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Also admitted in Massachusetts

January 16, 2014

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

Re: **Notice of Exempt Modification – Antenna Swap**
617 South Center Orange Road, Orange, Connecticut

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains twelve (12) wireless telecommunications antennas at the 117-foot level on the existing 180-foot tower at the above-referenced address. The tower is owned by the Town of Orange. Cellco's shared use of this tower was approved in 2001. 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-171063-12BF 2100 MHz antennas, at the same 117-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 James Zeoli, First Selectman of the Town of Orange. The Town of Orange is the owner of the property on which the tower is located.

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 117-foot level on the 180-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:
James Zeoli, Orange First Selectman
Sandy M. Carter

ATTACHMENT 1

Amphenol ANTENNA SOLUTIONS

BXA-70063-4CF-EDIN-X

X-Pol | FET Panel | 63° | 13.0 dBd

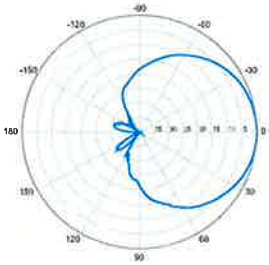
Replace "X" with desired electrical downtilt.

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	< -25 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 m² Side: 0.16 m²	Front: 3.7 ft² Side: 1.7 ft²
Wind load @ 161 km/hr (100 mph)	Front: 498 N Side: 260 N	Front: 111 lbf Side: 55 lbf

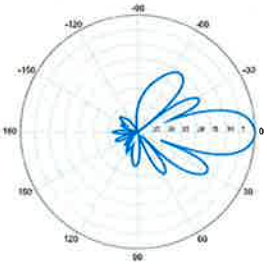
Mounting Options	Part Number	Fits Pipe Diameter	Weight
2-Point Mounting & Downtilt Bracket Kit	36210006	40-115 mm 1.57-4.5 in	4.1 kg 9 lbs
Concealment Configurations	For concealment configurations, order BXA-70063-4CF-EDIN-X-FP		

BXA-70063-4CF-EDIN-X



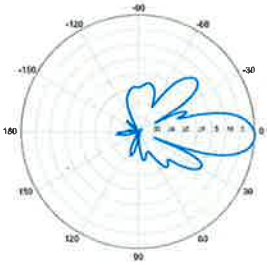
Horizontal | 750 MHz

BXA-70063-4CF-EDIN-0



0° | Vertical | 750 MHz

BXA-70063-4CF-EDIN-2

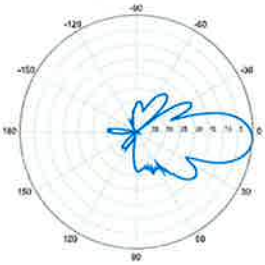


2° | Vertical | 750 MHz

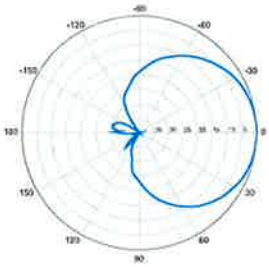
BXA-70063-4CF-EDIN-3

3° | Vertical | 750 MHz

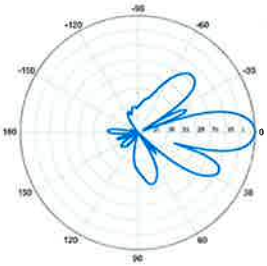
BXA-70063-4CF-EDIN-4



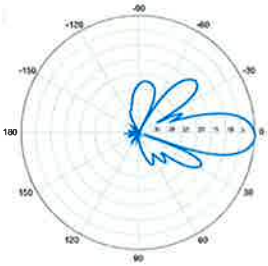
4° | Vertical | 750 MHz



Horizontal | 850 MHz

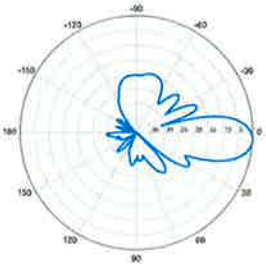


0° | Vertical | 850 MHz



2° | Vertical | 850 MHz

3° | Vertical | 850 MHz

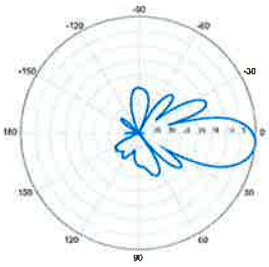


4° | Vertical | 850 MHz

BXA-70063-4CF-EDIN-X

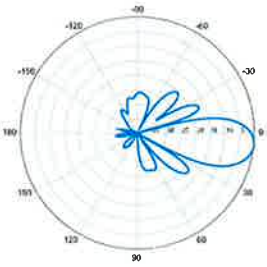
X-Pol | FET Panel | 63° | 13.0 dBd

BXA-70063-4CF-EDIN-5



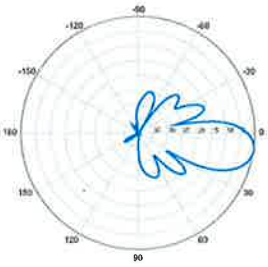
5° | Vertical | 750 MHz

BXA-70063-4CF-EDIN-6



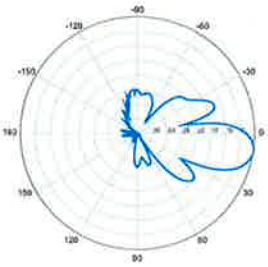
6° | Vertical | 750 MHz

BXA-70063-4CF-EDIN-8



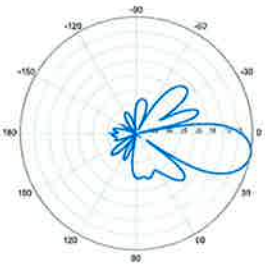
8° | Vertical | 750 MHz

BXA-70063-4CF-EDIN-9

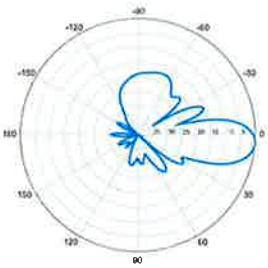


9° | Vertical | 750 MHz

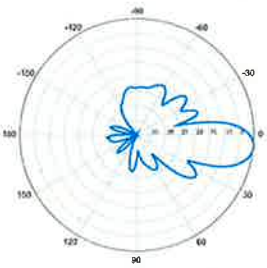
BXA-70063-4CF-EDIN-10



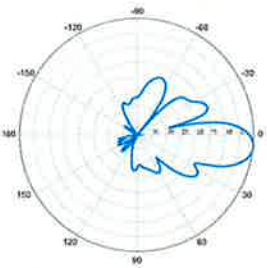
10° | Vertical | 750 MHz



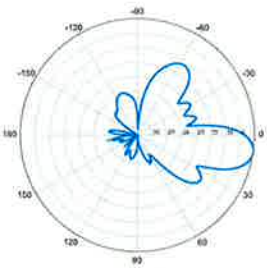
5° | Vertical | 850 MHz



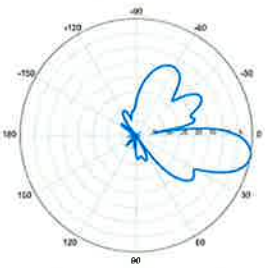
6° | Vertical | 850 MHz



8° | Vertical | 850 MHz

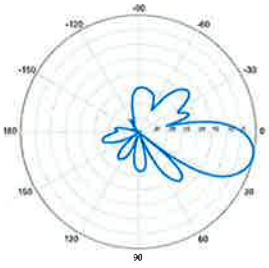


9° | Vertical | 850 MHz



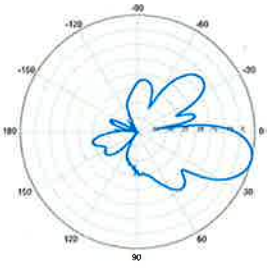
10° | Vertical | 850 MHz

BXA-70063-4CF-EDIN-12

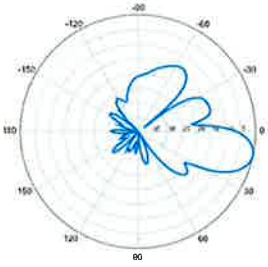


12° | Vertical | 750 MHz

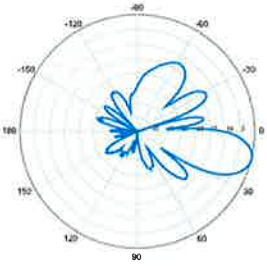
BXA-70063-4CF-EDIN-14



14° | Vertical | 750 MHz



12° | Vertical | 850 MHz



14° | Vertical | 850 MHz

BXA-171063-12BF-EDIN-X

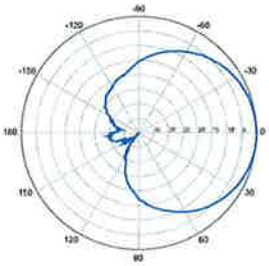
Replace "X" with desired electrical downtilt

X-Pol | FET Panel | 63° | 19.0 dBi

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	> 28 dB		
IM3 (20W carrier)	< -150 dBc		
Input power	300 W		
Lightning protection	Direct Ground		
Connector(s)	2 Ports / EDIN / Female / Bottom		
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	

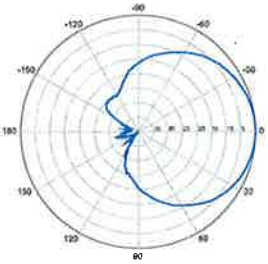
Mounting Options	Part Number	Fits Pipe Diameter	Weight
2-Point Mounting Bracket Kit	26799997	50-102 mm 2.0-4.0 in	2.3 kg 5 lbs
2-Point Mounting & Downtilt Bracket Kit	26799999	50-102 mm 2.0-4.0 in	3.6 kg 8 lbs
Concealment Configurations	For concealment configurations, order BXA-171063-12BF-EDIN-X-FP		

