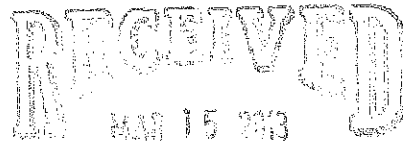


280 Trumbull Street  
 Hartford, CT 06103-3597  
 Main (860) 275-8200  
 Fax (860) 275-8299  
 kbaldwin@rc.com  
 Direct (860) 275-8345

Also admitted in Massachusetts

March 14, 2013



CONNECTICUT  
 SITING COUNCIL

Linda Roberts  
 Executive Director  
 Connecticut Siting Council  
 10 Franklin Square  
 New Britain, CT 06051

Re: **Notice of Exempt Modification – Revised Antenna Configuration  
 1593 Exeter Road, Lebanon, Connecticut**

Dear Ms. Roberts:

On October 7, 2010, the Connecticut Siting Council (the “Council”) approved Petition No. 964, a request by Cellco Partnership d/b/a Verizon Wireless (“Cellco”) to extend the existing AT&T tower by 30 feet to an overall height of 150 feet and install twelve (12) antennas at the top of the tower.

Since receiving the Petition No. 964 approval, Cellco has decided to modify its antenna configuration and install additional equipment on the tower. Cellco now intends to install three (3) model BXA-80063-6CF cellular antennas; three (3) model BXA-171063-12CF PCS antennas; three (3) model BXA-70063-6CF LTE antennas; and three (3) model BXA-171063-12CF AWS antennas, all at the 150-foot level on the extended tower. Cellco also intends to install three (3) remote radio heads (“RRHs”) behind its antennas and one (1) HYBRIFLEX™ fiber cables inside the monopole tower. Attached behind Tab 1 are the specifications for Cellco’s new 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 Joyce Okonuk, First Selectman for the Town of Lebanon. A copy of this letter is being sent to the Florence Liebman, 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).

12126622-v1



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Linda Roberts  
March 14, 2013  
Page 2

1. The proposed modifications will not result in an increase in the height of the approved (extended) tower. Celco's antennas and RRHs will be located at the same 150-foot level.
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 Celco's new antennas will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) adopted safety standard. A cumulative General Power Density table for Celco's modified facility is included behind Tab 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 Celco's proposed antennas, RRHs and related equipment described in this filing. (See Structural Analysis Report attached behind Tab 3).

For the foregoing reasons, Celco respectfully submits that the revised antenna configuration at 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:

Joyce Okonuk, Lebanon First Selectman  
Florence Liebman  
Sandy M. Carter



**BXA-80063-6CF-EDIN-X**

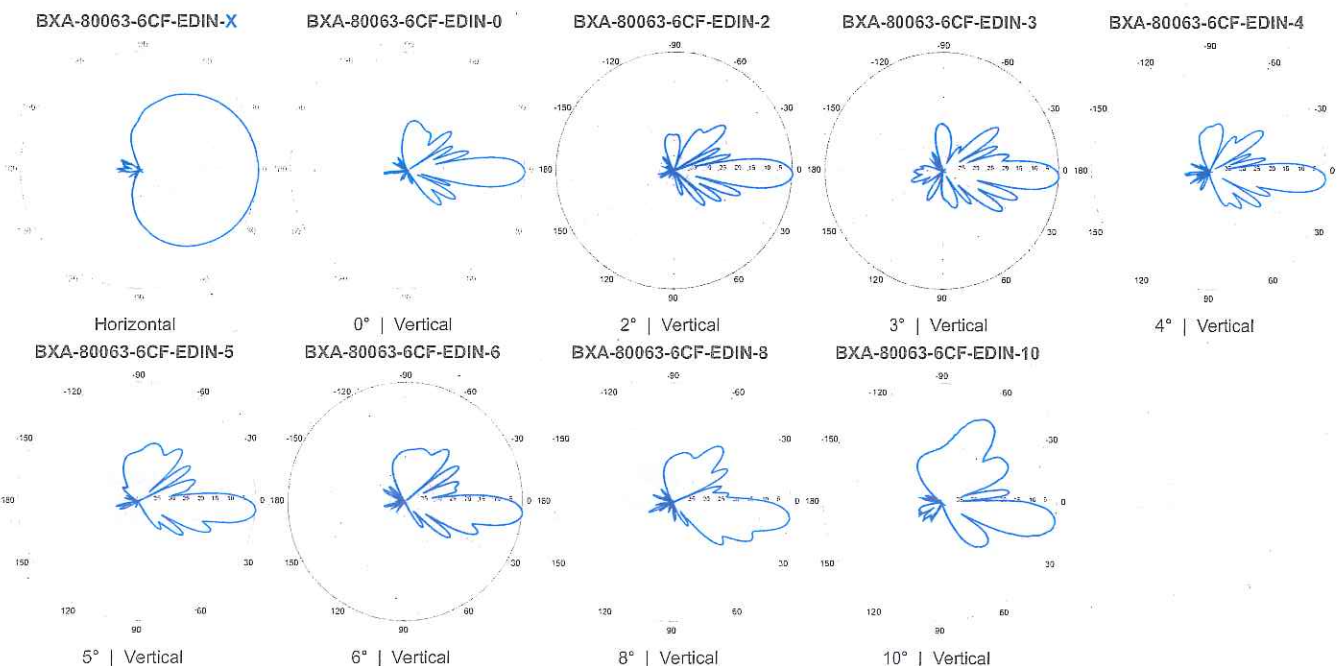
X-Pol | FET Panel | 63° | 14.5 dBd

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	
Frequency bands	806-900 MHz*
*Optional frequency band for iDEN	806-941 MHz (specify when ordering)
Polarization	±45°
Horizontal beamwidth	63°
Vertical beamwidth	11°
Gain	14.5 dBd (16.6 dBi)
Electrical downtilt (X)	0, 2, 3, 4, 5, 6, 8, 10
Impedance	50Ω
VSWR	≤1.4:1
Upper sidelobe suppression (0°)	-18.2 dB
Front-to-back ratio (+/-30°)	-36.3 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	1804 x 285 x 132 mm      71.0 x 11.2 x 5.2 in
Depth with z-brackets	172 mm      6.8 in
Weight without mounting brackets	7.9 kg      17 lbs
Survival wind speed	> 201 km/hr      > 125 mph
Wind area	Front: 0.51 m <sup>2</sup> Side: 0.24 m <sup>2</sup> Front: 5.5 ft <sup>2</sup> Side: 2.6 ft <sup>2</sup>
Wind load @ 161 km/hr (100 mph)	Front: 759 N    Side: 391 N      Front: 169 lbf    Side: 89 lbf
Mounting Options	
3-Point Mounting & Downtilt Bracket Kit	Part Number: 36210008    Fits Pipe Diameter: 40-115 mm 1.57-4.5 in    Weight: 6.9 kg 15.2 lbs
Concealment Configurations	For concealment configurations, order BXA-80063-6CF-EDIN-X-FP



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-171063-12CF-EDIN-X

X-Pol | FET Panel | 63° | 19.0 dBi

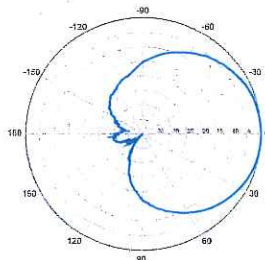
Replace "X" with desired electrical downtilt.

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

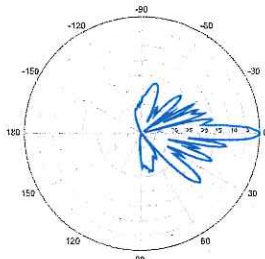


Electrical Characteristics		1710-2170 MHz				
Frequency bands	1710-1880 MHz	1850-1990 MHz	1920-2170 MHz			
Polarization	±45°	±45°	±45°			
Horizontal beamwidth	68°	65°	60°			
Vertical beamwidth	4.5°	4.5°	4.5°			
Gain	16.1 dBd / 18.2 dBi	16.5 dBd / 18.6 dBi	16.9 dBd / 19.0 dBi			
Electrical downtilt (X)		0, 2, 5				
Impedance	50Ω					
VSWR	≤1.5:1					
First upper sidelobe	< -17 dB					
Front-to-back ratio	> 30 dB					
In-band isolation	> 28 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 m <sup>2</sup> Side: 0.19 m <sup>2</sup>	Front: 3.1 ft <sup>2</sup> Side: 2.1 ft <sup>2</sup>				
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

