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Hartford, CT 06103-3597
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ORIGINAL

April 28, 2010

Via Hand Delivery

S. Derek Phelps
Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051



Re: **Notice of Exempt Modification – Antenna Swap
38 Kaechele Place, Bridgeport, Connecticut**

Dear Mr. Phelps:

Cellco Partnership d/b/a Verizon Wireless (“Cellco”) currently maintains wireless telecommunications antennas at the 100-foot level of the existing 150-foot tower at the above-referenced address. The tower and underlying property are owned by AT&T. The Council approved Cellco’s use of this tower in 2001. Cellco now intends to modify its installation by replacing six (6) its PCS antennas with three (3) model MG D3-800T0 PCS antennas and three (3) model P65-16-XL-2 LTE antennas, all at the same 100-foot level on the tower. Attached behind Tab 1 are the specifications for the proposed replacement antennas.

Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to William Finch, Mayor for the City of Bridgeport.

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

1. The proposed modifications will not result in any increase in the height of the existing tower. Cellco’s antennas will be located at the same 100-foot level on the existing tower.

2. The proposed modifications will not involve any changes to ground-mounted equipment and, therefore, will not require the extension of the site boundary.



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3. The proposed modifications will not increase noise levels at the facility by six decibels or more.

4. The operation of the replacement antennas will not increase radio frequency (RF) power density levels at the facility to a level at or above the Federal Communications Commission (FCC) adopted safety standard. A cumulative power density table for Cellco's modified facility is included behind Tab 2.

Also attached is a Structural Analysis Report confirming that the tower and foundation can support Cellco's proposed antenna modification. (See Tab 3).

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

Sincerely,



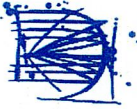
Kenneth C. Baldwin

Enclosures

Copy to:

William Finch, Bridgeport Mayor
Sandy M. Carter





SINGLE-BAND PANEL ANTENNA

BROADBAND 1700-2170 MHz

MGD3-800TX

1710-1880	1850-1990	1920-2170
H66° V7.2°	H64° V6.6°	H63° V6.3°
Fixed Tilt 0°, 2°, 4°, 6°	Fixed Tilt 0°, 2°, 4°, 6°	Fixed Tilt 0°, 2°, 4°, 6°

ELECTRICAL SPECIFICATIONS

BROADBAND 1710-2170 MHz

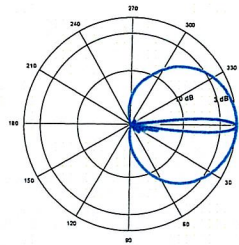
Antenna Model	MGD3-800TX		
Polarization	± 45°		
Frequency	1710 - 1880	1850 - 1990	1920 - 2170
Horizontal Beamwidth	66°	64°	63°
Vertical Beamwidth	7.2°	6.6°	6.3°
Gain (dBi)	17.9	18	18.5
Vertical Electrical Tilt	FIXED 0°, 2°, 4°, 6°	FIXED 0°, 2°, 4°, 6°	FIXED 0°, 2°, 4°, 6°
Upper Sidelobe Suppression for the 1 st lobe above main beam (dB)	20	20	20
Front-to-Back Ratio /Cpol @ ± 20° (dB)	> 30	> 30	> 30
VSWR	< 1.4 : 1	< 1.4 : 1	< 1.4 : 1
Cross Polar Ratio @ ± 60° (dB)	> 10	> 10	> 10
Isolation Between Ports (dB)	> 30	> 30	> 30
Maximum Power Per Input (W)	250		
Intermodulation (dBc)	< - 150		
Impedance (Ω)	50		

MECHANICAL SPECIFICATIONS

Connectors	2 X 7/16 Female
Connector Position	Bottom
Survival Wind Speed mph (km/h)	124 (200)
Front Windload lbs (N) @ 160 km/h	83 (370)
Lateral Windload lbs (N) @ 160 km/h	38 (170)
Radome Color	Grey, paintable
Temperature Range F (°C)	-67° to 140° (-55° to +60°)
Humidity	100%
Antenna Weight lbs (kg)	15.43 (7)
Antenna Dimension in (mm) H X W X D	53 X 6.29 X 3.54 (1340 X 160 X 90)



H&V Pattern



RYMSA Telecom Group (Headquarters)



www.rymsawireless.com

RYMSA México:
 Rymsa Wireless U.S.A.

P65-16-XL

Very Low Broadband Antennas

-2

POLARIZATION: Dual linear $\pm 45^\circ$
 FREQUENCY (MHz): 698-894
 HORIZONTAL BEAM WIDTH (*): 65
 GAIN (dBi/dBd): 16.0/13.9
 TILT: 2
 LENGTH: 72"

ELECTRICAL SPECIFICATIONS*

	698-806	698-894	806-894
Frequency range (MHz)			
Frequency band (MHz)	698-806		806-894
Gain (dBi/dBd)	15.5/13.4		16.0/13.9
Polarization			
Nominal Impedance (Ω)			
VSWR			
Horizontal beam width, -3 dB ($^\circ$)	68		65
Vertical beam width, -3 dB ($^\circ$)	10.5		9.5
Electrical down tilt ($^\circ$)			
Side lobe suppression, vertical 1st upper (dB)	> 15		> 15
Isolation between inputs (dB)	> 30		> 30
Tracking, horizontal plane $\pm 60^\circ$ (dB)	< 2		< 2
First null fill (dB)	-		-
Vertical beam squint ($^\circ$)	< 0.5		< 0.5
Front to back ratio (dB)	> 30		> 30
Front to back ratio, total power (dB)	> 25		> 25
Cross polar discrimination (XPD) 0° (dB)	> 15	> 15	> 25
Cross polar discrimination (XPD) $\pm 60^\circ$ (dB)	> 10		> 10
Far field coupling			
IM3, 2xTx@43dBm (dBc)	-153		
IM7, 2xTx@43dBm (dBc)			
Power handling, average per input (W)			
Power handling, average total (W)			

MECHANICAL SPECIFICATIONS*

Connector	2 X 7/16 DIN Female
Connector position	Bottom
Dimensions, HxWxD, mm (ft)	72" x 12" x 5" (1829 x 305 x 125)
Mounting	Pre-mounted Tilt Brackets
Weight, with brackets, kg (lbs)	44 (20)
Weight, without brackets, kg (lbs)	33 (15)
Wind load, frontal/lateral/rear side 42 m/s Cd=1.6 (N)	1380
Maximum operational wind speed, m/s (mph)	100 (45)
Survival wind speed, m/s (mph)	125 (55)
Lightning protection	DC Ground
Radome material	PVC
Radome colour	Light Grey
Package size, HxWxD, mm (ft)	82" x 16" x 10" (2082 x 400 x 255)
Shipping weight, kg (lbs)	55 (25)
RET	N/A
Brackets	7256.00, 7454.00, 2210.00

*All specifications subject to change without notice. Please contact your Powerwave representative for complete performance data.

ANTENNA PATTERNS*

For detailed patterns visit <http://www.powerwave.com/rpa/>.

		General	Power	Density				
Site Name: Trumbull SW								
Tower Height: Verizon @ 100Ft.								
CARRIER	# OF CHAN.	WATTS ERP	HEIGHT	CALC. POWER DENS	FREQ.	MAX. PERMISS. EXP.	FRACTION MPE	Total
*Clearwire	2	153	110	0.0091	2496	1.0000	0.91%	
*Clearwire	1	211	110	0.0063	18 GHz	1.0000	0.63%	
*MetroPCS	7	881	120	0.1540	2130	1.0000	15.40%	
*Cingular GSM	4	296	155	0.0177	880	0.5867	3.02%	
*Cingular GSM	2	427	155	0.0128	1900	1.0000	1.28%	
*Cingular UMTS	1	500	155	0.0075	880	0.5867	1.28%	
Verizon	3	446	100	0.0481	1970	1.0000	4.81%	
Verizon	9	289	100	0.0935	869	0.5793	16.14%	
Verizon	1	701	100	0.0252	757	0.4973	5.07%	
								48.53%
* Source: Siting Council								



at&t

Glynn Walker
AT&T Mobility
5405 Windward Parkway
Alpharetta, GA 30004
(770) 708-6122



GPD ASSOCIATES

Kevin Clements
520 South Main St, Suite 2531
Akron, Ohio 44311
(330) 572-2195
kclements@gpdgroup.com

GPD# 2010263.81 Rev. 1
April 21, 2010

REVISED STRUCTURAL ANALYSIS REPORT

AT&T DESIGNATION: Site USID: 60393
Site FA: 10034977
Site Name: BRIDGEPORT NORTH

VERIZON WIRELESS DESIGNATION: Site Name: Trumbull SW

ANALYSIS CRITERIA: Codes: TIA/EIA-222-F & 2003 IBC
85-mph with 0" ice
74-mph with 1/2" ice