BXA-171063-12BF-EDIN-X



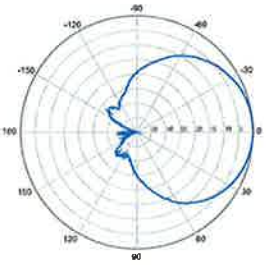
Horizontal | 1710-1880 MHz

BXA-171063-12BF-EDIN-X



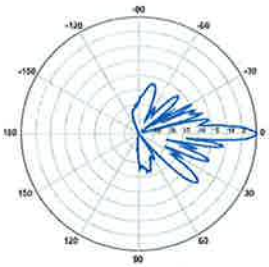
Horizontal | 1850-1990 MHz

BXA-171063-12BF-EDIN-X



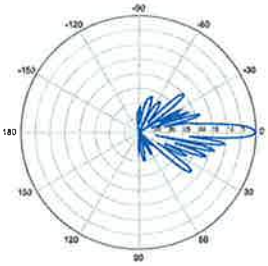
Horizontal | 1920-2170 MHz

BXA-171063-12BF-EDIN-0



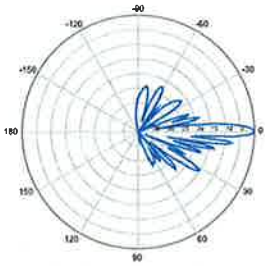
0° | Vertical | 1710-1880 MHz

BXA-171063-12BF-EDIN-0



0° | Vertical | 1850-1990 MHz

BXA-171063-12BF-EDIN-0

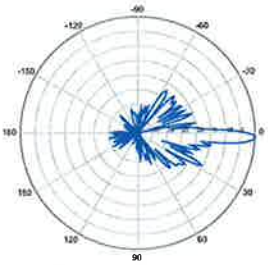


0° | Vertical | 1920-2170 MHz

BXA-171063-12BF-EDIN-X

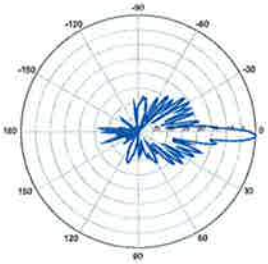
X-Pol | FET Panel | 63° | 19.0 dBi

BXA-171063-12BF-EDIN-2



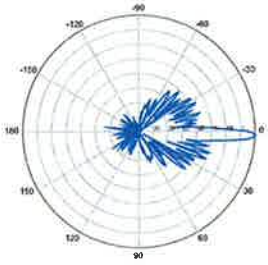
2° | Vertical | 1710-1880 MHz

BXA-171063-12BF-EDIN-2



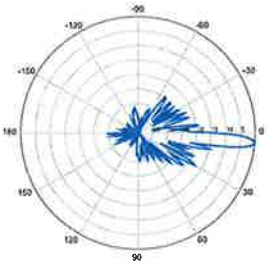
2° | Vertical | 1850-1990 MHz

BXA-171063-12BF-EDIN-2



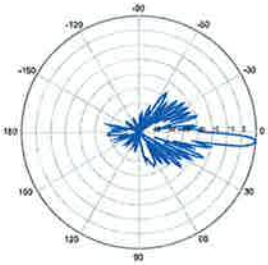
2° | Vertical | 1920-2170 MHz

BXA-171063-12BF-EDIN-5



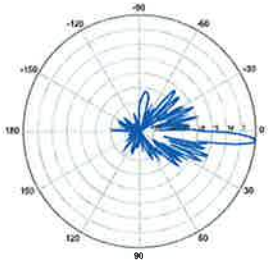
5° | Vertical | 1710-1880 MHz

BXA-171063-12BF-EDIN-5



5° | Vertical | 1850-1990 MHz

BXA-171063-12BF-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

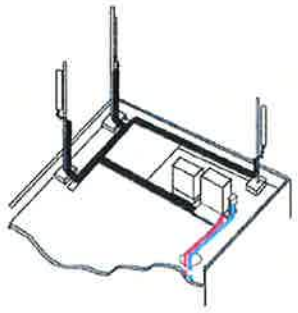
Because of its small size and weight, the Alcatel-Lucent RRH2x40-AWS can be installed close to the antenna. Operators can therefore locate the Alcatel-Lucent RRH2x40-AWS where RF engineering is deemed ideal, minimizing trade-offs between available sites and RF optimum sites. The RF feeder cost and installation 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

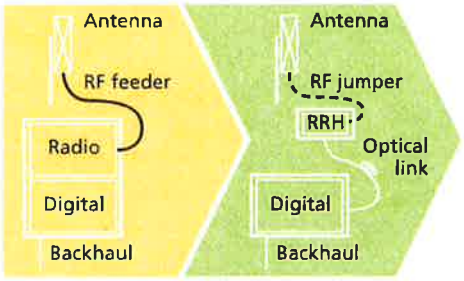
- Zero-footprint deployment
- Easy installation, with a lightweight unit can be carried and set up by one person
- Optimized RF power, with flexible site selection and elimination of a TMA
- Convection-cooled (fanless)
- Noise-free
- Best-in-class power efficiency, with significantly reduced energy consumption

Benefits

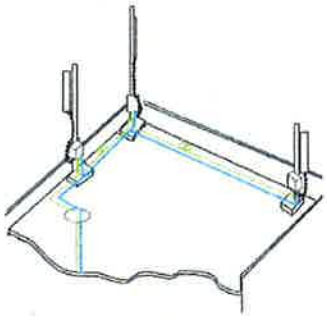
- Leverages existing real estate with lower site costs
- Reduces installation costs, with fewer installation materials and simplified logistics
- Decreases power costs and minimizes environmental impacts, with the potential for eco-sustainable power options
- Improves RF performance and adds flexibility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

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-99-689 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)

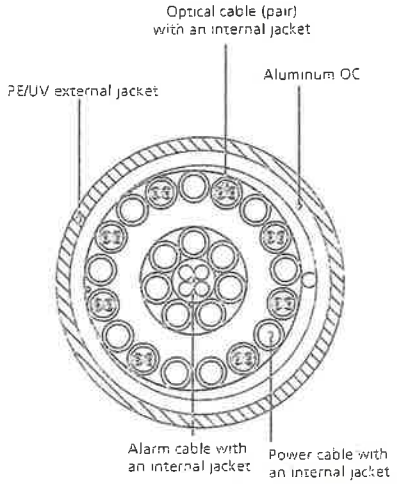


Figure 2: Construction Detail

- This data is provisional and subject to change

ATTACHMENT 2

	General	Power	Density					
Site Name: Orange 4								
Tower Height: Verizon @ 117'								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*Sprint CDMA/LTE	4	693	127.4	0.0614	1900	1.0000	6.14%	
*Sprint CDMA/LTE	1	390	127.4	0.0086	850	0.5667	1.52%	
*Clearwire	2	153	127	0.0068	2496	1.0000	0.68%	
*Clearwire	1	211	127	0.0047	11 GHz	1.0000	0.47%	
*Pocket (now MetroPCS)	3	631	165	0.0250	2130	1.0000	2.50%	
*AT&T UMTS	1	500	177	0.0057	1900	1.0000	0.57%	
*AT&T GSM	6	296	177	0.0204	880	0.5867	3.47%	
*AT&T GSM	3	427	177	0.0147	1900	1.0000	1.47%	
*AT&T LTE	1	500	177	0.0057	740	0.4933	1.16%	
*Nextel	12	100	137	0.0230	851	0.5673	4.05%	
*T-Mobile UMTS (AWS)	2	12.0815	150	0.0004	2100	1.0000	0.04%	
*T-Mobile GSM/UMTS	2	12.0815	150	0.0004	1950	1.0000	0.04%	
*T-Mobile LTE	2	24.16301	150	0.0008	2100	1.0000	0.08%	
Verizon	**7**	**441**	**117**	**0.0811**	**1970**	**1.0000**	**8.11%**	
Verizon	**9**	**287**	**117**	**0.0678**	**869**	**0.5793**	**11.71%**	
Verizon	**1**	**1750**	**117**	**0.0460**	**2145**	**1.0000**	**4.60%**	
Verizon	**1**	**998**	**117**	**0.0262**	**698**	**0.4653**	**5.63%**	
								52.3%
* Source: Siting Council								

ATTACHMENT 3

AT&T Towers
2300 Northlake Center Drive Suite 405
Tucker, GA 30084
770-708-6100

Ping Jiang
Black & Veatch Corp.
10950 Grandview Drive
Overland Park, KS 66210
(913) 458-7245
JiangP@bv.com

Wednesday, December 04, 2013

STRUCTURAL ANALYSIS
180' Monopole

AT&T DESIGNATION:	Site ID:	16326
	Site FA:	10071197
	Site Name:	ORANGE TRANSFER STATION
	AT&T Project:	Verizon Wireless Modification Twr Space Only 8-16-13
	BV Project:	176850 (16326VERCT-S (Rev 1))
ANALYSIS CRITERIA:	Codes:	TIA/EIA-222-F IBC 2003 2005 CT Building Code

SITE DATA: 617 South Orange Center Road, Orange, CT 06477, New Haven County
Latitude 41.25555, Longitude -73.010889
Market: MA/RI/VT/NH/ME/CT
180' Monopole

Mrs. Charlotte Malone

Black & Veatch Corp. 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:	98.80%	Pass
Connection Stress Level with Proposed Equipment:	98.00%	Pass
Foundation Ratio with Proposed Equipment:	17.11%	Pass

We at Black & Veatch Corp. appreciate the opportunity of providing our continuing professional services to you. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully Submitted by: Black & Veatch Corp.

Analysis Prepared by: Vishal Pawar

Analysis Reviewed by: Chris A. Krafft, P.E.

This analysis was prepared by me or under my direct supervision and to the best of my knowledge and ability complies with the applicable provisions of the governing codes and ordinances.

