



March 20, 2019

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

Regarding:	Notice of Exempt Modification – Equipment Modifications
Property Address:	69 Wheeler Street., New Haven, CT 06512 (the “Property”)
Applicant:	AT&T Mobility (“AT&T”, Site # CT2037)

Dear Ms. Bachman:

AT&T currently maintains a wireless telecommunications facility on an existing 98-foot monopole at the above-referenced address, latitude 41.29596944°, longitude -72.8792500°. Said monopole is owned by Landmark Dividend and the underlying property owner is the Whitney Realty Enterprises.

AT&T desires to modify its existing telecommunications facility by adding three (3) antennas and adding (6) remote-radio heads (“RRHs”), adding one (1) DC Surge Suppressor Squid with associated DC Cables. The centerline height of the existing antennas and ancillary tower-mounted equipment is and will remain at 91 feet.

Please accept this application as notification pursuant to R.C.S.A. §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. §16-50j-72 (b)(2). In accordance with R.C.S.A. §16-50j-73, a copy of this letter is being sent to the Honorable Toni N. Harp, Mayor of the City of New Haven; Michael Piscitelli, of the City Plan Department of the City of New Haven; Whitney Realty Enterprises, as property owner; and the tower owner, Landmark Dividend LLC.

The planned modifications to AT&T’s facility fall squarely within those activities explicitly provided for in R.C.S.A. §16-50j-72 (b)(2). Specifically:

1. The planned modification will not result in an increase in the height of the existing structure. The added antennas and accessory equipment along with equipment will be installed at the existing height of 91 feet on the 98-foot monopole.
2. The proposed modifications will not involve any changes to AT&T’s ground-space footprint, and therefore and therefore will not require an extension of the site boundary.
3. The proposed modification will not increase the noise level at the facility by six decibels or more, or to levels that exceed state and local criteria.

March 20, 2019

Page 2 of 2

4. The operation of the modified facility will not increase radio frequency (RF) emissions at the facility to a level at or above Federal Communications Commission (FCC) safety standard. An RF emissions calculation (enclosed) for AT&T's modified facility is herein provided.
5. The operation of the modified facility will not increase radio frequency (RF) emissions at the facility to a level at or above Federal Communications Commission (FCC) safety standard. An RF emissions calculation for AT&T's modified facility is herein provided.
6. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
7. The existing structure and its foundation can support AT&T's proposed modifications. Please see enclosed structural analysis completed by Maser Consulting Connecticut, dated December 5, 2018, and stamped by Petros Tsoukalas.

For the foregoing reasons, AT&T respectfully requests that the proposed installation be allowed within the exempt modifications under R.C.S.A. §16-50j-72 (b)(2).

Sincerely,

Michelle Scharath

Michelle Scharath
Site Acquisition Specialist
Empire Telecom USA, LLC
mscharath@empiretelecomm.com

Enclosures: Exhibit 1 – Field Card and GIS Map
Exhibit 2 – Construction Drawings
Exhibit 3 – Structural Analysis
Exhibit 4 – RF Emissions Analysis Report Evaluation

cc:

Hon. Toni M. Harp, Mayor
165 Church Street
New Haven, CT 06510

Michael Piscitelli
City Planning Department
165 Church St.
New Haven, CT 06510

Landmark Dividend, LLC
PO BOX 3429
2141 Rosecrans Avenue – Suite
2100
El Segundo, CA 90245

WHITNEY REALTY
ENTERPRISES LLC
51 LONGHINI LANE
NEW HAVEN, CT 06519

69 WHEELER ST

Location 69 WHEELER ST

Mblu 077/ 0975/ 00200/ /

Acct# 077 0975 00200

Owner WHITNEY REALTY
ENTERPRISES LLC

Assessment \$269,523

Appraisal \$385,033

PID 3459

Building Count 1

Current Value

Appraisal			
Valuation Year	Improvements	Land	Total
2018	\$254,933	\$130,100	\$385,033
Assessment			
Valuation Year	Improvements	Land	Total
2018	\$178,453	\$91,070	\$269,523

Owner of Record

Owner WHITNEY REALTY ENTERPRISES LLC
Co-Owner
Address 51 LONGHINI LANE
NEW HAVEN, CT 06519

Sale Price \$0
Certificate
Book & Page 8954/ 126
Sale Date 03/01/2013
Instrument 3

Ownership History

Ownership History					
Owner	Sale Price	Certificate	Book & Page	Instrument	Sale Date
WHITNEY REALTY ENTERPRISES LLC	\$0		8954/ 126	3	03/01/2013
ELMER LAYDON SPRAY TRUST	\$0		8826/ 20	25	05/04/2012
LAYDON ELMER F & WILLIAM M	\$0		2868/ 345		09/11/1980

Building Information

Building 1 : Section 1

Year Built: 1920
Living Area: 8,816
Replacement Cost: \$444,431
Building Percent Good: 60

Building Photo

 Building Photo
(<http://images.vgsi.com/photos/NewHavenCTPhotos//\00\05\09/>)

Building Layout

Replacement Cost
Less Depreciation: \$266,700

Building Attributes	
Field	Description
STYLE	Warehouse
MODEL	Ind/Lg Com
Grade	Above Average
Stories:	2
Occupancy	1
Exterior Wall 1	Brick
Exterior Wall 2	
Roof Structure	Flat
Roof Cover	T&G/Rubber
Interior Wall 1	Minim/Masonry
Interior Wall 2	
Interior Floor 1	Concr-Finished
Interior Floor 2	
Heating Fuel	Oil/Gas
Heating Type	FA/HW/ST
AC Type	None
Bldg Use	IND WHSES MDL-96
Total Rooms	
Total Bedrms	00
Total Baths	0
NBHD Code	
1st Floor Use:	4010
Heat/AC	NONE
Frame Type	MASONRY
Baths/Plumbing	AVERAGE
Ceiling/Wall	CEIL & MIN WL
Rooms/Prtns	AVERAGE
Wall Height	14
% Corn Wall	



(<http://images.vgsi.com/photos/NewHavenCTPhotos//Sketches/3>

Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
BAS	First Floor	7,656	7,656
AOF	Office	1,160	1,160
		8,816	8,816

Extra Features

Extra Features				Legend
Code	Description	Size	Value	Bldg #
MEZ1	MEZZANINE-UNF	250 S.F.	\$1,900	1

Land

Land Use		Land Line Valuation	
Use Code	4010	Size (Acres)	1.3
Description	IND WHSES MDL-96	Frontage	1
Zone	IH	Depth	0
Neighborhood	IND5	Assessed Value	\$91,070
Alt Land Appr Category	No	Appraised Value	\$130,100

Outbuildings

Outbuildings						<u>Legend</u>
Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
PAV1	PAVING-ASPHALT			11760 S.F.	\$24,100	1

Valuation History

Appraisal			
Valuation Year	Improvements	Land	Total
2017	\$292,700	\$130,100	\$422,800
2016	\$540,200	\$130,100	\$670,300
2015	\$340,800	\$115,200	\$456,000

Assessment			
Valuation Year	Improvements	Land	Total
2017	\$204,890	\$91,070	\$295,960
2016	\$378,140	\$91,070	\$469,210
2015	\$238,560	\$80,640	\$319,200



Map data ©2019 Google 200 ft



69 Wheeler St

New Haven, CT 06512



Directions



Save



Nearby



Send to your
phone



Share

Photos



At this location

Elmer F Laydon Construction
Excavating contractor · 69 Wheeler St



PROJECT NOTES

1. SITE INFORMATION OBTAINED FROM THE FOLLOWING:
 - A. PLAN ENTITLED "NEW HAVEN LAYDOWN" PREPARED BY COMPLEX CONSULTANTS OF DENVER, COLORADO, LAST REVISED 03/17/2018.
 - B. ON 02/29/2018.
2. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE CODES, ORDINANCES, LAWS AND REGULATIONS OF ALL MUNICIPALITIES, UTILITY COMPANIES OR OTHER PUBLIC GOVERNING AUTHORITIES.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS THAT MAY BE REQUIRED BY ANY FEDERAL, STATE, COUNTY OR MUNICIPAL AUTHORITIES.
4. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER, IN WRITING, OF ANY CONFLICTS, ERRORS OR OMISSIONS PRIOR TO THE SUBMISSION OF BIDS OR PERFORMANCE OF WORK.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING SITE IMPROVEMENTS PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL REPAIR ANY DAMAGE TO EXISTING SITE IMPROVEMENTS INCURRED BY THE CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE OWNER.
6. THE SCOPE OF WORK FOR THIS PROJECT SHALL INCLUDE THE CONSTRUCTION OF THE NEW FACILITY. THE CONTRACTOR SHALL BE REQUIRED TO COMPLETE THIS PROJECT. ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
7. THE CONTRACTOR SHALL VISIT THE PROJECT SITE PRIOR TO SUBMITTING THE BID TO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND CONSTRUCTION DRAWINGS.
8. THE CONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THESE PLANS SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO ANY CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
9. SINCE THE CELL SITE MAY BE ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUT DOWN PRIOR TO PERFORMING ANY WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND INSPECTIONS PRIOR TO ANY CONSTRUCTION. THE CONTRACTOR SHALL BE ALERT OF ANY POTENTIALLY DANGEROUS EXPOSURE LEVELS.
10. THE PROPOSED FACILITY WILL CAUSE AN INSIGNIFICANT OR MINOR IMPACT ON THE ENVIRONMENT. THE CONTRACTOR SHALL THEREFORE, NO DRAINAGE STRUCTURES ARE PROPOSED.
11. NO NOISE, SMOKE, ODOR OR OTHER WILL RESULT FROM THIS FACILITY AS TO CAUSE A NUISANCE.
12. THE FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION (NO HANDICAP ACCESS IS REQUIRED).
13. THE FACILITY DOES NOT REQUIRE POTABLE WATER OR SANITARY SERVICE.
14. CONTRACTOR SHALL VERIFY ANTENNA ELEVATION AND AZIMUTHS WITH RF ENGINEERING PRIOR TO INSTALLATION. TO MEET EMI/TA-22-H AS PER IBC REQUIREMENTS.
15. THE TOWER, MOUNTS AND ANTENNAS SHALL BE DESIGNED TO MEET EMI/TA-22-H AS PER IBC REQUIREMENTS.
16. ALL STRUCTURAL ELEMENTS SHALL BE HOT DIPPED GALVANIZED STEEL.
17. CONTRACTOR MUST FIELD LOCATE ALL EXISTING UNDERGROUND UTILITIES PRIOR TO ANY EXCAVATION.
18. CONSTRUCTION SHALL NOT COMMENCE UNTIL COMPLETION OF A PASSING STRUCTURAL ANALYSIS CERTIFIED BY A LICENSED PROFESSIONAL ENGINEER. THE STRUCTURAL ANALYSIS IS TO BE PERFORMED BY O THRS.

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SITE NAME: NEW HAVEN WHEELER ST
FA NUMBER: 10035247
SITE NUMBER: CT2037
4C - MRCTB031769
5C - MRCTB031849
69 WHEELER STREET
NEW HAVEN, CT 06512
NEW HAVEN COUNTY

VICINITY MAP



CODE COMPLIANCE

- ALL WORK AND MATERIALS SHALL BE PERFORMED AND INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THE LATEST EDITIONS OF THE FOLLOWING CODES.
1. 2018 CONNECTICUT STATE BUILDING CODE
 2. 2017 NATIONAL ELECTRICAL CODE - NFPA 70
 3. 2017 NFPA 101
 4. AMERICAN INSTITUTE OF STEEL CONSTRUCTION 360-10
 5. AMERICAN CONCRETE INSTITUTE
 6. TIA-222-G
 7. TIA 807 FOR GROUNDING
 8. INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS IEEE C2 LATEST EDITION
 9. TELCORDIA GR-1275
 10. ANSI T1.311
 11. PROPOSED USE: UNMANNED TELECOM FACILITY
 12. HANDICAP REQUIREMENTS: FACILITY IS UNMANNED ACCESS NOT REQUIRED
 13. CONSTRUCTION TYPE: IB
 14. USE GROUP: U

PROJECT INFORMATION

SITE INFORMATION
LATITUDE: 41.255931° N
LONGITUDE: 72.897431° W
JURISDICTION: NEW HAVEN COUNTY
APPLICANT / LESSEE
COMPANY: NEW CINGULAR WIRELESS PCS, LLC
ADDRESS: 550 COCHITUATE ROAD
CITY, STATE, ZIP: FRAMINGHAM, MA 01701
TOWER OWNER
COMPANY: T.B.D.
ADDRESS: T.B.D.
CITY, STATE, ZIP: T.B.D.
CLIENT REPRESENTATIVE
COMPANY: EMPIRE TELECOM
ADDRESS: 16 ESQUIRE ROAD
CITY, STATE, ZIP: BILLERICA, MA 01862
CONTACT: DAVID COOPER
E-MAIL: DCOOPER@EMPIRETELECOM.COM
SITE ACQUISITION
COMPANY: EMPIRE TELECOM
ADDRESS: 16 ESQUIRE ROAD
CITY, STATE, ZIP: BILLERICA, MA 01862
CONTACT: DCOOPER@EMPIRETELECOM.COM

ENGINEER
COMPANY: MASER CONSULTING CONNECTICUT
ADDRESS: 331 NEWMAN SPRINGS ROAD, SUITE 203
CITY, STATE, ZIP: RED BANK, NJ 07070-5699
CONTACT: ROBERT ANDREWS
PHONE: (908) 797-0432
E-MAIL: RANDREWS@MASERCONSULTING.COM

PROJECT DESCRIPTION/
SCOPE OF WORK

- INSTALL (6) NEW RRUS (2) PER SECTOR
 - INSTALL (3) NEW PANEL ANTENNAS (1) PER SECTOR
 - INSTALL (1) NEW DC-6 SURGE SUPPRESSION DOME
 - INSTALL (1) NEW DC-6 SURGE SUPPRESSION DOME
 - INSTALL (1) NEW DC-6 SURGE SUPPRESSION DOME
 - INSTALL (1) NEW RACK MOUNTED DC-12-48-40-RM
- PROPOSED PROJECT SCOPE BASED ON RFDS ID# 228459, VERSION 2.00, LAST UPDATED 06/4/2018.

SHEET INDEX

SHEET	DESCRIPTION
T-1	TITLE SHEET
GN-1	GENERAL NOTES
C-1	COMPOUND PLAN
C-2	EQUIPMENT LAYOUTS AND ELEVATION VIEW
C-3	ANTENNA LAYOUTS AND ANTENNA SCHEDULE
A-1	DETAILS
A-2	DETAILS
A-3	DETAILS
A-4	DETAILS
A-5	GROUNDING DIAGRAM
G-1	GROUNDING DETAILS AND NOTES



CUSTOMER: NEW HAVEN WHEELER ST
FA# 10035247
SITE# CT2037
69 WHEELER STREET
NEW HAVEN, CT 06512
NEW HAVEN COUNTY



PROPOSED PROJECT SCOPE BASED ON RFDS ID# 228459, VERSION 2.00, LAST UPDATED 06/4/2018.

REV	DATE	DESCRIPTION
1	06/04/2018	ISSUED FOR PERMIT
2	06/04/2018	ISSUED FOR PERMIT
3	06/04/2018	ISSUED FOR PERMIT
4	06/04/2018	ISSUED FOR PERMIT
5	06/04/2018	ISSUED FOR PERMIT
6	06/04/2018	ISSUED FOR PERMIT
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13	06/04/2018	ISSUED FOR PERMIT
14	06/04/2018	ISSUED FOR PERMIT
15	06/04/2018	ISSUED FOR PERMIT
16	06/04/2018	ISSUED FOR PERMIT
17	06/04/2018	ISSUED FOR PERMIT
18	06/04/2018	ISSUED FOR PERMIT
19	06/04/2018	ISSUED FOR PERMIT
20	06/04/2018	ISSUED FOR PERMIT



PROPOSED PROJECT SCOPE BASED ON RFDS ID# 228459, VERSION 2.00, LAST UPDATED 06/4/2018.

SITE NAME:
NEW HAVEN WHEELER ST
FA# 10035247
SITE# CT2037
69 WHEELER STREET
NEW HAVEN, CT 06512
NEW HAVEN COUNTY



TITLE SHEET
T-1



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SAP AC ANYWHERE IN ANY STATE

SCALE:	JOB NUMBER:
AS SHOWN	19913010A

0	032210	FOR CONSTRUCTION	AC	BA
2	091710	REVISED PER COMMENTS	AC	BA
1	091710	GRABED FOR REVIEW	ANN	BA
	041010	DEVELOP	DEVELOP	HIGHER



SITE NAME:

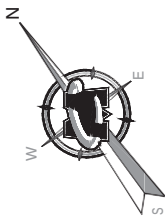
ME:

NEW HAVEN WHEELER ST
FA# 10035247
SITE# CT2037
69 WHEELER STREET
NEW HAVEN, CT 06512
NEW HAVEN COUNTY



COMPOUND PLAN

C-1



COMPOUND PLAN





16 ESQUIRE ROAD
BILLERICA, MA 01862

[illegible]

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THE CONTRACTING UNDER THE DIRECT, TO ASSUME RESPONSIBILITY FOR DESIGNING OR PROFESSIONAL ENGINEER, TO ALTER THE DESIGN.

SITE NAME:
NEW HAVEN WHEELER ST
FA# 10035247
SITE# CT2037
69 WHEELER STREET
NEW HAVEN, CT 06512
NEW HAVEN COUNTY



SHEET TITLE:
**EQUIPMENT LAYOUT AND
ELEVATION VIEW**

SHEET NUMBER: C-2

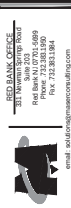




16 ESQUIRE ROAD
BILLERICA, MA 01862

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SITE NAME:
NEW HAVEN WHEELER ST
FA# 10035247
SITE# CT2037
69 WHEELER STREET
NEW HAVEN, CT 06512
NEW HAVEN COUNTY



ANTENNA LAYOUTS AND ANTENNA SCHEDULE

3



ANTENNA SCHEDULE										
SAC. TYP.	EXISTING ANTENNA	PROPOSED ANTENNA	INTERFERENCE	ANTENNA			ANTENNA HEIGHT (ft.)	AZIMUTH (deg.)	ELEVATION (deg.)	REMARKS
				STATION	WIDTH (ft.)	DEPTH (ft.)				
Zone 1	1	Proposed 7750.00	NWTS	EASTING	37.00	11.00	5.25	319.00	91°	7750.00m EASTING
	2	COMM-FM Spectrum 10.5A	ATE	EASTING	53.00	11.00	7.10	451°	91°	10.5m EASTING
	3	-	-	SCOPE	33.00	18.00	7.10	44.00	91°	10.5m EASTING
	4	COMM-FM Spectrum 10.5A	LTE	PROPOSED	33.00	18.00	7.10	44.00	91°	10.5m EASTING
Zone 2	1	Proposed 7750.00	NWTS	EASTING	51.00	12.00	6.00	52.45	91°	7750.00m EASTING
	2	COMM-FM Spectrum 10.5A	LTE	EASTING	37.00	11.00	5.25	319.00	91°	10.5m EASTING
	3	Proposed 7750.00	CCF	EASTING	72.00	14.00	9.25	50.75	91°	7750.00m EASTING
	4	COMM-FM Spectrum 10.5A	LTE	PROPOSED	72.00	14.00	9.00	50.75	91°	7750.00m EASTING
Zone 3	1	Proposed 7750.00	NWTS	EASTING	72.00	12.00	9.45	111.00	91°	7750.00m EASTING
	2	COMM-FM Spectrum 10.5A	ATE	EASTING	37.00	11.00	5.25	319.00	91°	10.5m EASTING
	3	Proposed 7750.00	CCF	EASTING	72.00	14.00	9.25	50.75	91°	7750.00m EASTING
	4	COMM-FM Spectrum 10.5A	LTE	PROPOSED	72.00	14.00	9.00	50.75	91°	7750.00m EASTING



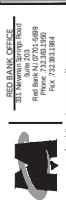
SCALE:	AS SHOWN	JOB NUMBER:	18863010A
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PROJECT INFORMATION		REVISIONS	
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76	0.0000	0.0000	0.0000
77	0.0000	0.0000	0.0000
78	0.0000	0.0000	0.0000
79	0.0000	0.0000	0.0000



IT IS A VIOLATION OF LAW FOR ANY PERSON, WITHOUT THE CONTRACTING UNDER THE DIRECT CONTROL OF THE RESPONSIBLE ENGINEER, TO SIGN OR SIGNATURE OF AN ENGINEER, TO ALTER THIS DOCUMENT.

SITE NAME:
NEW HAVEN WHEELER ST
FA# 10035247
SITE# CT2037
69 WHEELER STREET
NEW HAVEN, CT 06512
NEW HAVEN COUNTY



email: solutions@magnummasterconsulting.com

DATE: _____

DETAILS

1000

FEET MARKER :





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SCALE: AS SHOWN

[illegible]

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BE RESPONSIBLE FOR THE DESIGN OF A STRUCTURE
THEY ARE NOT QUALIFIED TO DESIGN. THE
RESPONSIBILITY FOR THE DESIGN OF A STRUCTURE
SHOULD BE PLACED ON THE PROFESSIONAL ENGINEER,
ARCHITECT, OR OTHER QUALIFIED PERSON.