SITE DATA: 38 Kaechele Place, Bridgeport, CT 06606, Fairfield County
Latitude 41° 13' 23.951" N, Longitude 73° 13' 0.407" W
150' Modified Monopole

Mr. Walker,

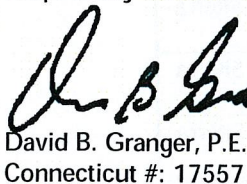
GPD is pleased to submit this Revised Structural Analysis Report to determine the structural integrity of the aforementioned tower. The purpose of the analysis is to determine the suitability of the tower in its modified state with the following proposed loading configuration:

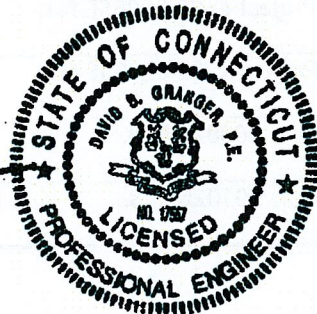
Elev. 100' (6) Antel LPD 6513 Antennas on (3) existing 12' T-Arms w/ (6) existing 1-5/8" external coax
(3) Powerwave P6516XL-2 Antennas on the same 12' T-Arms w/ (3) existing 1-5/8" internal coax
(3) Rymsa MG D3-800TO Antennas on the same 12' T-Arms w/ (3) existing 1-5/8" internal coax
(6) RFS FD9R6004 Tower Mounted Amplifiers mounted behind the antennas

Based on our analysis we have determined the designs of the modified tower and its foundation are sufficient for the proposed, existing and reserved loadings as referenced in Appendix A.

We at GPD appreciate the opportunity of providing our continuing professional services to you and AT&T. If you have any questions please do not hesitate to call.

Respectfully submitted,


David B. Granger, P.E.
Connecticut #: 17557



SUMMARY & RESULTS

The purpose of this analysis was to verify whether the existing structure is capable of carrying the proposed loading configuration as specified by Verizon Wireless to AT&T. This report was commissioned by Mr. Glynn Walker of AT&T.

The tower has been previously modified with (8) 2-1/2" diameter threaded rods from 0' – 50', (4) 2-1/2" diameter threaded rods from 50' – 95' and 5" x 3/4" mod plates from 95' – 115'. In addition, triangular stiffener plates have been installed on the base plate and bridge stiffeners on the flange plate at 109'. Additional concrete has also been poured on top of the existing foundation. All modifications have been considered in this analysis.

TOWER SUMMARY AND RESULTS

Member	Capacity	Results
Monopole	93.1%	Pass
Flange Plate	74.6%	Pass
Flange Bolts	59.6%	Pass
Mod Plate Connection	99.8%	Pass
Base Plate	38.5%	Pass
Anchor Rods	82.5%	Pass
Foundation	90.6%	Pass

ANALYSIS METHOD

RISA Tower (Version 5.4.1.5), a commercially available software program, was used to create a three-dimensional model of the tower and calculate primary member stresses for various dead, live, wind, and ice load cases. Selected output from the analysis is included in Appendix B. The following table details the information provided to complete this structural analysis. This analysis is based solely on this information.

DOCUMENTS PROVIDED

Document	Remarks	Source
Preliminary Tower Summary	Verizon Wireless Co-location document	Siterra
Site Lease Application	Verizon Wireless Application, dated 12/1/2009	Siterra
Previous Structural Analysis	GPD Associates Job #: 2008264.38 Rev. 1, dated 9/28/2009	Siterra
Tower Mapping	GPD Associates & Patriot Towers, Inc., dated 4/11/2008	Siterra
Foundation Exploration	FDH Engineering Project #: 08-09065E N1, dated 9/23/2008	Siterra
Geotechnical Report	FDH Engineering Project #: 08-09065E G1, dated 9/23/2008	Siterra
Modification Drawings	GPD Associates Job #: 2008264.38, dated 10/16/2008	Siterra
Previous Structural Analysis	GPD Associates Job #: 2010261.78, dated 2/11/2010	Siterra

ASSUMPTIONS

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

1. The monopole shaft sizes and shape are considered accurate as supplied. The material grade is as per data supplied and/or as assumed and as stated in the materials section.
2. The antenna configuration is as supplied and/or as modeled in the analysis. It is assumed to be complete and accurate. All antennas, mounts, coax and waveguides are assumed to be properly installed and supported as per manufacturer requirements
3. Some assumptions are made regarding antennas and mount sizes and their projected areas based on best interpretation of data supplied and of best knowledge of antenna type and industry practice.
4. All mounts, if applicable, are considered adequate to support the loading. No actual analysis of the mount(s) is performed. This analysis is limited to analyzing the tower only.
5. The soil parameters are as per data supplied or as assumed and stated in the calculations. If no data is available, the foundation system is not verified.
6. The tower and structures have been properly maintained in accordance with TIA Standards and/or with manufacturer's specifications.
7. All welds and connections are assumed to develop at least the member capacity, unless determined otherwise and explicitly stated in this report.
8. Tower Mounted Amplifiers are assumed to be installed behind the antennas.
9. All existing loading was obtained from the previous structural analysis by GPD Associates Job #: 2010261.78 dated 2/11/2010, site photos and the provided preliminary tower summary and is assumed to be accurate.
10. No steel grade information was provided, therefore, steel grades are assumed based on previous engineering experience.
11. The threaded rod modifications are assumed to be installed through the base plate into the foundation, carrying forces directly into the foundation.
12. Foundations are properly designed and constructed to resist the original design loads indicated in the documents provided.
13. Future feedlines to 150' level are assumed to be internal to the monopole.
14. Loading interpreted from photos is accurate to $\pm 5'$ AGL, antenna size accurate to ± 3.3 sf, and coax equal to the number of existing antennas without reserve.

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

DISCLAIMER OF WARRANTIES

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

The engineering services rendered by GPD ASSOCIATES in connection with this Structural Analysis are limited to a computer analysis of the tower structure and theoretical capacity of its main structural members. All tower components have been assumed to only resist dead loads when no other loads are applied. No allowance was made for any damaged, bent, missing, loose, or rusted members (above and below ground). No allowance was made for loose bolts or cracked welds.

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

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

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

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

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

APPENDIX A

Tower Analysis Summary Form

Tower Analysis Summary Form

General Info	
Site Name	BRIDGEPORT NORTH
Site Number	60393
EA Number	10034977
Date of Analysis	4/21/2010
Company Performing Analysis	GPD

The information contained in this summary report is not to be used independently from the PE stamped tower analysis.

Tower Info	Description	Date
Tower Type (G, SST, MP)	MP	
Tower Height (top of steel AGL)	150'	
Tower Manufacturer	n/a	
Tower Model	n/a	
Tower Design	n/a	
Foundation Investigation	FDH Engineering Project #: 08-09065E N1	9/23/2008
Geotech Report	FDH Engineering Project #: 08-09065E G1	9/23/2008
Modification Drawings	GPD Associates Job #: 2008264.38	10/16/2008
Previous Structural Analysis	GPD Associates Job #: 2008013.14	9/23/2008
Previous Structural Analysis	GPD Associates Job #: 2008264.38 Rev. 1	9/28/2009
Previous Structural Analysis	GPD Associates Job #: 2010261.78	2/11/2010
Tower Mapping	GPD Associates & Patriot Towers, Inc.	4/11/2008

Design Parameters	
Design Code Used	TIA/EIA-222-F
Location of Tower (County, State)	Fairfield, Connecticut
Basic Wind Speed (mph)	85-Fastest
Ice Thickness (in)	0.5
Structure Classification (I, II, III)	
Exposure Category (B, C, D)	
Topographic Category (1 to 5)	

Analysis Results (% Maximum Usage)	
Existing/Reserved + Future + Proposed	Condition
Tower	99.9%
Base Plate	82.5%
Foundation	90.6%

Analysis Results (% Maximum Usage)	
Existing	Condition
Tower	99.7%
Base Plate	84.6%
Foundation	93.1%

Steel Yield Strength (ksi)	
Pole	60
Anchor Rods	75
Base Plate	50
Modification Rods	60

Note: Steel grades were taken from previous analyses.