Black & Veatch Corp.
10950 Grandview Drive
Overland Park, KS 66210
B&V: 176850 (16326VERCT-S (Rev 1))

Documents

Document	Description	Source
Site Photos from 2013	Site Condition Data	AT&T Siterra
Carrier Co-Location Documents (Applications, Leases, Initial Co-Location Analyses, Modification Request for Information Form, etc.)	Tower Loading Data	AT&T Siterra
Structural Analysis completed by Black & Veatch, dated 09/27/2013	Previous Structural Analysis w/Tower Geometry & Loading Data	AT&T Siterra
Geotechnical Report completed by WEI Geotechnical Engineering, dated 03/31/2010	Geotechnical Data	AT&T Siterra
Foundation Mapping Report completed by WEI Geotechnical Engineering, dated 03/31/2010	Foundation Data	AT&T Siterra

Black & Veatch Corp.
10950 Grandview Drive
Overland Park, KS 66210
B&V: 176850 (16326VERCT-S (Rev 1))

Assumptions, Disclaimers, and Notes

1. This analysis was performed under the assumption that all information provided to Black & Veatch is current and correct. This is to include site data, existing/proposed appurtenance loading, tower/foundation details, and geotechnical data. If this information is not current and correct, this report should be considered obsolete and further analysis will be required.
2. This analysis assumes that the tower structural components and mounts, including all steel sections and attachment hardware, are in good working order and in their original state, free of rust or other forms of corrosion. Furthermore, it is assumed that the tower and the tower foundation have been properly maintained and monitored since the time of construction. This report should be considered obsolete and further analysis will be required if the tower and/or foundation does not meet all of the above specifications.
3. This analysis assumes that all existing and/or proposed equipment mounts on the tower will have adequate capacity to support the existing and proposed equipment loading.
4. Capacity of the structural members is based on theoretical values as shown in the attached TAS form.
5. When applicable, this structural analysis is only valid if the proposed coax cables are stacked as shown in the attached feedline sketch.
6. Reported tilt and twist information is for the tower only. Possible deflection of foundation and mounting equipment is not considered.
7. The existing tower foundation was analyzed assuming 3000 psi concrete and a minimum flexural steel area (As) of 0.5% of the gross section of concrete.
8. This analysis assumes that all existing and proposed port cuts are properly installed such that the overall structural capacity of the monopole is not reduced.
9. This analysis was revised due to changes in the proposed loading outlined in the attached TAS form as requested by the client.

Tower Analysis Summary Form

General Info

Site Name	ORANGE TRANSFER STATION
Site Number	16326VERCT-S (Rev 1)
FA Number	10071197
Date of Analysis	12/4/2013
Company Performing Analysis	Black & Veatch Corp.

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	N/A
Tower Height (Top of Steel)	180 ft	N/A
Tower Manufacturer	Rohn	N/A
Tower Model	N/A	N/A
Tower Design	N/A	N/A
Foundation Design	N/A	N/A
Geotech Report	WEI Geotechnical Engineering	3/31/2010
Tower Mapping	N/A	N/A
Previous Structural Analysis	Black & Veatch	9/27/2013
Foundation Mapping	WEI Geotechnical Engineering	3/31/2010

Design Parameters

Design Code Used	TIA/EIA-222-F IBC 2003
Location of Tower (County, State)	New Haven County, CT
Basic Wind Speed (mph)	90
Ice Thickness (in)	0.75
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 (%)	98.80%
Connection (%)	98.00%
Foundation (%)	17.11%
Foundation Adequate?	Yes

Steel Yield Strength (ksi)

Pole	65
Base Plate	60
Anchor Bolts	75

Existing 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 Inside/Outside
AT&T	177	177	6	Panel	Powerwave	7770.00	20, 120, 230	1	Unknown	Low Profile Platform	9	Unknown	1 5/8"	Inside
AT&T	177	177	3	Panel	KMW	AM-X-CW-14-65-00T-RET	20, 120, 230				1	Conduit	3"	Inside
AT&T	177	177	6	TMA	Powerwave	LGP21401					6	Fiber Cable	1/2"	Inside Conduit
AT&T	176	178	6	RRU	Ericsson	RRUS 11		1	Unknown	Collar Mount				
AT&T	176	174	1	SA Box	Raycap	DC6-48-60-18-8F								
Unknown	165	165	3	Panel	Unknown	5' Panel					6	Unknown	1 5/8"	Outside
T-Mobile	148	148	6	Panel	RFS	APX16PV-16PVL		1	Unknown	Low Profile Platform	12	Unknown	1 5/8"	Inside
T-Mobile	148	148	6	TMA	Powerwave	LGP 21401								
Nextel	137	137	12	Panel	Decibel	844G45VTZASX		1	Unknown	Low Profile Platform	12	Unknown	1 5/8"	Inside
Sprint	125	127.4	6	Panel	RFS	APXVSPP18-C-A20	10, 120, 255	1	Unknown	Low Profile Platform	6	Unknown	1 5/8"	Inside
Sprint	125	127.4	3	RRH	Alcatel-Lucent	1900 MHz RRH					3	Hybrid	1 1/4"	Inside
Sprint	125	127.4	3	RRH	Alcatel-Lucent	800 MHz RRH								
Sprint	125	127.4	3	Filter	Alcatel-Lucent	800 External Notch Filter								
Clear Wireless	125	127	3	Panel	Argus	LLPX310R	50, 150, 260				6	Unknown	5/16"	Inside Conduit
Clear Wireless	125	127	3	RRH	Samsung	FDD R6 RRH					3	RET Cable	1/4"	Inside Conduit
Clear Wireless	125	127	2	MW Dish	Dragonwave	A-ANT-23G-2-C	50, 150				2	Unknown	1/2"	Inside Conduit
Clear Wireless	125	127	2	ODU	Dragonwave	Horizon DUO					2	Flex Conduit	2"	Inside
Verizon	115	117	3	Panel	Swedcom	SLCP 2X6015	40, 120, 280	1	Unknown	Low Profile Platform	12	Unknown	1 5/8"	Inside
Verizon	115	117	6*	Panel	Swedcom	SC-E 6014 REV2	40, 120, 280				6	Unknown	1 5/8"	Outside
Verizon	115	117	3	Panel	Antel	BXA-171063-12BF	40, 120, 280							
Verizon	115	115	1	GPS	Lucent	GPS					1	Unknown	1/2"	Inside
Sprint	60	60	1	GPS	PCTEL	GPS-TMG-HR-26NCM		1	Unknown	Standoff	1	Unknown	1/2"	Inside

* To be removed

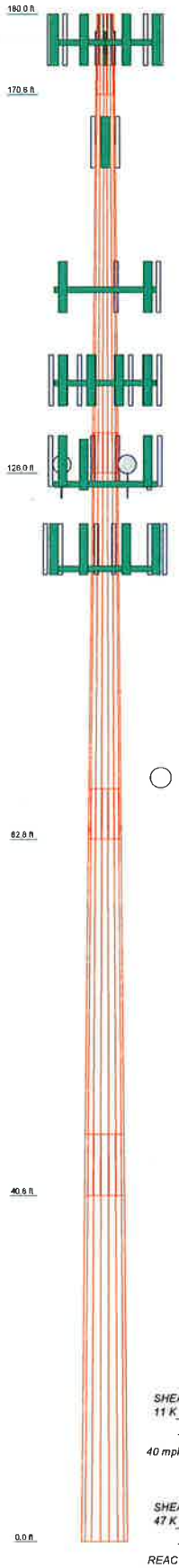
Proposed Loading

Antenna								Mount			Transmission Line			
Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Quantity	Type	Manufacturer	Model	Azimuth	Quantity	Manufacturer	Type	Quantity	Model	Size	Attachment Leg/Face
Verizon	115	117	3	Panel	Antel	BXA-171063-12BF	40, 120, 280				1	Fiber Cable	1 5/8	Inside
Verizon	115	117	3	Panel	Antel	BXA-70063-4CF	40, 120, 280							
Verizon	115	117	3	RRU	Alcatel-Lucent	RRH 2X40AWS								
Verizon	115	117	1	Box	RFS	DB-T1-6Z-8AB-0Z								

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 Leg/Face
AT&T	177	177	3	Panel	Powerwave	7770.00	20, 120, 230				6	Unknown	1 5/8"	Inside
AT&T	177	177	6	TMA	Powerwave	LGP21401								

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	9.42	18	0.1875	3.42	24.0000	26.2500		0.5
2	48.00	18	0.2500	4.75	25.0581	35.9250		4.0
3	48.00	16	0.3125	6.00	34.6803	46.3570	A572-65	6.5
4	48.00	18	0.3750	7.25	44.2987	55.7650		9.7
5	48.00	18	0.4375		53.2351	64.7500		13.3



