	30.33	29.11	29.11	0.00	71.99	40.4%
47	1.250	A325	81	105	157.5	47.00	0.00	1.23	30.33	29.11	29.11	0.00	71.99	40.4%
48	1.250	A325	81	105	168.8	47.00	0.00	1.23	30.33	29.11	29.11	0.00	71.99	40.4%
49	1.250	A325	81	105	180.0	47.00	0.00	1.23	30.33	29.11	29.11	0.00	71.99	40.4%
50	1.250	A325	81	105	191.3	47.00	0.00	1.23	30.33	29.11	29.11	0.00	71.99	40.4%
51	1.250	A325	81	105	202.5	47.00	0.00	1.23	30.33	29.11	29.11	0.00	71.99	40.4%
52	1.250	A325	81	105	213.8	47.00	0.00	1.23	30.33	29.11	29.11	0.00	71.99	40.4%
53	1.250	A325	81	105	225.0	47.00	0.00	1.23	30.33	29.11	29.11	0.00	71.99	40.4%
54	1.250	A325	81	105	236.3	47.00	0.00	1.23	30.33	29.11	29.11	0.00	71.99	40.4%
55	1.250	A325	81	105	247.5	47.00	0.00	1.23	30.33	29.11	29.11	0.00	71.99	40.4%
56	1.250	A325	81	105	258.8	47.00	0.00	1.23	30.33	29.11	29.11	0.00	71.99	40.4%
57	1.250	A325	81	105	270.0	47.00	0.00	1.23	30.33	29.11	29.11	0.00	71.99	40.4%

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v4.1 - Effective 7-3-12

Date: 2/20/2014
PJF Project: 37513-0787 R6
Client Ref.# 829046
Site Name:
Description: Flange at 40'
Owner:
Engineer: JJW

Asymmetric Bolt Analysis

Moment adjusted to account for load in Reinforcing Flat Plate on Pole Exterior

Moment =	3553	k-ft	TIA Ref.	F	Location =	Flange Plate	
Axial =	57.1	kips	ASIF =	1.3333	η =	N/A	for BP, Rev. G Sect. 4.9.9
Shear =	44.1	kips	Max Ratio =	100.0%	Threads =	N/A	for FP, Rev. G
Anchor Qty =	70						

**** For Flange Plates: Prying action is not considered in the bolt loads. ****

58	1.250	A325	81	105	281.3	47.00	0.00	1.23	30.33	29.11	29.11	0.00	71.99	40.4%
59	1.250	A325	81	105	292.5	47.00	0.00	1.23	30.33	29.11	29.11	0.00	71.99	40.4%
60	1.250	A325	81	105	303.8	47.00	0.00	1.23	30.33	29.11	29.11	0.00	71.99	40.4%
61	1.250	A325	81	105	315.0	47.00	0.00	1.23	30.33	29.11	29.11	0.00	71.99	40.4%
62	1.250	A325	81	105	326.3	47.00	0.00	1.23	30.33	29.11	29.11	0.00	71.99	40.4%
63	1.250	A325	81	105	337.5	47.00	0.00	1.23	30.33	29.11	29.11	0.00	71.99	40.4%
64	1.250	A325	81	105	348.8	47.00	0.00	1.23	30.33	29.11	29.11	0.00	71.99	40.4%
65	0.000	Sabre 6 x 1	65	80	0.0	61.00	6.00	6.00	191.57	185.58	191.57	250.40	250.40	76.5%
66	0.000	Sabre 6 x 1	65	80	60.0	61.00	6.00	6.00	191.57	185.58	191.57	250.40	250.40	76.5%
67	0.000	Sabre 6 x 1	65	80	120.0	61.00	6.00	6.00	191.57	185.58	191.57	250.40	250.40	76.5%
68	0.000	Sabre 6 x 1	65	80	180.0	61.00	6.00	6.00	191.57	185.58	191.57	250.40	250.40	76.5%
69	0.000	Sabre 6 x 1	65	80	240.0	61.00	6.00	6.00	191.57	185.58	191.57	250.40	250.40	76.5%
70	0.000	Sabre 6 x 1	65	80	300.0	61.00	6.00	6.00	191.57	185.58	191.57	250.40	250.40	76.5%
								114.54						

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev F

Site Data	40' Flange
BU#:	829046
Site Name:	
App #:	

Reactions		
Moment:	2115.2	ft-kips
Axial:	57.1	kips
Shear:	44.1	kips
Exterior Flange Run, T+Q:	0	kips

Reactions adjusted to account for flange jumps

Manufacturer:	Other

Elevation: 40 feet

Bolt Data			
Qty:	32		
Diam:	1.25	Bolt Fu:	105
Bolt Material:	A325	Bolt Fy:	81
N/A:	100	<-- Disregard	Bolt Fty:
N/A:	75	<-- Disregard	44.00
Circle:	50	in	

PLATE CHECK ONLY

Plate Data		
Plate Outer Diam:	59	in
Plate Inner Diam:	41	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	5.79	in

Stiffener Data (Welding at Both Sides)		
Config:	1	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	7	in
Height:	10	in
Thick:	0.625	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

Pole Data		
Pole OuterDiam:	60	in
Thick:	0.5	in
Pole Inner Diam:	59	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi

Stress Increase Factor	
ASIF:	1.333

Interior Flange Plate Results — Flexural Check

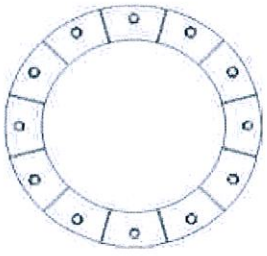
Controlling Bolt Axial Force:	65.2 Kips, Ext. C= Interior C
Plate Stress:	26.6 ksi
Allowable Plate Stress:	36.0 ksi
Plate Stress Ratio:	73.8% **Pass**

Stiffener Results

Horizontal Weld :	46.2% **Pass**
Vertical Weld:	40.3% **Pass**
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	28.3% **Pass**
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	33.1% **Pass**
Plate Comp. (AISC Bracket):	66.5% **Pass**

Pole Results

Pole Punching Shear Check:	16.3% **Pass**



* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

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v4.1 - Effective 7-3-12

Date: 2/20/2014
PJF Project: 37513-0787 R6
Client Ref.# 829046
Site Name:
Description: Flange at 60'
Owner:
Engineer: JJW

Asymmetric Bolt Analysis

Moment adjusted to account for load in Reinforcing Flat Plate on Pole Exterior

Moment =	3029	k-ft	TIA Ref.	F	Location =	Flange Plate		
Axial =	47.2	kips	ASIF =	1.3333	η =	N/A	for BP, Rev. G Sect. 4.9.9	
Shear =	41.4	kips	Max Ratio =	100.0%	Threads =	N/A	for FP, Rev. G	
Anchor Qty =	67							

