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Also admitted in Massachusetts

January 9, 2014

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

Re: **Notice of Exempt Modification – Antenna Swap**
371 Terryville Avenue, Bristol, Connecticut

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains twelve (12) wireless telecommunications antennas at the 140-foot level on the existing 168.5-foot tower at the above-referenced address. The tower is owned by AT&T. Cellco's shared use of this tower was approved in 2006. Cellco now intends to replace six (6) of its existing antennas with three (3) model BXA-70063-4CF 850 MHz antennas and three (3) model BXA-171063-12CF 2100 MHz antennas, at the same 140-foot level. Cellco also intends to install three (3) remote radio heads ("RRHs") behind its 2100 MHz antennas and one (1) HYBRIFLEX™ antenna cable. Included in Attachment 1 are specifications for the replacement antennas, RRHs and HYBRIFLEX™ cable.

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 Kenneth B. Cockayne, Mayor for the City of Bristol. A copy of this letter is also being sent to Laviero Realty LLC, the owner of the property at 371 Terryville Avenue.

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

1. The proposed modifications will not result in an increase in the height of the existing tower. Cellco's proposed antennas and RRHs will be located at the 140-foot level on the 168.5-foot tower.

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

3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.

4. The operation of the modified facility will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. A cumulative General Power Density table for Cellco's modified facility is included behind Attachment 2.

5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

6. The tower and its foundation can support Cellco's proposed modifications. (*See* Structural Analysis included in Attachment 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:
Kenneth B. Cockayne, Bristol Mayor
Laviero Realty LLC
Sandy M. Carter

ATTACHMENT 1

Amphenol ANTENNA SOLUTIONS

BXA-70063-4CF-EDIN-X

X-Pol | FET Panel | 63° | 13.0 dBd

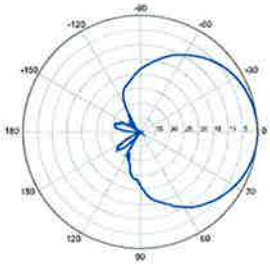
Replace "X" with desired electrical downtilt.

Antenna is also available with NE connector(s). Replace "EDIN" with "NE" in the model number when ordering.

Electrical Characteristics	696-900 MHz	
Frequency bands	696-806 MHz	806-900 MHz
Polarization	±45°	
Horizontal beamwidth	65°	63°
Vertical beamwidth	17°	15°
Gain	12.5 dBd (14.6 dBi)	13.0 dBd (15.1 dBi)
Electrical downtilt (X)	0, 2, 3, 4, 5, 6, 8, 9, 10, 12, 14	
Impedance	50Ω	
VSWR	≤1.35:1	
Upper sidelobe suppression (0°)	-16.3 dB	-22.1 dB
Front-to-back ratio (+/-30°)	-36.1 dB	-34.9 dB
Null fill	5% (-26.02 dB)	
Isolation between ports	< -30 dB	
Input power with EDIN connectors	500 W	
Input power with NE connectors	300 W	
Lightning protection	Direct Ground	
Connector(s)	2 Ports / EDIN or NE / Female / Center (Back)	
Mechanical Characteristics		
Dimensions Length x Width x Depth	1205 x 285 x 133 mm	47.4 x 11.2 x 5.2 in
Depth with z-brackets	173 mm	6.8 in
Weight without mounting brackets	4.5 kg	9.9 lbs
Survival wind speed	> 201 km/hr	> 125 mph
Wind area	Front: 0.34 m^2 Side: 0.16 m^2	Front: 3.7 ft^2 Side: 1.7 ft^2
Wind load @ 161 km/hr (100 mph)	Front: 498 N Side: 260 N	Front: 111 lbf Side: 55 lbf

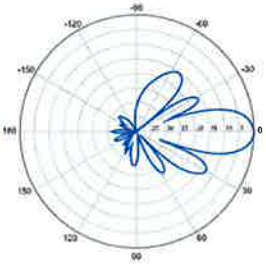
Mounting Options	Part Number	Fits Pipe Diameter	Weight
2-Point Mounting & Downtilt Bracket Kit	36210006	40-115 mm 1.57-4.5 in	4.1 kg 9 lbs
Concealment Configurations	For concealment configurations, order BXA-70063-4CF-EDIN-X-FP		

BXA-70063-4CF-EDIN-X



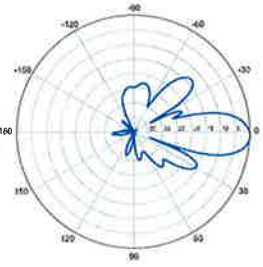
Horizontal | 750 MHz

BXA-70063-4CF-EDIN-0



0° | Vertical | 750 MHz

BXA-70063-4CF-EDIN-2

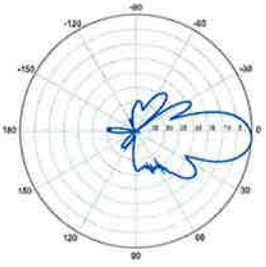


2° | Vertical | 750 MHz

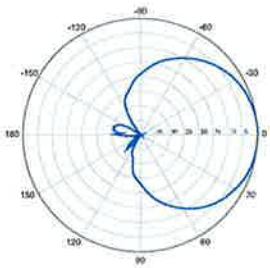
BXA-70063-4CF-EDIN-3

3° | Vertical | 750 MHz

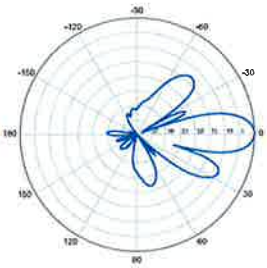
BXA-70063-4CF-EDIN-4



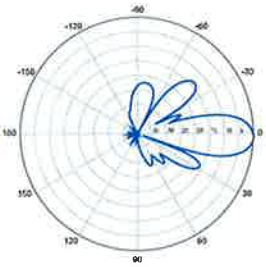
4° | Vertical | 750 MHz



Horizontal | 850 MHz

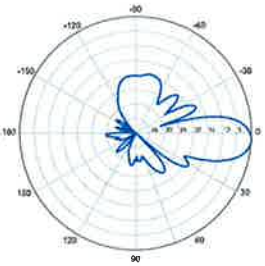


0° | Vertical | 850 MHz



2° | Vertical | 850 MHz

3° | Vertical | 850 MHz



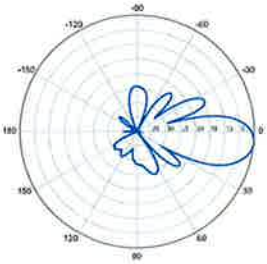
4° | Vertical | 850 MHz

Quoted performance parameters are provided to offer typical or range values only and may vary as a result of normal manufacturing and operational conditions. Extreme operational conditions and/or stress on structural supports is beyond our control. Such conditions may result in damage to this product. Improvements to product may be made without notice.

BXA-70063-4CF-EDIN-X

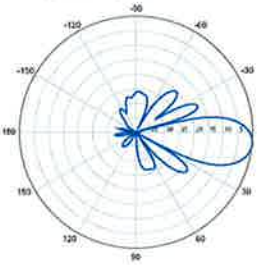
X-Pol | FET Panel | 63° | 13.0 dBd

BXA-70063-4CF-EDIN-5



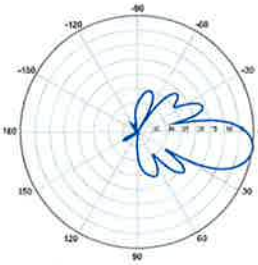
5° | Vertical | 750 MHz

BXA-70063-4CF-EDIN-6



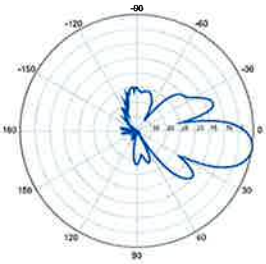
6° | Vertical | 750 MHz

BXA-70063-4CF-EDIN-8



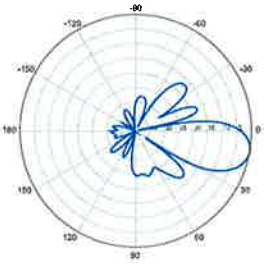
8° | Vertical | 750 MHz

BXA-70063-4CF-EDIN-9

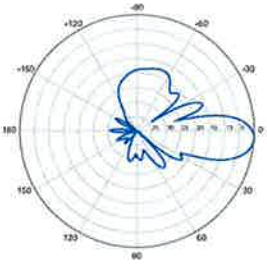


9° | Vertical | 750 MHz

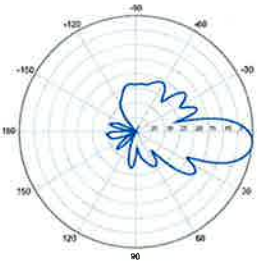
BXA-70063-4CF-EDIN-10



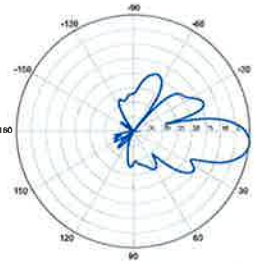
10° | Vertical | 750 MHz



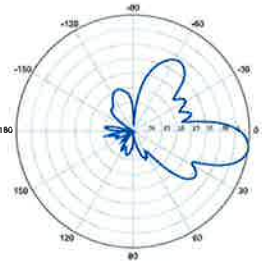
5° | Vertical | 850 MHz



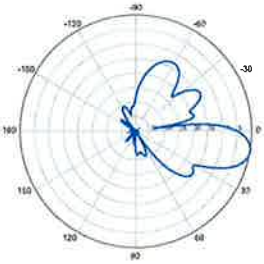
6° | Vertical | 850 MHz



8° | Vertical | 850 MHz

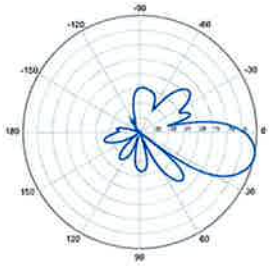


9° | Vertical | 850 MHz



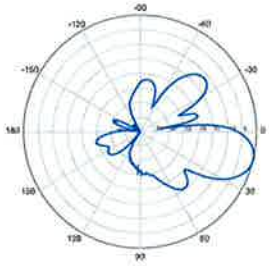
10° | Vertical | 850 MHz

BXA-70063-4CF-EDIN-12

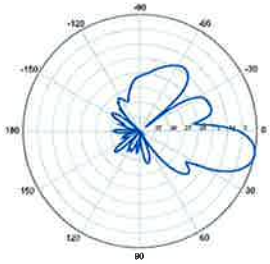


12° | Vertical | 750 MHz

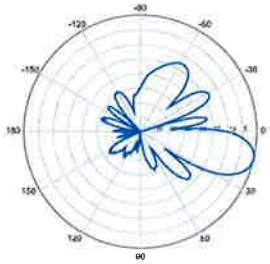
BXA-70063-4CF-EDIN-14



14° | Vertical | 750 MHz



12° | Vertical | 850 MHz



14° | Vertical | 850 MHz

BXA-171063-12CF-EDIN-X

X-Pol | FET Panel | 63° | 19.0 dBi

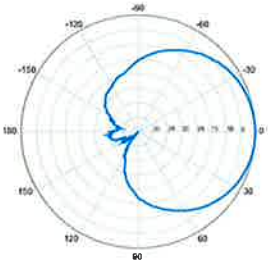
Replace "X" with desired electrical downtilt.

Antenna is also available with NE connector(s). Replace "EDIN" with "NE" in the model number when ordering.