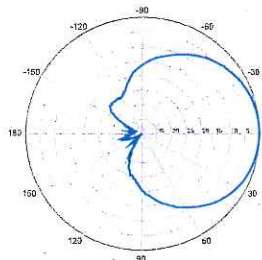


Horizontal | 1710-1880 MHz  
BXA-171063-12CF-EDIN-0

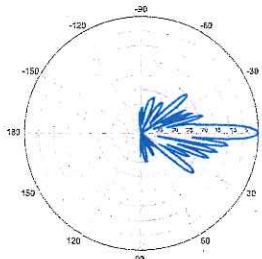


0° | Vertical | 1710-1880 MHz

BXA-171063-12CF-EDIN-X

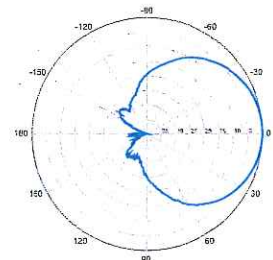


Horizontal | 1850-1990 MHz  
BXA-171063-12CF-EDIN-0

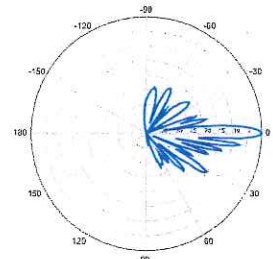


0° | Vertical | 1850-1990 MHz

BXA-171063-12CF-EDIN-X



Horizontal | 1920-2170 MHz  
BXA-171063-12CF-EDIN-0



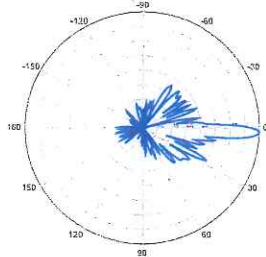
0° | Vertical | 1920-2170 MHz

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-171063-12CF-EDIN-X

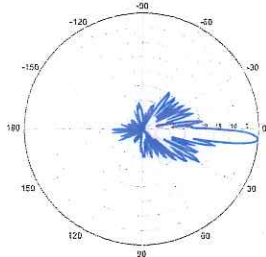
X-Pol | FET Panel | 63° | 19.0 dBi

BXA-171063-12CF-EDIN-2



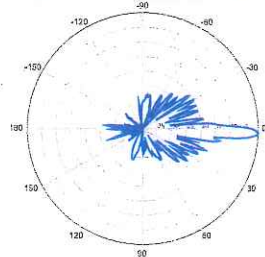
2° | Vertical | 1710-1880 MHz

BXA-171063-12CF-EDIN-5



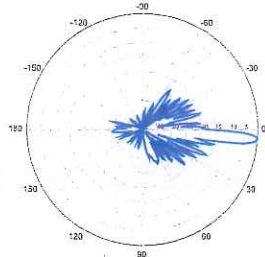
5° | Vertical | 1710-1880 MHz

BXA-171063-12CF-EDIN-2



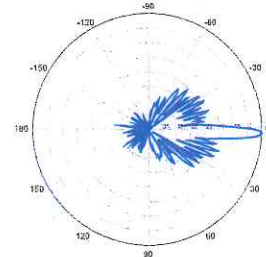
2° | Vertical | 1850-1990 MHz

BXA-171063-12CF-EDIN-5



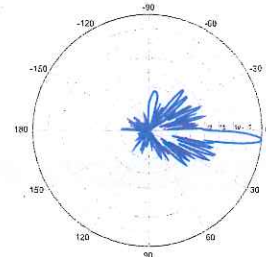
5° | Vertical | 1850-1990 MHz

BXA-171063-12CF-EDIN-2



2° | Vertical | 1920-2170 MHz

BXA-171063-12CF-EDIN-5



5° | Vertical | 1920-2170 MHz

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**BXA-70063-6CF-EDIN-X**

X-Pol | FET Panel | 63° | 14.5 dBd

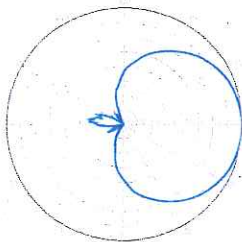
Replace "X" with desired electrical downtilt

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

Electrical Characteristics	696-900 MHz	
	696-806 MHz	806-900 MHz
Frequency bands	696-806 MHz	806-900 MHz
Polarization	±45°	
Horizontal beamwidth	65°	63°
Vertical beamwidth	13°	11°
Gain	14.0 dBd (16.1 dBi)	14.5 dBd (16.6 dBi)
Electrical downtilt (X)	0, 2, 3, 4, 5, 6, 8, 10	
Impedance	50Ω	
VSWR	≤1.35:1	
Upper sidelobe suppression (0°)	-18.3 dB	-18.2 dB
Front-to-back ratio (+/-30°)	-33.4 dB	-36.3 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	1804 x 285 x 132 mm	71.0 x 11.2 x 5.2 in
Depth with z-brackets	172 mm	6.8 in
Weight without mounting brackets	7.9 kg	17 lbs
Survival wind speed	> 201 km/hr	> 125 mph
Wind area	Front: 0.51 m <sup>2</sup> Side: 0.24 m <sup>2</sup>	Front: 5.5 ft <sup>2</sup> Side: 2.6 ft <sup>2</sup>
Wind load @ 161 km/hr (100 mph)	Front: 759 N Side: 391 N	Front: 169 lbf Side: 89 lbf
Mounting Options		
	Part Number	Fits Pipe Diameter
3-Point Mounting & Downtilt Bracket Kit	36210008	40-115 mm 1.57-4.5 in
Concealment Configurations	For concealment configurations, order BXA-70063-6CF-EDIN-X-FP	

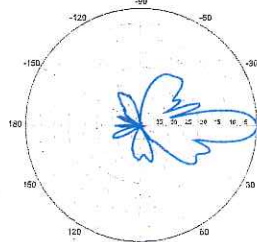


BXA-70063-6CF-EDIN-X



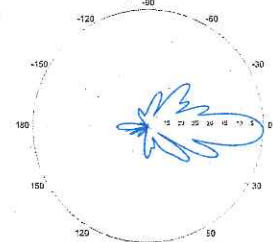
Horizontal | 750 MHz

BXA-70063-6CF-EDIN-0

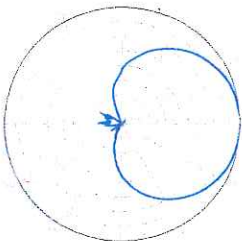


0° | Vertical | 750 MHz

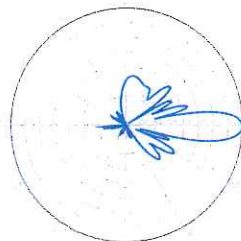
BXA-70063-6CF-EDIN-2



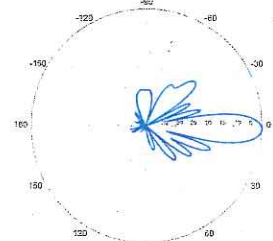
2° | Vertical | 750 MHz



Horizontal | 850 MHz



0° | Vertical | 850 MHz



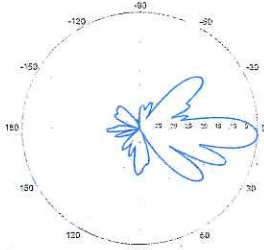
2° | Vertical | 850 MHz

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**BXA-70063-6CF-EDIN-X**

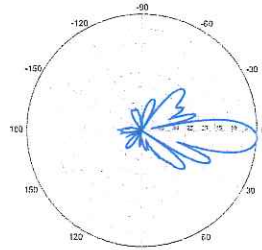
X-Pol | FET Panel | 63° | 14.5 dBd

BXA-70063-6CF-EDIN-3



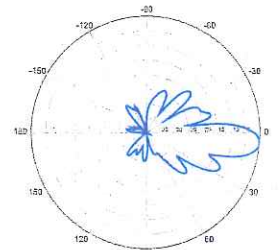
3° | Vertical | 750 MHz

BXA-70063-6CF-EDIN-4

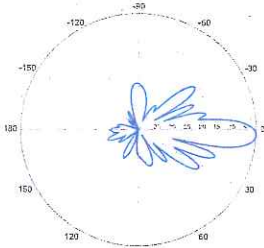


4° | Vertical | 750 MHz

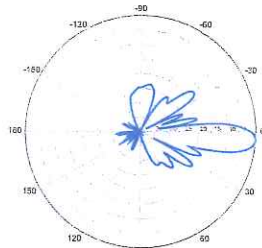
BXA-70063-6CF-EDIN-5



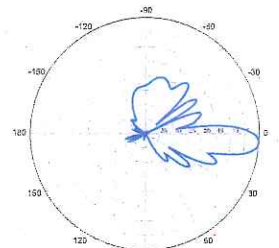
5° | Vertical | 750 MHz



3° | Vertical | 850 MHz

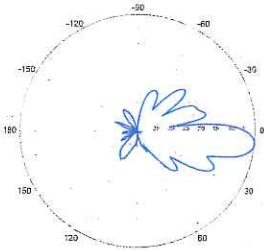


4° | Vertical | 850 MHz



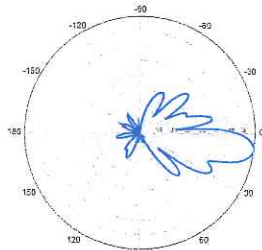
5° | Vertical | 850 MHz

BXA-70063-6CF-EDIN-6



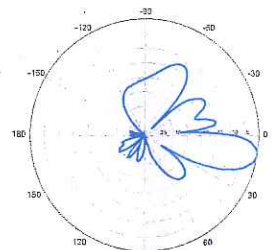
6° | Vertical | 750 MHz

BXA-70063-6CF-EDIN-8

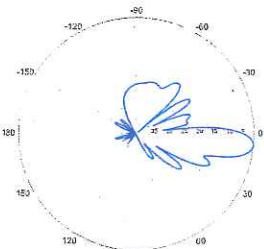


8° | Vertical | 750 MHz

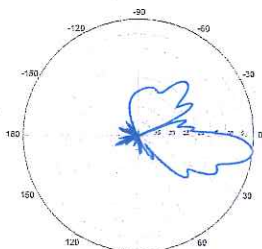
BXA-70063-6CF-EDIN-10



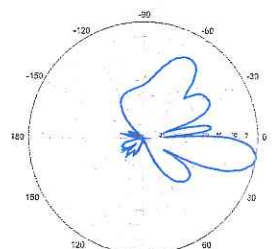
10° | Vertical | 750 MHz



6° | Vertical | 850 MHz



8° | Vertical | 850 MHz



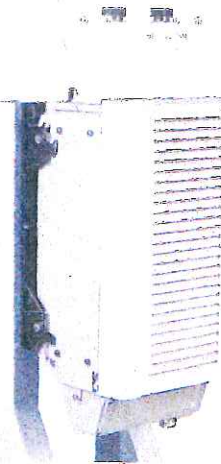
10° | Vertical | 850 MHz

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## 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.

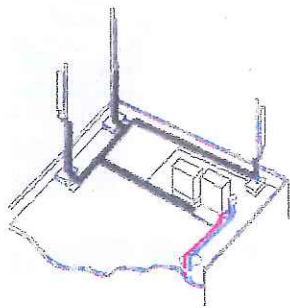
#### Fast, low-cost installation and deployment

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.