**** For Flange Plates: Prying action is not considered in the bolt loads. ****

Item	Nominal Bolt Dia, in	Spec	Fy, ksi	Fu, ksi	Location, degrees	Bolt Circle, in	Area Override, in²	Area, in²	Max Net Compression, kips	Max Net Tension, kips	Load for Capacity Calc, kips	Capacity Override, kips	Capacity, kips	Capacity Ratio
1	1.250	A325	81	105	0.0	53.00	0.00	1.23	33.34	32.22	32.22	0.00	71.99	44.7%
2	1.250	A325	81	105	11.3	53.00	0.00	1.23	33.34	32.22	32.22	0.00	71.99	44.7%
3	1.250	A325	81	105	22.5	53.00	0.00	1.23	33.34	32.22	32.22	0.00	71.99	44.7%
4	1.250	A325	81	105	33.8	53.00	0.00	1.23	33.34	32.22	32.22	0.00	71.99	44.7%
5	1.250	A325	81	105	45.0	53.00	0.00	1.23	33.34	32.22	32.22	0.00	71.99	44.7%
6	1.250	A325	81	105	56.3	53.00	0.00	1.23	33.34	32.22	32.22	0.00	71.99	44.7%
7	1.250	A325	81	105	67.5	53.00	0.00	1.23	33.34	32.22	32.22	0.00	71.99	44.7%
8	1.250	A325	81	105	78.8	53.00	0.00	1.23	33.34	32.22	32.22	0.00	71.99	44.7%
9	1.250	A325	81	105	90.0	53.00	0.00	1.23	33.34	32.22	32.22	0.00	71.99	44.7%
10	1.250	A325	81	105	101.3	53.00	0.00	1.23	33.34	32.22	32.22	0.00	71.99	44.7%
11	1.250	A325	81	105	112.5	53.00	0.00	1.23	33.34	32.22	32.22	0.00	71.99	44.7%
12	1.250	A325	81	105	123.8	53.00	0.00	1.23	33.34	32.22	32.22	0.00	71.99	44.7%
13	1.250	A325	81	105	135.0	53.00	0.00	1.23	33.34	32.22	32.22	0.00	71.99	44.7%
14	1.250	A325	81	105	146.3	53.00	0.00	1.23	33.34	32.22	32.22	0.00	71.99	44.7%
15	1.250	A325	81	105	157.5	53.00	0.00	1.23	33.34	32.22	32.22	0.00	71.99	44.7%
16	1.250	A325	81	105	168.8	53.00	0.00	1.23	33.34	32.22	32.22	0.00	71.99	44.7%
17	1.250	A325	81	105	180.0	53.00	0.00	1.23	33.34	32.22	32.22	0.00	71.99	44.7%
18	1.250	A325	81	105	191.3	53.00	0.00	1.23	33.34	32.22	32.22	0.00	71.99	44.7%
19	1.250	A325	81	105	202.5	53.00	0.00	1.23	33.34	32.22	32.22	0.00	71.99	44.7%
20	1.250	A325	81	105	213.8	53.00	0.00	1.23	33.34	32.22	32.22	0.00	71.99	44.7%
21	1.250	A325	81	105	225.0	53.00	0.00	1.23	33.34	32.22	32.22	0.00	71.99	44.7%
22	1.250	A325	81	105	236.3	53.00	0.00	1.23	33.34	32.22	32.22	0.00	71.99	44.7%
23	1.250	A325	81	105	247.5	53.00	0.00	1.23	33.34	32.22	32.22	0.00	71.99	44.7%
24	1.250	A325	81	105	258.8	53.00	0.00	1.23	33.34	32.22	32.22	0.00	71.99	44.7%
25	1.250	A325	81	105	270.0	53.00	0.00	1.23	33.34	32.22	32.22	0.00	71.99	44.7%
26	1.250	A325	81	105	281.3	53.00	0.00	1.23	33.34	32.22	32.22	0.00	71.99	44.7%
27	1.250	A325	81	105	292.5	53.00	0.00	1.23	33.34	32.22	32.22	0.00	71.99	44.7%
28	1.250	A325	81	105	303.8	53.00	0.00	1.23	33.34	32.22	32.22	0.00	71.99	44.7%
29	1.250	A325	81	105	315.0	53.00	0.00	1.23	33.34	32.22	32.22	0.00	71.99	44.7%
30	1.250	A325	81	105	326.3	53.00	0.00	1.23	33.34	32.22	32.22	0.00	71.99	44.7%
31	1.250	A325	81	105	337.5	53.00	0.00	1.23	33.34	32.22	32.22	0.00	71.99	44.7%
32	1.250	A325	81	105	348.8	53.00	0.00	1.23	33.34	32.22	32.22	0.00	71.99	44.7%
33	1.250	A325	81	105	0.0	47.00	0.00	1.23	29.63	28.51	28.51	0.00	71.99	39.6%
34	1.250	A325	81	105	11.3	47.00	0.00	1.23	29.63	28.51	28.51	0.00	71.99	39.6%
35	1.250	A325	81	105	22.5	47.00	0.00	1.23	29.63	28.51	28.51	0.00	71.99	39.6%
36	1.250	A325	81	105	33.8	47.00	0.00	1.23	29.63	28.51	28.51	0.00	71.99	39.6%
37	1.250	A325	81	105	45.0	47.00	0.00	1.23	29.63	28.51	28.51	0.00	71.99	39.6%
38	1.250	A325	81	105	56.3	47.00	0.00	1.23	29.63	28.51	28.51	0.00	71.99	39.6%
39	1.250	A325	81	105	67.5	47.00	0.00	1.23	29.63	28.51	28.51	0.00	71.99	39.6%
40	1.250	A325	81	105	78.8	47.00	0.00	1.23	29.63	28.51	28.51	0.00	71.99	39.6%
41	1.250	A325	81	105	90.0	47.00	0.00	1.23	29.63	28.51	28.51	0.00	71.99	39.6%
42	1.250	A325	81	105	101.3	47.00	0.00	1.23	29.63	28.51	28.51	0.00	71.99	39.6%
43	1.250	A325	81	105	112.5	47.00	0.00	1.23	29.63	28.51	28.51	0.00	71.99	39.6%
44	1.250	A325	81	105	123.8	47.00	0.00	1.23	29.63	28.51	28.51	0.00	71.99	39.6%
45	1.250	A325	81	105	135.0	47.00	0.00	1.23	29.63	28.51	28.51	0.00	71.99	39.6%
46	1.250	A325	81	105	146.3	47.00	0.00	1.23	29.63	28.51	28.51	0.00	71.99	39.6%
47	1.250	A325	81	105	157.5	47.00	0.00	1.23	29.63	28.51	28.51	0.00	71.99	39.6%
48	1.250	A325	81	105	168.8	47.00	0.00	1.23	29.63	28.51	28.51	0.00	71.99	39.6%
49	1.250	A325	81	105	180.0	47.00	0.00	1.23	29.63	28.51	28.51	0.00	71.99	39.6%
50	1.250	A325	81	105	191.3	47.00	0.00	1.23	29.63	28.51	28.51	0.00	71.99	39.6%
51	1.250	A325	81	105	202.5	47.00	0.00	1.23	29.63	28.51	28.51	0.00	71.99	39.6%
52	1.250	A325	81	105	213.8	47.00	0.00	1.23	29.63	28.51	28.51	0.00	71.99	39.6%
53	1.250	A325	81	105	225.0	47.00	0.00	1.23	29.63	28.51	28.51	0.00	71.99	39.6%
54	1.250	A325	81	105	236.3	47.00	0.00	1.23	29.63	28.51	28.51	0.00	71.99	39.6%
55	1.250	A325	81	105	247.5	47.00	0.00	1.23	29.63	28.51	28.51	0.00	71.99	39.6%
56	1.250	A325	81	105	258.8	47.00	0.00	1.23	29.63	28.51	28.51	0.00	71.99	39.6%
57	1.250	A325	81	105	270.0	47.00	0.00	1.23	29.63	28.51	28.51	0.00	71.99	39.6%

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v4.1 - Effective 7-3-12

Date: 2/20/2014
PJF Project: 37513-0787 R6
Client Ref.# 829046
Site Name:
Description: Flange at 60'
Owner:
Engineer: JJW

Asymmetric Bolt Analysis

Moment adjusted to account for load in Reinforcing Flat Plate on Pole Exterior

Moment =	3029	k-ft	TIA Ref.	F	Location =	Flange Plate	
Axial =	47.2	kips	ASIF =	1.3333	η =	N/A	for BP, Rev. G Sect. 4.9.9
Shear =	41.4	kips	Max Ratio =	100.0%	Threads =	N/A	for FP, Rev. G
Anchor Qty =	67						

**** For Flange Plates: Prying action is not considered in the bolt loads. ****

58	1.250	A325	81	105	281.3	47.00	0.00	1.23	29.63	28.51	28.51	0.00	71.99	39.6%
59	1.250	A325	81	105	292.5	47.00	0.00	1.23	29.63	28.51	28.51	0.00	71.99	39.6%
60	1.250	A325	81	105	303.8	47.00	0.00	1.23	29.63	28.51	28.51	0.00	71.99	39.6%
61	1.250	A325	81	105	315.0	47.00	0.00	1.23	29.63	28.51	28.51	0.00	71.99	39.6%
62	1.250	A325	81	105	326.3	47.00	0.00	1.23	29.63	28.51	28.51	0.00	71.99	39.6%
63	1.250	A325	81	105	337.5	47.00	0.00	1.23	29.63	28.51	28.51	0.00	71.99	39.6%
64	1.250	A325	81	105	348.8	47.00	0.00	1.23	29.63	28.51	28.51	0.00	71.99	39.6%
65	0.000	Sabre 6.5 x 1.25	65	80	0.0	61.25	8.13	8.13	254.53	247.08	254.53	345.86	345.86	73.6%
66	0.000	Sabre 6.5 x 1.25	65	80	120.0	61.25	8.13	8.13	254.53	247.08	254.53	345.86	345.86	73.6%
67	0.000	Sabre 6.5 x 1.25	65	80	240.0	61.25	8.13	8.13	254.53	247.08	254.53	345.86	345.86	73.6%
								102.91						

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev F

Site Data	60' Flange
BU#:	829046
Site Name:	
App #:	

Reactions		
Moment:	2069	ft-kips
Axial:	47.2	kips
Shear:	41.4	kips
Exterior Flange Run, T+Q:	0	kips

Reactions adjusted to account for flange jumps

Manufacturer:	Other

Elevation: 60 feet

Bolt Data			
Qty:	32		
Diam:	1.25	Bolt Fu:	105
Bolt Material:	A325	Bolt Fy:	81
N/A:	100	<-- Disregard	Bolt Fty:
N/A:	75	<-- Disregard	44.00
Circle:	50	in	

PLATE CHECK ONLY

Plate Data		
Plate Outer Diam:	59	in
Plate Inner Diam:	41	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	5.79	in

Stiffener Data (Welding at Both Sides)		
Config:	1	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	7	in
Height:	10	in
Thick:	0.625	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

Pole Data		
Pole OuterDiam:	60	in
Thick:	0.5	in
Pole Inner Diam:	59	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi

Stress Increase Factor		
ASIF:	1.333	

Interior Flange Plate Results — Flexural Check

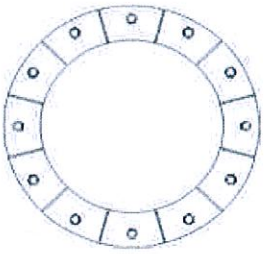
Controlling Bolt Axial Force:	63.5 Kips, Ext. C= Interior C
Plate Stress:	25.9 ksi
Allowable Plate Stress:	36.0 ksi
Plate Stress Ratio:	71.9% **Pass**

Stiffener Results

Horizontal Weld :	45.0% **Pass**
Vertical Weld:	39.3% **Pass**
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	27.4% **Pass**
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	32.1% **Pass**
Plate Comp. (AISC Bracket):	64.7% **Pass**

Pole Results

Pole Punching Shear Check:	15.8% **Pass**



* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

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Date: 2/20/2014
PJF Project: 37513-0787 R6
Client Ref.# 829046
Site Name:
Description: Flange at 80'
Owner:
Engineer: JJW

Asymmetric Bolt Analysis

Moment adjusted to account for load in Reinforcing Flat Plate on Pole Exterior

Moment =	2241	k-ft	TIA Ref.	F	Location =	Flange Plate		
Axial =	38.4	kips	ASIF =	1.3333	η =	N/A	for BP, Rev. G Sect. 4.9.9	
Shear =	38.1	kips	Max Ratio =	100.0%	Threads =	N/A	for FP, Rev. G	
Anchor Qty =	67							