Electrical Characteristics	1710-2170 MHz		
Frequency bands	1710-1880 MHz	1850-1990 MHz	1920-2170 MHz
Polarization	±45°	±45°	±45°
Horizontal beamwidth	68°	65°	60°
Vertical beamwidth	4.5°	4.5°	4.5°
Gain	16.1 dBd / 18.2 dBi	16.5 dBd / 18.6 dBi	16.9 dBd / 19.0 dBi
Electrical downtilt (X)	0, 2, 5		
Impedance	50Ω		
VSWR	≤1.5:1		
First upper sidelobe	< -17 dB		
Front-to-back ratio	> 30 dB		
In-band isolation	< -25 dB		
IM3 (20W carrier)	< -150 dBc		
Input power	300 W		
Lightning protection	Direct Ground		
Connector(s)	2 Ports / EDIN or NE / Female / Center (Back)		
Operating temperature	-40° to +60° C / -40° to +140° F		
Mechanical Characteristics			
Dimensions Length x Width x Depth	1842 x 154 x 105 mm		72.5 x 6.1 x 4.1 in
Depth with z-brackets	133 mm		5.2 in
Weight without mounting brackets	5.8 kg		12.8 lbs
Survival wind speed	> 201 km/hr		> 125 mph
Wind area	Front: 0.28 m² Side: 0.19 m²		Front: 3.1 ft² Side: 2.1 ft²
Wind load @ 161 km/hr (100 mph)	Front: 460 N Side: 304 N		Front: 103 lbf Side: 68 lbf

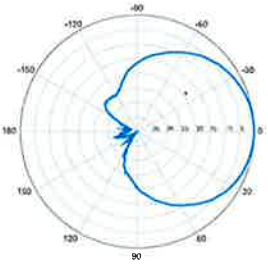
Mounting Options	Part Number	Fits Pipe Diameter	Weight
2-Point Mounting Bracket Kit	26799997	50-102 mm 2.0-4.0 in	2.3 kg 5 lbs
2-Point Mounting & Downtilt Bracket Kit	26799999	50-102 mm 2.0-4.0 in	3.6 kg 8 lbs
Concealment Configurations	For concealment configurations, order BXA-171063-12CF-EDIN-X-FP		

BXA-171063-12CF-EDIN-X



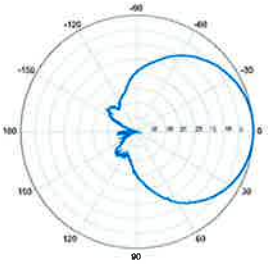
Horizontal | 1710-1880 MHz

BXA-171063-12CF-EDIN-X



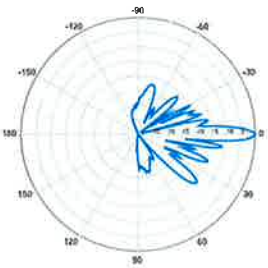
Horizontal | 1850-1990 MHz

BXA-171063-12CF-EDIN-X



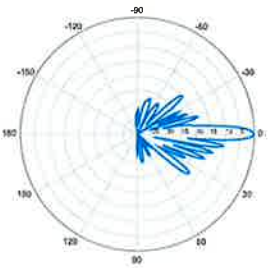
Horizontal | 1920-2170 MHz

BXA-171063-12CF-EDIN-0



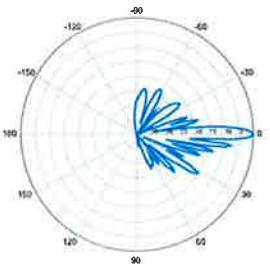
0° | Vertical | 1710-1880 MHz

BXA-171063-12CF-EDIN-0



0° | Vertical | 1850-1990 MHz

BXA-171063-12CF-EDIN-0

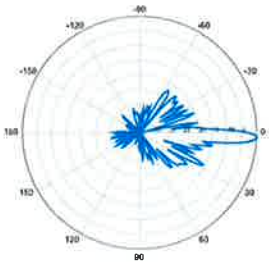


0° | Vertical | 1920-2170 MHz

BXA-171063-12CF-EDIN-X

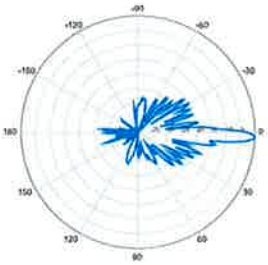
X-Pol | FET Panel | 63° | 19.0 dBi

BXA-171063-12CF-EDIN-2



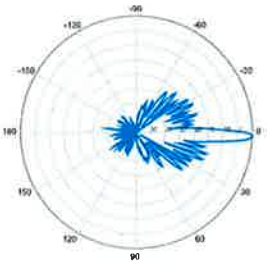
2° | Vertical | 1710-1880 MHz

BXA-171063-12CF-EDIN-2



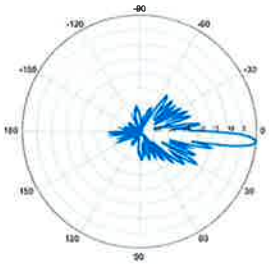
2° | Vertical | 1850-1990 MHz

BXA-171063-12CF-EDIN-2



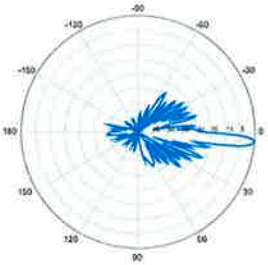
2° | Vertical | 1920-2170 MHz

BXA-171063-12CF-EDIN-5



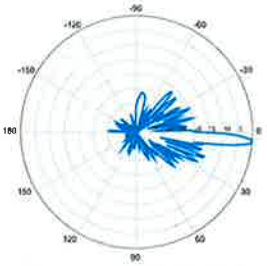
5° | Vertical | 1710-1880 MHz

BXA-171063-12CF-EDIN-5



5° | Vertical | 1850-1990 MHz

BXA-171063-12CF-EDIN-5

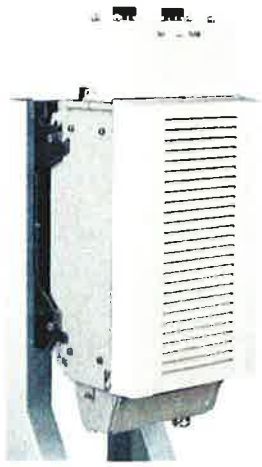


5° | Vertical | 1920-2170 MHz

Alcatel-Lucent RRH2x40-AWS

REMOTE RADIO HEAD

The Alcatel-Lucent RRH2x40-AWS is a high-power, small form-factor Remote Radio Head (RRH) operating in the AWS frequency band (1700/2100MHz - 3GPP Band 4). The Alcatel-Lucent RRH2x40-AWS is designed with an eco-efficient approach, providing operators with the means to achieve high quality and capacity coverage with minimum site requirements.



A distributed eNodeB expands deployment options by using two components, a Base Band Unit (BBU) containing the digital assets and a separate RRH containing the radio-frequency (RF) elements. This modular design optimizes available space and allows the main components of an eNodeB to be installed separately, within the same site or several kilometres apart.

The Alcatel-Lucent RRH2x40-AWS is linked to the BBU by an optical-fiber connection carrying downlink and uplink digital radio signals along with operations, administration and maintenance (OA&M) information. The Alcatel-Lucent RRH2x40-AWS has two transmit RF paths, 40 W RF output power per transmit path, and is designed to manage up to four-way receive diversity. The device is ideally suited to support macro coverage, with multiple-input multiple-output (MIMO) 2x2 operation in up to 20 MHz of bandwidth.

The Alcatel-Lucent RRH2x40-AWS is designed to make available all the benefits of a distributed eNodeB, with excellent RF characteristics, with low capital expenditures (CAPEX) and low operating expenditures (OPEX). The limited space available in some sites may prevent the installation of traditional single-cabinet BTS equipment or require costly cranes to be employed, leaving coverage holes. However, many of these sites can host an Alcatel-Lucent RRH2x40-AWS installation, providing more flexible site selection and improved network quality along with greatly reduced installation time and costs.

Fast, low-cost installation and deployment

The Alcatel-Lucent RRH2x40-AWS is a zero-footprint solution and operates noise-free, simplifying negotiations with site property owners and minimizing environmental impacts. Installation can easily be done by a single person because the Alcatel-Lucent RRH2x40-AWS is compact and weighs less than 20 kg (44 lb), eliminating the need for a crane to hoist the BTS cabinet to the rooftop. A site can be in operation in less than one day — a fraction of the time required for a traditional BTS.

Excellent RF performance

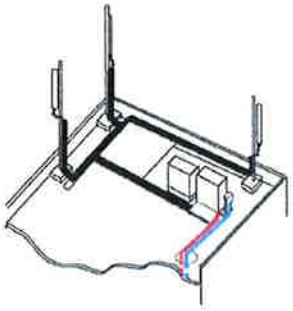
Because of its small size and weight, the Alcatel-Lucent RRH2x40-AWS can be installed close to the antenna. Operators can therefore locate the Alcatel-Lucent RRH2x40-AWS where RF engineering is deemed ideal, minimizing trade-offs between available sites and RF optimum sites. The RF feeder cost and installation costs are reduced or eliminated, and there is no need for a Tower Mounted Amplifier (TMA) because losses introduced by the RF feeder are greatly reduced. The Alcatel-Lucent RRH2x40-AWS provides more RF power while at the same time consuming less electricity.

Features

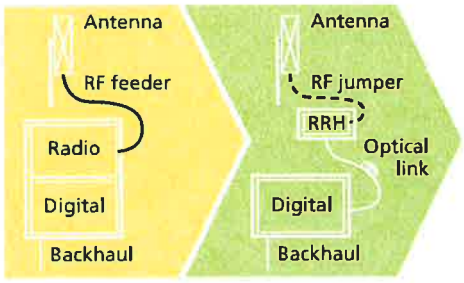
- Zero-footprint deployment
- Easy installation, with a lightweight unit can be carried and set up by one person
- Optimized RF power, with flexible site selection and elimination of a TMA
- Convection-cooled (fanless)
- Noise-free
- Best-in-class power efficiency, with significantly reduced energy consumption

Benefits

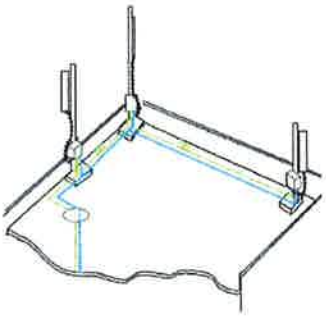
- Leverages existing real estate with lower site costs
- Reduces installation costs, with fewer installation materials and simplified logistics
- Decreases power costs and minimizes environmental impacts, with the potential for eco-sustainable power options
- Improves RF performance and adds flexibility to network planning



Macro



RRH for space-constrained cell sites



Distributed

Technical specifications

Physical dimensions

- Height: 620 mm (24.4 in.)
- Width: 270 mm (10.63 in.)
- Depth: 170m (6.7 in.)
- Weight (without mounting kit): less than 20 kg (44 lb)

Power

- Power supply: -48VDC

Operating environment

- Outdoor temperature range:
  - ¬ With solar load: -40°C to +50°C (-40°F to +122°F)
  - ¬ Without solar load: -40°C to +55°C (-40°F to +131°F)
- Passive convection cooling (no fans)
- Enclosure protection
  - ¬ IP65 (International Protection rating)

RF characteristics

- Frequency band: 1700/2100 MHz (AWS); 3GPP Band 4
- Bandwidth: up to 20 MHz
- RF output power at antenna port: 40 W nominal RF power for each Tx port
- Rx diversity: 2-way or 4-way with optional Rx Diversity module
- Noise figure: below 2.0 dB typical
- Antenna Line Device features
  - ¬ TMA and Remote electrical tilt (RET) support via AISG v2.0

Optical characteristics

Type/number of fibers

- Single-mode variant
  - ¬ One Single Mode Single Fiber per RRH2x, carrying UL and DL using CWDM
  - ¬ Single mode dual fiber (SM/DF)
- Multi-mode variant
  - ¬ Two Multi-mode fibers per RRH2x: one carrying UL, the other carrying DL

Optical fiber length

- Up to 500 m (0.31 mi), using MM fiber
- Up to 20 km (12.43 mi), using SM fiber

Digital Ports and Alarms

- Two optical ports to support daisy-chaining
- Six external alarms

CPG2809100912 (09)

Alcatel·Lucent

Product Data Sheet HB158-1-08U8-S8J18

HYBRIFLEX™ RRH Hybrid Feeder Cabling Solution, 1-5/8", Single-Mode Fiber

Product Description

RFS' HYBRIFLEX Remote Radio Head (RRH) hybrid feeder cabling solution combines optical fiber and DC power for RRHs in a single lightweight aluminum corrugated cable, making it the world's most innovative solution for RRH deployments.

