

**JULIE D. KOHLER**

PLEASE REPLY TO: [Bridgeport](mailto:Bridgeport)  
WRITER'S DIRECT DIAL: (203) 337-4157  
E-Mail Address: [jkohler@cohenandwolf.com](mailto:jkohler@cohenandwolf.com)

March 20, 2015

Attorney Melanie Bachman  
Acting Executive Director  
Connecticut Siting Council  
Ten Franklin Square  
New Britain, CT 06051

**Re: Notice of Exempt Modification  
Town of Burlington/MetroPCS equipment upgrade  
CTHA539A  
719 George Washington Turnpike, Burlington, CT**

Dear Attorney Bachman:

This office represents MetroPCS Massachusetts, LLC a Delaware limited liability company ("MetroPCS") and has been retained to file exempt modification filings with the Connecticut Siting Council on its behalf.

In this case, the Town of Burlington owns the existing monopole telecommunications tower and related facility at 719 George Washington Turnpike, Burlington, CT (41.766390/-72.96167). MetroPCS intends to replace three (3) existing antennas and add three (3) new antennas and related equipment at this existing telecommunications facility in Burlington ("Burlington Facility"). Please accept this letter as notification, pursuant to R.C.S.A. §16-50j-73, of construction which 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 First Selectman Theodore Shafer. The Town of Burlington is also the property owner.

The existing Burlington Facility consists of a 180 foot monopole tower.<sup>1</sup> MetroPCS plans to replace three (3) existing antennas and add three (3) antennas at a centerline of 175 feet. (See the plans revised to May 12, 2014 attached hereto as **Exhibit A**). MetroPCS will also install a battery backup unit, replace a Nortel cabinet with a 6201 ODE cabinet, install a 6x6' concrete pad within the lease area, install fiber cable, and reuse existing coax cables.

The existing Burlington Facility is structurally capable of supporting MetroPCS' proposed modifications, as indicated in the structural analysis dated October 8, 2014 and attached hereto as **Exhibit B**.<sup>2</sup>

<sup>1</sup> While the online docket for the Connecticut Siting Council does not provide a docket or petition number for approval of this structure, it does reference this structure in connection with a notices of intent captioned EM-VER-008-020-025-108-130-131-050315, TS-CING-020-050913, TS-CING-020-050913, EM-POCKET-020-080930, EM-VER-020-111202, EM-VER-020-111228, EM-AT&T-020-121001, EM-AT&T-020-140114.

<sup>2</sup> The tower owner has requested that the structural capacity of the Facility be brought below 80%. As evidenced in Exhibit B, MetroPCS is proposing a tower upgrade to accommodate this request.

March 11, 2015  
Site ID CTHA539A  
Page 2

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

1. The proposed modification will not increase the height of the tower. MetroPCS' existing antennas are at a centerline of 175 feet; the replacement antennas will be installed at the same 175 foot level. The enclosed tower drawing confirms that the proposed modification will not increase the height of the tower.

2. The proposed modifications will not require an extension on the site boundaries or lease area, as depicted on Sheet 2 of Exhibit A. MetroPCS' equipment will be located entirely within the existing compound area.

3. The proposed modification to the Facility will not increase the noise levels at the existing facility by six decibels or more.

4. The operation of the replacement and additional antennas will not increase the total radio frequency (RF) power density, measured at the base of the tower, to a level at or above the applicable standard. According to a Radio Frequency Emissions Analysis Report prepared by EBI dated September 11, 2014. MetroPCS' operations would add 0.365% of the FCC Standard. Therefore, the calculated "worst case" power density for the planned combined operation at the site including all of the proposed antennas would be 35.945% of the FCC Standard as calculated for a mixed frequency site as evidenced by the engineering exhibit attached hereto as **Exhibit C**.

For the foregoing reasons, MetroPCS respectfully submits that the proposed additional and replacement antennas and equipment at the Burlington Facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2). Upon acknowledgement of this exempt modification, MetroPCS shall commence construction approximately sixty days from the receipt of the Council's decision.