Existing / Reserved Loading

Antenna										
Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Quantity	Type	Manufacturer	Model	Azimuth	Quantity	Manufacturer	Type
AT&T Mobility	149.5	154	6	Panel	Powerwave	7770.00	20/141/263	1	Unknown	10' Platform on the same mount
AT&T Mobility	149.5	154	6	TMA	Powerwave	LGP21401				
Metro PCS	120	120	6	Panel	Kathrein	800 10504	60/180/300	3	Unknown	10' T-Arms
Clearwire	110	110	5	Dish	Dragonwave	A-ANT-23G-2-C	2/108/188/264/310			Pipe Mounted behind the dishes
Clearwire	110	110	5	ODU	Dragonwave	Horizon DUO				on the same mounts behind the antennas
Clearwire	110	110	3	Panel	Argus	LLPX310R	50/150/260			
Clearwire	110	110	3	RRH	Samsung	FDD R6 RRH				
Verizon Wireless	98	100	6	Panel	Antel	LPD 6513	60/180/300	3	Unknown	12' T-Arms
Verizon Wireless	98	100	6	Panel	Antel	BSA 185065/10	60/180/300			on the same mounts behind the antennas
Verizon Wireless	98	100	6	TMA	Unknown	TMA				

Proposed Loading

Antenna										
Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Quantity	Type	Manufacturer	Model	Azimuth	Quantity	Manufacturer	Type
Verizon Wireless	98	100	6	Panel	Antel	LPD 6513	60/180/300			on the existing mounts
Verizon Wireless	98	100	3	Panel	Powerwave	PS516XL-2	60/180/300			on the same mounts
Verizon Wireless	98	100	3	Panel	Ryma Wireless	MG D3-800T0	60/180/300			on the same mounts
Verizon Wireless	98	100	6	TMA	RFS	FD9R6004				behind the antennas

Note: Proposed loading shall replace the existing loading at the same elevation. The existing feedlines shall be reused for the proposed loading.

Future Loading

Antenna										
Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Quantity	Type	Manufacturer	Model	Azimuth	Quantity	Manufacturer	Type
AT&T Mobility	149.5	154	3	Panel	Powerwave	7770.00	20/141/263			on the existing mount behind the antennas
AT&T Mobility	149.5	154	3	TMA	Powerwave	LGP21401				

Note: Future loading is in addition to the existing loading at the same elevation.

APPENDIX B

RISA Tower Output File

RISA Tower GPD Associates 520 South Main Street, Suite 2531 Akron, Ohio 44311 Phone: 330.572.2100 FAX: 330.572.3702	Job	60393 - BRIDGEPORT NORTH	Page	1 of 5
	Project	2010263.81 Rev. 1	Date	15:30:05 04/21/10
	Client	AT&T Mobility	Designed by	jnoos

Tower Input Data

There is a pole section.

This tower is designed using the TIA/EIA-222-F standard.

The following design criteria apply:

Tower is located in Fairfield County, Connecticut.

Basic wind speed of 85 mph.

Nominal ice thickness of 0.5000 in.

Ice density of 56 pcf.

A wind speed of 74 mph is used in combination with ice.

Temperature drop of 50 °F.

Deflections calculated using a wind speed of 50 mph.

A non-linear (P-delta) analysis was used.

Pressures are calculated at each section.

Stress ratio used in pole design is 1.333.

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

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement	Total Number	C _{AA}	
						ft	plf
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	150.00 - 8.00	18	No Ice	0.00
						1/2" Ice	0.82
LDF7-50A (1-5/8 FOAM)	A	No	CaAa (Out Of Face)	120.00 - 8.00	12	No Ice	0.82
						1/2" Ice	2.33
LDF4-50A (1/2 FOAM)	A	No	Inside Pole	110.00 - 8.00	5	No Ice	0.15
						1/2" Ice	0.15
9207 (5/16")	A	No	Inside Pole	110.00 - 8.00	6	No Ice	0.06
						1/2" Ice	0.06
LDF7-50A (1-5/8 FOAM)	B	No	Inside Pole	99.00 - 8.00	6	No Ice	0.82
						1/2" Ice	0.82
LDF7-50A (1-5/8 FOAM)	B	No	CaAa (Out Of Face)	99.00 - 8.00	3	No Ice	0.82
						1/2" Ice	2.33
LDF7-50A (1-5/8 FOAM)	B	No	CaAa (Out Of Face)	99.00 - 8.00	3	No Ice	0.82
						1/2" Ice	2.33
2.5" threaded rod	A	No	CaAa (Out Of Face)	98.00 - 0.00	1	No Ice	15.58
						1/2" Ice	17.41
2.5" threaded rod	A	No	CaAa (Out Of Face)	98.00 - 0.00	1	No Ice	15.58
						1/2" Ice	17.41
2.5" threaded rod	A	No	CaAa (Out Of Face)	52.00 - 0.00	1	No Ice	15.58
						1/2" Ice	17.41
2.5" threaded rod	A	No	CaAa (Out Of Face)	52.00 - 0.00	1	No Ice	15.58
						1/2" Ice	17.41
2.5" threaded rod	B	No	CaAa (Out Of Face)	98.00 - 0.00	1	No Ice	15.58
						1/2" Ice	17.41
2.5" threaded rod	B	No	CaAa (Out Of Face)	52.00 - 0.00	1	No Ice	15.58
						1/2" Ice	17.41
2.5" threaded rod	C	No	CaAa (Out Of Face)	98.00 - 0.00	1	No Ice	15.58
						1/2" Ice	17.41
2.5" threaded rod	C	No	CaAa (Out Of Face)	52.00 - 0.00	1	No Ice	15.58
						1/2" Ice	17.41
5" x 0.5" Mod Plate	A	No	CaAa (Out Of Face)	115.00 - 98.00	1	No Ice	8.49
						1/2" Ice	9.18
5" x 0.5" Mod Plate	A	No	CaAa (Out Of Face)	98.00 - 95.00	1	No Ice	8.49
						1/2" Ice	9.18
5" x 0.5" Mod Plate	B	No	CaAa (Out Of Face)	115.00 - 95.00	1	No Ice	8.49
						1/2" Ice	9.18
5" x 0.5" Mod Plate	C	No	CaAa (Out Of Face)	115.00 - 95.00	1	No Ice	8.49
						1/2" Ice	9.18

RISATower GPD Associates 520 South Main Street, Suite 2531 Akron, Ohio 44311 Phone: 330.572.2100 FAX: 330.572.3702	Job 60393 - BRIDGEPORT NORTH	Page 2 of 5
	Project 2010263.81 Rev. 1	Date 15:30:05 04/21/10
	Client AT&T Mobility	Designed by jness

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight	
			Horz	Lateral Vert						
			ft	ft	°	ft	ft ²	ft ²	K	
(3) 7770.00	A	From Centroid-Leg	3.76 1.37 4.50		20.0000	149.50	No Ice 1/2" Ice	5.88 6.31	2.93 3.27	0.04 0.07
(3) 7770.00	B	From Centroid-Leg	3.73 1.43 4.50		21.0000	149.50	No Ice 1/2" Ice	5.88 6.31	2.93 3.27	0.04 0.07
(3) 7770.00	C	From Centroid-Leg	3.68 1.56 4.50		23.0000	149.50	No Ice 1/2" Ice	5.88 6.31	2.93 3.27	0.04 0.07
(3) LGP21401	A	From Centroid-Leg	3.76 1.37 4.50		20.0000	149.50	No Ice 1/2" Ice	0.00 0.00	0.23 0.31	0.01 0.02
(3) LGP21401	B	From Centroid-Leg	3.73 1.43 4.50		21.0000	149.50	No Ice 1/2" Ice	0.00 0.00	0.23 0.31	0.01 0.02
(3) LGP21401	C	From Centroid-Leg	3.68 1.56 4.50		23.0000	149.50	No Ice 1/2" Ice	0.00 0.00	0.23 0.31	0.01 0.02
10'-8" Central Platform w/ 42" tower extension	C	None			0.0000	149.50	No Ice 1/2" Ice	43.32 46.28	43.32 46.28	2.50 3.25
(2) 800 10504	A	From Face	4.00 0.00 0.00		0.0000	120.00	No Ice 1/2" Ice	3.35 3.70	1.87 2.20	0.02 0.04
(2) 800 10504	B	From Face	4.00 0.00 0.00		0.0000	120.00	No Ice 1/2" Ice	3.35 3.70	1.87 2.20	0.02 0.04
(2) 800 10504	C	From Face	4.00 0.00 0.00		0.0000	120.00	No Ice 1/2" Ice	3.35 3.70	1.87 2.20	0.02 0.04
10' T-arms (3)	C	None			0.0000	120.00	No Ice 1/2" Ice	11.70 13.00	11.70 13.00	0.75 0.90
LLPX310R w/ Mount Pipe	A	From Leg	0.50 0.00 0.00		50.0000	110.00	No Ice 1/2" Ice	5.07 5.48	2.98 3.53	0.05 0.08
LLPX310R w/ Mount Pipe	B	From Leg	0.50 0.00 0.00		30.0000	110.00	No Ice 1/2" Ice	5.07 5.48	2.98 3.53	0.05 0.08
LLPX310R w/ Mount Pipe	C	From Leg	0.50 0.00 0.00		20.0000	110.00	No Ice 1/2" Ice	5.07 5.48	2.98 3.53	0.05 0.08
FDD R6 RRH	A	From Leg	0.50 0.00 0.00		50.0000	110.00	No Ice 1/2" Ice	1.80 1.99	0.78 0.92	0.03 0.04
FDD R6 RRH	B	From Leg	0.50 0.00 0.00		30.0000	110.00	No Ice 1/2" Ice	1.80 1.99	0.78 0.92	0.03 0.04
FDD R6 RRH	C	From Leg	0.50 0.00 0.00		20.0000	110.00	No Ice 1/2" Ice	1.80 1.99	0.78 0.92	0.03 0.04
Horizon DUO	A	From Leg	0.50 0.00 0.00		2.0000	110.00	No Ice 1/2" Ice	0.55 0.65	0.34 0.43	0.01 0.01