**** For Flange Plates: Prying action is not considered in the bolt loads. ****

Item	Nominal Bolt Dia, in	Spec	Fy, ksi	Fu, ksi	Location, degrees	Bolt Circle, in	Area Override, in²	Area, in²	Max Net Compression, kips	Max Net Tension, kips	Load for Capacity Calc, kips	Capacity Override, kips	Capacity, kips	Capacity Ratio
1	1.250	A325	81	105	0.0	53.00	0.00	1.23	28.80	27.78	27.78	0.00	71.99	38.6%
2	1.250	A325	81	105	11.3	53.00	0.00	1.23	28.80	27.78	27.78	0.00	71.99	38.6%
3	1.250	A325	81	105	22.5	53.00	0.00	1.23	28.80	27.78	27.78	0.00	71.99	38.6%
4	1.250	A325	81	105	33.8	53.00	0.00	1.23	28.80	27.78	27.78	0.00	71.99	38.6%
5	1.250	A325	81	105	45.0	53.00	0.00	1.23	28.80	27.78	27.78	0.00	71.99	38.6%
6	1.250	A325	81	105	56.3	53.00	0.00	1.23	28.80	27.78	27.78	0.00	71.99	38.6%
7	1.250	A325	81	105	67.5	53.00	0.00	1.23	28.80	27.78	27.78	0.00	71.99	38.6%
8	1.250	A325	81	105	78.8	53.00	0.00	1.23	28.80	27.78	27.78	0.00	71.99	38.6%
9	1.250	A325	81	105	90.0	53.00	0.00	1.23	28.80	27.78	27.78	0.00	71.99	38.6%
10	1.250	A325	81	105	101.3	53.00	0.00	1.23	28.80	27.78	27.78	0.00	71.99	38.6%
11	1.250	A325	81	105	112.5	53.00	0.00	1.23	28.80	27.78	27.78	0.00	71.99	38.6%
12	1.250	A325	81	105	123.8	53.00	0.00	1.23	28.80	27.78	27.78	0.00	71.99	38.6%
13	1.250	A325	81	105	135.0	53.00	0.00	1.23	28.80	27.78	27.78	0.00	71.99	38.6%
14	1.250	A325	81	105	146.3	53.00	0.00	1.23	28.80	27.78	27.78	0.00	71.99	38.6%
15	1.250	A325	81	105	157.5	53.00	0.00	1.23	28.80	27.78	27.78	0.00	71.99	38.6%
16	1.250	A325	81	105	168.8	53.00	0.00	1.23	28.80	27.78	27.78	0.00	71.99	38.6%
17	1.250	A325	81	105	180.0	53.00	0.00	1.23	28.80	27.78	27.78	0.00	71.99	38.6%
18	1.250	A325	81	105	191.3	53.00	0.00	1.23	28.80	27.78	27.78	0.00	71.99	38.6%
19	1.250	A325	81	105	202.5	53.00	0.00	1.23	28.80	27.78	27.78	0.00	71.99	38.6%
20	1.250	A325	81	105	213.8	53.00	0.00	1.23	28.80	27.78	27.78	0.00	71.99	38.6%
21	1.250	A325	81	105	225.0	53.00	0.00	1.23	28.80	27.78	27.78	0.00	71.99	38.6%
22	1.250	A325	81	105	236.3	53.00	0.00	1.23	28.80	27.78	27.78	0.00	71.99	38.6%
23	1.250	A325	81	105	247.5	53.00	0.00	1.23	28.80	27.78	27.78	0.00	71.99	38.6%
24	1.250	A325	81	105	258.8	53.00	0.00	1.23	28.80	27.78	27.78	0.00	71.99	38.6%
25	1.250	A325	81	105	270.0	53.00	0.00	1.23	28.80	27.78	27.78	0.00	71.99	38.6%
26	1.250	A325	81	105	281.3	53.00	0.00	1.23	28.80	27.78	27.78	0.00	71.99	38.6%
27	1.250	A325	81	105	292.5	53.00	0.00	1.23	28.80	27.78	27.78	0.00	71.99	38.6%
28	1.250	A325	81	105	303.8	53.00	0.00	1.23	28.80	27.78	27.78	0.00	71.99	38.6%
29	1.250	A325	81	105	315.0	53.00	0.00	1.23	28.80	27.78	27.78	0.00	71.99	38.6%
30	1.250	A325	81	105	326.3	53.00	0.00	1.23	28.80	27.78	27.78	0.00	71.99	38.6%
31	1.250	A325	81	105	337.5	53.00	0.00	1.23	28.80	27.78	27.78	0.00	71.99	38.6%
32	1.250	A325	81	105	348.8	53.00	0.00	1.23	28.80	27.78	27.78	0.00	71.99	38.6%
33	1.250	A325	81	105	0.0	47.00	0.00	1.23	25.60	24.57	24.57	0.00	71.99	34.1%
34	1.250	A325	81	105	11.3	47.00	0.00	1.23	25.60	24.57	24.57	0.00	71.99	34.1%
35	1.250	A325	81	105	22.5	47.00	0.00	1.23	25.60	24.57	24.57	0.00	71.99	34.1%
36	1.250	A325	81	105	33.8	47.00	0.00	1.23	25.60	24.57	24.57	0.00	71.99	34.1%
37	1.250	A325	81	105	45.0	47.00	0.00	1.23	25.60	24.57	24.57	0.00	71.99	34.1%
38	1.250	A325	81	105	56.3	47.00	0.00	1.23	25.60	24.57	24.57	0.00	71.99	34.1%
39	1.250	A325	81	105	67.5	47.00	0.00	1.23	25.60	24.57	24.57	0.00	71.99	34.1%
40	1.250	A325	81	105	78.8	47.00	0.00	1.23	25.60	24.57	24.57	0.00	71.99	34.1%
41	1.250	A325	81	105	90.0	47.00	0.00	1.23	25.60	24.57	24.57	0.00	71.99	34.1%
42	1.250	A325	81	105	101.3	47.00	0.00	1.23	25.60	24.57	24.57	0.00	71.99	34.1%
43	1.250	A325	81	105	112.5	47.00	0.00	1.23	25.60	24.57	24.57	0.00	71.99	34.1%
44	1.250	A325	81	105	123.8	47.00	0.00	1.23	25.60	24.57	24.57	0.00	71.99	34.1%
45	1.250	A325	81	105	135.0	47.00	0.00	1.23	25.60	24.57	24.57	0.00	71.99	34.1%
46	1.250	A325	81	105	146.3	47.00	0.00	1.23	25.60	24.57	24.57	0.00	71.99	34.1%
47	1.250	A325	81	105	157.5	47.00	0.00	1.23	25.60	24.57	24.57	0.00	71.99	34.1%
48	1.250	A325	81	105	168.8	47.00	0.00	1.23	25.60	24.57	24.57	0.00	71.99	34.1%
49	1.250	A325	81	105	180.0	47.00	0.00	1.23	25.60	24.57	24.57	0.00	71.99	34.1%
50	1.250	A325	81	105	191.3	47.00	0.00	1.23	25.60	24.57	24.57	0.00	71.99	34.1%
51	1.250	A325	81	105	202.5	47.00	0.00	1.23	25.60	24.57	24.57	0.00	71.99	34.1%
52	1.250	A325	81	105	213.8	47.00	0.00	1.23	25.60	24.57	24.57	0.00	71.99	34.1%
53	1.250	A325	81	105	225.0	47.00	0.00	1.23	25.60	24.57	24.57	0.00	71.99	34.1%
54	1.250	A325	81	105	236.3	47.00	0.00	1.23	25.60	24.57	24.57	0.00	71.99	34.1%
55	1.250	A325	81	105	247.5	47.00	0.00	1.23	25.60	24.57	24.57	0.00	71.99	34.1%
56	1.250	A325	81	105	258.8	47.00	0.00	1.23	25.60	24.57	24.57	0.00	71.99	34.1%
57	1.250	A325	81	105	270.0	47.00	0.00	1.23	25.60	24.57	24.57	0.00	71.99	34.1%

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v4.1 - Effective 7-3-12

Date: 2/20/2014
PJF Project: 37513-0787 R6
Client Ref. # 829046
Site Name:
Description: Flange at 80'
Owner:
Engineer: JJW

Asymmetric Bolt Analysis

Moment adjusted to account for load in Reinforcing Flat Plate on Pole Exterior

Moment =	2241	k-ft	TIA Ref.	F	Location =	Flange Plate	
Axial =	38.4	kips	ASIF =	1.3333	η =	N/A	for BP, Rev. G Sect. 4.9.9
Shear =	38.1	kips	Max Ratio =	100.0%	Threads =	N/A	for FP, Rev. G
Anchor Qty =	67						

**** For Flange Plates: Prying action is not considered in the bolt loads. ****

58	1.250	A325	81	105	281.3	47.00	0.00	1.23	25.60	24.57	24.57	0.00	71.99	34.1%
59	1.250	A325	81	105	292.5	47.00	0.00	1.23	25.60	24.57	24.57	0.00	71.99	34.1%
60	1.250	A325	81	105	303.8	47.00	0.00	1.23	25.60	24.57	24.57	0.00	71.99	34.1%
61	1.250	A325	81	105	315.0	47.00	0.00	1.23	25.60	24.57	24.57	0.00	71.99	34.1%
62	1.250	A325	81	105	326.3	47.00	0.00	1.23	25.60	24.57	24.57	0.00	71.99	34.1%
63	1.250	A325	81	105	337.5	47.00	0.00	1.23	25.60	24.57	24.57	0.00	71.99	34.1%
64	1.250	A325	81	105	348.8	47.00	0.00	1.23	25.60	24.57	24.57	0.00	71.99	34.1%
65	0.000	Sabre 4.5 x 1	65	80	0.0	61.00	4.50	4.50	121.26	117.51	121.26	170.16	170.16	71.3%
66	0.000	Sabre 4.5 x 1	65	80	120.0	61.00	4.50	4.50	121.26	117.51	121.26	170.16	170.16	71.3%
67	0.000	Sabre 4.5 x 1	65	80	240.0	61.00	4.50	4.50	121.26	117.51	121.26	170.16	170.16	71.3%
								92.04						