Sincerely,



Julie D. Kohler, Esq.

cc: Town of Burlington, First Selectman Theodore C. Shafer  
Sheldon J. Freinle, Northeast Site Solutions



T-MOBILE USA, INC.  
 12920 SE 38TH STREET  
 BELLEVUE, WA 98006  
 (425) 378-4000

3066920  
 3/16/2015  
 2000011160

Invoice Number	Inv. Date	Description	Deductions	Voucher	Amount Paid
CKKMB00410	3/11/2015	VK FILING FEES	0.00	1100430332	625.00

CTHA539A

DO NOT ACCEPT THIS CHECK UNLESS THE FACE FADES FROM BLACK TO RED WITH LOGO IN BACKGROUND. THE BACK OF THIS DOCUMENT HAS HEAT-SENSITIVE INK THAT CHANGES FROM ORANGE TO YELLOW.



T-MOBILE USA, INC.  
 12920 SE 38th Street  
 Bellevue, WA 98006  
 (425) 378-4000

The Bank of New York Mellon  
 Pittsburgh, PA  
 60160/433

3066920  
 3/16/2015  
 VID 2000011160

PAY **\$625.00**  
SIX TWO FIVE CTS CTS

**\*\$625.00**

\*\*\*Six Hundred Twenty Five Dollars Only\*\*\*\*\*

To The Order Of  
**CONNECTICUT SITING COUNCIL**  
 10 FRANKLIN SQ  
 NEW BRITAIN, CT 06051

VOID AFTER 180 DAYS  
 THIS CHECK CLEARS THROUGH POSITIVE PAY

*David [Signature]*

⑈0003066920⑈ ⑆043301601⑆ 013⑈8430⑈

THE ORIGINAL DOCUMENT HAS A REFLECTIVE WATERMARK ON THE BACK.

HOLD AT AN ANGLE TO VIEW, DO NOT CASH IF MISSING.

# **EXHIBIT A**





**KEY PLAN**

N.T.S.

CONFIGURATION

**5A**

SUBMITTALS	
LE REV A	05-12-14


**ATLANTIS GROUP**  
 1340 Centre Street  
 Suite 212  
 Newton, MA 02459  
 Office: 617-965-0789  
 Fax: 617-213-5056

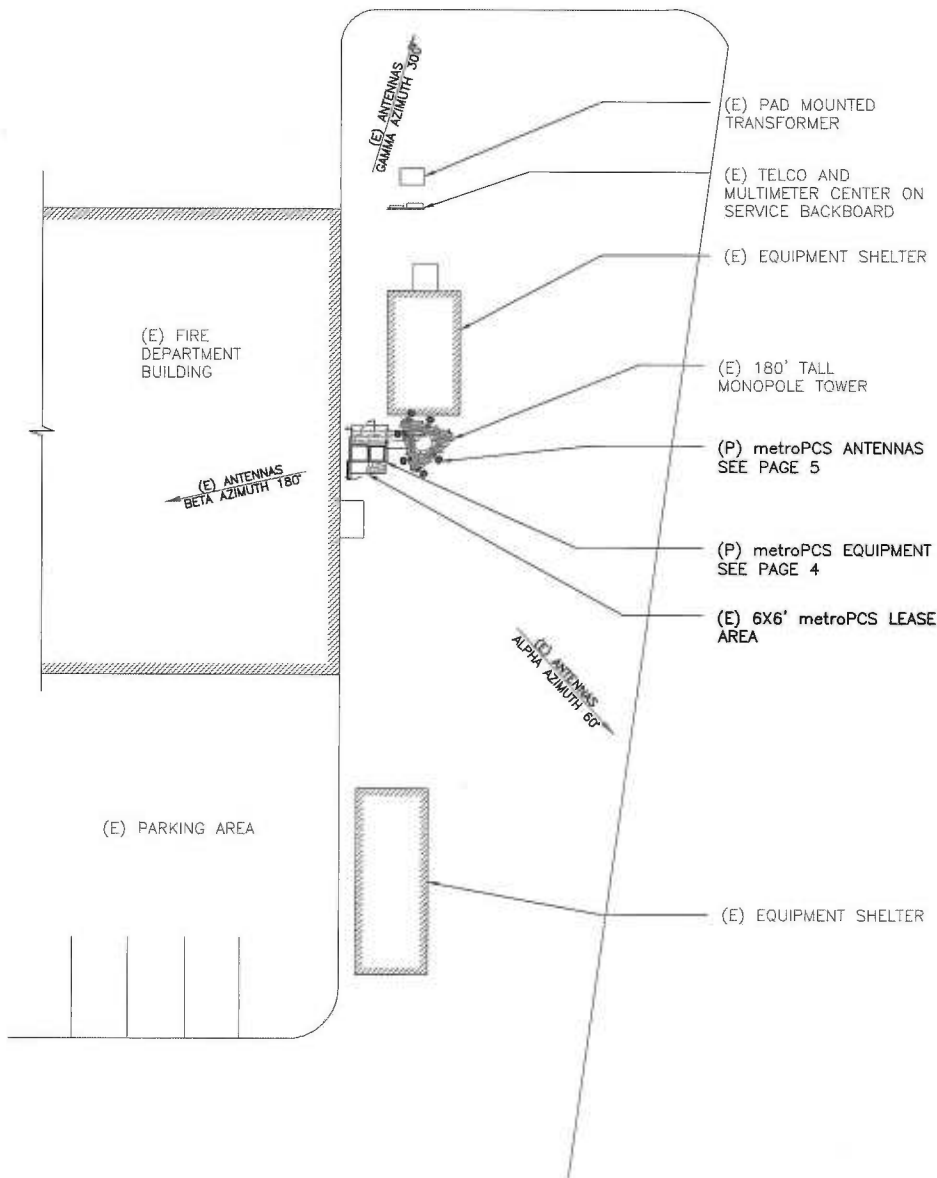
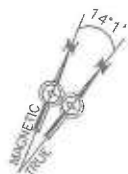
**LEASE EXHIBIT**  
 SITE NUMBER:  
 CTHA539A  
 SITE NAME:  
 BURLINGTON FIRE DEP. MONOPOLE  
 SITE ADDRESS:  
 719 GEORGE  
 WASHINGTON TPKE.  
 BURLINGTON, CT 06013