SITE NAME: _____

NEW HAVEN WHEELER ST
FA# 10035247
SITE# CT2037
69 WHEELER STREET
NEW HAVEN, CT 06512
NEW HAVEN COUNTY

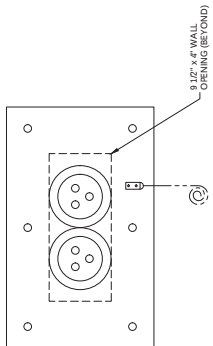
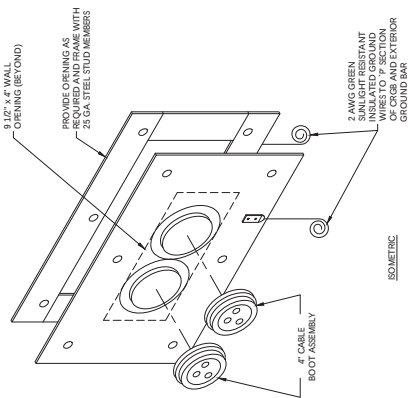


RED BANK OFFICE
331 Newtown Springs Road
Suite 203
Red Bank NJ 07701-6099
Phone: 732.383.1950
Fax: 732.383.1984

email: solutions@maserconsulting.com

DETAILS

A-2



CABLE ENTRY PANEL CHART

SITE PRO B220 FOR (1) PORT
SITE PRO B148 FOR (2) PORTS
SITE PRO B570, 4" BOOT
SITE PRO B57A, 4" BOOT FOR (1) 7/8" COAX
SITE PRO B53A, 4" BOOT FOR (1) 1-5/8" COAX
ROSENBERG CX400-SERIES 4" BOOT ASSEMBLY FOR FIBER & DC CABLES

NOTES:

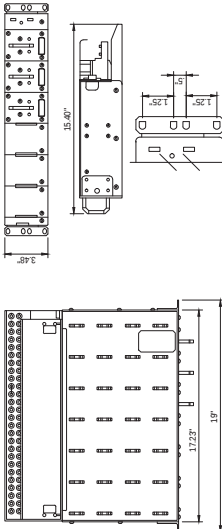
1. ENTRY PANEL AND BOOT IN SITE SIZES (SEE CHART FOR BAY IN). ORDER BOOTS SEPARATELY FOR EACH BAY SIZE) & QUANTITY. PROVIDE PLUGS BY SITE PRO FOR EACH UNUSED HOLE IN BOOT.
2. AN APPROVED EQUAL MAY BE SUBSTITUTED FOR SITE PRO PARTS REFERENCED IN THIS DETAIL.
3. STEEL FRAMES ARE REQUIRED ON BOTH SIDES OF THE WALL. THE FRAMES SHALL BE SEALED WITH THE MANUFACTURER'S RECOMMENDED SEALANT TO HELP RESIST WEATHER EXPOSURE ON THE INTERIOR OF THE SHELTER.
4. OPENING IN WALL CAN BE EITHER ONE OVERALL RECTANGULAR OPENING OR SEVERAL ROUND CORE DRILLS PLACED TO MATCH BOOT LOCATIONS IN THE STEEL FRAMES.

CABLE ENTRY PANEL DETAIL 2 PORT

NOT TO SCALE

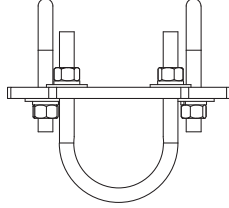
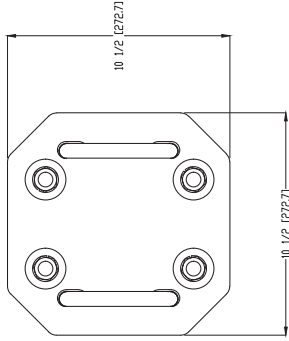
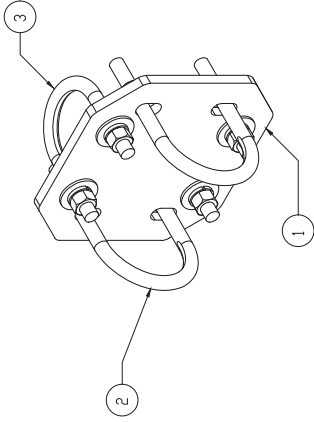
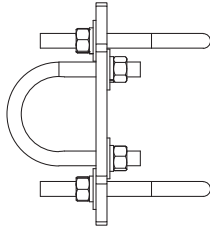
ELECTRICAL SPECIFICATIONS		MECHANICAL SPECIFICATIONS	
MODEL NUMBER	DC12-48-00-0M	SUPPRESSION METHOD	COMPRESSION IUG 2-MOLE, 48V, 56 PITCH, 12.4 AWG
SURGE PROTECTIVE DEVICE TYPE	CLASSY	WEIGHT	27 LBS
MAXIMUM CONTINUOUS OPERATING VOLTAGE	75 VDC		
MAXIMUM DISCHARGE CURRENT	20KA 3200 us	STORAGE TEMPERATURE	-40°C TO +60°C
MAXIMUM LEAKAGE CURRENT	5KA 10/350 us	STORAGE TEMPERATURE	-40°C TO +60°C
VOLTAGE PROTECTION RATING	60KA 3200 us	ENCLOSURE TYPE	INDOOR ONLY
NUMBER OF PROTECTED RADIOS	300V		
	12		

DC-12-48-60-RM DETAIL



ITEM	PART NO.	DESCRIPTION	QTY.	WEIGHT
1	XP202002	CROSSOVER PLATE 2-3/8" O.D. TO 2-7/8" O.D.	1	5.05 LBS
2	GUB-4352	1/2" X 3" X 5-1/4" GALV U-BOLT	2	0.72 LBS
3	GUB-4240	1/2" X 2-1/2" X 4" GALV U-BOLT	2	0.36 LBS

REV.	ZONE	DESCRIPTION	BY	DATE
A		INITIAL RELEASE	MSM	08/20/10



NOTES:
1. ALL METRIC DIMENSIONS ARE IN BRACKETS.

These drawings and specifications are the property of ANDREW® and are not to be reproduced without the written permission of ANDREW®.		DATE: 08/20/10	REV: A	QTY: 1 of 1	PART NAME: XP-2025
ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED:		DATE: 08/20/10	REV: A	QTY: 1 of 1	PART NAME: XP-2025
TOLERANCES UNLESS OTHERWISE SPECIFIED:		DATE: 08/20/10	REV: A	QTY: 1 of 1	PART NAME: XP-2025
X = ± .12		DATE: 08/20/10	REV: A	QTY: 1 of 1	PART NAME: XP-2025
Y = ± .03		DATE: 08/20/10	REV: A	QTY: 1 of 1	PART NAME: XP-2025
Z = ± .03		DATE: 08/20/10	REV: A	QTY: 1 of 1	PART NAME: XP-2025
REMOVE BURS AND BREAK EDGES .005		DATE: 08/20/10	REV: A	QTY: 1 of 1	PART NAME: XP-2025
DO NOT SCALE THIS PRINT		DATE: 08/20/10	REV: A	QTY: 1 of 1	PART NAME: XP-2025
ASSEMBLY DRAWING		DATE: 08/20/10	REV: A	QTY: 1 of 1	PART NAME: XP-2025
CROSSOVER PLATE, 2-3/8" O.D. x 2-7/8" O.D.		DATE: 08/20/10	REV: A	QTY: 1 of 1	PART NAME: XP-2025
WESTCHESTER, IL 60154		DATE: 08/20/10	REV: A	QTY: 1 of 1	PART NAME: XP-2025
ANDREW® USA		DATE: 08/20/10	REV: A	QTY: 1 of 1	PART NAME: XP-2025

COMMSCOPE P/N: XP-2025
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Master Consulting
CONSULTING
COMMERCIAL

Customer Service Representative
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Landscape Architecture • Environmental Sciences

at&t

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Fax: 803.733.1000
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DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
100 STATE STREET, 10TH FLOOR
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SITE# CT2037
69 WHEELER STREET
NEW HAVEN, CT 06511
NEW HAVEN COUNTY
NEW HAVEN COUNTY

AED BANK CHECK
3017 WILLOW STREET
BOSTON, MA 02109
Phone: 617.725.1000
Fax: 617.725.1000
www.aedbankcheck.com

DETAILS

A-3

16 ESQUIRE ROAD
BILLERICA, MA 01862

PROTECT YOURSELF
ALL STATES REQUIRE NOTIFICATION OF
EXCAVATORS, DISBURSERS, OR ANY PERSON
PREPARED TO DISTURB THE SAILING
SAFE ANYWHERE IN THE

SCALE:	AS SHOWN
JOB NUMBER:	19963010A

[illegible]

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SITE NAME:

NEW HAVEN WHEELER STREET
FA# 10035247
SITE# CT2037
69 WHEELER STREET
NEW HAVEN, CT 06512
NEW HAVEN COUNTY

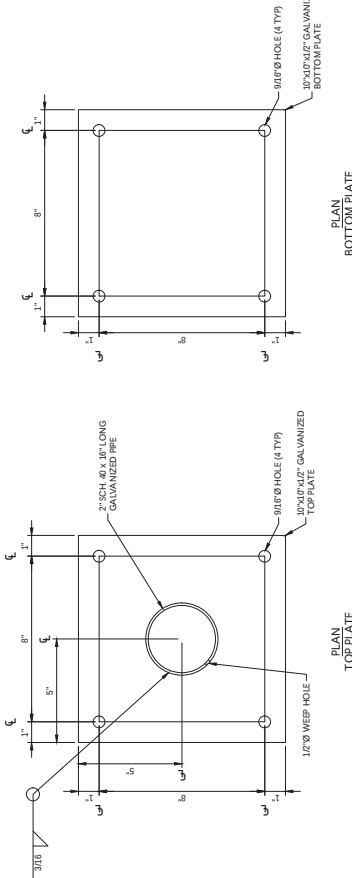
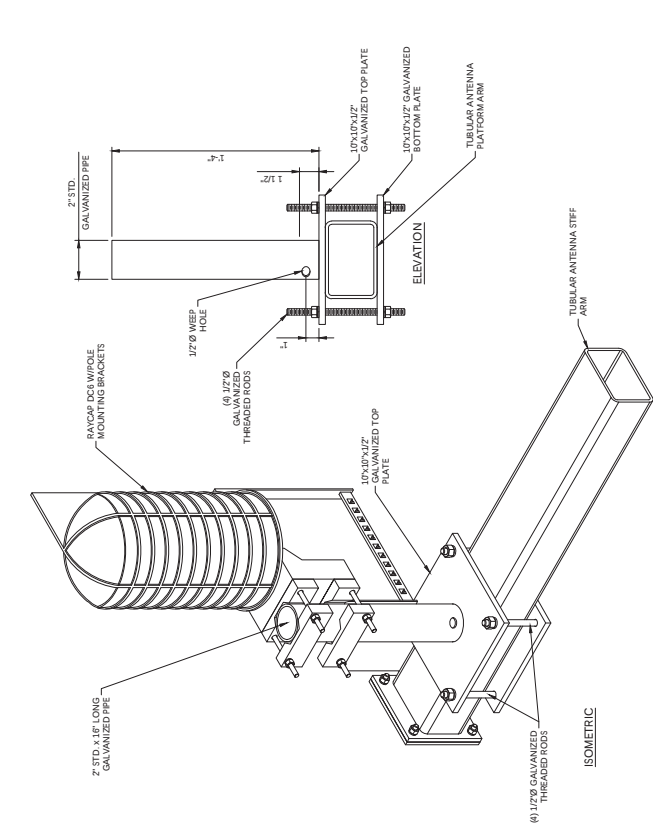


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email : solution@gmaiserconsulting.com

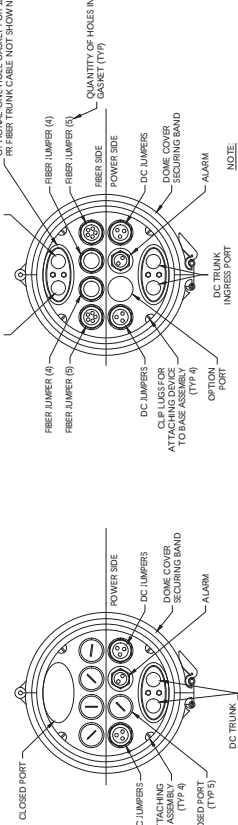
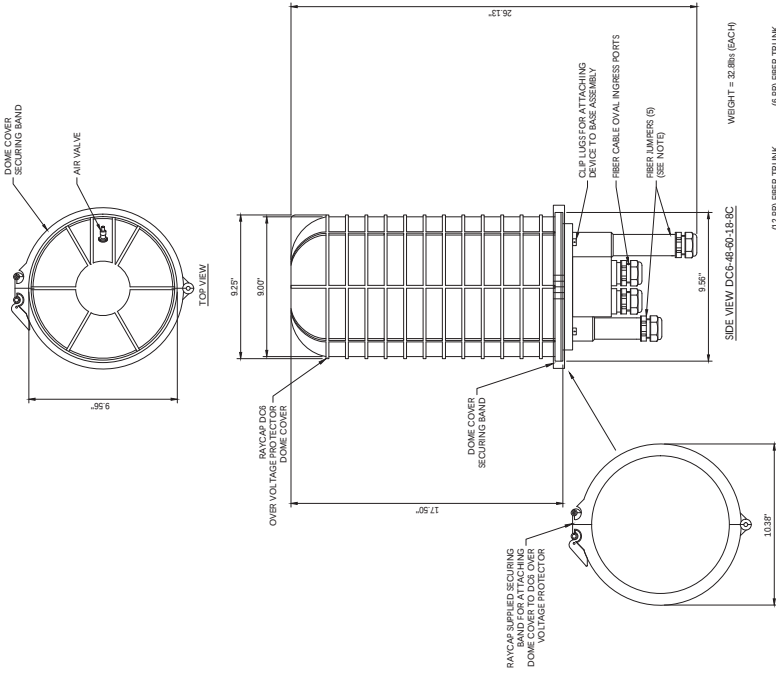
DETAILS

A-



DOC6 SURGE SUPPRESSION DOME MOUNTING DETAIL (TUBE)

NOT TO SCALE



DC6 SURGE SUPPRESSION DOME DETAIL

NOT TO SCALE

30004186-2004AC-CRITICAL-REVIEW-01202007 NAME: HANSEN, WILHELM 21 CD REV 0 DWG-A-1
By: ACOA



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PLANNING TO DIG OR DRIVE OVER
UNDERGROUND UTILITIES IN ANY STATE

SCALE: AS SHOWN

REV	DATE	ORGANIZATION	ISSUED FOR REVIEW	APPROVED FOR COMMENTS	AC	RA
1	03/07/18				AC	RA
2	04/17/18				AC	RA
3	05/21/18				AC	RA
4	06/11/18				AC	RA
5	06/11/18				AC	RA
6	06/11/18				AC	RA
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67	06/11/18				AC	RA
68	06/11/18				AC	RA
69	06/11/18				AC	RA
70	06/11/18				AC	RA



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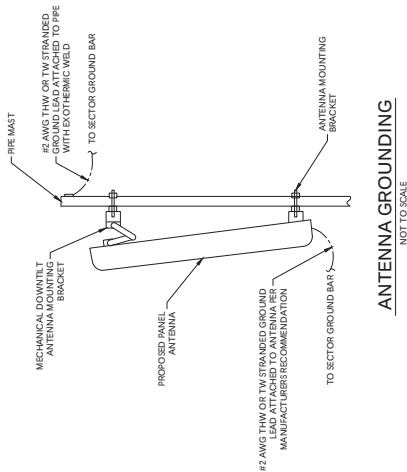
SITE NAME:

NEW HAVEN WHEELER ST
FA# 10035247
SITE# CT2037
69 WHEELER STREET
NEW HAVEN, CT 06512
NEW HAVEN COUNTY



GROUNDING DETAILS

TEST NUMBER: _____



ANTENNA GROUNDING

NOT TO SCALE



- THINW COOPER GROUND HAS 105-4-007 NEWTON
INSTRUMENT CO. CAT. NO. 8-6-2 OR EQUAL. HOLE
CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION.
INSULATORS NEWTON INSTRUMENT CAT. NO. 300-4
5-61 LOCKWASHERS NEWTON INSTRUMENT CO.
CAT. NO. 310-8
WALL MOUNTING BRACKET NEWTON INSTRUMENT CO.
CAT. NO. A-206
5-6-11 X 1/4-13 BOLTS NEWTON INSTRUMENT CO.
CAT. NO. 312-1
EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR HAVE AN
IDENTIFICATION TAG ATTACHED TO EACH END THAT WILL IDENTIFY ITS

SECTION "P" - SURGE PRODUCERS

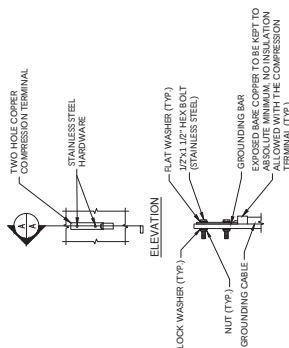
- CABLE ENTRY PORTS (HATCH PLATES) (#2)
GENERATOR FRAMEWORK (IF AVAILABLE) (#2)
ELCO GROUND BAR
COMMERCIAL POWER COMMON NEUTRAL/GROUND BOND (#2)
24V POWER SUPPLY RETURN BAR (#2)
48V POWER SUPPLY RETURN BAR (#2)
CONNECTER FRAMES.

SECTION "A" - SURGE ABSORBERS

- INTERIOR GROUND RING (#12)
EXTERNAL EARTH GROUND RING (BURIED GROUND RING) (#2)
METALLIC COLD WATER PIPE (IF AVAILABLE) (#2)
BUILDING STEEL (IF AVAILABLE) (#2)

MASTER GROUND BAR

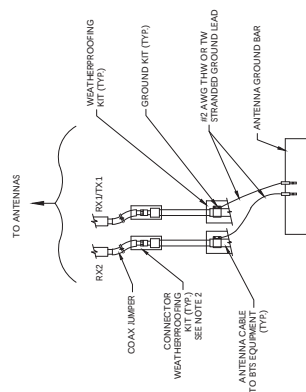
NOT TO SCALE



SECTION A-A

**TYPICAL GROUND BAR
CONNECTION DETAIL**

NOT TO SCALE



NOTES

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO ANTENNA GROUND BAR.
2. WEATHER PROOFING SHALL BE TWO-PART TAPE KIT. COLD SHRINK SHALL NOT BE USED.

TYPICAL GROUND WIRE
TO GROUNDING BAR

NOT TO SCALE



MASER CONSULTING
— CONNECTICUT —

Monopole Structural Analysis

FOR
CT2037 – New Haven Wheeler St

FA # 10035247
69 Wheeler Street
New Haven, CT 06512
New Haven County

4C - MRCTB031769
5C - MRCTB031849

Monopole Utilization: 78.8%
Foundation Utilization: 47.2%

December 5, 2018

Prepared For

AT&T
550 Cochituate Road
Framingham, MA 01701

Prepared By

Maser Consulting Connecticut
331 Newman Springs Road, Suite 203
New York, NY 07701
Tel: 201.383.1950



PETROS E. TSOUKALAS, P.E.
Geographic Discipline Leader
Connecticut License No. 32557



Objective:

The objective of this report is to determine the structural capacity of the existing modified 98' steel monopole located at the above referenced address for the addition of the proposed wireless telecommunications equipment by **AT&T**, together with the existing loading.

Introduction:

Maser Consulting Connecticut has performed limited field observations on May 29, 2018 to verify the existing condition of the structure and to locate and quantify the existing wireless appurtenances where possible, from ground level. Maser Consulting Connecticut has reviewed the following documents in completing this report:

- Previous Structural Analysis Report, prepared by Destek Engineering, dated January 11, 2017
- Previous Tower Modification Drawings, prepared by Bennett & Pless, dated August 26, 2016
- RFDS 2282459 Version 2.00, provided by Empire Telecom, dated June 14, 2018

It is assumed that all the information in the referenced analysis and drawings is accurate and no other changes have been made to the monopole.

Discrete and Linear Appurtenances:

Maser Consulting Connecticut understands the existing and proposed **AT&T** loading to be as follows:

- (3) Powerwave 7750 Antennas (Existing)
- (2) Commscope SBNHH-1D65A Antennas (1 Existing, **1 Proposed**)
- (4) CCI HPA-65R-BUU-H6 Antennas (2 Existing, **2 Proposed**)
- (3) Quintel QS46512-2 Antennas (Existing)
- **(3) Nokia RRU-4478 B5 (Proposed)**
- **(3) Nokia RRUS-4426 B66 (Proposed)**
- (3) Ericsson RRUS-32 (Existing)
- (3) Ericsson RRUS-32 B2 (Existing)
- (3) Ericsson RRUS-11 (Existing)
- (6) Powerwave LGP 21401 TMAs (Existing)
- (3) DC6-48-60-18C Surge Suppressor (2 Existing, **1 Proposed**)

Monopole Member Information:

See the Material Take-Off sheet in Appendix A for monopole information and loading from other carriers.