AXIAL 80 K
SHEAR 11 K
MOMENT 1419 kip-ft
TORQUE 0 kip-ft
40 mph WIND - 0.7500 in ICE
AXIAL 54 K
SHEAR 47 K
MOMENT 5647 kip-ft
TORQUE 2 kip-ft
REACTIONS - 90 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
PROD 13' Low Profile Platform (Monopole) (ATI-Existing)	177	(2) APXVSPP18-C-A20 w/ Mount Pipe (Sprint-Existing)	125
7770.00 w/ Mount Pipe (ATI-Existing)	177	1900 MHz RRH (Sprint-Existing)	125
7770.00 w/ Mount Pipe (ATI-Existing)	177	1900 MHz RRH (Sprint-Existing)	125
7770.00 w/ Mount Pipe (ATI-Existing)	177	1900 MHz RRH (Sprint-Existing)	125
7770.00 w/ Mount Pipe (ATI-Existing)	177	800 MHz RRH (Sprint-Existing)	125
7770.00 w/ Mount Pipe (ATI-Existing)	177	800 MHz RRH (Sprint-Existing)	125
7770.00 w/ Mount Pipe (ATI-Existing)	177	800 MHz RRH (Sprint-Existing)	125
AM-X-CW-14-65-00T-RET w/ Mount Pipe (ATI-Existing)	177	800MHz External Notch Filter (Sprint-Existing)	125
		800MHz External Notch Filter (Sprint-Existing)	125
AM-X-CW-14-65-00T-RET w/ Mount Pipe (ATI-Existing)	177	800MHz External Notch Filter (Sprint-Existing)	125
AM-X-CW-14-65-00T-RET w/ Mount Pipe (ATI-Existing)	177	LLPX310R w/ Mount Pipe (Clear Wireless-Existing)	125
(4) LGP21401 (ATI-Existing/Future)	177	LLPX310R w/ Mount Pipe (Clear Wireless-Existing)	125
(4) LGP21401 (ATI-Existing/Future)	177	LLPX310R w/ Mount Pipe (Clear Wireless-Existing)	125
(4) LGP21401 (ATI-Existing/Future)	177		
7770.00 w/ Mount Pipe (ATI-Future)	177	FDD-R6-RRH - RRH (Clear Wireless-Existing)	125
7770.00 w/ Mount Pipe (ATI-Future)	177	FDD-R6-RRH - RRH (Clear Wireless-Existing)	125
7770.00 w/ Mount Pipe (ATI-Future)	177	FDD-R6-RRH - RRH (Clear Wireless-Existing)	125
Light collar (ATI-Existing)	176	Horizon Duo CDU (Clear Wireless-Existing)	125
(2) RRUS-11 (ATI-Existing)	176	Horizon Duo CDU (Clear Wireless-Existing)	125
(2) RRUS-11 (ATI-Existing)	176	4'x2" Mount Pipe (Clear Wireless-Existing)	125
(2) RRUS-11 (ATI-Existing)	176	4'x2" Mount Pipe (Clear Wireless-Existing)	125
DC6-48-60-18-8F SA Squid (ATI-Existing)	176	Dragonwave A-ANT-23G-2-C (Clear Wireless-Existing)	125
4'x2" Mount Pipe (ATI-Existing)	176		
4'x2" Mount Pipe (ATI-Existing)	176	Dragonwave A-ANT-23G-2-C (Clear Wireless-Existing)	125
4'x2" Mount Pipe (ATI-Existing)	176		
5' panel antenna w/ Mount Pipe (Unknown-Existing)	165	BXA-171063-12BF w/ Mount Pipe (Verizon-Proposed)	115
5' panel antenna w/ Mount Pipe (Unknown-Existing)	165	BXA-171063-12BF w/ Mount Pipe (Verizon-Proposed)	115
5' panel antenna w/ Mount Pipe (Unknown-Existing)	165	BXA-70063-4CF w/ Mount Pipe (Verizon-Proposed)	115
PROD 13' Low Profile Platform (Monopole) (T-Mobile-Existing)	148	BXA-70063-4CF w/ Mount Pipe (Verizon-Proposed)	115
(2) APX16PV-16PVL w/ Mount Pipe (T-Mobile-Existing)	148	BXA-70063-4CF w/ Mount Pipe (Verizon-Proposed)	115
(2) APX16PV-16PVL w/ Mount Pipe (T-Mobile-Existing)	148	SLCP 2x6015 w/mount pipe (Verizon-Existing)	115
(2) APX16PV-16PVL w/ Mount Pipe (T-Mobile-Existing)	148	SLCP 2x6015 w/mount pipe (Verizon-Existing)	115
(2) LGP21401 (T-Mobile-Existing)	148	SLCP 2x6015 w/mount pipe (Verizon-Existing)	115
(2) LGP21401 (T-Mobile-Existing)	148	BXA-171063-12BF w/ Mount Pipe (Verizon-Existing)	115
(2) LGP21401 (T-Mobile-Existing)	148	BXA-171063-12BF w/ Mount Pipe (Verizon-Existing)	115
PROD 13' Low Profile Platform (Monopole) (Nextel-Existing)	137	BXA-171063-12BF w/ Mount Pipe (Verizon-Existing)	115
(4) 844345VTZASX w/Mount Pipe (Nextel-Existing)	137	RRH2x40-AWS - RRH (Verizon-Proposed)	115
		RRH2x40-AWS - RRH (Verizon-Proposed)	115
(4) 844345VTZASX w/Mount Pipe (Nextel-Existing)	137	RRH2x40-AWS - RRH (Verizon-Proposed)	115
(4) 844345VTZASX w/Mount Pipe (Nextel-Existing)	137	DB-T1-6Z-8AB-0Z Distribution Box (Verizon-Proposed)	115
		GPS (Verizon-Existing)	115
PROD 13' Low Profile Platform (Monopole) (Sprint-Existing)	125	PROD 13' Low Profile Platform (Monopole) (Verizon-Existing)	115
(2) APXVSPP18-C-A20 w/ Mount Pipe (Sprint-Existing)	125	BXA-171063-12BF w/ Mount Pipe (Verizon-Proposed)	115
(2) APXVSPP18-C-A20 w/ Mount Pipe (Sprint-Existing)	125	2' Standoff T-Arm (5' face width) (Sprint-Existing)	60
		GPS-TMG-HR-26NCM (Sprint-Existing)	60

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for a 90 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 40 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 98.8%

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corp.
10950 Grandview Drive
Overland Park, KS 66210
Phone: (913) 458-2000
FAX: (913) 458-8136

Job	16326	ORANGE TRANSFER STATIO	
Project	176850	(16326VERCT-S (Rev 1))	
Client	AT&T Towers	Drawn by Vishal Pawar	Appd
Code	TIA/EIA-222-F	Date 12/04/13	Scale NTS
Path			Dwg No. E-1

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 New Haven County, Connecticut.
Basic wind speed of 90 mph.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 40 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 (Existing)	C	No	CaAa (Out Of Face)	180.00 - 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
HJ7-50A (1-5/8 AIR) (AT&T-Existing/Future)	A	No	Inside Pole	177.00 - 8.00	15	No Ice	0.00	1.04
						1/2" Ice	0.00	1.04
						1" Ice	0.00	1.04
						2" Ice	0.00	1.04
						4" Ice	0.00	1.04
3" Flexible Conduit (AT&T-Existing)	A	No	Inside Pole	177.00 - 8.00	1	No Ice	0.00	0.30
						1/2" Ice	0.00	0.30
						1" Ice	0.00	0.30
						2" Ice	0.00	0.30
						4" Ice	0.00	0.30
1/2" Fiber cable (AT&T-Existing)	A	No	Inside Pole	177.00 - 8.00	6	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) (Unknown-Existing)	A	No	CaAa (Out Of Face)	165.00 - 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) (Unknown-Existing)	A	No	CaAa (Out Of Face)	165.00 - 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
LDF7-50A (1-5/8	B	No	Inside Pole	148.00 - 8.00	12	No Ice	0.00	0.82

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
FOAM)						1/2" Ice	0.00	0.82
(T-Mobile-Existing)						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
LDF7-50A (1-5/8	C	No	Inside Pole	137.00 - 8.00	12	No Ice	0.00	0.82
FOAM)						1/2" Ice	0.00	0.82
(Nextel-Existing)						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
LDF7-50A (1-5/8	C	No	Inside Pole	127.40 - 8.00	6	No Ice	0.00	0.82
FOAM)						1/2" Ice	0.00	0.82
(Sprint-Existing)						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
1 1/4" Hybrid Cable	C	No	Inside Pole	127.40 - 8.00	3	No Ice	0.00	1.57
(Sprint-Existing)						1/2" Ice	0.00	1.57
						1" Ice	0.00	1.57
						2" Ice	0.00	1.57
						4" Ice	0.00	1.57
RG-11 (5/16 FOAM	C	No	Inside Pole	127.00 - 8.00	6	No Ice	0.00	0.09
POLYE.)						1/2" Ice	0.00	0.09
(Clear Wireless-Existing)						1" Ice	0.00	0.09
						2" Ice	0.00	0.09
						4" Ice	0.00	0.09
1/4" RET Cable	C	No	Inside Pole	127.00 - 8.00	3	No Ice	0.00	0.06
(Clear Wireless-Existing)						1/2" Ice	0.00	0.06
						1" Ice	0.00	0.06
						2" Ice	0.00	0.06
						4" Ice	0.00	0.06
LDF4-50A (1/2 FOAM)	C	No	Inside Pole	127.00 - 8.00	2	No Ice	0.00	0.15
(Clear Wireless-Existing)						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
2" innerduct conduit	C	No	Inside Pole	127.00 - 8.00	2	No Ice	0.00	0.20
(Clear Wireless-Existing)						1/2" Ice	0.00	0.20
						1" Ice	0.00	0.20
						2" Ice	0.00	0.20
						4" Ice	0.00	0.20
LDF7-50A (1-5/8	B	No	Inside Pole	117.00 - 8.00	12	No Ice	0.00	0.82
FOAM)						1/2" Ice	0.00	0.82
(Verizon-Existing)						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
LDF7-50A (1-5/8	B	No	CaAa (Out Of	117.00 - 8.00	1	No Ice	0.20	0.82
FOAM)			Face)			1/2" Ice	0.30	2.33
(Verizon-Existing)						1" Ice	0.40	4.46
						2" Ice	0.60	10.54
						4" Ice	1.00	30.04
LDF7-50A (1-5/8	B	No	CaAa (Out Of	117.00 - 8.00	5	No Ice	0.00	0.82
FOAM)			Face)			1/2" Ice	0.00	2.33
(Verizon-Existing)						1" Ice	0.00	4.46
						2" Ice	0.00	10.54
						4" Ice	0.00	30.04
LDF4-50A (1/2 FOAM)	B	No	Inside Pole	115.00 - 8.00	1	No Ice	0.00	0.15
(Verizon-Existing)						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
LDF4-50A (1/2 FOAM)	B	No	Inside Pole	60.00 - 8.00	1	No Ice	0.00	0.15
(Sprint-Existing)						1/2" Ice	0.00	0.15

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
						1" Ice	0.00	0.15
						2" Ice	0.00	0.15
						4" Ice	0.00	0.15
1 5/8" Fiber Line (Verizon-Proposed)	B	No	Inside Pole	117.00 - 8.00	1	No Ice	0.00	1.04
						1/2" Ice	0.00	1.04
						1" Ice	0.00	1.04
						2" Ice	0.00	1.04
						4" Ice	0.00	1.04