NORTHEAST SITE SOLUTIONS  
 54 MAIN STREET, UNIT 3  
 STURBRIDGE, MA 01566  
 (508) 434-5237  
 FOR  
  
 metroPCS WIRELESS, INC.  
 35 GRIFFIN ROAD SOUTH  
 BLOOMFIELD, CT 06002

DRAWN BY: MA

CHECKED BY: SM

GEORGE WASHINGTON TPKE



ALL EQUIPMENT LOCATIONS ARE APPROXIMATE AND ARE SUBJECT TO APPROVAL BY LESSEE/LICENSEE'S STRUCTURAL & RF ENGINEERS. LOCATIONS OF POWER & TELEPHONE FACILITIES ARE SUBJECT TO APPROVAL BY UTILITY COMPANIES.



SITE PLAN

SCALE: N. T.S.



CONFIGURATION

5A

SUBMITTALS		 <b>ATLANTIS GROUP</b> 1340 Centre Street Suite 212 Newton, MA 02459 Office: 617-965-0789 Fax: 617-213-5056	<b>LEASE EXHIBIT</b> SITE NUMBER: CTHA539A SITE NAME: BURLINGTON FIRE DEP. MONOPOLE SITE ADDRESS: 719 GEORGE WASHINGTON TPKE. BURLINGTON, CT 06013	NORTHEAST SITE SOLUTIONS 54 MAIN STREET, UNIT 3 STURBRIDGE, MA 01566 (508) 434-5237 FOR  metroPCS WIRELESS, INC. 35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002
LE REV A	05-12-14			

DRAWN BY: MA

CHECKED BY: SM

PAGE 2 OF 5

(P) UMTS QUAD POLE ANTENNA  
TO REPLACE  
(E) CDMA/EVDO/LTE DUAL POLE ANTENNA  
(TYP 1/SECTOR, TOTAL OF 3)

(P) LTE QUAD POLE ANTENNA  
ON (P) MAST  
(TYP 1/SECTOR, TOTAL OF 3)

(P) (1) 1-5/8" FIBER CABLE  
(E) (6) 7/8" COAX CABLE  
TO REMAIN INSIDE MONOPOLE

(E) 180'-0" TALL  
MONOPOLE TOWER

(P) BBU UNIT  
(P) 6201 ODE CABINET  
TO REPLACE  
(E) NORTEL CABINET

(E) FIRE  
DEPARTMENT  
BUILDING

(P) 6'x6' CONC. PAD WITHIN  
(E) 6'x6' LEASE AREA

(E) FIRE DEPARTMENT  
WHIP ANTENNA

TOP OF (E) MONOPOLE TOWER  
ELEV. = 180'-0"± (AGL)

RAD CENTER OF (P) metroPCS ANTENNAS  
ELEV. = 175'-0"± (AGL)

RAD CENTER OF (E) ANTENNAS  
ELEV. = 170'-0"± (AGL)

RAD CENTER OF (E) ANTENNAS  
ELEV. = 160'-0"± (AGL)

RAD CENTER OF (E) ANTENNAS  
ELEV. = 147'-0"± (AGL)

RAD CENTER OF (E) ANTENNAS  
ELEV. = 123'-0"± (AGL)

(E) EQUIPMENT  
SHELTER ON  
CONCRETE PAD

ELEVATION

N.T.S.