Codes, Standards and Loading:

Maser Consulting Connecticut utilized the following codes and standards:

- The 2018 Connecticut State Building Code, Incorporating the 2015 International Building Code
- Structural Standards for Antenna Supporting Structures and Antennas ANSI/TIA-222-G
 - Ultimate Wind Speed – 125 mph (3-Second Gust)
 - Nominal Wind Speed – 97 mph (3-Second Gust)
 - Ice Thickness – 0.75 in
 - Wind Speed with Ice – 40 mph
 - Topographic Category 1
 - Exposure Category C
 - Risk Category – II

Analysis Approach & Assumptions:

The analysis approach used in this structural analysis is based on the premise that if the existing structure is structurally adequate to support the existing and proposed equipment per the aforementioned codes and standards, then the proposed equipment can be installed as intended. Tower Numerics, *tnx* Tower, a tower and monopole analysis and design program, designed specifically for the telecommunications industry and for all applicable codes and standards was used for this structural analysis.

The following assumptions were considered during this analysis:

- No physical deterioration has occurred in any of the structural components of the monopole.
- The monopole has the same capacity as the day it was erected.
- The proposed modifications per aforementioned Modification Drawings were installed as intended.
- Foundation and Geotechnical Information has been taken from the previous Structural Analysis by Destek Engineering (Job No. 1629163, dated January 11, 2017) and has been assumed accurate.

Calculations:

The calculations are found in Appendix A of this report.

Conclusion:

Maser Consulting Connecticut has determined that the existing 98' tall structural steel galvanized monopole is **ADEQUATE** to support the existing and proposed loading per the aforementioned codes and standards. It has been calculated that the maximum stress ratio is in the base plate. The monopole and its baseplate are stressed to **78.8%** and **44.8%** respectively. The existing foundation has been determined to be stressed to **47.2%** of its structural capacity. Therefore, the proposed **AT&T** installation **CAN** be installed as intended.

Maser Consulting Connecticut reserves the right to amend this report if additional information about the monopole and foundation is provided. The conclusions reached by Maser Consulting Connecticut in this report are only valid for the discrete and linear appurtenances listed in this report. Any change to the installation will require a revision to this structural analysis.



12/05/2018
Page 4 of 4
Prepared by PSC
Checked by SMS

We appreciate the opportunity to be of service on this project. If you should have any questions or require any additional information, please do not hesitate to call our office.
Sincerely,

Maser Consulting Connecticut.

A handwritten signature in blue ink, appearing to read 'P. Tsoukalas', with a large, sweeping loop at the end.

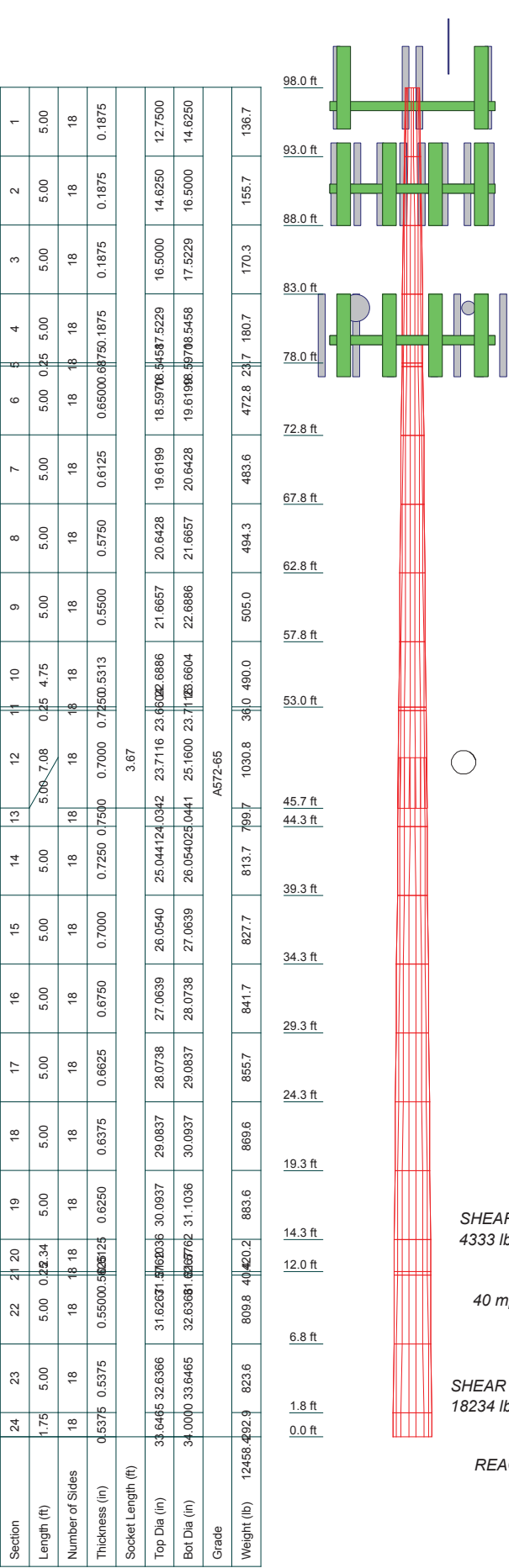
Petros E. Tsoukalas, P.E.
Geographic Discipline Leader

A handwritten signature in blue ink, appearing to read 'Pedro Sabillon', with a stylized, cursive script.

Pedro Sabillon
Project Engineer



APPENDIX A



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(2) APX16DWV-16DWV-S-E-A20 W/Mount Pipe (T-Mobile)	98	RRUS 32 B2 (ATI)	91
(2) APX16DWV-16DWV-S-E-A20 W/Mount Pipe (T-Mobile)	98	RRUS 4478 B5 (ATI)	91
(2) APX16DWV-16DWV-S-E-A20 W/Mount Pipe (T-Mobile)	98	RRUS 4478 B5 (ATI)	91
(3) ATMAA1412D TMA (T-Mobile)	98	RRUS 4426 B66 (ATI)	91
(3) ATMAA1412D TMA (T-Mobile)	98	RRUS 4426 B66 (ATI)	91
(3) ATMAA1412D TMA (T-Mobile)	98	RRUS 4426 B66 (ATI)	91
6'x1/2" Lightning Rod	98	(2) LGP 21401 (ATI)	91
Platform Mount (T-Mobile)	97	(2) LGP 21401 (ATI)	91
7750 w/Mount Pipe (ATI)	91	DC6-48-60-18-8C (ATI)	91
7750 w/Mount Pipe (ATI)	91	DC6-48-60-18-8C (ATI)	91
7750 w/Mount Pipe (ATI)	91	DC6-48-60-18-8C (ATI)	91
(2) SBNH-1D65A with 6' pipe (ATI)	91	1' HP Dish w/Shroud (Clearwire)	82
(2) HPA-65R-BUU-H6 w/Mount Pipe (ATI)	91	A-ANT-18G-2-C (Clearwire)	82
(2) HPA-65R-BUU-H6 w/Mount Pipe (ATI)	91	T-Arm Mount (Sprint)	80
(2) HPA-65R-BUU-H6 w/Mount Pipe (ATI)	91	(2) ODU (Clearwire)	80
(2) HPA-65R-BUU-H6 w/Mount Pipe (ATI)	91	(2) ODU (Clearwire)	80
QS46512-2 w/6' Pipe (ATI)	91	LLPX310R-V1 w/Pipe Mounts (Sprint)	80
QS46512-2 w/6' Pipe (ATI)	91	LLPX310R-V1 w/Pipe Mounts (Sprint)	80
QS46512-2 w/6' Pipe (ATI)	91	LLPX310R-V1 w/Pipe Mounts (Sprint)	80
T-Arm Mount (ATI)	91	Samsung RRUS (Sprint)	80
RRUS 32 (ATI)	91	Samsung RRUS (Sprint)	80
RRUS 32 (ATI)	91	Samsung RRUS (Sprint)	80
RRUS-11 (ATI)	91	(3) DB844H65E-XY w/Mount Pipe (Sprint)	80
RRUS-11 (ATI)	91	(4) DB844H65E-XY w/Mount Pipe (Sprint)	80
RRUS-11 (ATI)	91	(4) DB844H65E-XY w/Mount Pipe (Sprint)	80
RRUS 32 B2 (ATI)	91	(4) DB844H65E-XY w/Mount Pipe (Sprint)	80
RRUS 32 B2 (ATI)	91		

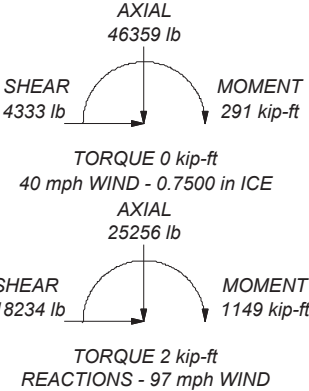
MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower designed for Exposure C to the TIA-222-G Standard.
2. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
3. Tower is also designed for a 40 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Risk Category II.
6. Topographic Category 1 with Crest Height of 0.00 ft
7. TOWER RATING: 40.3%

ALL REACTIONS
ARE FACTORED



Maser Consulting, P.A

2000 Midlantic Drive, Suite 100

Mount Laurel, NJ 08054

Phone: (856) 797-0412

FAX:

Job: **18963010A**

Project: **CT2037**

Client: AT&T	Drawn by: psabillon	App'd:
Code: TIA-222-G	Date: 12/05/18	Scale: NTS
Path:		Dwg No. E-1

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tnxTower Maser Consulting, P.A 2000 Midlantic Drive, Suite 100 Mount Laurel, NJ 08054 Phone: (856) 797-0412 FAX:	Job	18963010A	Page	1 of 22
	Project	CT2037	Date	08:15:25 12/05/18
	Client	AT&T	Designed by	psabillon

Tower Input Data

There is a pole section.

This tower is designed using the TIA-222-G standard.

The following design criteria apply:

ASCE 7-10 Wind Data is used.

Basic wind speed of 97 mph.

Risk Category II.

Exposure Category C.

Topographic Category 1.

Crest Height 0.00 ft.

Nominal ice thickness of 0.7500 in.

Ice thickness is considered to increase with height.

Ice density of 56 pcf.

A wind speed of 40 mph is used in combination with ice.

Temperature drop of 50 °F.

Deflections calculated using a wind speed of 60 mph.

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

Pressures are calculated at each section.

Stress ratio used in pole design is 1.

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	Retention 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	Section Length	Splice Length	Number of Sides	Top Diameter	Bottom Diameter	Wall Thickness	Bend Radius	Pole Grade
	ft	ft	ft		in	in	in	in	
L1	98.00-93.00	5.00	0.00	18	12.7500	14.6250	0.1875	0.7500	A572-65 (65 ksi)
L2	93.00-88.00	5.00	0.00	18	14.6250	16.5000	0.1875	0.7500	A572-65 (65 ksi)

<i>tnxTower</i> <i>Maser Consulting, P.A</i> 2000 Midlantic Drive, Suite 100 Mount Laurel, NJ 08054 Phone: (856) 797-0412 FAX:	Job	18963010A	Page	2 of 22
	Project	CT2037	Date	08:15:25 12/05/18
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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
L3	88.00-83.00	5.00	0.00	18	16.5000	17.5229	0.1875	0.7500	A572-65 (65 ksi)
L4	83.00-78.00	5.00	0.00	18	17.5229	18.5458	0.1875	0.7500	A572-65 (65 ksi)
L5	78.00-77.75	0.25	0.00	18	18.5458	18.5970	0.6875	2.7500	A572-65 (65 ksi)
L6	77.75-72.75	5.00	0.00	18	18.5970	19.6199	0.6500	2.6000	A572-65 (65 ksi)
L7	72.75-67.75	5.00	0.00	18	19.6199	20.6428	0.6125	2.4500	A572-65 (65 ksi)
L8	67.75-62.75	5.00	0.00	18	20.6428	21.6657	0.5750	2.3000	A572-65 (65 ksi)
L9	62.75-57.75	5.00	0.00	18	21.6657	22.6886	0.5500	2.2000	A572-65 (65 ksi)
L10	57.75-53.00	4.75	0.00	18	22.6886	23.6604	0.5313	2.1250	A572-65 (65 ksi)
L11	53.00-52.75	0.25	0.00	18	23.6604	23.7116	0.7250	2.9000	A572-65 (65 ksi)
L12	52.75-45.67	7.08	3.67	18	23.7116	25.1600	0.7000	2.8000	A572-65 (65 ksi)
L13	45.67-44.34	5.00	0.00	18	24.0342	25.0441	0.7500	3.0000	A572-65 (65 ksi)
L14	44.34-39.34	5.00	0.00	18	25.0441	26.0540	0.7250	2.9000	A572-65 (65 ksi)
L15	39.34-34.34	5.00	0.00	18	26.0540	27.0639	0.7000	2.8000	A572-65 (65 ksi)
L16	34.34-29.34	5.00	0.00	18	27.0639	28.0738	0.6750	2.7000	A572-65 (65 ksi)
L17	29.34-24.34	5.00	0.00	18	28.0738	29.0837	0.6625	2.6500	A572-65 (65 ksi)
L18	24.34-19.34	5.00	0.00	18	29.0837	30.0937	0.6375	2.5500	A572-65 (65 ksi)
L19	19.34-14.34	5.00	0.00	18	30.0937	31.1036	0.6250	2.5000	A572-65 (65 ksi)
L20	14.34-12.00	2.34	0.00	18	31.1036	31.5762	0.6125	2.4500	A572-65 (65 ksi)
L21	12.00-11.75	0.25	0.00	18	31.5762	31.6267	0.5625	2.2500	A572-65 (65 ksi)
L22	11.75-6.75	5.00	0.00	18	31.6267	32.6366	0.5500	2.2000	A572-65 (65 ksi)
L23	6.75-1.75	5.00	0.00	18	32.6366	33.6465	0.5375	2.1500	A572-65 (65 ksi)
L24	1.75-0.00	1.75		18	33.6465	34.0000	0.5375	2.1500	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	12.9467	7.4763	149.0644	4.4597	6.4770	23.0144	298.3249	3.7388	1.9140	10.208
	14.8506	8.5921	226.2672	5.1253	7.4295	30.4552	452.8322	4.2969	2.2440	11.968
L2	14.8506	8.5921	226.2672	5.1253	7.4295	30.4552	452.8322	4.2969	2.2440	11.968
	16.7545	9.7080	326.3677	5.7909	8.3820	38.9367	653.1649	4.8549	2.5740	13.728
L3	16.7545	9.7080	326.3677	5.7909	8.3820	38.9367	653.1649	4.8549	2.5740	13.728
	17.7932	10.3167	391.6953	6.1541	8.9016	44.0026	783.9061	5.1593	2.7540	14.688
L4	17.7932	10.3167	391.6953	6.1541	8.9016	44.0026	783.9061	5.1593	2.7540	14.688

<i>tnxTower</i> <i>Maser Consulting, P.A</i> 2000 Midlantic Drive, Suite 100 Mount Laurel, NJ 08054 Phone: (856) 797-0412 FAX:	Job	18963010A	Page 3 of 22
	Project	CT2037	Date 08:15:25 12/05/18
	Client	AT&T	Designed by psabillon

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
L5	18.8319	10.9255	465.2059	6.5172	9.4213	49.3782	931.0239	5.4638	2.9341	15.648
	18.8319	38.9691	1570.1445	6.3397	9.4213	166.6593	3142.3551	19.4883	2.0541	2.988
	18.8839	39.0807	1583.6738	6.3579	9.4473	167.6331	3169.4314	19.5441	2.0631	3.001
L6	18.8839	37.0264	1506.7166	6.3712	9.4473	159.4871	3015.4159	18.5167	2.1291	3.275
	19.9226	39.1368	1779.3126	6.7343	9.9669	178.5221	3560.9665	19.5721	2.3091	3.552
L7	19.9226	36.9518	1686.6230	6.7476	9.9669	169.2223	3375.4653	18.4794	2.3751	3.878
	20.9613	38.9404	1973.8459	7.1108	10.4865	188.2265	3950.2891	19.4739	2.5551	4.172
L8	20.9613	36.6248	1863.4251	7.1241	10.4865	177.6967	3729.3021	18.3159	2.6211	4.558
	22.0000	38.4916	2163.1495	7.4872	11.0062	196.5394	4329.1454	19.2495	2.8012	4.872
L9	22.0000	36.8617	2076.4661	7.4961	11.0062	188.6635	4155.6645	18.4344	2.8452	5.173
	23.0386	38.6474	2393.0936	7.8592	11.5258	207.6288	4789.3362	19.3274	3.0252	5.5
L10	23.0386	37.3615	2317.3890	7.8659	11.5258	201.0605	4637.8273	18.6843	3.0582	5.757
	24.0254	39.0001	2635.8621	8.2109	12.0195	219.2991	5275.1926	19.5038	3.2292	6.079
L11	24.0254	52.7778	3507.5324	8.1421	12.0195	291.8205	7019.6802	26.3939	2.8882	3.984
	24.0773	52.8955	3531.0501	8.1602	12.0455	293.1434	7066.7464	26.4528	2.8972	3.996
L12	24.0773	51.1271	3420.4256	8.1691	12.0455	283.9595	6845.3519	25.5684	2.9412	4.202
	25.5481	54.3452	4107.8235	8.6833	12.7813	321.3937	8221.0521	27.1778	3.1962	4.566
L13	25.1577	55.4280	3796.5445	8.2659	12.2094	310.9535	7598.0846	27.7193	2.9100	3.88
	25.4304	57.8321	4312.2875	8.6244	12.7224	338.9524	8630.2492	28.9215	3.0878	4.117
L14	25.4304	55.9619	4181.4269	8.6333	12.7224	328.6665	8368.3557	27.9863	3.1318	4.32
	26.4559	58.2858	4724.2929	8.9918	13.2354	356.9428	9454.8021	29.1485	3.3095	4.565
L15	26.4559	56.3315	4574.9060	9.0007	13.2354	345.6559	9155.8318	28.1711	3.3535	4.791
	27.4814	58.5754	5143.6606	9.3592	13.7485	374.1260	10294.0894	29.2932	3.5312	5.045
L16	27.4814	56.5369	4974.0819	9.3681	13.7485	361.7916	9954.7088	28.2738	3.5752	5.297
	28.5069	58.7006	5567.2955	9.7266	14.2615	390.3722	11141.9166	29.3559	3.7530	5.56
L17	28.5069	57.6399	5471.6795	9.7310	14.2615	383.6677	10950.5588	28.8254	3.7750	5.698
	29.5324	59.7635	6099.0125	10.0895	14.7745	412.8055	12206.0502	29.8874	3.9527	5.966
L18	29.5324	57.5588	5884.3619	10.0984	14.7745	398.2771	11776.4665	28.7849	3.9967	6.269
	30.5579	59.6023	6533.6043	10.4569	15.2876	427.3800	13075.8057	29.8068	4.1745	6.548
L19	30.5579	58.4584	6413.6526	10.4614	15.2876	419.5336	12835.7444	29.2348	4.1965	6.714
	31.5834	60.4619	7095.9109	10.8199	15.8006	449.0908	14201.1587	30.2367	4.3742	6.999
L20	31.5834	59.2769	6962.5522	10.8243	15.8006	440.6507	13934.2658	29.6441	4.3962	7.178
	32.0633	60.1958	7291.3745	10.9921	16.0407	454.5542	14592.3432	30.1036	4.4794	7.313
L21	32.0633	55.3711	6728.6514	11.0099	16.0407	419.4733	13466.1566	27.6908	4.5674	8.12
	32.1146	55.4613	6761.5712	11.0278	16.0664	420.8526	13532.0394	27.7359	4.5763	8.136
L22	32.1146	54.2506	6619.2983	11.0322	16.0664	411.9972	13247.3064	27.1305	4.5983	8.361
	33.1401	56.0136	7285.8274	11.3907	16.5794	439.4506	14581.2418	28.0121	4.7760	8.684
L23	33.1401	54.7619	7128.5652	11.3952	16.5794	429.9652	14266.5104	27.3862	4.7980	8.927
	34.1656	56.4848	7822.8001	11.7537	17.0924	457.6761	15655.8937	28.2478	4.9758	9.257
L24	34.1656	56.4848	7822.8001	11.7537	17.0924	457.6761	15655.8937	28.2478	4.9758	9.257
	34.5245	57.0879	8076.0313	11.8792	17.2720	467.5794	16162.6893	28.5494	5.0380	9.373

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A _f	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontal in	Double Angle Stitch Bolt Spacing Redundants in
ft	ft ²	in							
L1 98.00-93.00				1	1	1			
L2 93.00-88.00				1	1	1			
L3 88.00-83.00				1	1	1			
L4 83.00-78.00				1	1	1			
L5 78.00-77.75				1	1	0.715195			
L6 77.75-72.75				1	1	0.729726			
L7 72.75-67.75				1	1	0.749039			
L8 67.75-62.75				1	1	0.773588			
L9 62.75-57.75				1	1	0.786221			
L10				1	1	0.79394			
57.75-53.00									
L11				1	1	0.800139			
53.00-52.75									
L12				1	1	0.811339			

