Crown Castle
3 Corporate Park Drive, Suite 101
Clifton Park, NY 12065

September 13, 2016

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

RE: **Notice of Exempt Modification for AT&T/ LTE 3C Crown Site BU: 806355**
AT&T Site ID: CT2105
281 Wood House Road, Fairfield, CT 06430
Latitude: 41° 11' 45.3"/ Longitude: -73° 16' 52.9"

Dear Ms. Bachman:

AT&T currently maintains nine (9) antennas at the 148-foot level of the existing 171-foot monopole tower at 281 Woodhouse Road in Fairfield, CT. The tower is owned by Crown Castle. The property is owned by Ranjan and Moitrayee Ghosh. AT&T now intends to replace three (3) antennas with three (3) new antennas. These antennas would be installed at the 148-foot level of the tower. AT&T also intends to install three (3) RRU32s, one (1) Raycap, two (2) DC, one (1) Fiber, three (3) Bias-Ts, and replace (3) RRU11s with (3) RRUS32-B2s.

This facility was approved by the Connecticut Siting Council in Docket No. 86 on February 17, 1898. This approval was given without conditions.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 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.S.C.A. § 16-50j-73, a copy of this letter is being sent to First-Selectman Michael C. Tetreau, Town of Fairfield, as well as the property owner, and Crown Castle is the tower owner.

1. The proposed modifications will not result in an increase in the height of the existing tower.

2. The proposed modifications will not require the extension of the site boundary.

3. The proposed modification 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 replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communication Commission safety standard.

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

6. The existing structure and its foundation can support the proposed loading.

For the foregoing reasons, AT&T respectfully submits that the proposed modifications to the above-reference telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2). Please send approval/rejection letter to Attn: Jeffrey Barbadora.

Sincerely,

Jeffrey Barbadora
Real Estate Specialist
12 Gill Street, Suite 5800, Woburn, MA 01801
781-729-0053
Jeff.Barbadora@crowncastle.com

Attachments:

Tab 1: Exhibit-1: Compound plan and elevation depicting the planned changes
Tab 2: Exhibit-2: Structural Modification Report
Tab 3: Exhibit-3: General Power Density Table Report (RF Emissions Analysis Report)

cc: First-Selectman Michael C. Tetreau
Town of Fairfield
725 Old Post Road
Fairfield, CT 06824

Ranjan & Moitrayee Ghosh
11 Peterson Road
Palmer, MA 01069

8945

CROWN CASTLE - ETA PROPERTY
3530 TORINGDON WAY, SUITE 300
CHARLOTTE, NC 28277

32-61-1110

DATE 9-13-2016

PAY TO THE ORDER OF Connecticut Siting Council $ 625.00

Six hundred twenty five 00/100 DOLLARS

Security Features Included. Details on Back.

VALID FOR 180 DAYS

CHASE
JPMorgan Chase Bank, N.A.
www.Chase.com

FOR CTL02105-806355-353118-384544

MP

⑈008945⑈ ⑆111000614⑆ 664638118⑈

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

136 Main Street, Suite 401
New Britain, Connecticut 06051
Phone: 827-7682

BK

CERTIFICATE

OF

ENVIRONMENTAL COMPATIBILITY AND PUBLIC NEED

Pursuant to section 16-50k of the General Statutes of Connecticut, as amended, the Connecticut Siting Council hereby issues a Certificate of Environmental Compatibility and Public Need in Docket No. 86 to Metro Mobile CTS of Fairfield County Inc., for tower sites in Greenwich and Fairfield, Connecticut. This Certificate is issued in accordance with and subject to the terms and conditions set forth in the Decision and Order of the Council on February 17, 1988.

By order of the Council,

Gloria Dibble Pond

Gloria Dibble Pond, Chairperson

February 17, 1988

1009E

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL
136 Main Street, Suite 401
New Britain, Connecticut 06051-4225
Phone: 827-7682

August 6, 1992

David S. Malko
Manager, Engineering and
Regulatory Services
Bell Atlantic Metro Mobile
20 Alexander Drive
Wallingford, CT 06492

RE: Metro Mobile CTS of Fairfield County, Inc., notice of intent to allow Springwich Cellular Limited Partnership to install cellular telecommunications antennas and associated equipment on an existing facility site located off Wood House Road, Fairfield, Connecticut.

Dear Mr. Malko:

At a meeting held August 4, 1992, the Connecticut Siting Council acknowledged your notice of an exempt modification for an existing tower site on Wood House Road in Fairfield, Connecticut.

As proposed in your notice dated July 21, 1992, the modification is in compliance with the exception criteria specified in Regulations of State Agencies 16-50j-72 for changes to an existing facility site that would not increase the tower height, extend the boundary of the tower site, increase noise levels at the tower site boundary by 6 decibels, and add radio frequency transmitting capability which increases the total power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to Section 22a-162 of the Connecticut General Statutes.

The Council is pleased to acknowledge this first shared use of existing cellular towers by two cellular carriers which meets the Council's long-time goal and the public interest of sharing facilities to avoid the proliferation of additional tower structures.

Very truly yours,

Mortimer A. Gelston
Chairman

MAG/TEF/cp

cc: Peter Van Wilgan

5766E-3

Bell Atlantic
Metro Mobile

Bell Atlantic Metro Mobile
20 Alexander Drive
P.O. Box 5029
Wallingford, CT 06492
203 269-8858

July 21, 1992

Connecticut Siting Council
136 Main Street
Suite 401
New Britain, Connecticut 06051

Attention: Joel M. Rinebold, Executive Director

Re: Metro Mobile CTS of Fairfield County, Inc. - Fairfield Cell

Dear Mr. Rinebold:

Metro Mobile CTS of Fairfield County, Inc. ("Metro Mobile" or the "Company") plans to allow Springwich Cellular Limited Partnership to install cellular antennas and related equipment at the existing tower facility owned by Metro Mobile in Fairfield, Connecticut. Please accept this letter as notification, pursuant to R.C.S.A. Section 16-50j-73, of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b).

The existing facility is a 160' self supporting monopole tower located on a 70' by 70' parcel off of Wood House Road in Fairfield. Metro Mobile plans to add a 15' by 21' addition to the existing equipment building while Springwich Cellular Limited Partnership plans to install 9 antennas to the existing tower and cellular equipment to the building addition.

The addition of Springwich Cellular's antennas and equipment and Metro Mobile's building addition to the tower site does not constitute a modification as defined in C.G.S. Section 16-50i(d) because the general physical characteristics of the facility will not be significantly changed or altered. Rather, Metro Mobile's and Springwich Cellular's planned use of the facility falls squarely within those activities which explicitly do not constitute a modification to an existing tower, as set forth in R.C.S.A. Section 16-50j-72(b).

First, the height of the existing facility will be unaffected. Nine panel type transmit/receive antennas, Model DB-834-RF, will be face mounted on the lower platform at 144' AGL. The antennas will extend upward approximately 3 1/2' from the 144' level points. Thus, Springwich Cellular's antennas will extend no higher than the 148' level of the 173' tower including existing Metro Mobile appurtenances.

Second, the proposed addition will not expand the site (See attached site plan). Metro Mobile's equipment building addition to accommodate Springwich Cellular's equipment will extend 15' from the existing building and will be within the leased parcel. No strengthening of the tower is necessary in order for the tower to support the additional loading.

Third, the proposed addition will not increase the noise levels at the existing facility by six decibels or more. Except during construction, the only noise associate with Springwich Cellular's equipment will be from air conditioning, when in use.

Fourth, Springwich Cellular's additional antennas will not increase the total radio frequency electromagnetic radiation power density measured at the tower site boundary to a level at or above the State Department of Environmental Protection standard. A worst case calculation at the base of the tower indicates that Springwich Cellular's antennas combined with Metro Mobile's operation would result in a power density level of 0.15964 mW/cm2. This power density level is 18.3% of the standard for cellular frequencies of 2.92mW/cm2.

For the foregoing reasons, Metro Mobile respectfully submits that the planned addition of Springwich Cellular's antennas and equipment, and Metro Mobile's building addition to the existing facility, constitutes an exempt modification under R.C.S.A. Section 16-50j-72(b).

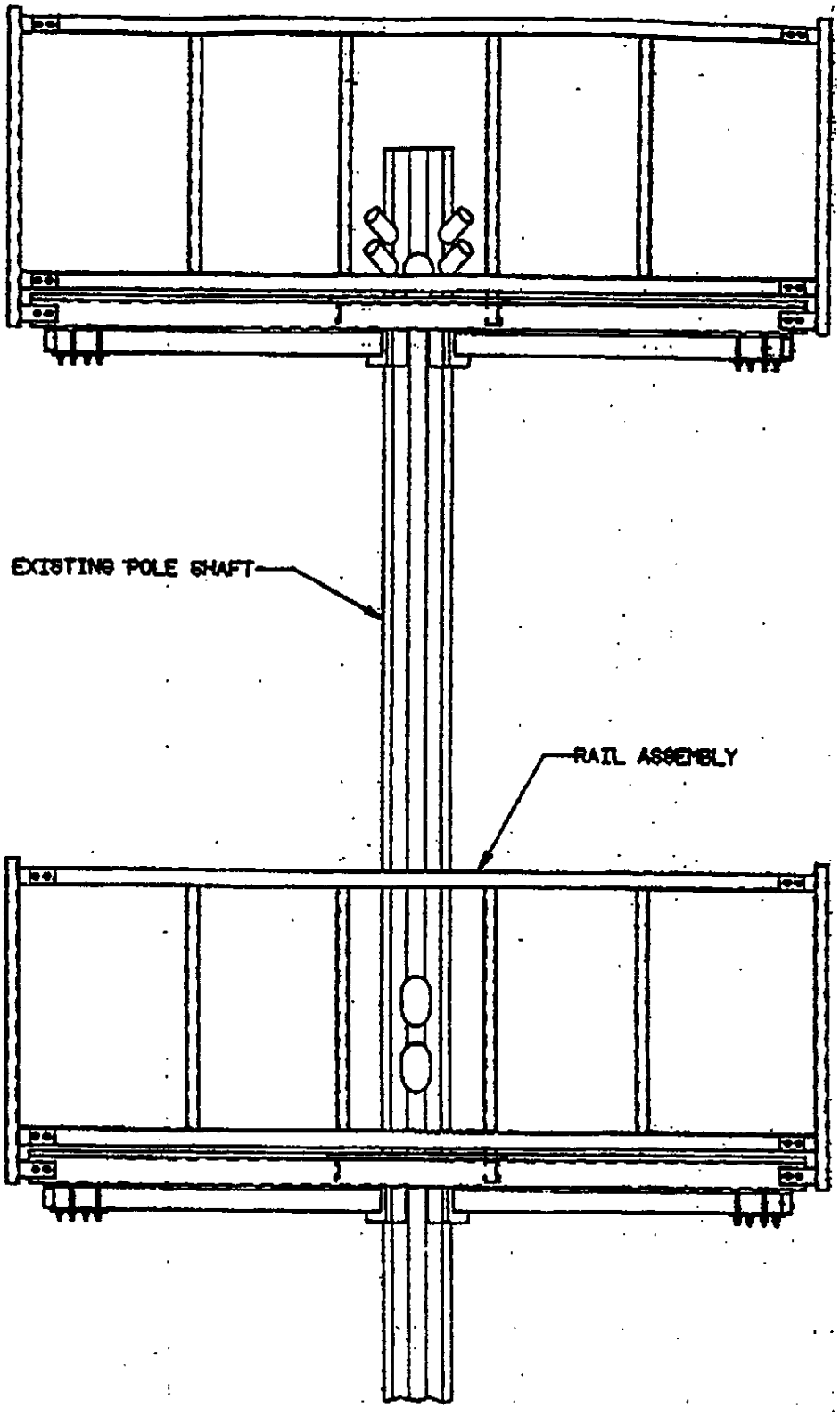
By copy of this letter, the chief elected official of the Town of Fairfield is receiving written notice of the intent to construct an exempt modification to the Metro Mobile facility in Fairfield, as required by R.C.S.A. Section 16-50j-73.

Respectfully,

David S. Malko, P.E.
Manager, Engineering and Regulatory Services

Attachments

cc: Jacquelyn C. Durrell, 1st Selectman



METROMOBILE - CT
PROPOSED PLATFORM MODIFICATION
FOR THE EXISTING FAIRFIELD SITE

DRAWING #	DRAWN	SCALE
10750-68	MAL	NONE
REFERENCE	DATE	
160 FT	04-01-92	

VALMONT

Bell Atlantic Metro Mobile
20 Alexander Drive
P.O. Box 5029
Wallingford, CT 06492
203 269-8858

July 31, 1992

Mr. Joel M. Rinebold, Executive Director
Connecticut Siting Council
136 Main Street
New Britain, Connecticut 06051

Re: Fairfield Exempt Modification

Dear Joel:

This is to provide you additional information in response to the recent memorandum from the Town of Fairfield. As indicated in the original filing, Metro Mobile plans to expand its existing building to accommodate a Springwich cell site. This building expansion will be accomplished by adding two new sections, identical in all respect, to the two sections currently in place. These sections will house the Springwich Cellular equipment which, like ours, requires heating, air-conditioning and ventilation. Enclosed are a copy of the manufacture's engineered drawings and our electrical, mechanical, structural and grounding plans for your information and/or review. Also enclosed are the Valmont drawings for the platform reworking necessary to accommodate Springwich's antennas.

Our procedure would be to provide these plans and drawings to the town's building department in order to secure the necessary building permits after receipt of the Council's acknowledgement of our exempt modification filing.

I trust this information will answer any outstanding questions raised by either the town or your staff such that a favorable ruling can be issued at your upcoming August 4, 1992 meeting. As always, Metro Mobile remains committed to our common goal of shared tower use as a means of minimizing the proliferation of towers wherever possible.

Very truly yours,

David S. Malko, P.E.
Manager, Engineering &
Regulatory Services

Enclosures

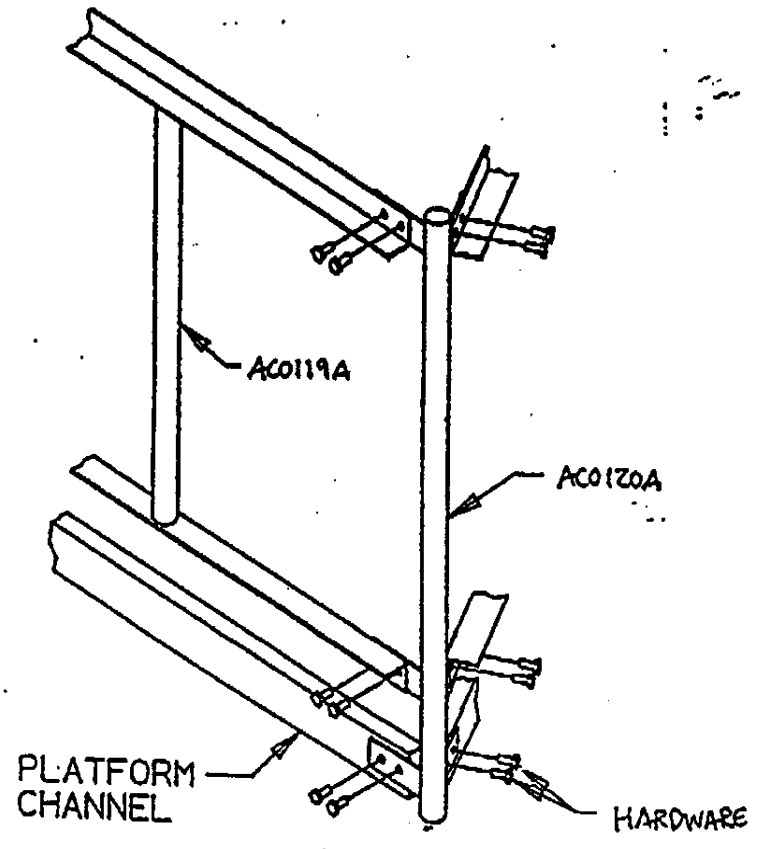
cc: Joseph E. Devonshuk, Director of TPZ

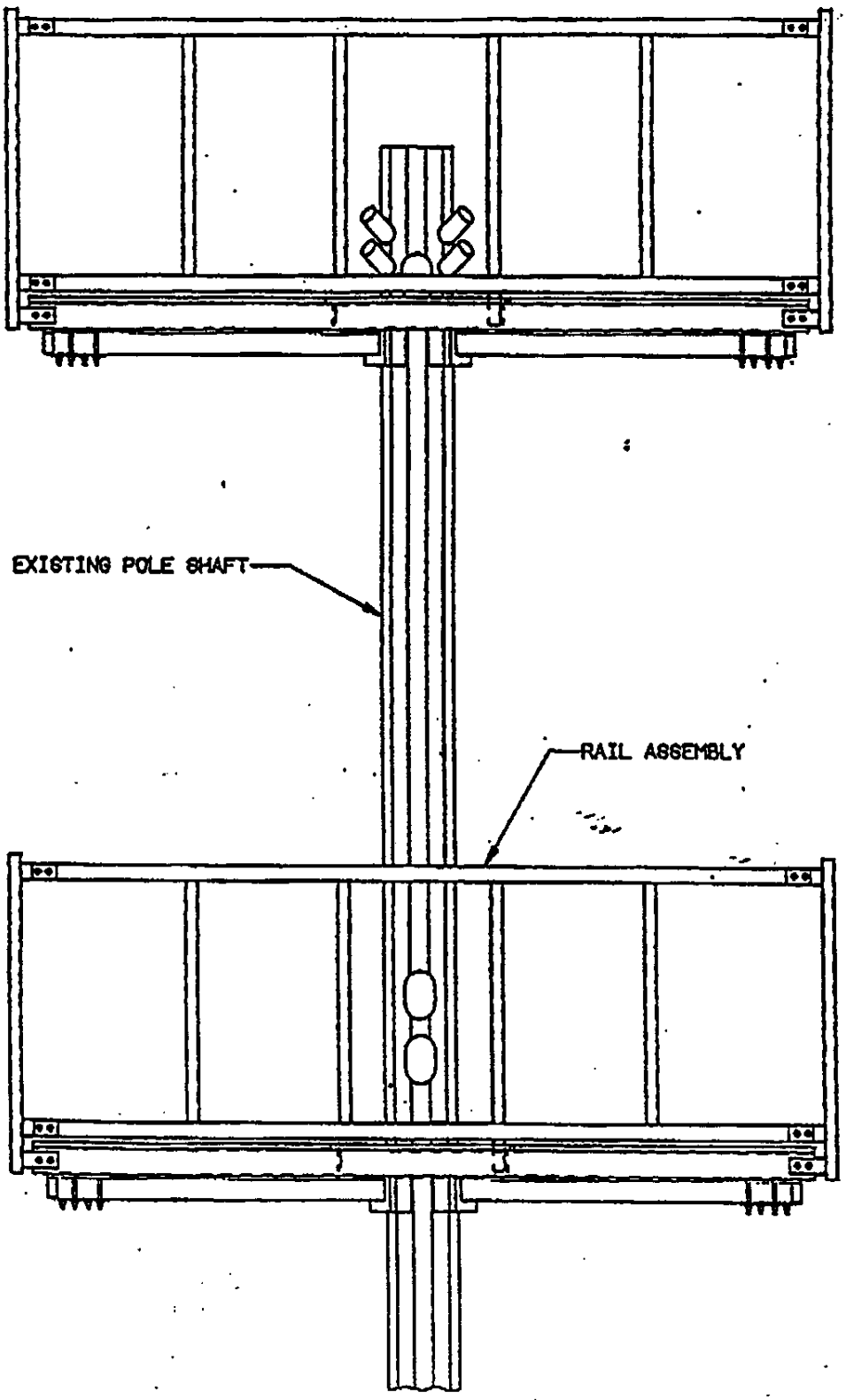
JUNE 24, 1992

ADDITIONAL PARTS FOR ADDING RAILS TO TWO (2) PLATFORMS:

PART NO	DESCRIPTION		WEIGHT	QTY
AC0119A	PLATFORM RAIL ASSEMBLY		188#	6
	angle - 3 x 3 x 1/4 x 12'-10" lg	2ea		
	pipe - 2" schedule 40 x 3'-8.25" lg	4ea		
AC0120A	CORNER POST ASSEMBLY		28#	6
	pipe - 2" schedule 40 x 4'-11" lg	1ea		
	tabs - 1/2 x 3 x 0'-7 1/4"	6ea		
161147	5/8" dia x 1 1/2" lg bolt - A325			76
333014	5/8" dia lock nut - A563			76

Total price for both rail kits and hardware: $1,750.00





METROMOBILE - CT
PROPOSED PLATFORM MODIFICATION.
FOR THE EXISTING FAIRFIELD SITE

10730-66	MAL	NONE
140 FT	04-01-92	

VALMONT
VALMONT INDUSTRIES, INC.