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev F

Site Data	80' Flange
BU#:	829046
Site Name:	
App #:	

Manufacturer:	Other

Reactions		
Moment:	1785.5	ft-kips
Axial:	38.4	kips
Shear:	38.1	kips
Exterior Flange Run, T+Q:	0	kips

Reactions adjusted to account for flange jumps

Elevation: 80 feet

Bolt Data			
Qty:	32		
Diam:	1.25	Bolt Fu:	105
Bolt Material:	A325	Bolt Fy:	81
N/A:	100	<-- Disregard	Bolt Fty:
N/A:	75	<-- Disregard	44.00
Circle:	50	in	

PLATE CHECK ONLY

Plate Data		
Plate Outer Diam:	59.25	in
Plate Inner Diam:	41	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	5.82	in

Stiffener Data (Welding at Both Sides)		
Config:	1	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	7	in
Height:	10	in
Thick:	0.625	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

Pole Data		
Pole OuterDiam:	60	in
Thick:	0.375	in
Pole Inner Diam:	59.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi

Stress Increase Factor		
ASIF:	1.333	

Interior Flange Plate Results — Flexural Check

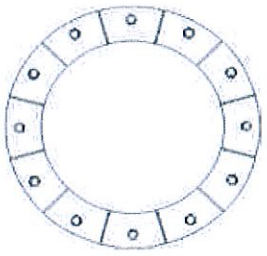
Controlling Bolt Axial Force:	54.8 Kips, Ext. C= Interior C
Plate Stress:	22.3 ksi
Allowable Plate Stress:	36.0 ksi
Plate Stress Ratio:	62.0% **Pass**

Stiffener Results

Horizontal Weld :	44.0% **Pass**
Vertical Weld:	38.4% **Pass**
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	26.6% **Pass**
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	31.3% **Pass**
Plate Comp. (AISC Bracket):	63.3% **Pass**

Pole Results

Pole Punching Shear Check:	20.6% **Pass**



* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev F

Site Data

BU#: *829046*
Site Name:
App #:

Pole Manufacturer:	Other

Reactions		
Moment:	1511.83	ft-kips
Axial:	30.827	kips
Shear:	34.42	kips
Elevation:	100	feet

Reactions adjusted to account for load in flat plate shaft reinforcing.

If No stiffeners, Criteria:	AISC ASD	<-Only Applcable to Unstiffened Cases

Bolt Data			
Qty:	48		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	75	<-- Disregard	Bolt Fty:
N/A:	55	<-- Disregard	44.00
Circle (in.):	57		

Plate Data		
Diam:	60	in
Thick, t:	1.25	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	3.53	in

Stiffener Data (Welding at Both Sides)		
Config:	1	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	3	in
Height:	5	in
Thick:	0.625	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

Pole Data		
Diam:	54	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

Flange Bolt Results

			Stiffened
Bolt Tension Capacity, **B**:	46.07	kips	Service, ASD
Max Bolt directly applied T:	25.88	Kips	Fty*ASIF
Min. PL "tc" for **B** cap. **w/o** Pry:	Stiffened	in	
Min PL "treq" for actual **T w/ Pry**:	Stiffened	in	
Min PL "t1" for actual **T w/o Pry**:	Stiffened	in	
T allowable	46.07	kips	<-- B, Stiffened
Prying Force, Q:	0.00	kips	Stiffened
Total Bolt Tension=T+Q:	25.88	kips	
Non-Prying Bolt Stress Ratio, T/B:	56.2%	**Pass**	

Exterior Flange Plate Results

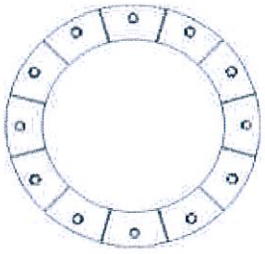
	Shear Check Only		Stiffened
Compression Side Plate Stress:	3.6	ksi	Service, ASD
Allowable Plate Stress:	19.2	ksi	0.75*Fy*ASIF
Compression Plate Stress Ratio:	18.9%	**Pass**	Comp. Y.L. Length:
Stiffened			N/A, Roark
Tension Side Stress Ratio, (treq/t)^2:	N/A		

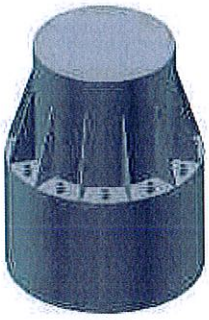
Stiffener Results

Horizontal Weld :	56.6%	**Pass**
Vertical Weld:	38.4%	**Pass**
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	26.4%	**Pass**
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	41.7%	**Pass**
Plate Comp. (AISC Bracket):	60.7%	**Pass**

Pole Results

Pole Punching Shear Check:	19.4%	**Pass**





* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev F

Site Data

BU#: *829046*
Site Name:
App #:

Manufacturer:	Other

Reactions		
Moment:	1511.83	ft-kips
Axial:	30.827	kips
Shear:	34.42	kips
Exterior Flange Run, T+Q:	25.88	kips

Reactions adjusted to account for load in flat plate shaft reinforcing

Elevation: 100 feet

Bolt Data			
Qty:	48		
Diam:	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	100	<-- Disregard	Bolt Fty: 44.00
N/A:	75	<-- Disregard	
Circle:	57	in	

Plate Data		
Plate Outer Diam:	59.25	in
Plate Inner Diam:	54	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	3.88	in

Stiffener Data (Welding at Both Sides)		
Config:	1	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	3	in
Height:	5	in
Thick:	0.625	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

Pole Data		
Pole OuterDiam:	60	in
Thick:	0.375	in
Pole Inner Diam:	59.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi

Stress Increase Factor		
ASIF:	1.333	

Interior Flange Bolt Results

Maximum Bolt Tension:	25.9 Kips, Ext. T=Interior T
Allowable Tension:	46.1 Kips
Bolt Stress Ratio:	56.2% **Pass**

Interior Flange Plate Results Shear Check Only

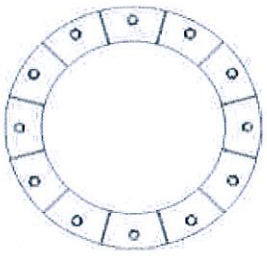
Controlling Bolt Axial Force:	27.2 Kips, Ext. C= Interior C
Plate Stress:	4.1 ksi
Allowable Plate Stress:	19.2 ksi
Plate Stress Ratio:	21.6% **Pass**

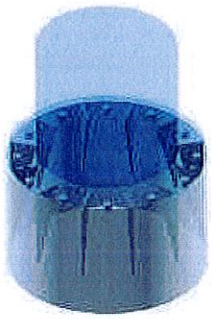
Stiffener Results

Horizontal Weld :	56.3% **Pass**
Vertical Weld:	31.6% **Pass**
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	20.2% **Pass**
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	41.1% **Pass**
Plate Comp. (AISC Bracket):	52.5% **Pass**

Pole Results

Pole Punching Shear Check:	15.0% **Pass**





* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev F

Site Data

BU#: *829046*
Site Name: *Weston*
App #:

Pole Manufacturer:	Pirod

Bolt Data			
Qty:	36		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	0	<-- Disregard	Bolt Fty: 44.00
N/A:	0	<-- Disregard	
Circle (in.):	51		

Plate Data		
Diam:	54	in
Thick, t:	1.25	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	4.19	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	0	
Groove Depth:	0	in **
Groove Angle:	0	degrees
Fillet H. Weld:	0	<-- Disregard
Fillet V. Weld:	0	in
Width:	0	in
Height:	0	in
Thick:	0	in
Notch:	0	in
Grade:	0	ksi
Weld str.:	0	ksi

Pole Data		
Diam:	48	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor	
ASIF:	1.3333333

Reactions		
Moment:	1311.35	ft-kips
Axial:	24.36	kips
Shear:	30.92	kips
Elevation:	120	feet

If No stiffeners, Criteria: AISC ASD <-Only Applcable to Unstiffened Cases

Flange Bolt Results

			Rigid
Bolt Tension Capacity, **B**:	46.08	kips	Service, ASD
Max Bolt directly applied T:	33.61	Kips	Fty*ASIF
Min. PL "tc" for **B** cap. **w/o** Pry:	1.354	in	
Min PL "treq" for actual **T w/ Pry**:	0.875	in	
Min PL "t1" for actual **T w/o Pry**:	1.156	in	
T allowable with Prying:	43.81	kips	0≤α'≤1 case
Prying Force, Q:	0.00	kips	
Total Bolt Tension=T+Q:	33.61	kips	
Prying Bolt Stress Ratio=(T+Q)/(B):	72.9%	**Pass**	

Exterior Flange Plate Results Flexural Check

		Rigid
Compression Side Plate Stress:	Rohn/Pirod, OK	Service ASD
Allowable Plate Stress:	36.0 ksi	0.75*Fy*ASIF
Compression Plate Stress Ratio:	Rohn/Pirod, OK	Comp. Y.L. Length: 17.23
No Prying		
Tension Side Stress Ratio, (treq/t)^2:	49.0% **Pass**	

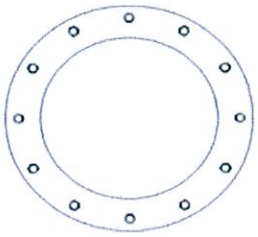
n/a

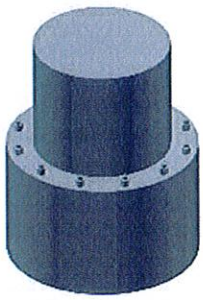
Stiffener Results N/A for Rohn / Pirod

Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A

Pole Results

Pole Punching Shear Check: N/A





* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev F

Site Data	
BU#:	*829046*
Site Name:	*Weston*
App #:	