Job	18963010A	Page	4 of 22
Project	CT2037	Date	08:15:25 12/05/18
Client	AT&T	Designed by	psabillon

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontal in	Double Angle Stitch Bolt Spacing Redundants in
52.75-45.67									
L13				1	1	0.829957			
45.67-44.34									
L14				1	1	0.837244			
44.34-39.34									
L15				1	1	0.846787			
39.34-34.34									
L16				1	1	0.858632			
34.34-29.34									
L17				1	1	0.856771			
29.34-24.34									
L18				1	1	0.872532			
24.34-19.34									
L19				1	1	0.873382			
19.34-14.34									
L20				1	1	0.883473			
14.34-12.00									
L21				1	1	0.857475			
12.00-11.75									
L22 11.75-6.75				1	1	0.863326			
L23 6.75-1.75				1	1	0.870311			
L24 1.75-0.00				1	1	0.866031			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Component Type	Placement	Total Number	Number Per Row	Start/End Position	Width or Diameter	Perimeter	Weight
			ft				in	in	plf
Safety Line 3/8	A	Surface Ar (CaAa)	70.00 - 10.00	1	1	0.000	0.3750		0.22
Switchblade	A	Surface Af (CaAa)	80.00 - 0.00	1	1	0.500	3.5000	20.0000	0.00
Switchblade	B	Surface Af (CaAa)	55.00 - 0.00	1	1	0.200	3.5000	20.0000	0.00
Switchblade	B	Surface Af (CaAa)	80.00 - 10.00	1	1	0.500	3.5000	20.0000	0.00
Switchblade	C	Surface Af (CaAa)	55.00 - 0.00	1	1	-0.200	3.5000	20.0000	0.00
Switchblade	C	Surface Af (CaAa)	80.00 - 0.00	1	1	0.500	3.5000	20.0000	0.00

Feed Line/Linear Appurtenances - Entered As Area

<i>Description</i>	<i>Face or Leg</i>	<i>Allow Shield</i>	<i>Component Type</i>	<i>Placement</i>	<i>Total Number</i>		<i>C_{AA}</i>	<i>Weight</i>
				<i>ft</i>			<i>ft²/ft</i>	<i>plf</i>
LDF6-50A (1-1/4 FOAM)	C	No	Inside Pole	98.00 - 4.00	18	No Ice	0.00	0.66
(T-Mobile)						1/2" Ice	0.00	0.66
1/4" OD						1" Ice	0.00	0.66
(T-Mobile)	C	No	Inside Pole	98.00 - 4.00	1	No Ice	0.00	0.10
						1/2" Ice	0.00	0.10
						1" Ice	0.00	0.10

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	Project	CT2037	Date	08:15:25 12/05/18
	Client	AT&T	Designed by	psabillon

<i>Description</i>	<i>Face or Leg</i>	<i>Allow Shield</i>	<i>Component Type</i>	<i>Placement ft</i>	<i>Total Number</i>		<i>C_{AA}</i> <i>ft²/ft</i>	<i>Weight plf</i>
LDF5-50A (7/8 FOAM) (AT&T)	B	No	Inside Pole	91.00 - 7.50	17	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
						1" Ice	0.00	0.33
2" ID (AT&T)	B	No	Inside Pole	91.00 - 7.50	2	No Ice	0.00	3.15
						1/2" Ice	0.00	3.15
						1" Ice	0.00	3.15
LDF4P-50A (1/2 FOAM) (Clearwire)	A	No	Inside Pole	82.00 - 7.50	4	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
2-3/8" OD Conduit (Sprint)	A	No	Inside Pole	80.00 - 7.50	2	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
LDF5-50A (7/8 FOAM) (Sprint)	A	No	Inside Pole	80.00 - 7.50	12	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
						1" Ice	0.00	0.33
3/8" Fiber Cable (AT&T)	B	No	Inside Pole	91.00 - 7.50	1	No Ice	0.00	0.10
						1/2" Ice	0.00	0.10
						1" Ice	0.00	0.10
3/4" DC Cable (AT&T)	B	No	Inside Pole	91.00 - 7.50	2	No Ice	0.00	0.45
						1/2" Ice	0.00	0.45
						1" Ice	0.00	0.45
3/8" Fiber Cable (AT&T)	B	No	Inside Pole	91.00 - 7.50	2	No Ice	0.00	0.10
						1/2" Ice	0.00	0.10
						1" Ice	0.00	0.10
3/4" DC Cable (AT&T)	B	No	Inside Pole	91.00 - 7.50	4	No Ice	0.00	0.45
						1/2" Ice	0.00	0.45
						1" Ice	0.00	0.45

Feed Line/Linear Appurtenances Section Areas

<i>Tower Section</i>	<i>Tower Elevation ft</i>	<i>Face</i>	<i>A_R</i> <i>ft²</i>	<i>A_F</i> <i>ft²</i>	<i>C_{AA}</i> <i>In Face</i> <i>ft²</i>	<i>C_{AA}</i> <i>Out Face</i> <i>ft²</i>	<i>Weight</i> <i>lb</i>
L1	98.00-93.00	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	59.90
L2	93.00-88.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	44.73
		C	0.000	0.000	0.000	0.000	59.90
L3	88.00-83.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	74.55
		C	0.000	0.000	0.000	0.000	59.90
L4	83.00-78.00	A	0.000	0.000	1.167	0.000	13.60
		B	0.000	0.000	1.167	0.000	74.55
		C	0.000	0.000	1.167	0.000	59.90
L5	78.00-77.75	A	0.000	0.000	0.146	0.000	1.55
		B	0.000	0.000	0.146	0.000	3.73
		C	0.000	0.000	0.146	0.000	3.00
L6	77.75-72.75	A	0.000	0.000	2.917	0.000	31.00
		B	0.000	0.000	2.917	0.000	74.55
		C	0.000	0.000	2.917	0.000	59.90
L7	72.75-67.75	A	0.000	0.000	3.001	0.000	31.50
		B	0.000	0.000	2.917	0.000	74.55
		C	0.000	0.000	2.917	0.000	59.90
L8	67.75-62.75	A	0.000	0.000	3.104	0.000	32.10
		B	0.000	0.000	2.917	0.000	74.55
		C	0.000	0.000	2.917	0.000	59.90
L9	62.75-57.75	A	0.000	0.000	3.104	0.000	32.10

<i>tnxTower</i> <i>Maser Consulting, P.A</i> 2000 Midlantic Drive, Suite 100 Mount Laurel, NJ 08054 Phone: (856) 797-0412 FAX:	Job	18963010A	Page	6 of 22
	Project	CT2037	Date	08:15:25 12/05/18
	Client	AT&T	Designed by	psabillon

Tower Section	Tower Elevation ft	Face	A_R ft ²	A_F ft ²	C_{AA} In Face ft ²	C_{AA} Out Face ft ²	Weight lb
L10	57.75-53.00	B	0.000	0.000	2.917	0.000	74.55
		C	0.000	0.000	2.917	0.000	59.90
		A	0.000	0.000	2.949	0.000	30.50
L11	53.00-52.75	B	0.000	0.000	3.938	0.000	70.82
		C	0.000	0.000	3.938	0.000	56.91
		A	0.000	0.000	0.155	0.000	1.61
L12	52.75-45.67	B	0.000	0.000	0.292	0.000	3.73
		C	0.000	0.000	0.292	0.000	3.00
		A	0.000	0.000	4.396	0.000	45.45
L13	45.67-44.34	B	0.000	0.000	8.260	0.000	105.56
		C	0.000	0.000	8.260	0.000	84.82
		A	0.000	0.000	0.826	0.000	8.54
L14	44.34-39.34	B	0.000	0.000	1.552	0.000	19.83
		C	0.000	0.000	1.552	0.000	15.93
		A	0.000	0.000	3.104	0.000	32.10
L15	39.34-34.34	B	0.000	0.000	5.833	0.000	74.55
		C	0.000	0.000	5.833	0.000	59.90
		A	0.000	0.000	3.104	0.000	32.10
L16	34.34-29.34	B	0.000	0.000	5.833	0.000	74.55
		C	0.000	0.000	5.833	0.000	59.90
		A	0.000	0.000	3.104	0.000	32.10
L17	29.34-24.34	B	0.000	0.000	5.833	0.000	74.55
		C	0.000	0.000	5.833	0.000	59.90
		A	0.000	0.000	3.104	0.000	32.10
L18	24.34-19.34	B	0.000	0.000	5.833	0.000	74.55
		C	0.000	0.000	5.833	0.000	59.90
		A	0.000	0.000	3.104	0.000	32.10
L19	19.34-14.34	B	0.000	0.000	5.833	0.000	74.55
		C	0.000	0.000	5.833	0.000	59.90
		A	0.000	0.000	3.104	0.000	32.10
L20	14.34-12.00	B	0.000	0.000	2.730	0.000	34.89
		C	0.000	0.000	2.730	0.000	28.03
		A	0.000	0.000	0.155	0.000	1.61
L21	12.00-11.75	B	0.000	0.000	0.292	0.000	3.73
		C	0.000	0.000	0.292	0.000	3.00
		A	0.000	0.000	2.982	0.000	26.73
L22	11.75-6.75	B	0.000	0.000	3.938	0.000	63.37
		C	0.000	0.000	5.833	0.000	59.90
		A	0.000	0.000	2.917	0.000	0.00
L23	6.75-1.75	B	0.000	0.000	2.917	0.000	0.00
		C	0.000	0.000	5.833	0.000	32.95
		A	0.000	0.000	1.021	0.000	0.00
L24	1.75-0.00	B	0.000	0.000	1.021	0.000	0.00
		C	0.000	0.000	2.042	0.000	0.00

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} In Face ft ²	C_{AA} Out Face ft ²	Weight lb
L1	98.00-93.00	A	1.668	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	59.90
L2	93.00-88.00	A	1.659	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	44.73

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	Project	CT2037	Date	08:15:25 12/05/18
	Client	AT&T	Designed by	psabillon

<i>Tower Section</i>	<i>Tower Elevation ft</i>	<i>Face or Leg</i>	<i>Ice Thickness in</i>	<i>A_R</i> <i>ft²</i>	<i>A_F</i> <i>ft²</i>	<i>C_AA_A</i> <i>In Face</i> <i>ft²</i>	<i>C_AA_A</i> <i>Out Face</i> <i>ft²</i>	<i>Weight</i> <i>lb</i>
L3	88.00-83.00	C		0.000	0.000	0.000	0.000	59.90
		A	1.650	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	74.55
		C		0.000	0.000	0.000	0.000	59.90
L4	83.00-78.00	A	1.640	0.000	0.000	1.823	0.000	47.03
		B		0.000	0.000	1.823	0.000	107.98
		C		0.000	0.000	1.823	0.000	93.33
L5	78.00-77.75	A	1.634	0.000	0.000	0.228	0.000	5.71
		B		0.000	0.000	0.228	0.000	7.89
		C		0.000	0.000	0.228	0.000	7.16
L6	77.75-72.75	A	1.629	0.000	0.000	4.546	0.000	113.87
		B		0.000	0.000	4.546	0.000	157.42
		C		0.000	0.000	4.546	0.000	142.77
L7	72.75-67.75	A	1.618	0.000	0.000	5.347	0.000	122.53
		B		0.000	0.000	4.534	0.000	156.72
		C		0.000	0.000	4.534	0.000	142.07
L8	67.75-62.75	A	1.606	0.000	0.000	6.316	0.000	132.96
		B		0.000	0.000	4.522	0.000	155.98
		C		0.000	0.000	4.522	0.000	141.33
L9	62.75-57.75	A	1.593	0.000	0.000	6.290	0.000	131.88
		B		0.000	0.000	4.510	0.000	155.18
		C		0.000	0.000	4.510	0.000	140.53
L10	57.75-53.00	A	1.580	0.000	0.000	5.950	0.000	124.22
		B		0.000	0.000	6.070	0.000	178.55
		C		0.000	0.000	6.070	0.000	164.63
L11	53.00-52.75	A	1.572	0.000	0.000	0.312	0.000	6.51
		B		0.000	0.000	0.449	0.000	11.66
		C		0.000	0.000	0.449	0.000	10.93
L12	52.75-45.67	A	1.561	0.000	0.000	8.816	0.000	182.95
		B		0.000	0.000	12.681	0.000	328.28
		C		0.000	0.000	12.681	0.000	307.54
L13	45.67-44.34	A	1.547	0.000	0.000	1.656	0.000	34.37
		B		0.000	0.000	2.382	0.000	61.67
		C		0.000	0.000	2.382	0.000	57.77
L14	44.34-39.34	A	1.536	0.000	0.000	6.176	0.000	127.13
		B		0.000	0.000	8.905	0.000	228.74
		C		0.000	0.000	8.905	0.000	214.09
L15	39.34-34.34	A	1.517	0.000	0.000	6.137	0.000	125.53
		B		0.000	0.000	8.866	0.000	226.36
		C		0.000	0.000	8.866	0.000	211.71
L16	34.34-29.34	A	1.495	0.000	0.000	6.093	0.000	123.73
		B		0.000	0.000	8.822	0.000	223.68
		C		0.000	0.000	8.822	0.000	209.03
L17	29.34-24.34	A	1.469	0.000	0.000	6.043	0.000	121.68
		B		0.000	0.000	8.772	0.000	220.60
		C		0.000	0.000	8.772	0.000	205.95
L18	24.34-19.34	A	1.439	0.000	0.000	5.983	0.000	119.27
		B		0.000	0.000	8.712	0.000	216.99
		C		0.000	0.000	8.712	0.000	202.34
L19	19.34-14.34	A	1.402	0.000	0.000	5.909	0.000	116.33
		B		0.000	0.000	8.638	0.000	212.56
		C		0.000	0.000	8.638	0.000	197.91
L20	14.34-12.00	A	1.368	0.000	0.000	2.734	0.000	53.20
		B		0.000	0.000	4.011	0.000	97.60
		C		0.000	0.000	4.011	0.000	90.74
L21	12.00-11.75	A	1.354	0.000	0.000	0.291	0.000	5.63
		B		0.000	0.000	0.427	0.000	10.34
		C		0.000	0.000	0.427	0.000	9.61
L22	11.75-6.75	A	1.321	0.000	0.000	4.765	0.000	95.72
		B		0.000	0.000	5.720	0.000	150.03
		C		0.000	0.000	8.475	0.000	188.29

tnxTower Maser Consulting, P.A 2000 Midlantic Drive, Suite 100 Mount Laurel, NJ 08054 Phone: (856) 797-0412 FAX:	Job	18963010A	Page	8 of 22
	Project	CT2037	Date	08:15:25 12/05/18
	Client	AT&T	Designed by	psabillon

<i>Tower Section</i>	<i>Tower Elevation ft</i>	<i>Face or Leg</i>	<i>Ice Thickness in</i>	<i>A_R ft²</i>	<i>A_F ft²</i>	<i>C_AA_A In Face ft²</i>	<i>C_AA_A Out Face ft²</i>	<i>Weight lb</i>
L23	6.75-1.75	A	1.222	0.000	0.000	4.138	0.000	58.49
		B		0.000	0.000	4.138	0.000	58.49
		C		0.000	0.000	8.277	0.000	149.93
L24	1.75-0.00	A	1.043	0.000	0.000	1.386	0.000	17.00
		B		0.000	0.000	1.386	0.000	17.00
		C		0.000	0.000	2.772	0.000	34.01

Feed Line Center of Pressure

<i>Section</i>	<i>Elevation ft</i>	<i>CP_x in</i>	<i>CP_z in</i>	<i>CP_x Ice in</i>	<i>CP_z Ice in</i>
L1	98.00-93.00	0.0000	0.0000	0.0000	0.0000
L2	93.00-88.00	0.0000	0.0000	0.0000	0.0000
L3	88.00-83.00	0.0000	0.0000	0.0000	0.0000
L4	83.00-78.00	0.0000	0.0000	0.0000	0.0000
L5	78.00-77.75	0.0000	0.0000	0.0000	0.0000
L6	77.75-72.75	0.0000	0.0000	0.0000	0.0000
L7	72.75-67.75	-0.0109	-0.0063	-0.0753	-0.0435
L8	67.75-62.75	-0.0244	-0.0141	-0.1629	-0.0941
L9	62.75-57.75	-0.0250	-0.0144	-0.1671	-0.0965
L10	57.75-53.00	0.3506	0.2024	0.2549	0.1472
L11	53.00-52.75	0.7442	0.4296	0.6912	0.3991
L12	52.75-45.67	0.7538	0.4352	0.7026	0.4056
L13	45.67-44.34	0.7598	0.4387	0.7095	0.4096
L14	44.34-39.34	0.7678	0.4433	0.7193	0.4153
L15	39.34-34.34	0.7800	0.4503	0.7340	0.4238
L16	34.34-29.34	0.7918	0.4571	0.7484	0.4321
L17	29.34-24.34	0.8032	0.4637	0.7624	0.4402
L18	24.34-19.34	0.8143	0.4701	0.7763	0.4482
L19	19.34-14.34	0.8250	0.4763	0.7899	0.4560
L20	14.34-12.00	0.8327	0.4808	0.7997	0.4617
L21	12.00-11.75	0.8354	0.4823	0.8032	0.4637
L22	11.75-6.75	0.7644	0.1058	0.8247	0.0945
L23	6.75-1.75	0.7278	-0.1229	0.8397	-0.1418
L24	1.75-0.00	0.7336	-0.1246	0.8341	-0.1417

Shielding Factor Ka

<i>Tower Section</i>	<i>Feed Line Record No.</i>	<i>Description</i>	<i>Feed Line Segment Elev.</i>	<i>K_a No Ice</i>	<i>K_a Ice</i>
L4	9	Switchblade	78.00 - 80.00	1.0000	1.0000
L4	11	Switchblade	78.00 - 80.00	1.0000	1.0000
L4	13	Switchblade	78.00 - 80.00	1.0000	1.0000
L5	9	Switchblade	77.75 - 78.00	1.0000	1.0000
L5	11	Switchblade	77.75 - 78.00	1.0000	1.0000
L5	13	Switchblade	77.75 - 78.00	1.0000	1.0000
L6	9	Switchblade	72.75 - 77.75	1.0000	1.0000
L6	11	Switchblade	72.75 - 77.75	1.0000	1.0000
L6	13	Switchblade	72.75 - 77.75	1.0000	1.0000
L7	8	Safety Line 3/8	67.75 - 70.00	1.0000	1.0000

<i>tnxTower</i> <i>Maser Consulting, P.A</i> <i>2000 Midlantic Drive, Suite 100</i> <i>Mount Laurel, NJ 08054</i> <i>Phone: (856) 797-0412</i> <i>FAX:</i>	Job	18963010A	Page	9 of 22
	Project	CT2037	Date	08:15:25 12/05/18
	Client	AT&T	Designed by	psabillon