1  
LE-3

CONFIGURATION

5A

SUBMITTALS

LE REV A	05-12-14

**ATLANTIS  
GROUP**  
1340 Centre Street  
Suite 212  
Newton, MA 02459  
Office: 617-965-0789  
Fax: 617-213-5056

LEASE EXHIBIT

SITE NUMBER:  
CTHA539A  
SITE NAME:  
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719 GEORGE  
WASHINGTON TPKE.  
BURLINGTON, CT 06013

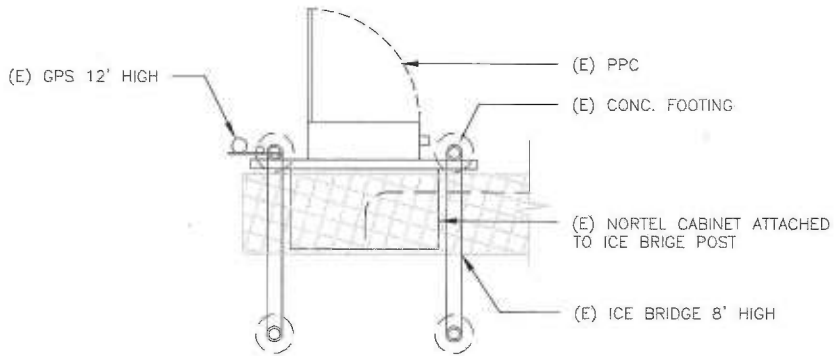
NORTHEAST SITE SOLUTIONS  
54 MAIN STREET, UNIT 3  
STURBRIDGE, MA 01566  
(508) 434-5237

FOR  
**metroPCS.**  
metroPCS WIRELESS, INC.  
35 GRIFFIN ROAD SOUTH  
BLOOMFIELD, CT 06002

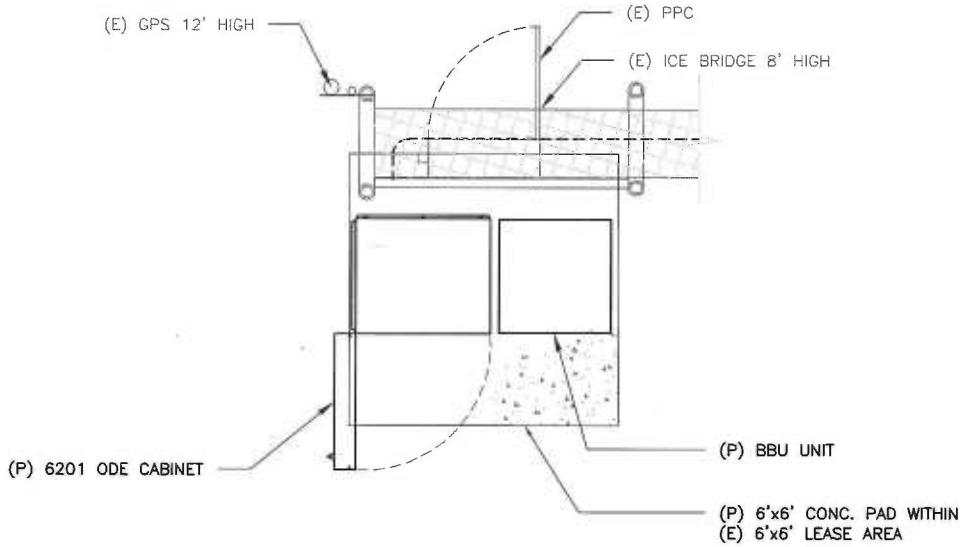
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PAGE 3 OF 5



EXISTING EQUIPMENT



PROPOSED EQUIPMENT

CONFIGURATION

**5A**

SUBMITTALS	
LE REV A	05-12-14

**ATLANTIS GROUP**  
 1340 Centre Street  
 Suite 212  
 Newton, MA 02459  
 Office: 617-965-0789  
 Fax: 617-213-5056

**LEASE EXHIBIT**  
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 54 MAIN STREET, UNIT 3  
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 (508) 434-5237