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _A A _A Front	C _A A _A Side	Weight	
			Horz	Lateral						
			ft	ft	°	ft	ft ²	ft ²	K	
Horizon DUO	B	From Leg	0.50		-12.0000	110.00	No Ice	0.55	0.34	0.01
			0.00				1/2" Ice	0.65	0.43	0.01
Horizon DUO	C	From Face	0.50		8.0000	110.00	No Ice	0.55	0.34	0.01
			0.00				1/2" Ice	0.65	0.43	0.01
Horizon DUO	C	From Leg	0.50		24.0000	110.00	No Ice	0.55	0.34	0.01
			0.00				1/2" Ice	0.65	0.43	0.01
Horizon DUO	C	From Face	0.50		10.0000	110.00	No Ice	0.55	0.34	0.01
			0.00				1/2" Ice	0.65	0.43	0.01
(2) LPD 6513	A	From Face	4.00		0.0000	100.00	No Ice	6.42	5.14	0.03
			0.00				1/2" Ice	6.83	5.52	0.07
(2) LPD 6513	B	From Face	4.00		0.0000	100.00	No Ice	6.42	5.14	0.03
			0.00				1/2" Ice	6.83	5.52	0.07
(2) LPD 6513	C	From Face	4.00		0.0000	100.00	No Ice	6.42	5.14	0.03
			0.00				1/2" Ice	6.83	5.52	0.07
P6516XL-2	A	From Face	4.00		0.0000	100.00	No Ice	8.40	4.12	0.03
			2.00				1/2" Ice	8.95	4.56	0.08
P6516XL-2	B	From Face	4.00		0.0000	100.00	No Ice	8.40	4.12	0.03
			2.00				1/2" Ice	8.95	4.56	0.08
P6516XL-2	C	From Face	4.00		0.0000	100.00	No Ice	8.40	4.12	0.03
			2.00				1/2" Ice	8.95	4.56	0.08
MG D3-800TO	A	From Face	4.00		0.0000	100.00	No Ice	3.28	2.10	0.02
			-2.00				1/2" Ice	3.61	2.42	0.04
MG D3-800TO	B	From Face	4.00		0.0000	100.00	No Ice	3.28	2.10	0.02
			-2.00				1/2" Ice	3.61	2.42	0.04
MG D3-800TO	C	From Face	4.00		0.0000	100.00	No Ice	3.28	2.10	0.02
			-2.00				1/2" Ice	3.61	2.42	0.04
(2) FD9R6004	A	From Face	4.00		0.0000	100.00	No Ice	0.00	0.25	0.00
			0.00				1/2" Ice	0.00	0.32	0.01
(2) FD9R6004	B	From Face	4.00		0.0000	100.00	No Ice	0.00	0.25	0.00
			0.00				1/2" Ice	0.00	0.32	0.01
(2) FD9R6004	C	From Face	4.00		0.0000	100.00	No Ice	0.00	0.25	0.00
			0.00				1/2" Ice	0.00	0.32	0.01
12' T-arms (3)	C	None			0.0000	98.00	No Ice	14.10	14.10	1.00
							1/2" Ice	16.00	16.00	1.20

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	Client	AT&T Mobility	Designed by	jnoos

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets:		Azimuth Adjustment	3 dB Beam Width	Elevation	Outside Diameter	Aperture Area	Weight	
				Horz Lateral	Vert							
				ft	°	ft	ft	ft ²	K			
A-ANT-23G-2-C	A	Paraboloid w/o Radome	From Leg	0.50	2.0000			110.00	2.17	No Ice 1/2" Ice	3.72 4.01	0.01 0.02
A-ANT-23G-2-C	B	Paraboloid w/o Radome	From Leg	0.50	-12.0000			110.00	2.17	No Ice 1/2" Ice	3.72 4.01	0.01 0.02
A-ANT-23G-2-C	C	Paraboloid w/o Radome	From Face	0.50	8.0000			110.00	2.17	No Ice 1/2" Ice	3.72 4.01	0.01 0.02
A-ANT-23G-2-C	C	Paraboloid w/o Radome	From Leg	0.50	24.0000			110.00	2.17	No Ice 1/2" Ice	3.72 4.01	0.01 0.02
A-ANT-23G-2-C	C	Paraboloid w/o Radome	From Face	0.50	10.0000			110.00	2.17	No Ice 1/2" Ice	3.72 4.01	0.01 0.02

Critical Deflections and Radius of Curvature - Service Wind

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
149.50	(3) 7770.00	28	82.266	4.8726	0.0021	9959
120.00	(2) 800 10504	28	53.460	4.3428	0.0020	2037
110.00	A-ANT-23G-2-C	28	44.694	4.0311	0.0020	1820
100.00	(2) LPD 6513	28	36.591	3.7103	0.0018	1682
98.00	12' T-arms (3)	28	35.053	3.6408	0.0017	1633

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Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P _{allow} K	% Capacity	Pass Fail	
L1	150 - 124.75	Pole	TP18.764x15x0.2188	1	-2.95	626.86	63.0	Pass	
L2	124.75 - 119.75	Pole	TP19.5093x18.764x0.2188	2	-3.79	652.05	71.8	Pass	
L3	119.75 - 114.75	Pole	TP20.2547x19.5093x0.2188	3	-4.13	677.25	82.2	Pass	
L4	114.75 - 109.75	Pole	TP21x20.2547x0.2188	4	-4.59	702.44	65.5	Pass	
L5	109.75 - 106.06	Pole	TP21.5497x21x0.25	5	-4.98	822.81	66.3	Pass	
L6	106.06 - 102.37	Pole	TP22.0994x21.5497x0.25	6	-5.39	844.05	72.3	Pass	
L7	102.37 - 98.68	Pole	TP22.6491x22.0994x0.25	7	-5.67	865.28	78.7	Pass	
L8	98.68 - 95	Pole	TP23.1988x22.6491x0.25	8	-7.20	886.52	86.5	Pass	
L9	95 - 92.5	Pole	TP23.5714x23.1988x0.25	9	-7.62	900.91	90.5	Pass	
L10	92.5 - 90	Pole	TP23.944x23.5714x0.25	10	-8.04	915.31	59.4	Pass	
L11	90 - 85	Pole	TP24.6894x23.944x0.25	11	-8.93	944.10	65.8	Pass	
L12	85 - 80	Pole	TP25.4348x24.6894x0.25	12	-9.84	972.90	72.0	Pass	
L13	80 - 75	Pole	TP26.1801x25.4348x0.25	13	-10.79	1001.69	78.0	Pass	
L14	75 - 69.25	Pole	TP27.0373x26.1801x0.25	14	-11.91	1034.80	84.5	Pass	
L15	69.25 - 64.25	Pole	TP27.7826x27.0373x0.3125	15	-12.98	1326.47	80.9	Pass	
L16	64.25 - 59.25	Pole	TP28.528x27.7826x0.3125	16	-14.06	1362.47	85.4	Pass	
L17	59.25 - 54.25	Pole	TP29.2733x28.528x0.3125	17	-15.18	1398.46	89.7	Pass	
L18	54.25 - 50	Pole	TP29.9068x29.2733x0.3125	18	-16.27	1429.04	93.1	Pass	
L19	50 - 45	Pole	TP30.6522x29.9068x0.3125	19	-17.74	1465.05	66.9	Pass	
L20	45 - 40	Pole	TP31.3975x30.6522x0.3125	20	-19.24	1501.02	69.8	Pass	
L21	40 - 35	Pole	TP32.1429x31.3975x0.3125	21	-20.76	1537.03	72.7	Pass	
L22	35 - 30	Pole	TP32.8882x32.1429x0.3125	22	-22.31	1573.01	75.4	Pass	
L23	30 - 25	Pole	TP33.6335x32.8882x0.4063	23	-24.00	2085.81	69.9	Pass	
L24	25 - 20	Pole	TP34.3789x33.6335x0.4063	24	-25.71	2132.61	72.0	Pass	
L25	20 - 15	Pole	TP35.1242x34.3789x0.4063	25	-27.45	2179.40	74.1	Pass	
L26	15 - 10	Pole	TP35.8696x35.1242x0.4063	26	-29.21	2226.19	76.1	Pass	
L27	10 - 5	Pole	TP36.6149x35.8696x0.4063	27	-30.88	2272.98	78.0	Pass	
L28	5 - 0	Pole	TP37.3602x36.6149x0.4063	28	-32.51	2319.75	79.7	Pass	
							Summary		
							Pole (L18)	93.1	Pass
							RATING =	93.1	Pass