It was developed to reduce installation complexity and costs at Cellular sites. HYBRIFLEX allows mobile operators deploying an RRH architecture to standardize the RRH installation process and eliminate the need for and cost of cable grounding. HYBRIFLEX combines optical fiber (multi-mode or single-mode) and power in a single corrugated cable. It eliminates the need for junction boxes and can connect multiple RRHs with a single feeder. Standard RFS CELLFLEX® accessories can be used with HYBRIFLEX cable. Both pre-connectorized and on-site options are available.

Figure 1: HYBRIFLEX Series

Features/Benefits

- Aluminum corrugated armor with outstanding bending characteristics – minimizes installation time and enables mechanical protection and shielding
- Same accessories as 1 5/8" coaxial cable
- Outer conductor grounding – Eliminates typical grounding requirements and saves on installation costs
- Lightweight solution and compact design – Decreases tower loading
- Robust cabling – Eliminates need for expensive cable trays and ducts
- Installation of tight bundled fiber optic cable pairs directly to the RRH – Reduces CAPEX and wind load by eliminating need for interconnection
- Optical fiber and power cables housed in single corrugated cable – Saves CAPEX by standardizing RRH cable installation and reducing installation requirements
- Outdoor polyethylene jacket – Ensures long-lasting cable protection

Technical Specifications

Outer Conductor Armor	Corrugated Aluminum	[mm (in)]	46.5 (1.83)
Jacket	Polyethylene, PE	[mm (in)]	50.3 (1.98)
UV-Protection	Individual and External Jacket		Yes
Weight, Approximate		[kg/m (lb/ft)]	1.9 (1.30)
Minimum Bending Radius, Single Bending		[mm (in)]	200 (8)
Minimum Bending Radius, Repeated Bending		[mm (in)]	500 (20)
Recommended/Maximum Clamp Spacing		[m (ft)]	1.0 / 1.2 (3.25 / 4.0)
DC-Resistance Outer Conductor Armor		[Ω/km (Ω/1000ft)]	068 (0.205)
DC-Resistance Power Cable, 8.4mm² (8AWG)		[Ω/km (Ω/1000ft)]	2.1 (0.307)
Version			Single-mode OM3
Quantity, Fiber Count			16 (8 pairs)
Core/Clad		[µm]	50/125
Primary Coating (Acrylate)		[µm]	245
Buffer Diameter, Nominal		[µm]	900
Secondary Protection, Jacket, Nominal		[mm (in)]	2.0 (0.08)
Minimum Bending Radius		[mm (in)]	104 (4.1)
Insertion Loss @ wavelength 850nm		dB/km	3.0
Insertion Loss @ wavelength 1310nm		dB/km	1.0
Standards (Meets or exceeds)			UL94-V0, UL1666 RoHS Compliant
Size (Power)		[mm² (AWG)]	8.4 (8)
Quantity, Wire Count (Power)			16 (8 pairs)
Size (Alarm)		[mm² (AWG)]	0.8 (18)
Quantity, Wire Count (Alarm)			4 (2 pairs)
Type			UV protected
Strands			19
Primary Jacket Diameter, Nominal		[mm (in)]	6.8 (0.27)
Standards (Meets or exceeds)			NFPA 130, ICEA S-95-658 UL Type XHHW-2, UL 44 UL-LS Limited Smoke, UL VW-1 IEEE-383 (1974), IEEE1202/FT4 RoHS Compliant
Installation Temperature		[°C (°F)]	-40 to +65 (-40 to149)
Operation Temperature		[°C (°F)]	-40 to +65 (-40 to149)

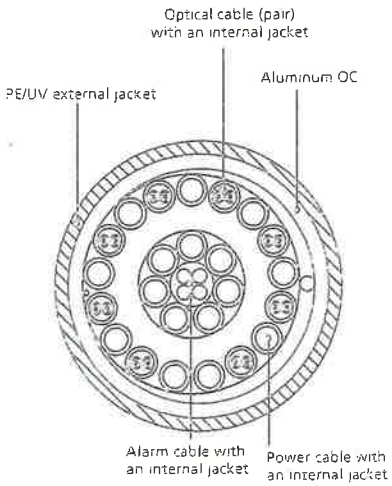


Figure 2: Construction Detail

* This data is provisional and subject to change

ATTACHMENT 2

	General	Power	Density					
Site Name: Bristol W 2								
Tower Height: Verizon @ 140'								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*Sprint CDMA/LTE	4	693	158	0.0399	1900	1.0000	3.99%	
*Sprint CDMA/LTE	1	526	158	0.0076	850	0.5667	1.34%	
*MetroPCS CDMA	3	727	156	0.0322	2135	1.0000	3.22%	
*MetroPCS LTE	1	1200	156	0.0177	2130	1.0000	1.77%	
*AT&T UMTS	2	565	169	0.0142	880	0.5867	2.42%	
*AT&T UMTS	2	1077	169	0.0271	1900	1.0000	2.71%	
*AT&T GSM	1	283	169	0.0036	880	0.5867	0.61%	
*AT&T GSM	4	646	169	0.0325	1900	1.0000	3.25%	
*AT&T LTE	1	1615	169	0.0203	734	0.4893	4.16%	
*T-Mobile GSM/UMTS	2	12	130	0.0005	1950	1.0000	0.05%	
*T-Mobile UMTS	2	12	130	0.0005	2100	1.0000	0.05%	
*T-Mobile LTE	2	24	130	0.0010	2100	1.0000	0.10%	
Verizon	**11**	**408**	**140**	**0.0823**	**1970**	**1.0000**	**8.23%**	
Verizon	**9**	**386**	**140**	**0.0637**	**869**	**0.5793**	**11.00%**	
Verizon	**1**	**1750**	**140**	**0.0321**	**2145**	**1.0000**	**3.21%**	
Verizon	**1**	**1050**	**140**	**0.0193**	**746**	**0.4973**	**3.87%**	
								50.0%
* Source: Siting Council								

ATTACHMENT 3

AT&T Mobility
2300 Northlake Center Dr Ste 405
Tucker, GA 30084-4032
(404) 532-5859

Kevin Clements
520 South Main Street, Suite 2531
Akron, OH 44311
(330) 572-3546
kclements@gpdgroup.com

GPD# 2013723.01.27074.04
November 19, 2013

STRUCTURAL ANALYSIS REPORT

AT&T DESIGNATION:	**Site USID:**	**27074**
	Site FA:	**10070954**
	Client #:	**Bristol West 2**
	Site Name:	**BRISTOL CENTER**
	AT&T Project:	**4_Verizon Modification 10-9-13**
ANALYSIS CRITERIA:	**Codes:**	**TIA/EIA-222-F, 2005 CTBC, 2003 IBC & ASCE 7-05** **80-mph (fastest-mile) with 0" ice** **28-mph (fastest-mile) with 1.00" ice**
SITE DATA:		**371 Terryville Ave, Bristol, CT 06010, Hartford County** **Latitude 41° 40' 51.211" N, Longitude 72° 57' 56.516" W** **Market: NEW ENGLAND** **168.5' Modified EEI Monopole**

Ms. Charlotte Malone,

GPD is pleased to submit this 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 with the existing and proposed loading configuration detailed in the analysis report.

Analysis Results

Tower Stress Level with Proposed Equipment:	96.4%	Pass
Foundation Ratio with Proposed Equipment:	87.3%	Pass

We at GPD appreciate the opportunity of providing our continuing professional services to you and AT&T Mobility. If you have any questions or need further assistance on this or any other projects please do not hesitate to call.

Respectfully submitted,

John N. Kabak, P.E.
Connecticut #: 28336

SUMMARY & RESULTS

The purpose of this analysis was to verify whether the existing modified structure is capable of carrying the proposed loading configuration as specified by Verizon to AT&T Mobility. This report was commissioned by Ms. Charlotte Malone of AT&T Mobility.

The modifications by Black & Veatch (Project #: 166951, dated 5/3/2012) and by GPD (Project #: 2013801.01, dated 2/8/13 and Project #: 2013723.01.27074.02, dated 8/15/2013) were considered in this analysis.

The proposed coax shall be banded flush and external to the monopole in order for the analysis to be valid.

TOWER SUMMARY AND RESULTS

Member	Capacity	Results
Monopole	96.4%	Pass
Anchor Rods	61.1%	Pass
Base Plate	94.1%	Pass
Foundation	87.3%	Pass

ANALYSIS METHOD

tnxTower (Version 6.1.3.1), 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 solely based on this information and is being completed without the benefit of a detailed site visit.

DOCUMENTS PROVIDED

Document	Remarks	Source
Notice of Co-lo Form (Part 2)	Verizon Co-Location Document, dated 10/28/2013	Siterra
Site Lease Application	Verizon Application, dated 10/9/2013	Siterra
Tower Design	EEI, Inc. Project #: 12027 Rev 1, dated 11/26/2003	Siterra
Foundation Design	EEI, Inc. Project #: 12027, dated 12/2/2003	Siterra
Geotechnical Report	VN Engineers Project #: 23-124G, dated 11/11/2003	Siterra
Previous Structural Analysis	GPD Job #: 2013723.01.27074.03 Rev. 1, dated 10/30/2013	Siterra
Modification Drawings	GPD Project #: 2013801.01, dated 2/8/2013	Siterra
Modification Drawings	B&V Project #: 166951, dated 5/3/2012	Siterra
Modification Drawings	GPD Project #: 2013723.01.27074.02, dated 8/15/2013	Siterra
Post Modification Report	B&V Project #: 166951, dated 10/10/2012	Siterra

ASSUMPTIONS

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

1. The tower shaft sizes and shapes 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.
6. Foundations are properly designed and constructed to resist the original design loads indicated in the documents provided.
7. The tower and structures have been properly maintained in accordance with TIA Standards and/or with manufacturer's specifications.
8. All welds and connections are assumed to develop at least the member capacity unless determined otherwise and explicitly stated in this report.
9. All prior structural modifications are assumed to be as per data supplied/available and to have been properly installed.
10. 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.
11. All existing loading was obtained from the previous analysis by GPD (Project #: 2013723.27074.03, dated 10/30/2013), site photos, the provided Site Lease Application, and the provided Notice of Co-Location Form and is assumed to be accurate.
12. The existing AT&T loading was based on recent site photos.
13. The future AT&T loading was based on the generic future loading scenario.
14. The proposed coax shall be banded flush and external to the monopole in order for the analysis to be valid.

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

DISCLAIMER OF WARRANTIES

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

The engineering services rendered by GPD GROUP 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 GROUP 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 GROUP 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 in excess of the specified code recommended amount, if any, that should be considered in the structural analysis.

The attached sketches are a schematic representation of the analyzed tower. If any material is fabricated from these sketches, the contractor shall be responsible for field verifying the existing conditions, proper fit, and clearance in the field. Any mentions of structural modifications are reasonable estimates and should not be used as a precise construction document. Precise modification drawings are obtainable from GPD GROUP, 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 GROUP 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 GROUP 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 GROUP 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	BRISTOL CENTER
Site Number	27074
FA Number	10070954
Date of Analysis	11/19/2013
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)	168.5'	
Tower Manufacturer	EEI	
Tower Model	n/a	
Tower Design	EEI Project #: 12027 Rev. 1	11/26/2003
Foundation Design	EEI Project #: 12027	12/2/2003
Geotech Report	VN Engineer Project #: 23-124G	11/11/2003
Tower Mapping	n/a	
Modification Drawings	B&V Project #: 166951	5/3/2013
Modification Drawings	GPD Job #: 2013801.01	2/8/2013
Modification Drawings	GPD Job #: 2013723.01.27074.02	8/16/2013
Previous Structural Analysis	GPD Job #: 2013723.01.27074.03	10/30/2013
Post Modification Inspection	B&V Project #: 166951	10/15/2013

Design Parameters

Design Code Used	TIA/EIA-222-F, 2003 IBC, 2005 CTSC & ASCE 7-05
Location of Tower (County, State)	Hartford, CT
Basic Wind Speed (mph)	80 (fastest mile)
Ice Thickness (in)	1
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 (%)	96.4%
Tower Base (%)	94.5%
Foundation (%)	87.3%
Foundation Adequate?	Yes

The modifications by Black & Veatch (Project #: 166951, dated 5/3/2013) and by GPD (Project #: 2013801.01, dated 2/8/13 and Project #: 2013723.01.27074.02, dated 8/15/2013) were considered in this analysis.