<i>Tower Section</i>	<i>Feed Line Record No.</i>	<i>Description</i>	<i>Feed Line Segment Elev.</i>	<i>K_a No Ice</i>	<i>K_a Ice</i>
L7	9	Switchblade	67.75 - 72.75	1.0000	1.0000
L7	11	Switchblade	67.75 - 72.75	1.0000	1.0000
L7	13	Switchblade	67.75 - 72.75	1.0000	1.0000
L8	8	Safety Line 3/8	62.75 - 67.75	1.0000	1.0000
L8	9	Switchblade	62.75 - 67.75	1.0000	1.0000
L8	11	Switchblade	62.75 - 67.75	1.0000	1.0000
L8	13	Switchblade	62.75 - 67.75	1.0000	1.0000
L9	8	Safety Line 3/8	57.75 - 62.75	1.0000	1.0000
L9	9	Switchblade	57.75 - 62.75	1.0000	1.0000
L9	11	Switchblade	57.75 - 62.75	1.0000	1.0000
L9	13	Switchblade	57.75 - 62.75	1.0000	1.0000
L10	8	Safety Line 3/8	53.00 - 57.75	1.0000	1.0000
L10	9	Switchblade	53.00 - 57.75	1.0000	1.0000
L10	10	Switchblade	53.00 - 55.00	1.0000	1.0000
L10	11	Switchblade	53.00 - 57.75	1.0000	1.0000
L10	12	Switchblade	53.00 - 55.00	1.0000	1.0000
L10	13	Switchblade	53.00 - 57.75	1.0000	1.0000
L11	8	Safety Line 3/8	52.75 - 53.00	1.0000	1.0000
L11	9	Switchblade	52.75 - 53.00	1.0000	1.0000
L11	10	Switchblade	52.75 - 53.00	1.0000	1.0000
L11	11	Switchblade	52.75 - 53.00	1.0000	1.0000
L11	12	Switchblade	52.75 - 53.00	1.0000	1.0000
L11	13	Switchblade	52.75 - 53.00	1.0000	1.0000
L12	8	Safety Line 3/8	45.67 - 52.75	1.0000	1.0000
L12	9	Switchblade	45.67 - 52.75	1.0000	1.0000
L12	10	Switchblade	45.67 - 52.75	1.0000	1.0000
L12	11	Switchblade	45.67 - 52.75	1.0000	1.0000
L12	12	Switchblade	45.67 - 52.75	1.0000	1.0000
L12	13	Switchblade	45.67 - 52.75	1.0000	1.0000
L14	8	Safety Line 3/8	39.34 - 44.34	1.0000	1.0000
L14	9	Switchblade	39.34 - 44.34	1.0000	1.0000
L14	10	Switchblade	39.34 - 44.34	1.0000	1.0000
L14	11	Switchblade	39.34 - 44.34	1.0000	1.0000
L14	12	Switchblade	39.34 - 44.34	1.0000	1.0000
L14	13	Switchblade	39.34 - 44.34	1.0000	1.0000
L15	8	Safety Line 3/8	34.34 - 39.34	1.0000	1.0000
L15	9	Switchblade	34.34 - 39.34	1.0000	1.0000
L15	10	Switchblade	34.34 - 39.34	1.0000	1.0000
L15	11	Switchblade	34.34 - 39.34	1.0000	1.0000
L15	12	Switchblade	34.34 - 39.34	1.0000	1.0000
L15	13	Switchblade	34.34 - 39.34	1.0000	1.0000
L16	8	Safety Line 3/8	29.34 - 34.34	1.0000	1.0000
L16	9	Switchblade	29.34 - 34.34	1.0000	1.0000
L16	10	Switchblade	29.34 - 34.34	1.0000	1.0000
L16	11	Switchblade	29.34 - 34.34	1.0000	1.0000
L16	12	Switchblade	29.34 - 34.34	1.0000	1.0000
L16	13	Switchblade	29.34 - 34.34	1.0000	1.0000
L17	8	Safety Line 3/8	24.34 - 29.34	1.0000	1.0000
L17	9	Switchblade	24.34 - 29.34	1.0000	1.0000
L17	10	Switchblade	24.34 - 29.34	1.0000	1.0000
L17	11	Switchblade	24.34 - 29.34	1.0000	1.0000
L17	12	Switchblade	24.34 - 29.34	1.0000	1.0000
L17	13	Switchblade	24.34 - 29.34	1.0000	1.0000
L18	8	Safety Line 3/8	19.34 - 24.34	1.0000	1.0000
L18	9	Switchblade	19.34 - 24.34	1.0000	1.0000
L18	10	Switchblade	19.34 - 24.34	1.0000	1.0000
L18	11	Switchblade	19.34 - 24.34	1.0000	1.0000
L18	12	Switchblade	19.34 - 24.34	1.0000	1.0000
L18	13	Switchblade	19.34 - 24.34	1.0000	1.0000
L19	8	Safety Line 3/8	14.34 - 19.34	1.0000	1.0000
L19	9	Switchblade	14.34 - 19.34	1.0000	1.0000
L19	10	Switchblade	14.34 - 19.34	1.0000	1.0000

tnxTower Maser Consulting, P.A 2000 Midlantic Drive, Suite 100 Mount Laurel, NJ 08054 Phone: (856) 797-0412 FAX:	Job	18963010A	Page	10 of 22
	Project	CT2037	Date	08:15:25 12/05/18
	Client	AT&T	Designed by	psabillon

<i>Tower Section</i>	<i>Feed Line Record No.</i>	<i>Description</i>	<i>Feed Line Segment Elev.</i>	<i>K_a No Ice</i>	<i>K_a Ice</i>
L19	11	Switchblade	14.34 - 19.34	1.0000	1.0000
L19	12	Switchblade	14.34 - 19.34	1.0000	1.0000
L19	13	Switchblade	14.34 - 19.34	1.0000	1.0000
L20	8	Safety Line 3/8	12.00 - 14.34	1.0000	1.0000
L20	9	Switchblade	12.00 - 14.34	1.0000	1.0000
L20	10	Switchblade	12.00 - 14.34	1.0000	1.0000
L20	11	Switchblade	12.00 - 14.34	1.0000	1.0000
L20	12	Switchblade	12.00 - 14.34	1.0000	1.0000
L20	13	Switchblade	12.00 - 14.34	1.0000	1.0000
L21	8	Safety Line 3/8	11.75 - 12.00	1.0000	1.0000
L21	9	Switchblade	11.75 - 12.00	1.0000	1.0000
L21	10	Switchblade	11.75 - 12.00	1.0000	1.0000
L21	11	Switchblade	11.75 - 12.00	1.0000	1.0000
L21	12	Switchblade	11.75 - 12.00	1.0000	1.0000
L21	13	Switchblade	11.75 - 12.00	1.0000	1.0000
L22	8	Safety Line 3/8	10.00 - 11.75	1.0000	1.0000
L22	9	Switchblade	6.75 - 11.75	1.0000	1.0000
L22	10	Switchblade	6.75 - 11.75	1.0000	1.0000
L22	11	Switchblade	10.00 - 11.75	1.0000	1.0000
L22	12	Switchblade	6.75 - 11.75	1.0000	1.0000
L22	13	Switchblade	6.75 - 11.75	1.0000	1.0000
L23	9	Switchblade	1.75 - 6.75	1.0000	1.0000
L23	10	Switchblade	1.75 - 6.75	1.0000	1.0000
L23	12	Switchblade	1.75 - 6.75	1.0000	1.0000
L23	13	Switchblade	1.75 - 6.75	1.0000	1.0000
L24	9	Switchblade	0.00 - 1.75	1.0000	1.0000
L24	10	Switchblade	0.00 - 1.75	1.0000	1.0000
L24	12	Switchblade	0.00 - 1.75	1.0000	1.0000
L24	13	Switchblade	0.00 - 1.75	1.0000	1.0000

Discrete Tower Loads

<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horiz Lateral Vert</i>	<i>Azimuth Adjustment °</i>	<i>Placement ft</i>	<i>C_AA_A Front</i>	<i>C_AA_A Side</i>	<i>Weight lb</i>
			<i>ft</i>			<i>ft²</i>	<i>ft²</i>	
			<i>ft</i>					
(2)	A	From	3.50	0.0000	98.00	No Ice	7.61	63.51
APX16DWV-16DWV-S-E-A		Centroid-Fa	0.00			1/2" Ice	8.20	113.59
20 W/Mount Pipe		ce	0.00			1" Ice	8.76	170.27
(T-Mobile)								
(2)	B	From	3.50	0.0000	98.00	No Ice	7.61	63.51
APX16DWV-16DWV-S-E-A		Centroid-Fa	0.00			1/2" Ice	8.20	113.59
20 W/Mount Pipe		ce	0.00			1" Ice	8.76	170.27
(T-Mobile)								
(2)	C	From	3.50	0.0000	98.00	No Ice	7.61	63.51
APX16DWV-16DWV-S-E-A		Centroid-Fa	0.00			1/2" Ice	8.20	113.59
20 W/Mount Pipe		ce	0.00			1" Ice	8.76	170.27
(T-Mobile)								
(3) ATMAA1412D TMA	A	From	3.50	0.0000	98.00	No Ice	1.00	13.00
(T-Mobile)		Centroid-Fa	0.00			1/2" Ice	1.13	20.62
		ce	0.00			1" Ice	1.26	30.11
(3) ATMAA1412D TMA	B	From	3.50	0.0000	98.00	No Ice	1.00	13.00

<i>tnxTower</i> <i>Maser Consulting, P.A</i> 2000 Midlantic Drive, Suite 100 Mount Laurel, NJ 08054 Phone: (856) 797-0412 FAX:	Job	18963010A	Page	11 of 22
	Project	CT2037	Date	08:15:25 12/05/18
	Client	AT&T	Designed by	psabillon

<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz Lateral Vert ft ft ft</i>	<i>Azimuth Adjustment °</i>	<i>Placement ft</i>	<i>C_{AA} Front ft²</i>	<i>C_{AA} Side ft²</i>	<i>Weight lb</i>
(T-Mobile)		Centroid-Fa ce	0.00			1/2" Ice	1.13	20.62
			0.00			1" Ice	1.26	30.11
(3) ATMAA1412D TMA	C	From	3.50	0.0000	98.00	No Ice	1.00	13.00
(T-Mobile)		Centroid-Fa ce	0.00			1/2" Ice	1.13	20.62
			0.00			1" Ice	1.26	30.11
6'x1/2" Lightning Rod	B	From Face	2.50	0.0000	98.00	No Ice	0.30	50.00
			0.00			1/2" Ice	0.62	65.00
			3.00			1" Ice	0.94	80.00
Platform Mount	A	None		0.0000	97.00	No Ice	28.47	1122.00
(T-Mobile)						1/2" Ice	33.59	1513.66
						1" Ice	38.71	1905.31
LLPX310R-V1 w/Pipe	A	From Face	4.00	0.0000	80.00	No Ice	5.21	45.85
Mounts			0.00			1/2" Ice	5.66	85.15
(Sprint)			0.00			1" Ice	6.11	129.99
LLPX310R-V1 w/Pipe	B	From Face	4.00	0.0000	80.00	No Ice	5.21	45.85
Mounts			0.00			1/2" Ice	5.66	85.15
(Sprint)			0.00			1" Ice	6.11	129.99
LLPX310R-V1 w/Pipe	C	From Face	4.00	0.0000	80.00	No Ice	5.21	45.85
Mounts			0.00			1/2" Ice	5.66	85.15
(Sprint)			0.00			1" Ice	6.11	129.99
Samsung RRUS	A	From Face	4.00	0.0000	80.00	No Ice	2.78	50.70
(Sprint)			0.00			1/2" Ice	2.99	71.50
			0.00			1" Ice	3.21	95.33
Samsung RRUS	B	From Face	4.00	0.0000	80.00	No Ice	2.78	50.70
(Sprint)			0.00			1/2" Ice	2.99	71.50
			0.00			1" Ice	3.21	95.33
Samsung RRUS	C	From Face	4.00	0.0000	80.00	No Ice	2.78	50.70
(Sprint)			0.00			1/2" Ice	2.99	71.50
			0.00			1" Ice	3.21	95.33
(3) DB844H65E-XY	A	From Face	4.00	0.0000	80.00	No Ice	9.80	38.25
w/Mount Pipe			0.00			1/2" Ice	10.31	105.94
(Sprint)			0.00			1" Ice	10.83	180.33
(4) DB844H65E-XY	B	From Face	4.00	0.0000	80.00	No Ice	9.80	38.25
w/Mount Pipe			0.00			1/2" Ice	10.31	105.94
(Sprint)			0.00			1" Ice	10.83	180.33
(4) DB844H65E-XY	C	From Face	4.00	0.0000	80.00	No Ice	9.80	38.25
w/Mount Pipe			0.00			1/2" Ice	10.31	105.94
(Sprint)			0.00			1" Ice	10.83	180.33
T-Arm Mount	C	None		0.0000	80.00	No Ice	11.59	774.30
(Sprint)						1/2" Ice	15.44	990.35
						1" Ice	19.29	1206.41
(2) ODU	A	From Face	3.00	0.0000	80.00	No Ice	1.14	14.10
(Clearwire)			0.00			1/2" Ice	1.27	23.28
			2.50			1" Ice	1.41	34.50
(2) ODU	B	From Face	3.00	0.0000	80.00	No Ice	1.14	14.10
(Clearwire)			0.00			1/2" Ice	1.27	23.28
			2.50			1" Ice	1.41	34.50
7750 w/Mount Pipe	A	From Face	3.00	0.0000	91.00	No Ice	5.84	60.90
(AT&T)			0.00			1/2" Ice	6.32	107.25
			0.00			1" Ice	6.77	160.01
7750 w/Mount Pipe	B	From Face	3.00	0.0000	91.00	No Ice	5.84	60.90
(AT&T)			0.00			1/2" Ice	6.32	107.25
			0.00			1" Ice	6.77	160.01
7750 w/Mount Pipe	C	From Face	3.00	0.0000	91.00	No Ice	5.84	60.90
(AT&T)			0.00			1/2" Ice	6.32	107.25
			0.00			1" Ice	6.77	160.01
(2) SBNH-1D65A with 6'	A	From Face	3.00	0.0000	91.00	No Ice	8.69	75.90

<i>tnxTower</i> <i>Maser Consulting, P.A</i> 2000 Midlantic Drive, Suite 100 Mount Laurel, NJ 08054 Phone: (856) 797-0412 FAX:	Job	18963010A	Page	12 of 22
	Project	CT2037	Date	08:15:25 12/05/18
	Client	AT&T	Designed by	psabillon

<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz Lateral Vert ft ft ft</i>	<i>Azimuth Adjustment °</i>	<i>Placement ft</i>		<i>C_{AA} Front ft²</i>	<i>C_{AA} Side ft²</i>	<i>Weight lb</i>
pipe			0.00			1/2" Ice	9.19	8.82	155.36
(AT&T)			0.00			1" Ice	9.67	9.59	242.40
(2) HPA-65R-BUU-H6	B	From Face	3.00	0.0000	91.00	No Ice	10.59	7.75	91.15
w/Mount Pipe			0.00			1/2" Ice	11.14	8.97	171.68
(AT&T)			0.00			1" Ice	11.68	9.91	260.79
(2) HPA-65R-BUU-H6	C	From Face	3.00	0.0000	91.00	No Ice	10.59	7.75	91.15
w/Mount Pipe			0.00			1/2" Ice	11.14	8.97	171.68
(AT&T)			0.00			1" Ice	11.68	9.91	260.79
QS46512-2 w/6' Pipe	A	From Face	3.00	0.0000	91.00	No Ice	5.95	6.51	112.50
(AT&T)			0.00			1/2" Ice	6.44	7.35	173.47
			0.00			1" Ice	6.89	8.07	241.15
QS46512-2 w/6' Pipe	B	From Face	3.00	0.0000	91.00	No Ice	5.95	6.51	112.50
(AT&T)			0.00			1/2" Ice	6.44	7.35	173.47
			0.00			1" Ice	6.89	8.07	241.15
QS46512-2 w/6' Pipe	C	From Face	3.00	0.0000	91.00	No Ice	5.95	6.51	112.50
(AT&T)			0.00			1/2" Ice	6.44	7.35	173.47
			0.00			1" Ice	6.89	8.07	241.15
T-Arm Mount	C	None		0.0000	91.00	No Ice	11.59	11.59	774.30
(AT&T)						1/2" Ice	15.44	15.44	990.35
						1" Ice	19.29	19.29	1206.41
RRUS 32	A	From Face	3.00	0.0000	91.00	No Ice	2.72	1.67	52.90
(AT&T)			0.00			1/2" Ice	2.94	1.86	73.90
			0.00			1" Ice	3.17	2.05	98.09
RRUS 32	B	From Face	3.00	0.0000	91.00	No Ice	2.72	1.67	52.90
(AT&T)			0.00			1/2" Ice	2.94	1.86	73.90
			0.00			1" Ice	3.17	2.05	98.09
RRUS 32	C	From Face	3.00	0.0000	91.00	No Ice	2.72	1.67	52.90
(AT&T)			0.00			1/2" Ice	2.94	1.86	73.90
			0.00			1" Ice	3.17	2.05	98.09
RRUS-11	A	From Face	1.00	0.0000	91.00	No Ice	2.52	1.02	55.00
(AT&T)			0.00			1/2" Ice	2.72	1.16	74.32
			0.00			1" Ice	2.92	1.30	96.56
RRUS-11	B	From Face	1.00	0.0000	91.00	No Ice	2.52	1.02	55.00
(AT&T)			0.00			1/2" Ice	2.72	1.16	74.32
			0.00			1" Ice	2.92	1.30	96.56
RRUS-11	C	From Face	1.00	0.0000	91.00	No Ice	2.52	1.02	55.00
(AT&T)			0.00			1/2" Ice	2.72	1.16	74.32
			0.00			1" Ice	2.92	1.30	96.56
RRUS 32 B2	A	From Face	3.00	0.0000	91.00	No Ice	2.72	1.67	52.90
(AT&T)			0.00			1/2" Ice	2.94	1.86	73.90
			0.00			1" Ice	3.17	2.05	98.09
RRUS 32 B2	B	From Face	3.00	0.0000	91.00	No Ice	2.72	1.67	52.90
(AT&T)			0.00			1/2" Ice	2.94	1.86	73.90
			0.00			1" Ice	3.17	2.05	98.09
RRUS 32 B2	C	From Face	3.00	0.0000	91.00	No Ice	2.72	1.67	52.90
(AT&T)			0.00			1/2" Ice	2.94	1.86	73.90
			0.00			1" Ice	3.17	2.05	98.09
RRUS 4478 B5	A	From Face	3.00	0.0000	91.00	No Ice	1.84	1.06	59.90
(AT&T)			0.00			1/2" Ice	2.01	1.20	75.78
			0.00			1" Ice	2.19	1.34	94.29
RRUS 4478 B5	B	From Face	3.00	0.0000	91.00	No Ice	1.84	1.06	59.90
(AT&T)			0.00			1/2" Ice	2.01	1.20	75.78
			0.00			1" Ice	2.19	1.34	94.29
RRUS 4478 B5	C	From Face	3.00	0.0000	91.00	No Ice	1.84	1.06	59.90
(AT&T)			0.00			1/2" Ice	2.01	1.20	75.78
			0.00			1" Ice	2.19	1.34	94.29
RRUS 4426 B66	A	From Face	3.00	0.0000	91.00	No Ice	1.65	0.68	46.00

tnxTower Maser Consulting, P.A 2000 Midlantic Drive, Suite 100 Mount Laurel, NJ 08054 Phone: (856) 797-0412 FAX:	Job	18963010A	Page	13 of 22
	Project	CT2037	Date	08:15:25 12/05/18
	Client	AT&T	Designed by	psabillon

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight lb
(AT&T)			0.00			1/2" Ice	1.81	0.79	58.47
			0.00			1" Ice	1.98	0.92	73.32
RRUS 4426 B66	B	From Face	3.00	0.0000	91.00	No Ice	1.65	0.68	46.00
(AT&T)			0.00			1/2" Ice	1.81	0.79	58.47
			0.00			1" Ice	1.98	0.92	73.32
RRUS 4426 B66	C	From Face	3.00	0.0000	91.00	No Ice	1.65	0.68	46.00
(AT&T)			0.00			1/2" Ice	1.81	0.79	58.47
			0.00			1" Ice	1.98	0.92	73.32
(2) LGP 21401	A	From Face	2.50	0.0000	91.00	No Ice	0.82	0.35	17.50
(AT&T)			0.00			1/2" Ice	0.94	0.44	23.31
			0.00			1" Ice	1.06	0.54	30.86
(2) LGP 21401	B	From Face	2.50	0.0000	91.00	No Ice	0.82	0.35	17.50
(AT&T)			0.00			1/2" Ice	0.94	0.44	23.31
			0.00			1" Ice	1.06	0.54	30.86
(2) LGP 21401	C	From Face	2.50	0.0000	91.00	No Ice	0.82	0.35	17.50
(AT&T)			0.00			1/2" Ice	0.94	0.44	23.31
			0.00			1" Ice	1.06	0.54	30.86
DC6-48-60-18-8C	A	From Face	1.00	0.0000	91.00	No Ice	0.55	0.55	26.20
(AT&T)			0.00			1/2" Ice	0.90	0.90	37.21
			0.00			1" Ice	1.04	1.04	50.18
DC6-48-60-18-8C	B	From Face	1.00	0.0000	91.00	No Ice	0.55	0.55	26.20
(AT&T)			0.00			1/2" Ice	0.90	0.90	37.21
			0.00			1" Ice	1.04	1.04	50.18
DC6-48-60-18-8C	C	From Face	1.00	0.0000	91.00	No Ice	0.55	0.55	26.20
(AT&T)			0.00			1/2" Ice	0.90	0.90	37.21
			0.00			1" Ice	1.04	1.04	50.18

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 lb
1' HP Dish w/Shroud (Clearwire)	B	Paraboloid w/Shroud (HP)	From Face	4.00 0.00 0.00	Worst		82.00	1.00	No Ice 1/2" Ice 1" Ice 0.79 0.92 1.06	19.00 25.00 28.45
A-ANT-18G-2-C (Clearwire)	A	Paraboloid w/Shroud (HP)	From Face	4.00 0.00 0.00	Worst		82.00	2.00	No Ice 1/2" Ice 1" Ice 3.14 3.41 3.68	25.00 42.50 60.01

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice

<i>tnxTower</i> <i>Maser Consulting, P.A</i> 2000 Midlantic Drive, Suite 100 Mount Laurel, NJ 08054 Phone: (856) 797-0412 FAX:	Job	18963010A	Page	14 of 22
	Project	CT2037	Date	08:15:25 12/05/18
	Client	AT&T	Designed by	psabillon