APPENDIX C

Tower Elevation Drawing

Section	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28		
Length (ft)	25.25	5.00	5.00	5.00	3.69	3.69	3.69	3.69	5.00	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50		
Number of Sides	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12		
Thickness (in)	0.2188	0.2188	0.2188	0.2188	0.2188	0.2188	0.2188	0.2188	0.2188	0.2188	0.2188	0.2188	0.2188	0.2188	0.2188	0.2188	0.2188	0.2188	0.2188	0.2188	0.2188	0.2188	0.2188	0.2188	0.2188	0.2188	0.2188	0.2188	0.2188	
Top Dia (in)	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000
Bot Dia (in)	18.7640	18.7640	18.7640	18.7640	18.7640	18.7640	18.7640	18.7640	18.7640	18.7640	18.7640	18.7640	18.7640	18.7640	18.7640	18.7640	18.7640	18.7640	18.7640	18.7640	18.7640	18.7640	18.7640	18.7640	18.7640	18.7640	18.7640	18.7640	18.7640	18.7640
Grade	18.7640	18.7640	18.7640	18.7640	18.7640	18.7640	18.7640	18.7640	18.7640	18.7640	18.7640	18.7640	18.7640	18.7640	18.7640	18.7640	18.7640	18.7640	18.7640	18.7640	18.7640	18.7640	18.7640	18.7640	18.7640	18.7640	18.7640	18.7640	18.7640	18.7640
Weight (K)	1.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2



DESIGNED APPURTENANCE LOADING

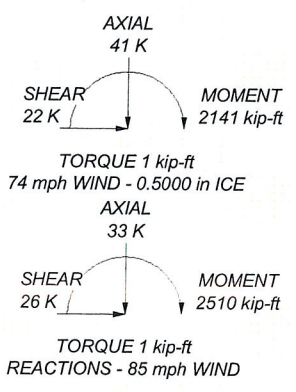
TYPE	ELEVATION	TYPE	ELEVATION
(3) 7770.00	149.5	Horizon DUO	110
(3) 7770.00	149.5	Horizon DUO	110
(3) 7770.00	149.5	A-ANT-23G-2-C	110
(3) LGP21401	149.5	A-ANT-23G-2-C	110
(3) LGP21401	149.5	A-ANT-23G-2-C	110
(3) LGP21401	149.5	A-ANT-23G-2-C	110
10'-8" Central Platform w/ 42" tower extension	149.5	A-ANT-23G-2-C	110
(2) 800 10504	120	P6516XL-2	100
(2) 800 10504	120	MG D3-800TO	100
(2) 800 10504	120	MG D3-800TO	100
(2) 800 10504	120	MG D3-800TO	100
10' T-arms (3)	120	(2) FD9R6004	100
LLPX310R w/ Mount Pipe	110	(2) FD9R6004	100
LLPX310R w/ Mount Pipe	110	(2) LPD 6513	100
LLPX310R w/ Mount Pipe	110	(2) LPD 6513	100
FDD R6 RRRH	110	(2) LPD 6513	100
FDD R6 RRRH	110	P6516XL-2	100
FDD R6 RRRH	110	P6516XL-2	100
Horizon DUO	110	12' T-arms (3)	98
Horizon DUO	110		
Horizon DUO	110		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-60	60 ksi	75 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 74 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 93.1%

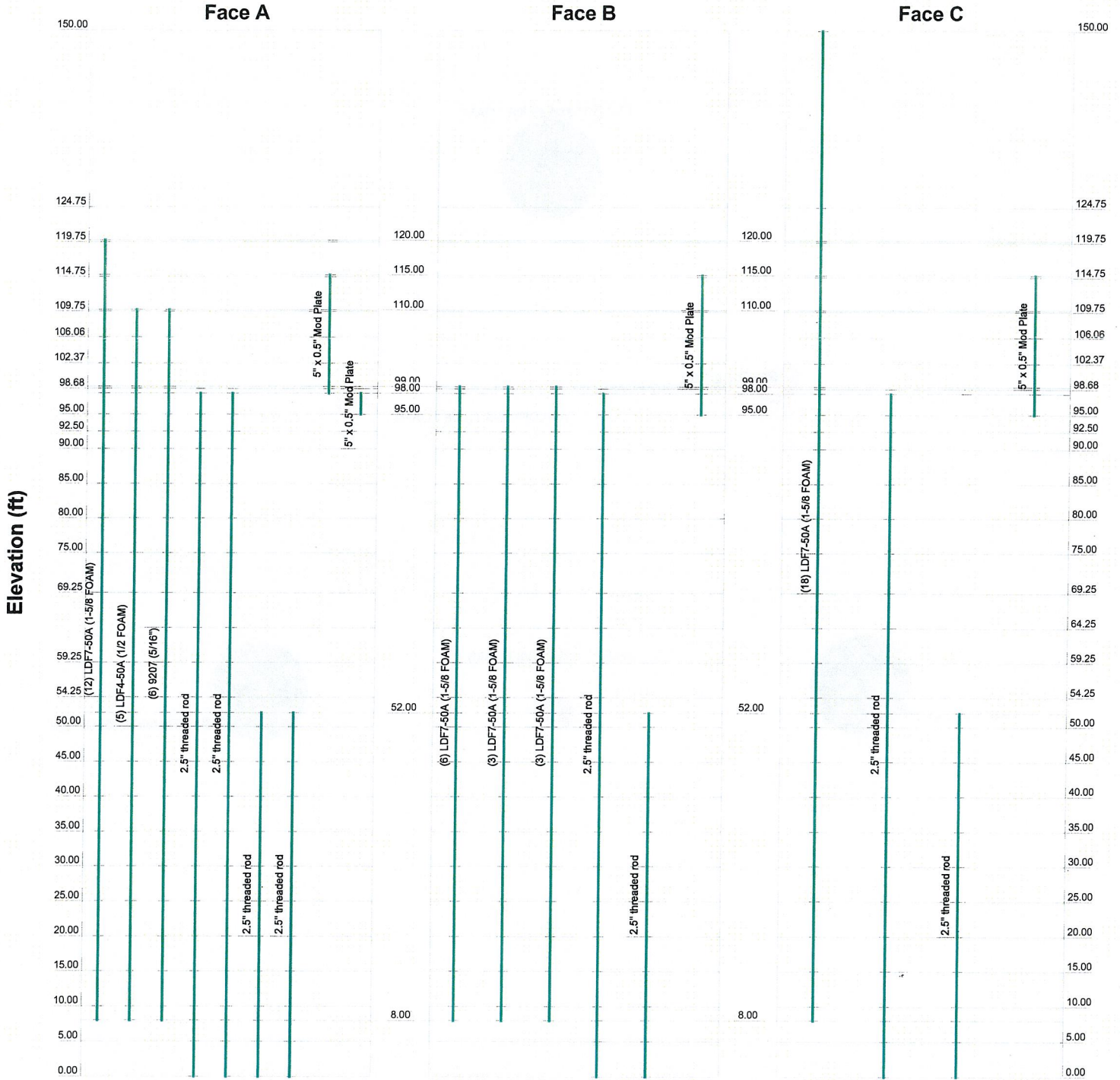



<p>GPD Associates 520 South Main Street, Suite 2531 Akron, Ohio 44311 Phone: 330.572.2100 FAX: 330.572.3702</p>	Job: 60393 - BRIDGEPORT NORTH
	Project: 2010263.81 Rev. 1
	Client: AT&T Mobility Drawn by: jnoos App'd:
	Code: TIA/EIA-222-F Date: 04/21/10 Scale: NTS
	Path: N:\2010\2010263\81\1\ISA\60393.dwg Dwg No. E-1

Feedline Distribution Chart

0' - 150'