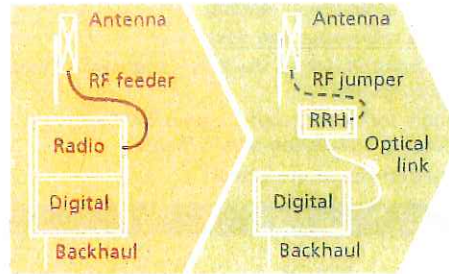
Macro

## Features

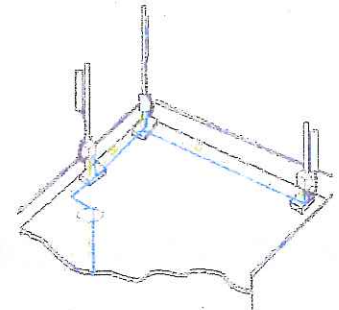
- Zero-footprint deployment
- Easy installation, with a lightweight unit can be carried and set up by one person
- Optimized RF power, with flexible site selection and elimination of a TMA
- Convection-cooled (fanless)
- Noise-free
- Best-in-class power efficiency, with significantly reduced energy consumption

## 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



RRH for space-constrained cell sites



Distributed

## Technical specifications

### Physical dimensions

- Height: 620 mm (24.4 in.)
- Width: 270 mm (10.63 in.)
- Depth: 170 mm (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

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**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.

**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

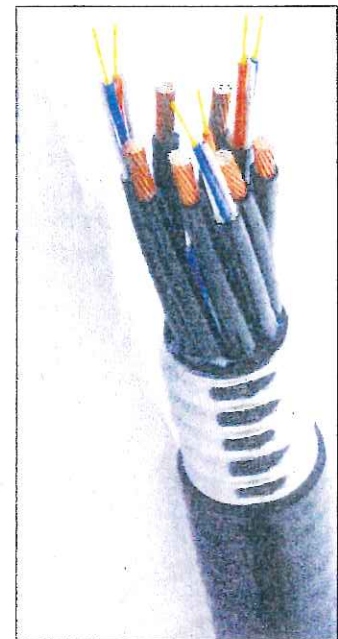


Figure 1: HYBRIFLEX Series

**Technical Specifications**

**Structure**

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

**Mechanical Properties**

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)

**Electrical Properties**

DC-Resistance Outer Conductor Armor		[Ω/km (Ω/1000ft)]	068 (0.205)
DC-Resistance Power Cable, 8.4mm <sup>2</sup> (8AWG)		[Ω/km (Ω/1000ft)]	2.1 (0.307)

**Fiber Optic Properties**

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

**DC Power Cable Properties**

Size (Power)		[mm <sup>2</sup> (AWG)]	8.4 (8)
Quantity, Wire Count (Power)			16 (8 pairs)
Size (Alarm)		[mm <sup>2</sup> (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 XH-HW-2, UL 44 UL-LS Limited Smoke, UL VW-1 IEEE-383 (1974), IEEE1202/FT4 RoHS Compliant

**Environment**

Installation Temperature		[°C (°F)]	-40 to +65 (-40 to 149)
Operation Temperature		[°C (°F)]	-40 to +65 (-40 to 149)

\* This data is provisional and subject to change.

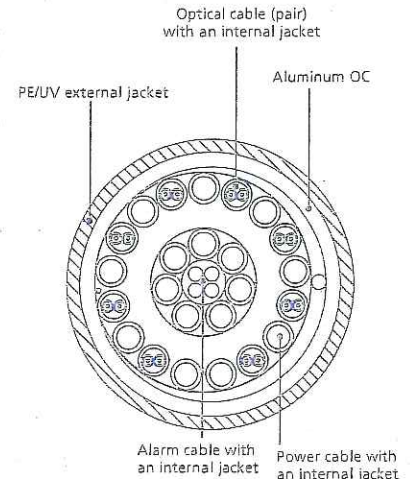


Figure 2: Construction Detail

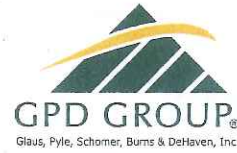
All information contained in the present datasheet is subject to confirmation at time of ordering.

General		Power	Density					
CARRIER	# OF CHAN.	WATTS ERP	HEIGHT	CALC. POWER DENS	FREQ.	MAX. PERMISS. EXP.	FRACTION MPE	Total
*AT&T UMTS	2	565	120	0.0282	880	0.5867	4.81%	
*AT&T UMTS	2	875	120	0.0437	1900	1.0000	4.37%	
*AT&T GSM	1	283	120	0.0071	880	0.5867	1.20%	
*AT&T GSM	4	525	120	0.0524	1900	1.0000	5.24%	
*AT&T LTE	1	1615	120	0.0403	734	0.4893	8.24%	
Verizon PCS	11	238	150	0.0418	1970	1.0000	4.18%	
Verizon Cellular	9	249	150	0.0358	869	0.5793	6.18%	
Verizon AWS	1	1750	150	0.0280	2145	1.0000	2.80%	
Verizon 700	1	1050	150	0.0168	698	0.4653	3.61%	40.64%
* Source: Siting Council								





AT&T Towers  
 5405 Windward Pkwy  
 Alpharetta, GA 30004  
 (770) 708-6100



Kevin Clements  
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 kclements@gpdgroup.com

**GPD# 2013723.27057.01**  
 February 7, 2013

**STRUCTURAL ANALYSIS REPORT**

**AT&T DESIGNATION:** Site USID: 27057  
 Site FA: 10071090  
 Site Name: LEBANON WEST  
 AT&T Project: Verizon tower Extension Colo 4-8/10

**ANALYSIS CRITERIA:** Codes: TIA/EIA-222-F, 2003 IBC, ASCE 7-05 & 2005 CTBC  
 85-mph with 0" ice  
 37-mph with 3/4" ice

**SITE DATA:** 1593 Exeter Road, Lebanon, CT 06249 New London County  
 Latitude 41° 37' 39.331" N, Longitude 72° 18' 20.876" W  
 Market: New England  
 119' EEI Monopole w/ Proposed 30' Extension

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:	75.9%	Pass
Foundation Ratio with Proposed Equipment:	40.9%	Pass

We at GPD appreciate the opportunity of providing our continuing professional services to you and AT&T. 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 Wireless to AT&T. This report was commissioned by Ms. Charlotte Malone of AT&T.

The extension designed by GPD (Project #: 2010276.14, dated 12/28/2010) has been considered for this analysis.

**The proposed coax shall be run internal to the monopole with the existing coax in order for the analysis to be valid.**

### TOWER SUMMARY AND RESULTS

Member	Capacity	Results
Monopole	70.9%	Pass
Flange Bolts	52.6%	Pass
Flange Plates	46.6%	Pass
Anchor Rods	55.6%	Pass
Base Plate	75.9%	Pass
Foundation	40.9%	Pass

## ANALYSIS METHOD

tnxTower (Version 6.0.4.0), 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 site visit.

### DOCUMENTS PROVIDED

Document	Remarks	Source
Preliminary Tower Summary	Verizon Co-location document, uploaded 4/12/2010	Siterra
Site Lease Application	Verizon Application, dated 1/8/2013	N/A
Tower Design	EEL Job #: 12092, dated 10/25/2003	Siterra
Foundation Design	EEL Job #: 12092, dated 10/25/2003	Siterra
Geotechnical Report	VN Engineers, Inc. Project #: 23-121G, dated 11/5/2003	Siterra
Extension Design	GPD Job #: 2010276.14, dated 12/28/2010	Siterra
Previous Structural Analysis	GPD Job #: 2012801.79, dated 1/3/2013	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 monopole shaft sizes and shape are considered accurate as supplied. The material grade is as per data supplied and/or as assumed and as stated in the materials section.
2. The antenna configuration is as supplied and/or as modeled in the analysis. It is assumed to be complete and accurate. All antennas, mounts, coax and waveguides are assumed to be properly installed and supported as per manufacturer requirements.
3. Some assumptions are made regarding antennas and mount sizes and their projected areas based on best interpretation of data supplied and of best knowledge of antenna type and industry practice.
4. All mounts, if applicable, are considered adequate to support the loading. No actual analysis of the mount(s) is performed. This analysis is limited to analyzing the tower only.
5. The soil parameters are as per data supplied or as assumed and stated in the calculations. If no data is available, the foundation system is not verified. In the case of absent foundation data, it is the tower owner's responsibility to insure that the foundation system is adequate to support the structure with its new reactions.
6. The tower and structures have been properly maintained in accordance with TIA Standards and/or with manufacturer's specifications.
7. All welds and connections are assumed to develop at least the member capacity, unless determined otherwise and explicitly stated in this report.
8. All prior structural modifications, if any, are assumed to be as per data supplied/available, to have been properly installed and to be fully effective.
9. Loading interpreted from photos is accurate to  $\pm 5'$  AGL, antenna size accurate to  $\pm 3.3$  sf, and coax equal to the number of existing antennas without reserve.
10. All existing loading was obtained from the Previous Structural Analysis by GPD Job #: 2012801.79, dated 1/3/2013, the Site Lease Application, the Notice of Co-location document and site photos and is assumed to be accurate.
11. The proposed coax shall be installed internal to the monopole for the analysis results to be valid.
12. The existing AT&T loading has been modeled based on the final configuration specified in the MOD LTE 010213 project in Siterra.
13. The AT&T future loading has been modeled based on the generic future loading scenario.