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
PiROD 13' Low Profile Platform (Monopole) (AT&T-Existing)	C	None		0.0000	177.00	No Ice	15.70	15.70	1.30
						1/2" Ice	20.10	20.10	1.76
						1" Ice	24.50	24.50	2.23
						2" Ice	33.30	33.30	3.16
						4" Ice	50.90	50.90	5.02
7770.00 w/ Mount Pipe (AT&T-Existing)	A	From Face	3.00 2.50 0.00	20.0000	177.00	No Ice	6.12	4.25	0.06
						1/2" Ice	6.63	5.01	0.11
						1" Ice	7.13	5.71	0.16
						2" Ice	8.16	7.16	0.29
						4" Ice	10.36	10.41	0.67
7770.00 w/ Mount Pipe (AT&T-Existing)	B	From Face	3.00 2.50 0.00	0.0000	177.00	No Ice	6.12	4.25	0.06
						1/2" Ice	6.63	5.01	0.11
						1" Ice	7.13	5.71	0.16
						2" Ice	8.16	7.16	0.29
						4" Ice	10.36	10.41	0.67
7770.00 w/ Mount Pipe (AT&T-Existing)	C	From Face	3.00 2.50 0.00	-10.0000	177.00	No Ice	6.12	4.25	0.06
						1/2" Ice	6.63	5.01	0.11
						1" Ice	7.13	5.71	0.16
						2" Ice	8.16	7.16	0.29
						4" Ice	10.36	10.41	0.67
7770.00 w/ Mount Pipe (AT&T-Existing)	A	From Face	3.00 -2.50 0.00	20.0000	177.00	No Ice	6.12	4.25	0.06
						1/2" Ice	6.63	5.01	0.11
						1" Ice	7.13	5.71	0.16
						2" Ice	8.16	7.16	0.29
						4" Ice	10.36	10.41	0.67
7770.00 w/ Mount Pipe (AT&T-Existing)	B	From Face	3.00 -2.50 0.00	0.0000	177.00	No Ice	6.12	4.25	0.06
						1/2" Ice	6.63	5.01	0.11
						1" Ice	7.13	5.71	0.16
						2" Ice	8.16	7.16	0.29
						4" Ice	10.36	10.41	0.67
7770.00 w/ Mount Pipe (AT&T-Existing)	C	From Face	3.00 -2.50 0.00	-10.0000	177.00	No Ice	6.12	4.25	0.06
						1/2" Ice	6.63	5.01	0.11
						1" Ice	7.13	5.71	0.16
						2" Ice	8.16	7.16	0.29
						4" Ice	10.36	10.41	0.67
AM-X-CW-14-65-00T-RET w/ Mount Pipe (AT&T-Existing)	A	From Face	3.00 6.00 0.00	20.0000	177.00	No Ice	5.74	4.02	0.05
						1/2" Ice	6.20	4.63	0.10
						1" Ice	6.66	5.28	0.15
						2" Ice	7.62	6.68	0.27
						4" Ice	9.67	9.74	0.63
AM-X-CW-14-65-00T-RET	B	From Face	3.00	0.0000	177.00	No Ice	5.74	4.02	0.05

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
w/ Mount Pipe			6.00			1/2" Ice	6.20	4.63	0.10
(AT&T-Existing)			0.00			1" Ice	6.66	5.28	0.15
						2" Ice	7.62	6.68	0.27
						4" Ice	9.67	9.74	0.63
AM-X-CW-14-65-00T-RET	C	From Face	3.00	-10.0000	177.00	No Ice	5.74	4.02	0.05
w/ Mount Pipe			6.00			1/2" Ice	6.20	4.63	0.10
(AT&T-Existing)			0.00			1" Ice	6.66	5.28	0.15
						2" Ice	7.62	6.68	0.27
						4" Ice	9.67	9.74	0.63
(4) LGP21401	A	From Face	3.00	20.0000	177.00	No Ice	1.23	0.26	0.01
(AT&T-Existing/Future)			0.00			1/2" Ice	1.38	0.34	0.02
			0.00			1" Ice	1.54	0.44	0.03
						2" Ice	1.89	0.64	0.05
						4" Ice	2.69	1.16	0.14
(4) LGP21401	B	From Face	3.00	0.0000	177.00	No Ice	1.23	0.26	0.01
(AT&T-Existing/Future)			0.00			1/2" Ice	1.38	0.34	0.02
			0.00			1" Ice	1.54	0.44	0.03
						2" Ice	1.89	0.64	0.05
						4" Ice	2.69	1.16	0.14
(4) LGP21401	C	From Face	3.00	-10.0000	177.00	No Ice	1.23	0.26	0.01
(AT&T-Existing/Future)			0.00			1/2" Ice	1.38	0.34	0.02
			0.00			1" Ice	1.54	0.44	0.03
						2" Ice	1.89	0.64	0.05
						4" Ice	2.69	1.16	0.14
7770.00 w/ Mount Pipe	A	From Face	3.00	20.0000	177.00	No Ice	6.12	4.25	0.06
(AT&T-Future)			-6.00			1/2" Ice	6.63	5.01	0.11
			0.00			1" Ice	7.13	5.71	0.16
						2" Ice	8.16	7.16	0.29
						4" Ice	10.36	10.41	0.67
7770.00 w/ Mount Pipe	B	From Face	3.00	0.0000	177.00	No Ice	6.12	4.25	0.06
(AT&T-Future)			-6.00			1/2" Ice	6.63	5.01	0.11
			0.00			1" Ice	7.13	5.71	0.16
						2" Ice	8.16	7.16	0.29
						4" Ice	10.36	10.41	0.67
7770.00 w/ Mount Pipe	C	From Face	3.00	-10.0000	177.00	No Ice	6.12	4.25	0.06
(AT&T-Future)			-6.00			1/2" Ice	6.63	5.01	0.11
			0.00			1" Ice	7.13	5.71	0.16
						2" Ice	8.16	7.16	0.29
						4" Ice	10.36	10.41	0.67
Light collar	C	None		0.0000	176.00	No Ice	0.58	0.58	0.01
(AT&T-Existing)						1/2" Ice	0.70	0.70	0.01
						1" Ice	0.82	0.82	0.03
						2" Ice	1.09	1.09	0.06
						4" Ice	1.74	1.74	0.15
(2) RRUS-11	A	From Face	0.50	0.0000	176.00	No Ice	2.94	1.25	0.04
(AT&T-Existing)			0.00			1/2" Ice	3.17	1.41	0.06
			2.00			1" Ice	3.41	1.59	0.09
						2" Ice	3.91	1.96	0.14
						4" Ice	5.02	2.82	0.29
(2) RRUS-11	B	From Face	0.50	0.0000	176.00	No Ice	2.94	1.25	0.04
(AT&T-Existing)			0.00			1/2" Ice	3.17	1.41	0.06
			2.00			1" Ice	3.41	1.59	0.09
						2" Ice	3.91	1.96	0.14
						4" Ice	5.02	2.82	0.29
(2) RRUS-11	C	From Face	0.50	0.0000	176.00	No Ice	2.94	1.25	0.04
(AT&T-Existing)			0.00			1/2" Ice	3.17	1.41	0.06
			2.00			1" Ice	3.41	1.59	0.09

tnxTower	Job: 16326 ORANGE TRANSFER STATION	Page: 5 of 11
Black & Veatch Corp. 10950 Grandview Drive Overland Park, KS 66210 Phone: (913) 458-2000 FAX: (913) 458-8136	Project: 176850 (16326VERCT-S (Rev 1))	Date: 16:30:57 12/04/13
	Client: AT&T Towers	Designed by: Vishal Pawar

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	3.91	1.96	0.14
						4" Ice	5.02	2.82	0.29
DC6-48-60-18-8F : SA Squid (AT&T-Existing)	C	From Face	0.50 0.00 -2.00	0.0000	176.00	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	0.03 0.05 0.07 0.12 0.25
4'x2" Mount Pipe (AT&T-Existing)	A	From Face	0.25 0.00 0.00	0.0000	176.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.87 1.11 1.36 1.90 3.23	0.87 1.11 1.36 1.90 3.23	0.01 0.02 0.03 0.06 0.16
4'x2" Mount Pipe (AT&T-Existing)	B	From Face	0.25 0.00 0.00	0.0000	176.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.87 1.11 1.36 1.90 3.23	0.87 1.11 1.36 1.90 3.23	0.01 0.02 0.03 0.06 0.16
4'x2" Mount Pipe (AT&T-Existing)	C	From Face	0.25 0.00 0.00	0.0000	176.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.87 1.11 1.36 1.90 3.23	0.87 1.11 1.36 1.90 3.23	0.01 0.02 0.03 0.06 0.16
5' panel antenna w/ Mount Pipe (Unknown-Existing)	A	From Face	0.50 0.00 0.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.00 7.47 7.95 8.94 11.01	2.78 3.15 3.52 4.29 5.93	0.03 0.07 0.11 0.20 0.47
5' panel antenna w/ Mount Pipe (Unknown-Existing)	B	From Face	0.50 0.00 0.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.00 7.47 7.95 8.94 11.01	2.78 3.15 3.52 4.29 5.93	0.03 0.07 0.11 0.20 0.47
5' panel antenna w/ Mount Pipe (Unknown-Existing)	C	From Face	0.50 0.00 0.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.00 7.47 7.95 8.94 11.01	2.78 3.15 3.52 4.29 5.93	0.03 0.07 0.11 0.20 0.47
PiROD 13' Low Profile Platform (Monopole) (T-Mobile-Existing)	C	None		0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	15.70 20.10 24.50 33.30 50.90	15.70 20.10 24.50 33.30 50.90	1.30 1.76 2.23 3.16 5.02
(2) APX16PV-16PVL w/ Mount Pipe (T-Mobile-Existing)	A	From Leg	3.00 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.94 7.44 7.94 8.98 11.17	3.31 4.02 4.68 6.07 9.05	0.06 0.11 0.16 0.28 0.65
(2) APX16PV-16PVL w/ Mount Pipe (T-Mobile-Existing)	B	From Face	3.00 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.94 7.44 7.94 8.98 11.17	3.31 4.02 4.68 6.07 9.05	0.06 0.11 0.16 0.28 0.65
(2) APX16PV-16PVL w/ Mount Pipe (T-Mobile-Existing)	C	From Face	3.00 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.94 7.44 7.94 8.98 11.17	3.31 4.02 4.68 6.07 9.05	0.06 0.11 0.16 0.28 0.65