Steel Yield Strength (ksi)

Pole	65
Anchor Rods	75
Base Plate	60

Existing / Reserved Loading

Antenna								Mount			Transmission Line			
Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Quantity	Type	Manufacturer	Model	Azimuth	Quantity	Manufacturer	Type	Quantity	Model	Size	Attachment Internal/External
AT&T Mobility	168	169	3	Panel	Kathrein	800-10121	30/150/270	1	Unknown	12.5' LP Platform	6	Unknown	1-5/8"	Internal
AT&T Mobility	168	169	1	Panel	Andrew	SBNH-1D6565C	30			on the same mount	2	DC Power	7/8"	Within Conduit
AT&T Mobility	168	169	1	Panel	KMW	AM-X-CD-17-65-00T-RET	150			on the same mount	1	RET Cable	3/8"	Internal
AT&T Mobility	168	169	1	Panel	KMW	AM-X-CD-16-65-00T-RET	270			on the same mount	1	Fiber	1/2"	Within Conduit
AT&T Mobility	168	169	6	TMA	Powerwave	LGP 21401				behind the antennas	1	Conduit	2"	Internal
AT&T Mobility	168	169	3	RRH	Ericsson	RRUS 11				on the same mount				
AT&T Mobility	168	167	1	Surge	Raycap	DC6-48-60-18-8F				on the same mount				
AT&T Mobility	168	167	6	RET	Kathrein	860 10025				on the same mount				
Sprint	158	158	9	Panel	Decibel	DB980F90T4E-M	60/180/280	3	Unknown	12' T-Arms	9	Unknown	1-5/8"	Internal
Sprint	158	158	2	Panel	Powerwave	P40-16-XLPP-RR-A	15/205			on the same mount	3	Hybriflex	1-1/4"	Internal
Sprint	158	158	1	Panel	Andrew	APXVSPP18-C-A20	300			on the same mount				
Sprint	158	158	3	RRH	Alcatel lucent	1900 MHz RRH				on the same mount				
Sprint	158	158	3	RRH	Alcatel Lucent	800 MHz RRH				on the same mount				
Pocket Communications	148	145	3	Panel	RFS	APXV18-206517S-C	25/130/250	3	Unknown	Pipe Mounts	6	Unknown	1-5/8"	Internal
Verizon	138	140	6	Panel	Antel	LPD-6513	60/180/300	1	Unknown	12.5' LP Platform	12	Unknown	1-5/8"	Internal
Verizon	138	140	2	Panel	Antel	BXA 70080/6CF-4	60/300			on the same mount				
Verizon	138	140	2	Panel	Antel	BXA 171085-12BF	60/300			on the same mount				
Verizon	138	140	1	Panel	Antel	BXA 70063/4CF	180			on the same mount				
Verizon	138	140	1	Panel	Antel	BXA 171063/8BF	180			on the same mount				
Verizon	138	140	6	Diplexer	RFS	FD9R6004/2C-3L				behind the antennas				
T-Mobile	128	130	6	Panel	Ericsson	AIR 21	30/150/270	1	Unknown	12.5' LP Platform	12	Unknown	1-5/8"	Internal
T-Mobile	128	130	3	TMA	Andrew	Twin Dual Duplex				on the same mount	1	Hybrid	1-5/8"	External
Sprint	70	70	1	GPS	Unknown	GPS Unit		1	Unknown	Pipe Mount	1	Unknown	1/2"	Internal

Note: Prior to the installation of the proposed loading, (6) LPD-6513 panel antennas at 138' shall be removed. All other loading shall remain and be reused.

Proposed Loading

Antenna								Mount			Transmission Line			
Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Quantity	Type	Manufacturer	Model	Azimuth	Quantity	Manufacturer	Type	Quantity	Model	Size	Attachment Internal/External
Verizon	138	140	3	Panel	Antel	BXA 70063/4CF	60/180/300			on the existing mount	1	Fiber	1-5/8"	External
Verizon	138	140	3	Panel	Antel	BXA 171063/12CF	60/180/300			on the existing mount				
Verizon	138	140	3	RRH	Alcatel Lucent	2x40AWS				on the existing mount				
Verizon	138	140	1	Dist. Box	RFS	DB-T1-6Z-8AB-0Z				on the existing mount				

Note: The proposed loading shall be installed in addition to the remaining existing loading at the same elevation.
Note: The proposed coax shall be banded flush and external to the monopole in order for the analysis to be valid.

Future Loading

Antenna								Mount			Transmission Line			
Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Quantity	Type	Manufacturer	Model	Azimuth	Quantity	Manufacturer	Type	Quantity	Model	Size	Attachment Internal/External
AT&T Mobility	168	169	3	Panel	Andrew	SBNH-1D6565C	30/150/270			on the existing mounts	6	LDF7-50A	1-5/8"	External

Note: The future loading shall be installed in addition to the existing/reserved loading at the same elevation.

APPENDIX B

tnxTower Output File

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 Hartford County, Connecticut.
Basic wind speed of 80 mph.
Nominal ice thickness of 1.0000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 28 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, feed line supports, and appurtenance mounts are not considered.

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
Safety Line 3/8	C	No	CaAa (Out Of Face)	168.50 - 8.00	1	No Ice	0.04	0.22
						1/2" Ice	0.14	0.75
						1" Ice	0.24	1.28
						2" Ice	0.44	2.34
						4" Ice	0.84	4.46
Climbing Pegs	C	No	CaAa (Out Of Face)	168.50 - 8.00	1	No Ice	0.01	0.31
						1/2" Ice	0.12	0.71
						1" Ice	0.22	1.71
						2" Ice	0.41	5.56
						4" Ice	0.82	20.59
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	168.00 - 8.00	6	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
LDF7-50A (1-5/8 FOAM)	A	No	CaAa (Out Of Face)	168.00 - 8.00	1	No Ice	0.20	0.82
						1/2" Ice	0.30	2.33
						1" Ice	0.40	4.46
						2" Ice	0.60	10.54
						4" Ice	1.00	30.04
LDF7-50A (1-5/8 FOAM)	A	No	CaAa (Out Of Face)	168.00 - 8.00	5	No Ice	0.00	0.82
						1/2" Ice	0.00	2.33
						1" Ice	0.00	4.46
						2" Ice	0.00	10.54
						4" Ice	0.00	30.04
RET Cable	C	No	Inside Pole	168.00 - 8.00	1	No Ice	0.00	0.08
						1/2" Ice	0.00	0.08
						1" Ice	0.00	0.08
						2" Ice	0.00	0.08
						4" Ice	0.00	0.08
7/8" DC Power Cable	C	No	Inside Pole	168.00 - 8.00	2	No Ice	0.00	0.60
						1/2" Ice	0.00	0.60
						1" Ice	0.00	0.60
						2" Ice	0.00	0.60
						4" Ice	0.00	0.60

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
1/2" Fiber Cable	C	No	Inside Pole	168.00 - 8.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
						2" Ice	0.00	0.15
						4" Ice	0.00	0.15
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	158.00 - 8.00	9	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
1 1/4" Hybriflex Cable	C	No	Inside Pole	158.00 - 8.00	3	No Ice	0.00	0.70
						1/2" Ice	0.00	0.70
						1" Ice	0.00	0.70
						2" Ice	0.00	0.70
						4" Ice	0.00	0.70
LDF7-50A (1-5/8 FOAM)	B	No	Inside Pole	148.00 - 8.00	6	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
LDF7-50A (1-5/8 FOAM)	A	No	Inside Pole	140.00 - 8.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
LDF7-50A (1-5/8 FOAM)	B	No	Inside Pole	130.00 - 8.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
1-5/8" Hybrid Cable	B	No	CaAa (Out Of Face)	130.00 - 8.00	1	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
LDF4-50A (1/2 FOAM)	A	No	Inside Pole	70.00 - 8.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
						2" Ice	0.00	0.15
						4" Ice	0.00	0.15
1-1/4" Mod Plate	A	No	CaAa (Out Of Face)	115.75 - 0.75	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
1-1/4" Mod Plate	B	No	CaAa (Out Of Face)	115.75 - 0.75	2	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
1-1/4" Mod Plate	C	No	CaAa (Out Of Face)	115.75 - 0.75	1	No Ice	0.21	0.00
						1/2" Ice	0.32	0.00
						1" Ice	0.43	0.00
						2" Ice	0.65	0.00
						4" Ice	1.10	0.00
1-5/8" Fiber Cable	C	No	CaAa (Out Of Face)	140.00 - 0.80	1	No Ice	0.00	0.82
						1/2" Ice	0.00	2.33
						1" Ice	0.00	4.46
						2" Ice	0.00	10.54
						4" Ice	1.00	30.04
2" Flex Conduit	C	No	Inside Pole	168.00 - 8.00	1	No Ice	0.00	0.32

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
						1/2" Ice	0.00	0.32
						1" Ice	0.00	0.32
						2" Ice	0.00	0.32
						4" Ice	0.00	0.32

Discrete Tower Loads

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 lb
MTS 12.5' LP Platform	B	None		0.0000	168.00	No Ice	14.66	14.66	1250.00
						1/2" Ice	18.87	18.87	1481.33
						1" Ice	23.08	23.08	1712.66
						2" Ice	31.50	31.50	2175.32
						4" Ice	48.34	48.34	3100.64
800 10121 w/ Mount Pipe	A	From Centroid-Leg	3.46 2.00 1.00	30.0000	168.00	No Ice	5.46	3.29	46.00
						1/2" Ice	5.88	3.64	78.91
						1" Ice	6.31	3.99	116.59
						2" Ice	7.21	4.76	207.06
						4" Ice	9.09	6.53	453.88
800 10121 w/ Mount Pipe	B	From Centroid-Leg	3.46 2.00 1.00	30.0000	168.00	No Ice	5.46	3.29	46.00
						1/2" Ice	5.88	3.64	78.91
						1" Ice	6.31	3.99	116.59
						2" Ice	7.21	4.76	207.06
						4" Ice	9.09	6.53	453.88
800 10121 w/ Mount Pipe	C	From Centroid-Leg	3.46 2.00 1.00	30.0000	168.00	No Ice	5.46	3.29	46.00
						1/2" Ice	5.88	3.64	78.91
						1" Ice	6.31	3.99	116.59
						2" Ice	7.21	4.76	207.06
						4" Ice	9.09	6.53	453.88
AM-X-CD-17-65-00T-RET w/ Mount Pipe	B	From Centroid-Leg	3.46 2.00 1.00	30.0000	168.00	No Ice	11.31	9.10	105.82
						1/2" Ice	11.93	10.52	192.08
						1" Ice	12.55	11.60	289.03
						2" Ice	13.88	13.80	512.59
						4" Ice	16.88	18.41	1127.58
AM-X-CD-16-65-00T-RET w/ 2" x 54" mount pipe	C	From Centroid-Leg	3.46 2.00 1.00	30.0000	168.00	No Ice	8.26	5.67	64.93
						1/2" Ice	8.81	6.39	123.40
						1" Ice	9.36	7.12	189.26
						2" Ice	10.50	8.65	345.85
						4" Ice	12.88	12.02	784.00
(2) SBNH-1D6565C w/ Mount Pipe	A	From Centroid-Leg	3.46 2.00 1.00	30.0000	168.00	No Ice	11.45	9.60	90.00
						1/2" Ice	12.06	11.02	176.97
						1" Ice	12.69	12.29	273.69
						2" Ice	14.03	14.51	500.39
						4" Ice	17.05	19.14	1124.30
SBNH-1D6565C w/ mount Pipe	B	From Centroid-Leg	3.46 2.00 1.00	30.0000	168.00	No Ice	11.45	9.60	90.00
						1/2" Ice	12.06	11.02	176.97
						1" Ice	12.69	12.29	273.69
						2" Ice	14.03	14.51	500.39
						4" Ice	17.05	19.14	1124.30
SBNH-1D6565C w/ mount Pipe	C	From Centroid-Leg	3.46 2.00 1.00	30.0000	168.00	No Ice	11.45	9.60	90.00
						1/2" Ice	12.06	11.02	176.97
						1" Ice	12.69	12.29	273.69
						2" Ice	14.03	14.51	500.39
						4" Ice	17.05	19.14	1124.30