TOWN OF FAIRFIELD

INTER-OFFICE CORRESPONDENCE

TO: Sam D. Koutas, Executive Assistant to First Selectman

FROM: Joseph E. Devonshuk, Director of TPZ

SUBJECT: Bell Atlantic Metro Mobile

DATE: July 29, 1992

This memo is in response to the letters from the Bell Atlantic Metro Mobile concerning expansion of their existing tower facility.

Please be advised that based on the information submitted, the Town Plan and Zoning department feels that the addition of Springwich Cellular's antennas and equipment and Metro Mobiles building addition to the tower site does constitute a modification and does significantly change and alter the physical characteristics of this facility.

This department, therefore, requests additional information including engineered building plans for the 15' by 21' addition to the existing equipment building and for the installation of the nine (9) antennas. A more specific explanation of the use of this facility is, also, required including an explanation for the need of air-conditioning equipment. Section 5.1.4. of the Fairfield Zoning Regulations states that public utility substations are subject to the securing of a special exception from the Town Plan and Zoning Commission.

This requested information is essential to determine if a special exception is required. If you have any questions or need any further comment please do not hesitate to contact me.

cc: David S. Malko, P.E., Bell Atlantic Metro Mobile
Joel M. Rinebond, Executive Director, CT. Siting Council

Town of Fairfield

FAIRFIELD, CONNECTICUT 06430

Tel # 256-3000

Jacquelyn C. Durrell
First Selectman

July 29, 1992

Mr. David S. Malko, P.E.
Manager, Engineering and Reguatory Services
Bell Atlantic Metro Mobile
20 Alexander Drive
P.O. Box 5029
Wallingford, CT 06492

Dear Mr. Malkos:

Please be advised that based on the information submitted, the Fairfield Town Plan and Zoning Department feels that the addition of Springwich Cellular's antennas and equipment and Metro Mobile's building addition to the tower site does constitute a modification and does significantly change and alter the physical characteristics of this facility.

Town Plan and Zoning, therefore, requests additional information including engineered building plans for the 15' by 21' addition to the existing equipment building and for the installation of the nine (9) antennas. A more specific explanation of the use of this facility is, also, required including an explanation for the need of air-conditioning equipment. Section 5.1.4. of the Fairfield Zoning Regulations states that public utility substations are subject to the securing of a special exeption from the Town Plan and Zoning Commission.

This requested information is essential to determine if a special exception is required. If you have any questions or need any further comment please do not hesitate to contact Mr. Joe Devonshuk, Planning Director, or me.

Sincerely,

Sam D. Koutas
Executive Assistant

Sublease.

7/30/92 (in 1st option)

Telecom Information Management System (TIMS) v1.0B ©1994
Lease Abstract Module (revision 4.5)

Property Information

Site Number: -
Property Type:
Height (ft): 0
Alternate Name:

Name: [illegible] Ltd
Address 1: 555 Long Wharf
Address 2: 9th Floor
City/St/Zip: New Haven CT 06511

Edit Owner
Edit Site

Owner Information — Owner_ID: 0

Lessor Information

Name: Metro Mobile CTS of Fairfield Cty.
St. Address: 180 Washington Valley Rd.
City/St/Zip: Bedminster NJ 07921
Contact: Phone:

Lease Information

Counter #: 200
Base Term: 1,000 (m)
Annual Base Amount: $0.00
Renewals: 0
Lease Terms: *option to renew same as overlease, if sublease still in effect, w/ 90 days notice.

Master Lease?
Purchase?
Option?

Abstract Date:
Abstract By:
BANM Approved Date:
BANM Approved By:

Lease Critical Dates

DateType	Schedule Date	Notify Date	Action Date	Action Amount	Note
				$0.00	
				$0.00	
				$0.00	

Lease Increments

Increase Type	Num	Notify Date	Action Date	Period (months)	Increase Amount	Note

Standard Lease?
Can Sublease?
Additional Insurance Required?
Certificate Required?

Standard Lease Notes:
*SUBLEASE

Insurance Notes:

Sublease Language:
Sublease to expire one (1) day prior to term of overlease.
* Sublessee to furnish/install a 280 sq ft addition to existing shelter/all antennas, cabling and route cables to sublessee's equipment bldg. Sublessor to provide cable rack support

Title Notes:
NO consents Req'd from overland Local to this sublease.

Parcel: 4,773 ft
Nine (9) transmit Cellular receive antennas mounted on existing 160 Ft tower

Bell Atlantic
Metro Mobile

Bell Atlantic Metro Mobile
20 Alexander Drive
P.O. Box 5029
Wallingford, CT 06492
203 269-8858

July 21, 1992

The Honorable Jacquelyn C. Durrell
Office of the First Selectman
725 Old Post Road
Fairfield, Connecticut 06430

Dear Ms. Durrell:

Metro Mobile CTS of Fairfield County, Inc. and Springwich Cellular Limited Partnership plan to install cellular antennas and related equipment at an existing tower site owned by Metro Mobile CTS of Fairfield County, Inc. in Fairfield, Connecticut. As required by Section 16-50j-73 of the Regulations of Connecticut State Agencies (R.C.S.A.), please accept this letter and the attached letter to the Connecticut Siting Council dated May 27, 1992, as notice of intent of our exempt modification to an existing tower pursuant to R.C.S.A. Section 16-50j-72(b).

The attached letter fully sets forth Metro Mobile's proposal. However, if you have any questions or require any further information on our plans or the Siting Council's procedures, please contact the undersigned at 294-7403, or Mr. Joel M. Rinebold, Executive Director, Connecticut Siting Council at 827-7682.

Respectfully yours,

David S. Malko, P.E.
Manager, Engineering and Regulatory Services

Attachments

281 WOOD HOUSE ROAD

Location	281 WOOD HOUSE ROAD	**Mblu**	118/ 57/ / /
Acct#	06700	**Owner**	GHOSH MOITRAYEE & RANJAN
Assessment	$529,200	**Appraisal**	$756,000
PID	8854	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$387,400	$368,600	$756,000
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$271,180	$258,020	$529,200

Owner of Record

Owner	GHOSH MOITRAYEE & RANJAN	**Sale Price**	$172,000
Co-Owner	(SV)	**Certificate**	
Address	11 PETERSON ROAD PALMER, MA 01069-09801	**Book & Page**	706/ 293
		Sale Date	06/13/1983

Ownership History

Ownership History				
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Sale Date**
GHOSH MOITRAYEE & RANJAN	$172,000		706/ 293	06/13/1983

Building Information

Building 1 : Section 1

Year Built:	1968
Living Area:	2,426
Replacement Cost:	$444,461
Building Percent Good:	69
Replacement Cost Less Depreciation:	$306,700

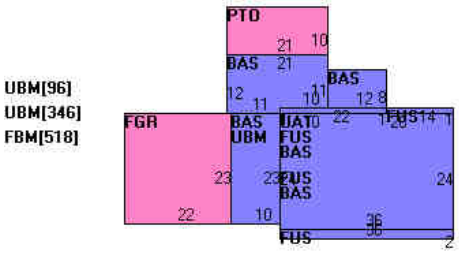
Building Attributes	
Field	**Description**
Style	Colonial
Stories:	2 Stories

Building Photo

Occupancy	1
Exterior Wall 1	Vinyl Siding
Exterior Wall 2	
Roof Structure:	Gable/Hip
Roof Cover	Asphalt
Interior Wall 1	Drywall
Interior Wall 2	
Interior Flr 1	Hardwood
Interior Flr 2	Carpet
Heat Fuel	Oil
Heat Type:	Hot Water
AC Type:	None
Total Bedrooms:	4 Bedrooms
Total Bthrms:	2
Total Half Baths:	1
Total Xtra Fixtrs:	
Total Rooms:	8 Rooms
Bath Style:	Average
Kitchen Style:	Average
FCPZ	

(http://images.vgsi.com/photos/FairfieldCTPhotos//\02\04\39/16.jpg)

Building Layout



Building Sub-Areas (sq ft)			
Code	**Description**	**Gross Area**	**Living Area**
BAS	First Floor	1,454	1,454
FUS	Upper Story, Finished	972	972
FBM	Basement, Finished	518	0
FGR	Garage	506	0
PTO	Patio	210	0
UAT	Attic, Unfinished	864	0
UBM	Basement, Unfinished	672	0
		5,196	2,426

Extra Features

Extra Features				
Code	**Description**	**Size**	**Value**	**Bldg #**
FPL3	2.0 STORY FIREPLACE	1 UNITS	$5,200	1
FPL1	1.0 STORY FIREPLACE	1 UNITS	$3,500	1

Land

Land Use **Land Line Valuation**

Use Code	1010	**Size (Acres)**	2.00
Description	Single Fam MDL-01	**Depth**	0
Zone	AAA	**Assessed Value**	$258,020
Neighborhood	0057	**Appraised Value**	$368,600
Alt Land Appr	No		
Category			

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
	UTIL BLD			1	$31,000	1
	UTIL BLD			1	$31,000	1
	EQUIP SHED			1	$10,000	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$387,400	$368,600	$756,000
2014	$372,300	$409,800	$782,100
2013	$372,300	$409,800	$782,100

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$271,180	$258,020	$529,200
2014	$260,610	$286,860	$547,470
2013	$260,610	$286,860	$547,470

200

278

1180560000
ABRAHAMSON MARK V & MAUREEN M (SV)
278 WOOD HOUSE ROAD

1180550000
DOSDALL MICHAEL T & CAROL M (SV)
310 WOOD HOUSE ROAD

1180540000
KUEFFNER W BRUCE
370 WOOD HOUSE ROAD

420

WOOD HOUSE RD

153020K0000
BUTTS BERNADETTE TR & SKUBLY DE LA CHAPE
248 WOOD HOUSE ROAD

153020H0000
SUNDER SANKAR & SUBHASHREE GOPOLAN (SV)
200 WOOD HOUSE ROAD

WOOD HOUSE RD

325

373

421

281

1180590000
CSONTOS MICHAEL J JR & MEMI M (SV)
373 WOOD HOUSE ROAD

1180580000
MONTAGUE LAWRENCE F & BARBARA J (SV)
325 WOOD HOUSE ROAD

233

1180570000
GHOSH MOITRAYEE & RANJAN (SV)
281 WOOD HOUSE ROAD

363 ft

1180600000
KNAUF CHRISTOPHER & O'SHEA AMY (SV)
421 WOOD HOUSE ROAD

153020G0000
CIMINIELLO FRANK A & ABDER ROXANNE C (SV
233 WOOD HOUSE ROAD

195

153020F0000
BLOCH JEFFREY E & MARISA (SV)
195 WOOD HOUSE ROAD

MERRITT PKWY

15

MERRITT PKWY

15

1180370000
TARASOVIC MARY LOUISE
2468 CONGRESS STREET

PROJECT INFORMATION

SCOPE OF WORK:
- AT&T ANTENNAS: REPLACE EXISTING ANTENNAS (1 PER SECTOR, 3 TOTAL) TO EXISTING MOUNT PIPE
- AT&T RRUs: (2) NEW RRUs PER SECTOR WITH (3) SECTORS, FOR A TOTAL OF (6) NEW RRUs; (1) EXISTING RRU PER SECTOR TO REMAIN, FOR A TOTAL OF (3) EXISTING RRUs.
- REMOVE EXISTING RRUs (1 PER SECTOR, 3 TOTAL)

SITE ADDRESS:	281 WOOD HOUSE ROAD FAIRFIELD, CT 06824	
LATITUDE:	41.195908	41° 11' 45.27"N
LONGITUDE:	−73.281358	−73° 16' 52.89"W
USID:	05788	
TOWER OWNER:	VERIZON	
TYPE OF SITE:	MONOPOLE/INDOOR EQUIPMENT	
MONOPOLE HEIGHT:	171'−0"±	
RAD CENTER:	148'−0"±	
CURRENT USE:	UNMANNED WIRELESS TELECOMMUNICATIONS FACILITY	
PROPOSED USE:	UNMANNED WIRELESS TELECOMMUNICATIONS FACILITY	

DRAWING INDEX

		REV.
T−1	TITLE SHEET	0
GN−1	GROUNDING & GENERAL NOTES	0
A−1	COMPOUND LAYOUT	0
A−2	EQUIPMENT LAYOUTS	0
A−3	ANTENNA LAYOUTS & ELEVATIONS	0
A−4	ANTENNA MOUNTING DETAILS	0
G−1	GROUNDING, ONE−LINE DIAGRAM & DETAILS	0

APPROVALS

THE FOLLOWING PARTIES HEREBY APPROVE AND ACCEPT THESE DOCUMENTS AND AUTHORIZE THE SUBCONTRACTOR TO PROCEED WITH THE CONSTRUCTION DESCRIBED HEREIN, ALL DOCUMENTS ARE SUBJECT TO REVIEW BY THE LOCAL BUILDING DEPARTMENT AMD MAY IMPOSE CHANGES OR SITE MODIFICATIONS.

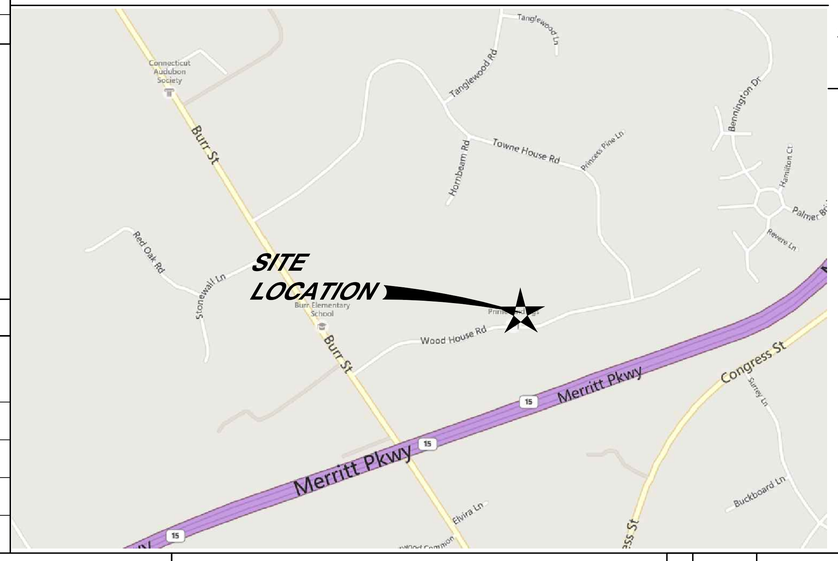
DISCIPLINE:	NAME:	DATE:
SITE ACQUISITION:		
CONSTRUCTION MANAGER:		
AT&T PROJECT MANAGER:		

at&t MOBILITY

FA CODE: 10035026
SITE NUMBER: CT2105
SITE NAME: FAIRFIELD
BU #: 806355
PROJECT: LTE 3C WCS/BWE

VICINITY MAP

1.) DEPART RT−30 W/COCHITUATE RD TOWARD BURR ST (0.3 MI) TURN BACK ON RT−30 E/COCHITUATE RD (0.3 MI) 2.) TAKE RAMP RIGHT FOR I−90 WEST TOWARD WORCESTER/SPRINGFIELD (38.9 MI) 3.) AT EXIT 9, TAKE RAMP RIGHT FOR I−84 TOWARD NEW YORK CITY/HARTFORD ENTERING CONNECTICUT (41.7 MI) 4.) AT EXIT 57, TAKE RAMP LEFT FOR CT−15 SOUTH TOWARD N.Y. CITY/CHARTER OAK BR (1.1 MI) 5.) KEEP STRAIGHT ONTO US−5 S/CT−15 S (0.8 MI) 6.) AT EXIT 86, TAKE RAMP RIGHT FOR I−91 SOUTH TOWARD N.Y. CITY/NEW HAVEN (17.1 MI) 7.) AT EXIT 17, TAKE RAMP RIGHT FOR CT−15 SOUTH TOWARD E. MAIN ST/W. CROSS PKWY (37.7 MI) 8.) AT EXIT 44, TAKE RAMP RIGHT TOWARD FAIRFIELD/ REDDING 9.) 327 FT TURN LEFT ONTO CONGRESS ST, AND THEN IMMEDIATELY TURN RIGHT ONTO CT−58/BLACK ROCK TPKE (0.7 MI) 10.) TURN LEFT ONTO TANGLEWOOD RD (0.2 MI) 11.) TURN LEFT ONTO TOWNE HOUSE RD (0.4 MI) 12.) TURN RIGHT ONTO WOOD HOUSE RD (0.1 MI) 13.) ARRIVE AT 281 WOOD HOUSE RD, FAIRFIELD, CT 06824



PROJECT TEAM

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CONTACT: DAVID COOPER
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CONTACT: NICHOLAS D. BARILE, P.E.
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RF ENGINEER:
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CONTACT: CAMERON SYME
PHONE: 508−596−7146
EMAIL: cs6970@att.com

CONSTRUCTION MANAGEMENT:
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GENERAL NOTES

1. THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY, AND COPYRIGHTED WORK OF AT&T. ANY DUPLICATION OR USE WITHOUT EXPRESS WRITTEN CONSENT IS STRICTLY PROHIBITED. DUPLICATION AND USE BY GOVERNMENT AGENCIES FOR THE PURPOSES OF CONDUCTING THEIR LAWFULLY AUTHORIZED REGULATORY AND ADMINISTRATIVE FUNCTIONS IS SPECIFICALLY ALLOWED.

2. THE FACILITY IS AN UNMANNED PRIVATE AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSED BY TRAINED TECHNICIANS FOR PERIODIC ROUTINE MAINTENANCE AND THEREFORE DOES NOT REQUIRE ANY WATER OR SANITARY SEWER SERVICE. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.

3. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE AT&T REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

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FAX: 862.209.4301

EMPIRE telecom
16 ESQUIRE ROAD
BILLERICA, MA 01821

SITE NUMBER: CTU2105
SITE NAME: FAIRFIELD-MURRAY

281 WOOD HOUSE ROAD
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FAIRFIELD COUNTY

at&t MOBILITY
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
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0	07/12/16	ISSUED AS FINAL	AM	NDB	NDB

SCALE: AS SHOWN | DESIGNED BY: AM | DRAWN BY: AM

SEAL: STATE OF CONNECTICUT · NICHOLAS D. BARILE · 30643 · PROFESSIONAL ENGINEER

AT&T

DRAWING TITLE: TITLE SHEET

JOB NUMBER	DRAWING NUMBER	REV
16033−EMP	T−1	1

GROUNDING NOTES:

1. THE SUBCONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM AND LIGHTNING PROTECTION SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ), THE SITE-SPECIFIC (UL, LPI, OR NFPA) LIGHTING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE SUBCONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE CONTRACTOR FOR RESOLUTION.

2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.

3. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR NEW GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS. TESTS SHALL BE PERFORMED IN ACCORDANCE WITH 25471-000-3PS-EG00-0001, DESIGN & TESTING OF FACILITY GROUNDING FOR CELL SITES.

4. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.

5. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS; 2 AWG STRANDED COPPER FOR OUTDOOR BTS.

6. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.

7. APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.

8. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED WITH STAINLESS STEEL HARDWARE TO THE BRIDGE AND THE TOWER GROUND BAR.

9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.

10. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.

11. METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 AWG COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.

12. GROUND CONDUCTORS USED IN THE FACILITY GROUND AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS. WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON-METALLIC MATERIAL SUCH AS PVC PLASTIC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (E.G., NON-METALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT.

13. ALL TOWER GROUNDING SYSTEMS SHALL COMPLY WITH THE REQUIREMENTS OF ANSI/TIA 222. FOR TOWERS BEING BUILT TO REV-G OF THE STANDARD, THE WIRE SIZE OF THE BURIED GROUND RING AND CONNECTIONS BETWEEN THE TOWER AND THE BURIED GROUND RING SHALL BE CHANGED FROM 2 AWG TO 2/0 AWG. IN ADDITION, THE MINIMUM LENGTH OF THE GROUND RODS SHALL BE INCREASED FROM EIGHT FEET (8') TO TEN FEET (10').

14. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE ½" OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID TINNED COPPER GROUND WIRE, PER NEC 250.50.

GENERAL NOTES:

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
   CONTRACTOR – EMPIRE TELECOM
   SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
   OWNER – AT&T MOBILITY
   OEM – ORIGINAL EQUIPMENT MANUFACTURER

2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR (EMPIRE TELECOM).

3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.

4. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.

5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.

6. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.

7. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.

8. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR. ROUTING OF TRENCHING SHALL BE APPROVED BY CONTRACTOR

9. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.

10. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OFF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.

11. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.

12. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.

13. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS UNLESS OTHERWISE SPECIFIED. ALL CONCRETING WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.

14. ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (Fy=36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCH UP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.

15. CONSTRUCTION SHALL COMPLY WITH SPECIFICATION 25741-000-3APS-A00Z-00002, "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T MOBILITY SITES."

16. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.

17. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK MAY NEED TO BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.

18. SINCE THE CELL SITE MAY BE ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE REQUIRED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.

19. SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.
   - INTERNATIONAL BUILDING CODE: IBC 2009 WITH LOCAL & COUNTY AMENDMENTS
   - NATIONAL ELECTRICAL CODE: NEC 2011 WITH LOCAL & COUNTY AMENDMENTS
   - FIRE/LIFE SAFETY CODE: NFPA-101 2009 WITH LOCAL & COUNTY AMENDMENTS

20. SUBCONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS:
   - AMERICAN CONCRETE INSTITUTE (ACI) 318, BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE
   - AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC), MANUAL OF STEEL CONSTRUCTION, THIRTEENTH EDITION
   - AMERICAN SOCIETY OF TESTING OF MATERIALS, ASTM
   - TELECOMMUNICATIONS INDUSTRY ASSOCIATION (ANSI/TIA-222-G-1), STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES:
   - TIA 607, COMMERCIAL BUILDING GROUNDING AND BONDING REQUIREMENTS FOR TELECOMMUNICATIONS
   - OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION, OSHA
   - INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE) 81, GUIDE FOR MEASURING EARTH RESISTIVELY, GROUND IMPEDANCE, AND EARTH SURFACE POTENTIALS OF A GROUND SYSTEM IEEE 1100 (1999) RECOMMENDED PRACTICE FOR POWERING AND GROUNDING OF ELECTRONIC EQUIPMENT
   - TELCORDIA GR-1503, COAXIAL CABLE CONNECTIONS

21. FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS REGARDING MATERIAL, METHODS OF CONSTRUCTION, OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN. WHERE THERE IS CONFLICT BETWEEN A GENERAL REQUIREMENT AND A SPECIFIC REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL GOVERN.

22. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES AND EXISTING CONDITIONS AT THE SITE PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA AND SUBMIT TO THE ENGINEER ANY DISCREPANCIES FROM THE DRAWINGS.

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SITE NAME: FAIRFIELD-MURRAY

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FAIRFIELD COUNTY

at&t MOBILITY
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

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0	07/12/16	ISSUED AS FINAL	AM	NDB	NDB

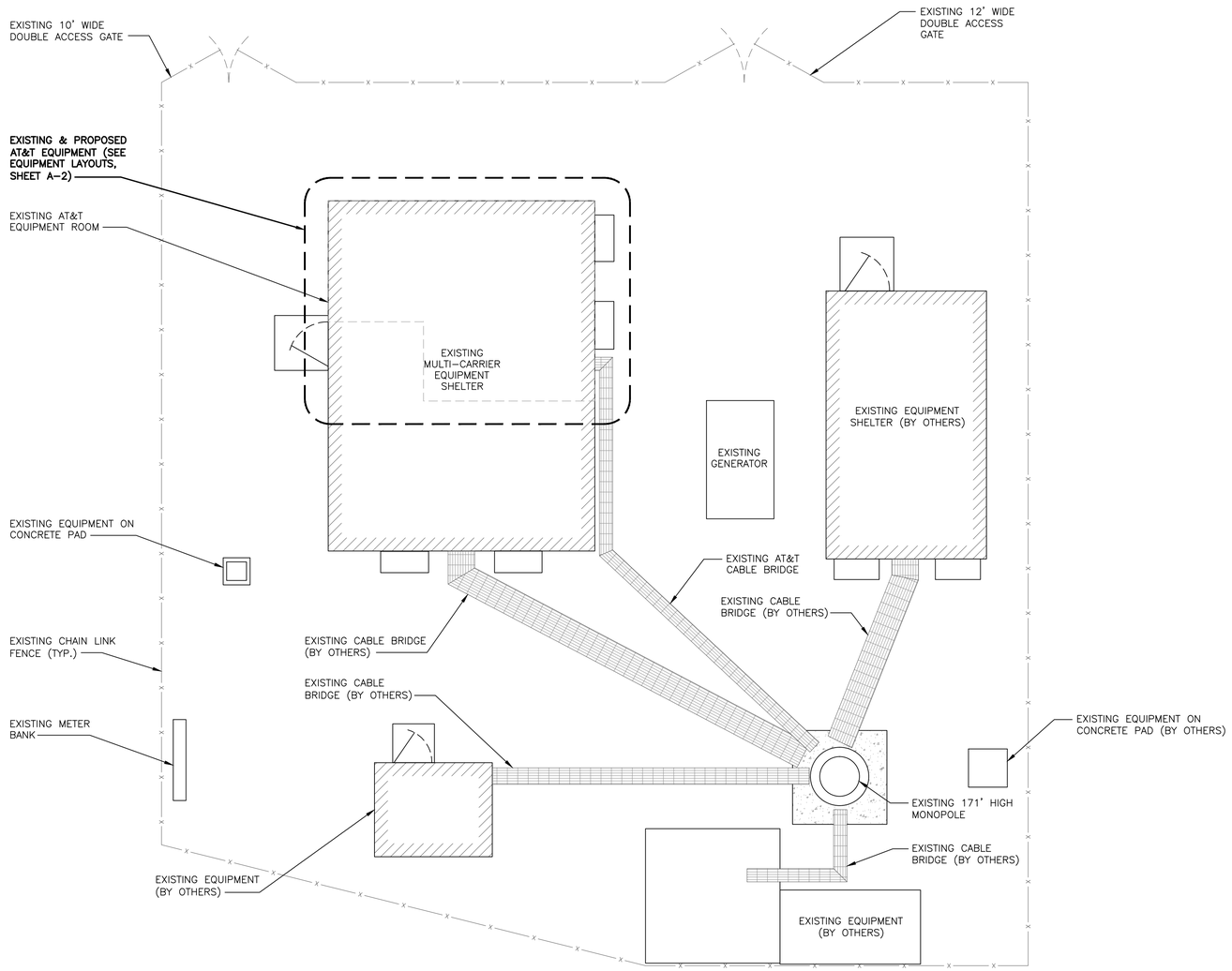
SCALE: AS SHOWN | DESIGNED BY: AM | DRAWN BY: AM

SEAL:
STATE OF CONNECTICUT
DOUGLAS B. BIBBO
LICENSED PROFESSIONAL ENGINEER
PROFESSIONAL ENGINEER
CT LICENSE NO. 23643

AT&T

DRAWING TITLE:
GROUNDING & GENERAL NOTES

JOB NUMBER	DRAWING NUMBER	REV
16033-EMP	GN-1	1



COMPOUND LAYOUT

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

NORTH

NOTE:
CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA AND SUBMIT TO THE ENGINEER ANY DISCREPANCIES FROM THE DRAWINGS.

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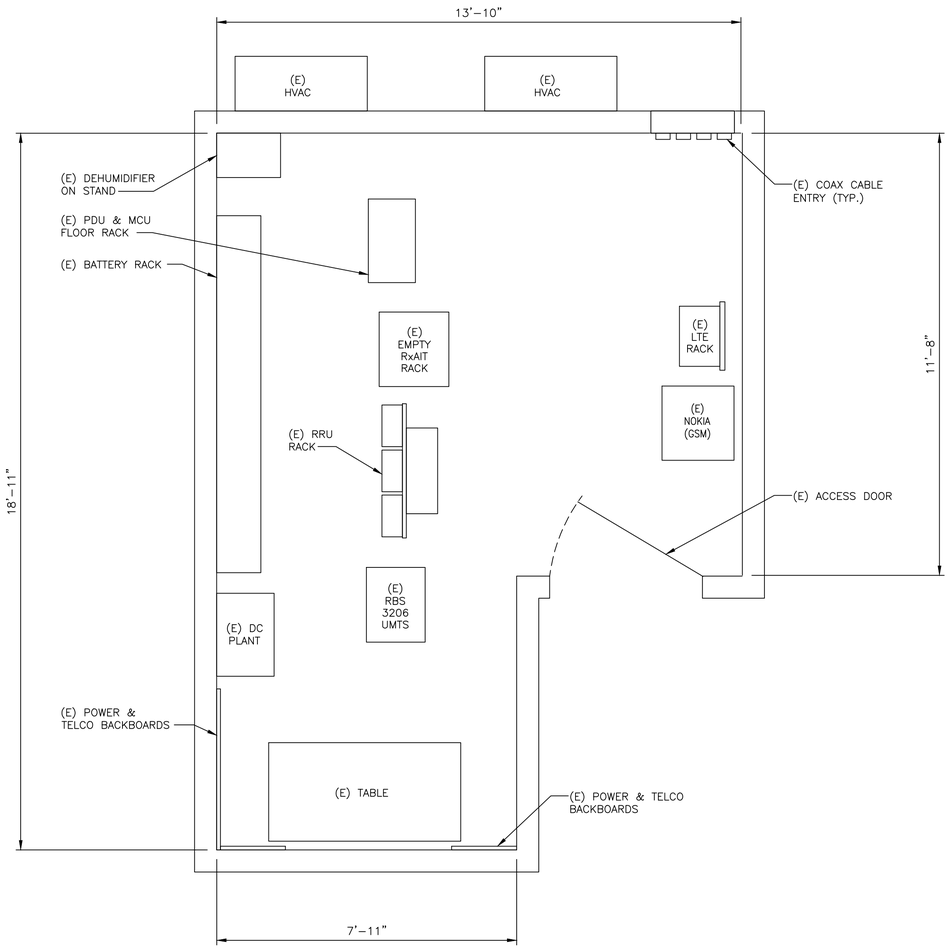
SEAL:
STATE OF CONNECTICUT
NICHOLAS D. BOBAK
No. 28643
REGISTERED PROFESSIONAL ENGINEER
PROFESSIONAL ENGINEER
CT LICENSE NO. 28643

AT&T

DRAWING TITLE:
COMPOUND LAYOUT

JOB NUMBER	DRAWING NUMBER	REV
16033-EMP	A-1	1



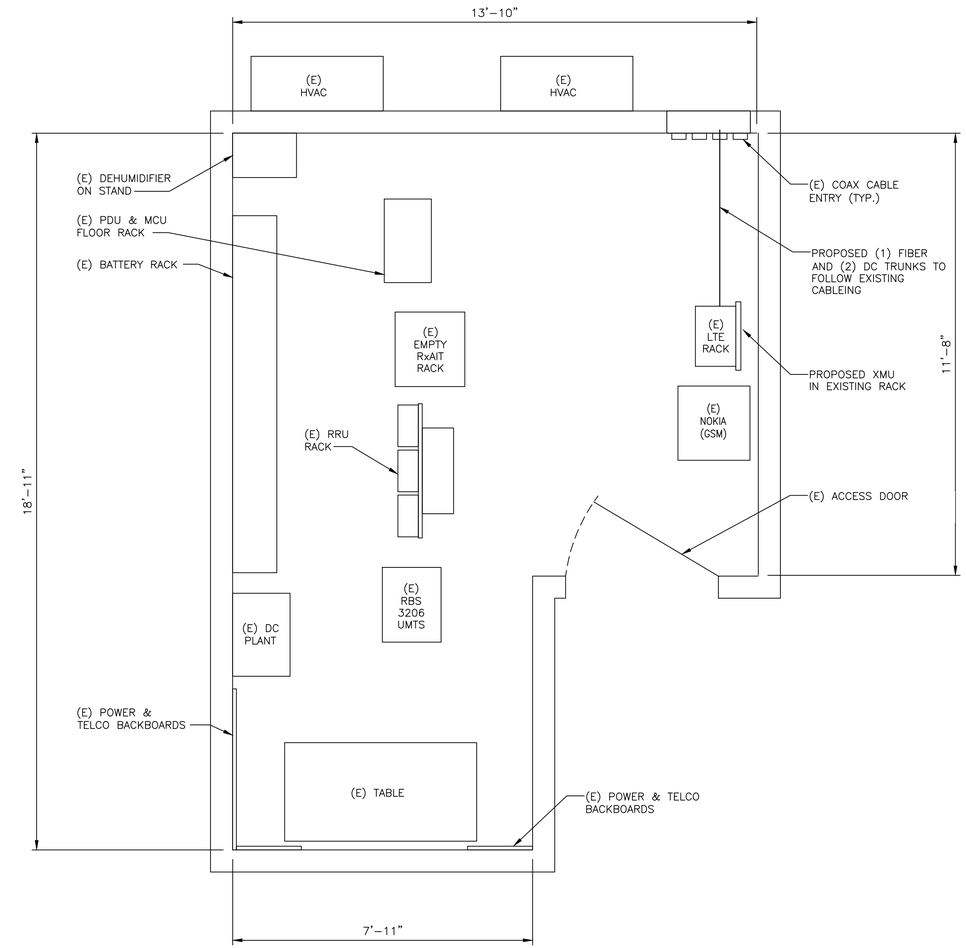
EXISTING EQUIPMENT LAYOUT

SCALE: 1/2" = 1'-0"

2 0 1 2 4 8

(IN FEET)
1/2 Inch = 1 Foot

NORTH



PROPOSED EQUIPMENT LAYOUT

SCALE: 1" = 2'-0"

2 0 1 2 4 8

(IN FEET)
1/2 Inch = 1 Foot

NORTH

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SEAL:

STATE OF CONNECTICUT
DOUGLAS D. REPETTI
LICENSED PROFESSIONAL ENGINEER
No. 28643
PROFESSIONAL ENGINEER
CT LICENSE NO. 28643

AT&T

DRAWING TITLE:
EQUIPMENT LAYOUTS

JOB NUMBER	DRAWING NUMBER	REV
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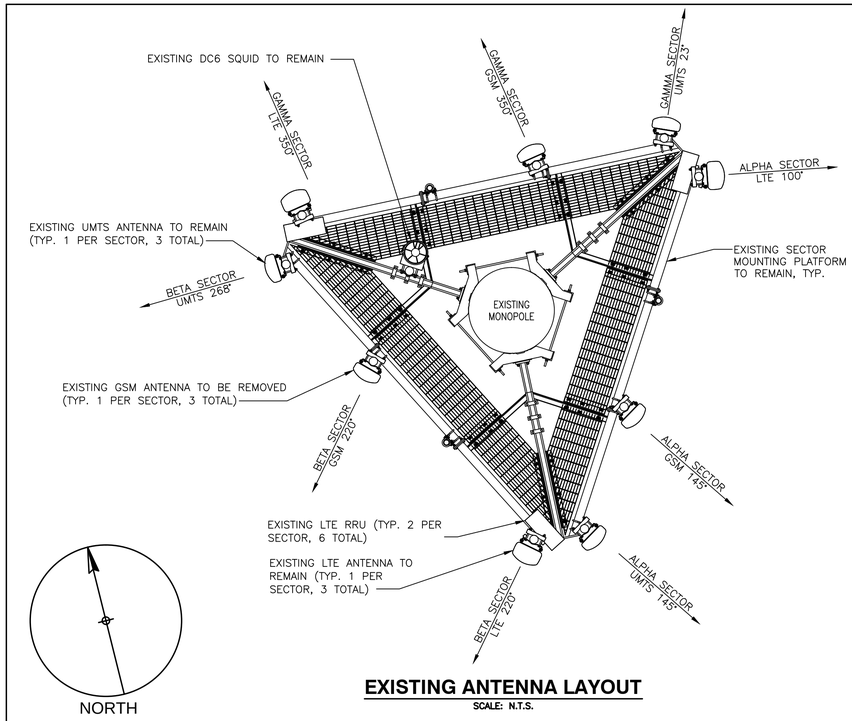
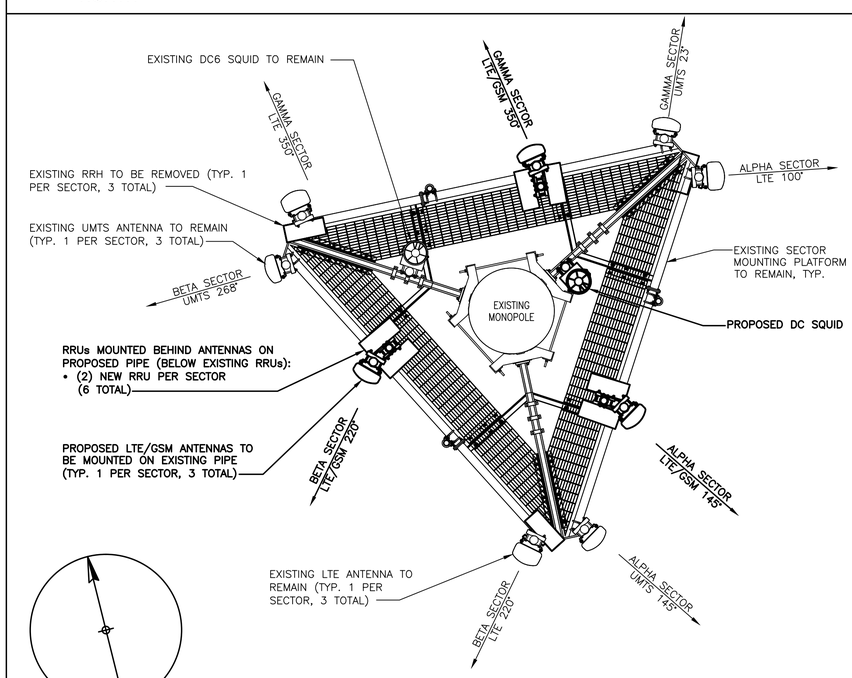


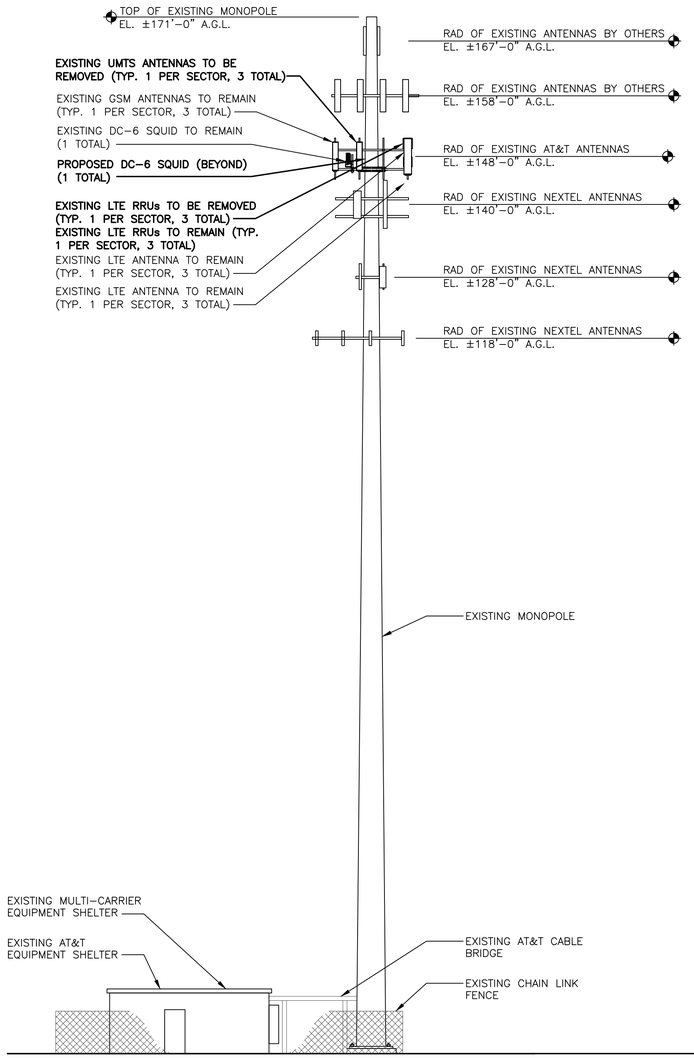
EXISTING ANTENNA LAYOUT

SCALE: N.T.S.