Reactions		
Moment:	1311.35	ft-kips
Axial:	24.36	kips
Shear:	30.92	kips
Exterior Flange Run, T+Q:	33.61	kips

Elevation: 120 feet

Manufacturer:	Pirod

Bolt Data			
Qty:	36		
Diam:	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	0	<-- Disregard	Bolt Fty: 44.00
N/A:	0	<-- Disregard	
Circle:	51	in	

Interior Flange Bolt Results

Maximum Bolt Tension:	33.6	Kips, Ext. Flange T+Q
Allowable Tension:	46.1	Kips
Bolt Stress Ratio:	72.9%	**Pass**

Plate Data		
Plate Outer Diam:	53.25	in
Plate Inner Diam:	48	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	4.65	in

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	35.0	Kips, Ext. C= Interior C
Plate Stress:	Rohn/Pirod	OK
Allowable Plate Stress:	36.0	ksi
Plate Stress Ratio:	Rohn/Pirod	OK

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	0	
Groove Depth:	0	in **
Groove Angle:	0	degrees
Fillet H. Weld:	0	<-- Disregard
Fillet V. Weld:	0	in
Width:	0	in
Height:	0	in
Thick:	0	in
Notch:	0	in
Grade:	0	ksi
Weld str.:	0	ksi

n/a

Stiffener Results N/A for Rohn / Pirod

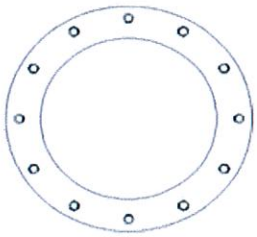
Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A

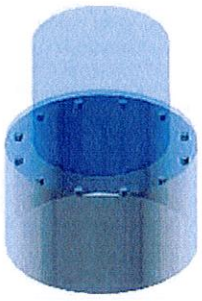
Pole Results

Pole Punching Shear Check:	N/A

Pole Data		
Pole OuterDiam:	54	in
Thick:	0.375	in
Pole Inner Diam:	53.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi

Stress Increase Factor		
ASIF:	1.3333333	





* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev F

Site Data

BU#: *829046*
Site Name: *Weston*
App #:

Pole Manufacturer:	Pirod

Reactions		
Moment:	726.73	ft-kips
Axial:	19.29	kips
Shear:	27.58	kips
Elevation:	140	feet

If No stiffeners, Criteria:	AISC ASD	<-Only Applcable to Unstiffened Cases

Bolt Data			
Qty:	32		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	0	<-- Disregard	Bolt Fty: 44.00
N/A:	0	<-- Disregard	
Circle (in.):	45		

Plate Data		
Diam:	48	in
Thick, t:	1.25	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	4.12	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	0	
Groove Depth:	0	in **
Groove Angle:	0	degrees
Fillet H. Weld:	0	<-- Disregard
Fillet V. Weld:	0	in
Width:	0	in
Height:	0	in
Thick:	0	in
Notch:	0	in
Grade:	0	ksi
Weld str.:	0	ksi

Pole Data		
Diam:	42	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.3333333	

Flange Bolt Results

		Rigid
Bolt Tension Capacity, **B**:	46.08 kips	Service, ASD
Max Bolt directly applied T:	23.62 Kips	Fty*ASIF
Min. PL "tc" for **B** cap. **w/o** Pry:	1.365 in	
Min PL "treq" for actual **T w/ Pry**:	0.740 in	
Min PL "t1" for actual **T w/o Pry**:	0.977 in	
T allowable with Prying:	43.60 kips	0≤α'≤1 case
Prying Force, Q:	0.00 kips	
Total Bolt Tension=T+Q:	23.62 kips	
Prying Bolt Stress Ratio=(T+Q)/(B):	51.3% **Pass**	

Exterior Flange Plate Results

	Flexural Check	Rigid
Compression Side Plate Stress:	Rohn/Pirod, OK	Service ASD
Allowable Plate Stress:	36.0 ksi	0.75*Fy*ASIF
Compression Plate Stress Ratio:	Rohn/Pirod, OK	Comp. Y.L. Length:
No Prying		16.16
Tension Side Stress Ratio, (treq/t)^2:	35.1% **Pass**	

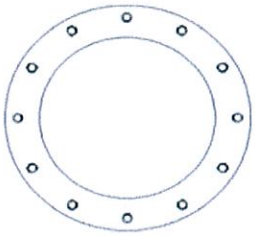
n/a

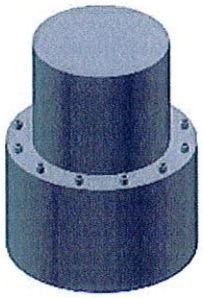
Stiffener Results N/A for Rohn / Pirod

Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A

Pole Results

Pole Punching Shear Check: N/A





* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev F

Site Data

BU#: *829046*
Site Name: *Weston*
App #:

Manufacturer:	Pirod

Reactions		
Moment:	726.73	ft-kips
Axial:	19.29	kips
Shear:	27.58	kips
Exterior Flange Run, T+Q:	23.62	kips

Elevation: 140 feet

Bolt Data			
Qty:	32		
Diam:	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	0	<-- Disregard	Bolt Fty: 44.00
N/A:	0	<-- Disregard	
Circle:	45	in	

Interior Flange Bolt Results
Maximum Bolt Tension: 23.6 Kips, Ext. T=Interior T
Allowable Tension: 46.1 Kips
Bolt Stress Ratio: 51.3% **Pass**

Plate Data		
Plate Outer Diam:	47.25	in
Plate Inner Diam:	42	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	4.64	in

Interior Flange Plate Results Flexural Check
Controlling Bolt Axial Force: 24.8 Kips, Ext. C= Interior C
Plate Stress: Rohn/Pirod OK
Allowable Plate Stress: 36.0 ksi
Plate Stress Ratio: Rohn/Pirod OK

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	0	
Groove Depth:	0	in **
Groove Angle:	0	degrees
Fillet H. Weld:	0	<-- Disregard
Fillet V. Weld:	0	in
Width:	0	in
Height:	0	in
Thick:	0	in
Notch:	0	in
Grade:	0	ksi
Weld str.:	0	ksi

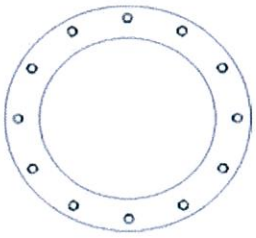
n/a

Stiffener Results N/A for Rohn / Pirod
Horizontal Weld : N/A
Vertical Weld: N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2: N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2: N/A
Plate Comp. (AISC Bracket): N/A

Pole Results
Pole Punching Shear Check: N/A

Pole Data		
Pole OuterDiam:	48	in
Thick:	0.375	in
Pole Inner Diam:	47.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi

Stress Increase Factor		
ASIF:	1.3333333	



* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt
** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev F

Site Data

BU#: *829046*
Site Name: *Weston*
App #:

Pole Manufacturer:	Pirod

Reactions		
Moment:	272.13	ft-kips
Axial:	12.84	kips
Shear:	17.81	kips
Elevation:	160	feet

If No stiffeners, Criteria:	AISC ASD	<-Only Applcable to Unstiffened Cases

Bolt Data			
Qty:	28		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	0	<-- Disregard	Bolt Fty:
N/A:	0	<-- Disregard	44.00
Circle (in.):	39		

Plate Data		
Diam:	42	in
Thick, t:	1.25	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	4.04	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	0	
Groove Depth:	0	in **
Groove Angle:	0	degrees
Fillet H. Weld:	0	<-- Disregard
Fillet V. Weld:	0	in
Width:	0	in
Height:	0	in
Thick:	0	in
Notch:	0	in
Grade:	0	ksi
Weld str.:	0	ksi

Pole Data		
Diam:	36	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.3333333	

Flange Bolt Results

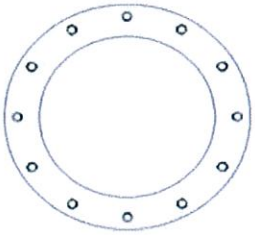
		Rigid
Bolt Tension Capacity, **B**:	46.08 kips	Service, ASD
Max Bolt directly applied T:	11.50 Kips	Fty*ASIF
Min. PL "tc" for **B** cap. **w/o** Pry:	1.379 in	
Min PL "treq" for actual **T w/ Pry**:	0.523 in	
Min PL "t1" for actual **T w/o Pry**:	0.689 in	
T allowable with Prying:	43.34 kips	0≤α'≤1 case
Prying Force, Q:	0.00 kips	
Total Bolt Tension=T+Q:	11.50 kips	
Prying Bolt Stress Ratio=(T+Q)/(B):	25.0% **Pass**	

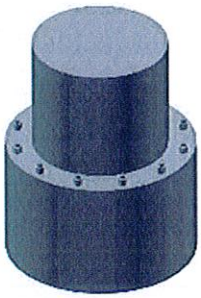
Exterior Flange Plate Results — Flexural Check

		Rigid
Compression Side Plate Stress:	Rohn/Pirod, OK	Service ASD
Allowable Plate Stress:	36.0 ksi	0.75*Fy*ASIF
Compression Plate Stress Ratio:	Rohn/Pirod, OK	Comp. Y.L. Length:
No Prying		15.00
Tension Side Stress Ratio, (treq/t)^2:	17.5% **Pass**	

n/a

Stiffener Results	N/A for Rohn / Pirod
Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A
Pole Results	
Pole Punching Shear Check:	N/A





* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev F

Site Data

BU#: *829046*
Site Name: *Weston*
App #:

Manufacturer:	Pirod

Reactions		
Moment:	272.13	ft-kips
Axial:	12.84	kips
Shear:	17.81	kips
Exterior Flange Run, T+Q:	11.5	kips

Elevation: 160 feet

Bolt Data			
Qty:	28		
Diam:	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	0	<-- Disregard	Bolt Fty: 44.00
N/A:	0	<-- Disregard	
Circle:	39	in	