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(2) LGP21401 (T-Mobile-Existing)	A	From Face	3.00 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.23 1.38 1.54 1.89 2.69	0.26 0.34 0.44 0.64 1.16	0.01 0.02 0.03 0.05 0.14
(2) LGP21401 (T-Mobile-Existing)	B	From Face	3.00 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.23 1.38 1.54 1.89 2.69	0.26 0.34 0.44 0.64 1.16	0.01 0.02 0.03 0.05 0.14
(2) LGP21401 (T-Mobile-Existing)	C	From Face	3.00 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.23 1.38 1.54 1.89 2.69	0.26 0.34 0.44 0.64 1.16	0.01 0.02 0.03 0.05 0.14
PiROD 13' Low Profile Platform (Monopole) (Nextel-Existing)	C	None		0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	15.70 20.10 24.50 33.30 50.90	15.70 20.10 24.50 33.30 50.90	1.30 1.76 2.23 3.16 5.02
(4) 844G45VTZASX w/Mount Pipe (Nextel-Existing)	A	From Face	3.00 0.00 0.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.71 8.44 9.04 10.29 12.93	5.63 6.73 7.54 9.21 12.75	0.04 0.10 0.17 0.33 0.78
(4) 844G45VTZASX w/Mount Pipe (Nextel-Existing)	B	From Face	3.00 0.00 0.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.71 8.44 9.04 10.29 12.93	5.63 6.73 7.54 9.21 12.75	0.04 0.10 0.17 0.33 0.78
(4) 844G45VTZASX w/Mount Pipe (Nextel-Existing)	C	From Face	3.00 0.00 0.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.71 8.44 9.04 10.29 12.93	5.63 6.73 7.54 9.21 12.75	0.04 0.10 0.17 0.33 0.78
PiROD 13' Low Profile Platform (Monopole) (Sprint-Existing)	C	None		0.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	15.70 20.10 24.50 33.30 50.90	15.70 20.10 24.50 33.30 50.90	1.30 1.76 2.23 3.16 5.02
(2) APXVSPP18-C-A20 w/ Mount Pipe (Sprint-Existing)	A	From Face	3.00 0.00 2.40	10.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.95 8.13 9.02 10.84 14.85	0.08 0.15 0.23 0.41 0.91
(2) APXVSPP18-C-A20 w/ Mount Pipe (Sprint-Existing)	B	From Face	3.00 0.00 2.40	0.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.95 8.13 9.02 10.84 14.85	0.08 0.15 0.23 0.41 0.91
(2) APXVSPP18-C-A20 w/ Mount Pipe (Sprint-Existing)	C	From Face	3.00 0.00 2.40	15.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.95 8.13 9.02 10.84 14.85	0.08 0.15 0.23 0.41 0.91
1900 MHz RRH (Sprint-Existing)	A	From Face	3.00 -6.00	10.0000	125.00	No Ice 1/2" Ice	3.83 4.10	2.88 3.12	0.10 0.14

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			2.40			1" Ice	4.37	3.36	0.17
						2" Ice	4.94	3.88	0.25
						4" Ice	6.19	5.01	0.47
1900 MHz RRH (Sprint-Existing)	B	From Face	3.00 -6.00 2.40	0.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.83 4.10 4.37 4.94 6.19	2.88 3.12 3.36 3.88 5.01	0.10 0.14 0.17 0.25 0.47
1900 MHz RRH (Sprint-Existing)	C	From Face	3.00 -6.00 2.40	15.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.83 4.10 4.37 4.94 6.19	2.88 3.12 3.36 3.88 5.01	0.10 0.14 0.17 0.25 0.47
800 MHz RRH (Sprint-Existing)	A	From Face	3.00 6.00 2.40	10.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.40 2.61 2.83 3.30 4.34	2.25 2.46 2.68 3.13 4.15	0.10 0.12 0.15 0.21 0.37
800 MHz RRH (Sprint-Existing)	B	From Face	3.00 6.00 2.40	0.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.40 2.61 2.83 3.30 4.34	2.25 2.46 2.68 3.13 4.15	0.10 0.12 0.15 0.21 0.37
800 MHz RRH (Sprint-Existing)	C	From Face	3.00 6.00 2.40	15.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.40 2.61 2.83 3.30 4.34	2.25 2.46 2.68 3.13 4.15	0.10 0.12 0.15 0.21 0.37
800MHz External Notch Filter (Sprint-Existing)	A	From Face	3.00 0.00 2.40	10.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.77 0.89 1.02 1.30 1.97	0.39 0.48 0.58 0.81 1.36	0.01 0.02 0.02 0.04 0.11
800MHz External Notch Filter (Sprint-Existing)	B	From Face	3.00 0.00 2.40	0.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.77 0.89 1.02 1.30 1.97	0.39 0.48 0.58 0.81 1.36	0.01 0.02 0.02 0.04 0.11
800MHz External Notch Filter (Sprint-Existing)	C	From Face	3.00 0.00 2.40	15.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.77 0.89 1.02 1.30 1.97	0.39 0.48 0.58 0.81 1.36	0.01 0.02 0.02 0.04 0.11
LLPX310R w/ Mount Pipe (Clear Wireless-Existing)	A	From Face	3.00 2.50 2.00	50.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.06 5.47 5.90 6.78 8.70	2.97 3.51 4.07 5.30 8.11	0.05 0.08 0.13 0.23 0.54
LLPX310R w/ Mount Pipe (Clear Wireless-Existing)	B	From Face	3.00 2.50 2.00	30.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.06 5.47 5.90 6.78 8.70	2.97 3.51 4.07 5.30 8.11	0.05 0.08 0.13 0.23 0.54
LLPX310R w/ Mount Pipe (Clear Wireless-Existing)	C	From Face	3.00 2.50 2.00	20.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.06 5.47 5.90 6.78	2.97 3.51 4.07 5.30	0.05 0.08 0.13 0.23

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						4" Ice	8.70	8.11	0.54
FDD-R6-RRH : RRH (Clear Wireless-Existing)	A	From Face	3.00 2.50 2.00	50.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.82 2.00 2.19 2.60 3.53	0.83 0.97 1.12 1.45 2.22	0.03 0.04 0.06 0.10 0.20
FDD-R6-RRH : RRH (Clear Wireless-Existing)	B	From Face	3.00 2.50 2.00	30.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.82 2.00 2.19 2.60 3.53	0.83 0.97 1.12 1.45 2.22	0.03 0.04 0.06 0.10 0.20
FDD-R6-RRH : RRH (Clear Wireless-Existing)	C	From Face	3.00 2.50 2.00	20.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.82 2.00 2.19 2.60 3.53	0.83 0.97 1.12 1.45 2.22	0.03 0.04 0.06 0.10 0.20
Horizon Duo : ODU (Clear Wireless-Existing)	A	From Face	3.00 -2.50 2.00	50.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.20 0.27 0.35 0.56 1.09	0.20 0.27 0.35 0.56 1.09	0.01 0.01 0.02 0.03 0.08
Horizon Duo : ODU (Clear Wireless-Existing)	B	From Face	3.00 -2.50 2.00	30.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.20 0.27 0.35 0.56 1.09	0.20 0.27 0.35 0.56 1.09	0.01 0.01 0.02 0.03 0.08
4'x2" Mount Pipe (Clear Wireless-Existing)	A	From Face	3.00 -2.50 0.00	0.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.87 1.11 1.36 1.90 3.23	0.87 1.11 1.36 1.90 3.23	0.01 0.02 0.03 0.06 0.16
4'x2" Mount Pipe (Clear Wireless-Existing)	B	From Face	3.00 -2.50 0.00	0.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.87 1.11 1.36 1.90 3.23	0.87 1.11 1.36 1.90 3.23	0.01 0.02 0.03 0.06 0.16
PiROD 13' Low Profile Platform (Monopole) (Verizon-Existing)	C	None		0.0000	115.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	15.70 20.10 24.50 33.30 50.90	15.70 20.10 24.50 33.30 50.90	1.30 1.76 2.23 3.16 5.02
BXA-171063-12BF w/ Mount Pipe (Verizon-Proposed)	A	From Face	3.00 6.00 2.00	40.0000	115.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.92 5.47 5.99 7.04 9.30	5.18 6.34 7.22 9.00 12.78	0.04 0.09 0.14 0.27 0.67
BXA-171063-12BF w/ Mount Pipe (Verizon-Proposed)	B	From Face	3.00 6.00 2.00	0.0000	115.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.92 5.47 5.99 7.04 9.30	5.18 6.34 7.22 9.00 12.78	0.04 0.09 0.14 0.27 0.67
BXA-171063-12BF w/ Mount Pipe (Verizon-Proposed)	C	From Face	3.00 6.00 2.00	40.0000	115.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.92 5.47 5.99 7.04 9.30	5.18 6.34 7.22 9.00 12.78	0.04 0.09 0.14 0.27 0.67
BXA-70063-4CF w/ Mount	A	From Face	3.00	40.0000	115.00	No Ice	5.89	4.10	0.04