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 lb
(2) LGP21401	A	From Centroid-Leg	3.46 2.00 1.00	30.0000	168.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.00 0.00 0.00 0.00 0.00	0.23 0.31 0.40 0.61 1.12	14.10 21.26 30.32 54.89 135.29
(2) LGP21401	B	From Centroid-Leg	3.46 2.00 1.00	30.0000	168.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.00 0.00 0.00 0.00 0.00	0.23 0.31 0.40 0.61 1.12	14.10 21.26 30.32 54.89 135.29
(2) LGP21401	C	From Centroid-Leg	3.46 2.00 1.00	30.0000	168.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.00 0.00 0.00 0.00 0.00	0.23 0.31 0.40 0.61 1.12	14.10 21.26 30.32 54.89 135.29
RRUS 11	A	From Centroid-Leg	3.46 2.00 1.00	30.0000	168.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.25 3.49 3.74 4.27 5.43	1.37 1.55 1.74 2.14 3.04	50.70 71.50 95.33 152.89 312.97
RRUS 11	B	From Centroid-Leg	3.46 2.00 1.00	30.0000	168.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.25 3.49 3.74 4.27 5.43	1.37 1.55 1.74 2.14 3.04	50.70 71.50 95.33 152.89 312.97
RRUS 11	C	From Centroid-Leg	3.46 2.00 1.00	30.0000	168.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.25 3.49 3.74 4.27 5.43	1.37 1.55 1.74 2.14 3.04	50.70 71.50 95.33 152.89 312.97
DC6-48-60-18-8F Surge Suppression Unit	A	From Centroid-Leg	3.46 2.00 -1.00	30.0000	168.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.47 1.67 1.88 2.33 3.38	1.47 1.67 1.88 2.33 3.38	18.90 36.62 56.82 105.34 239.02
(2) 860 10025	A	From Centroid-Leg	3.46 2.00 -1.00	30.0000	168.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.16 0.23 0.30 0.48 0.93	0.14 0.20 0.27 0.44 0.88	1.16 2.72 5.20 13.76 50.63
(2) 860 10025	B	From Centroid-Leg	3.46 2.00 -1.00	30.0000	168.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.16 0.23 0.30 0.48 0.93	0.14 0.20 0.27 0.44 0.88	1.16 2.72 5.20 13.76 50.63
(2) 860 10025	C	From Centroid-Leg	3.46 2.00 -1.00	30.0000	168.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.16 0.23 0.30 0.48 0.93	0.14 0.20 0.27 0.44 0.88	1.16 2.72 5.20 13.76 50.63
12' T-Arm - Round (GPD)	B	From Face	2.00 0.00 0.00	0.0000	158.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.70 5.33 6.00 6.67 8.33	2.33 2.96 3.60 4.87 7.41	333.00 400.00 467.00 533.00 600.00
12' T-Arm - Round (GPD)	C	From Face	1.88 -0.68	-20.0000	158.00	No Ice 1/2" Ice	4.70 5.33	2.33 2.96	333.00 400.00

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 lb
			0.00			1" Ice	6.00	3.60	467.00
						2" Ice	6.67	4.87	533.00
						4" Ice	8.33	7.41	600.00
12' T-Arm - Round (GPD)	A	From Face	1.88	-20.0000	158.00	No Ice	4.70	2.33	333.00
			-0.68			1/2" Ice	5.33	2.96	400.00
			0.00			1" Ice	6.00	3.60	467.00
						2" Ice	6.67	4.87	533.00
						4" Ice	8.33	7.41	600.00
(3) DB980F90T4E-M w/Mount Pipe	B	From Face	4.00	0.0000	158.00	No Ice	3.99	3.72	31.40
			0.00			1/2" Ice	4.45	4.58	67.64
			0.00			1" Ice	4.90	5.32	110.22
						2" Ice	5.82	6.85	217.69
						4" Ice	7.98	10.10	552.44
(3) DB980F90T4E-M w/Mount Pipe	C	From Face	3.76	-20.0000	158.00	No Ice	3.99	3.72	31.40
			-1.36			1/2" Ice	4.45	4.58	67.64
			0.00			1" Ice	4.90	5.32	110.22
						2" Ice	5.82	6.85	217.69
						4" Ice	7.98	10.10	552.44
(3) DB980F90T4E-M w/Mount Pipe	A	From Face	3.76	-20.0000	158.00	No Ice	3.99	3.72	31.40
			-1.36			1/2" Ice	4.45	4.58	67.64
			0.00			1" Ice	4.90	5.32	110.22
						2" Ice	5.82	6.85	217.69
						4" Ice	7.98	10.10	552.44
P40-16-XLPP-RR-A w/ Mount Pipe	B	From Face	4.00	-45.0000	158.00	No Ice	7.04	4.24	74.90
			0.00			1/2" Ice	7.61	5.08	126.13
			0.00			1" Ice	8.15	5.79	183.84
						2" Ice	9.25	7.26	321.96
						4" Ice	11.60	10.59	719.65
P40-16-XLPP-RR-A w/ Mount Pipe	C	From Face	3.76	-35.0000	158.00	No Ice	7.04	4.24	74.90
			-1.36			1/2" Ice	7.61	5.08	126.13
			0.00			1" Ice	8.15	5.79	183.84
						2" Ice	9.25	7.26	321.96
						4" Ice	11.60	10.59	719.65
APXVSPP18-C-A20 w/mount pipe	A	From Face	3.76	0.0000	158.00	No Ice	8.26	6.71	78.90
			-1.36			1/2" Ice	8.81	7.66	144.31
			0.00			1" Ice	9.36	8.49	217.47
						2" Ice	10.50	10.20	390.34
						4" Ice	12.88	13.98	872.84
1900MHz RRH	B	From Face	4.00	-45.0000	158.00	No Ice	2.91	3.80	44.00
			0.00			1/2" Ice	3.14	4.06	75.27
			0.00			1" Ice	3.39	4.34	110.18
						2" Ice	3.91	4.91	191.65
						4" Ice	5.05	6.15	406.70
1900MHz RRH	C	From Face	3.76	-35.0000	158.00	No Ice	2.91	3.80	44.00
			-1.36			1/2" Ice	3.14	4.06	75.27
			0.00			1" Ice	3.39	4.34	110.18
						2" Ice	3.91	4.91	191.65
						4" Ice	5.05	6.15	406.70
1900MHz RRH	A	From Face	3.76	0.0000	158.00	No Ice	2.91	3.80	44.00
			-1.36			1/2" Ice	3.14	4.06	75.27
			0.00			1" Ice	3.39	4.34	110.18
						2" Ice	3.91	4.91	191.65
						4" Ice	5.05	6.15	406.70
800 MHZ RRH	B	From Face	4.00	-45.0000	158.00	No Ice	2.49	2.07	53.00
			0.00			1/2" Ice	2.71	2.27	74.19
			0.00			1" Ice	2.93	2.48	98.39
						2" Ice	3.41	2.93	156.61

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 lb
						4" Ice	4.46	3.93	317.77
800 MHZ RRH	C	From Face	3.76 -1.36 0.00	-35.0000	158.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.49 2.71 2.93 3.41 4.46	2.07 2.27 2.48 2.93 3.93	53.00 74.19 98.39 156.61 317.77
800 MHZ RRH	A	From Face	3.76 -1.36 0.00	0.0000	158.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.49 2.71 2.93 3.41 4.46	2.07 2.27 2.48 2.93 3.93	53.00 74.19 98.39 156.61 317.77
APXV18-206517S-C w/mount pipe	A	From Leg	0.91 0.42 0.00	25.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.17 5.62 6.08 7.02 9.12	3.04 3.47 3.91 4.81 6.70	26.40 53.00 85.10 166.61 404.25
APXV18-206517S-C w/mount pipe	B	From Leg	0.98 0.17 0.00	10.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.17 5.62 6.08 7.02 9.12	3.04 3.47 3.91 4.81 6.70	26.40 53.00 85.10 166.61 404.25
APXV18-206517S-C w/mount pipe	C	From Leg	0.98 0.17 0.00	10.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.17 5.62 6.08 7.02 9.12	3.04 3.47 3.91 4.81 6.70	26.40 53.00 85.10 166.61 404.25
MTS 12.5' LP Platform	B	None		0.0000	138.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	14.66 18.87 23.08 31.50 48.34	14.66 18.87 23.08 31.50 48.34	1250.00 1481.33 1712.66 2175.32 3100.64
BXA-70080/6CFx4 w/ Mount Pipe	A	From Centroid-Face	4.00 0.00 2.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.01 6.58 7.10 8.20 10.75	6.21 7.38 8.26 10.05 13.89	43.55 98.24 160.50 311.34 752.33
BXA-70080/6CFx4 w/ Mount Pipe	B	From Centroid-Face	4.00 0.00 2.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.01 6.58 7.10 8.20 10.75	6.21 7.38 8.26 10.05 13.89	43.55 98.24 160.50 311.34 752.33
BXA-70063/4CF w/ mount pipe	A	From Centroid-Face	4.00 0.00 2.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.65 6.20 6.72 7.80 10.08	3.87 4.67 5.34 6.79 10.00	31.80 76.48 127.16 249.76 610.57
BXA-70063/4CF w/ mount pipe	B	From Centroid-Face	4.00 0.00 2.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.65 6.20 6.72 7.80 10.08	3.87 4.67 5.34 6.79 10.00	31.80 76.48 127.16 249.76 610.57
(2) BXA-70063/4CF w/ mount pipe	C	From Centroid-Face	4.00 0.00 2.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.65 6.20 6.72 7.80 10.08	3.87 4.67 5.34 6.79 10.00	31.80 76.48 127.16 249.76 610.57
BXA-171063/12CF w/ Mount	A	From	4.00	0.0000	138.00	No Ice	4.79	5.34	49.74

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 lb
Pipe		Centroid-Face	0.00 2.00			1/2" Ice 1" Ice 2" Ice 4" Ice	5.24 5.70 6.64 8.64	6.15 6.96 8.65 12.22	95.92 150.13 281.07 672.43
BXA-171063/12CF w/ Mount Pipe	B	From Centroid-Face	4.00 0.00 2.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.79 5.24 5.70 6.64 8.64	5.34 6.15 6.96 8.65 12.22	49.74 95.92 150.13 281.07 672.43
BXA-171063/12CF w/ Mount Pipe	C	From Centroid-Face	4.00 0.00 2.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.79 5.24 5.70 6.64 8.64	5.34 6.15 6.96 8.65 12.22	49.74 95.92 150.13 281.07 672.43
BXA-171085-12BF w/Mount Pipe	A	From Centroid-Face	4.00 0.00 2.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.74 5.19 5.64 6.58 8.58	5.30 6.10 6.91 8.59 12.14	49.74 95.67 149.57 279.78 669.13
BXA-171085-12BF w/Mount Pipe	B	From Centroid-Face	4.00 0.00 2.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.74 5.19 5.64 6.58 8.58	5.30 6.10 6.91 8.59 12.14	49.74 95.67 149.57 279.78 669.13
BXA-171063/8BF w/Mount Pipe	C	From Centroid-Face	4.00 0.00 2.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.44 3.87 4.34 5.35 7.50	3.81 4.48 5.15 6.56 9.72	45.24 82.21 125.62 230.18 549.63
(2) FD9R6004/2C-3L	A	From Centroid-Face	4.00 0.00 2.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.00 0.00 0.00 0.00 0.00	0.08 0.14 0.20 0.34 0.74	3.10 5.40 8.79 19.61 62.87
(2) FD9R6004/2C-3L	B	From Centroid-Face	4.00 0.00 2.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.00 0.00 0.00 0.00 0.00	0.08 0.14 0.20 0.34 0.74	3.10 5.40 8.79 19.61 62.87
(2) FD9R6004/2C-3L	C	From Centroid-Face	4.00 0.00 2.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.00 0.00 0.00 0.00 0.00	0.08 0.14 0.20 0.34 0.74	3.10 5.40 8.79 19.61 62.87
RRH2X40-AWS	A	From Centroid-Face	4.00 0.00 2.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.60 2.84 3.08 3.60 4.74	2.02 2.24 2.47 2.96 4.03	41.88 61.61 84.39 139.88 296.03
RRH2X40-AWS	B	From Centroid-Face	4.00 0.00 2.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.60 2.84 3.08 3.60 4.74	2.02 2.24 2.47 2.96 4.03	41.88 61.61 84.39 139.88 296.03
RRH2X40-AWS	C	From Centroid-Face	4.00 0.00 2.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	2.60 2.84 3.08	2.02 2.24 2.47	41.88 61.61 84.39