Interior Flange Bolt Results

Maximum Bolt Tension:	11.5 Kips, Ext. T=Interior T
Allowable Tension:	46.1 Kips
Bolt Stress Ratio:	25.0% **Pass**

Plate Data		
Plate Outer Diam:	41.25	in
Plate Inner Diam:	36	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	4.63	in

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	12.4 Kips, Ext. C= Interior C
Plate Stress:	Rohn/Pirod OK
Allowable Plate Stress:	36.0 ksi
Plate Stress Ratio:	Rohn/Pirod OK

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	0	
Groove Depth:	0	in **
Groove Angle:	0	degrees
Fillet H. Weld:	0	<-- Disregard
Fillet V. Weld:	0	in
Width:	0	in
Height:	0	in
Thick:	0	in
Notch:	0	in
Grade:	0	ksi
Weld str.:	0	ksi

n/a

Stiffener Results N/A for Rohn / Pirod

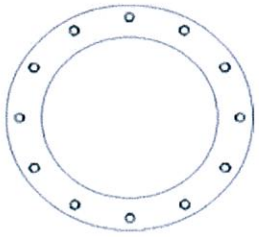
Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A

Pole Results

Pole Punching Shear Check: N/A

Pole Data		
Pole OuterDiam:	42	in
Thick:	0.375	in
Pole Inner Diam:	41.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi

Stress Increase Factor		
ASIF:	1.3333333	



* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev F

Site Data

BU#: *829046*
Site Name: *Weston*
App #:

Pole Manufacturer:	Pirod

Bolt Data			
Qty:	24		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	0	<-- Disregard	Bolt Fty: 44.00
N/A:	0	<-- Disregard	
Circle (in.):	33		

Plate Data		
Diam:	36	in
Thick, t:	1.25	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	3.93	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	0	
Groove Depth:	0	in **
Groove Angle:	0	degrees
Fillet H. Weld:	0	<-- Disregard
Fillet V. Weld:	0	in
Width:	0	in
Height:	0	in
Thick:	0	in
Notch:	0	in
Grade:	0	ksi
Weld str.:	0	ksi

Pole Data		
Diam:	30	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor	
ASIF:	1.3333333

Reactions		
Moment:	54.22	ft-kips
Axial:	4.97	kips
Shear:	7.35	kips
Elevation:	180	feet

If No stiffeners, Criteria: AISC ASD <-Only Applcable to Unstiffened Cases

Flange Bolt Results

Rigid
Service, ASD
Fty*ASIF

Bolt Tension Capacity, **B**:	46.08 kips	
Max Bolt directly applied T:	3.08 Kips	
Min. PL "tc" for **B** cap. **w/o** Pry:	1.398 in	
Min PL "treq" for actual **T w/ Pry**:	0.275 in	
Min PL "t1" for actual **T w/o Pry**:	0.361 in	
T allowable with Prying:	42.99 kips	0≤α'≤1 case
Prying Force, Q:	0.00 kips	
Total Bolt Tension=T+Q:	3.08 kips	
Prying Bolt Stress Ratio=(T+Q)/(B):	6.7% **Pass**	

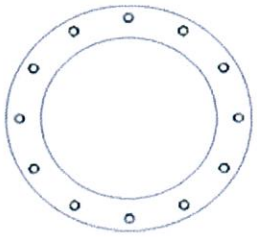
Exterior Flange Plate Results — Flexural Check

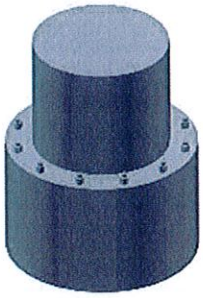
Rigid
Service ASD
0.75*Fy*ASIF
Comp. Y.L. Length: 13.75

Compression Side Plate Stress:	Rohn/Pirod, OK	
Allowable Plate Stress:	36.0 ksi	
Compression Plate Stress Ratio:	Rohn/Pirod, OK	
No Prying		
Tension Side Stress Ratio, (treq/t)^2:	4.8% **Pass**	

n/a

Stiffener Results	N/A for Rohn / Pirod
Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A
Pole Results	
Pole Punching Shear Check:	N/A





* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev F

Site Data

BU#: *829046*
Site Name: *Weston*
App #:

Reactions		
Moment:	54.22	ft-kips
Axial:	4.97	kips
Shear:	7.35	kips
Exterior Flange Run, T+Q:	3.08	kips

Manufacturer:	Pirod

Elevation: 180 feet

Bolt Data			
Qty:	24		
Diam:	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	0	<-- Disregard	Bolt Fty: 44.00
N/A:	0	<-- Disregard	
Circle:	33	in	

Interior Flange Bolt Results

Maximum Bolt Tension:	3.1	Kips, Ext. Flange T+Q
Allowable Tension:	46.1	Kips
Bolt Stress Ratio:	6.7%	**Pass**

Plate Data		
Plate Outer Diam:	35.25	in
Plate Inner Diam:	30	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	4.61	in

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	3.5	Kips, Ext. C= Interior C
Plate Stress:	Rohn/Pirod	OK
Allowable Plate Stress:	36.0	ksi
Plate Stress Ratio:	Rohn/Pirod	OK

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	0	
Groove Depth:	0	in **
Groove Angle:	0	degrees
Fillet H. Weld:	0	<-- Disregard
Fillet V. Weld:	0	in
Width:	0	in
Height:	0	in
Thick:	0	in
Notch:	0	in
Grade:	0	ksi
Weld str.:	0	ksi

n/a

Stiffener Results N/A for Rohn / Pirod

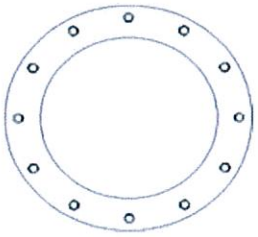
Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A

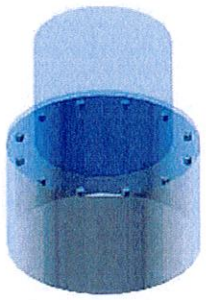
Pole Results

Pole Punching Shear Check: N/A

Pole Data		
Pole OuterDiam:	36	in
Thick:	0.375	in
Pole Inner Diam:	35.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi

Stress Increase Factor	
ASIF:	1.3333333





* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Moment Capacity of Rock Anchored Foundation - Wind into Corner

PJF job no. 37513-0787, R6

Note: For purposes of this check, max allowable rock anchor cap limited to proved rock anchor cap / lock-off load of 172 kips

Determination of effective rock compression area (for moment loads)

Controlling foundation % Capacity = 60.2% OK

Elevation = 0 feet Total pole plus soil & fdn weight = 376.4 kips
Diagonal dimension = 305.40 in 1/2 x diagonal dimension = 152.70 in
Neutral axis location = 108.85 in (Measured from max. compression fiber)
Therefore c= 108.85 inches and a = β_1 x c = 92.52 inches β_1 = 0.85

Area of fdn-rock contact, Afr = 8559.6 square inches Net area of Afr = 8470.3 square inches

Centroid of Afr located 243.72 inches from maximum tension fiber of cross-section

Check fdn-rock contact area compression capacity versus actual rock compressive stress

Rock f'c = 277 psi Gross area of rock, Ac = ###### sq. in. $\Sigma T - \Sigma C$ = 0.0

Total rock anchor load, T_L, on annulus area, ΣT = 730.5 kips

Usable rock and rock anchor compression capacity, SC = 1106.9 kips
Rock contribution to Mn = 4350.5 ft-kips
Pole / foundation / soil wt contribution to Mn = 1375.6 ft-kips

Cross-section Moment Cap.		
M_{cap} =	12094.5	ft-kips

M_{actual} = 6554 ft-kips (At bottom of pad)
Mact / Mcap = 54.2%

Rock anchor steel capacity = 200 kips (SF = 2)
Rock anchor % Cap = 46.6% OK

Max rock strain = 0.0015 (SF=2)
Rock % Cap = 60.2% OK

Additional bar reinforcement information

No. of bars, Nb = 4 Number of bar group locations = 3 No. of bars per group location = 1

Separation angle between bar groups = 90 degrees Area of bar = 2.6 sq. in.

Bar edge distance = 44.5 inches (measured to center of bar group) Modulus of elasticity of bar, E_b = 29000 ksi

Bar strain calculations

Assumed rock strain = 0.001665

Location	No. of bar groups, N_{BG}	Dist. to neutral axis	ε (Tension)	Tension per bar, T_B	$T_L = N_{BG} \times T_B$	Mn Contribution
1	1	152.05	0.0023	171.8	171.8	2177.5
2	2	43.85	0.0006	47.0	94.1	343.9
3	1	-64.35	0.0000	0.0	0.0	0.0
4	0	---	---	---	---	---
5	0	---	---	---	---	---
6	0	---	---	---	---	---
7	0	---	---	---	---	---
8	0	---	---	---	---	---
9	0	---	---	---	---	---
10	0	---	---	---	---	---

Determination of bar contribution to ultimate moment capacity

Location	No. of bar groups, N_{BG}	ε (C)	Comp. per bar, C_B	$C_L = N_{BG} \times C_B$	Mn Contribution	Area Occupied by Bar
1	1	0.0000	0.0	0.0	0.0	- - -
2	2	0.0000	0.0	0.0	0.0	- - -
3	1	-0.0010	-77.7	0.0	0.0	28.27
4	0	- - -	- - -	- - -	- - -	- - -
5	0	- - -	- - -	- - -	- - -	- - -
6	0	- - -	- - -	- - -	- - -	- - -
7	0	- - -	- - -	- - -	- - -	- - -
8	0	- - -	- - -	- - -	- - -	- - -
9	0	- - -	- - -	- - -	- - -	- - -
10	0	- - -	- - -	- - -	- - -	- - -

$M_n = \Sigma$ (Load in bar groups x bar group distance to N.A.) = **2521.4** ft-kips