PROPOSED ANTENNA LAYOUT

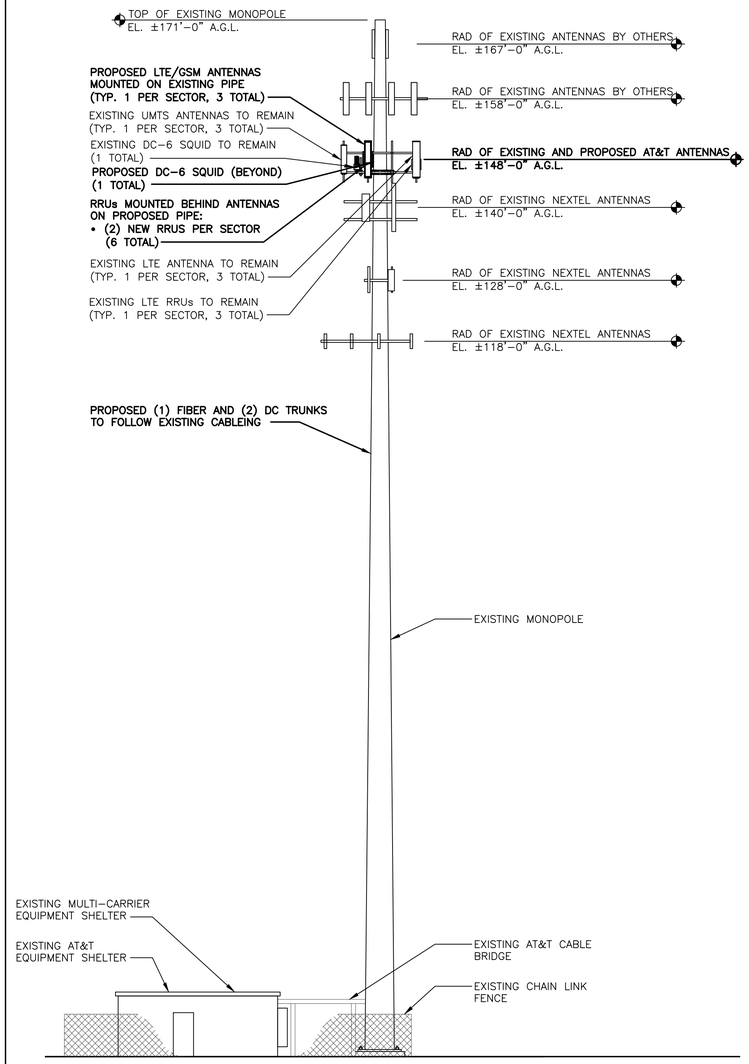
SCALE: N.T.S.



EXISTING TOWER ELEVATION

SCALE: NTS

EXISTING CABLES TO BE UTILIZED FOR NEW EQUIPMENT (PER RFDS)



PROPOSED TOWER ELEVATION

SCALE: NTS

PROJECT OWNER IS RESPONSIBLE FOR PROVIDING A STRUCTURAL STABILITY ANALYSIS TO DETERMINE THE CAPACITY AND SUITABILITY OF THE EXISTING ANTENNA SUPPORT STRUCTURE TO SAFELY CARRY ALL ADDITIONAL LOADS IMPOSED BY THE PROPOSED EQUIPMENT AS SHOWN HEREIN. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR INCORPORATING ANY REQUIRED STRUCTURAL MODIFICATIONS INTO THEIR SCOPE OF WORK.

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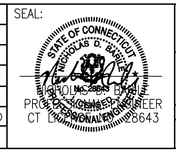
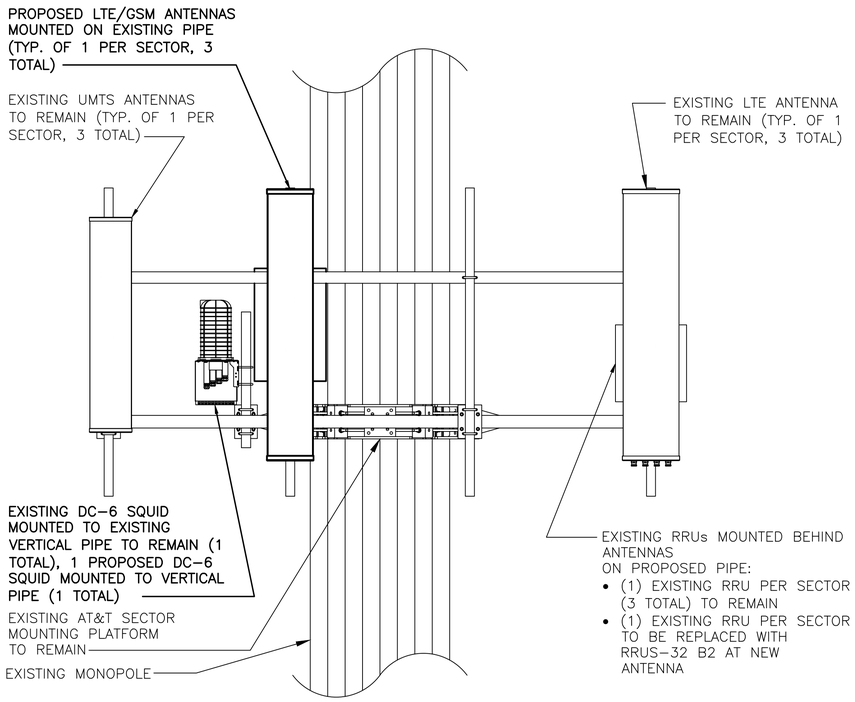


PROFESSIONAL ENGINEER
CT LICENSE NO. 23643

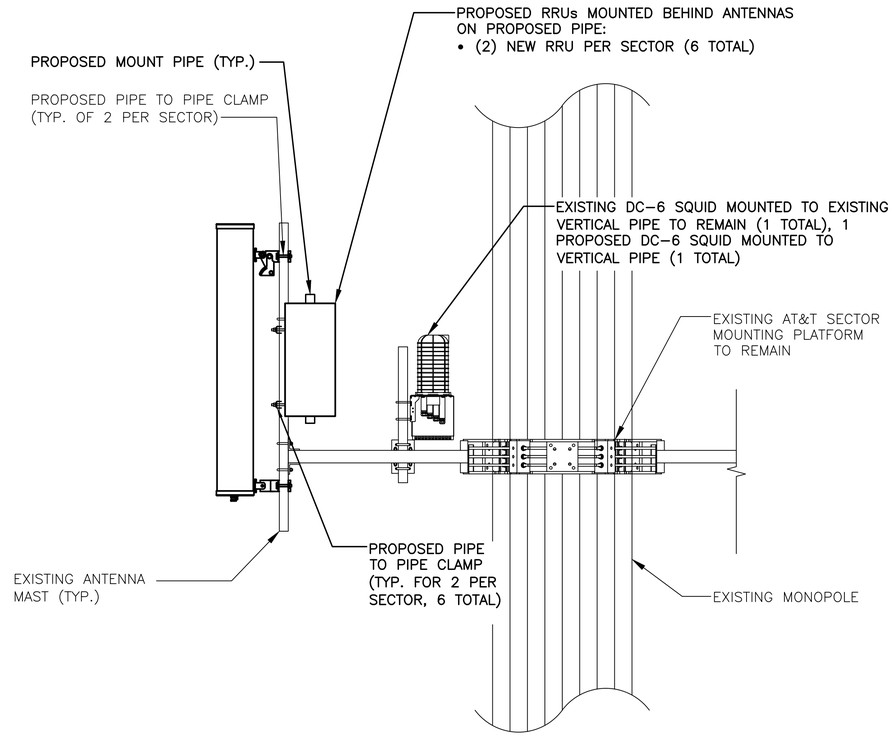
AT&T

DRAWING TITLE:
ANTENNA LAYOUTS & ELEVATIONS

JOB NUMBER	DRAWING NUMBER	REV
16033-EMP	A-3	1



EXISTING ANTENNA MOUNTING DETAIL (FRONT VIEW)
SCALE: N.T.S.



PROPOSED ANTENNA MOUNTING DETAIL (SIDE VIEW)
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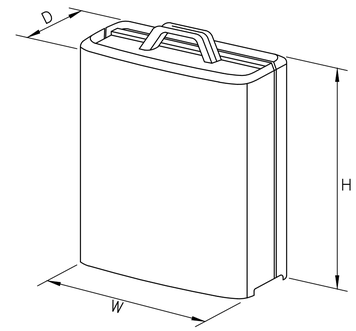


MODEL	L x W x H	WEIGHT
RRUS-11	19.69" x 16.97" x 7.17"	50.7 LBS
RRUS-32	29.9" x 13.3" x 9.5"	77 LBS

RRUS DETAIL
SCALE: N.T.S.

EXISTING ANTENNA SCHEDULE

SECTOR	POSITION	MAKE	MODEL	SIZE (INCHES)
ALPHA	A1	POWERWAVE	P65-16-XLH-RR	72"x12"x6"
	A2	–	–	–
	A3	POWERWAVE	7770	55"x11"x5"
	A4	POWERWAVE	7770	55"x11"x5"
BETA	B1	POWERWAVE	P65-16-XLH-RR	72"x12"x6"
	B2	–	–	–
	B3	POWERWAVE	7770	55"x11"x5"
	B4	POWERWAVE	7770	55"x11"x5"
GAMMA	G1	POWERWAVE	P65-16-XLH-RR	72"x12"x6"
	G2	–	–	–
	G3	POWERWAVE	7770	55"x11"x5"
	G4	POWERWAVE	7770	55"x11"x5"

FINAL ANTENNA SCHEDULE

SECTOR	POSITION	MAKE	MODEL	SIZE (INCHES)
ALPHA	A1	POWERWAVE	P65-16-XLH-RR	72"x12"x6"
	A2	–	–	–
	A3	**QUINTEL**	**QS66512-2**	**72"x12"x9.6"**
	A4	POWERWAVE	7770	55"x11"x5"
BETA	B1	POWERWAVE	P65-16-XLH-RR	72"x12"x6"
	B2	–	–	–
	B3	**QUINTEL**	**QS66512-2**	**72"x12"x9.6"**
	B4	POWERWAVE	7770	55"x11"x5"
GAMMA	G1	POWERWAVE	P65-16-XLH-RR	72"x12"x6"
	G2	–	–	–
	G3	**QUINTEL**	**QS66512-2**	**72"x12"x9.6"**
	G4	POWERWAVE	7770	55"x11"x5"

FINAL RRU SCHEDULE

SECTOR	MAKE	MODEL	SIZE (INCHES)	ADDITIONAL COMPONENT	SIZE (INCHES)
ALPHA	ERICSSON	**RRUS-32 B2**			
	ERICSSON	**RRU-32**			
	ERICSSON	RRUS-11 (EXISTING)	19.7"x16.9"x7.2"		
BETA	ERICSSON	**RRUS-32 B2**			
	ERICSSON	**RRU-32**			
	ERICSSON	RRUS-11 (EXISTING)	19.7"x16.9"x7.2"		
GAMMA		**RRUS-32 B2**			
	ERICSSON	**RRU-32**			
	ERICSSON	RRUS-11 (EXISTING)	19.7"x16.9"x7.2"		

PROJECT OWNER IS RESPONSIBLE FOR PROVIDING A STRUCTURAL STABILITY ANALYSIS TO DETERMINE THE CAPACITY AND SUITABILITY OF THE EXISTING ANTENNA SUPPORT STRUCTURE TO SAFELY CARRY ALL ADDITIONAL LOADS IMPOSED BY THE PROPOSED EQUIPMENT AS SHOWN HEREIN. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR INCORPORATING ANY REQUIRED STRUCTURAL MODIFICATIONS INTO THEIR SCOPE OF WORK.

COM-EX Consultants
115 ROUTE 46
SUITE E39
MOUNTAIN LAKES, NJ 07046
PHONE: 862.209.4300
FAX: 862.209.4301

EMPIRE telecom
16 ESQUIRE ROAD
BILLERICA, MA 01821

SITE NUMBER: CTU2105
SITE NAME: FAIRFIELD-MURRAY

281 WOOD HOUSE ROAD
FAIRFIELD, CT 06824
FAIRFIELD COUNTY

at&t MOBILITY
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	08/17/16	REVISED PER CLIENT COMMENTS	NM	NDB	NDB
0	07/12/16	ISSUED AS FINAL	AM	NDB	NDB

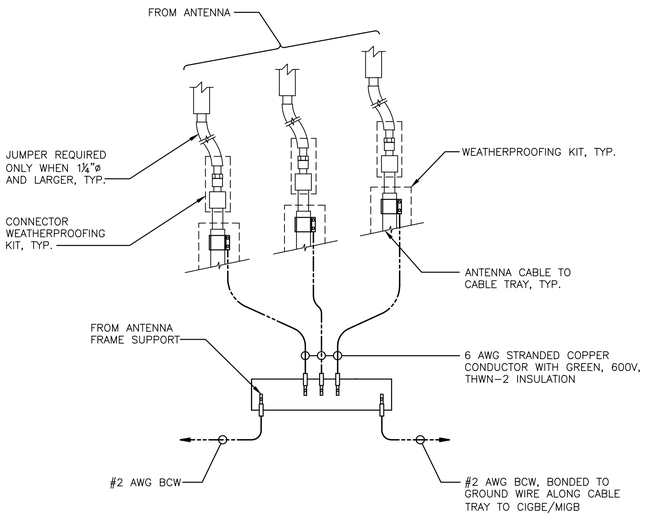
SCALE: AS SHOWN | DESIGNED BY: AM | DRAWN BY: AM

SEAL:
STATE OF CONNECTICUT
NICHOLAS D. BOWDEN
12/31/2016
PROFESSIONAL ENGINEER
CT LICENSE NO. 28643

AT&T

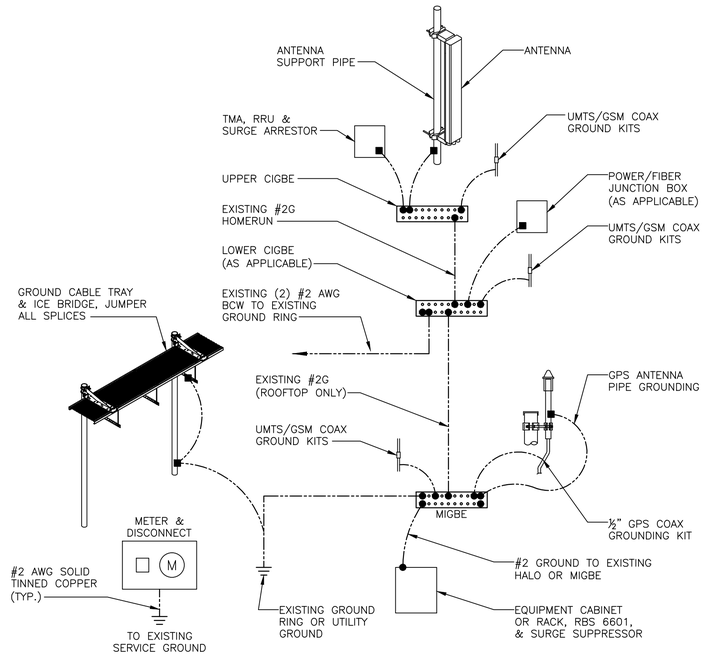
DRAWING TITLE:
ANTENNA MOUNTING DETAILS

JOB NUMBER	DRAWING NUMBER	REV
16033-EMP	A-4	1



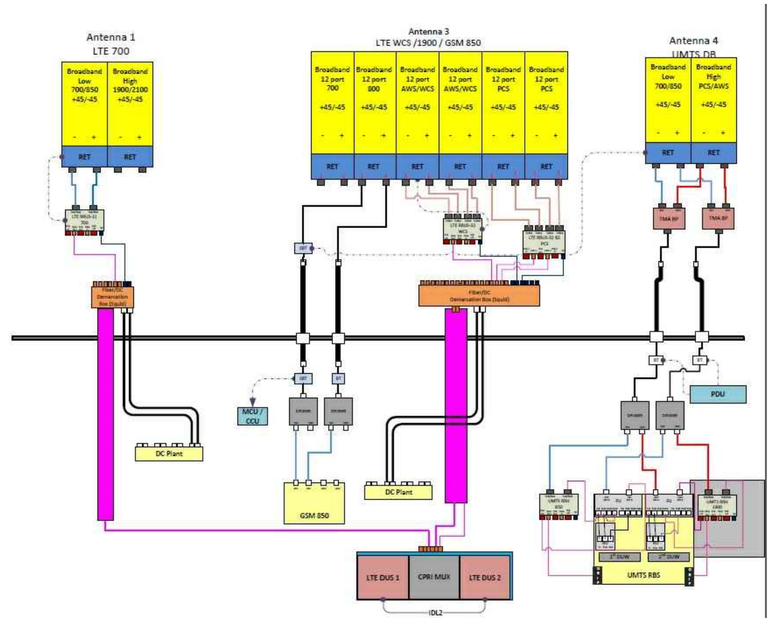
GROUND WIRE TO GROUND BAR CONNECTION DETAIL

SCALE: N.T.S.



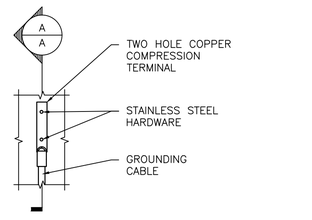
GROUNDING RISER DIAGRAM

SCALE: N.T.S.

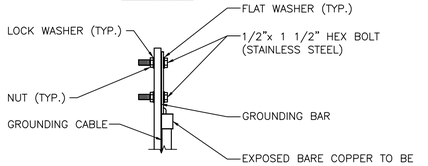


TYPICAL PLUMBING DIAGRAM (PER SECTOR)

SCALE: N.T.S.



ELEVATION



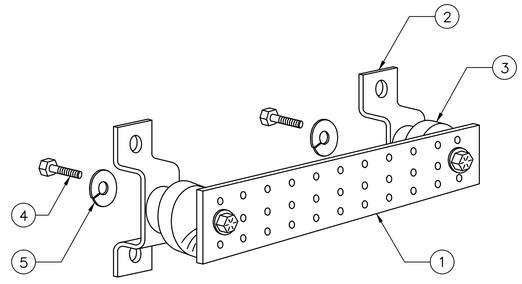
SECTION "A–A"

NOTE:

1. "DOUBLING UP" OR "STACKING" OF CONNECTIONS IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
3. CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB, AND MGB.

TYPICAL GROUND BAR CONNECTION DETAIL

SCALE: N.T.S.



ITEM NO.	QTY.	DESCRIPTION
1	1	SOLID GROUND BAR (20"x 4"x ¼")
2	2	WALL MOUNTING BRACKET
3	2	INSULATORS
4	4	⅝"–11x1" H.H.C.S.
5	4	⅝" LOCK WASHER

NOTES:

EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION

SECTION "P" – SURGE PRODUCERS
- CABLE ENTRY PORTS (HATCH PLATES) (#2)
- GENERATOR FRAMEWORK (IF AVAILABLE) (#2)
- TELCO GROUND BAR
- COMMERCIAL POWER COMMON NEUTRAL/GROUND BOND (#2)
- +24V POWER SUPPLY RETURN BAR (#2)
- –48V POWER SUPPLY RETURN BAR (#2)
- RECTIFIER FRAMES

SECTION "A" – SURGE ABSORBERS
- INTERIOR GROUND RING (#2)
- EXTERNAL EARTH GROUND FIELD (BURIED GROUND RING) (#2)
- METALLIC COLD WATER PIPE (IF AVAILABLE) (#2)
- BUILDING STEEL (IF AVAILABLE) (#2)

GROUND BAR DETAIL

SCALE: N.T.S.