<i>Comb. No.</i>	<i>Description</i>
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 60 deg - No Ice
7	0.9 Dead+1.0 Wind 60 deg - No Ice
8	1.2 Dead+1.0 Wind 90 deg - No Ice
9	0.9 Dead+1.0 Wind 90 deg - No Ice
10	1.2 Dead+1.0 Wind 120 deg - No Ice
11	0.9 Dead+1.0 Wind 120 deg - No Ice
12	1.2 Dead+1.0 Wind 150 deg - No Ice
13	0.9 Dead+1.0 Wind 150 deg - No Ice
14	1.2 Dead+1.0 Wind 180 deg - No Ice
15	0.9 Dead+1.0 Wind 180 deg - No Ice
16	1.2 Dead+1.0 Wind 210 deg - No Ice
17	0.9 Dead+1.0 Wind 210 deg - No Ice
18	1.2 Dead+1.0 Wind 240 deg - No Ice
19	0.9 Dead+1.0 Wind 240 deg - No Ice
20	1.2 Dead+1.0 Wind 270 deg - No Ice
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice
25	0.9 Dead+1.0 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

<i>Section No.</i>	<i>Elevation ft</i>	<i>Component Type</i>	<i>Condition</i>	<i>Gov. Load Comb.</i>	<i>Axial lb</i>	<i>Major Axis Moment kip-ft</i>	<i>Minor Axis Moment kip-ft</i>
L1	98 - 93	Pole	Max Tension	26	0.00	0.00	0.00
			Max. Compression	26	-4022.09	-0.29	0.17
			Max. Mx	8	-1834.49	-7.51	0.09
			Max. My	2	-1830.91	-0.16	7.46
			Max. Vy	8	1724.50	-7.51	0.09
			Max. Vx	2	-1728.30	-0.16	7.46

<i>tnxTower</i> <i>Maser Consulting, P.A</i> 2000 Midlantic Drive, Suite 100 Mount Laurel, NJ 08054 Phone: (856) 797-0412 FAX:	Job	18963010A	Page	15 of 22
	Project	CT2037	Date	08:15:25 12/05/18
	Client	AT&T	Designed by	psabillon

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L2	93 - 88	Pole	Max. Torque	12			0.04
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-13042.03	-0.47	0.07
			Max. Mx	8	-5337.09	-26.67	0.17
			Max. My	2	-5323.56	-0.42	26.63
			Max. Vy	8	5224.68	-26.67	0.17
			Max. Vx	2	-5287.37	-0.42	26.63
L3	88 - 83	Pole	Max. Torque	33			0.04
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-13597.79	-0.49	0.07
			Max. Mx	8	-5709.46	-53.15	0.41
			Max. My	2	-5695.80	-0.66	53.43
			Max. Vy	8	5371.54	-53.15	0.41
			Max. Vx	2	-5434.98	-0.66	53.43
L4	83 - 78	Pole	Max. Torque	33			0.04
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-20070.31	-1.42	-0.10
			Max. Mx	8	-7860.24	-87.04	0.81
			Max. My	2	-7830.71	-1.15	88.05
			Max. Vy	8	8550.53	-87.04	0.81
			Max. Vx	2	-8838.90	-1.15	88.05
L5	78 - 77.75	Pole	Max. Torque	19			-0.52
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-20131.41	-1.42	-0.10
			Max. Mx	8	-7901.89	-89.18	0.83
			Max. My	2	-7872.33	-1.17	90.26
			Max. Vy	8	8571.35	-89.18	0.83
			Max. Vx	2	-8863.02	-1.17	90.26
L6	77.75 - 72.75	Pole	Max. Torque	12			0.22
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-21354.39	-1.44	-0.10
			Max. Mx	8	-8662.12	-133.20	1.30
			Max. My	2	-8628.99	-1.65	135.94
			Max. Vy	8	9042.47	-133.20	1.30
			Max. Vx	2	-9413.67	-1.65	135.94
L7	72.75 - 67.75	Pole	Max. Torque	12			0.22
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-22606.34	-1.45	-0.10
			Max. Mx	8	-9442.25	-179.58	1.78
			Max. My	2	-9406.33	-2.12	184.36
			Max. Vy	8	9516.11	-179.58	1.78
			Max. Vx	2	-9964.86	-2.12	184.36
L8	67.75 - 62.75	Pole	Max. Torque	12			0.22
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-23888.67	-1.45	-0.10
			Max. Mx	8	-10241.69	-228.32	2.25
			Max. My	2	-10203.84	-2.60	235.55
			Max. Vy	8	9990.92	-228.32	2.25
			Max. Vx	2	-10515.80	-2.60	235.55
L9	62.75 - 57.75	Pole	Max. Torque	12			0.22
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-25189.31	-1.45	-0.09
			Max. Mx	8	-11059.44	-279.44	2.72
			Max. My	2	-11020.57	-3.07	289.48
			Max. Vy	8	10465.80	-279.44	2.72
			Max. Vx	2	-11065.25	-3.07	289.48
L10	57.75 - 53	Pole	Max. Torque	12			0.22
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-26505.57	-1.52	-0.12
			Max. Mx	8	-11851.22	-330.32	3.17
			Max. My	2	-11811.79	-3.52	343.39

<i>tnxTower</i> <i>Maser Consulting, P.A</i> 2000 Midlantic Drive, Suite 100 Mount Laurel, NJ 08054 Phone: (856) 797-0412 FAX:	Job	18963010A	Page	16 of 22
	Project	CT2037	Date	08:15:25 12/05/18
	Client	AT&T	Designed by	psabillon

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L11	53 - 52.75	Pole	Max. Vy	8	10967.44	-330.32	3.17
			Max. Vx	2	-11646.97	-3.52	343.39
			Max. Torque	12			0.24
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-26591.74	-1.53	-0.13
			Max. Mx	8	-11908.15	-333.06	3.19
			Max. My	2	-11869.00	-3.54	346.31
			Max. Vy	8	10995.57	-333.06	3.19
L12	52.75 - 45.67	Pole	Max. Vx	2	-11678.90	-3.54	346.31
			Max. Torque	12			0.25
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-27765.98	-1.64	-0.19
			Max. Mx	8	-12634.88	-371.25	3.51
			Max. My	2	-12594.78	-3.86	386.94
			Max. Vy	8	11408.90	-371.25	3.51
			Max. Vx	2	-12159.03	-3.86	386.94
L13	45.67 - 44.34	Pole	Max. Torque	14			0.35
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-30424.22	-1.80	-0.28
			Max. Mx	8	-14445.24	-429.91	3.99
			Max. My	2	-14403.30	-4.33	449.61
			Max. Vy	8	12055.39	-429.91	3.99
			Max. Vx	2	-12905.28	-4.33	449.61
			Max. Torque	14			0.51
L14	44.34 - 39.34	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-32260.71	-1.96	-0.37
			Max. Mx	8	-15638.58	-491.65	4.46
			Max. My	2	-15597.21	-4.80	515.83
			Max. Vy	8	12652.38	-491.65	4.46
			Max. Vx	2	-13596.14	-4.80	515.83
			Max. Torque	14			0.67
			Max Tension	1	0.00	0.00	0.00
L15	39.34 - 34.34	Pole	Max. Compression	26	-34113.68	-2.12	-0.47
			Max. Mx	8	-16852.41	-556.35	4.93
			Max. My	2	-16812.51	-5.27	585.48
			Max. Vy	8	13240.18	-556.35	4.93
			Max. Vx	2	-14274.93	-5.27	585.48
			Max. Torque	14			0.83
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-35981.60	-2.29	-0.56
L16	34.34 - 29.34	Pole	Max. Mx	8	-18087.79	-623.96	5.40
			Max. My	2	-18050.43	-5.74	658.47
			Max. Vy	8	13814.59	-623.96	5.40
			Max. Vx	2	-14937.01	-5.74	658.47
			Max. Torque	14			0.99
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-37862.44	-2.45	-0.66
			Max. Mx	8	-19344.14	-694.39	5.87
L17	29.34 - 24.34	Pole	Max. My	2	-19310.31	-6.21	734.73
			Max. Vy	8	14372.66	-694.39	5.87
			Max. Vx	2	-15579.07	-6.21	734.73
			Max. Torque	14			1.14
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-39753.52	-2.62	-0.76
			Max. Mx	8	-20622.02	-767.56	6.34
			Max. My	2	-20592.80	-6.67	814.13
L18	24.34 - 19.34	Pole	Max. Vy	8	14908.87	-767.56	6.34
			Max. Vx	2	-16195.00	-6.67	814.13
			Max. Torque	14			1.30
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-41650.87	-2.79	-0.85
			Max. Mx	8			
			Max. My	2			
			Max. Vy	8			
L19	19.34 - 14.34	Pole	Max. Vx	2			
			Max. Torque	14			
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26			

<i>tnxTower</i> <i>Maser Consulting, P.A</i> 2000 Midlantic Drive, Suite 100 Mount Laurel, NJ 08054 Phone: (856) 797-0412 FAX:	Job	18963010A	Page	17 of 22
	Project	CT2037	Date	08:15:25 12/05/18
	Client	AT&T	Designed by	psabillon

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L20	14.34 - 12	Pole	Max. Mx	8	-21920.73	-843.34	6.81
			Max. My	2	-21897.10	-7.13	896.52
			Max. Vy	8	15417.44	-843.34	6.81
			Max. Vx	2	-16778.25	-7.13	896.52
			Max. Torque	14			1.45
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-42541.53	-2.86	-0.90
			Max. Mx	8	-22537.15	-879.67	7.03
			Max. My	2	-22516.32	-7.35	936.08
			Max. Vy	8	15651.57	-879.67	7.03
L21	12 - 11.75	Pole	Max. Vx	2	-17046.37	-7.35	936.08
			Max. Torque	14			1.52
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-42631.06	-2.87	-0.90
			Max. Mx	8	-22602.20	-883.58	7.05
			Max. My	2	-22582.41	-7.37	940.34
			Max. Vy	8	15670.87	-883.58	7.05
			Max. Vx	2	-17068.10	-7.37	940.34
			Max. Torque	14			1.53
			Max Tension	1	0.00	0.00	0.00
L22	11.75 - 6.75	Pole	Max. Compression	26	-44339.54	-3.02	-0.92
			Max. Mx	8	-23798.96	-963.15	7.51
			Max. My	2	-23786.52	-7.83	1026.94
			Max. Vy	8	16168.15	-963.15	7.51
			Max. Vx	2	-17581.86	-7.83	1026.94
			Max. Torque	14			1.65
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-45860.51	-3.14	-0.90
			Max. Mx	8	-24879.76	-1045.18	7.97
			Max. My	2	-24875.90	-8.29	1116.00
L23	6.75 - 1.75	Pole	Max. Vy	8	16662.77	-1045.18	7.97
			Max. Vx	2	-18060.94	-8.29	1116.00
			Max. Torque	14			1.76
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-46358.51	-3.18	-0.89
			Max. Mx	8	-25246.07	-1074.48	8.13
			Max. My	2	-25244.56	-8.45	1147.74
			Max. Vy	8	16843.53	-1074.48	8.13
			Max. Vx	2	-18236.57	-8.45	1147.74
			Max. Torque	14			1.80
L24	1.75 - 0	Pole	Max. Torque	14			1.80
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-46358.51	-3.18	-0.89
			Max. Mx	8	-25246.07	-1074.48	8.13
			Max. My	2	-25244.56	-8.45	1147.74
			Max. Vy	8	16843.53	-1074.48	8.13
			Max. Vx	2	-18236.57	-8.45	1147.74
			Max. Torque	14			1.80
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-46358.51	-3.18	-0.89

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	29	46358.51	-3747.05	2176.18
	Max. H _x	20	25255.71	16829.07	-91.18
	Max. H _z	2	25255.71	-91.18	18221.12
	Max. M _x	2	1147.74	-91.18	18221.12
	Max. M _z	8	1074.48	-16829.07	91.18
	Max. Torsion	14	1.80	91.18	-18221.12
	Min. Vert	25	18941.78	8335.57	14604.94
	Min. H _x	8	25255.71	-16829.07	91.18
	Min. H _z	14	25255.71	91.18	-18221.12
	Min. M _x	14	-1147.50	91.18	-18221.12
	Min. M _z	20	-1073.60	16829.07	-91.18

<i>tnxTower</i> <i>Maser Consulting, P.A</i> 2000 Midlantic Drive, Suite 100 Mount Laurel, NJ 08054 Phone: (856) 797-0412 FAX:	Job	18963010A	Page	18 of 22
	Project	CT2037	Date	08:15:25 12/05/18
	Client	AT&T	Designed by	psabillon

<i>Location</i>	<i>Condition</i>	<i>Gov. Load Comb.</i>	<i>Vertical lb</i>	<i>Horizontal, X lb</i>	<i>Horizontal, Z lb</i>
	Min. Torsion	2	-1.80	-91.18	18221.12

Tower Mast Reaction Summary

<i>Load Combination</i>	<i>Vertical lb</i>	<i>Shear_x lb</i>	<i>Shear_z lb</i>	<i>Overturning Moment, M_x kip-ft</i>	<i>Overturning Moment, M_z kip-ft</i>	<i>Torque kip-ft</i>
Dead Only	21046.42	0.00	0.00	-0.09	-0.35	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	25255.71	91.18	-18221.12	-1147.74	-8.45	1.80
0.9 Dead+1.0 Wind 0 deg - No Ice	18941.78	91.18	-18221.12	-1140.22	-8.28	1.79
1.2 Dead+1.0 Wind 30 deg - No Ice	25255.71	8597.90	-14876.95	-951.83	-550.65	1.58
0.9 Dead+1.0 Wind 30 deg - No Ice	18941.78	8597.90	-14876.95	-945.55	-546.92	1.58
1.2 Dead+1.0 Wind 60 deg - No Ice	25255.71	15749.41	-9189.52	-580.87	-991.58	1.46
0.9 Dead+1.0 Wind 60 deg - No Ice	18941.78	15749.41	-9189.52	-577.04	-985.00	1.46
1.2 Dead+1.0 Wind 90 deg - No Ice	25255.71	16829.07	-91.18	-8.13	-1074.48	0.44
0.9 Dead+1.0 Wind 90 deg - No Ice	18941.78	16829.07	-91.18	-8.04	-1067.29	0.44
1.2 Dead+1.0 Wind 120 deg - No Ice	25255.71	14523.70	8376.57	545.21	-946.25	-0.31
0.9 Dead+1.0 Wind 120 deg - No Ice	18941.78	14523.70	8376.57	541.63	-939.87	-0.31
1.2 Dead+1.0 Wind 150 deg - No Ice	25255.71	8335.57	14604.94	932.76	-530.52	-1.03
0.9 Dead+1.0 Wind 150 deg - No Ice	18941.78	8335.57	14604.94	926.64	-526.92	-1.02
1.2 Dead+1.0 Wind 180 deg - No Ice	25255.71	-91.18	18221.12	1147.50	7.57	-1.80
0.9 Dead+1.0 Wind 180 deg - No Ice	18941.78	-91.18	18221.12	1140.05	7.63	-1.79
1.2 Dead+1.0 Wind 210 deg - No Ice	25255.71	-8597.90	14876.95	951.60	549.77	-1.58
0.9 Dead+1.0 Wind 210 deg - No Ice	18941.78	-8597.90	14876.95	945.37	546.27	-1.58
1.2 Dead+1.0 Wind 240 deg - No Ice	25255.71	-15749.41	9189.52	580.63	990.70	-1.46
0.9 Dead+1.0 Wind 240 deg - No Ice	18941.78	-15749.41	9189.52	576.87	984.35	-1.46
1.2 Dead+1.0 Wind 270 deg - No Ice	25255.71	-16829.07	91.18	7.89	1073.60	-0.44
0.9 Dead+1.0 Wind 270 deg - No Ice	18941.78	-16829.07	91.18	7.86	1066.63	-0.44
1.2 Dead+1.0 Wind 300 deg - No Ice	25255.71	-14523.70	-8376.57	-545.45	945.37	0.31
0.9 Dead+1.0 Wind 300 deg - No Ice	18941.78	-14523.70	-8376.57	-541.80	939.22	0.31
1.2 Dead+1.0 Wind 330 deg - No Ice	25255.71	-8335.57	-14604.94	-933.00	529.64	1.03
0.9 Dead+1.0 Wind 330 deg - No Ice	18941.78	-8335.57	-14604.94	-926.81	526.27	1.02
1.2 Dead+1.0 Ice+1.0 Temp	46358.51	0.00	0.00	0.89	-3.18	-0.00

tnxTower Maser Consulting, P.A 2000 Midlantic Drive, Suite 100 Mount Laurel, NJ 08054 Phone: (856) 797-0412 FAX:	Job	18963010A	Page	19 of 22
	Project	CT2037	Date	08:15:25 12/05/18
	Client	AT&T	Designed by	psabillon

<i>Load Combination</i>	<i>Vertical lb</i>	<i>Shear_x lb</i>	<i>Shear_z lb</i>	<i>Overturning Moment, M_x kip-ft</i>	<i>Overturning Moment, M_z kip-ft</i>	<i>Torque kip-ft</i>
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	46358.51	12.61	-4330.50	-287.50	-4.41	0.45
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	46358.51	2128.55	-3683.72	-244.85	-145.32	0.46
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	46358.51	3747.05	-2176.18	-144.28	-252.74	0.35
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	46358.51	4065.16	-12.61	-0.23	-278.43	0.11
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	46358.51	3600.56	2077.03	141.25	-246.60	-0.11
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	46358.51	2021.66	3523.81	239.52	-139.86	-0.29
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	46358.51	-12.61	4330.50	289.34	-2.13	-0.45
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	46358.51	-2128.55	3683.72	246.69	138.78	-0.46
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	46358.51	-3747.05	2176.18	146.11	246.20	-0.35
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	46358.51	-4065.16	12.61	2.06	271.90	-0.11
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	46358.51	-3600.56	-2077.03	-139.42	240.07	0.11
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	46358.51	-2021.66	-3523.81	-237.69	133.33	0.29
Dead+Wind 0 deg - Service	21046.42	31.21	-6237.77	-391.38	-3.09	0.06
Dead+Wind 30 deg - Service	21046.42	2943.38	-5092.94	-324.57	-187.95	0.03
Dead+Wind 60 deg - Service	21046.42	5391.61	-3145.92	-198.11	-338.30	-0.00
Dead+Wind 90 deg - Service	21046.42	5761.22	-31.21	-2.83	-366.54	-0.04
Dead+Wind 120 deg - Service	21046.42	4972.01	2867.61	185.82	-322.82	-0.07
Dead+Wind 150 deg - Service	21046.42	2853.58	4999.82	317.95	-181.09	-0.07
Dead+Wind 180 deg - Service	21046.42	-31.21	6237.77	391.19	2.37	-0.06
Dead+Wind 210 deg - Service	21046.42	-2943.38	5092.94	324.38	187.22	-0.03
Dead+Wind 240 deg - Service	21046.42	-5391.61	3145.92	197.91	337.57	0.00
Dead+Wind 270 deg - Service	21046.42	-5761.22	31.21	2.63	365.81	0.04
Dead+Wind 300 deg - Service	21046.42	-4972.01	-2867.61	-186.01	322.09	0.07
Dead+Wind 330 deg - Service	21046.42	-2853.58	-4999.82	-318.14	180.36	0.07

Solution Summary

<i>Load Comb.</i>	<i>Sum of Applied Forces</i>			<i>Sum of Reactions</i>			<i>% Error</i>
	<i>PX lb</i>	<i>PY lb</i>	<i>PZ lb</i>	<i>PX lb</i>	<i>PY lb</i>	<i>PZ lb</i>	
1	0.00	-21046.42	0.00	0.00	21046.42	0.00	0.000%
2	91.18	-25255.71	-18221.12	-91.18	25255.71	18221.12	0.000%
3	91.18	-18941.78	-18221.12	-91.18	18941.78	18221.12	0.000%
4	8597.90	-25255.71	-14876.95	-8597.90	25255.71	14876.95	0.000%
5	8597.90	-18941.78	-14876.95	-8597.90	18941.78	14876.95	0.000%
6	15749.41	-25255.71	-9189.52	-15749.41	25255.71	9189.52	0.000%
7	15749.41	-18941.78	-9189.52	-15749.41	18941.78	9189.52	0.000%
8	16829.07	-25255.71	-91.18	-16829.07	25255.71	91.18	0.000%
9	16829.07	-18941.78	-91.18	-16829.07	18941.78	91.18	0.000%
10	14523.70	-25255.71	8376.57	-14523.70	25255.71	-8376.57	0.000%
11	14523.70	-18941.78	8376.57	-14523.70	18941.78	-8376.57	0.000%
12	8335.57	-25255.71	14604.94	-8335.57	25255.71	-14604.94	0.000%
13	8335.57	-18941.78	14604.94	-8335.57	18941.78	-14604.94	0.000%
14	-91.18	-25255.71	18221.12	91.18	25255.71	-18221.12	0.000%
15	-91.18	-18941.78	18221.12	91.18	18941.78	-18221.12	0.000%
16	-8597.90	-25255.71	14876.95	8597.90	25255.71	-14876.95	0.000%

tnxTower Maser Consulting, P.A 2000 Midlantic Drive, Suite 100 Mount Laurel, NJ 08054 Phone: (856) 797-0412 FAX:	Job	18963010A	Page	20 of 22
	Project	CT2037	Date	08:15:25 12/05/18
	Client	AT&T	Designed by	psabillon