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

<b>General Info</b>	
Site Name	LEBARON WEST
Site Number	27057
FA Number	10071090
Date of Analysis	2/7/2013
Company Performing Analysis	GPD

Tower Info	Description	Date
MP	119' w/ 30' Extension	
MP	119' w/ 30' Extension	
EET	EET	
via	via	
EET Job #:	12092	10/25/2003
Foundation Design		10/25/2003
Geotech Report		11/5/2003
Tower Mapping		
Previous Structural Analysis		
Extension Design		

<b>Steel Yield Strength (ksi)</b>	
Pole	65
Base Plate	60
Anchor Rods	75

<b>Design Parameters</b>	
Design Code Used	11A/EIA-222-F, 2003 IBC
Location of Tower (County, State)	ASCE 7-05 & 2005 CTBC New London, CT
Basic Wind Speed (mph)	88 (fastest mile)
Ice Thickness (in)	0.75
Structure Classification (I, II, III)	
Exposure Category (B, C, D)	
Topographic Category (1 to 5)	

<b>Analysis Results (% Maximum Usage)</b>	
Tower (%)	70.9%
Base Plate (%)	75.9%
Foundation (%)	40.9%
Foundation Adequate?	Yes

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

The Extension Design by GPD (Job #: 2010276-14, dated 12/28/2010) has been considered for this analysis.

## Existing / Reserved Loading

Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Antenna			Mount			Transmission Line					
			Quantity	Type	Manufacturer	Model	Azimuth	Quantity	Manufacturer	Type	Quantity	Model	Size	Attachment Internal/External
AT&T Mobility	119	120	6	Panel	Powerwave	7770.00	30°/150.270	3	Unknown	10' T-Arms	12	Unknown	1-1/4"	Internal
AT&T Mobility	119	120	3	Panel	Powerwave	P65-17-XLH-RR	30°/150.270	3	Unknown	on the same mounts	2	DC Power Fiber	7/8"	Internal
AT&T Mobility	119	120	6	RRU	Ericsson	RBS 6601				on the same mounts	1		1/2"	Internal
AT&T Mobility	119	120	1	Surge	Raycap	DC6-48-60-18-8F				on the same mounts				
AT&T Mobility	119	120	6	TMA	Powerwave	LGP21401				on the same mounts				
AT&T Mobility	119	120	6	Diplexer	Powerwave	LGP21901				on the same mounts				
AT&T Mobility	119	120	3	Cleoc	Powerwave	Cleoc				on the same mounts				
AT&T Mobility	119	120	6	RET	Powerwave	7020.00				on the same mounts				

## Proposed Loading

Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Antenna			Mount			Transmission Line					
			Quantity	Type	Manufacturer	Model	Azimuth	Quantity	Manufacturer	Type	Quantity	Model	Size	Attachment Internal/External
Verizon Wireless	150	150	3	Panel	Aniel	BXA-40063/6CF	10°/202.270	1	Unknown	12' LP platform	12	LD7-50A	1-5/8"	Internal
Verizon Wireless	150	150	3	Panel	Aniel	BXA-171063/15CF	10°/202.270	1	Unknown	on the same mount	1	HYBRID Cable	1-5/8"	Internal
Verizon Wireless	150	150	3	Panel	Aniel	BXA-70063/6CF	10°/202.270	1	Unknown	on the same mount	1			
Verizon Wireless	150	150	3	RRH	Alcatel Lucent	RRH24-16-AWS				on the same mount				
Verizon Wireless	150	150	1	Distribution Box	RFS	DB-T1-62-9AB-0Z				on the same mount				

Note: The proposed coax shall be installed internal to the monopole for the analysis results to be valid.

## Future Loading

Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Antenna			Mount			Transmission Line					
			Quantity	Type	Manufacturer	Model	Azimuth	Quantity	Manufacturer	Type	Quantity	Model	Size	Attachment Internal/External
AT&T Mobility	119	120	3	Panel	Powerwave	P65-17-XLH-RR	30°/150.270	3	Unknown	on the existing mounts	6	LD7-50A	1-5/8"	Internal

## APPENDIX B

tnxTower Output File

<b>tnxTower</b>  <b>GPD Group</b> 520 South Main Street, Suite 2531 Akrón, Ohio 44311 Phone: 330.572.2100 FAX: 330.572.2101	<b>Job</b> 27057 - LEBANON WEST	<b>Page</b> 1 of 6
	<b>Project</b> 2013723.27057.01	<b>Date</b> 15:37:59 02/07/13
	<b>Client</b> AT&T Mobility	<b>Designed by</b> jboegel

### 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 London County, Connecticut.

Basic wind speed of 85 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 37 mph is used in combination with ice.

Temperature drop of 50 °F.

Deflections calculated using a wind speed of 50 mph.

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

Pressures are calculated at each section.

Stress ratio used in pole design is 1.333.

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

### Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	CAAA		Weight plf
						ft <sup>2</sup> /ft		
Climbing Pegs	C	No	CaAa (Out Of Face)	150.00 - 9.00	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
Safety Line (3/8")	C	No	CaAa (Out Of Face)	150.00 - 9.00	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
LDF6-50A (1-1/4 FOAM)	A	No	Inside Pole	120.00 - 9.00	12	No Ice	0.00	0.66
						1/2" Ice	0.00	0.66
						1" Ice	0.00	0.66
						2" Ice	0.00	0.66
						4" Ice	0.00	0.66
LDF7-50A (1-5/8 FOAM)	A	No	Inside Pole	120.00 - 9.00	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
7/8" DC Power Cable	C	No	Inside Pole	120.00 - 9.00	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
1/2" Fiber Cable	C	No	Inside Pole	120.00 - 9.00	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)	B	No	Inside Pole	150.00 - 9.00	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	Inside Pole	150.00 - 9.00	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

<b>tnxTower</b>  <b>GPD Group</b> 520 South Main Street, Suite 2531 Akron, Ohio 44311 Phone: 330.572.2100 FAX: 330.572.2101	<b>Job</b>	27057 - LEBANON WEST	<b>Page</b>	2 of 6
	<b>Project</b>	2013723.27057.01	<b>Date</b>	15:37:59 02/07/13
	<b>Client</b>	AT&T Mobility	<b>Designed by</b>	jboegel

### Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight lb
Sabre 10' T-Arm C10-113-001	A	From Leg	1.73	30.0000	119.00	No Ice	6.67	3.02	242.00
			1.00			1/2" Ice	8.82	4.20	308.52
			0.00			1" Ice	10.97	5.38	375.04
						2" Ice	15.27	7.74	508.08
						4" Ice	23.87	12.46	774.16
Sabre 10' T-Arm C10-113-001	B	From Leg	1.73	30.0000	119.00	No Ice	6.67	3.02	242.00
			1.00			1/2" Ice	8.82	4.20	308.52
			0.00			1" Ice	10.97	5.38	375.04
						2" Ice	15.27	7.74	508.08
						4" Ice	23.87	12.46	774.16
Sabre 10' T-Arm C10-113-001	C	From Leg	1.73	30.0000	119.00	No Ice	6.67	3.02	242.00
			1.00			1/2" Ice	8.82	4.20	308.52
			0.00			1" Ice	10.97	5.38	375.04
						2" Ice	15.27	7.74	508.08
						4" Ice	23.87	12.46	774.16
(2) 7770.00 w/Mount Pipe	A	From Leg	3.46	30.0000	119.00	No Ice	5.88	4.10	61.54
			2.00			1/2" Ice	6.31	4.73	107.08
			1.00			1" Ice	6.75	5.37	160.39
						2" Ice	7.66	6.70	289.46
						4" Ice	9.58	9.87	654.29
(2) 7770.00 w/Mount Pipe	B	From Leg	3.46	30.0000	119.00	No Ice	5.88	4.10	61.54
			2.00			1/2" Ice	6.31	4.73	107.08
			1.00			1" Ice	6.75	5.37	160.39
						2" Ice	7.66	6.70	289.46
						4" Ice	9.58	9.87	654.29
(2) 7770.00 w/Mount Pipe	C	From Leg	3.46	30.0000	119.00	No Ice	5.88	4.10	61.54
			2.00			1/2" Ice	6.31	4.73	107.08
			1.00			1" Ice	6.75	5.37	160.39
						2" Ice	7.66	6.70	289.46
						4" Ice	9.58	9.87	654.29
P65-17-XLH-RR w/ Mount Pipe	A	From Leg	3.46	30.0000	119.00	No Ice	11.47	8.70	99.20
			2.00			1/2" Ice	12.08	10.11	179.13
			1.00			1" Ice	12.71	11.38	273.32
						2" Ice	14.07	13.58	493.70
						4" Ice	17.08	18.18	1100.38
P65-17-XLH-RR w/ Mount Pipe	B	From Leg	3.46	30.0000	119.00	No Ice	11.47	8.70	99.20
			2.00			1/2" Ice	12.08	10.11	179.13
			1.00			1" Ice	12.71	11.38	273.32
						2" Ice	14.07	13.58	493.70
						4" Ice	17.08	18.18	1100.38
P65-17-XLH-RR w/ Mount Pipe	C	From Leg	3.46	30.0000	119.00	No Ice	11.47	8.70	99.20
			2.00			1/2" Ice	12.08	10.11	179.13
			1.00			1" Ice	12.71	11.38	273.32
						2" Ice	14.07	13.58	493.70
						4" Ice	17.08	18.18	1100.38
P65-17-XLH-RR w/ Mount Pipe	A	From Leg	3.46	30.0000	119.00	No Ice	11.47	8.70	99.20
			2.00			1/2" Ice	12.08	10.11	179.13
			1.00			1" Ice	12.71	11.38	273.32
						2" Ice	14.07	13.58	493.70
						4" Ice	17.08	18.18	1100.38
P65-17-XLH-RR w/ Mount Pipe	B	From Leg	3.46	30.0000	119.00	No Ice	11.47	8.70	99.20
			2.00			1/2" Ice	12.08	10.11	179.13
			1.00			1" Ice	12.71	11.38	273.32
						2" Ice	14.07	13.58	493.70
						4" Ice	17.08	18.18	1100.38