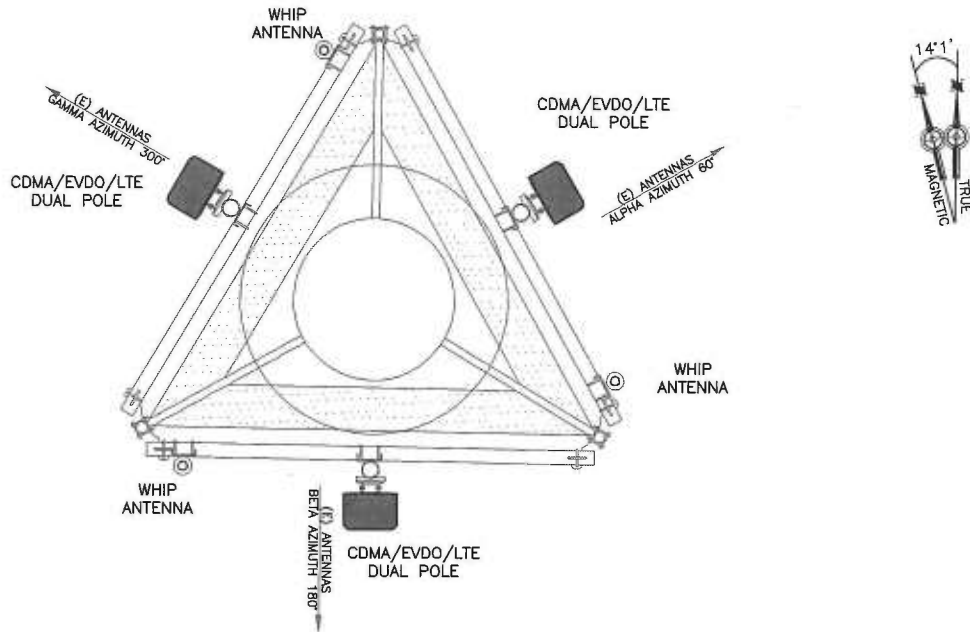
FOR  
**metroPCS.**  
 metroPCS WIRELESS, INC.  
 35 GRIFFIN ROAD SOUTH  
 BLOOMFIELD, CT 06002

DRAWN BY: MA

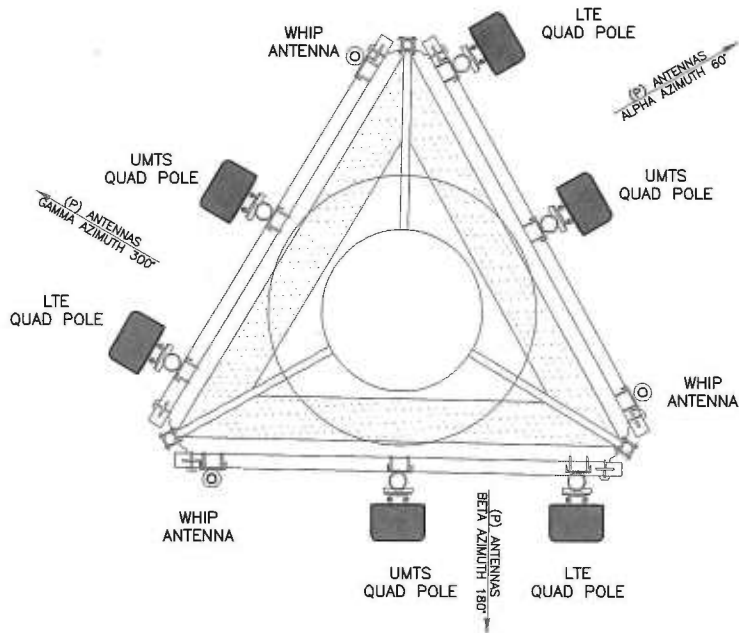
CHECKED BY: SM

PAGE 4 OF 5





EXISTING ANTENNA CONFIGURATION



PROPOSED ANTENNA CONFIGURATION

CONFIGURATION

5A

SUBMITTALS	
LE REV A	05-12-14

**ATLANTIS GROUP**  
 1340 Centre Street  
 Suite 212  
 Newton, MA 02459  
 Office: 617-965-0789  
 Fax: 617-213-5056

**LEASE EXHIBIT**  
 SITE NUMBER:  
 CTHA539A  
 SITE NAME:  
 BURLINGTON FIRE DEP. MONOPOLE  
 SITE ADDRESS:  
 719 GEORGE  
 WASHINGTON TPKE.  
 BURLINGTON, CT 06013