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	
17	-8597.90	-18941.78	14876.95	8597.90	18941.78	-14876.95	0.000%
18	-15749.41	-25255.71	9189.52	15749.41	25255.71	-9189.52	0.000%
19	-15749.41	-18941.78	9189.52	15749.41	18941.78	-9189.52	0.000%
20	-16829.07	-25255.71	91.18	16829.07	25255.71	-91.18	0.000%
21	-16829.07	-18941.78	91.18	16829.07	18941.78	-91.18	0.000%
22	-14523.70	-25255.71	-8376.57	14523.70	25255.71	8376.57	0.000%
23	-14523.70	-18941.78	-8376.57	14523.70	18941.78	8376.57	0.000%
24	-8335.57	-25255.71	-14604.94	8335.57	25255.71	14604.94	0.000%
25	-8335.57	-18941.78	-14604.94	8335.57	18941.78	14604.94	0.000%
26	0.00	-46358.51	0.00	-0.00	46358.51	-0.00	0.000%
27	12.61	-46358.51	-4330.49	-12.61	46358.51	4330.50	0.000%
28	2128.54	-46358.51	-3683.72	-2128.55	46358.51	3683.72	0.000%
29	3747.04	-46358.51	-2176.17	-3747.05	46358.51	2176.18	0.000%
30	4065.16	-46358.51	-12.61	-4065.16	46358.51	12.61	0.000%
31	3600.55	-46358.51	2077.03	-3600.56	46358.51	-2077.03	0.000%
32	2021.65	-46358.51	3523.80	-2021.66	46358.51	-3523.81	0.000%
33	-12.61	-46358.51	4330.49	12.61	46358.51	-4330.50	0.000%
34	-2128.54	-46358.51	3683.72	2128.55	46358.51	-3683.72	0.000%
35	-3747.04	-46358.51	2176.17	3747.05	46358.51	-2176.18	0.000%
36	-4065.16	-46358.51	12.61	4065.16	46358.51	-12.61	0.000%
37	-3600.55	-46358.51	-2077.03	3600.56	46358.51	2077.03	0.000%
38	-2021.65	-46358.51	-3523.80	2021.66	46358.51	3523.81	0.000%
39	31.21	-21046.42	-6237.77	-31.21	21046.42	6237.77	0.000%
40	2943.38	-21046.42	-5092.94	-2943.38	21046.42	5092.94	0.000%
41	5391.61	-21046.42	-3145.92	-5391.61	21046.42	3145.92	0.000%
42	5761.22	-21046.42	-31.21	-5761.22	21046.42	31.21	0.000%
43	4972.01	-21046.42	2867.61	-4972.01	21046.42	-2867.61	0.000%
44	2853.58	-21046.42	4999.82	-2853.58	21046.42	-4999.82	0.000%
45	-31.21	-21046.42	6237.77	31.21	21046.42	-6237.77	0.000%
46	-2943.38	-21046.42	5092.94	2943.38	21046.42	-5092.94	0.000%
47	-5391.61	-21046.42	3145.92	5391.61	21046.42	-3145.92	0.000%
48	-5761.22	-21046.42	31.21	5761.22	21046.42	-31.21	0.000%
49	-4972.01	-21046.42	-2867.61	4972.01	21046.42	2867.61	0.000%
50	-2853.58	-21046.42	-4999.82	2853.58	21046.42	4999.82	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	0.00007236
3	Yes	5	0.00000001	0.00003457
4	Yes	5	0.00000001	0.00053432
5	Yes	5	0.00000001	0.00025317
6	Yes	5	0.00000001	0.00053096
7	Yes	5	0.00000001	0.00024835
8	Yes	4	0.00000001	0.00034714
9	Yes	4	0.00000001	0.00019830
10	Yes	5	0.00000001	0.00050107
11	Yes	5	0.00000001	0.00023715
12	Yes	5	0.00000001	0.00049957
13	Yes	5	0.00000001	0.00023781
14	Yes	5	0.00000001	0.00005336
15	Yes	5	0.00000001	0.00002550
16	Yes	5	0.00000001	0.00048075
17	Yes	5	0.00000001	0.00022714

tnxTower Maser Consulting, P.A 2000 Midlantic Drive, Suite 100 Mount Laurel, NJ 08054 Phone: (856) 797-0412 FAX:	Job	18963010A	Page	21 of 22
	Project	CT2037	Date	08:15:25 12/05/18
	Client	AT&T	Designed by	psabillon

18	Yes	5	0.00000001	0.00056937
19	Yes	5	0.00000001	0.00026761
20	Yes	4	0.00000001	0.00057231
21	Yes	4	0.00000001	0.00036180
22	Yes	5	0.00000001	0.00051810
23	Yes	5	0.00000001	0.00024567
24	Yes	5	0.00000001	0.00045854
25	Yes	5	0.00000001	0.00021782
26	Yes	4	0.00000001	0.00013010
27	Yes	5	0.00000001	0.00062032
28	Yes	5	0.00000001	0.00067053
29	Yes	5	0.00000001	0.00068180
30	Yes	5	0.00000001	0.00061075
31	Yes	5	0.00000001	0.00067086
32	Yes	5	0.00000001	0.00065745
33	Yes	5	0.00000001	0.00062350
34	Yes	5	0.00000001	0.00065555
35	Yes	5	0.00000001	0.00066664
36	Yes	5	0.00000001	0.00059072
37	Yes	5	0.00000001	0.00064939
38	Yes	5	0.00000001	0.00063676
39	Yes	4	0.00000001	0.00010915
40	Yes	4	0.00000001	0.00070637
41	Yes	4	0.00000001	0.00076467
42	Yes	4	0.00000001	0.00009081
43	Yes	4	0.00000001	0.00066590
44	Yes	4	0.00000001	0.00068201
45	Yes	4	0.00000001	0.00009354
46	Yes	4	0.00000001	0.00066906
47	Yes	4	0.00000001	0.00075136
48	Yes	4	0.00000001	0.00008000
49	Yes	4	0.00000001	0.00071941
50	Yes	4	0.00000001	0.00061193

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
L1	98 - 93	Pole	TP14.625x12.75x0.1875	1	-1830.69	638351.00	4.3	Pass
L2	93 - 88	Pole	TP16.5x14.625x0.1875	2	-5322.97	721254.00	11.9	Pass
L3	88 - 83	Pole	TP17.5229x16.5x0.1875	3	-5701.48	766482.00	20.5	Pass
L4	83 - 78	Pole	TP18.5458x17.5229x0.1875	4	-7829.40	811710.00	29.9	Pass
L5	78 - 77.75	Pole	TP18.597x18.5458x0.6875	5	-7871.05	2903500.00	9.0	Pass
L6	77.75 - 72.75	Pole	TP19.6199x18.597x0.65	6	-8627.74	2907670.00	12.6	Pass
L7	72.75 - 67.75	Pole	TP20.6428x19.6199x0.6125	7	-9405.13	2893080.00	16.2	Pass
L8	67.75 - 62.75	Pole	TP21.6657x20.6428x0.575	8	-10202.70	2859740.00	19.8	Pass
L9	62.75 - 57.75	Pole	TP22.6886x21.6657x0.55	9	-11019.50	2871310.00	23.0	Pass
L10	57.75 - 53	Pole	TP23.6604x22.6886x0.5313	10	-11810.80	2897510.00	25.8	Pass
L11	53 - 52.75	Pole	TP23.7116x23.6604x0.725	11	-11868.00	3929870.00	19.4	Pass
L12	52.75 - 45.67	Pole	TP25.16x23.7116x0.7	12	-12593.90	3913640.00	21.1	Pass
L13	45.67 - 44.34	Pole	TP25.0441x24.0342x0.75	13	-14402.40	4296640.00	21.8	Pass
L14	44.34 - 39.34	Pole	TP26.054x25.0441x0.725	14	-15596.40	4330350.00	23.7	Pass
L15	39.34 - 34.34	Pole	TP27.0639x26.054x0.7	15	-16811.80	4351860.00	25.7	Pass
L16	34.34 - 29.34	Pole	TP28.0738x27.0639x0.675	16	-18049.80	4361160.00	27.7	Pass
L17	29.34 - 24.34	Pole	TP29.0837x28.0738x0.6625	17	-19309.70	4440130.00	29.2	Pass
L18	24.34 - 19.34	Pole	TP30.0937x29.0837x0.6375	18	-20592.30	4428150.00	31.3	Pass
L19	19.34 - 14.34	Pole	TP31.1036x30.0937x0.625	19	-21896.70	4492010.00	32.8	Pass
L20	14.34 - 12	Pole	TP31.5762x31.1036x0.6125	20	-22516.00	4472250.00	33.8	Pass
L21	12 - 11.75	Pole	TP31.6267x31.5762x0.5625	21	-22582.10	4120490.00	36.7	Pass

<i>tnxTower</i> <i>Maser Consulting, P.A</i> 2000 Midlantic Drive, Suite 100 Mount Laurel, NJ 08054 Phone: (856) 797-0412 FAX:	Job	18963010A	Page	22 of 22
	Project	CT2037	Date	08:15:25 12/05/18
	Client	AT&T	Designed by	psabillon

<i>Section No.</i>	<i>Elevation ft</i>	<i>Component Type</i>	<i>Size</i>	<i>Critical Element</i>	<i>P lb</i>	<i>ϕP_{allow} lb</i>	<i>% Capacity</i>	<i>Pass Fail</i>
L22	11.75 - 6.75	Pole	TP32.6366x31.6267x0.55	22	-23786.30	4161530.00	38.4	Pass
L23	6.75 - 1.75	Pole	TP33.6465x32.6366x0.5375	23	-24875.80	4196540.00	40.0	Pass
L24	1.75 - 0	Pole	TP34x33.6465x0.5375	24	-25244.50	4241340.00	40.3	Pass
							Summary	
							Pole (L24)	Pass
							RATING = 40.3	Pass*

*Due to limitations of the tnx Tower software when analyzing monopoles with additional bolted plates and additional reinforcing anchor rods, the above output has not been used to determine the governing tower usage. Please see Appendix A for additional calculations based on output generated in this report.

Site BU: _____

Work Order: _____



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Pole Geometry

	Pole Height Above Base (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Bend Radius (in)	Pole Material
1	98	10	0	18	12.75	16.5	0.1875	Auto	A572-65
2	88	42.33	3.67	18	16.50	25.16	0.1875	Auto	A572-65
3	49.34	49.34	0	18	24.03	34	0.25	Auto	A572-65

Reinforcement Configuration

	Bottom Effective Elevation (ft)	Top Effective Elevation (ft)	Type	Model	Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	0	78	channel	RSB-01 Top	2	1						1											
2	0	53	channel	RSB-01 Top	2											1				1			
3	12	78	channel	RSB-01 Both	1												1						
4																							
5																							
6																							
7																							
8																							
9																							
10																							

Reinforcement Details

	B (in)	H (in)	Gross Area (in ²)	Pole Face to Centroid (in)	Bottom Termination Length (in)	Top Termination Length (in)	L _u (in)	Net Area (in ²)	Bolt Hole Size (in)	Reinforcement Material
1	6.1875	3.5	5.6646	2.0625	n/a	24.000	31.000	5.008	1.2500	A572-65
2	6.1875	3.5	5.6646	2.0625	n/a	24.000	31.000	5.008	1.2500	A572-65
3	6.1875	3.5	5.6646	2.0625	24.000	24.000	31.000	5.008	1.2500	A572-65

TNX Geometry Input

Increment (ft): 5

	Section Height (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Tapered Pole Grade	Weight Multiplier
1	98 - 93	5		18	12.750	14.625	0.1875	A572-65	1.000
2	93 - 88	5	0	18	14.625	16.500	0.1875	A572-65	1.000
3	88 - 83	5		18	16.500	17.523	0.1875	A572-65	1.000
4	83 - 78	5		18	17.523	18.546	0.1875	A572-65	1.000
5	78 - 77.75	0.25		18	18.546	18.597	0.6875	A572-65	0.715
6	77.75 - 72.75	5		18	18.597	19.620	0.65	A572-65	0.730
7	72.75 - 67.75	5		18	19.620	20.643	0.6125	A572-65	0.749
8	67.75 - 62.75	5		18	20.643	21.666	0.575	A572-65	0.774
9	62.75 - 57.75	5		18	21.666	22.689	0.55	A572-65	0.786
10	57.75 - 53	4.75		18	22.689	23.660	0.53125	A572-65	0.794
11	53 - 52.75	0.25		18	23.660	23.712	0.725	A572-65	0.800
12	52.75 - 49.34	7.08	3.67	18	23.712	25.160	0.7	A572-65	0.811
13	49.34 - 44.34	5		18	24.034	25.044	0.75	A572-65	0.830
14	44.34 - 39.34	5		18	25.044	26.054	0.725	A572-65	0.837
15	39.34 - 34.34	5		18	26.054	27.064	0.7	A572-65	0.847
16	34.34 - 29.34	5		18	27.064	28.074	0.675	A572-65	0.859
17	29.34 - 24.34	5		18	28.074	29.084	0.6625	A572-65	0.857
18	24.34 - 19.34	5		18	29.084	30.094	0.6375	A572-65	0.873
19	19.34 - 14.34	5		18	30.094	31.104	0.625	A572-65	0.873
20	14.34 - 12	2.34		18	31.104	31.576	0.6125	A572-65	0.883
21	12 - 11.75	0.25		18	31.576	31.627	0.5625	A572-65	0.857
22	11.75 - 6.75	5		18	31.627	32.637	0.55	A572-65	0.863
23	6.75 - 1.75	5		18	32.637	33.647	0.5375	A572-65	0.870
24	1.75 - 0	1.75		18	33.647	34.000	0.5375	A572-65	0.866

TNX Section Forces

Increment (ft):		TNX Output		
	Section Height (ft)	P _u (K)	M _{ux} (kip-ft)	V _u (K)
1	98 - 93	1.71	9.13	2.17
2	93 - 88	5.52	37.19	7.95
3	88 - 83	5.96	77.84	8.20
4	83 - 78	7.11	125.00	10.78
5	78 - 77.75	7.15	127.70	10.82
6	77.75 - 72.75	7.89	183.95	11.69
7	72.75 - 67.75	8.66	244.57	12.57
8	67.75 - 62.75	9.45	309.59	13.45
9	62.75 - 57.75	10.27	379.01	14.33
10	57.75 - 53	11.06	449.25	15.26
11	53 - 52.75	11.12	453.08	15.32
12	52.75 - 49.34	11.85	506.59	16.08
13	49.34 - 44.34	13.65	589.97	17.26
14	44.34 - 39.34	14.85	679.01	18.37
15	39.34 - 34.34	16.08	773.54	19.46
16	34.34 - 29.34	17.33	873.46	20.53
17	29.34 - 24.34	18.62	978.63	21.56
18	24.34 - 19.34	19.93	1088.87	22.56
19	19.34 - 14.34	21.27	1203.96	23.50
20	14.34 - 12	21.91	1259.44	23.94
21	12 - 11.75	21.98	1265.43	23.98
22	11.75 - 6.75	23.23	1387.36	24.81
23	6.75 - 1.75	24.41	1513.47	25.62
24	1.75 - 0	24.76	1558.62	25.97

Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
98 - 93	Pole	TP14.625x12.75x0.1875	Pole	5.1%	Pass
93 - 88	Pole	TP16.5x14.625x0.1875	Pole	16.2%	Pass
88 - 83	Pole	TP17.523x16.5x0.1875	Pole	29.4%	Pass
83 - 78	Pole	TP18.546x17.523x0.1875	Pole	41.8%	Pass
78 - 77.75	Pole + Reinf.	TP18.597x18.546x0.6875	Reinf. 3 Bolt-Shaft Bearing	27.8%	Pass
77.75 - 72.75	Pole + Reinf.	TP19.62x18.597x0.65	Reinf. 3 Tension Rupture	32.0%	Pass
72.75 - 67.75	Pole + Reinf.	TP20.643x19.62x0.6125	Reinf. 3 Tension Rupture	39.7%	Pass
67.75 - 62.75	Pole + Reinf.	TP21.666x20.643x0.575	Reinf. 3 Tension Rupture	47.1%	Pass
62.75 - 57.75	Pole + Reinf.	TP22.689x21.666x0.55	Reinf. 3 Tension Rupture	54.2%	Pass
57.75 - 53	Pole + Reinf.	TP23.66x22.689x0.5313	Reinf. 3 Tension Rupture	60.7%	Pass
53 - 52.75	Pole + Reinf.	TP23.712x23.66x0.725	Reinf. 2 Bolt-Shaft Bearing	45.3%	Pass
52.75 - 49.34	Pole + Reinf.	TP25.16x23.712x0.7	Reinf. 1 Tension Yield	44.8%	Pass
49.34 - 44.34	Pole + Reinf.	TP25.044x24.034x0.75	Reinf. 1 Tension Yield	45.3%	Pass
44.34 - 39.34	Pole + Reinf.	TP26.054x25.044x0.725	Reinf. 1 Tension Yield	49.3%	Pass
39.34 - 34.34	Pole + Reinf.	TP27.064x26.054x0.7	Reinf. 1 Tension Yield	53.3%	Pass
34.34 - 29.34	Pole + Reinf.	TP28.074x27.064x0.675	Reinf. 1 Tension Yield	57.1%	Pass
29.34 - 24.34	Pole + Reinf.	TP29.084x28.074x0.6625	Reinf. 1 Tension Yield	60.9%	Pass
24.34 - 19.34	Pole + Reinf.	TP30.094x29.084x0.6375	Reinf. 1 Tension Yield	64.5%	Pass
19.34 - 14.34	Pole + Reinf.	TP31.104x30.094x0.625	Reinf. 1 Tension Yield	68.0%	Pass
14.34 - 12	Pole + Reinf.	TP31.576x31.104x0.6125	Reinf. 1 Tension Yield	69.6%	Pass
12 - 11.75	Pole + Reinf.	TP31.627x31.576x0.5625	Reinf. 1 Tension Yield	71.3%	Pass
11.75 - 6.75	Pole + Reinf.	TP32.637x31.627x0.55	Reinf. 1 Tension Yield	74.6%	Pass
6.75 - 1.75	Pole + Reinf.	TP33.647x32.637x0.5375	Reinf. 1 Tension Yield	77.7%	Pass
1.75 - 0	Pole + Reinf.	TP34x33.647x0.5375	Reinf. 1 Tension Yield	78.8%	Pass
				Summary	
			Pole	63.6%	Pass
			Reinforcement	78.8%	Pass
			Overall	78.8%	Pass

Additional Calculations

Section Elevation (ft)	Moment of Inertia (in ⁴)			Area (in ²)			% Capacity			
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1	R2	R3
98 - 93	226	n/a	226	8.59	n/a	8.59	5.1%			
93 - 88	326	n/a	326	9.71	n/a	9.71	16.2%			
88 - 83	392	n/a	392	10.32	n/a	10.32	29.4%			
83 - 78	465	n/a	465	10.93	n/a	10.93	41.8%			
78 - 77.75	469	1119	1588	10.96	16.99	27.95	13.1%	27.8%		27.8%
77.75 - 72.75	552	1220	1771	11.56	16.99	28.56	17.7%	26.3%		32.0%
72.75 - 67.75	643	1325	1968	12.17	16.99	29.17	22.4%	32.7%		39.7%
67.75 - 62.75	745	1435	2180	12.78	16.99	29.78	27.2%	38.7%		47.1%
62.75 - 57.75	856	1549	2405	13.39	16.99	30.38	31.9%	44.6%		54.2%
57.75 - 53	972	1662	2634	13.97	16.99	30.96	36.4%	49.9%		60.7%
53 - 52.75	1028	2555	3582	14.00	28.32	42.32	31.4%	41.6%	45.3%	36.1%
52.75 - 49.34	1116	2686	3802	14.41	28.32	42.74	34.1%	44.8%	34.6%	39.0%
49.34 - 44.34	1575	2820	4395	19.67	28.32	48.00	31.9%	45.3%	35.9%	40.7%
44.34 - 39.34	1774	3018	4791	20.47	28.32	48.80	35.2%	49.3%	39.2%	44.6%
39.34 - 34.34	1988	3223	5210	21.28	28.32	49.60	38.6%	53.3%	42.5%	48.4%
34.34 - 29.34	2219	3434	5653	22.08	28.32	50.40	42.0%	57.1%	45.7%	52.1%
29.34 - 24.34	2467	3653	6120	22.88	28.32	51.20	45.3%	60.9%	48.9%	55.8%
24.34 - 19.34	2733	3878	6611	23.68	28.32	52.00	48.7%	64.5%	52.0%	59.3%
19.34 - 14.34	3017	4110	7128	24.48	28.32	52.80	52.1%	68.0%	55.0%	62.8%
14.34 - 12	3157	4222	7378	24.86	28.32	53.18	53.6%	69.6%	56.3%	64.3%
12 - 11.75	3111	3643	6754	24.90	22.66	47.55	55.7%	71.3%	68.9%	
11.75 - 6.75	3420	3853	7273	25.70	22.66	48.36	59.1%	74.6%	72.1%	
6.75 - 1.75	3749	4068	7818	26.50	22.66	49.16	62.4%	77.7%	75.2%	
1.75 - 0	3869	4145	8015	26.78	22.66	49.44	63.6%	78.8%	76.2%	

Note: Section capacity checked in 5 degree increments.