$M_u = \phi M_n = 0.75 \times M_n =$ **1891.1** ft-kips

Bar yield strength = **332.000** kips

Additional bar reinforcement information

PJF job no. 37513-0787, R6

No. of bar, Nf = 12 Number of bar group locations = 7 No. of bar per group location = 1

Separation angle between bar groups = 30 degrees Area of bar = 2.6 sq. in.

bar edge distance = 72.1 inches (measured to center of bar group) Modulus of elasticity of bar, Ef = 29000 ksi

Bar strain calculations

(Type of bar = B ("B" for bar, "T" for tape or "L" for laminate)

Assumed rock strain = 0.001665

Location	No. of bar groups, NFG	Dist. to neutral axis	ε (Tension)	Tension per bar, TF	$T_L = N_{FG} \times T_F$	Mn Contribution
1	0	124.45	0.0019	143.5	0.0	0.0
2	2	113.66	0.0017	131.1	262.2	2483.2
3	2	84.15	0.0013	97.1	194.1	1361.4
4	0	43.85	0.0007	50.6	0.0	0.0
5	2	3.55	0.0001	4.1	8.2	2.4
6	2	-25.95	0.0000	0.0	0.0	0.0
7	0	-36.75	0.0000	0.0	0.0	0.0
8	0	- - -	- - -	- - -	- - -	- - -
9	0	- - -	- - -	- - -	- - -	- - -
10	0	- - -	- - -	- - -	- - -	- - -

Determination of bar contribution to ultimate moment capacity

Location	No. of bar groups, NFG	ε (Comp)	Comp. per bar, CF	$C_L = N_{FG} \times C_F$	Mn Contribution	Area Occupied by bar
1	0	0.0000	0.0	0.0	0.0	- - -
2	2	0.0000	0.0	0.0	0.0	- - -
3	2	0.0000	0.0	0.0	0.0	- - -
4	0	0.0000	0.0	0.0	0.0	- - -
5	2	0.0000	0.0	0.0	0.0	- - -
6	2	-0.0004	-29.9	0.0	0.0	28.27
7	0	-0.0006	-42.4	0.0	0.0	28.27
8	0	- - -	- - -	- - -	- - -	- - -
9	0	- - -	- - -	- - -	- - -	- - -
10	0	- - -	- - -	- - -	- - -	- - -

Mn = S (Load in bar groups x bar group distance to N.A.) = **3847.0** ft-kips

$M_u = \phi M_n = 0.9 \times M_n =$ **3462.3** ft-kips

bar yield strength = **332.000** kips

Rock Anchored Foundation Structural and Overturning Checks

Beam Shear, Tension Side - Wind into corner

b =	151	in	(Critical section at distance of d away from center of anchor, towards face of pier)
d=	31	in	
f'c=	5000	psi	
Vu=	223.6	kips	(Assumed to be 1.3 times max proven anchor capacity)
ϕ=	0.85		
ϕVc=	562.7	kips	
% Cap=	21.5%	OK	(Vu adjusted for actual rock bolt load)

Beam Shear, Compression Side - Wind into corner

b =	271.0	in	(Critical section at distance of a plus d away from corner of foundation)
d=	43	in	
f'c=	5000	psi	
Vu=	779.7	kips	(1.3 times SC, adjusted for overall foundation % Capacity)
ϕ=	0.85		
ϕVc=	1401.0	kips	
% Cap=	55.7%	OK	

Punching Shear, Tension Side - Wind into corner

b =	94	in	(Critical section at distance of 0.5d away from center of anchor in all applicable directions)
d=	31	in	
f'c=	5000	psi	
Vu=	223.6	kips	(Assumed to be 1.3 times max proven anchor capacity)
ϕ=	0.85		
ϕVc=	700.6	kips	
% Cap=	17.3%	OK	(Adjusted for actual rock bolt load)

Internal Pad Bending - Wind into Side

Centroid of loads on tension and compression sides of foundation less than distance of d away from face of pier. Therefore, load assumed to be transferred through deep beam type action (bending is negligible)

Overturning / Stability - Worst case assumed to be wind into the side

Rock anchor proof load, PL =	259	kips	(Assumed to be ultimate anchor capacity)
# of anchors in Line 1, N1 =	4		
Line 1 distance to rotation pt, d1 =	13.75	feet	
# of anchors in Line 2, N2 =	4		(Combined anchors on either side of foundation centerline)
Line 2 distance to rotation pt, d2 =	9	feet	
Foundation / pole / soil wt, W =	376.4	kips	
Distance to rotation pt, dw =	9	feet	
Foundation actual OTM, Mo =	6554	ft-k	(At bottom of foundation)
Overturning resistance, Mr =	23736	ft-k	(N1 x d1 x PL + N2 x d2 x [d2/d1 x PL] + W x dw)
% Cap = Mo / 0.5Mr =	55.2%	OK	(Min SF=2)

Note - Overturning % Cap conservative due to:

1) Line of anchors closest to point of overturning not included in calculation
2) Ultimate / maximum anchor capacity likely greater than proof load applied to anchor during installation

Moment Capacity of Rock Anchored Foundation - Wind into Side

PJF job no. 37513-0787, R6

Note: For purposes of this check, max allowable rock anchor cap limited to proved rock anchor cap / lock-off load of 172 kips

Determination of effective rock compression area (for moment loads)

Controlling foundation % Capacity = 74.9% OK

Elevation = 0 feet Total pole plus soil & fdn weight = 376.4 kips
Side dimension = 216.00 in 1/2 x diagonal dimension = 108.00 in
Neutral axis location = 68.20 in (Measured from max. compression fiber)
Therefore c= 68.20 inches and a = β_1 x c = 57.97 inches β_1 = 0.85

Area of fdn-rock contact, Afr = 12521.7 square inches Net area of Afr = 12347.9 square inches

Centroid of Afr located 187.01 inches from maximum tension fiber of cross-section

Check fdn-rock contact area compression capacity versus actual rock compressive stress

Rock f'c = 277 psi Gross area of rock, Ac = ###### sq. in. $\Sigma T - \Sigma C$ = 0.0

Total rock anchor load, T_L, on annulus area, ΣT = 916.7 kips

Usable rock and rock anchor compression capacity, SC = 1293.1 kips

Rock contribution to Mn = 4225.7 ft-kips

Pole / foundation / soil wt contribution to Mn = 1248.4 ft-kips

Cross-section Moment Cap.		
M_{cap} =	13170.6	ft-kips

M_{actual} = 6554 ft-kips (At bottom of pad)

Mact / Mcap = 49.8%

Rock anchor steel capacity = 200 kips (SF = 2)

Rock anchor % Cap = 42.7% OK

Max rock strain = 0.0015 (SF=2)

Rock % Cap = 44.3% OK

Additional bar reinforcement information

No. of bars, Nb = 8 Number of bar group locations = 5 No. of bars per group location = 1

Separation angle between bar groups = 45 degrees Area of bar = 2.6 sq. in.

Bar edge distance = -0.187 inches (measured to center of bar group) Modulus of elasticity of bar, E_b = 29000 ksi

Bar strain calculations

Assumed rock strain = 0.0013343

Location	No. of bar groups, N_{BG}	Dist. to neutral axis	ε (Tension)	Tension per bar, T_B	$T_L = N_{BG} \times T_B$	Mn Contribution
1	0	147.99	0.0029	215.9	0.0	0.0
2	2	116.30	0.0022	169.1	338.3	3278.4
3	0	39.80	0.0007	56.3	0.0	0.0
4	2	-36.70	0.0000	0.0	0.0	0.0
5	0	-68.39	0.0000	0.0	0.0	0.0
6	0	---	---	---	---	---
7	0	---	---	---	---	---
8	0	---	---	---	---	---
9	0	---	---	---	---	---
10	0	---	---	---	---	---

Determination of bar contribution to ultimate moment capacity

PJF job no. 37513-0787, R6

Location	No. of bar groups, N_{BG}	ε (C)	Comp. per bar, C_B	$C_L = N_{BG} \times C_B$	Mn Contribution	Area Occupied by Bar
1	0	0.0000	0.0	0.0	0.0	- - -
2	2	0.0000	0.0	0.0	0.0	- - -
3	0	0.0000	0.0	0.0	0.0	- - -
4	2	-0.0007	-54.1	0.0	0.0	28.27
5	0	-0.0013	-100.9	0.0	0.0	28.27
6	0	- - -	- - -	- - -	- - -	- - -
7	0	- - -	- - -	- - -	- - -	- - -
8	0	- - -	- - -	- - -	- - -	- - -
9	0	- - -	- - -	- - -	- - -	- - -
10	0	- - -	- - -	- - -	- - -	- - -

$M_n = \Sigma$ (Load in bar groups x bar group distance to N.A.) = **3278.4** ft-kips

$M_u = \phi M_n = 0.75 \times M_n =$ **2458.8** ft-kips

Bar yield strength = **332.000** kips

Additional bar reinforcement information

No. of bar, Nf = 20 Number of bar group locations = 11 No. of bar per group location = 1

Separation angle between bar groups = 18 degrees Area of bar = 2.6 sq. in.

bar edge distance = 27.4 inches (measured to center of bar group) Modulus of elasticity of bar, Ef = 29000 ksi

Bar strain calculations

(Type of bar = B ("B" for bar, "T" for tape or "L" for laminate)

Assumed rock strain = 0.0013343

Location	No. of bar groups, NFG	Dist. to neutral axis	ε (Tension)	Tension per bar, TF	$T_L = N_{FG} \times T_F$	Mn Contribution
1	0	120.40	0.0024	177.6	0.0	0.0
2	2	116.45	0.0023	171.8	343.6	3334.2
3	0	105.01	0.0021	154.9	0.0	0.0
4	0	87.17	0.0017	128.6	0.0	0.0
5	2	64.71	0.0013	95.5	190.9	1029.4
6	0	39.80	0.0008	58.7	0.0	0.0
7	2	14.89	0.0003	22.0	43.9	54.5
8	0	-7.58	0.0000	0.0	0.0	0.0
9	0	-25.41	0.0000	0.0	0.0	0.0
10	2	-36.86	0.0000	0.0	0.0	0.0
11	0	-40.80	0.0000	0.0	0.0	0.0
12	0	---	---	---	---	---
13	0	---	---	---	---	---