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight	
			Horz	Lateral						Vert
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	lb	
P65-17-XLH-RR w/ Mount Pipe	C	From Leg	3.46		30.0000	119.00	No Ice	11.47	8.70	99.20
			2.00				1/2" Ice	12.08	10.11	179.13
			1.00				1" Ice	12.71	11.38	273.32
							2" Ice	14.07	13.58	493.70
(2) LGP21401	A	From Leg	3.46		30.0000	119.00	4" Ice	17.08	18.18	1100.38
			2.00				No Ice	1.29	0.23	14.10
			1.00				1/2" Ice	1.45	0.31	21.26
							1" Ice	1.61	0.40	30.32
(2) LGP21401	B	From Leg	3.46		30.0000	119.00	2" Ice	1.97	0.61	54.89
			2.00				4" Ice	2.79	1.12	135.29
			1.00				No Ice	1.29	0.23	14.10
							1/2" Ice	1.45	0.31	21.26
(2) LGP21401	C	From Leg	3.46		30.0000	119.00	1" Ice	1.61	0.40	30.32
			2.00				2" Ice	1.97	0.61	54.89
			1.00				4" Ice	2.79	1.12	135.29
							No Ice	1.29	0.23	14.10
(2) LGP21901	A	From Leg	3.46		30.0000	119.00	1/2" Ice	1.45	0.31	21.26
			2.00				1" Ice	1.61	0.40	30.32
			1.00				2" Ice	1.97	0.61	54.89
							4" Ice	2.79	1.12	135.29
(2) LGP21901	B	From Leg	3.46		30.0000	119.00	No Ice	0.27	0.18	5.50
			2.00				1/2" Ice	0.34	0.25	7.92
			1.00				1" Ice	0.43	0.32	11.41
							2" Ice	0.62	0.49	22.43
(2) LGP21901	C	From Leg	3.46		30.0000	119.00	4" Ice	1.10	0.94	66.02
			2.00				No Ice	0.27	0.18	5.50
			1.00				1/2" Ice	0.34	0.25	7.92
							1" Ice	0.43	0.32	11.41
(2) 7020.00 RET	A	From Leg	3.46		30.0000	119.00	2" Ice	0.62	0.49	22.43
			2.00				4" Ice	1.10	0.94	66.02
			1.00				No Ice	0.12	0.20	2.20
							1/2" Ice	0.17	0.28	5.16
(2) 7020.00 RET	B	From Leg	3.46		30.0000	119.00	1" Ice	0.23	0.36	9.33
			2.00				2" Ice	0.38	0.56	22.11
			1.00				4" Ice	0.78	1.05	70.85
							No Ice	0.12	0.20	2.20
(2) 7020.00 RET	C	From Leg	3.46		30.0000	119.00	1/2" Ice	0.17	0.28	5.16
			2.00				1" Ice	0.23	0.36	9.33
			1.00				2" Ice	0.38	0.56	22.11
							4" Ice	0.78	1.05	70.85
ciloc	A	From Leg	3.46		30.0000	119.00	No Ice	0.06	0.12	1.00
			2.00				1/2" Ice	0.09	0.17	2.16
			1.00				1" Ice	0.14	0.23	4.11
							2" Ice	0.26	0.37	11.10
ciloc	B	From Leg	3.46		30.0000	119.00	4" Ice	0.60	0.77	42.98
			2.00				No Ice	0.06	0.12	1.00
							1/2" Ice	0.09	0.17	2.16

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight lb.
			1.00			1" Ice 0.14	0.23	4.11
						2" Ice 0.26	0.37	11.10
						4" Ice 0.60	0.77	42.98
ciloc	C	From Leg	3.46	30.0000	119.00	No Ice 0.06	0.12	1.00
			2.00			1/2" Ice 0.09	0.17	2.16
			1.00			1" Ice 0.14	0.23	4.11
						2" Ice 0.26	0.37	11.10
						4" Ice 0.60	0.77	42.98
(2) RBS 6601	A	From Leg	3.46	30.0000	119.00	No Ice 0.55	0.40	22.00
			2.00			1/2" Ice 0.70	0.52	34.88
			1.00			1" Ice 0.86	0.64	50.27
						2" Ice 1.19	0.91	89.38
						4" Ice 1.97	1.55	206.33
(2) RBS 6601	B	From Leg	3.46	30.0000	119.00	No Ice 0.55	0.40	22.00
			2.00			1/2" Ice 0.70	0.52	34.88
			1.00			1" Ice 0.86	0.64	50.27
						2" Ice 1.19	0.91	89.38
						4" Ice 1.97	1.55	206.33
(2) RBS 6601	C	From Leg	3.46	30.0000	119.00	No Ice 0.55	0.40	22.00
			2.00			1/2" Ice 0.70	0.52	34.88
			1.00			1" Ice 0.86	0.64	50.27
						2" Ice 1.19	0.91	89.38
						4" Ice 1.97	1.55	206.33
DC6-48-60-18-8F Surge Suppression Unit	C	From Leg	3.46	30.0000	119.00	No Ice 1.47	1.47	32.80
			2.00			1/2" Ice 1.67	1.67	50.52
			1.00			1" Ice 1.88	1.88	70.72
						2" Ice 2.33	2.33	119.24
						4" Ice 3.38	3.38	252.92
12' LP Platform	C	None		0.0000	150.00	No Ice 25.00	25.00	1500.00
						1/2" Ice 30.00	30.00	1750.00
						1" Ice 35.00	35.00	2000.00
						2" Ice 40.00	40.00	2250.00
						4" Ice 50.00	50.00	2750.00
BXA-80063/6CF w/ Mount Pipe	A	From Centroid-Le g	4.00 0.00 0.00	10.0000	150.00	No Ice 7.76	5.19	36.80
						1/2" Ice 8.30	6.12	90.91
						1" Ice 8.85	6.93	155.97
						2" Ice 9.98	8.60	311.14
						4" Ice 12.34	12.14	752.48
BXA-80063/6CF w/ Mount Pipe	B	From Centroid-Le g	4.00 0.00 0.00	0.0000	150.00	No Ice 7.76	5.19	36.80
						1/2" Ice 8.30	6.12	90.91
						1" Ice 8.85	6.93	155.97
						2" Ice 9.98	8.60	311.14
						4" Ice 12.34	12.14	752.48
BXA-80063/6CF w/ Mount Pipe	C	From Centroid-Le g	4.00 0.00 0.00	30.0000	150.00	No Ice 7.76	5.19	36.80
						1/2" Ice 8.30	6.12	90.91
						1" Ice 8.85	6.93	155.97
						2" Ice 9.98	8.60	311.14
						4" Ice 12.34	12.14	752.48
(2) BXA-171063/12CF w/ Mount Pipe	A	From Centroid-Le g	4.00 0.00 0.00	10.0000	150.00	No Ice 4.79	5.34	49.74
						1/2" Ice 5.24	6.15	94.00
						1" Ice 5.70	6.96	147.53
						2" Ice 6.64	8.65	280.92
						4" Ice 8.64	12.22	672.28
(2) BXA-171063/12CF w/ Mount Pipe	B	From Centroid-Le g	4.00 0.00 0.00	0.0000	150.00	No Ice 4.79	5.34	49.74
						1/2" Ice 5.24	6.15	94.00
						1" Ice 5.70	6.96	147.53
						2" Ice 6.64	8.65	280.92

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	CAAA Front ft <sup>2</sup>	CAAA Side ft <sup>2</sup>	Weight lb	
(2) BXA-171063/12CF w/ Mount Pipe	C	From Centroid-Le g	4.00 0.00 0.00	30.0000	150.00	4" Ice	8.64	12.22	672.28
						No Ice	4.79	5.34	49.74
						1/2" Ice	5.24	6.15	94.00
						1" Ice	5.70	6.96	147.53
						2" Ice	6.64	8.65	280.92
BXA-70063/6CF w/ Mount Pipe	A	From Centroid-Le g	4.00 0.00 0.00	10.0000	150.00	4" Ice	8.64	12.22	672.28
						No Ice	8.00	5.42	42.55
						1/2" Ice	8.65	6.59	98.87
						1" Ice	9.26	7.46	166.91
						2" Ice	10.51	9.25	328.87
BXA-70063/6CF w/ Mount Pipe	B	From Centroid-Le g	4.00 0.00 0.00	0.0000	150.00	4" Ice	13.14	13.02	790.67
						No Ice	8.00	5.42	42.55
						1/2" Ice	8.65	6.59	98.87
						1" Ice	9.26	7.46	166.91
						2" Ice	10.51	9.25	328.87
BXA-70063/6CF w/ Mount Pipe	C	From Centroid-Le g	4.00 0.00 0.00	30.0000	150.00	4" Ice	13.14	13.02	790.67
						No Ice	8.00	5.42	42.55
						1/2" Ice	8.65	6.59	98.87
						1" Ice	9.26	7.46	166.91
						2" Ice	10.51	9.25	328.87
RRH2X40-AWS	A	From Centroid-Le g	4.00 0.00 0.00	10.0000	150.00	4" Ice	13.14	13.02	790.67
						No Ice	2.52	1.59	40.00
						1/2" Ice	2.75	1.80	60.00
						1" Ice	2.99	2.01	80.00
						2" Ice	3.44	2.43	120.00
RRH2X40-AWS	B	From Centroid-Le g	4.00 0.00 0.00	0.0000	150.00	4" Ice	4.36	3.27	200.00
						No Ice	2.52	1.59	40.00
						1/2" Ice	2.75	1.80	60.00
						1" Ice	2.99	2.01	80.00
						2" Ice	3.44	2.43	120.00
RRH2X40-AWS	C	From Centroid-Le g	4.00 0.00 0.00	30.0000	150.00	4" Ice	4.36	3.27	200.00
						No Ice	2.52	1.59	40.00
						1/2" Ice	2.75	1.80	60.00
						1" Ice	2.99	2.01	80.00
						2" Ice	3.44	2.43	120.00
DB-T1-6Z-8AB-OZ	C	From Centroid-Le g	1.00 0.00 0.00	0.0000	150.00	4" Ice	4.36	3.27	200.00
						No Ice	1.47	1.47	44.00
						1/2" Ice	1.67	1.67	50.52
						1" Ice	1.88	1.88	70.72
						2" Ice	2.33	2.33	119.24
						4" Ice	3.38	3.38	252.91

### Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
150.00	12' LP Platform	37	29.188	1.8108	0.0046	22991
119.00	Sabre 10' T-Arm C10-113-001	37	18.104	1.5362	0.0021	3900



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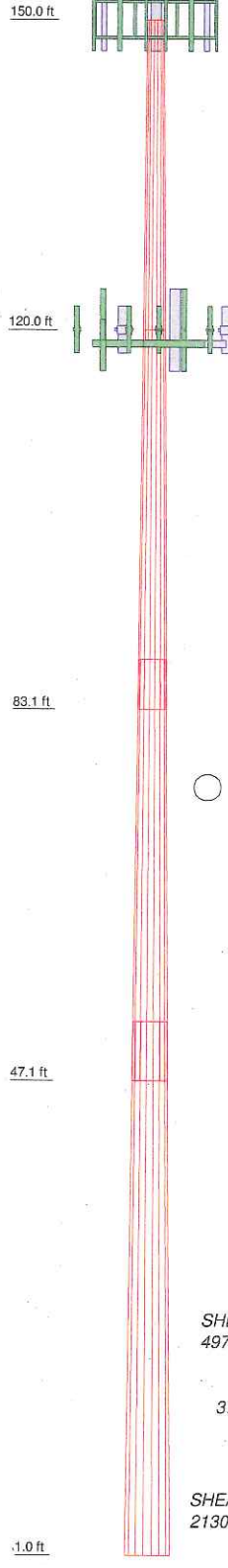
**Section Capacity Table**

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	SF*P <sub>allow</sub> lb	% Capacity	Pass Fail	
L1	150 - 120	Pole	TP26.12x19.5x0.1875	1	-3366.58	802319.34	43.4	Pass	
L2	120 - 83.08	Pole	TP34.26x26.12x0.25	2	-8418.87	1359046.76	68.2	Pass	
L3	83.08 - 47.12	Pole	TP41.57x32.6951x0.3125	3	-14301.50	2062910.72	70.9	Pass	
L4	47.12 - 1	Pole	TP51x39.6939x0.375	4	-26163.40	3132549.87	68.3	Pass	
							Summary		
							Pole (L3)	70.9	Pass
							<b>RATING =</b>	<b>70.9</b>	<b>Pass</b>

## APPENDIX C

### Tower Elevation Drawing

Section	1	2	3	4
Length (ft)	30.00	36.92	40.79	51.87
Number of Sides	18	18	18	18
Thickness (in)	0.1875	0.2500	0.3125	0.3750
Socket Length (ft)		4.83	5.75	39.6939
Top Dia (in)	19.5000	26.1200	32.6951	51.0000
Bot Dia (in)	26.1200	34.2600	41.5700	84.47.8
Grade			A572-65	
Weight (lb)	1374.4	2984.7	5089.1	9447.8



### DESIGNED APPURTENANCE LOADING

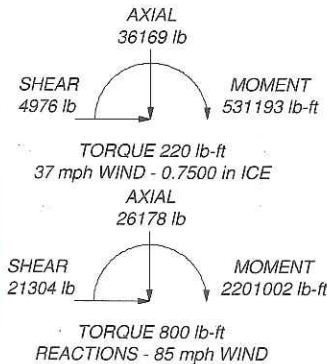
TYPE	ELEVATION	TYPE	ELEVATION
12' LP Platform	150	ciloc	119
BXA-80063/6CF w/ Mount Pipe	150	ciloc	119
BXA-80063/6CF w/ Mount Pipe	150	(2) RBS 6601	119
BXA-80063/6CF w/ Mount Pipe	150	(2) RBS 6601	119
(2) BXA-171063/12CF w/ Mount Pipe	150	(2) RBS 6601	119
(2) BXA-171063/12CF w/ Mount Pipe	150	DC6-48-60-18-8F Surge Suppression Unit	119
(2) BXA-171063/12CF w/ Mount Pipe	150	Sabre 10' T-Arm C10-113-001	119
BXA-70063/6CF w/ Mount Pipe	150	Sabre 10' T-Arm C10-113-001	119
BXA-70063/6CF w/ Mount Pipe	150	Sabre 10' T-Arm C10-113-001	119
RRH2X40-AWS	150	(2) 7770.00 w/Mount Pipe	119
RRH2X40-AWS	150	(2) 7770.00 w/Mount Pipe	119
RRH2X40-AWS	150	(2) 7770.00 w/Mount Pipe	119
DB-T1-6Z-8AB-0Z	150	P65-17-XLH-RR w/ Mount Pipe	119
(2) LGP21401	119	P65-17-XLH-RR w/ Mount Pipe	119
(2) LGP21901	119	P65-17-XLH-RR w/ Mount Pipe	119
(2) LGP21901	119	P65-17-XLH-RR w/ Mount Pipe	119
(2) LGP21901	119	P65-17-XLH-RR w/ Mount Pipe	119
(2) 7020.00 RET	119	P65-17-XLH-RR w/ Mount Pipe	119
(2) 7020.00 RET	119	(2) LGP21401	119
(2) 7020.00 RET	119	(2) LGP21401	119
ciloc	119		


### MATERIAL STRENGTH

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

### TOWER DESIGN NOTES

1. Tower is located in New London County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 37 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: 70.9%

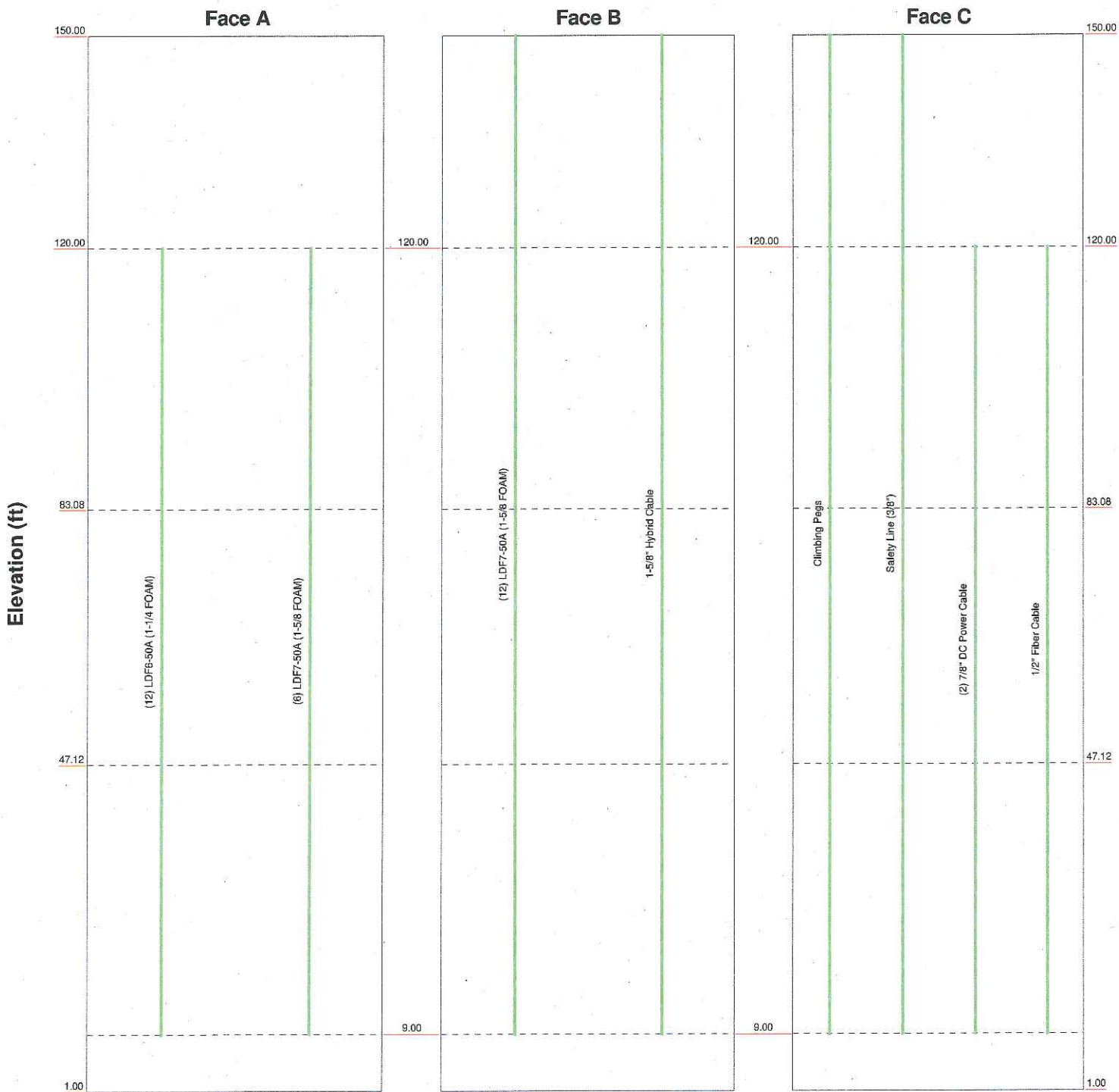


 <b>GPD Group</b> Consulting Engineers	520 South Main Street, Suite 2531 Akron, Ohio 44311 Phone: 330.572.2100 FAX: 330.572.2101	<b>Job: 27057 - LEBANON WEST</b> Project: 2013723.27057.01 Client: AT&T Mobility Code: TIA/EIA-222-F Path: C:\Users\jboegel\Desktop\Updated Since on Desktop\27057.01\TNX\27057 Lebanon West.dwg	Drawn by: jboegel Date: 02/07/13 App'd: Scale: NTS Dwg No: E-1
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# Feedline Distribution Chart

1' - 150'