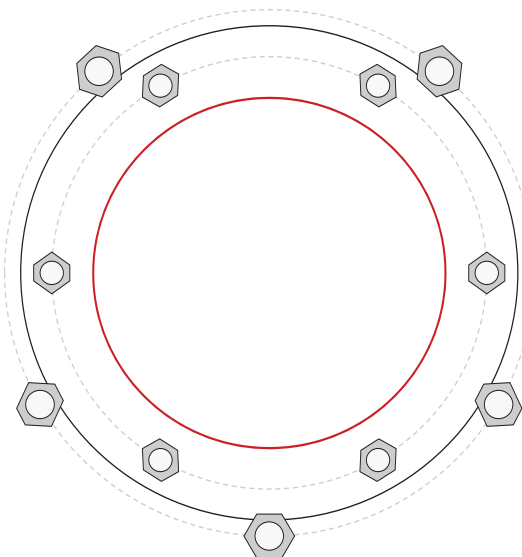
Monopole Base Plate Connection



Site Info	
Site Name	CT2037

Analysis Considerations	
TIA-222 Revision	G
Grout Considered:	No
I_{ar} (in)	0
Eta Factor, η	0.5

Applied Loads	
Moment (kip-ft)	1149.19
Axial Force (kips)	25.24
Shear Force (kips)	18.25



Connection Properties		Analysis Results	
Anchor Rod Data		Anchor Rod Summary (units of kips, kip-in)	
GROUP 1: (6) 2-1/4" ϕ bolts (A615-75 N; $F_y=75$ ksi, $F_u=100$ ksi) on 42" BC		GROUP 1:	
GROUP 2: (5) 2-3/4" ϕ bolts (95 N; $F_y=95$ ksi, $F_u=125$ ksi) on 51.125" BC		$Pu_c = 84$	$\phi Pn_t = 260$
<i>pos. (deg): 50, 130, 210, 270, 330</i>		$Vu = 3.04$	$\phi Vn = n/a$
		$Mu = n/a$	$\phi Mn = n/a$
			Stress Rating
			34.6%
			Pass
Base Plate Data		GROUP 2:	
48" OD x 1.5" Plate (A572-60; $F_y=60$ ksi, $F_u=75$ ksi)		$Pu_c = 145.63$	$\phi Pn_t = 493$
		$Vu = 0$	$\phi Vn = n/a$
		$Mu = n/a$	$\phi Mn = n/a$
			Stress Rating
			29.5%
			Pass
Stiffener Data		Base Plate Summary	
N/A		Max Stress (ksi):	24.2 (Flexural)
		Allowable Stress (ksi):	54
		Stress Rating:	44.8%
			Pass
Pole Data			
34" x 0.375" 18-sided pole (A572-65; $F_y=65$ ksi, $F_u=80$ ksi)			

Pier and Pad Foundation



Site Name:

TIA-222 Revision:
Tower Type:

Block Foundation?: ☐

Superstructure Analysis Reactions		
Compression, P_{comp} :	25.24	kips
Base Shear, V_{u_comp} :	18.25	kips
Moment, M_u :	1149.19	ft-kips
Tower Height, H :	98	ft
BP Dist. Above Fdn, bp_{dist} :	3	in

Foundation Analysis Checks				
	Capacity	Demand	Rating	Check
Lateral (Sliding) (kips)	88.53	18.25	20.6%	Pass
Bearing Pressure (ksf)	5.18	1.30	25.1%	Pass
Overturning (kip*ft)	2644.68	1249.57	47.2%	Pass
Pier Flexure (Comp.) (kip*ft)	2895.26	1185.69	41.0%	Pass
Pier Compression (kip)	22913.28	38.20	0.2%	Pass
Pad Flexure (kip*ft)	2770.39	419.32	15.1%	Pass
Pad Shear - 1-way (kips)	849.53	68.82	8.1%	Pass
Pad Shear - 2-way (Comp) (ksi)	0.190	0.013	6.8%	Pass

Pier Properties		
Pier Shape:	Square	
Pier Diameter, $dpier$:	6	ft
Ext. Above Grade, E :	1	ft
Pier Rebar Size, Sc :	8	
Pier Rebar Quantity, mc :	26	
Pier Tie/Spiral Size, St :	3	
Pier Tie/Spiral Quantity, mt :	4	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier} :	3	in

Soil Rating:	47.2%
Structural Rating:	41.0%

Pad Properties		
Depth, D :	4.25	ft
Pad Width, W :	21.63	ft
Pad Thickness, T :	3.25	ft
Pad Rebar Size, Sp :	8	
Pad Rebar Quantity, mp :	23	
Pad Clear Cover, cc_{pad} :	3	in

Material Properties		
Rebar Grade, F_y :	60000	psi
Concrete Compressive Strength, F'_c :	4000	psi
Dry Concrete Density, δ_c :	150	pcf

Soil Properties		
Total Soil Unit Weight, γ :	100	pcf
Ultimate Gross Bearing, Q_{ult} :	6.900	ksf
Cohesion, C_u :	0.000	ksf
Friction Angle, ϕ :	30	degrees
SPT Blow Count, N_{blows} :		
Base Friction, μ :	0.35	
Neglected Depth, N :	3.33	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, gw :	none	ft

<--Toggle between Gross and Net



Radio Frequency Emissions Analysis Report

AT&T Existing Facility

Site ID: CT2037

FA#: 10035247

New Haven Wheeler Street
69 Wheeler Street
New Haven, CT 06512

January 28, 2019

Centerline Communications Project Number: 950006-168

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	27.67 %



January 28, 2019

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

Emissions Analysis for Site: **CT2037 – New Haven Wheeler Street**

Centerline Communications, LLC (“Centerline”) was directed to analyze the proposed AT&T facility located at **69 Wheeler Street, New Haven, 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 97-01 and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The number of $\mu\text{W}/\text{cm}^2$ 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 population 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 population 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.

Population exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The general population exposure limits for the 700 and 850 MHz Bands are approximately $467 \mu\text{W}/\text{cm}^2$ and $567 \mu\text{W}/\text{cm}^2$ respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 2300 MHz (WCS) bands is $1000 \mu\text{W}/\text{cm}^2$. 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 performed for the proposed AT&T Wireless antenna facility located at **69 Wheeler Street, New Haven, 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.

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. All power values expressed and analyzed are maximum power levels expected to be used on all radios.

All emissions values for additional carriers were taken from the Connecticut Siting Council (CSC) active MPE database. Values in this database are provided by the individual carriers themselves

For each sector the following channel counts, frequency bands and power levels were utilized as shown in *Table 1*:

Technology	Frequency Band	Channel Count	Transmit Power per Channel (W)
UMTS	850 MHz	2	30
UMTS	1900 MHz (PCS)	2	40
LTE	2300 MHz (WCS)	4	30
LTE	850 MHz	2	40
5G	850 MHz	2	25
LTE	1900 MHz (PCS)	4	40
LTE	700 MHz	2	40
LTE	2100 MHz (AWS)	4	30

Table 1: Channel Data Table



The following antennas listed in *Table 2* were used in the modeling for transmission in the 700 MHz, 850 MHz, 1900 MHz (PCS), 2100 MHz (AWS) 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.

Sector	Antenna Number	Antenna Make / Model	Antenna Centerline (ft)
A	1	Powerwave 7750	91
A	2	Commscope SBNH-1D6565A	91
A	3	Commscope SBNHH-1D65A	91
A	4	Quintel QS46512-2	91
B	1	Powerwave 7750	91
B	2	CCI HPA-65R-BUU-H6	91
B	3	CCI HPA-65R-BUU-H6	91
B	4	Quintel QS46512-2	91
C	1	Powerwave 7750	91
C	2	CCI HPA-65R-BUU-H6	91
C	3	CCI HPA-65R-BUU-H6	91
C	4	Quintel QS46512-2	91

Table 2: Antenna Data

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



RESULTS

Per the calculations completed for the proposed AT&T configurations *Table 3* shows resulting emissions power levels and percentages of the FCC's allowable general population limit.

Antenna ID	Antenna Make / Model	Frequency Bands	Antenna Gain (dBd)	Channel Count	Total TX Power (W)	ERP (W)	MPE %
Antenna A1	Powerwave 7750	850 MHz / 1900 MHz (PCS)	12.5 / 15.6	4	120	3,245.44	2.02
Antenna A2	Commscope SBNH-1D6565A	2300 MHz (WCS)	14.75	4	120	3,582.46	1.78
Antenna A3	Commscope SBNHH-1D65A	850 MHz / 1900 MHz (PCS)	10.65 / 10.65 / 14.55	8	290	6,071.51	3.59
Antenna A4	Quintel QS46512-2	700 MHz / 2100 MHz (AWS)	10.55 / 13.85	6	200	3,819.94	2.42
Sector A Composite MPE%							9.81
Antenna B1	Powerwave 7750	850 MHz / 1900 MHz (PCS)	12.5 / 15.6	4	120	3,245.44	2.02
Antenna B2	CCI HPA-65R-BUU-H6	2300 MHz (WCS)	15.25	4	120	4,019.59	2.00
Antenna B3	CCI HPA-65R-BUU-H6	850 MHz / 1900 MHz (PCS)	12.65 / 12.65 / 14.75	8	290	7,169.62	4.48
Antenna B4	Quintel QS46512-2	700 MHz / 2100 MHz (AWS)	10.55 / 13.85	6	200	3,819.94	2.42
Sector B Composite MPE%							10.91
Antenna C1	Powerwave 7750	850 MHz / 1900 MHz (PCS)	12.5 / 15.6	4	120	3,245.44	2.02
Antenna C2	CCI HPA-65R-BUU-H6	2300 MHz (WCS)	15.25	4	120	4,019.59	2.00
Antenna C3	CCI HPA-65R-BUU-H6	850 MHz / 1900 MHz (PCS)	12.65 / 12.65 / 14.75	8	290	7,169.62	4.48
Antenna C4	Quintel QS46512-2	700 MHz / 2100 MHz (AWS)	10.55 / 13.85	6	200	3,819.94	2.42
Sector C Composite MPE%							10.91

Table 3: AT&T Emissions Levels



The Following table (*table 4*) shows all additional carriers on site and their MPE% as recorded in the CSC active MPE database for this facility along with the newly calculated maximum AT&T MPE contributions per this report. FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. For this site, the sectors with the largest calculated MPE% are Sectors B & C. *Table 5* below shows a summary for each AT&T Sector as well as the composite MPE value for the site.

Site Composite MPE%	
Carrier	MPE%
AT&T – Max Sector Value (Sectors B & C)	10.91 %
Sprint	9.69 %
T-Mobile	7.07 %
Site Total MPE %:	27.67 %

Table 4: All Carrier MPE Contributions

AT&T Sector A Total:	9.81 %
AT&T Sector B Total:	10.91 %
AT&T Sector C Total:	10.91 %
Site Total:	27.67 %

Table 5: Site MPE Summary



FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. *Table 6* below details a breakdown by frequency band and technology for the MPE power values for the maximum calculated AT&T sector(s). For this site, the sectors with the largest calculated MPE% are Sectors B & C.

AT&T _ Frequency Band / Technology Max Power Values (Sectors B & C)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu\text{W}/\text{cm}^2$)	Frequency (MHz)	Allowable MPE ($\mu\text{W}/\text{cm}^2$)	Calculated % MPE
AT&T 850 MHz UMTS – Antenna 1	2	533.48	91	5.31	850 MHz	567	0.94%
AT&T 1900 MHz (PCS) UMTS – Antenna 1	2	1,089.23	91	10.84	1900 MHz (PCS)	1000	1.08%
AT&T 2300 MHz (WCS) LTE – Antenna 2	4	1,004.90	91	20.00	2300 MHz (WCS)	1000	2.00%
AT&T 850 MHz LTE – Antenna 3	2	736.31	91	7.33	850 MHz	567	1.29%
AT&T 850 MHz 5G – Antenna 3	2	460.19	91	4.58	850 MHz	567	0.81%
AT&T 1900 MHz (PCS) LTE – Antenna 3	4	1,194.15	91	23.77	1900 MHz (PCS)	1000	2.38%
AT&T 700 MHz LTE – Antenna 4	2	454.00	91	4.52	700 MHz	467	0.97%
AT&T 2100 MHz (AWS) LTE – Antenna 4	4	727.98	91	14.49	2100 MHz (AWS)	1000	1.45%
						Total:	10.91 %

Table 6: AT&T Maximum Sector MPE Power Values



Summary

All calculations performed for this analysis yielded results that were **within** the allowable limits for general population 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 population exposure to RF Emissions are shown here:

AT&T Sector	Power Density Value (%)
Sector A:	9.81 %
Sector B:	10.91 %
Sector C:	10.91 %
AT&T Maximum Total (Sectors B & C):	10.91 %
Site Total:	27.67 %
Site Compliance Status:	COMPLIANT

The anticipated composite MPE value for this site assuming all carriers present is **27.67 %** of the allowable FCC established general population 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.

A handwritten signature in black ink, appearing to read 'Scott Heffernan', is positioned above the contact information.

Scott Heffernan
RF Engineering Director
Centerline Communications, LLC
95 Ryan Drive, Suite 1
Raynham, MA 02767

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WHITNEY REALTY ENTERPRISES LLC
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Package:

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Service:

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Transaction Number: [459639077](#)

Transaction Type: [Label](#)

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USPS Tracking® [Free](#)

Label Total: [\\$7.90](#)

Order Total: [\\$31.60](#)

Feedback

Timestamp	Message
03-20-2019 14:07:18	LABEL REPRINTED
03-20-2019 14:05:58	LABEL PRINTED
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Scheduled Date: [03/22/2019 11:59 PM](#)

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ne_sa_deliverable@empiretelecomm.com

Delivery Address:

LANDMARK DIVIDEND, LLC
PO BOX 3429
2141 ROSECRANS AVE
STE 2100
EL SEGUNDO, CA 90245-4821

Package:

Ship Date: 03/20/19
Value: \$50.00
From: 01862

Service:

Priority Mail® 2-Day
Small Flat Rate Box
USPS Tracking®

Transaction Number: [459639077](#)

Transaction Type: Label

Payment Method: AMEX-1005

Payment Status: Account Charged

Postage Cost \$7.90
USPS Tracking® Free

Label Total: **\$7.90**

Order Total: **\$31.60**

Feedback

Timestamp	Message
03-20-2019 14:07:18	LABEL REPRINTED
03-20-2019 14:05:57	LABEL PRINTED
03-20-2019 14:05:29	Getting Payment
03-20-2019 14:03:55	Setting Payment

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Account # 161958927

Label Details

Label Number:

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SCAN® Form: [9475703699300307998613](#)

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Acceptance Cutoff: [03/20/2019 4:30 PM](#)

Acceptance Time: [03/21/2019 8:04 AM](#)

Scheduled Date: [03/22/2019 11:59 PM](#)

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Return Address:

KRISTEN WHITE
EMPIRE TELECOM
16 ESQUIRE RD
N BILLERICA, MA 01862-2527
ne_sa_deliverable@empiretelecomm.com

Delivery Address:

CITY OF NEW HAVEN
HON. MAYOR TONI M. HARP
165 CHURCH ST
NEW HAVEN, CT 06510-2010

Package:

Ship Date: 03/20/19
Value: \$50.00
From: 01862

Service:

Priority Mail® 2-Day
Small Flat Rate Box
USPS Tracking®

Transaction Number: [459639077](#)

Transaction Type: Label

Payment Method: AMEX-1005

Payment Status: Account Charged

Postage Cost \$7.90
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Label Total: **\$7.90**

Order Total: **\$31.60**

Feedback

Timestamp	Message
03-20-2019 14:07:18	LABEL REPRINTED
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Tracking Number: 9405503699300453389737

Remove X

Expected Delivery by

SATURDAY

23

MARCH
2019 ⓘ

by

8:00pm ⓘ

Alert

March 23, 2019 at 9:32 am
Delivery Attempted - No Access to Delivery Location
NEW HAVEN, CT 06510

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All Below Updates

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Expected Delivery Updates ⓘ

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Day of Delivery Updates ⓘ

☐☐

Package Delivered ⓘ



Available for Pickup ⓘ



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Package In-Transit Updates ⓘ

Tracking History



March 23, 2019, 9:32 am

Delivery Attempted - No Access to Delivery Location

NEW HAVEN, CT 06510

We attempted to deliver your package at 9:32 am on March 23, 2019 in NEW HAVEN, CT 06510 but could not access the delivery location. We will redeliver on the next business day.

March 23, 2019, 8:58 am

Out for Delivery

NEW HAVEN, CT 06510

March 23, 2019, 8:48 am

Sorting Complete

NEW HAVEN, CT 06510

March 23, 2019, 7:41 am

Arrived at Post Office

NEW HAVEN, CT 06511

March 23, 2019, 4:06 am

Departed USPS Regional Facility

SPRINGFIELD MA NETWORK DISTRIBUTION CENTER

March 22, 2019, 2:00 pm

Arrived at USPS Regional Facility

SPRINGFIELD MA NETWORK DISTRIBUTION CENTER

March 22, 2019, 1:00 am

Arrived at USPS Regional Facility

SPRINGFIELD MA NETWORK DISTRIBUTION CENTER

Feedback

March 21, 2019, 11:02 pm
Departed USPS Regional Facility
NASHUA NH DISTRIBUTION CENTER

March 21, 2019, 6:58 pm
Arrived at USPS Regional Origin Facility
NASHUA NH DISTRIBUTION CENTER

March 21, 2019, 9:19 am
Arrived at USPS Origin Facility
NORTH BILLERICA, MA 01862

March 21, 2019, 8:04 am
Accepted at USPS Origin Facility
NORTH BILLERICA, MA 01862

March 20, 2019
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Acceptance Time: [03/21/2019 8:04 AM](#)

Scheduled Date: [03/22/2019 11:59 PM](#)

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EMPIRE TELECOM
16 ESQUIRE RD
N BILLERICA, MA 01862-2527
ne_sa_deliverable@empiretelecomm.com

Delivery Address:

CITY OF NEW HAVEN
MICHAEL PISCITELLI, CITY PLANNING
DEPARTMENT
165 CHURCH ST
NEW HAVEN, CT 06510-2010

Package:

Ship Date: 03/20/19
Value: \$50.00
From: 01862

Service:

Priority Mail® 2-Day
Small Flat Rate Box
USPS Tracking®

Transaction Number: [459639077](#)

Transaction Type: Label

Payment Method: AMEX-1005

Payment Status: Account Charged

Postage Cost \$7.90
USPS Tracking® Free

Label Total: **\$7.90**

Order Total: **\$31.60**

Feedback

Timestamp	Message
03-20-2019 14:07:18	LABEL REPRINTED
03-20-2019 14:05:56	LABEL PRINTED
03-20-2019 14:05:29	Getting Payment
03-20-2019 14:03:55	Setting Payment

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Track Another Package +

Tracking Number: 9405503699300453389744

Remove X

Expected Delivery by

SATURDAY

23

MARCH
2019 ⓘ

by

8:00pm ⓘ

Alert

March 23, 2019 at 9:32 am
Delivery Attempted - No Access to Delivery Location
NEW HAVEN, CT 06510

Get Updates ✓

Feedback

Text & Email Updates



Tracking History



March 23, 2019, 9:32 am

Delivery Attempted - No Access to Delivery Location
NEW HAVEN, CT 06510

We attempted to deliver your package at 9:32 am on March 23, 2019 in NEW HAVEN, CT 06510 but could not access the delivery location. We will redeliver on the next business day.

March 23, 2019, 8:58 am

Out for Delivery
NEW HAVEN, CT 06510

March 23, 2019, 8:48 am

Sorting Complete

NEW HAVEN, CT 06510

March 23, 2019, 7:40 am

Arrived at Post Office

NEW HAVEN, CT 06511

March 23, 2019, 4:06 am

Departed USPS Regional Facility

SPRINGFIELD MA NETWORK DISTRIBUTION CENTER

March 22, 2019, 2:00 pm

Arrived at USPS Regional Facility

SPRINGFIELD MA NETWORK DISTRIBUTION CENTER

March 22, 2019, 1:00 am

Arrived at USPS Regional Facility

SPRINGFIELD MA NETWORK DISTRIBUTION CENTER

March 21, 2019, 11:02 pm

Departed USPS Regional Facility

NASHUA NH DISTRIBUTION CENTER

March 21, 2019, 6:56 pm

Arrived at USPS Regional Origin Facility

NASHUA NH DISTRIBUTION CENTER

March 21, 2019, 9:19 am

Arrived at USPS Origin Facility

NORTH BILLERICA, MA 01862

March 21, 2019, 8:04 am

Accepted at USPS Origin Facility

NORTH BILLERICA, MA 01862

March 20, 2019

Pre-Shipment Info Sent to USPS, USPS Awaiting Item

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