Round Flat App In Face App Out Face Truss Leg



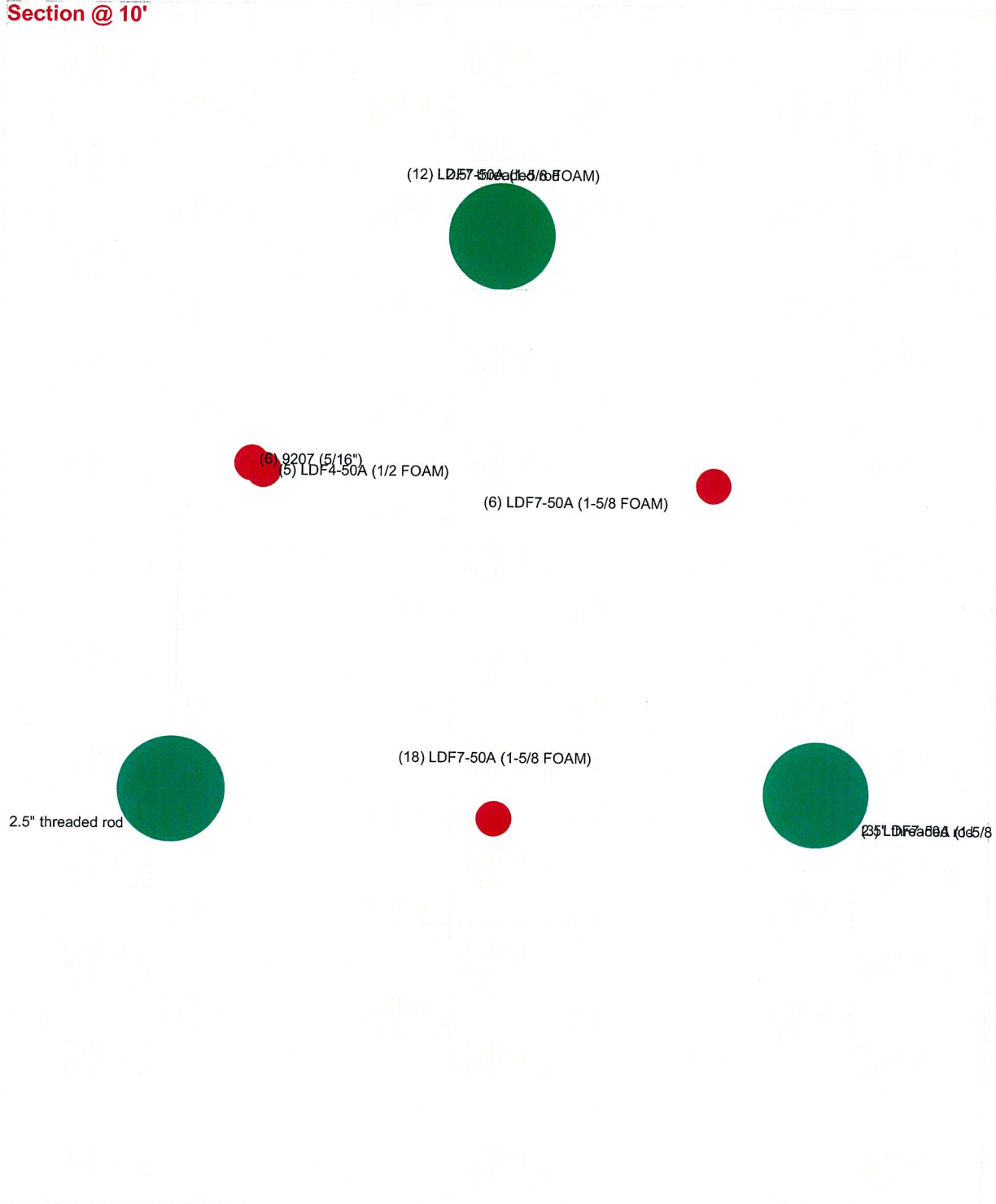
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Job: 60393 - BRIDGEPORT NORTH			
Project: 2010263.81 Rev. 1			
Client: AT&T Mobility	Drawn by: jnoss	App'd:	
Code: TIA/EIA-222-F	Date: 04/21/10	Scale: NTS	
Path: N:\2010\2010263\81\1\RISA\60393.dwg	Dwg No. E-7		

Feedline Plan 10'

Round _____ Flat _____ App In Face _____ App Out Face _____

Section @ 10'



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	Project: 2010263.81 Rev. 1		
	Client: AT&T Mobility	Drawn by: jnoess	App'd:
	Code: TIA/EIA-222-F	Date: 04/21/10	Scale: NTS
	Path: N:\2010\2010263\81\TIA\60393.dwg		Dwg No: E-7

APPENDIX D

Base Plate and Anchor Rod Analysis

Anchor Rod and Base Plate Stresses

60393 - BRIDGEPORT NORTH

GPD Job Number: 2010263.81 Rev. 1

Anchor Rods		
Pole Diameter =	37.36	in
Number of Rods =	8	
Rod Grade (Fy) =	75	ksi
Rod Circle =	43	in
Rod Diameter =	2.25	in
Net Tensile Area =	3.25	in ²
Force on Rod =	160.86	klps
Allow. Rod Force =	195.00	klps
Anchor Rod Capacity =	82.5%	OK

Base Plate		
Plate Strength (Fy) =	50	ksi
Plate Thickness =	2.75	in
Plate Width =	41	in
Est. Dist. b/w Rods =	18	in
w_{calc} =	24.78	in
e =	1.695	in
w_{max} =	20.6228	in
w =	20.6228	in
l =	4.31	in
b =	6	in
l/b =	0.718	
M_x =	13.948	kip-in
M_y =	24.275	kip-in
M_{max} =	24.275	kip-in
fc =	6.22045	ksi
fb =	19.26	ksi
Fb =	50	ksi
Base Plate Capacity =	38.5%	OK



Project	60393 - BRIDGEPORT NORTH
Engineer	JWN
Date	4/21/2010

FORCE ON BOLTS

$$M = n \cdot P \cdot d_1 = P[(n_2 d_2^2 / d_1) + (n_3 d_3^2 / d_1) + \dots]$$

SECTION X-X

M (k-ft) **2509.51** 30114.12 M (k-in)

					$n_1 d_1$	$n_x d_x^2 / d_1$
d ₁	21.2897	in	n ₁	4	85.1588	
d ₂	20.0514	in	n ₂	4		75.5405
d ₃	7.88	in	n ₃	4		11.66656
d ₄	3	in	n ₇	4		1.690959
				Total	85.1588	88.89802

P max= 173.0132 k

SECTION Y-Y

M (k-ft) **2509.51** 30114.12 M (k-in)

					$n_1 d_1$	$n_x d_x^2 / d_1$
d ₁	21.5	in	n ₁	2	43	
d ₂	21.2897	in	n ₂	2		42.16291
d ₃	20.9547	in	n ₃	2		40.84646
d ₄	18.7557	in	n ₄	2		32.72338
d ₅	10.6008	in	n ₅	2		10.45367
d ₆	5.9413	in	n ₆	2		3.283632
d ₇	5.0051	in	n ₇	2		2.330328
				Total	43	131.8004

P max= 172.2772 k

SECTION Z-Z

M (k-ft) **2509.51** 30114.12 M (k-in)

					$n_1 d_1$	$n_x d_x^2 / d_1$
d ₁	19.7505	in	n ₁	4	79.002	
d ₂	17.1754	in	n ₂	4		59.74418
d ₃	12.9327	in	n ₃	4		33.87352
d ₄	8.6064	in	n ₇	4		15.00116
				Total	79.002	108.6189

P max= 160.5052 k

Anchor Bolt Dia. **2.25** in Max force (Bolt) 160.8609
 # of Anchor Bolts **8**
 Area 3.976078 sq in

Threaded Rod Dia. **2.414** in Max force (Rod) 185.1654
 # of Rods **8**
 Area 4.576826 sq in

APPENDIX E

Flange Bolt and Flange Plate Analysis



109*

**Existing Flange Connection @
60393 - BRIDGEPORT NORTH
GPD Job Number: 2010263.81 Rev. 1**

*O.T. Moment =	180.73 k'ft
Axial =	4.59 kips
Shear =	11.00 kips

*Above reactions have been adjusted due to consideration of modifications. See attached hand calculations for determination of flange bolt forces used in the analysis.

Flange Bolts	
# Bolts =	12
Bolt Type =	A325
F _t =	44 ksi
ASIF =	1.333
Bolt Circle =	26 in
Bolt Diameter =	1 in

Tension & Shear (ASD, Section J3.5)

F _y =	21 ksi
Nominal Area =	0.79 in ²
f _t =	1.17 ksi
Applied Shear =	0.92 kips
Allowable Shear =	21.99 kips
F _v ² - 4.39(f _v /2) ² =	43.93 ksi
Allowable Bolt Stress =	58.57/599 ksi
B =	46.01 kips

Prying Action Check

N/A for stiffened flange

Max Comp. on Bolt =	28.17 kips
Max Tension on Bolt =	27.40 kips
Shear Capacity =	4.2%
Tensile Capacity =	59.6%
Bolt Capacity =	59.6% OK

Pole Information

Shaft Diam. (Upper) =	21 in
Thickness (Upper) =	0.21875 in
# of Sides (Upper) =	12
F _y (Upper) =	60 ksi
Shaft Diam. (Lower) =	21 in
Thickness (Lower) =	0.25 in
# of Sides (Lower) =	12
F _y (Lower) =	60 ksi

Acceptable Stress Ratio =	100.0%
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See attached hand calculations

Upper Flange Plate	
Location =	External
Plate Thickness (F _y) =	36 ksi
Plate Thickness =	1 in
Outer Diameter =	28.5 in
b =	6.31 in
Le =	3.00 in
f _p =	26.87 ksi
F _p =	36 ksi
Upper Plate Capacity =	74.6% OK