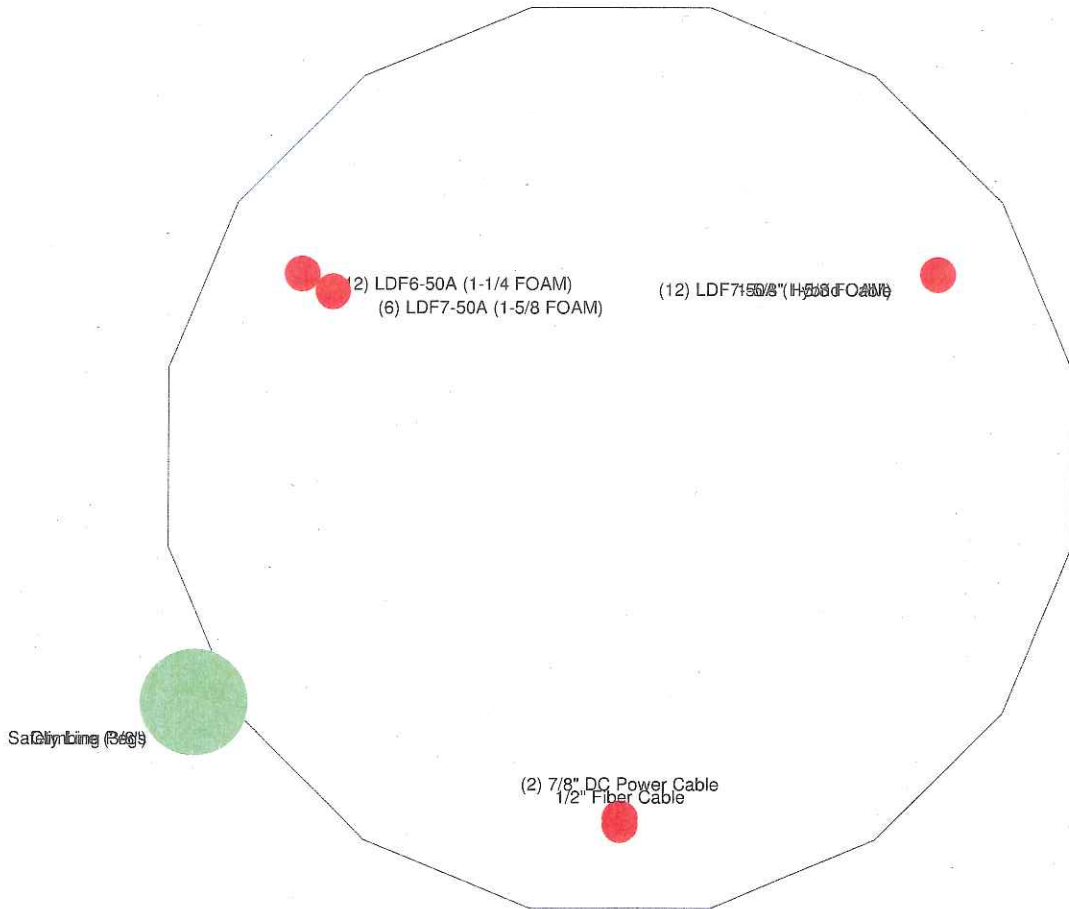
— Round   
 — Flat   
 — App In Face   
 — App Out Face   
 — Truss Leg



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	Client: AT&T Mobility	Drawn by: jboegel	App'd:
	Code: TIA/EIA-222-F	Date: 02/07/13	Scale: NTS
	Path: C:\Users\jboegel\Desktop\Updated Since on Desktop\27057.01\TX\27057 Lebanon West.er	Dwg No. E-7	

# Feedline Plan

Round Flat App In Face App Out Face



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	Project: <b>2013723.27057.01</b>			
	Client: AT&T Mobility	Drawn by: jboegel	App'd:	
	Code: TIA/EIA-222-F	Date: 02/07/13	Scale: NTS	
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## APPENDIX D

### Anchor Rod & Base Plate Analysis



**Anchor Rod and Base Plate Stresses**  
**27057 - LEBANON WEST**  
 2013723.27057.01

Overturning Moment =	2201.00 k*ft
Axial Force =	26.18 k
Shear Force =	21.30 k

Acceptable Stress Ratio	=	105.0%
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Anchor Rods	
Number of Rods =	16
Type =	Upset Rod
Rod Yield Strength (Fy) =	75 ksi
ASIF =	1.333
Rod Circle =	60 in
Rod Diameter =	2.25 in
Net Tensile Area =	3.25 in <sup>2</sup>
Max Tension on Rod =	108.34 kips
Max Compression on Rod =	111.61 kips
Allow. Rod Force =	195.00 kips
<b>Anchor Rod Capacity =</b>	<b>55.6% OK</b>

Base Plate	
Location =	External
Plate Strength (F <sub>y</sub> ) =	60 ksi
Outside Diameter =	66 in
Plate Thickness =	2 in
wcalc =	31.61 in
wmax =	42.96 in
w =	31.61 in
S =	21.07 in <sup>3</sup>
fb =	45.55 ksi
Fb =	60 ksi
<b>BP Capacity =</b>	<b>75.9% OK</b>

Stiffeners	
Configuration =	None

Pole	
Pole Diameter =	51 in
Number of Sides =	18
Thickness =	0.375 in
Pole Yield Strength =	65 ksi

## APPENDIX E

### Flange Plate & Flange Bolt Analysis





Existing Flange Connection @  
27057 - LEBANON WEST  
2013723.27057.01

120'

O.T. Moment =	183.7917	k*ft
Axial =	3.36658	kips
Shear =	7.12	kips

Acceptable Stress Ratio	=	105.0%
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Flange Bolts	
# Bolts =	12
Bolt Type =	A325
$F_t$ =	44 ksi
ASIF =	1.333
Bolt Circle =	30 in
Bolt Diameter =	1 in
<i>Tension &amp; Shear (ASD, Section J3.5)</i>	
$F_v$ =	21 ksi
Nominal Area =	0.79 in <sup>2</sup>
$f_v$ =	0.76 ksi
Applied Shear =	0.59 kips
Allowable Shear =	21.99 kips
$F_t^2 - 4.39(f_v^2)^{1/2}$ =	43.97 ksi
Allowable Bolt Stress =	58.62869 ksi
B =	46.05 kips
<i>Prying Action Check</i>	
N/A, lap flange thickness > $t_c$	
Max Comp. on Bolt =	24.77 kips
Max Tension on Bolt =	24.21 kips
Shear Capacity =	2.7%
Tensile Capacity =	52.6%
<b>Bolt Capacity =</b>	<b>52.6% OK</b>

Pole Information	
Shaft Diam. (Upper) =	26.12 in
Thickness (Upper) =	0.1875 in
# of Sides (Upper) =	18
$F_y$ (Upper) =	65 ksi
Shaft Diam. (Lower) =	26.12 in
Thickness (Lower) =	0.25 in
# of Sides (Lower) =	18
$F_y$ (Lower) =	65 ksi

Upper Flange Plate	
Location =	External
Plate Strength ( $F_y$ ) =	60 ksi
Plate Thickness =	1 in
Outer Diameter =	33 in
wcalc =	14.76 in
wmax =	17.76 in
w =	14.76 in
S =	2.46 in <sup>3</sup>
$f_b$ =	27.82 ksi
$F_b$ =	60 ksi
<b>UP Capacity =</b>	<b>46.4% OK</b>

Upper Stiffeners	
Configuration =	None

Lower Flange Plate	
Location =	External
Plate Strength ( $F_y$ ) =	60 ksi
Plate Thickness =	1 in
Outer Diameter =	33 in
wcalc =	14.76 in
wmax =	17.76 in
w =	14.76 in
S =	2.46 in <sup>3</sup>
$f_b$ =	27.82 ksi
$F_b$ =	60 ksi
<b>LP Capacity =</b>	<b>46.4% OK</b>

Lower Stiffeners	
Configuration =	None

## APPENDIX F

### Foundation Analysis



**Mat Foundation Analysis**  
**27057 - LEBANON WEST**  
**2013723.27057.01**

General Info	
Code	TIA/EIA-222-F (ASD)
Bearing On	Soil
Foundation Type	Mono Pad
Pier Type	Square
Reinforcing Known	Yes
Max Capacity	1

Tower Reactions	
Moment, M	2201.002 k-ft
Axial, P	26.178 k
Shear, V	21.304 k

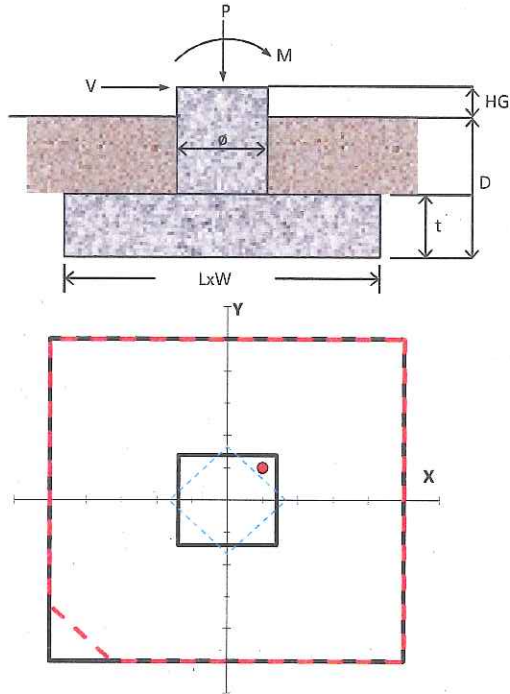
Pad & Pier Geometry	
Pier Width, $\phi$	7 ft
Pad Length, L	25 ft
Pad Width, W	25 ft
Pad Thickness, t	3 ft
Depth, D	6.5 ft
Height Above Grade, HG	1 ft

Pad & Pier Reinforcing	
Rebar Fy	60 ksi
Concrete Fc'	4 ksi
Clear Cover	3 in
Reinforced Top & Bottom?	Yes
Pad Reinforcing Size	# 8
Pad Quantity Per Layer	20
Pier Rebar Size	# 8
Pier Quantity of Rebar	45