COM-EX Consultants
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SUITE E39
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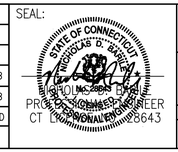
SCALE: AS SHOWN | DESIGNED BY: AM | DRAWN BY: AM

SEAL:



AT&T

DRAWING TITLE:
GROUNDING, ONE–LINE DIAGRAM & DETAILS

JOB NUMBER	DRAWING NUMBER	REV
16033–EMP	G–1	1

Date: **July 06, 2016**

Charles McGuirt
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277

JACOBS
Jacobs Engineering Group, Inc.
5449 Bells Ferry Rd
Acworth, GA 30102
(770) 701-2500

Subject: **Structural Analysis Report**

Carrier Designation:

***AT&T Mobility* Co-Locate**
Carrier Site Number: CTL02105
Carrier Site Name: FAIRFIELD-MURRAY

Crown Castle Designation:

Crown Castle BU Number: 806355
Crown Castle Site Name: BRG 126 943086
Crown Castle JDE Job Number: 384544
Crown Castle Work Order Number: 1261241
Crown Castle Application Number: 353118 Rev. 3

Engineering Firm Designation: **Jacobs Engineering Group, Inc. Project Number:** 1261241

Site Data:

281 WOODHOUSE ROAD, FAIRFIELD, Fairfield County, CT
Latitude *41° 11' 45.3"*, Longitude *-73° 16' 52.9"*
170.5 Foot - Monopole Tower

Dear Charles McGuirt,

Jacobs Engineering Group, Inc. is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 921167, in accordance with application 353118, revision 3.

The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

- LC7: Existing + Reserved + Proposed Equipment **Sufficient Capacity**
  Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

The analysis has been performed in accordance with the TIA/EIA-222-F standard and 2005 CT State Building Code based upon a wind speed of 85 mph fastest mile.

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

We at *Jacobs Engineering Group, Inc.* appreciate the opportunity of providing our continuing professional services to you and Crown Castle. If you have any questions or need further assistance on this or any other projects please give us a call.

Structural analysis prepared by:

Ankit Biratia
Structural Engineer

7/06/16

Reviewed By:

Matthew E. Watkins, P.E., LEED[AP]
Project Engineer

tnxTower Report - version 7.0.5.1

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 170.5 ft Monopole tower designed by ENGINEERED ENDEAVORS, INC. in May of 1998. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-E & F.

2) ANALYSIS CRITERIA

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

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
146.0	148.0	3	ericsson	RRUS 32	2 1	3/4 3/8	-
		3	ericsson	RRUS 32 B2			
		3	kathrein	782 10254			
		3	quintel technology	QS66512-2 w/ Mount Pipe			
		1	raycap	DC6-48-60-18-8F			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
166.0	167.0	3	ems wireless	DR90-14-00DPL2 w/ Mount Pipe	6	1-5/8	3
	166.0	1	tower mounts (crown)	Pipe Mount [PM 601-3]			
155.0	158.0	3	antel	BXA-171063/12CF w/ Mount Pipe	1	1-5/8	2
		1	rfs celwave	DB-T1-6Z-8AB-0Z			
		3	alcatel lucent	RRH2X40-AWS			
		3	andrew	LNX-6514DS-T4M w/ Mount Pipe	12 1	1-5/8 1/2	1
		6	decibel	DB844G65ZAXY w/ Mount Pipe			
		3	rymsa wireless	MG D3-800TV w/ Mount Pipe			
		1	rfs celwave	FD9R6004/2C-3L			
	155.0	5	rfs celwave	FD9R6004/2C-3L			
		1	tower mounts (crown)	Platform Mount [LP 713-1]			
	160.0	1	gps	GPS_A			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
146.0	148.0	1	raycap	DC6-48-60-18-8F	3	3/8	4
		3	powerwave technologies	7770.00 w/ Mount Pipe			
		3	ericsson	RRUS 11 B2			
		12	powerwave technologies	7020.00	12 2 1	1-5/8 5/8 3/8	1
		3	powerwave technologies	7770.00			
		3	powerwave technologies	P65-16-XLH-RR w/ Mount Pipe			
		1	raycap	DC6-48-60-18-8F			
	146.0	1	tower mounts (crown)	Platform Mount [LP 713-1]			
		3	ericsson	RRUS-11			
		12	powerwave technologies	LGP2140X			
138.0	140.0	3	commscope	LNX-6515DS-VTM w/ Mount Pipe	13	1-5/8	1
		3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe			
		3	ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe			
		3	ericsson	RRUS 11 B12			
	138.0	3	ericsson	KRY 112 144/1			
		1	tower mounts (crown)	Platform Mount [LP 713-1]			
128.0	128.0	1	andrew	VHLP800-11	3 3 1	5/16 1/4 1/2	1
		3	kathrein	840 10054 w/ Mount Pipe			
		1	tower mounts (crown)	Side Arm Mount [SO 101-3]			

Notes:
1) Existing Equipment
2) Reserved Equipment
3) Abandoned Equipment
4) Equipment to be removed; Not considered in this analysis

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
160.0	160.0	12	Allgon	ALP 9212	-	-
148.0	148.0	12	Allgon	ALP 11011	-	-
138.0	138.0	6	Celwave	APN 199015	-	-
128.0	128.0	12	Allgon	ALP 9212	-	-
118.0	118.0	12	Allgon	ALP 9212	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-TOWER MANUFACTURER DRAWINGS	Engineered Endeavors, Inc.	653293	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Engineered Endeavors, Inc.	1098364	CCISITES
4-GEOTECHNICAL REPORTS	Clarence Welti Assoc., Inc.	1099974	CCISITES

3.1) Analysis Method

tnxTower (version 7.0.5.1), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
4) When applicable, transmission cables are considered as structural components for calculating wind loads as allowed by TIA/EIA-222-F.

This analysis may be affected if any assumptions are not valid or have been made in error. Jacobs Engineering Group, Inc. should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	170.5 - 156	Pole	TP10.75x10.75x0.365	1	-0.78	333.35	16.6	Pass
L2	156 - 155.5	Pole	TP19.5x10.75x0.365	2	-0.78	333.35	16.6	Pass
L3	155.5 - 132.17	Pole	TP24.79x19.5x0.1875	3	-7.84	735.45	76.2	Pass
L4	132.17 - 86.5867	Pole	TP34.63x23.5836x0.375	4	-16.21	2052.54	96.1	Pass
L5	86.5867 - 42.5	Pole	TP43.75x32.7959x0.4375	5	-27.51	3029.76	98.0	Pass
L6	42.5 - 0	Pole	TP52.5x41.5315x0.5	6	-34.57	3747.61	90.5	Pass
							Summary	
						Pole (L5)	98.0	Pass
						Rating =	98.0	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	80.8	Pass
1	Base Plate	0	97.9	Pass
1	Base Foundation (Structural)	0	97.2	Pass
1	Base Foundation Soil Interaction	0	77.9	Pass
1	Flange Bolts & Plates	156	3.3 & 30.7	Pass

Structure Rating (max from all components) =	98.0%

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

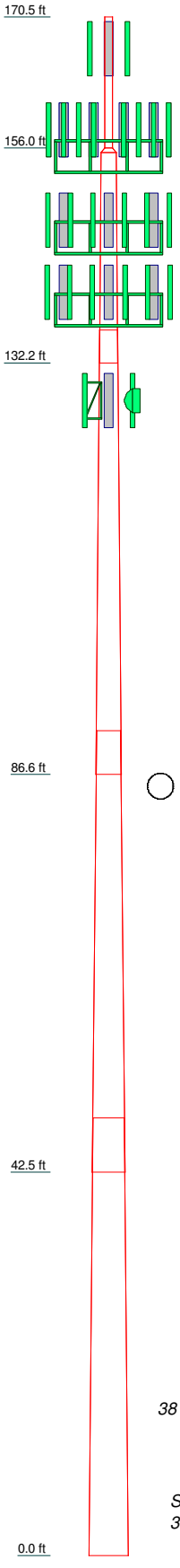
4.1) Recommendations

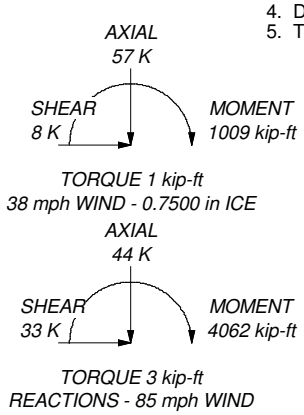
The tower and its base and anchor foundations have sufficient capacity to carry the existing, reserved and proposed loads. No modifications are required at this time.

APPENDIX A

TNXTOWER OUTPUT

Section	1	2	3	4	5	6
Length (ft)	14.50	0.50	23.33	49.25	48.92	48.50
Number of Sides	1	1	18	18	18	18
Thickness (in)	0.3650	0.3650	0.1875	0.3750	0.4375	0.5000
Socket Length (ft)			3.67	4.83	6.00	
Top Dia (in)	10.7500	10.7500	19.5000	23.5836	32.7959	41.5315
Bot Dia (in)	10.7500	19.5000	24.7900	34.6300	43.7500	52.5000
Grade	A53-B-35			A572-65		
Weight (K)	0.6	0.0	1.0	5.7	8.7	12.2





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
DR90-14-00DPL2 w/ Mount Pipe	166	DC6-48-60-18-8F	146
DR90-14-00DPL2 w/ Mount Pipe	166	RRUS 32	146
DR90-14-00DPL2 w/ Mount Pipe	166	RRUS 32	146
Pipe Mount [PM 601-3]	166	RRUS 32	146
(2) DB844G65ZAXY w/ Mount Pipe	155	RRUS 32 B2	146
DB844G65ZAXY w/ Mount Pipe	155	RRUS 32 B2	146
(3) DB844G65ZAXY w/ Mount Pipe	155	RRUS 32 B2	146
LNX-6514DS-T4M w/ Mount Pipe	155	782 10254	146
LNX-6514DS-T4M w/ Mount Pipe	155	782 10254	146
LNX-6514DS-T4M w/ Mount Pipe	155	782 10254	146
MG D3-800TV w/ Mount Pipe	155	6' x 2" Mount Pipe	146
MG D3-800TV w/ Mount Pipe	155	6' x 2" Mount Pipe	146
MG D3-800TV w/ Mount Pipe	155	6' x 2" Mount Pipe	146
GPS_A	155	Platform Mount [LP 713-1]	146
BXA-171063/12CF w/ Mount Pipe	155	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	138
BXA-171063/12CF w/ Mount Pipe	155		
BXA-171063/12CF w/ Mount Pipe	155	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	138
RRH2X40-AWS	155		
RRH2X40-AWS	155	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	138
RRH2X40-AWS	155		
(2) FD9R6004/2C-3L	155	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	138
(2) FD9R6004/2C-3L	155		
FD9R6004/2C-3L	155	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	138
FD9R6004/2C-3L	155		
DB-T1-6Z-8AB-0Z	155	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	138
Platform Mount [LP 713-1]	155		
P65-16-XLH-RR w/ Mount Pipe	146	LNX-6515DS-VTM w/ Mount Pipe	138
P65-16-XLH-RR w/ Mount Pipe	146	LNX-6515DS-VTM w/ Mount Pipe	138
P65-16-XLH-RR w/ Mount Pipe	146	LNX-6515DS-VTM w/ Mount Pipe	138
7770.00	146	KRY 112 144/1	138
7770.00	146	KRY 112 144/1	138
7770.00	146	KRY 112 144/1	138
QS66512-2 w/ Mount Pipe	146	RRUS 11 B12	138
QS66512-2 w/ Mount Pipe	146	RRUS 11 B12	138
QS66512-2 w/ Mount Pipe	146	RRUS 11 B12	138
RRUS-11	146	6' x 2" Mount Pipe	138
RRUS-11	146	6' x 2" Mount Pipe	138
RRUS-11	146	6' x 2" Mount Pipe	138
(4) LGP2140X	146	Platform Mount [LP 713-1]	138
(4) LGP2140X	146	840 10054 w/ Mount Pipe	128
(4) LGP2140X	146	840 10054 w/ Mount Pipe	128
(4) 7020.00	146	840 10054 w/ Mount Pipe	128
(4) 7020.00	146	6' x 2" Mount Pipe	128
(4) 7020.00	146	Side Arm Mount [SO 101-3]	128
DC6-48-60-18-8F	146	VHLP800-11	128

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-35	35 ksi	60 ksi	A572-65	65 ksi	80 ksi

TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 98%

JACOBS

Jacobs Engineering Group, Inc.

Jacobs Engineering Group, Inc.
5449 Bells Ferry Rd
Acworth, GA 30102
Phone: (770) 701-2500
FAX: (770) 701-2501

Job:	***170.50 Ft. MP, BRG 126 943086, Fairfield, CT***		
Project:	***BU#806355_WO1261241***		
Client: Crown Castle	Drawn by: Ankit Biratia		App'd:
Code: TIA/EIA-222-F	Date: 07/05/16		Scale: NTS
Path: C:\Users\biratiaa\Desktop\WORK\TNX TOWERS\806355 BRG 126 943086\WO 1261241\Analysis\Models\BU#806355_WO#1261241.eri			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:

1) Tower is located in Fairfield County, Connecticut.
2) Basic wind speed of 85 mph.
3) Nominal ice thickness of 0.7500 in.
4) Ice density of 56 pcf.
5) A wind speed of 38 mph is used in combination with ice.
6) Temperature drop of 50 °F.
7) Deflections calculated using a wind speed of 50 mph.
8) A non-linear (P-delta) analysis was used.
9) Pressures are calculated at each section.
10) Stress ratio used in pole design is 1.333.
11) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

	Consider Moments - Legs		Distribute Leg Loads As Uniform		Use ASCE 10 X-Brace Ly Rules
	Consider Moments - Horizontals		Assume Legs Pinned		Calculate Redundant Bracing Forces
	Consider Moments - Diagonals	√	Assume Rigid Index Plate		Ignore Redundant Members in FEA
	Use Moment Magnification	√	Use Clear Spans For Wind Area		SR Leg Bolts Resist Compression
√	Use Code Stress Ratios		Use Clear Spans For KL/r		All Leg Panels Have Same Allowable
√	Use Code Safety Factors - Guys		Retension Guys To Initial Tension		Offset Girt At Foundation
	Escalate Ice	√	Bypass Mast Stability Checks	√	Consider Feed Line Torque
	Always Use Max Kz	√	Use Azimuth Dish Coefficients		Include Angle Block Shear Check
	Use Special Wind Profile	√	Project Wind Area of Appurt.		Use TIA-222-G Bracing Resist. Exemption
	Include Bolts In Member Capacity		Autocalc Torque Arm Areas		Use TIA-222-G Tension Splice Exemption
	Leg Bolts Are At Top Of Section		Add IBC .6D+W Combination		Poles
	Secondary Horizontal Braces Leg	√	Sort Capacity Reports By Component	√	Include Shear-Torsion Interaction
	Use Diamond Inner Bracing (4 Sided)		Triangulate Diamond Inner Bracing		Always Use Sub-Critical Flow
	SR Members Have Cut Ends		Treat Feed Line Bundles As Cylinder		Use Top Mounted Sockets
	SR Members Are Concentric				

Tapered Pole Section Geometry

Section	*Elevation* *ft*	*Section Length* *ft*	*Splice Length* *ft*	*Number of Sides*	*Top Diameter* *in*	*Bottom Diameter* *in*	*Wall Thickness* *in*	*Bend Radius* *in*	*Pole Grade*
L1	170.50-156.00	14.50	0.00	Round	10.7500	10.7500	0.3650		A53-B-35 (35 ksi)
L2	156.00-155.50	0.50	0.00	Round	10.7500	19.5000	0.3650		A53-B-35 (35 ksi)
L3	155.50-132.17	23.33	3.67	18	19.5000	24.7900	0.1875	0.7500	A572-65 (65 ksi)
L4	132.17-86.59	49.25	4.83	18	23.5836	34.6300	0.3750	1.5000	A572-65 (65 ksi)
L5	86.59-42.50	48.92	6.00	18	32.7959	43.7500	0.4375	1.7500	A572-65 (65 ksi)
L6	42.50-0.00	48.50		18	41.5315	52.5000	0.5000	2.0000	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	10.7500	11.9083	160.7342	3.6739	5.3750	29.9040	321.4685	5.9506	0.0000	0
	10.7500	11.9083	160.7342	3.6739	5.3750	29.9040	321.4685	5.9506	0.0000	0
L2	10.7500	11.9083	160.7342	3.6739	5.3750	29.9040	321.4685	5.9506	0.0000	0
	19.5000	21.9417	1004.6069	6.7665	9.7500	103.0366	2009.2137	10.9643	0.0000	0
L3	19.8008	11.4934	541.5782	6.8559	9.9060	54.6717	1083.8689	5.7478	3.1020	16.544
	25.1724	14.6416	1119.6528	8.7339	12.5933	88.9085	2240.7788	7.3222	4.0330	21.51
L4	24.7825	27.6240	1879.8457	8.2391	11.9805	156.9092	3762.1650	13.8146	3.4907	9.309
	35.1642	40.7720	6044.3215	12.1605	17.5920	343.5828	12096.5963	20.3899	5.4349	14.493
L5	34.4008	44.9337	5944.0759	11.4872	16.6603	356.7803	11895.9731	22.4711	5.0021	11.433
	44.4249	60.1448	14254.8347	15.3759	22.2250	641.3874	28528.4263	30.0781	6.9300	15.84
L6	43.5500	65.1170	13850.5258	14.5662	21.0980	656.4853	27719.2764	32.5647	6.4295	12.859
	53.3099	82.5240	28191.9040	18.4600	26.6700	1057.0643	56420.9036	41.2698	8.3600	16.72

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 170.50-156.00				1	1	1			
L2 156.00-155.50				1	1	1			
L3 155.50-132.17				1	1	1			
L4 132.17-86.59				1	1	1			
L5 86.59-42.50				1	1	1			
L6 42.50-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
CR 50 1873(1-5/8")	A	Surface Ar (CaAa)	155.00 - 6.00	1	1	0.050 0.050	1.9800		0.83
LCF158-50JA-A0(1 5/8") *****	C	Surface Ar (CaAa)	138.00 - 6.00	1	1	0.400 0.400	1.9800		0.72

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
** 166 **								
LDF7-50A(1-5/8")	B	No	Inside Pole	166.00 - 6.00	6	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
** 155 **								
CR 50 1873(1-5/8")	A	No	Inside Pole	155.00 - 6.00	12	No Ice	0.00	0.83
						1/2" Ice	0.00	0.83
						1" Ice	0.00	0.83
LDF4-50A(1/2")	A	No	Inside Pole	155.00 - 6.00	1	No Ice	0.00	0.15
						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
** 146 **								
CR 50 1873(1-5/8")	A	No	Inside Pole	146.00 - 6.00	12	No Ice	0.00	0.83
						1/2" Ice	0.00	0.83
						1" Ice	0.00	0.83
FB-L98B-002-75000(3/8")	A	No	Inside Pole	146.00 - 6.00	1	No Ice	0.00	0.06
						1/2" Ice	0.00	0.06
						1" Ice	0.00	0.06
WR-VG82ST-BRDA(5/8")	A	No	Inside Pole	146.00 - 6.00	2	No Ice	0.00	0.31
						1/2" Ice	0.00	0.31
						1" Ice	0.00	0.31
2" Rigid Conduit	A	No	Inside Pole	146.00 - 6.00	1	No Ice	0.00	2.80
						1/2" Ice	0.00	2.80
						1" Ice	0.00	2.80
FB-L98B-034- XXX(3/8")	A	No	Inside Pole	146.00 - 0.00	1	No Ice	0.00	0.06
						1/2" Ice	0.00	0.06
						1" Ice	0.00	0.06
WR-VG86ST- BRD(3/4")	A	No	Inside Pole	146.00 - 0.00	2	No Ice	0.00	0.58
						1/2" Ice	0.00	0.58
						1" Ice	0.00	0.58
2" Rigid Conduit	A	No	Inside Pole	146.00 - 6.00	1	No Ice	0.00	2.80
						1/2" Ice	0.00	2.80
						1" Ice	0.00	2.80
** 138 **								
LCF158-50JA-A0(1 5/8")	C	No	Inside Pole	138.00 - 6.00	12	No Ice	0.00	0.72
						1/2" Ice	0.00	0.72
						1" Ice	0.00	0.72
** 128 **								
7983A(1/2")	B	No	Inside Pole	128.00 - 6.00	1	No Ice	0.00	0.08
						1/2" Ice	0.00	0.08
						1" Ice	0.00	0.08
9207(5/16")	B	No	Inside Pole	128.00 - 6.00	3	No Ice	0.00	0.60
						1/2" Ice	0.00	0.60
						1" Ice	0.00	0.60
9258(1/4)	B	No	Inside Pole	128.00 - 6.00	3	No Ice	0.00	0.04
						1/2" Ice	0.00	0.04
						1" Ice	0.00	0.04
2" Rigid Conduit	B	No	Inside Pole	128.00 - 6.00	2	No Ice	0.00	2.80
						1/2" Ice	0.00	2.80
						1" Ice	0.00	2.80
*****								