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 lb
						2" Ice	3.60	2.96	139.88
						4" Ice	4.74	4.03	296.03
DB-T1-6Z-8AB-0Z	C	From Centroid-Face	4.00 0.00 2.00	0.0000	138.00	No Ice	5.60	2.33	44.00
						1/2" Ice	5.92	2.56	80.13
						1" Ice	6.24	2.79	120.22
						2" Ice	6.91	3.28	213.04
						4" Ice	8.37	4.37	454.67
MTS 12.5' LP Platform	B	None		0.0000	128.00	No Ice	14.66	14.66	1250.00
						1/2" Ice	18.87	18.87	1481.33
						1" Ice	23.08	23.08	1712.66
						2" Ice	31.50	31.50	2175.32
						4" Ice	48.34	48.34	3100.64
(2) AIR 21 w/ Mount Pipe	A	From Centroid-Leg	4.00 0.00 2.00	30.0000	128.00	No Ice	6.85	5.78	112.90
						1/2" Ice	7.41	6.70	170.69
						1" Ice	7.94	7.50	235.28
						2" Ice	9.05	9.14	388.12
						4" Ice	11.38	12.65	819.05
(2) AIR 21 w/ Mount Pipe	B	From Centroid-Leg	4.00 0.00 2.00	30.0000	128.00	No Ice	6.85	5.78	112.90
						1/2" Ice	7.41	6.70	170.69
						1" Ice	7.94	7.50	235.28
						2" Ice	9.05	9.14	388.12
						4" Ice	11.38	12.65	819.05
(2) AIR 21 w/ Mount Pipe	C	From Centroid-Leg	4.00 0.00 2.00	30.0000	128.00	No Ice	6.85	5.78	112.90
						1/2" Ice	7.41	6.70	170.69
						1" Ice	7.94	7.50	235.28
						2" Ice	9.05	9.14	388.12
						4" Ice	11.38	12.65	819.05
Twin Dual Duplex TMA	A	From Centroid-Leg	4.00 0.00 2.00	30.0000	128.00	No Ice	0.00	0.31	11.00
						1/2" Ice	0.00	0.39	15.83
						1" Ice	0.00	0.49	22.16
						2" Ice	0.00	0.70	40.11
						4" Ice	0.00	1.23	102.61
Twin Dual Duplex TMA	B	From Centroid-Leg	4.00 0.00 2.00	30.0000	128.00	No Ice	0.00	0.31	11.00
						1/2" Ice	0.00	0.39	15.83
						1" Ice	0.00	0.49	22.16
						2" Ice	0.00	0.70	40.11
						4" Ice	0.00	1.23	102.61
Twin Dual Duplex TMA	C	From Centroid-Leg	4.00 0.00 2.00	30.0000	128.00	No Ice	0.00	0.31	11.00
						1/2" Ice	0.00	0.39	15.83
						1" Ice	0.00	0.49	22.16
						2" Ice	0.00	0.70	40.11
						4" Ice	0.00	1.23	102.61
Pipe Mount 2'x2.375"	A	From Leg	0.50 0.00 0.00	0.0000	70.00	No Ice	0.34	0.34	7.60
						1/2" Ice	0.47	0.47	11.40
						1" Ice	0.63	0.63	16.82
						2" Ice	0.99	0.99	33.12
						4" Ice	1.84	1.84	91.83
GPS	A	From Leg	1.00 0.00 0.00	0.0000	70.00	No Ice	0.17	0.17	0.87
						1/2" Ice	0.24	0.24	3.85
						1" Ice	0.32	0.32	7.85
						2" Ice	0.51	0.51	19.56
						4" Ice	1.02	1.02	62.07

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
168.00	MTS 12.5' LP Platform	32	46.462	2.7720	0.0109	14024
158.00	12' T-Arm - Round (GPD)	32	40.732	2.6525	0.0085	6677
148.00	APXV18-206517S-C w/mount pipe	32	35.182	2.5088	0.0063	3419
138.00	MTS 12.5' LP Platform	32	29.983	2.3181	0.0044	2298
128.00	MTS 12.5' LP Platform	32	25.301	2.0626	0.0030	1984
70.00	Pipe Mount 2'x2.375"	27	7.330	1.0099	0.0007	3364

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
L1	168.5 - 130.667	Pole	TP25.3135x19x0.1875	1	-6863.20	758450.31	82.1	Pass
L2	130.667 - 118.75	Pole	TP26.8917x24.3271x0.25	2	-10729.50	1099013.13	96.5	Pass
L3	118.75 - 114.75	Pole	TP27.5501x26.8917x0.38	3	-11405.00	*	90.4*	Pass
L4	114.75 - 84.7188	Pole	TP32.4932x27.5501x0.5802	4	-17215.60	*	81.2*	Pass
L5	84.7188 - 75.67	Pole	TP33.4763x31.2422x0.6865	5	-21875.20	*	81.3*	Pass
L6	75.67 - 73	Pole	TP33.9145x33.4763x0.7931	6	-22737.60	*	71.4*	Pass
L7	73 - 43.8308	Pole	TP38.7021x33.9145x0.7022	7	-30537.80	*	82.3*	Pass
L8	43.8308 - 28	Pole	TP40.6663x37.2009x0.8108	8	-40089.10	*	81.8*	Pass
L9	28 - 0	Pole	TP45.25x40.6663x0.7283	9	-50882.30	*	88.3*	Pass

Summary	ELC:	Future
Pole (L2)	96.5	Pass
Rating =	96.5	Pass

*See additional calculations

APPENDIX C

Modification Calculations

Reinforcement 1						
Bottom	Top	QTY	Type	Position	Gap	Ten/Comp
0	75.67	6	PL0.675x5-12	F	0	T&C
75.67	118.75	3	PL0.675x5-12	F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C

Reinforcement 2						
Bottom	Top	QTY	Type	Position	Gap	Ten/Comp
0	28	4	PL1.25x6-18	F	0	T&C
28	45.25	4	PL1.25x6-18	F	0	T&C
45.25	73	4	PL1.25x5-18	F	0	T&C
73	85.75	4	PL1.25x5-18	F	0	T&C
85.75	114.75	3	PL1.25x5-18	F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C

Reinforcement 3						
Bottom	Top	QTY	Type	Position	Gap	Ten/Comp
0				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C

	Bottom Elevation	Top Elevation	Original Thickness	Original Yield Stress	Original Ultimate Stress	Reinforced Shaft Capacity	Reinf. 1 QTY	Reinf. 1 Type	Rein. 1 Capacity	Reinf. 2 QTY	Reinf. 2 Type	Rein. 2 Capacity	Reinf. 3 QTY	Reinf. 3 Type	Rein. 3 Capacity	Controlling Stress Ratio	Top Height	Section Length	Lap Splice	# of Sides	Top Diameter	Bottom Diameter	Equivalent Shaft Thickness	Equivalent Shaft Fy	Equivalent Weight Mult.	Top Elevation Failure	Bottom Elevation Failure	Section Failure %
1	150.6667	168.5000	0.1875	65	80	82.1%										82.1%	168.5000	37.8333	3.0641	18	15.0000	25.3135	0.1875	65.0	1.00			
2	118.7500	134.3308	0.2500	65	80	96.5%										96.5%	134.3308	15.5808	0.0000	18	24.3271	26.8916	0.2500	65.0	1.00			
3	114.7500	118.7500	0.2500	65	80	68.5%	3	PL0.675x5-12	90.4%							90.4%	118.7500	4.0000	0.0000	18	26.8916	27.5501	0.3800	48.4	0.97			
4	84.7188	114.7500	0.2500	65	80	61.1%	3	PL0.675x5-12	75.0%	3	PL1.25x5-18	81.2%				81.2%	114.7500	30.0312	4.5625	18	27.5501	32.4932	0.5802	47.7	0.94			
5	75.6700	89.2813	0.3125	65	80	62.3%	3	PL0.675x5-12	81.3%	4	PL1.25x5-18	67.9%				81.3%	89.2813	13.6113	0.0000	18	31.2422	33.4763	0.6865	51.0	0.95			
6	73.0000	75.6700	0.3125	65	80	54.9%	6	PL0.675x5-12	71.4%	4	PL1.25x5-18	60.7%				71.4%	75.6700	2.6700	0.0000	18	33.4763	33.9145	0.7931	50.6	0.94			
7	43.8308	73.0000	0.3125	65	80	63.4%	6	PL0.675x5-12	82.3%	4	PL1.25x5-18	64.2%				82.3%	73.0000	29.1692	5.3385	18	33.9145	38.7021	0.7022	48.0	1.00			
8	28.0000	49.1693	0.3750	65	80	63.2%	6	PL0.675x5-12	81.8%	4	PL1.25x6-18	66.0%				81.8%	49.1693	21.1693	0.0000	18	37.2009	40.6663	0.8108	51.5	0.96			
9	0.0000	28.0000	0.3750	65	80	68.3%	6	PL0.675x5-12	88.3%	4	PL1.25x6-18	65.0%				88.3%	28.0000	28.0000	0.0000	18	40.6663	45.2500	0.7283	48.9	1.01			
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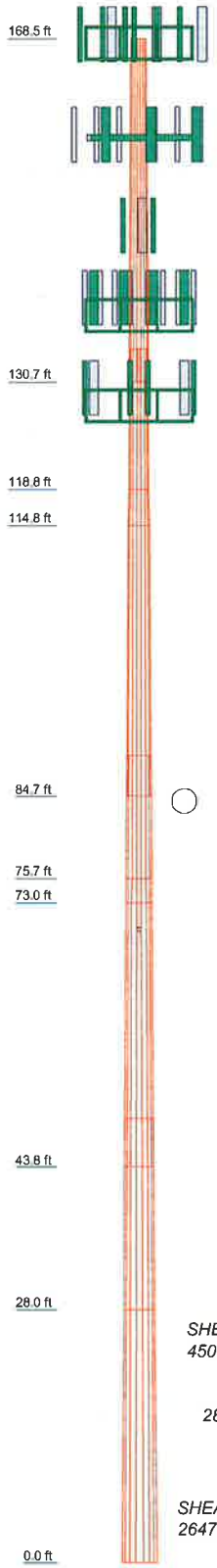
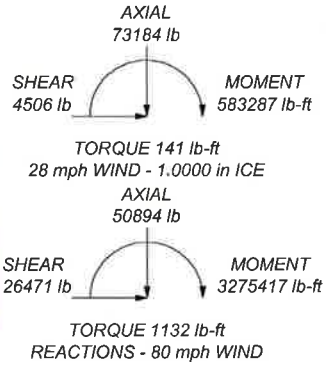
APPENDIX D