Lower Flange Plate	
Location =	External
Plate Thickness (F _y) =	36 ksi
Plate Thickness =	1 in
Outer Diameter =	28.5 in
b =	6.31 in
Le =	3.00 in
f _p =	26.87 ksi
F _p =	36 ksi
Lower Plate Capacity =	74.6% OK

Upper Stiffeners	
Configuration =	Every Bolt
Thickness =	0.5 in
Width =	3 in
Notch =	0.75 in
Height =	5 in
Stiffener Strength (F _y) =	70 ksi
Weld Info. Known? =	No
Stiffener Vertical Force =	18.01 kips
Vert. Weld Capacity =	Not Verified
Horiz. Weld Capacity =	Not Verified
Stiffener Capacity =	60.4%
Controlling Capacity =	60.4% OK

Lower Stiffeners	
Configuration =	Every Bolt
Thickness =	0.5 in
Width =	3 in
Notch =	0.75 in
Height =	5 in
Stiffener Strength (F _y) =	70 ksi
Weld Info. Known? =	No
Stiffener Vertical Force =	16.90 kips
Vert. Weld Capacity =	Not Verified
Horiz. Weld Capacity =	Not Verified
Stiffener Capacity =	56.7%
Controlling Capacity =	56.7% OK

Strain Compatability (Flange @ 109')

60393 - BRIDGEPORT NORTH

GPD Job Number: 2010263.81 Rev. 1

Number	Area (in ²)	Distance (in)	Unbraced Length(in)	M= 270.44	k-ft
1	2	16.25	4	stiffener	
2	0.785	13	2	bolt	
3	0.785	11.2583	2	bolt	
4	0.785	6.5	2	bolt	
5	2	8.125	4	stiffener	

OUTPUT

M=	73.35886839	*P ₁
P ₁ =	44.23841413	
P ₂ =	27.78172407	Maximum flange bolt force
P ₃ =	24.05961417	
P ₄ =	13.89086204	
P ₅ =	22.11920707	

APPENDIX F

Modification Calculations

**MODIFICATION CALCULATIONS (0' - 95' OF EXISTING 150' MONOPOLE)
60393 - BRIDGEPORT NORTH**



Steel Strength

60 ksi

Existing Tower w/o mods

of Reinforcing Plates

4/8

Elevation	OD	thick	ID	Area	sides	Inertia	C	S	Pole Slend.	Slend. Stress	Number	Diag.	Inertia	Top OD	Bottom OD	Taper Tower Ht.	# of sides min slend.
90	23.95	0.25	23.44526	5.88	19.07	1366.79	12.40	110.20	182.192	53.24	4	2.5	3327.6323	23.2	37.36		
85	24.69	0.25	24.19053	6.08	19.67	1499.88	12.79	117.28	188.379	52.69	4	2.5	3560.1272				
80	25.44	0.25	24.93579	6.28	20.27	1641.33	13.18	124.58	194.566	52.13	4	2.5	3806.7524				
75	26.18	0.25	25.68105	6.48	20.87	1791.41	13.56	132.10	200.754	51.58	4	2.5	4061.1841			0.14905263	
69.25	27.04	0.25	26.53811	6.71	21.56	2451.51	14.01	175.04	207.869	50.94	4	2.5	4371.0535			95	
64.25	27.78	0.3125	27.15837	6.77	21.64	2662.40	14.39	185.00	167.924	54.52	4	2.5	5168.782				
59.25	28.53	0.3125	27.90363	6.97	28.39	2885.05	14.78	195.23	172.874	54.08	4	2.5	5507.7895				
54.25	29.27	0.3125	28.64889	7.17	29.14	3119.77	15.16	205.74	177.824	53.63	4	2.5	5856.8026				
50	29.91	0.3125	29.28237	7.34	29.78	3329.03	15.49	214.89	182.031	53.26	4	2.5	6170.5291				
45	30.65	0.3125	30.02763	7.54	30.53	3586.94	15.88	225.91	186.981	52.81	8	2.5	9503.2842				
40	31.40	0.3125	30.77289	7.74	31.28	3857.85	16.26	237.20	191.931	52.37	8	2.5	10025.29				
35	32.14	0.3125	31.51816	7.94	32.03	4142.06	16.65	248.77	196.880	51.92	8	2.5	10558.606			12	
30	32.89	0.3125	32.26342	8.14	32.78	4425.20	17.04	335.89	201.830	51.48	8	2.5	11117.968			240	
25	33.63	0.40625	32.82118	8.14	43.47	6125.20	17.42	351.57	155.230	55.66	8	2.5	13064.156				
20	34.38	0.40625	33.56645	8.34	44.44	6546.71	17.81	367.62	159.037	55.32	8	2.5	13758.345				
15	35.12	0.40625	34.31171	8.54	45.42	6987.12	18.19	384.03	162.845	54.98	8	2.5	14467.111				
10	35.87	0.40625	35.05697	8.74	46.39	7448.86	18.58	400.79	166.652	54.64	8	2.5	15210.029				
5	36.61	0.40625	35.80224	8.94	47.37	7926.34	18.97	417.91	170.460	54.30	8	2.5	15967.698				
0	37.36	0.40625	36.5475	9.14	48.34	8425.96	19.35	435.39	174.268	53.95	8	2.5	16761.015				

from ERI
Engineer Input
recalculate based on geometry

Elevation	M (k*ft)	M (k*m)	S	fb (ksi)	Fb (ksi)	Tower w/ Modifications	P (k)	fa (ksi)	Fa (ksi)	fa/Fa	V (k)	tV	Fv	tV/Fv	Interaction
90	541.16	6493.92	268.29	24.20	48.00	48.00	-8.04	-0.116	48.0	0.002	16.69	0.574	32.000	0.018	50.7%
85	626.30	7515.60	278.37	27.00	48.00	48.00	-8.93	-0.128	48.0	0.003	17.34	0.584	32.000	0.018	56.5%
80	714.61	8575.32	288.93	29.68	48.00	48.00	-9.84	-0.140	48.0	0.003	17.96	0.593	32.000	0.019	62.1%
75	806.01	9672.12	299.47	32.30	48.00	48.00	-10.79	-0.152	48.0	0.003	18.57	0.601	32.000	0.019	67.6%
69.25	914.81	10977.72	312.10	35.17	48.00	48.00	-11.91	-0.166	48.0	0.003	19.25	0.610	32.000	0.019	73.6%
64.25	1012.61	12151.32	359.16	33.83	48.00	48.00	-12.98	-0.167	48.0	0.003	19.85	0.527	32.000	0.016	70.8%
59.25	1113.36	13360.32	372.71	35.85	48.00	48.00	-14.06	-0.179	48.0	0.004	20.43	0.532	32.000	0.017	75.1%
54.25	1216.97	14603.64	386.24	37.81	48.00	48.00	-15.18	-0.192	48.0	0.004	20.99	0.536	32.000	0.017	79.2%
50	1307.28	15687.36	398.31	39.38	48.00	48.00	-16.27	-0.204	48.0	0.004	21.47	0.540	32.000	0.017	82.5%
45	1416.22	16994.64	598.53	28.39	48.00	48.00	-17.74	-0.136	48.0	0.003	22.05	0.436	32.000	0.014	59.4%
40	1527.97	18335.64	616.41	29.75	48.00	48.00	-19.24	-0.147	48.0	0.003	22.59	0.441	32.000	0.014	62.3%
35	1642.33	19707.96	634.15	31.08	48.00	48.00	-20.76	-0.157	48.0	0.003	23.10	0.444	32.000	0.014	65.1%
30	1759.12	21109.44	652.61	32.35	48.00	48.00	-22.31	-0.168	48.0	0.003	23.56	0.446	32.000	0.014	67.7%
25	1878.31	22539.72	749.86	30.06	48.00	48.00	-24.00	-0.167	48.0	0.003	24.06	0.379	32.000	0.012	63.0%
20	1999.99	23989.88	772.58	31.06	48.00	48.00	-25.71	-0.178	48.0	0.004	24.55	0.381	32.000	0.012	65.1%
15	2124.09	25489.08	795.15	32.06	48.00	48.00	-27.45	-0.189	48.0	0.004	25.03	0.383	32.000	0.012	67.2%
10	2250.55	27006.60	818.61	32.99	48.00	48.00	-29.21	-0.200	48.0	0.004	25.49	0.384	32.000	0.012	69.1%
5	2379.13	28549.56	841.89	33.91	48.00	48.00	-30.88	-0.210	48.0	0.004	25.89	0.384	32.000	0.012	71.1%
0	2509.51	30114.12	866.09	34.77	48.00	48.00	-32.51	-0.219	48.0	0.005	26.23	0.384	32.000	0.012	72.9%