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	170.50-156.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.05
		C	0.000	0.000	0.000	0.000	0.00
L2	156.00-155.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L3	155.50-132.17	A	0.000	0.000	4.520	0.000	0.49
		B	0.000	0.000	0.000	0.000	0.11
		C	0.000	0.000	1.154	0.000	0.05
L4	132.17-86.59	A	0.000	0.000	9.025	0.000	1.29
		B	0.000	0.000	0.000	0.000	0.54
		C	0.000	0.000	9.025	0.000	0.43
L5	86.59-42.50	A	0.000	0.000	8.729	0.000	1.25
		B	0.000	0.000	0.000	0.000	0.55
		C	0.000	0.000	8.729	0.000	0.41
L6	42.50-0.00	A	0.000	0.000	7.227	0.000	1.04
		B	0.000	0.000	0.000	0.000	0.46
		C	0.000	0.000	7.227	0.000	0.34

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	170.50-156.00	A	0.750	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.05
		C		0.000	0.000	0.000	0.000	0.00
L2	156.00-155.50	A	0.750	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L3	155.50-132.17	A	0.750	0.000	0.000	7.945	0.000	0.55
		B		0.000	0.000	0.000	0.000	0.11
		C		0.000	0.000	2.029	0.000	0.07
L4	132.17-86.59	A	0.750	0.000	0.000	15.863	0.000	1.41
		B		0.000	0.000	0.000	0.000	0.54
		C		0.000	0.000	15.863	0.000	0.54
L5	86.59-42.50	A	0.750	0.000	0.000	15.342	0.000	1.36
		B		0.000	0.000	0.000	0.000	0.55
		C		0.000	0.000	15.342	0.000	0.52
L6	42.50-0.00	A	0.750	0.000	0.000	12.702	0.000	1.14
		B		0.000	0.000	0.000	0.000	0.46
		C		0.000	0.000	12.702	0.000	0.43

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	170.50-156.00	0.0000	0.0000	0.0000	0.0000
L2	156.00-155.50	0.0000	0.0000	0.0000	0.0000
L3	155.50-132.17	-0.2843	-0.1131	-0.4352	-0.1731
L4	132.17-86.59	-0.4237	0.0222	-0.6482	0.0340
L5	86.59-42.50	-0.4317	0.0226	-0.6792	0.0356
L6	42.50-0.00	-0.3747	0.0196	-0.6048	0.0317

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
** 166 **									
DR90-14-00DPL2 w/ Mount Pipe	A	From Leg	2.00 0.00 1.00	0.0000	166.00	No Ice 1/2" Ice 1" Ice	4.59 5.09 5.58	3.32 4.09 4.78	0.04 0.08 0.12
DR90-14-00DPL2 w/ Mount Pipe	B	From Leg	2.00 0.00 1.00	0.0000	166.00	No Ice 1/2" Ice 1" Ice	4.59 5.09 5.58	3.32 4.09 4.78	0.04 0.08 0.12
DR90-14-00DPL2 w/ Mount Pipe	C	From Leg	2.00 0.00 1.00	0.0000	166.00	No Ice 1/2" Ice 1" Ice	4.59 5.09 5.58	3.32 4.09 4.78	0.04 0.08 0.12
Pipe Mount [PM 601-3]	C	From Leg	0.50 0.00 0.00	0.0000	166.00	No Ice 1/2" Ice Ice	4.39 5.48 6.57	4.39 5.48 6.57	0.20 0.24 0.28

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice			
** 155 **									
(2) DB844G65ZAXY w/ Mount Pipe	A	From Leg	4.00 0.00 3.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	4.90 5.35 5.80	4.92 5.60 6.28	0.03 0.08 0.13
DB844G65ZAXY w/ Mount Pipe	B	From Leg	4.00 0.00 3.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	4.90 5.35 5.80	4.92 5.60 6.28	0.03 0.08 0.13
(3) DB844G65ZAXY w/ Mount Pipe	C	From Leg	4.00 0.00 3.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	4.90 5.35 5.80	4.92 5.60 6.28	0.03 0.08 0.13
LNX-6514DS-T4M w/ Mount Pipe	A	From Leg	4.00 0.00 3.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	8.57 9.22 9.84	7.00 8.19 9.08	0.06 0.13 0.20
LNX-6514DS-T4M w/ Mount Pipe	B	From Leg	4.00 0.00 3.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	8.57 9.22 9.84	7.00 8.19 9.08	0.06 0.13 0.20
LNX-6514DS-T4M w/ Mount Pipe	C	From Leg	4.00 0.00 3.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	8.57 9.22 9.84	7.00 8.19 9.08	0.06 0.13 0.20
MG D3-800TV w/ Mount Pipe	A	From Leg	4.00 0.00 3.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	3.57 3.98 4.39	3.42 4.12 4.78	0.04 0.07 0.11
MG D3-800TV w/ Mount Pipe	B	From Leg	4.00 0.00 3.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	3.57 3.98 4.39	3.42 4.12 4.78	0.04 0.07 0.11
MG D3-800TV w/ Mount Pipe	C	From Leg	4.00 0.00 3.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	3.57 3.98 4.39	3.42 4.12 4.78	0.04 0.07 0.11
GPS_A	A	From Leg	4.00 0.00 5.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	0.30 0.37 0.46	0.30 0.37 0.46	0.00 0.00 0.01
BXA-171063/12CF w/ Mount Pipe	A	From Leg	4.00 0.00 3.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	5.03 5.58 6.10	5.29 6.46 7.35	0.04 0.09 0.14
BXA-171063/12CF w/ Mount Pipe	B	From Leg	4.00 0.00 3.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	5.03 5.58 6.10	5.29 6.46 7.35	0.04 0.09 0.14
BXA-171063/12CF w/ Mount Pipe	C	From Leg	4.00 0.00 3.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	5.03 5.58 6.10	5.29 6.46 7.35	0.04 0.09 0.14
RRH2X40-AWS	A	From Leg	4.00 0.00 3.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	0.04 0.06 0.08
RRH2X40-AWS	B	From Leg	4.00 0.00 3.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	0.04 0.06 0.08
RRH2X40-AWS	C	From Leg	4.00 0.00 3.00	0.0000	155.00	No Ice 1/2" Ice Ice	0.00 0.00 0.00	0.00 0.00 0.00	0.04 0.06 0.08

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice			
(2) FD9R6004/2C-3L	A	From Leg	4.00	0.0000	155.00	No Ice	0.00	0.00	0.00
			0.00			1/2"	0.00	0.00	0.01
			0.00			Ice	0.00	0.00	0.01
						1" Ice			
(2) FD9R6004/2C-3L	B	From Leg	4.00	0.0000	155.00	No Ice	0.00	0.00	0.00
			0.00			1/2"	0.00	0.00	0.01
			0.00			Ice	0.00	0.00	0.01
						1" Ice			
FD9R6004/2C-3L	C	From Leg	4.00	0.0000	155.00	No Ice	0.00	0.00	0.00
			0.00			1/2"	0.00	0.00	0.01
			0.00			Ice	0.00	0.00	0.01
						1" Ice			
FD9R6004/2C-3L	C	From Leg	4.00	0.0000	155.00	No Ice	0.00	0.00	0.00
			0.00			1/2"	0.00	0.00	0.01
			3.00			Ice	0.00	0.00	0.01
						1" Ice			
DB-T1-6Z-8AB-0Z	B	From Leg	4.00	0.0000	155.00	No Ice	0.00	0.00	0.04
			0.00			1/2"	0.00	0.00	0.08
			3.00			Ice	0.00	0.00	0.12
						1" Ice			
Platform Mount [LP 713-1]	C	None		0.0000	155.00	No Ice	31.27	31.27	1.51
						1/2"	39.68	39.68	1.93
						Ice	48.09	48.09	2.35
						1" Ice			
** 146 **									
P65-16-XLH-RR w/ Mount Pipe	A	From Leg	4.00	0.0000	146.00	No Ice	8.64	6.36	0.08
			0.00			1/2"	9.29	7.54	0.14
			2.00			Ice	9.91	8.43	0.22
						1" Ice			
P65-16-XLH-RR w/ Mount Pipe	B	From Leg	4.00	0.0000	146.00	No Ice	8.64	6.36	0.08
			0.00			1/2"	9.29	7.54	0.14
			2.00			Ice	9.91	8.43	0.22
						1" Ice			
P65-16-XLH-RR w/ Mount Pipe	C	From Leg	4.00	0.0000	146.00	No Ice	8.64	6.36	0.08
			0.00			1/2"	9.29	7.54	0.14
			2.00			Ice	9.91	8.43	0.22
						1" Ice			
7770.00	A	From Leg	4.00	0.0000	146.00	No Ice	5.88	2.93	0.04
			0.00			1/2"	6.31	3.27	0.07
			2.00			Ice	6.75	3.63	0.11
						1" Ice			
7770.00	B	From Leg	4.00	0.0000	146.00	No Ice	5.88	2.93	0.04
			0.00			1/2"	6.31	3.27	0.07
			2.00			Ice	6.75	3.63	0.11
						1" Ice			
7770.00	C	From Leg	4.00	0.0000	146.00	No Ice	5.88	2.93	0.04
			0.00			1/2"	6.31	3.27	0.07
			2.00			Ice	6.75	3.63	0.11
						1" Ice			
QS66512-2 w/ Mount Pipe	A	From Leg	4.00	0.0000	146.00	No Ice	8.64	8.46	0.14
			0.00			1/2"	9.29	9.66	0.21
			2.00			Ice	9.91	10.62	0.30
						1" Ice			
QS66512-2 w/ Mount Pipe	B	From Leg	4.00	0.0000	146.00	No Ice	8.64	8.46	0.14
			0.00			1/2"	9.29	9.66	0.21
			2.00			Ice	9.91	10.62	0.30
						1" Ice			
QS66512-2 w/ Mount Pipe	C	From Leg	4.00	0.0000	146.00	No Ice	8.64	8.46	0.14
			0.00			1/2"	9.29	9.66	0.21
			2.00			Ice	9.91	10.62	0.30
						1" Ice			
RRUS-11	A	From Leg	4.00	0.0000	146.00	No Ice	2.94	1.25	0.06
			0.00			1/2"	3.17	1.41	0.07
			0.00			Ice	3.41	1.59	0.10

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice			
RRUS-11	B	From Leg	4.00	0.0000	146.00	No Ice	2.94	1.25	0.06
			0.00			1/2"	3.17	1.41	0.07
			0.00			Ice	3.41	1.59	0.10
						1" Ice			
RRUS-11	C	From Leg	4.00	0.0000	146.00	No Ice	2.94	1.25	0.06
			0.00			1/2"	3.17	1.41	0.07
			0.00			Ice	3.41	1.59	0.10
						1" Ice			
(4) LGP2140X	A	From Leg	4.00	0.0000	146.00	No Ice	1.26	0.38	0.01
			0.00			1/2"	1.42	0.49	0.02
			0.00			Ice	1.58	0.62	0.03
						1" Ice			
(4) LGP2140X	B	From Leg	4.00	0.0000	146.00	No Ice	1.26	0.38	0.01
			0.00			1/2"	1.42	0.49	0.02
			0.00			Ice	1.58	0.62	0.03
						1" Ice			
(4) LGP2140X	C	From Leg	4.00	0.0000	146.00	No Ice	1.26	0.38	0.01
			0.00			1/2"	1.42	0.49	0.02
			0.00			Ice	1.58	0.62	0.03
						1" Ice			
(4) 7020.00	A	From Leg	4.00	0.0000	146.00	No Ice	0.12	0.20	0.00
			0.00			1/2"	0.17	0.28	0.01
			2.00			Ice	0.23	0.36	0.01
						1" Ice			
(4) 7020.00	B	From Leg	4.00	0.0000	146.00	No Ice	0.12	0.20	0.00
			0.00			1/2"	0.17	0.28	0.01
			2.00			Ice	0.23	0.36	0.01
						1" Ice			
(4) 7020.00	C	From Leg	4.00	0.0000	146.00	No Ice	0.12	0.20	0.00
			0.00			1/2"	0.17	0.28	0.01
			2.00			Ice	0.23	0.36	0.01
						1" Ice			
DC6-48-60-18-8F	C	From Leg	1.00	0.0000	146.00	No Ice	1.47	1.47	0.03
			0.00			1/2"	1.67	1.67	0.05
			2.00			Ice	1.88	1.88	0.07
						1" Ice			
DC6-48-60-18-8F	A	From Leg	4.00	0.0000	146.00	No Ice	1.47	1.47	0.03
			0.00			1/2"	1.67	1.67	0.05
			2.00			Ice	1.88	1.88	0.07
						1" Ice			
RRUS 32	A	From Leg	4.00	0.0000	146.00	No Ice	3.33	1.98	0.06
			0.00			1/2"	3.60	2.21	0.08
			2.00			Ice	3.87	2.45	0.10
						1" Ice			
RRUS 32	B	From Leg	4.00	0.0000	146.00	No Ice	3.33	1.98	0.06
			0.00			1/2"	3.60	2.21	0.08
			2.00			Ice	3.87	2.45	0.10
						1" Ice			
RRUS 32	C	From Leg	4.00	0.0000	146.00	No Ice	3.33	1.98	0.06
			0.00			1/2"	3.60	2.21	0.08
			2.00			Ice	3.87	2.45	0.10
						1" Ice			
RRUS 32 B2	A	From Leg	4.00	0.0000	146.00	No Ice	3.19	1.85	0.05
			0.00			1/2"	3.45	2.08	0.07
			2.00			Ice	3.71	2.31	0.10
						1" Ice			
RRUS 32 B2	B	From Leg	4.00	0.0000	146.00	No Ice	3.19	1.85	0.05
			0.00			1/2"	3.45	2.08	0.07
			2.00			Ice	3.71	2.31	0.10
						1" Ice			
RRUS 32 B2	C	From Leg	4.00	0.0000	146.00	No Ice	3.19	1.85	0.05
			0.00			1/2"	3.45	2.08	0.07
			2.00			Ice	3.71	2.31	0.10
						1" Ice			

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
782 10254	A	From Leg	4.00 0.00 2.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice	0.17 0.23 0.29	0.09 0.14 0.20	0.00 0.00 0.01
782 10254	B	From Leg	4.00 0.00 2.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice	0.17 0.23 0.29	0.09 0.14 0.20	0.00 0.00 0.01
782 10254	C	From Leg	4.00 0.00 2.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice	0.17 0.23 0.29	0.09 0.14 0.20	0.00 0.00 0.01
6' x 2" Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice	1.43 1.92 2.29	1.43 1.92 2.29	0.02 0.03 0.05
6' x 2" Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice	1.43 1.92 2.29	1.43 1.92 2.29	0.02 0.03 0.05
6' x 2" Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice	1.43 1.92 2.29	1.43 1.92 2.29	0.02 0.03 0.05
Platform Mount [LP 713-1]	C	None		0.0000	146.00	No Ice 1/2" Ice 1" Ice	31.27 39.68 48.09	31.27 39.68 48.09	1.51 1.93 2.35
** 138 **									
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	6.83 7.35 7.86	5.64 6.48 7.26	0.11 0.17 0.23
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	6.83 7.35 7.86	5.64 6.48 7.26	0.11 0.17 0.23
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	6.83 7.35 7.86	5.64 6.48 7.26	0.11 0.17 0.23
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	6.83 7.35 7.86	5.64 6.48 7.26	0.11 0.17 0.23
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	6.83 7.35 7.86	5.64 6.48 7.26	0.11 0.17 0.23
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	6.83 7.35 7.86	5.64 6.48 7.26	0.11 0.17 0.23
LNX-6515DS-VTM w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	11.68 12.40 13.14	9.84 11.37 12.91	0.08 0.17 0.27
LNX-6515DS-VTM w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	11.68 12.40 13.14	9.84 11.37 12.91	0.08 0.17 0.27
LNX-6515DS-VTM w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	11.68 12.40 13.14	9.84 11.37 12.91	0.08 0.17 0.27

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
KRY 112 144/1	A	From Leg	4.00 0.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	0.41 0.50 0.60	0.19 0.26 0.33	0.01 0.01 0.02
KRY 112 144/1	B	From Leg	4.00 0.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	0.41 0.50 0.60	0.19 0.26 0.33	0.01 0.01 0.02
KRY 112 144/1	C	From Leg	4.00 0.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	0.41 0.50 0.60	0.19 0.26 0.33	0.01 0.01 0.02
RRUS 11 B12	A	From Leg	4.00 0.00 2.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	3.31 3.55 3.80	1.36 1.54 1.73	0.05 0.07 0.10
RRUS 11 B12	B	From Leg	4.00 0.00 2.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	3.31 3.55 3.80	1.36 1.54 1.73	0.05 0.07 0.10
RRUS 11 B12	C	From Leg	4.00 0.00 2.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	3.31 3.55 3.80	1.36 1.54 1.73	0.05 0.07 0.10
6' x 2" Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	1.43 1.92 2.29	1.43 1.92 2.29	0.02 0.03 0.05
6' x 2" Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	1.43 1.92 2.29	1.43 1.92 2.29	0.02 0.03 0.05
6' x 2" Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	1.43 1.92 2.29	1.43 1.92 2.29	0.02 0.03 0.05
Platform Mount [LP 713-1]	C	None		0.0000	138.00	No Ice 1/2" Ice 1" Ice	31.27 39.68 48.09	31.27 39.68 48.09	1.51 1.93 2.35
** 128 ** 840 10054 w/ Mount Pipe	A	From Leg	2.00 0.00 0.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice	5.41 5.83 6.26	2.39 2.92 3.47	0.05 0.09 0.13
840 10054 w/ Mount Pipe	B	From Leg	2.00 0.00 0.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice	5.41 5.83 6.26	2.39 2.92 3.47	0.05 0.09 0.13
840 10054 w/ Mount Pipe	C	From Leg	2.00 0.00 0.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice	5.41 5.83 6.26	2.39 2.92 3.47	0.05 0.09 0.13
6' x 2" Mount Pipe	B	From Leg	2.00 0.00 0.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice	1.43 1.92 2.29	1.43 1.92 2.29	0.02 0.03 0.05
Side Arm Mount [SO 101-3] ** 118 ** *****	C	From Leg	1.00 0.00 0.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice	7.50 8.90 10.30	7.50 8.90 10.30	0.25 0.33 0.41

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
** 128 **											
VHLP800-11	B	Paraboloid w/Shroud (HP)	From Leg	1.00 0.00 0.00	-36.0000		128.00	2.60	No Ice 1/2" Ice 1" Ice	5.31 5.66 6.00	0.05 0.03 0.00
*****											

Load Combinations

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	170.5 - 156	Pole	Max Tension	5	0.00	0.00	0.00
			Max. Compression	14	-1.34	0.22	-0.12
			Max. Mx	11	-0.78	12.54	-0.08
			Max. My	8	-0.78	0.14	-12.47
			Max. Vy	11	-1.31	12.54	-0.08
			Max. Vx	8	1.31	0.14	-12.47
			Max. Torque	13			0.20
L2	156 - 155.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-1.38	0.22	-0.12
			Max. Mx	11	-0.81	13.20	-0.08
			Max. My	8	-0.81	0.15	-13.13
			Max. Vy	11	-1.33	13.20	-0.08
			Max. Vx	8	1.33	0.15	-13.13
			Max. Torque	13			0.20
L3	155.5 - 132.17	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-17.09	0.89	-0.07
			Max. Mx	11	-7.84	269.25	-0.10
			Max. My	8	-7.86	0.09	-268.95
			Max. Vy	11	-20.82	269.25	-0.10
			Max. Vx	8	20.82	0.09	-268.95
			Max. Torque	8			-2.29
L4	132.17 - 86.5867	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-26.64	1.79	-0.57
			Max. Mx	11	-16.21	1329.55	-1.05
			Max. My	8	-16.24	1.13	-1323.15
			Max. Vy	11	-26.10	1329.55	-1.05
			Max. Vx	2	-25.94	-1.06	1322.57
			Max. Torque	13			2.62
L5	86.5867 - 42.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-38.73	2.15	-0.58
			Max. Mx	11	-27.51	2531.49	-1.84
			Max. My	8	-27.52	1.87	-2517.88
			Max. Vy	11	-29.79	2531.49	-1.84
			Max. Vx	2	-29.63	-2.90	2517.56
			Max. Torque	13			2.73
L6	42.5 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-56.63	2.58	-0.60
			Max. Mx	11	-44.12	4062.42	-2.70
			Max. My	8	-44.12	2.63	-4040.83
			Max. Vy	11	-33.24	4062.42	-2.70
			Max. Vx	2	-33.09	-5.00	4040.80
			Max. Torque	13			2.85