Tower Elevation Drawing

Section	9	8	7	6	5	4	3	2	1
Length (ft)	28.00	21.17	29.17	2.67	13.61	30.03	4.00	15.58	37.83
Number of Sides	18	18	18	18	18	18	18	18	18
Thickness (in)	0.7283	0.8108	0.7022	0.7931	0.6865	0.5802	0.3800	0.2500	0.1875
Socket Length (ft)			5.34			4.56			3.66
Top Dia (in)	40.6663	37.2009	33.9145	33.4763	31.2422	27.5501	26.8916	24.3271	19.0000
Bot Dia (in)	45.2500	40.6663	38.7021	33.9145	33.4763	32.4932	27.5501	26.8916	25.3135
Grade	48.854564ksi	51.484489ksi	47.99721ksi	50.605082ksi	51.015276ksi	47.704733ksi	A572-65	48.397552ksi	A572-65
Weight (lb)	36144.1	9376.3	6772.3	7857.1	709.8	3045.6	5205.2	427.7	1066.9	1683.2





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
MTS 12.5' LP Platform	168	800 MHZ RRH	158
800 10121 w/ Mount Pipe	168	800 MHZ RRH	158
800 10121 w/ Mount Pipe	168	800 MHZ RRH	158
800 10121 w/ Mount Pipe	168	APXV18-206517S-C w/mount pipe	148
AM-X-CD-17-65-00T-RET w/ Mount Pipe	168	APXV18-206517S-C w/mount pipe	148
		APXV18-206517S-C w/mount pipe	148
AM-X-CD-16-65-00T-RET w/ 2" x 54" mount pipe	168	MTS 12.5' LP Platform	138
		BXA-70080/6CFx4 w/ Mount Pipe	138
(2) SBNH-1D6565C w/ Mount Pipe	168	BXA-70080/6CFx4 w/ Mount Pipe	138
SBNH-1D6565C w/ mount Pipe	168	BXA-70063/4CF w/ mount pipe	138
SBNH-1D6565C w/ mount Pipe	168	BXA-70063/4CF w/ mount pipe	138
(2) LGP21401	168	(2) BXA-70063/4CF w/ mount pipe	138
(2) LGP21401	168	BXA-171063/12CF w/ Mount Pipe	138
(2) LGP21401	168	BXA-171063/12CF w/ Mount Pipe	138
RRUS 11	168	BXA-171063/12CF w/ Mount Pipe	138
RRUS 11	168	BXA-171085-12BF w/Mount Pipe	138
RRUS 11	168	BXA-171085-12BF w/Mount Pipe	138
DC6-48-60-18-8F Surge Suppression Unit	168	BXA-171063/8BF w/Mount Pipe	138
		(2) FD9R6004/2C-3L	138
(2) 860 10025	168	(2) FD9R6004/2C-3L	138
(2) 860 10025	168	(2) FD9R6004/2C-3L	138
(2) 860 10025	168	RRH2X40-AWS	138
12' T-Arm - Round (GPD)	158	RRH2X40-AWS	138
12' T-Arm - Round (GPD)	158	RRH2X40-AWS	138
12' T-Arm - Round (GPD)	158	DB-T1-6Z-8AB-0Z	138
(3) DB980F90T4E-M w/Mount Pipe	158	MTS 12.5' LP Platform	128
(3) DB980F90T4E-M w/Mount Pipe	158	(2) AIR 21 w/ Mount Pipe	128
(3) DB980F90T4E-M w/Mount Pipe	158	(2) AIR 21 w/ Mount Pipe	128
P40-16-XLPP-RR-A w/ Mount Pipe	158	(2) AIR 21 w/ Mount Pipe	128
P40-16-XLPP-RR-A w/ Mount Pipe	158	Twin Dual Duplex TMA	128
APXVSPP18-C-A20 w/mount pipe	158	Twin Dual Duplex TMA	128
1900MHz RRH	158	Twin Dual Duplex TMA	128
1900MHz RRH	158	Pipe Mount 2'x2.375"	70
1900MHz RRH	158	GPS	70

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi	50.605082ksi	51 ksi	66 ksi
48.397552ksi	48 ksi	63 ksi	47.99721ksi	48 ksi	63 ksi
47.704733ksi	48 ksi	63 ksi	51.484489ksi	51 ksi	66 ksi
51.015276ksi	51 ksi	66 ksi	48.854564ksi	49 ksi	64 ksi

TOWER DESIGN NOTES

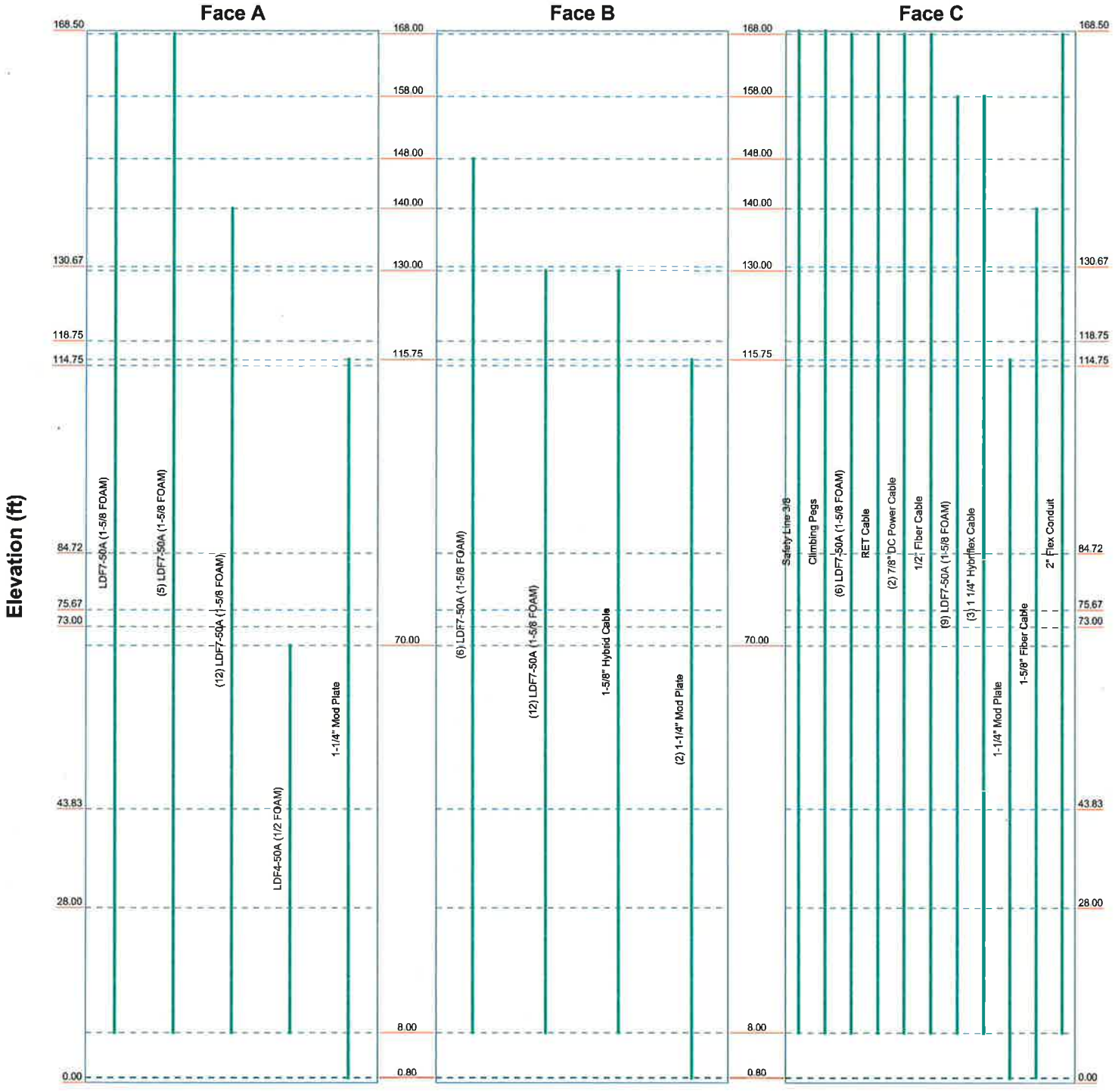
1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 28 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 96.5%

GPD Group
520 South Main St, Suite 2531
Akron, OH 44311
Phone: (330) 572-2100
FAX: (330) 572-2101

Job: 27074 BRISTOL CENTER			
Project: 2013723.01.27074.04			
Client: AT&T Mobility	Drawn by: kliccar	App'd:	
Code: TIA/EIA-222-F	Date: 11/19/13	Scale: NTS	
Path:		Dwg No. E-1	

Feed Line Distribution Chart
0' - 168'6"

Round | Flat | App In Face | App Out Face | Truss Leg

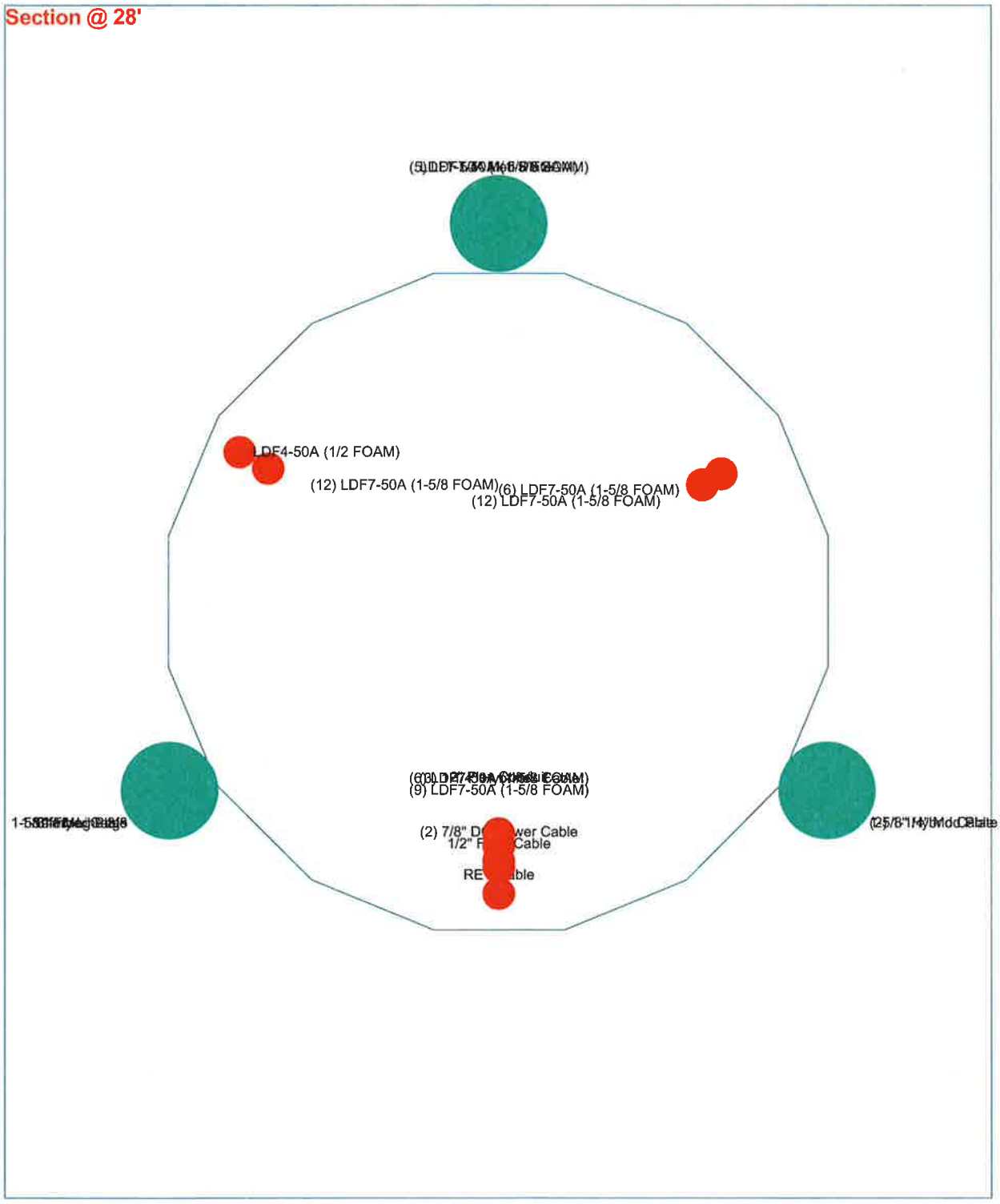


GPD Group
520 South Main St, Suite 2531
Akron, OH 44311
Phone: (330) 572-2100
FAX: (330) 572-2101