Soil Properties	
Soil Type	Granular
Soil Unit Weight	135 pcf
Angle of Friction, $\phi$	36 °
Bearing Type	Gross
Ultimate Bearing	12 ksf
Water Table Depth	19 ft
Frost Depth	3 ft

Bearing Summary			Load Case
Qxmax	1.78 ksf		1D+1W
Qymax	1.78 ksf		1D+1W
Qmax @ 45°	2.17 ksf		1D+1W
Q <sub>(all) Gross</sub>	6.00 ksf		
<b>Controlling Capacity</b>	<b>36.1%</b>	<b>Pass</b>	

Overturning Summary (Required FS=1.5)			Load Case
FS(ot)x	3.67	≥1.5	1D+1W
FS(ot)y	3.67	≥1.5	1D+1W
<b>Controlling Capacity</b>	<b>40.9%</b>	<b>Pass</b>	



## APPENDIX G

### Extension Design

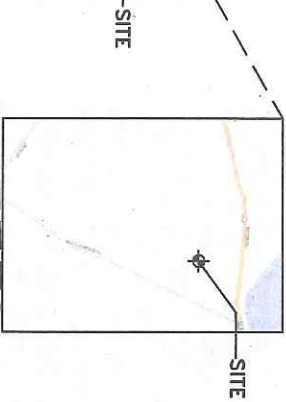
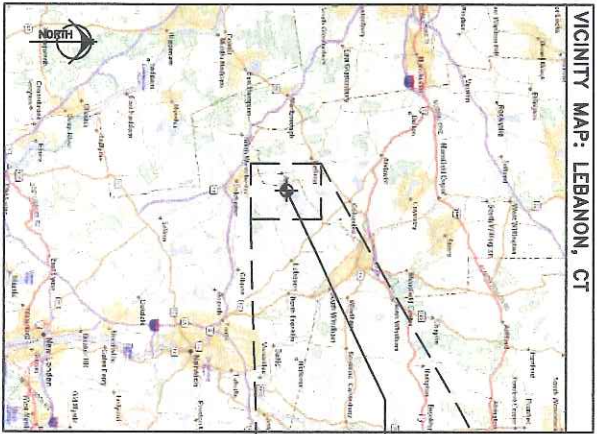
# LEBANON WEST

# USID #: 27057

## 119' EEI MONOPOLE

## W/ PROPOSED 30' EXTENSION

VICINITY MAP: LEBANON, CT



PROJECT SUMMARY	
TOWER OWNER:	AT&T MOBILITY
TOWER TYPE:	MONOPOLE
GOVERNING CODE:	114/EM-222-F & 2003 IBC
SITE ADDRESS:	1503 ENTER ROAD LEBANON, CT 06249 NEW LONDON COUNTY
LATITUDE:	41° 37' 30.323" N
LONGITUDE:	72° 18' 20.887" W
OWNER CONTACT:	MR. MARTIN, JILLIAN 5405 WINDWARD FRY ALPHARETTA, GA 30004 (770) 708-6124
ENGINEER CONTACT:	MR. KEVIN CLEMENTS 12800 DEERFIELD PKWY., SUITE 2030 ALPHARETTA, GA 30004 (678) 782-5300

**PROJECT OVERVIEW:**  
THE UNITED DOMAINS REPRESENT THE ADDITION OF A 30' EXTENSION TO THE EXISTING TOWER.

DATE	REVISION	DRAWING	INDEX
		1-1	PROJECT NOTES
		5-1	TOWER EXTENSION & EXTENSION DETAILS

*Kevin Clements*

TOWER OWNER



ENGINEERS



**GPD ASSOCIATES**  
320 South Main Street, Suite 2311, Albany, Ohio 44311  
330.972.2100, Fax: 330.972.2102

CO-LOCATOR

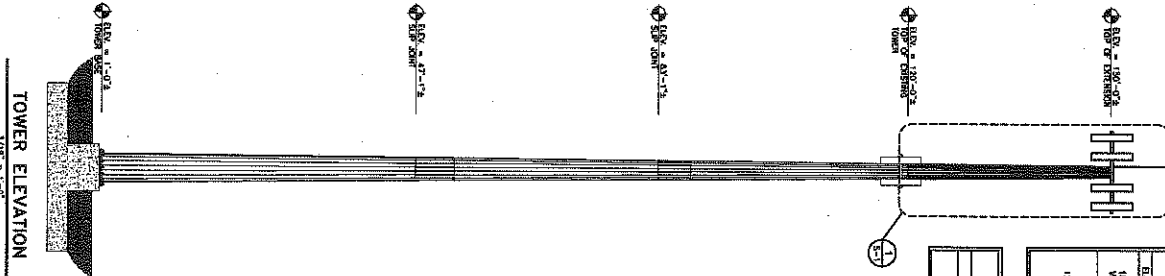


SITE NAME:	LEBANON WEST
SITE NUMBER:	USID #: 27057
GPO JOB NUMBER:	2010276.14
DATE: 1/28/10	REVISION 0



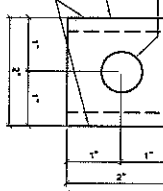
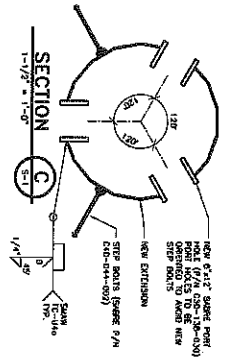
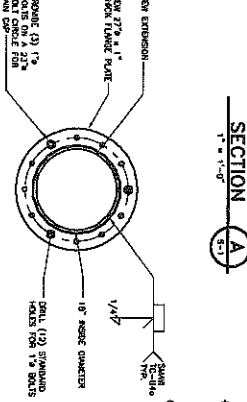
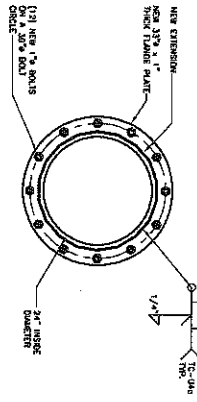
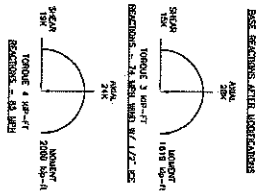
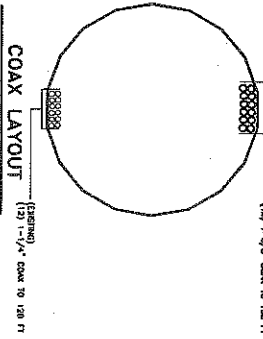
# TOWER SCHEDULE

LENGTH (FT.)	51.88	40.79	36.92	30.00
NO. OF JOINTS	8	10	18	18
THICKNESS (IN.)	0.3750	0.3125	0.2500	0.1875
LAP SPACE (FT.)		5.76	4.83	4.8
TOP DIA. (IN.)	30.636	32.8943	28.1200	19.2000
BOTTOM DIA. (FT.)	51.0000	41.5700	34.2800	24.1200

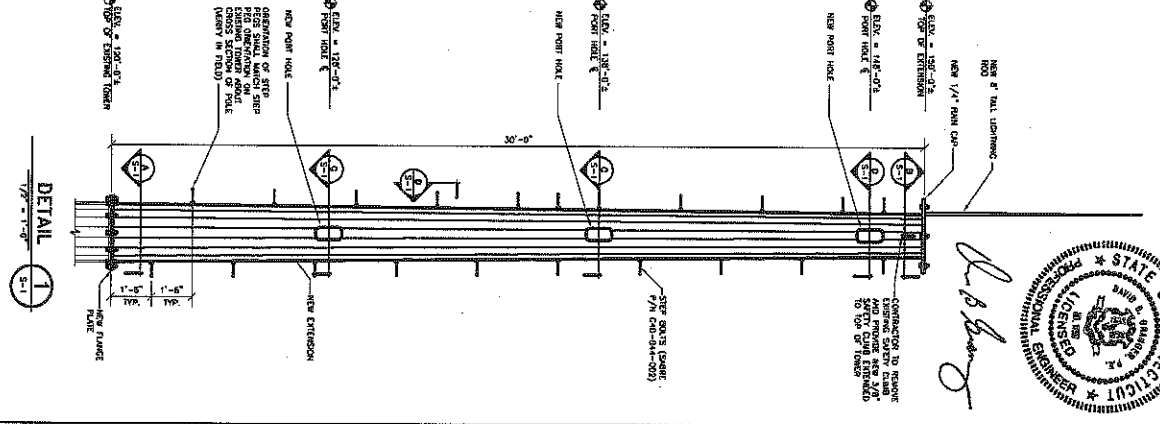


ANTENNA SCHEDULE			
ELEVATION	STATUS	ANTENNA	COORD.
150'-0"	PROPOSED	(1) 120' TOWER/100' ANTENNA	(12) 1-0/8"
150'-0"	PROPOSED	(2) 120' TOWER/100' ANTENNA	(12) 1-0/8"
150'-0"	EXISTING	(3) 5' T-ANTENNA	(12) 1-1/4"
150'-0"	EXISTING	(4) 100' TOWER/100' ANTENNA	(12) 1-1/4"
150'-0"	EXISTING	(5) 100' TOWER/100' ANTENNA	(12) 1-1/4"
150'-0"	EXISTING	(6) 100' TOWER/100' ANTENNA	(12) 1-1/4"
150'-0"	EXISTING	(7) 100' TOWER/100' ANTENNA	(12) 1-1/4"

MODIFICATION SCHEDULE	
ELEVATION	NOTE
150'-0"	REMOVE NEW 30' TOWER EXTENSION, REFER TO TOWER CONSTRUCTION AND DRAWING 1-201.



*L.B. Brown*



REV.	DATE	DESCRIPTION

27057 - LEBANON WEST  
 1593 EXETER ROAD  
 LEBANON, CT 06249

TOWER ELEVATION & EXTENSION DETAILS

DATE: 20100726.14

PROJECT: 27057

CLIENT: AT&T

SCALE: 1/8\"/>