Modification Steel Allowable Buckling (ksi) 48.3047

48

Fy (ksi) 60 Fb (ksi)

Elevation	95	90	85	80	75	69.25	64.25	59.25	54.25	50	45	40	35	30	25	20	15	10	5	0
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M (k*ft)	M (k*in)	Y (in)	I (in ⁴)	My/I (ksi)	Compression Capacity of Mod.	Buckling Capacity of Mod.	Maximum Usage of Mod.	Maximum Total Usage
541.16	6493.92	14.6	3327.63	28.49	59.4%	59.0%	59.4%	59.4%
626.30	7515.60	14.97	3560.13	31.60	65.8%	65.4%	65.8%	65.8%
714.61	8575.32	15.345	3806.75	34.57	72.0%	71.6%	72.0%	72.0%
806.01	9672.12	15.715	4061.18	37.43	78.0%	77.5%	78.0%	78.0%
914.81	10977.72	16.145	4371.05	40.55	84.5%	83.9%	84.5%	84.5%
1012.61	12151.32	16.515	4688.78	38.83	80.9%	80.4%	80.9%	80.9%
1113.36	13360.32	16.89	5007.79	40.97	85.4%	84.8%	85.4%	85.4%
1216.97	14603.64	17.26	5356.80	43.04	89.7%	89.1%	89.7%	89.7%
1307.28	15687.36	17.58	5707.53	44.69	93.1%	92.5%	93.1%	93.1%
1416.22	16994.64	17.95	6033.28	32.10	66.9%	66.5%	66.9%	66.9%
1527.97	18335.64	18.325	6425.29	33.52	69.8%	69.4%	69.8%	69.8%
1642.33	19707.96	18.695	6895.61	34.89	72.7%	72.2%	72.7%	72.7%
1759.12	21109.44	19.07	7411.97	36.21	75.4%	75.0%	75.4%	75.4%
1878.31	22539.72	19.44	7984.16	33.54	69.9%	69.4%	69.9%	69.9%
1999.99	23999.88	19.815	8618.34	34.57	72.0%	71.6%	72.0%	72.0%
2124.09	25489.08	20.185	9318.11	35.56	74.1%	73.6%	74.1%	74.1%
2250.55	27006.60	20.56	10086.03	36.51	76.1%	75.6%	76.1%	76.1%
2379.13	28549.56	20.93	10927.70	37.42	78.0%	77.5%	78.0%	78.0%
2509.51	30114.12	21.305	11846.01	38.28	79.7%	79.2%	79.7%	79.7%

60393-BRIDGEPORT NORTH

F_p polygon (ksi) 60 F_p mod plate (ksi) 50

Elevation (ft)	Moment M (k-ft)	Shear Force V (k)	Base Force P (k)	Max. of inertia (in ⁴)	Area (in ²)	Diagonal Area (in ²)	Thickness of polygon (in)	Thickness of mod plate (in)	Comod plate (in)	Polygon (in)	(F _p /Q.S)/wt (polygon)	Polygon Compact?	Allowable Stress F _p on polygon (ksi)	Allowable Stress F _p on mod plate (ksi)	Bending Stress f _b on polygon (ksi)	Bending Stress f _b on mod plate (ksi)	Ratio f _b /F _p (polygon)	Ratio f _b /F _p (mod plate)	Ratio f _b /F _p on polygon	Ratio f _b /F _p on mod plate	Combined Stress Ratio on mod plate	Allowable Stress Ratio	% Capacity
92.5 - 95	499.81	16.37	7.62	2063.146	39.6973	23.1988	0.75	12.3494	17.0886	192.5888	YES	36.0000	30.0000	34.9269	35.9182	0.9702	1.1873	0.9702	0.0086	0.0073	1.2058	1.3330	90.5%
95 - 98.66	459.28	16.03	7.70	1938.029	29.2556	21.1988	0.75	12.0746	11.7940	188.0351	YES	36.0000	30.0000	33.3361	34.3327	0.9260	1.1444	0.9260	0.0086	0.0073	1.1526	1.3330	86.5%
98.68 - 102.37	401.67	14.76	5.67	1819.669	28.8136	21.0994	0.75	11.7997	11.4995	183.4715	YES	36.0000	30.0000	30.3044	31.1587	0.8418	1.0420	0.8418	0.0086	0.0085	1.0485	1.3330	78.7%
102.37 - 106.06	354.24	11.71	5.39	1705.6163	28.3717	21.5407	0.75	11.5249	11.1949	178.9078	YES	36.0000	30.0000	27.8013	28.7232	0.7713	0.9574	0.7713	0.0085	0.0083	0.7775	1.3330	72.3%
106.06 - 109.75	311.68	11.35	4.98	1596.5384	27.9298	21.0000	0.75	11.1874	10.8704	174.3441	YES	36.0000	30.0000	25.654	26.5447	0.7074	0.8785	0.7074	0.0059	0.0059	0.8844	1.3330	65.5%
109.75 - 114.78	279.44	11.00	4.59	1386.9311	25.3436	20.2547	0.75	10.8724	10.4666	152.1799	YES	36.0000	30.0000	25.0816	26.0211	0.6967	0.8674	0.6967	0.0050	0.0050	0.8734	2.3330	65.5%

End Connection Capacity

Elevation (ft)	Allowable Strength-Tensile (k)	Allowable Strength-Block Shear (k)	Allowable Strength-Rupture (k)	Max. Tensile Force on connection (k)	Max. Compressive Force on connection (k)	% Capacity-Tensile Rupture	% Capacity-Block Shear	% Capacity-Bearing on polygon	% Capacity-Bearing on mod plate	% Capacity-Bolts
95	134.00	259.00	179.00	459.00	134.56	99.8%	51.6%	75.8%	29.6%	87.5%
99	134.00	259.00	179.00	459.00	98.16	72.8%	37.9%	55.6%	21.7%	64.2%
115	134.00	259.00	179.00	459.00	98.26	72.3%	37.4%	54.9%	21.6%	63.6%

APPENDIX G

Foundation Calculations

PAD & PIER DESIGN - Monopole
60393 - BRIDGEPORT NORTH
GPD Job Number: 2010263.81 Rev. 1

TOWER REACTIONS

total overturning moment = 2509.51 Kip-ft
 total shear = 26.23 Kip
 axial = 32.51 Kip
 ground water table = Below ft

PAD DIMENSIONS

width = 20 ft
 height = 5.5 ft
 depth of conc = 1.5 ft
 γ_{soil} = 0.103 kcf
 γ_{conc} = 0.150 kcf

M_r = 4430.06 k-ft
 M_{ot} = 2674.759 k-ft
 P = 339.41 k
 w_{wedge} = 9.51 k
 Allowable Bearing = 10 ksf

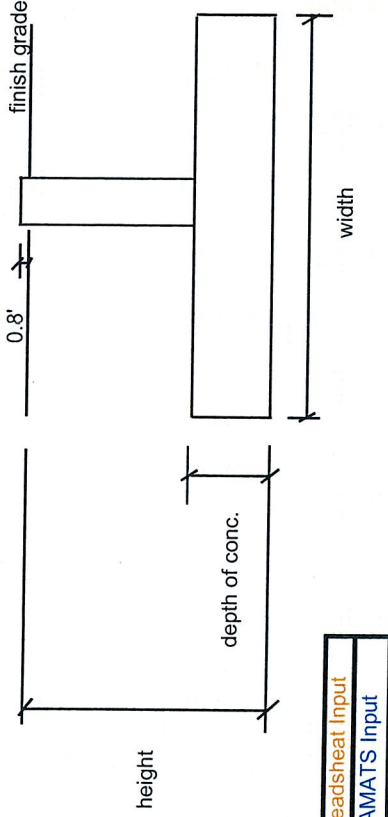
LOAD PERPENDICULAR TO PAD

Q_{MAX} = P/A+M/S = 2.85459425
 Q_{MIN} = P/A-M/S = -1.15754425
LOAD AT 45 DEGREES TO PAD
 Q_{MAX} = P/A+M/S = 3.69045644
 Q_{MIN} = P/A-M/S = -1.99340644

M_x = 1891.341
 M_y = 1891.341
 e_x = 5.572
 e_y = 5.572
 e_x/W = 0.279 NG (eW > 1/6) use Max Bearing Pressure
 e_y/W = 0.279 NG (eW > 1/6) use Max Bearing Pressure

PCA-Mats Input M_x & M_y = 472.835 k-ft
 PCA-Mats Input P_z = 8.128 k
 PCA-Mats Surface Load = 412.0 psf
 Max Bearing Pressure (PCA-Mats) = 5.746 ksf

Bearing Capacity = 57.5%



F.S. OVERTURNING = 1.65624781 ok > 1.5
 F.S. OVERTURNING / F.S. ALLOWABLE = 90.6%

Foundation Capacity: 90.6% OK

PAD
60393-Bridgeport North (Maximum Bearing Pressure)