Job: **27074 BRISTOL CENTER**			
Project: **2013723.01.27074.04**			
Client: AT&T Mobility	Drawn by: kliccar	App'd:	
Code: TIA/EIA-222-F	Date: 11/19/13	Scale: NTS	
Path:		Dwg No. E-7	

Feed Line Plan
28'

Round Flat App In Face App Out Face



GPD Group 520 South Main St, Suite 2531 Akron, OH 44311 Phone: (330) 572-2100 FAX: (330) 572-2101	Job: 27074 BRISTOL CENTER		
	Project: 2013723.01.27074.04		
	Client: AT&T Mobility	Drawn by: kliccar	App'd:
	Code: TIA/EIA-222-F	Date: 11/19/13	Scale: NTS
	Path:		Dwg No. E-7

APPENDIX E

Base Plate & Anchor Rod Analysis

GPD GROUP

Anchor Rod and Base Plate Stresses
27074 BRISTOL CENTER
2013723.01.27074.04

Overturning Moment =	3275.42	k*ft
Axial Force =	50.89	k
Shear Force =	26.47	k

Acceptable Stress Ratio =	100.0%

Anchor Rods		
Number of Rods =	24	
Type =	Upset Rod	
Rod Yield Strength (Fy) =	75	ksi
ASIF =	1.333	
Rod Circle =	54	in
Rod Diameter =	2.25	in
Net Tensile Area =	3.25	in^2
Max Tension on Rod =	119.09	kips
Max Compression on Rod =	123.33	kips
Allow. Rod Force =	195.00	kips
Anchor Rod Capacity =	**61.1%**	**OK**

Base Plate		
Location =	External	
Plate Strength (F_y) =	60	ksi
Outside Diameter =	60	in
Plate Thickness =	2	in
b =	6.57	in
Le =	7.00	in
fb =	30.59	ksi
Fb =	60	ksi
BP Capacity =	**51.0%**	**OK**

Stiffeners		
Configuration =	Every Rod	
Thickness =	0.5	in
Width =	7	in
Notch =	0.5	in
Height =	12	in
Stiffener Strength (F_y) =	65	ksi
Weld Info. Known? =	Yes	
Vertical Weld Size =	0.375	in
Horiz. Weld Type =	Both	
Groove Angle =	45	deg
Groove Size =	0.25	in
Fillet Size =	0.375	in
Weld Strength =	70	ksi
Stiffener Vertical Force =	83.75	kips
Vert. Weld Capacity =	65.9%	kips
Horiz. Weld Capacity =	28.4%	kips
Stiffener Capacity =	94.1%	kips
Controlling Capacity =	**94.1%**	**OK**

Pole		
Pole Diameter =	45.25	in
Number of Sides =	18	
Thickness =	0.375	in
Pole Yield Strength =	65	ksi

APPENDIX F

Foundation Analysis

GPD GROUP

Caisson Analysis
27074 BRISTOL CENTER
2013723.01.27074.04

General Info	
Code	TIA/EIA-222-F
Concrete Code	ACI 318-05
Seismic Design Category	B
Max Stress Ratio	1.00
Reinforcing Known?	Yes
Modified?	No

General Soil	
Ground Water	99.00 ft
Soil Depth to Neglect	3.00 ft

Reactions	
Moment, M	3275.42 k-ft
Axial, P	50.89 k
Shear, V	26.47 k

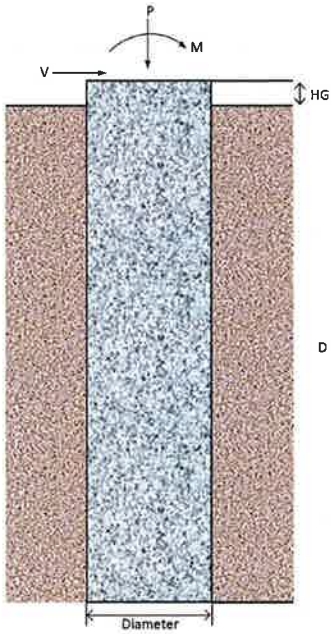
Pier Information		
Pier Diameter	6.5	ft
Pier Length Below Grade	26	ft
Distance Above Grade	1	ft
Vertical Bar Size	# 11	
Vertical Bar Quantity	16	
Tie Size	# 5	ft
fc' =	4	ksi
fy =	60	ksi
Clear Cover =	4	in

Soil Summary (Req. FS=2.0)		
Mu =	3275.42	k-ft
Mr =	9719.34	k-ft
FS =	2.97	
Capacity =	67.4%	Pass

Reinforcing Summary (Above 13.5')		
ϕMn =	5190.19*	k-ft
Mu =	4447.69	k-ft
Capacity =	87.3%	Pass

*See L-Pile output

Reinforcing Summary (Below 13.5')		
ϕMn =	3846.55	k-ft
Mu =	3188.90	k-ft
Capacity =	82.9%	Pass



Soil Info								
Layer	Soil Type	Thickness	γ, pcf	Cu, psf	ϕ	Kp	Top of Layer	Bot. of Layer
Layer 1	Clay	3	110	0	0	0.00	0.00	3.00
Layer 2	Sand	25	120	0	30	3.00	3.00	28.00
Layer 3	Clay					0.00	28.00	28.00
Layer 4	Clay					0.00	28.00	28.00
Layer 5	Clay					0.00	28.00	28.00
Layer 6	Sand					1.00	28.00	28.00
Layer 7	Sand					1.00	28.00	28.00
Layer 8	Clay					0.00	28.00	28.00
Layer 9	Sand					1.00	28.00	28.00
Layer 10	Clay					0.00	28.00	28.00

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U.W. Short Course - 1998

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**************************************************************************
*                                                                        *
*  PIER FOUNDATIONS ANALYSIS AND DESIGN - (C) 1995, POWER LINE SYSTEMS, INC.*
*                                                                        *
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*** ANALYSIS IDENTIFICATION : 27074 BRISTOL CENTER
NOTES : 2013723.01.27074.04

*** PIER PROPERTIES CONCRETE STRENGTH (ksi) = 4.00 STEEL STRENGTH (ksi) = 60.00
DIAMETER (ft) = 6.500 DISTANCE FROM TOP OF PIER TO GROUND LEVEL (ft) = 1.00

*** SOIL PROPERTIES

LAYER	TYPE	THICKNESS (ft)	DEPTH AT TOP OF LAYER (ft)	DENSITY (pcf)	CU (psf)	KP	PHI (degrees)
1	C	3.00	0.00	110.0	0.0		
2	S	25.00	3.00	120.0		3.000	30.00

*** DESIGN (FACTORED) LOADS AT TOP OF PIER MOMENT (ft-k) = 3275.4 VERTICAL (k) = 50.9 SHEAR (k) = 26.5
ADDITIONAL SAFETY FACTOR AGAINST SOIL FAILURE = 2.80

*** CALCULATED PIER LENGTH (ft) = 27.000

*** CHECK OF SOILS PROPERTIES AND ULTIMATE RESISTING FORCES ALONG PIER

TYPE	TOP OF LAYER BELOW TOP OF PIER (ft)	THICKNESS (ft)	DENSITY (pcf)	CU (psf)	KP	FORCE (k)	ARM (ft)
C	1.00	3.00	110.0	0.0		0.00	2.50
S	4.00	15.85	120.0		3.000	1187.67	13.89
S	19.85	7.15	120.0		3.000	-1113.13	23.62

*** SHEAR AND MOMENTS ALONG PIER

DISTANCE BELOW TOP OF PIER (ft)	WITH THE ADDITIONAL SAFETY FACTOR SHEAR (k)	WITH THE ADDITIONAL SAFETY FACTOR MOMENT (ft-k)	WITHOUT ADDITIONAL SAFETY FACTOR SHEAR (k)	WITHOUT ADDITIONAL SAFETY FACTOR MOMENT (ft-k)
0.00	74.5	9797.0	26.6	3498.9
2.70	74.5	9998.2	26.6	3570.8
5.40	40.6	10177.4	14.5	3634.8
8.10	-63.6	10157.9	-22.7	3627.8
10.80	-219.0	9787.8	-78.2	3495.6
13.50	-425.6	8929.0	-152.0	3188.9
16.20	-683.4	7443.3	-244.1	2658.3
18.90	-992.4	5192.6	-354.4	1854.5
21.60	-873.8	2451.3	-312.1	875.5
24.30	-462.5	635.9	-165.2	227.1
27.00	0.0	0.0	0.0	0.0

*** TOTAL REINFORCEMENT PCT = 0.54 REINFORCEMENT AREA (in^2) = 25.80
*** USABLE AXIAL CAP. (k) = 50.9 USABLE MOMENT CAP. (ft-k) = 3732.1

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*** US Standard Re-Bars (Select one of the following):
    130 BARS #4  (AREA = 0.20 in^2  DIA = 0.500 in) AT SPACING (in) =   1.64
    84  BARS #5  (AREA = 0.31 in^2  DIA = 0.625 in) AT SPACING (in) =   2.54
    59  BARS #6  (AREA = 0.44 in^2  DIA = 0.750 in) AT SPACING (in) =   3.62
    44  BARS #7  (AREA = 0.60 in^2  DIA = 0.875 in) AT SPACING (in) =   4.86
    33  BARS #8  (AREA = 0.79 in^2  DIA = 1.000 in) AT SPACING (in) =   6.47
    26  BARS #9  (AREA = 1.00 in^2  DIA = 1.128 in) AT SPACING (in) =   8.22
    21  BARS #10 (AREA = 1.27 in^2  DIA = 1.270 in) AT SPACING (in) =  10.17
    17  BARS #11 (AREA = 1.56 in^2  DIA = 1.410 in) AT SPACING (in) =  12.57
    12  BARS #14 (AREA = 2.25 in^2  DIA = 1.693 in) AT SPACING (in) =  17.80

*** PRESSURE UNDER CAISSON DUE TO DESIGN AXIAL LOAD  (psf) =   1533.7
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LPILE Plus for Windows, Version 5.0 (5.0.39)

Analysis of Individual Piles and Drilled Shafts
Subjected to Lateral Loading Using the p-y Method

Analysis Type 2:
- Computation of Ultimate Bending Moment of Cross Section (Section Design)

Computations of Nominal Moment Capacity and Nonlinear Bending Stiffness
---

Number of sections = 1

Pile Section No. 1

The sectional shape is a circular drilled shaft (bored pile).

Outside Diameter	=	78.0000 in

Material Properties:

Compressive Strength of Concrete	=	4.000 kip/in**2
Yield Stress of Reinforcement	=	60. kip/in**2
Modulus of Elasticity of Reinforcement	=	29000. kip/in**2
Number of Reinforcing Bars	=	0
Area of Single Bar	=	.00000 in**2
Number of Rows of Reinforcing Bars	=	11
Area of Steel	=	.000 in**2
Area of Shaft	=	4778.362 in**2
Percentage of Steel Reinforcement	=	.000 percent
Cover Thickness (edge to bar center)	=	4.000 in

Unfactored Axial Squash Load Capacity = 18012.35 kip

Distribution and Area of Steel Reinforcement

Row Number	Area of Reinforcement in**2	Distance to Centroidal Axis in
1	1.560	33.670
2	3.120	31.107
3	3.120	23.808
4	3.120	17.778
5	3.120	12.885
6	3.120	0.000
7	3.120	-12.885
8	3.120	-17.778
9	3.120	-23.808

10	3.120	-31.107
11	1.560	-33.670

Axial Thrust Force = 51743.60 lbs

Unfactored (Nominal) Moment Capacity at Concrete Strain of 0.003 = 62282.26340 in-kip

The analysis ended normally.