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Pipe			-6.00			1/2" Ice	6.59	5.13	0.08
(Verizon-Proposed)			2.00			1" Ice	7.17	5.88	0.14
						2" Ice	8.36	7.44	0.27
						4" Ice	10.91	10.88	0.65
BXA-70063-4CF w/ Mount	B	From Face	3.00	0.0000	115.00	No Ice	5.89	4.10	0.04
Pipe			-6.00			1/2" Ice	6.59	5.13	0.08
(Verizon-Proposed)			2.00			1" Ice	7.17	5.88	0.14
						2" Ice	8.36	7.44	0.27
						4" Ice	10.91	10.88	0.65
BXA-70063-4CF w/ Mount	C	From Face	3.00	40.0000	115.00	No Ice	5.89	4.10	0.04
Pipe			-6.00			1/2" Ice	6.59	5.13	0.08
(Verizon-Proposed)			2.00			1" Ice	7.17	5.88	0.14
						2" Ice	8.36	7.44	0.27
						4" Ice	10.91	10.88	0.65
SLCP 2x6015 w/mount pipe	A	From Face	3.00	40.0000	115.00	No Ice	10.72	10.00	0.06
(Verizon-Existing)			2.50			1/2" Ice	11.42	11.34	0.15
			2.00			1" Ice	12.09	12.45	0.25
						2" Ice	13.45	14.57	0.47
						4" Ice	16.28	19.03	1.09
SLCP 2x6015 w/mount pipe	B	From Face	3.00	0.0000	115.00	No Ice	10.72	10.00	0.06
(Verizon-Existing)			2.50			1/2" Ice	11.42	11.34	0.15
			2.00			1" Ice	12.09	12.45	0.25
						2" Ice	13.45	14.57	0.47
						4" Ice	16.28	19.03	1.09
SLCP 2x6015 w/mount pipe	C	From Face	3.00	40.0000	115.00	No Ice	10.72	10.00	0.06
(Verizon-Existing)			2.50			1/2" Ice	11.42	11.34	0.15
			2.00			1" Ice	12.09	12.45	0.25
						2" Ice	13.45	14.57	0.47
						4" Ice	16.28	19.03	1.09
BXA-171063-12BF w/	A	From Face	3.00	40.0000	115.00	No Ice	4.92	5.18	0.04
Mount Pipe			-2.50			1/2" Ice	5.47	6.34	0.09
(Verizon-Existing)			2.00			1" Ice	5.99	7.22	0.14
						2" Ice	7.04	9.00	0.27
						4" Ice	9.30	12.78	0.67
BXA-171063-12BF w/	B	From Face	3.00	0.0000	115.00	No Ice	4.92	5.18	0.04
Mount Pipe			-2.50			1/2" Ice	5.47	6.34	0.09
(Verizon-Existing)			2.00			1" Ice	5.99	7.22	0.14
						2" Ice	7.04	9.00	0.27
						4" Ice	9.30	12.78	0.67
BXA-171063-12BF w/	C	From Face	3.00	40.0000	115.00	No Ice	4.92	5.18	0.04
Mount Pipe			-2.50			1/2" Ice	5.47	6.34	0.09
(Verizon-Existing)			2.00			1" Ice	5.99	7.22	0.14
						2" Ice	7.04	9.00	0.27
						4" Ice	9.30	12.78	0.67
RRH2x40-AWS : RRH	A	From Face	3.00	40.0000	115.00	No Ice	2.52	1.59	0.04
(Verizon-Proposed)			0.00			1/2" Ice	2.75	1.80	0.06
			2.00			1" Ice	2.99	2.01	0.08
						2" Ice	3.50	2.46	0.13
						4" Ice	4.61	3.48	0.28
RRH2x40-AWS : RRH	B	From Face	3.00	0.0000	115.00	No Ice	2.52	1.59	0.04
(Verizon-Proposed)			0.00			1/2" Ice	2.75	1.80	0.06
			2.00			1" Ice	2.99	2.01	0.08
						2" Ice	3.50	2.46	0.13
						4" Ice	4.61	3.48	0.28
RRH2x40-AWS : RRH	C	From Face	3.00	40.0000	115.00	No Ice	2.52	1.59	0.04
(Verizon-Proposed)			0.00			1/2" Ice	2.75	1.80	0.06
			2.00			1" Ice	2.99	2.01	0.08

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	3.50	2.46	0.13
						4" Ice	4.61	3.48	0.28
DB-T1-6Z-8AB-0Z : Distribution Box (Verizon-Proposed)	C	From Face	1.00 0.00 2.00	0.0000	115.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.60 5.92 6.24 6.91 8.37	2.33 2.56 2.79 3.28 4.37	0.04 0.08 0.12 0.21 0.45
GPS (Verizon-Existing)	C	From Face	3.00 0.00 0.00	0.0000	115.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.00 1.50 2.00 3.00 5.00	1.00 1.50 2.00 3.00 5.00	0.01 0.01 0.02 0.03 0.05
2' Standoff T-Arm (5' face width) (Sprint-Existing)	C	From Face	0.00 0.00 0.00	0.0000	60.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.50 4.20 4.90 6.30 9.10	3.50 4.20 4.90 6.30 9.10	0.09 0.12 0.15 0.21 0.32
GPS-TMG-HR-26NCM (Sprint-Existing)	C	From Face	0.50 0.00 0.00	0.0000	60.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.16 0.21 0.28 0.44 0.86	0.16 0.21 0.28 0.44 0.86	0.00 0.00 0.01 0.01 0.05

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
Dragonwave A-ANT-23G-2-C (Clear Wireless-Existing)	A	Paraboloid w/Shroud (HP)	From Face	3.00 -2.50 2.00	50.0000		125.00	2.17	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.72 4.01 4.30 4.88 6.04	0.03 0.05 0.07 0.11 0.19
Dragonwave A-ANT-23G-2-C (Clear Wireless-Existing)	B	Paraboloid w/Shroud (HP)	From Face	3.00 -2.50 2.00	30.0000		125.00	2.17	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.72 4.01 4.30 4.88 6.04	0.03 0.05 0.07 0.11 0.19

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
177.00	PiROD 13' Low Profile Platform (Monopole)	27	36.800	1.7778	0.0028	35748
176.00	Light collar	27	36.428	1.7774	0.0028	35748
165.00	5' panel antenna w/ Mount Pipe	27	32.363	1.7551	0.0024	15721
148.00	PiROD 13' Low Profile Platform (Monopole)	27	26.279	1.6592	0.0021	8433
137.00	PiROD 13' Low Profile Platform	27	22.550	1.5661	0.0019	6477

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
	(Monopole)					
127.00	Dragonwave A-ANT-23G-2-C	27	19.353	1.4659	0.0017	5592
125.00	PiROD 13' Low Profile Platform (Monopole)	27	18.739	1.4444	0.0017	5524
115.00	PiROD 13' Low Profile Platform (Monopole)	27	15.800	1.3315	0.0014	5209
60.00	2' Standoff T-Arm (5' face width)	27	4.090	0.6438	0.0003	4163

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	180 - 170.58	Pole	TP26.25x24x0.1875	1	-5.37	36.47	14.8	Pass
L2	170.58 - 126	Pole	TP36.525x25.0581x0.25	2	-9.52	185.14	55.2	Pass
L3	126 - 82.75	Pole	TP46.357x34.8903x0.3125	3	-22.54	473.50	93.3	Pass
L4	82.75 - 40.75	Pole	TP55.765x44.2987x0.375	4	-35.26	988.72	98.8	Pass
L5	40.75 - 0	Pole	TP64.75x53.2831x0.4375	5	-54.08	1986.10	94.6	Pass
							Summary	
						Pole (L4)	98.8	Pass
						RATING =	**98.8**	**Pass**

BLACK & VEATCH
Building a world of difference.
10950 Grandview Drive
Overland Park, KS 66210
Phone: (913) 458-2000

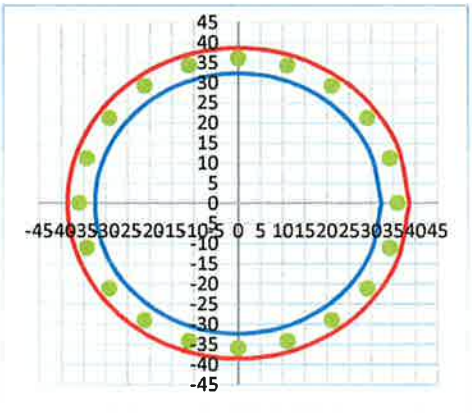
Client:	AT&T Towers	Design:	Vishal Pawar
Project:	176850	Date:	12/3/2013
Site:	16326VERCT-S (Rev 1)	Verify:	J. Riley
Title:	Base Plate Capacity Calculation	Date:	12/4/2013
		Code:	TIA/EIA-222-F

Template Version 1.3

3.0 ANALYSIS:

Base Plate Information:

Bolt Grade:	A615-75	
Bolt Diameter:	2 1/4	in
Number of Bolts, n:	20	
Base Plate Grade:	A572-60	
Base Plate Thickness, tp:	2.75	in
Bolt Circle Diameter, DBC:	72.0	in
Plate Outside Diameter, Do:	77.3	in
Pole Diameter, Dp:	64.750	in
Pole to Base Plate Weld Size:	5/16	in
Base Plate Type:	Plain Plate	
Grout Spacing:	3.0	in
Number of Leveling Nuts per bolt:	1.0	
Number of Stiffeners, ns:		
Stiffener Thickness, ts:		in
Stiffener Height, hs:		in



Tower Reactions (Per tnxTower):

Axial, Pu:	54	kip
Shear, Vu:	47	kip
Overturning Moment, Mu:	5647	kip-ft

Design Resistance Factor:

ASD Overstress Factor:	1.333
Bolts Tension Reduction Factor:	0.33
Bolts Shear Reduction Factor:	0.17
Bolts Flexure Reduction Factor:	0.75
Plate Flexure Reduction Factor:	0.75

Calculation:

Anchor Bolt Capacity Check:

Max Axial Force:	190.93	kip
Max Shear Force:	2.35	kip
Max Bending Moment due to Shear:	1.24	kip-in
Allowable Bolt Design Tensile Capacity:	194.81	kip
Allowable Bolt Design Shear Capacity:	90.10	kip
Allowable Bolt Design Flexural Capacity:	83.85	kip-in

Controlling Anchor Bolt Capacity: **98.0%**

Conclusion:

Existing anchor bolt has adequate capacity to support the existing and proposed loads.

BLACK & VEATCH Building a world of difference.	Client:	AT&T Towers	Design:	Vishal Pawar
	Project:	176850	Date:	12/3/2013
10950 Grandview Drive Overland Park, KS 66210 Phone: (913) 458-2000	Site:	16326VERCT-S (Rev 1)	Verify:	J. Riley
	Title:	Base Plate Capacity Calculation	Date:	12/4/2013
			Code:	TIA/EIA-222-F

Template Version 1.3

Base Plate Capacity Check:

Bolt Spacing:	11.31	In
Distance Between Bolts to Pole, c:	3.18	in
Angle Between Bolts, θ:	18	degree
Effective Width, b_{eff}:	11.26	in
Plate stress, σ:	42.81	ksi

Base Plate Capacity: **71.4%**

Conclusion:

Existing base plate has adequate capacity to support the existing and proposed loads.