Determination of bar contribution to ultimate moment capacity

Location	No. of bar groups, NFG	ε (Comp)	Comp. per bar, CF	$C_L = N_{FG} \times C_F$	Mn Contribution	Area Occupied by bar
1	0	0.0000	0.0	0.0	0.0	- - -
2	2	0.0000	0.0	0.0	0.0	- - -
3	0	0.0000	0.0	0.0	0.0	- - -
4	0	0.0000	0.0	0.0	0.0	- - -
5	2	0.0000	0.0	0.0	0.0	- - -
6	0	0.0000	0.0	0.0	0.0	- - -
7	2	0.0000	0.0	0.0	0.0	- - -
8	0	-0.0001	-11.2	0.0	0.0	28.27
9	0	-0.0005	-37.5	0.0	0.0	28.27
10	2	-0.0007	-54.4	0.0	0.0	28.27
11	0	-0.0008	-60.2	0.0	0.0	28.27
12	0	- - -	- - -	- - -	- - -	- - -
13	0	- - -	- - -	- - -	- - -	- - -

Mn = S (Load in bar groups x bar group distance to N.A.) = **4418.1** ft-kips

$M_u = \phi M_n = 0.9 \times M_n =$ **3976.3** ft-kips

bar yield strength = **332.000** kips

Rock Anchored Foundation Structural and Overturning Checks

PJF job no. 37513-0787, R6

Beam Shear, Tension Side - Wind into Side

b =	216.00	in	(Equal to width of mat)
d=	31	in	
f'c=	5000	psi	
Vu=	445.1	kips	(1.3 times max proven anchor capacity, adjusted for overall foundation % Capacity)
ϕ=	0.85		
ϕVc=	804.9	kips	
% Cap=	55.3%	OK	

Beam Shear, Compression Side - Wind into Side

b =	216.0	in	(Equal to width of mat)
d=	43	in	
f'c=	5000	psi	
Vu=	836.5	kips	(1.3 times SC, adjusted for overall foundation % Capacity)
ϕ=	0.85		
ϕVc=	1116.5	kips	
% Cap=	74.9%	OK	

Punching Shear, Tension Side - Wind into Side

b =	94	in	(Critical section at distance of 0.5d away from center of anchor in all applicable directions)
d=	31	in	
f'c=	5000	psi	
Vu=	223.6	kips	(Assumed to be 1.3 times max proven anchor capacity)
ϕ=	0.85		
ϕVc=	700.6	kips	
% Cap=	15.9%	OK	(Adjusted for actual rock bolt load)

Internal Pad Bending - Wind into Side

Centroid of loads on tension and compression sides of foundation less than distance of d away from face of pier. Therefore, load assumed to be transferred through deep beam type action (bending is negligible)

Overturning / Stability - Worst case assumed to be wind into the side

Rock anchor proof load, PL =	259	kips	(Assumed to be ultimate anchor capacity)
# of anchors in Line 1, N1 =	4		
Line 1 distance to rotation pt, d1 =	13.75	feet	
# of anchors in Line 2, N2 =	4		(Combined anchors on either side of foundation centerline)
Line 2 distance to rotation pt, d2 =	9	feet	
Foundation / pole / soil wt, W =	376.4	kips	
Distance to rotation pt, dw =	9	feet	
Foundation actual OTM, Mo =	6554	ft-k	(At bottom of foundation)
Overturning resistance, Mr =	23736	ft-k	(N1 x d1 x PL + N2 x d2 x [d2/d1 x PL] + W x dw)
% Cap = Mo / 0.5Mr =	55.2%	OK	(Min SF=2)

Note - Overturning % Cap conservative due to:

1) Line of anchors closest to point of overturning not included in calculation
2) Ultimate / maximum anchor capacity likely greater than proof load applied to anchor during installation

EXHIBIT C

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

T-Mobile Existing Facility

Site ID: CT11118C

Weston / Route 57 / Norfield
56 Norfield Road
Weston, CT 06883

February 27, 2014

21 B Street · Burlington, MA 01803 · Tel: (781) 273.2500 · Fax: (781) 273.3311

EBI Consulting
environmental | engineering | due diligence

February 27, 2014

T-Mobile USA
Attn: Jason Overbey, RF Manager
35 Griffin Road South
Bloomfield, CT 06002

Re: Emissions Values for Site: **CT11118C - Weston / Route 57 / Norfield**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at 56 Norfield Road, Weston, CT, for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

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

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

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

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter (μW/cm2). The general population exposure limit for the cellular band is 567 μW/cm2, and the general population exposure limit for the PCS and AWS bands is 1000 μW/cm2. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at 56 Norfield Road, Weston, CT, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, the actual antenna pattern gain value in the direction of the sample area was used. For this report the sample point is a 6 foot person standing at the base of the tower

For all calculations, all equipment was calculated using the following assumptions:

1) 2 GSM channels (1940.000 MHz—to 1950.000 MHz) were considered for each sector of the proposed installation.
2) 2 UMTS channels (2110.000 MHz to 2120.000 MHz / 2140.000 MHz to 2145.000 MHz) were considered for each sector of the proposed installation
3) 2 LTE channels (2110.000 MHz to 2120.000 MHz / 2140.000 MHz to 2145.000 MHz) were considered for each sector of the proposed installation
4) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
5) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The actual gain in this direction was used per the manufactures supplied specifications.
6) The antenna used in this modeling is the Ericsson AIR21 for LTE, UMTS and GSM. This is based on feedback from the carrier with regards to anticipated antenna selection. This antenna has a 15.6 dBd gain value at its main lobe. Actual antenna gain values were used for all calculations as per the manufacturers specifications

7) The antenna mounting height centerline of the proposed antennas is **170 feet** above ground level (AGL)
8) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

All calculation were done with respect to uncontrolled / general public threshold limits

Site ID	CT11118C - Weston / Route 57 / Norfield
Site Addresss	56 Norfield Road, Weston, CT 06883
Site Type	Monopole

Sector 1

Antenna Number	Antenna Make	Antenna Model	Status	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain in direction of sample point (dBd)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss	ERP	Power Density Value	Power Density Percentage
1a	Ericsson	AIR21 B4A/B2P	Active	AWS - 2100 MHz	LTE	60	2	120	-3.95	170	164	None	0	0	48.326044	0.645951	0.06460%
1b	Ericsson	AIR21 B4A/B2P	Not Used	-	-			0	-3.95	170	164	None	0	0	0	0	0.00000%
2a	Ericsson	AIR21 B2A / B4P	Active	PCS - 1950 MHz	GSM / UMTS	30	2	60	-3.95	170	164	1-5/8"	0	0	24.163022	0.322975	0.03230%
2B	Ericsson	AIR21 B2A / B4P	Passive	AWS - 2100 MHz	UMTS	30	2	60	-3.95	170	164	1-5/8"	0	0	24.163022	0.322975	0.03230%
														Sector total Power Density Value:			0.129%

Sector 2

Antenna Number	Antenna Make	Antenna Model	Status	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain in direction of sample point (dBd)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss	ERP	Power Density Value	Power Density Percentage
1a	Ericsson	AIR21 B4A/B2P	Active	AWS - 2100 MHz	LTE	60	2	120	-3.95	170	164	None	0	0	48.326044	0.645951	0.06460%
1b	Ericsson	AIR21 B4A/B2P	Not Used	-	-			0	-3.95	170	164	None	0	0	0	0	0.00000%
2a	Ericsson	AIR21 B2A / B4P	Active	PCS - 1950 MHz	GSM / UMTS	30	2	60	-3.95	170	164	1-5/8"	0	0	24.163022	0.322975	0.03230%
28	Ericsson	AIR21 B2A / B4P	Passive	AWS - 2100 MHz	UMTS	30	2	60	-3.95	170	164	1-5/8"	0	0	24.163022	0.322975	0.03230%
														Sector total Power Density Value:			0.129%

Sector 3

Antenna Number	Antenna Make	Antenna Model	Status	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain in direction of sample point (dBd)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss	ERP	Power Density Value	Power Density Percentage
1a	Ericsson	AIR21 B4A/B2P	Active	AWS - 2100 MHz	LTE	60	2	120	-3.95	170	164	None	0	0	48.326044	0.645951	0.06460%
1b	Ericsson	AIR21 B4A/B2P	Not Used	-	-			0	-3.95	170	164	None	0	0	0	0	0.00000%
2a	Ericsson	AIR21 B2A / B4P	Active	PCS - 1950 MHz	GSM / UMTS	30	2	60	-3.95	170	164	1-5/8"	0	0	24.163022	0.322975	0.03230%
28	Ericsson	AIR21 B2A / B4P	Passive	AWS - 2100 MHz	UMTS	30	2	60	-3.95	170	164	1-5/8"	0	0	24.163022	0.322975	0.03230%
														Sector total Power Density Value:			0.129%

Site Composite MPE %

Carrier	MPE %
T-Mobile	0.388%
Town Fire	3.980%
Town of Weston	5.910%
EMS	2.970%
Sprint	1.960%
AT&T	5.460%
Verizon Wireless	13.390%
Total Site MPE %	**34.058%**

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Summary

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

The anticipated Maximum Composite contributions from the T-Mobile facility are **0.388% (0.129% from each sector)** of the allowable FCC established general public limit considering all three sectors simultaneously.

The anticipated composite MPE value for this site assuming all carriers present is **34.058%** of the allowable FCC established general public limit. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

Scott Heffernan
RF Engineering Director

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