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	24	56.63	7.90	-0.00
	Max. H_x	11	44.15	33.21	-0.02
	Max. H_z	2	44.15	-0.04	33.06
	Max. M_x	2	4040.80	-0.04	33.06
	Max. M_z	5	4052.29	-33.15	0.01
	Max. Torsion	13	2.85	16.65	28.58
	Min. Vert	1	44.15	0.00	0.00
	Min. H_x	5	44.15	-33.15	0.01
	Min. H_z	8	44.15	0.01	-33.05
	Min. M_x	8	-4040.83	0.01	-33.05
	Min. M_z	11	-4062.42	33.21	-0.02
	Min. Torsion	8	-2.79	0.01	-33.05

Tower Mast Reaction Summary

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead Only	44.15	0.00	0.00	0.40	0.87	0.00
Dead+Wind 0 deg - No Ice	44.15	0.04	-33.06	-4040.80	-5.00	-2.73
Dead+Wind 30 deg - No Ice	44.15	16.63	-28.60	-3495.89	-2033.94	-2.16
Dead+Wind 60 deg - No Ice	44.15	28.72	-16.51	-2018.19	-3511.66	-1.00
Dead+Wind 90 deg - No Ice	44.15	33.15	-0.01	-0.98	-4052.29	0.47
Dead+Wind 120 deg - No Ice	44.15	28.73	16.48	2014.34	-3512.27	1.88
Dead+Wind 150 deg - No Ice	44.15	16.61	28.60	3496.31	-2030.84	2.71
Dead+Wind 180 deg - No Ice	44.15	-0.01	33.05	4040.83	2.63	2.79
Dead+Wind 210 deg - No Ice	44.15	-16.69	28.60	3496.46	2043.27	2.18
Dead+Wind 240 deg - No Ice	44.15	-28.79	16.53	2021.23	3521.98	0.97
Dead+Wind 270 deg - No Ice	44.15	-33.21	0.02	2.70	4062.42	-0.56
Dead+Wind 300 deg - No Ice	44.15	-28.79	-16.48	-2014.45	3521.85	-2.01
Dead+Wind 330 deg - No Ice	44.15	-16.65	-28.58	-3492.93	2038.04	-2.85
Dead+Ice+Temp	56.63	-0.00	0.00	0.60	2.58	0.00
Dead+Wind 0 deg+Ice+Temp	56.63	0.01	-7.87	-1000.96	1.90	-0.72
Dead+Wind 30 deg+Ice+Temp	56.63	3.95	-6.81	-865.77	-500.79	-0.57
Dead+Wind 60 deg+Ice+Temp	56.63	6.83	-3.93	-499.31	-867.27	-0.27
Dead+Wind 90 deg+Ice+Temp	56.63	7.89	0.00	0.82	-1001.54	0.12
Dead+Wind 120 deg+Ice+Temp	56.63	6.84	3.93	500.39	-867.89	0.49
Dead+Wind 150 deg+Ice+Temp	56.63	3.95	6.81	867.43	-500.97	0.71
Dead+Wind 180 deg+Ice+Temp	56.63	0.00	7.87	1002.04	2.59	0.73
Dead+Wind 210 deg+Ice+Temp	56.63	-3.97	6.81	866.97	507.86	0.58
Dead+Wind 240 deg+Ice+Temp	56.63	-6.85	3.93	501.05	874.55	0.26
Dead+Wind 270 deg+Ice+Temp	56.63	-7.90	0.00	0.64	1008.78	-0.14
Dead+Wind 300 deg+Ice+Temp	56.63	-6.85	-3.93	-499.34	875.02	-0.51
Dead+Wind 330 deg+Ice+Temp	56.63	-3.96	-6.81	-865.61	507.56	-0.74
Dead+Wind 0 deg - Service	44.15	0.02	-11.46	-1405.02	-1.11	-0.96
Dead+Wind 30 deg - Service	44.15	5.77	-9.92	-1215.52	-706.73	-0.76
Dead+Wind 60 deg - Service	44.15	9.96	-5.72	-701.61	-1220.66	-0.35
Dead+Wind 90 deg - Service	44.15	11.49	-0.00	-0.06	-1408.69	0.16
Dead+Wind 120 deg - Service	44.15	9.96	5.71	700.84	-1220.88	0.66
Dead+Wind 150 deg - Service	44.15	5.76	9.91	1216.24	-705.66	0.96
Dead+Wind 180 deg - Service	44.15	-0.00	11.46	1405.60	1.53	0.99
Dead+Wind 210 deg - Service	44.15	-5.79	9.91	1216.29	711.21	0.77
Dead+Wind 240 deg - Service	44.15	-9.98	5.73	703.24	1225.49	0.34
Dead+Wind 270 deg - Service	44.15	-11.51	0.01	1.22	1413.45	-0.20
Dead+Wind 300 deg - Service	44.15	-9.98	-5.72	-700.31	1225.44	-0.71
Dead+Wind 330 deg - Service	44.15	-5.77	-9.91	-1214.49	709.39	-1.01

Solution Summary

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
1	0.00	-44.15	0.00	0.00	44.15	0.00	0.000%
2	0.04	-44.15	-33.06	-0.04	44.15	33.06	0.000%
3	16.63	-44.15	-28.60	-16.63	44.15	28.60	0.000%
4	28.72	-44.15	-16.51	-28.72	44.15	16.51	0.000%
5	33.15	-44.15	-0.01	-33.15	44.15	0.01	0.000%
6	28.73	-44.15	16.48	-28.73	44.15	-16.48	0.000%
7	16.61	-44.15	28.60	-16.61	44.15	-28.60	0.000%
8	-0.01	-44.15	33.05	0.01	44.15	-33.05	0.000%
9	-16.69	-44.15	28.60	16.69	44.15	-28.60	0.000%
10	-28.79	-44.15	16.53	28.79	44.15	-16.53	0.000%
11	-33.21	-44.15	0.02	33.21	44.15	-0.02	0.000%
12	-28.79	-44.15	-16.48	28.79	44.15	16.48	0.000%
13	-16.65	-44.15	-28.58	16.65	44.15	28.58	0.000%
14	0.00	-56.63	0.00	0.00	56.63	-0.00	0.000%
15	0.01	-56.63	-7.87	-0.01	56.63	7.87	0.000%
16	3.95	-56.63	-6.81	-3.95	56.63	6.81	0.000%
17	6.83	-56.63	-3.93	-6.83	56.63	3.93	0.000%
18	7.89	-56.63	0.00	-7.89	56.63	-0.00	0.000%
19	6.84	-56.63	3.93	-6.84	56.63	-3.93	0.000%
20	3.95	-56.63	6.81	-3.95	56.63	-6.81	0.000%
21	0.00	-56.63	7.87	-0.00	56.63	-7.87	0.000%
22	-3.97	-56.63	6.81	3.97	56.63	-6.81	0.000%
23	-6.85	-56.63	3.93	6.85	56.63	-3.93	0.000%
24	-7.90	-56.63	0.00	7.90	56.63	-0.00	0.000%
25	-6.85	-56.63	-3.93	6.85	56.63	3.93	0.000%
26	-3.96	-56.63	-6.81	3.96	56.63	6.81	0.000%
27	0.02	-44.15	-11.46	-0.02	44.15	11.46	0.000%
28	5.77	-44.15	-9.92	-5.77	44.15	9.92	0.000%
29	9.96	-44.15	-5.72	-9.96	44.15	5.72	0.000%
30	11.49	-44.15	-0.00	-11.49	44.15	0.00	0.000%
31	9.96	-44.15	5.71	-9.96	44.15	-5.71	0.000%
32	5.76	-44.15	9.91	-5.76	44.15	-9.91	0.000%
33	-0.00	-44.15	11.46	0.00	44.15	-11.46	0.000%
34	-5.79	-44.15	9.91	5.79	44.15	-9.91	0.000%
35	-9.98	-44.15	5.73	9.98	44.15	-5.73	0.000%
36	-11.51	-44.15	0.01	11.51	44.15	-0.01	0.000%
37	-9.98	-44.15	-5.72	9.98	44.15	5.72	0.000%
38	-5.77	-44.15	-9.91	5.77	44.15	9.91	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00036292
3	Yes	6	0.00000001	0.00016603
4	Yes	6	0.00000001	0.00018081
5	Yes	4	0.00000001	0.00069573
6	Yes	6	0.00000001	0.00018214
7	Yes	6	0.00000001	0.00016522
8	Yes	5	0.00000001	0.00038690
9	Yes	6	0.00000001	0.00018624
10	Yes	6	0.00000001	0.00017028
11	Yes	4	0.00000001	0.00095105
12	Yes	6	0.00000001	0.00016846
13	Yes	6	0.00000001	0.00018727
14	Yes	4	0.00000001	0.00001530
15	Yes	5	0.00000001	0.00035296
16	Yes	5	0.00000001	0.00067682
17	Yes	5	0.00000001	0.00071802
18	Yes	5	0.00000001	0.00033024
19	Yes	5	0.00000001	0.00072702
20	Yes	5	0.00000001	0.00067967
21	Yes	5	0.00000001	0.00035435
22	Yes	5	0.00000001	0.00075542

23	Yes	5	0.00000001	0.00070266
24	Yes	5	0.00000001	0.00033369
25	Yes	5	0.00000001	0.00069569
26	Yes	5	0.00000001	0.00075600
27	Yes	5	0.00000001	0.00008921
28	Yes	5	0.00000001	0.00037818
29	Yes	5	0.00000001	0.00043131
30	Yes	4	0.00000001	0.00018381
31	Yes	5	0.00000001	0.00043725
32	Yes	5	0.00000001	0.00037672
33	Yes	5	0.00000001	0.00009190
34	Yes	5	0.00000001	0.00045839
35	Yes	5	0.00000001	0.00039592
36	Yes	4	0.00000001	0.00021021
37	Yes	5	0.00000001	0.00038807
38	Yes	5	0.00000001	0.00046030

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	170.5 - 156	53.771	36	2.8521	0.0150
L2	156 - 155.5	45.147	36	2.8079	0.0138
L3	155.5 - 132.17	44.853	36	2.8072	0.0138
L4	135.837 - 86.5867	33.732	36	2.5218	0.0065
L5	91.42 - 42.5	14.271	36	1.5794	0.0023
L6	48.5 - 0	3.781	36	0.7301	0.0008

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
166.00	DR90-14-00DPL2 w/ Mount Pipe	36	51.081	2.8346	0.0145	25320
155.00	(2) DB844G65ZAXY w/ Mount Pipe	36	44.560	2.8062	0.0138	8511
146.00	P65-16-XLH-RR w/ Mount Pipe	36	39.349	2.7175	0.0112	4502
138.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	36	34.897	2.5671	0.0074	3113
128.00	VHLP800-11	36	29.678	2.3563	0.0043	2820

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	170.5 - 156	153.745	11	8.1438	0.0430
L2	156 - 155.5	129.183	11	8.0273	0.0395
L3	155.5 - 132.17	128.346	11	8.0254	0.0395
L4	135.837 - 86.5867	96.616	11	7.2196	0.0185
L5	91.42 - 42.5	40.948	11	4.5302	0.0066
L6	48.5 - 0	10.861	11	2.0968	0.0023

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
166.00	DR90-14-00DPL2 w/ Mount Pipe	11	146.087	8.0981	0.0415	9909
155.00	(2) DB844G65ZAXY w/ Mount Pipe	11	127.509	8.0225	0.0394	3226
146.00	P65-16-XLH-RR w/ Mount Pipe	11	112.650	7.7730	0.0322	1647
138.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	11	99.942	7.3480	0.0213	1128
128.00	VHLP800-11	11	85.036	6.7498	0.0124	1016

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
L1	170.5 - 156 (1)	TP10.75x10.75x0.365	14.50	0.00	0.0	21.000	11.9083	-0.78	250.07	0.003
L2	156 - 155.5 (2)	TP19.5x10.75x0.365	0.50	0.00	0.0	21.000	11.9083	-0.78	250.07	0.003
L3	155.5 - 132.17 (3)	TP24.79x19.5x0.1875	23.33	0.00	0.0	39.000	14.1468	-7.84	551.72	0.014
L4	132.17 - 86.5867 (4)	TP34.63x23.5836x0.375	49.25	0.00	0.0	39.000	39.4817	-16.21	1539.79	0.011
L5	86.5867 - 42.5 (5)	TP43.75x32.7959x0.4375	48.92	0.00	0.0	39.000	58.2792	-27.51	2272.89	0.012
L6	42.5 - 0 (6)	TP52.5x41.5315x0.5	48.50	0.00	0.0	39.000	72.0873	-34.57	2811.41	0.012

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	170.5 - 156 (1)	TP10.75x10.75x0.365	12.57	5.042	23.100	0.218	0.00	0.000	23.100	0.000
L2	156 - 155.5 (2)	TP19.5x10.75x0.365	12.56	5.042	23.100	0.218	0.00	0.000	23.100	0.000
L3	155.5 - 132.17 (3)	TP24.79x19.5x0.1875	269.22	38.934	39.000	0.998	0.00	0.000	39.000	0.000
L4	132.17 - 86.5867 (4)	TP34.63x23.5836x0.375	1329.56	49.538	39.000	1.270	0.00	0.000	39.000	0.000
L5	86.5867 - 42.5 (5)	TP43.75x32.7959x0.4375	2531.48	50.460	39.000	1.294	0.00	0.000	39.000	0.000
L6	42.5 - 0 (6)	TP52.5x41.5315x0.5	3125.43	46.562	39.000	1.194	0.00	0.000	39.000	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	170.5 - 156 (1)	TP10.75x10.75x0.365	1.31	0.110	14.000	0.016	0.00	0.000	14.000	0.000
L2	156 - 155.5	TP19.5x10.75x0.365	1.33	0.112	14.000	0.009	0.00	0.000	14.000	0.000

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
	(2)									
L3	155.5 - 132.17 (3)	TP24.79x19.5x0.1875	20.82	1.472	26.000	0.113	1.38	0.097	26.000	0.004
L4	132.17 - 86.5867 (4)	TP34.63x23.5836x0.375	26.10	0.661	26.000	0.051	0.55	0.010	26.000	0.000
L5	86.5867 - 42.5 (5)	TP43.75x32.7959x0.4375	29.79	0.511	26.000	0.039	0.55	0.005	26.000	0.000
L6	42.5 - 0 (6)	TP52.5x41.5315x0.5	31.43	0.436	26.000	0.033	0.56	0.004	26.000	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	170.5 - 156 (1)	0.003	0.218	0.000	0.016	0.000	0.221 ✔	1.333	H1-3+VT ✔
L2	156 - 155.5 (2)	0.003	0.218	0.000	0.009	0.000	0.221 ✔	1.333	H1-3+VT ✔
L3	155.5 - 132.17 (3)	0.014	0.998	0.000	0.113	0.004	1.016 ✔	1.333	H1-3+VT ✔
L4	132.17 - 86.5867 (4)	0.011	1.270	0.000	0.051	0.000	1.281 ✔	1.333	H1-3+VT ✔
L5	86.5867 - 42.5 (5)	0.012	1.294	0.000	0.039	0.000	1.306 ✔	1.333	H1-3+VT ✔
L6	42.5 - 0 (6)	0.012	1.194	0.000	0.033	0.000	1.206 ✔	1.333	H1-3+VT ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P_{allow} K	% Capacity	Pass Fail
L1	170.5 - 156	Pole	TP10.75x10.75x0.365	1	-0.78	333.35	16.6	Pass
L2	156 - 155.5	Pole	TP19.5x10.75x0.365	2	-0.78	333.35	16.6	Pass
L3	155.5 - 132.17	Pole	TP24.79x19.5x0.1875	3	-7.84	735.45	76.2	Pass
L4	132.17 - 86.5867	Pole	TP34.63x23.5836x0.375	4	-16.21	2052.54	96.1	Pass
L5	86.5867 - 42.5	Pole	TP43.75x32.7959x0.4375	5	-27.51	3029.76	98.0	Pass
L6	42.5 - 0	Pole	TP52.5x41.5315x0.5	6	-34.57	3747.61	90.5	Pass
							Summary	
						Pole (L5)	98.0	Pass
						RATING =	**98.0**	**Pass**

APPENDIX B

BASE LEVEL DRAWING

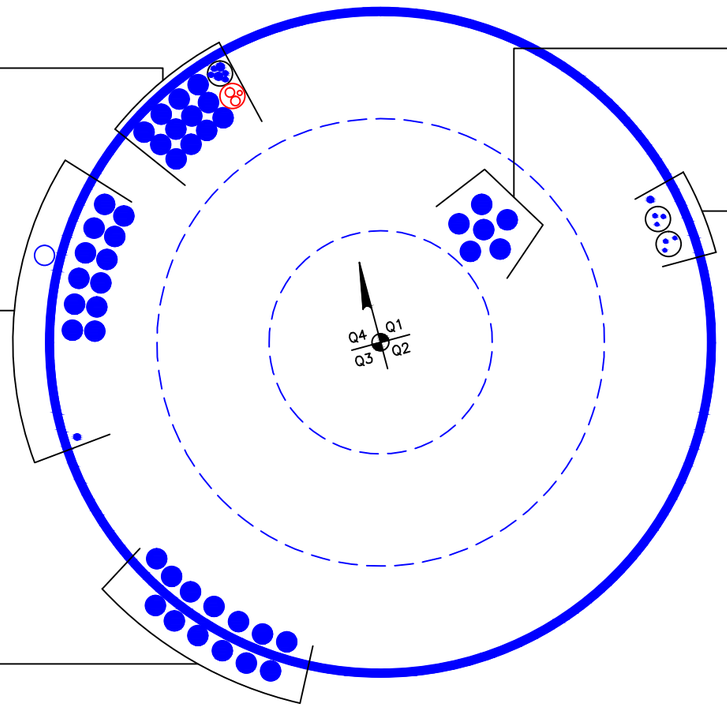
(PROPOSED–IN 2" CONDUIT)
(1) 3/8" TO 146 FT LEVEL
(2) 3/4" TO 146 FT LEVEL
(INSTALLED–IN 2" CONDUIT–TO BE REMOVED)
(3) 3/8" TO 146 FT LEVEL
(INSTALLED–IN 2" CONDUIT)
(1) 3/8" TO 146 FT LEVEL
(2) 5/8" TO 146 FT LEVEL
(INSTALLED)
(12) 1–5/8" TO 146 FT LEVEL

(RESERVED)
(1) 1–5/8" TO 155 FT LEVEL
(INSTALLED)
(1) 1/2" TO 155 FT LEVEL
(12) 1–5/8" TO 155 FT LEVEL

(INSTALLED)
(13) 1 5/8" TO 138 FT LEVEL

(ABANDONED)
(6) 1–5/8" TO 166 FT LEVEL

(INSTALLED)
(1) 1/2" TO 128 FT LEVEL
(INSTALLED–BUNDLED IN (2) 2" CONDUIT)
(3) 1/4" TO 128 FT LEVEL
(3) 5/16" TO 128 FT LEVEL



BUSINESS UNIT: 806355 TOWER ID: C_BASELEVEL

BASE LEVEL DRAWING | 1

PLOT DATE: 6/30/2016 FILE NAME: 806355_BASELEVEL.dwg
Xref R:\Standards – JRE\CAD Standards V5.0\Templates\Typical Blocks For Templates\TITLE BLOCK STD–VER 5.1.dwg

CROWN REGION ADDRESS

USA

14/05/12	AS–BUILT INFORMATION ADDED PER WORK ORDER	KAH
15/06/12	# 486332 AS–BUILT INFORMATION ADDED PER WORK ORDER	MG
18/08/12	# 501460 AS–BUILT INFORMATION ADDED PER WORK ORDER	BRM
25/10/12	# 503853 APPLICATION ADDED PER WORK ORDER # 546209	MDB
11/10/13	UPDATED PER WORK ORDER # 659641	BMH
26/11/2014	UPDATED PER WORK ORDER 970491	ARM
14/9/2015	UPDATED PER WORK ORDER 1119955	BMH
14/03/16	UPDATED PER WORK ORDER 1194085	WJT
28/06/16	UPDATED PER WORK ORDER 1261238	CRM