Dimensional Solutions Mat3D		Version	6.0.0		Date	12/3/2013
Foundation Name	16326VERCT-S (Rev 1) Foundation Analysis				Time	11:06:19
Designed By:	Black & Veatch Corporation	Engineer		Vishal Pawar	Checker	J. Riley
Filename:						

DETAIL REPORT

PROJECT INFORMATION

Project Name:	AT&T Tower Analysis
Project Number:	176850
Client:	AT&T Towers
Project Location	
Foundation Description	16326VERCT-S (REV 1) FOUNDATION ANALYSIS

DESIGN CODE ACI 318 - 2005 **INPUT UNITS** English **OUTPUT UNITS** English

CONCRETE PARAMETERS:

Compressive Strength (psi)	3000
Unit Weight (pcf)	150
Pier Concrete Cover - X Dir (in)	3
Pier Concrete Cover - Z Dir (in)	3
Footing Side Concrete Cover - X Dir (in)	3
Footing Side Concrete Cover - Z Dir (in)	3
Footing Top Concrete Cover (in)	3
Footing Bottom Concrete Cover - X Dir (in)	3

REINFORCING STEEL PARAMETERS:

Yield Strength (ksi)	60
Unit Weight (pcf)	490
Modulus of Elasticity (ksi)	29000
Pier Min Rebar Spacing (in)	3
Footing Min Rebar Spacing (in)	6
Footing Max Rebar Spacing (in)	24

SOIL PARAMETERS:

Unit Weight (pcf)	120
Allowable Net Bearing Capacity (psf)	6000
Bearing Capacity Method	Reduced Effective Area
Soil Type	Granular
Passive Pressure Coefficient Kp	3
Soil To Concrete Friction f	0.6
Allowable Increase in Soil Pressure due to Short Term Loads (%)	
Wind 0 Earthquake 0 Test 0	
Min Stability Ratio	1.5
Safety Factor against Lateral Forces	1.5

REBAR PARAMETERS:

Max Long Bar Size	10
Min Long Bar Size	5
Max Tie Bar Size	7
Min Tie Bar Size	3
Max Ftg Bar Size	10
Min Ftg Bar Size	5
Temp & Shrinkage Steel Ratio	0.0009

MINIMUM FOUNDATION CRITERIA:

Depth of Footing Below Grade (ft)	7
Minimum Soil Cover (ft)	1
Grade Elevation (ft)	0

BUOYANCY CRITERIA:

Consider Buoyancy:	No
Consider soil for buoyancy:	No
Water table below grade (ft)	7

Dimensional Solutions Mat3D		Version	6.0.0		Date	12/3/2013
Foundation Name	16326VERCT-S (Rev 1) Foundation Analysis				Time	11:06:19
Designed By:	Black & Veatch Corporation	Engineer		Vishal Pawar	Checker	J. Riley
Filename:						

DETAIL REPORT

APPLIED LOADS

P1

Load Case	Axial (kips)	Shear X (kips)	Mom Z (kip ft)	Shear Z (kips)	Mom X (kip ft)
1 - Dead	54.00	0.00	0.00	0.00	0.00
2 - Wind	0.00	47.00	5647.00	0.00	0.00

UNFACTORED (ALLOWABLE) LOAD COMBINATIONS

P1

Load Comb	Axial (kips)	Shear X (kips)	Mom Z (kip ft)	Shear Z (kips)	Mom X (kip ft)
1 - Dead	54.00	0.00	0.00	0.00	0.00
2 - Dead + Wind	54.00	47.00	5647.00	0.00	0.00

FACTORED (ULTIMATE) LOAD COMBINATIONS

P1

Load Comb	Axial (kips)	Shear X (kips)	Mom Z (kip ft)	Shear Z (kips)	Mom X (kip ft)
1 - 1.4Dead	75.60	0.00	0.00	0.00	0.00
2 - 1.2Dead + 1.6Wind	64.80	75.20	9035.20	0.00	0.00
3 - 0.9Dead + 1.6Wind	48.60	75.20	9035.20	0.00	0.00

BEARING CAPACITY - REDUCED EFFECTIVE AREA METHOD

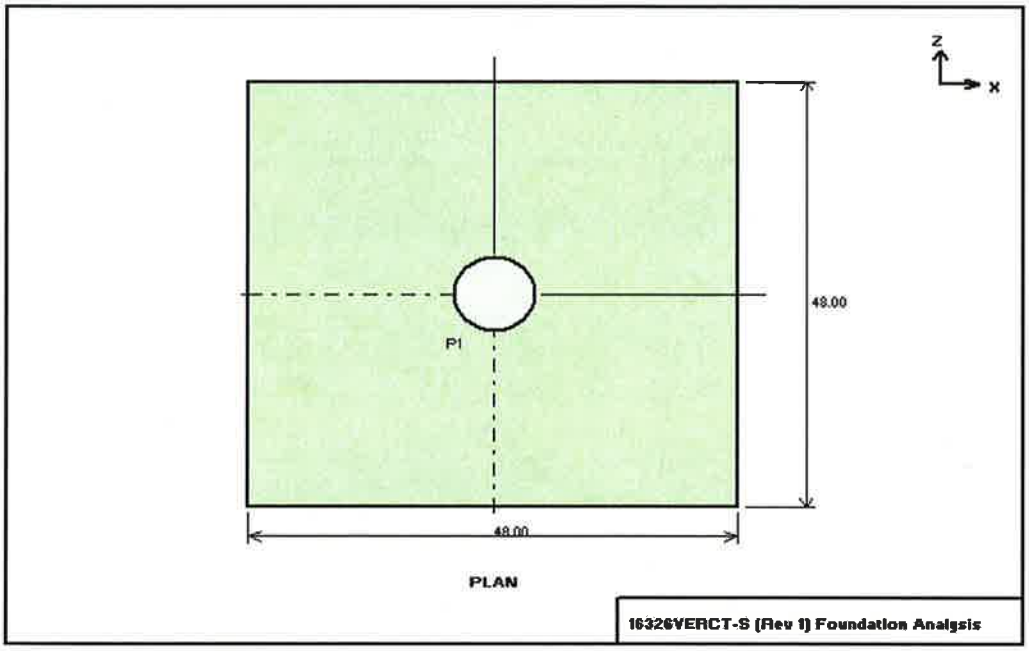
Load Comb	Max Pressure (ksf)	All Pressure (ksf)	Ecc Z Dir (ft)	Ecc X Dir (ft)	Moment Z axis (kip-ft)	Moment X axis (kip-ft)	Rem
1 - Dead	1.05	6.84	0.00	0.00	0.00	0.00	
2 - Dead + Wind	1.17	6.84	0.00	2.50	6023.00	0.00	
	Stress Ratio =	17.11 %					

STABILITY RATIO / SLIDING SAFETY FACTOR

Load Comb	S.R. Z Dir	S.R. X Dir	All S.R.	Sliding FS - Z	Sliding FS - X	All FS	Remarks
1 - Dead	100.00	100.00	1.50	100.00	100.00	1.50	
2 - Dead + Wind	100.00	9.62	1.50	100.00	39.63	1.50	
	Stress Ratio =	15.59 %					

Dimensional Solutions Mat3D		Version	6.0.0		Date	12/3/2013
Foundation Name	16326VERCT-S (Rev 1) Foundation Analysis				Time	11:06:19
Designed By:	Black & Veatch Corporation	Engineer		Vishal Pawar	Checker	J. Riley
Filename:						

DETAIL REPORT



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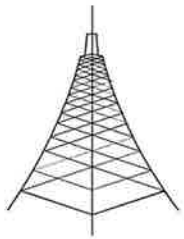


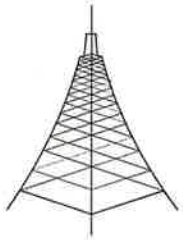
Letter of Explanation (LOE)

MUST be attached to any Structural Analysis

Site Name	*ORANGE TRANSFER STATION*
Site Number	*16326VERCT-S (Rev 1)*
PE of Record	*Chris A. Krafft, P.E. (Registration No. 27383)*

ALL STRUCTURES	Statement in COL A is Correct	VARIANCE from Col A	N/A	Alternate Value / Concept Used	Explanation	Yes	No	N/A	Comments / Reference
Structure Analyzed to F Code	X								
Note: ALL G analyses MUST be justified. A simple notation of jurisdiction requirement will suffice. F BUILT TOWERS in G Code jurisdictions MUST Have the new "5% Grace" Test Applied. G to be applied ONLY where this is exceeded. This 5% test applies to "like for like" only									
Guy Tensions Adjusted Within Code to Find Optimum tension / Minimum Reinforcement (Applies to Guyed Tower Failures Only). Note : AT&T requires a pulse chart for altered Tensions			X						
Antenna Azimuths Inputted Per AT&T Information Note Default Azimuths in PL		X			Precise azimuth information is not available for Unknown, T-Mobile, and Nextel				
All Yield Stresses > = 50 ksi (legs)			X						
All Yield Stresses > = 36 ksi (Diagonals and Horizontals))			X						
Structures Designated Class II (G Only)			X						
Exposure B Rating Used (Topography)			X						
K value for Slenderness ratio < 1.0			X						
Shielding of All Appurtenances Used when Appropriate PER 2.6.9.4 (G Code Only)			X						
0.75 Reduction "Shape" Factor (Figure 2.6) for platform mounts, 0.8 for T-Boom Mounts Used (G Only)			X						
Pipes and round Members have 1.0 Drag Factors. Note if Pipe is attached to flat antenna, these must be considered separately if differing Drag factors are Used	X								
Are Tower Diagonals Designed as "Tension Only"			X						

at&t



Letter of Explanation (LOE)

MUST be attached to any Structural Analysis

Site Name	***ORANGE TRANSFER STATION***
Site Number	***16326VERCT-S (Rev 1)***
PE of Record	***Chris A. Krafft, P.E. (Registration No. 27383)***

MODIFICATION SECTION	Statement in COL A is Correct	Deviation from Col A	N/A	Alternate Value / Concept Used	Explanation	Yes	No	N/A	Comments / Reference
Guyed									
Guyed Only: Reinforcement Recommendation accompanies Optimum Guy Tensioning Scenario.			X						
Compression Failing Legs / Diagonals / Horizontals: Effective Length Reduced by U-Bolted Member			X						
NOTE: Welded Solution Must be Explained and will only be considered in cases where other reinforcing methods will not work.									
Self Supporting									
Compression Failing Legs / Diagonals / Horizontals: Effective Length Reduced by U-Bolted Member			X						
NOTE: Welded Solution Must be Explained and will only be considered in cases where other reinforcing methods will not work.									
Monopole									
Compression Collars			X						
NOTE: Welded Solution Must be Explained and will only be considered in cases where other reinforcing methods will not work.									
Foundation									
Guyed Anchor Failure: Berm Solution			X						
SS Foundation Pad and Pier Failure Berm			X						
SS Foundation Caisson / Concrete Cap			X						
Monopole: Cap			X						