DRAWN BY: **SAC**
CHECKED BY:
DRAWING DATE: **21/07/05**

SITE NUMBER:
SITE NAME:

SITE NAME

BRG 126 943086

BUSINESS UNIT NUMBER

806355

SITE ADDRESS

281 WOODHOUSE ROAD
FAIRFIELD, CT 06430
FAIRFIELD COUNTY
USA

SHEET TITLE

BASE LEVEL

SHEET NUMBER

A1-0

APPENDIX C

ADDITIONAL CALCULATIONS

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

Site Data

BU#: *806355*
Site Name: *BRG 126 943086*
App #: *353118 Rev#3*

Pole Manufacturer:	Other

Bolt Data			
Qty:	15		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	100	<-- Disregard	Bolt Fty:
N/A:	75	<-- Disregard	44.00
Circle (in.):	25.75		

Plate Data		
Diam:	28.5	in
Thick, t:	1	in
Grade (Fy):	60	ksi
Strength, Fu:	75	ksi
Single-Rod B-eff:	2.25	in

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

Pole Data		
Diam:	10.75	in
Thick:	0.365	in
Grade:	35	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

Reactions		
Moment:	12.57	ft-kips
Axial:	0.78	kips
Shear:	1.31	kips
Elevation:	156	feet

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

Flange Bolt Results

			Non-Rigid
Bolt Tension Capacity, **B**:	46.07	kips	Service, ASD
Max Bolt directly applied T:	1.51	Kips	Fty*ASIF
Min. PL "tc" for **B** cap. **w/o** Pry:	3.785	in	
Min PL "treq" for actual **T w/ Pry**:	0.554	in	
Min PL "t1" for actual **T w/o Pry**:	0.685	in	
T allowable with Prying:	4.91	kips	α'>1 case
Prying Force, Q:	0.00	kips	
Total Bolt Tension=T+Q:	1.51	kips	
Prying Bolt Stress Ratio=(T+Q)/(B):	3.3%	**Pass**	

Exterior Flange Plate Results Flexural Check

			Non-Rigid
Compression Side Plate Stress:	9.8	ksi	Service ASD
Allowable Plate Stress:	60.0	ksi	0.75*Fy*ASIF
Compression Plate Stress Ratio:	16.3%	**Pass**	Comp. Y.L. Length:
No Prying			23.40
Tension Side Stress Ratio, (treq/t)^2:	30.7%	**Pass**	

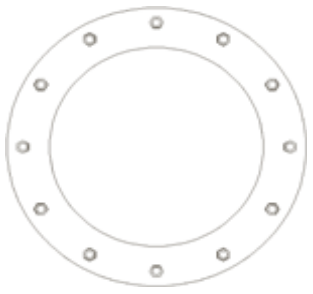
n/a

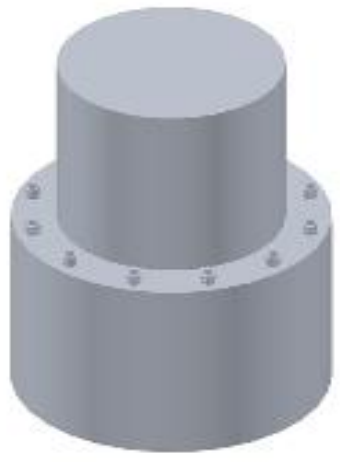
Stiffener Results

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

Pole Results

Pole Punching Shear Check: n/a





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

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

Site Data

BU#: *806355*
Site Name: *BRG 126 943086*
App #: *353118 Rev#3*

Pole Manufacturer:	Other

Bolt Data			
Qty:	15		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	100	<-- Disregard	Bolt Fty:
N/A:	75	<-- Disregard	44.00
Circle (in.):	25.75		

Plate Data		
Diam:	28.5	in
Thick, t:	1.5	in
Grade (Fy):	60	ksi
Strength, Fu:	75	ksi
Single-Rod B-eff:	2.25	in

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

Pole Data		
Diam:	10.75	in
Thick:	0.365	in
Grade:	35	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

Reactions		
Moment:	12.57	ft-kips
Axial:	0.78	kips
Shear:	1.31	kips
Elevation:	156	feet

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

Flange Bolt Results

			Non-Rigid
Bolt Tension Capacity, **B**:	46.07	kips	Service, ASD
Max Bolt directly applied T:	1.51	Kips	Fty*ASIF
Min. PL "tc" for **B** cap. **w/o** Pry:	3.785	in	
Min PL "treq" for actual **T w/ Pry**:	0.554	in	
Min PL "t1" for actual **T w/o Pry**:	0.685	in	
T allowable with Prying:	11.06	kips	α'>1 case
Prying Force, Q:	0.00	kips	
Total Bolt Tension=T+Q:	1.51	kips	
Prying Bolt Stress Ratio=(T+Q)/(B):	3.3%	**Pass**	

Exterior Flange Plate Results Flexural Check

			Non-Rigid
Compression Side Plate Stress:	4.3	ksi	Service ASD
Allowable Plate Stress:	60.0	ksi	0.75*Fy*ASIF
Compression Plate Stress Ratio:	7.2%	**Pass**	Comp. Y.L. Length:
No Prying			23.40
Tension Side Stress Ratio, (treq/t)^2:	13.7%	**Pass**	

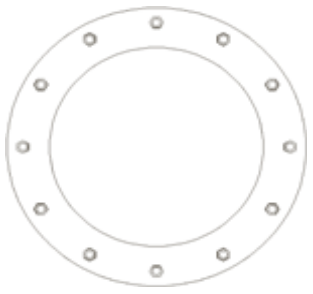
n/a

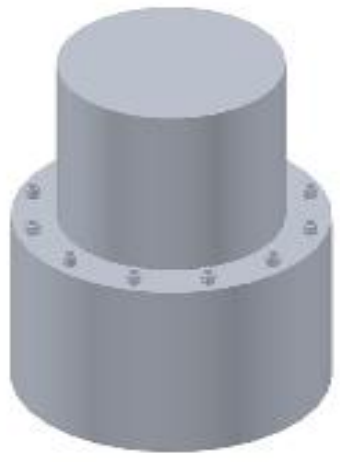
Stiffener Results

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

Pole Results

Pole Punching Shear Check: n/a





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

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

TIA Rev F

Site Data

BU#:	*806355*
Site Name:	*BRG 126 943086*
App #:	*353118 Rev#3*
Pole Manufacturer:	*Other*

Reactions		
Moment:	4062	ft-kips
Axial:	44	kips
Shear:	33	kips

Anchor Rod Data		
Qty:	20	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	61	in

Plate Data		
Diam:	67	in
Thick:	2.25	in
Grade:	60	ksi
Single-Rod B-eff:	8.33	in

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

Pole Data		
Diam:	52.5	in
Thick:	0.5	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

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

Anchor Rod Results

Maximum Rod Tension:	157.6 Kips	Rigid
Allowable Tension:	195.0 Kips	Service, ASD
Anchor Rod Stress Ratio:	80.8% **Pass**	Fty*ASIF

Base Plate Results Flexural Check

Base Plate Stress:	58.7 ksi	Rigid
Allowable Plate Stress:	60.0 ksi	Service ASD
Base Plate Stress Ratio:	97.9% **Pass**	0.75*Fy*ASIF
		Y.L. Length: 31.06

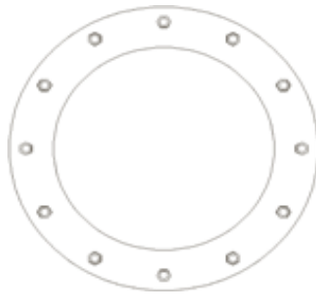
n/a

Stiffener Results

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

Pole Results

Pole Punching Shear Check: n/a



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

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

(Bearing and Stability Checks) Tool for TIA Rev F or G - Application (MP, SST with unitbase)

Site Data

BU#: *806355*
Site Name: *BRG 126 943086*
App #: *353118 Rev#3*

Enter Load Factors Below:		
For P (DL)	1.2	<---- Enter Factor
For P,V, and M (WL)	1.35	<---- Enter Factor

Pad & Pier Data		
Base PL Dist. Above Pier:	0	in
Pier Dist. Above Grade:	12	in
Pad Bearing Depth, D:	9	ft
Pad Thickness, T:	3	ft
Pad Width=Length, L:	22	ft
Pier Cross Section Shape:	Square	<--Pull Down
Enter Pier Side Width:	7	ft
Concrete Density:	150.0	pcf
Pier Cross Section Area:	49.00	ft^2
Pier Height:	7.00	ft
Soil (above pad) Height:	6.00	ft

Soil Parameters		
Unit Weight, γ:	125.0	pcf
Ultimate Bearing Capacity, qn:	24.00	ksf
Strength Reduct. factor, ϕ:	0.75	
Angle of Friction, Φ:	36.0	degrees
Undrained Shear Strength, Cu:	0.00	ksf
Allowable Bearing: ϕ*qn:	18.00	ksf
Passive Pres. Coeff., Kp	3.85	

Forces/Moments due to Wind and Lateral Soil		
Minimum of (φ*Ultimate Pad Passive Force, Vu):	44.6	kips
Pad Force Location Above D:	1.40	ft
ϕ(Passive Pressure Moment):	62.37	ft-kips
Factored O.T. M(WL), "1.6W":	5929.2	ft-kips
Factored OT (MW-Msoil), M1	5866.83	ft-kips

Resistance due to Foundation Gravity		
Soil Wedge Projection grade, a:	4.36	ft
Sum of Soil Wedges Wt:	96.87	kips
Soil Wedges ecc, K1:	7.53	ft
Ftg+Soil above Pad wt:	595.5	kips
Unfactored (Total ftg-soil Wt):	692.37	kips
1.2D. **No Soil Wedges**.	767.40	kips
0.9D. **With Soil Wedges**	662.74	kips

Resistance due to Cohesion (Vertical)		
ϕ*(1/2*Cu)(Total Vert. Planes)	0.00	kips
Cohesion Force Eccentricity, K2	0.00	ft

Monopole Base Reaction Forces		
TIA Revision:	F	<--Pull Down
Unfactored DL Axial, PD:	44	kips
Unfactored WL Axial, PW:	0	kips
Unfactored WL Shear, V:	33	kips
Unfactored WL Moment, M:	4062	ft-kips

Load Factor	Shaft Factored Loads		
1.20	1.2D+1.6W, Pu:	52.8	kips
0.90	0.9D+1.6W, Pu:	39.6	kips
1.35	Vu:	44.55	kips
	Mu:	5483.7	ft-kips

1.2D+1.6W Load Combination, Bearing Results:

(**No Soil Wedges**) [Reaction+Conc+Soil]	767.40	P1="1.2D+1.6W" (Kips)
Factored "1.6W" Overturning Moment (MW-Msoil), M1	5866.83	ft-kips

Orthogonal Direction:

ecc1 = M1/P1 =	7.65	ft
Orthogonal qu=	5.20	ksf
qu/ϕ*qn Ratio=	**28.88%**	**Pass**

Diagonal Direction:

ecc2 = (0.707M1)/P1 =	5.41	ft
Diagonal qu=	6.13	ksf
qu/ϕ*qn Ratio=	**34.05%**	**Pass**

Run <-- Press Upon Completing All Input

Overturning Stability Check

0.9D+1.6W Load Combination, Bearing Results:

(**w/ Soil Wedges**) [Reaction+Conc+Soil]	662.74	P2="0.9D+1.6W" (Kips)
Factored "1.6W" Overturning Moment (MW-Msoil) - 0.9(M of Wedge + M of Cohesion), M2	5210.52	ft-kips

Orthogonal ecc3 = M2/P2 =	7.86	ft
Ortho Non Bearing Length,NBL=	15.72	ft
Orthogonal qu=	4.80	ksf
Diagonal qu=	5.60	ksf

Max Reaction Moment (ft-kips) so that qu=φ*qn = 100% Capacity Rating			
Actual M:	4062.00		
M Orthogonal:	5214.55	**77.90%**	**Pass**
M Diagonal:	5214.55	**77.90%**	**Pass**

Project Name:	BRG 126 943086	JACOBS® Jacobs Engineering Group, Inc.	Created On: 6/3/2014
Project Number:	BU#806355		Checked By: DW
Job Number:	WO#1261241		Revised On: 3/4/2015
Date:	7/5/2016		Revision No.: 1.6

Monopole Pad & Pier Foundation

Foundation Parameters

Load		
Code	F	
Axial	44	kips
Shear	33	kips
Moment	4062	k-ft
Soil Unit Weight	125	pcf
Friction Angle	36	
Cohesion	0	psf

Material		
Concrete Strength (F'c)	4000	psi
Concrete Density	150	pcf
Rebar Tensile (Fy)	60	ksi
Clear Cover	3	in

Pad		
Thickness	3	ft
Bearing Depth	9	ft
Width	22	ft
Rebar Size	8	
Rebar Quantity	36	

Pier		
Pier type	Circle	
Diameter	7	ft
Height above Grade	1	ft
Rebar Size	8	
Rebar Quantity	46	
Tie Size	4	
Tie C/C Spacing	12	in

Structural Checks

Pad Beam Shear Capacity	788.9	kips
Pad Beam Shear	438.8	kips
Pad Beam Shear Check	55.6%	Pass

Pad Bending Moment Capacity	3909.7	k-ft
Pad Bending Moment	2713.6	k-ft
Pad Bending Moment Check	69.4%	Pass

Punching Shear Capacity	2168.7	kips
Punching Shear	308.1	kips
Punching Shear Check	14.2%	Pass

Pad-Pier Bearing Capacity	24494.6	kips
Pad-Pier Bearing	763.6	kips
Pad-Pier Bearing Check	3.1%	Pass

Pier Beam Shear Capacity	510.4	kips
Pier Beam Shear	44.6	kips
Pier Beam Shear Check	8.7%	Pass

Pier Bending Moment Capacity	5892.5	k-ft
Pier Bending Moment	5730.3	k-ft
Pier Bending Moment Check	97.2%	Pass

EBI Consulting
environmental | engineering | due diligence

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

AT&T Existing Facility

Site ID: CT2105

Fairfield-Murray
281 Wood House Road
Fairfield, CT 06824

July 12, 2016

EBI Project Number: 6216003218

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	10.20 %

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

July 12, 2016

AT&T Mobility – New England
Attn: Cameron Syme, RF Manager
550 Cochituate Road
Suite 550 – 13&14
Framingham, MA 06040

Emissions Analysis for Site: **CT2105 – Fairfield-Murray**

EBI Consulting was directed to analyze the proposed AT&T facility located at **281 Wood House Road, Fairfield, CT**, for the purpose of determining whether the emissions from the Proposed AT&T Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

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

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

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 700 and 850 MHz Bands are approximately 467 $\mu W/cm^2$ and 567 $\mu W/cm^2$ respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 2300 MHz (WCS) bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed AT&T Wireless antenna facility located at **281 Wood House Road, Fairfield, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since AT&T is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

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

1) 2 LTE channels (700 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

2) 4 LTE channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

3) 2 GSM channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

4) 2 LTE channels (2300 MHz (WCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

5) 2 UMTS channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

6) 2 UMTS channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

7) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

8) For the following calculations the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

9) The antennas used in this modeling are the **Powerwave P65-16-XLH-RR, Quintel QS66512-2 and Powerwave 7770** for transmission in the 700 MHz, 850 MHz, 1900 MHz (PCS) and 2300 MHz (WCS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

10) The antenna mounting height centerlines of the proposed antennas are **148 feet** above ground level (AGL) for **Sector A**, **148 feet** above ground level (AGL) for **Sector B** and **148 feet** above ground level (AGL) for Sector C.

11) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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

AT&T Site Inventory and Power Data by Antenna

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	Powerwave P65-16-XLH-RR	Make / Model:	Powerwave P65-16-XLH-RR	Make / Model:	Powerwave P65-16-XLH-RR
Gain:	12.7 / 15.1 dBd	Gain:	12.7 / 15.1 dBd	Gain:	12.7 / 15.1 dBd
Height (AGL):	**148 feet**	Height (AGL):	**148 feet**	Height (AGL):	**148 feet**
Frequency Bands	700 MHz / 1900 MHz (PCS)	Frequency Bands	700 MHz / 1900 MHz (PCS)	Frequency Bands	700 MHz / 1900 MHz (PCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	240 Watts	Total TX Power(W):	240 Watts	Total TX Power(W):	240 Watts
ERP (W):	6,117.63	ERP (W):	6,117.63	ERP (W):	6,117.63
Antenna A1 MPE%	**1.55 %**	Antenna B1 MPE%	**1.55 %**	Antenna C1 MPE%	**1.55 %**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	Quintel QS66512-2	Make / Model:	Quintel QS66512-2	Make / Model:	Quintel QS66512-2
Gain:	11.35 / 14.85 / 13.85 dBd	Gain:	11.35 / 14.85 / 13.85 dBd	Gain:	11.35 / 14.85 / 13.85 dBd
Height (AGL):	**148 feet**	Height (AGL):	**148 feet**	Height (AGL):	**148 feet**
Frequency Bands	850 MHz / 2300 MHz (WCS) / 1900 MHz (PCS)	Frequency Bands	850 MHz / 2300 MHz (WCS) / 1900 MHz (PCS)	Frequency Bands	850 MHz / 2300 MHz (WCS) / 1900 MHz (PCS)
Channel Count	6	Channel Count	6	Channel Count	6
Total TX Power(W):	300 Watts	Total TX Power(W):	300 Watts	Total TX Power(W):	300 Watts
ERP (W):	7,396.59	ERP (W):	7,396.59	ERP (W):	7,396.59
Antenna A2 MPE%	**1.43 %**	Antenna B2 MPE%	**1.43 %**	Antenna C2 MPE%	**1.43 %**
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	Powerwave 7770	Make / Model:	Powerwave 7770	Make / Model:	Powerwave 7770
Gain:	11.4 / 13.4 dBd	Gain:	11.4 / 13.4 dBd	Gain:	11.4 / 13.4 dBd
Height (AGL):	**148 feet**	Height (AGL):	**148 feet**	Height (AGL):	**148 feet**
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	120 Watts	Total TX Power(W):	120 Watts	Total TX Power(W):	120 Watts
ERP (W):	2,140.89	ERP (W):	2,140.89	ERP (W):	2,140.89
Antenna A3 MPE%	**0.49 %**	Antenna B3 MPE%	**0.49 %**	Antenna C3 MPE%	**0.49 %**

Site Composite MPE%	
Carrier	**MPE%**
AT&T – Max per sector	**3.47 %**
Clearwire	0.12 %
PageNet	0.19 %
T-Mobile	2.24 %
Verizon Wireless	2.15 %
XM Satellite Radio	2.03 %
Metricom	0.00 %
Site Total MPE %:	**10.20 %**

AT&T Sector A Total:	3.47 %
AT&T Sector B Total:	3.47 %
AT&T Sector C Total:	3.47 %
Site Total:	10.20 %

AT&T _ Max Values Per Sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
AT&T 700 MHz LTE	2	1,117.25	148	3.98	700 MHz	467	0.85 %
AT&T 1900 MHz (PCS) LTE	2	1,941.56	148	6.92	1900 MHz (PCS)	1000	0.69 %
AT&T 850 MHz GSM	2	409.37	148	1.46	850 MHz	567	0.26 %
AT&T 2300 MHz (WCS) LTE	2	1,832.95	148	6.54	2300 MHz (WCS)	1000	0.65 %
AT&T 1900 MHz (PCS) LTE	2	1,455.97	148	5.19	1900 MHz (PCS)	1000	0.52 %
AT&T 850 MHz UMTS	2	414.12	148	1.48	850 MHz	567	0.26 %
AT&T 1900 MHz (PCS) UMTS	2	656.33	148	2.34	1900 MHz (PCS)	1000	0.23 %
						Total:*	**3.47 %**

NOTE: Totals may vary by .01% due to summing of remainders

Summary

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

The anticipated maximum composite contributions from the AT&T facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general public exposure to RF Emissions are shown here:

AT&T Sector	Power Density Value (%)
Sector A:	3.47 %
Sector B:	3.47 %
Sector C:	3.47 %
AT&T Maximum Total (per sector):	3.47 %
Site Total:	10.20 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **10.20 %** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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