NORTHEAST SITE SOLUTIONS  
 54 MAIN STREET, UNIT 3  
 STURBRIDGE, MA 01566  
 (508) 434-5237  
 FOR **metroPCS.**  
 metroPCS WIRELESS, INC.  
 35 GRIFFIN ROAD SOUTH  
 BLOOMFIELD, CT 06002

# **EXHIBIT B**

**STRUCTURAL ANALYSIS REPORT – UPGRADE  
MONOPOLE**



Prepared For:



**35 Griffin Road South  
Bloomfield, CT 06002**



**Monopole Rating**

**Monopole: Pass (78.4 %)**  
**Foundation: Pass**

Sincerely,  
Atlantis Group, Inc.  
10-8-2014



Ahmet Colakoglu, PE  
CT Professional Engineer  
License No: 27057

**Site ID: CTHA539A**  
**Site Name: Burlington Fire Dep., Monopole**  
**719 George Washington TPKE.**  
**Burlington, CT 06013**

October 8, 2014

Prepared By:  
Atlantis Group, Inc.  
1340 Centre Street, Suite 212  
Newton, Massachusetts 02459  
Phone: 617-965-0789, Fax: 617-213-3123

**CONTENTS**

1.0 – SUBJECT AND REFERENCES

2.0 – PROPOSED ADDITION

3.0 - CODES AND LOADING

4.0 - STANDARD CONDITIONS FOR ENGINEERING SERVICES ON EXISTING STRUCTURES

5.0 - ANALYSIS AND ASSUMPTIONS

6.0 – RESULTS AND CONCLUSION

## APPENDICES

A – CALCULATIONS



**1.0 SUBJECT AND REFERENCES**

The purpose of this analysis is to evaluate and bring down the structural capacity of the existing 179 feet tall monopole, located at 719 George Washington Tpke., Burlington, CT 06013, below 80% passing for the additions and alterations proposed by MetroPCS.

The structural analysis of the site is based on the following documents provided to us:

1. Structural Analysis Report prepared by Hudson Design Group LLC, dated 09/26/2012.
2. Existing and proposed antenna information provided by MetroPCS.

**1.1 STRUCTURE**

The structure is a 179 feet high, 18-sided monopole, which is attached to the foundation with a base plate and anchor bolts. It is formed by the following sections:

SECTION LENGTH (FEET)	LAP SPLICE (IN)	SHAFT THICKNESS (IN)	TOP DIAMETER (IN)	BOTTOM DIAMETER (IN)	YIELD STRENGTH (KSI)
39.83	0.00	0.1875	19.69	28.04	65
45.96	0.00	0.2500	28.04	37.65	65
47.00	0.00	0.3750	37.65	47.10	65
46.21	-	0.3750	47.10	57.50	65

**2.0 PROPOSED CONFIGURATION**

**Antennas and Appurtenances:**

**Existing Configuration of MetroPCS Appurtenances:**

SECTOR	RAD CENTER (FT)	ANTENNA & TMA		MOUNT	*FEED LINES
ALPHA	175	CDMA/EVDO/LTE	(1) APXV18-206517S	(1) Low Profile Platform	(2) 7/8"
BETA	175	CDMA/EVDO/LTE	(1) APXV18-206517S	(1) Low Profile Platform	(2) 7/8"
GAMMA	175	CDMA/EVDO/LTE	(1) APXV18-206517S	(1) Low Profile Platform	(2) 7/8"

\*Feedlines Inside monopole shaft.

**Proposed & Final Configuration of MetroPCS Appurtenances:**

SECTOR	RAD CENTER (FT)	ANTENNA & TMA		MOUNT	*FEED LINES
ALPHA	175	UMTS Antenna LTE Antenna	(1) AIR21 B2A/B4P (1) AIR21 B4A/B2P	(1) Low Profile Platform	(1) New 1-5/8" Fiber Cable + (6) Existing 7/8"
BETA	175	UMTS Antenna LTE Antenna	(1) AIR21 B2A/B4P (1) AIR21 B4A/B2P	(1) Low Profile Platform	
GAMMA	175	UMTS Antenna LTE Antenna	(1) AIR21 B2A/B4P (1) AIR21 B4A/B2P	(1) Low Profile Platform	

\*Feedlines Inside monopole shaft.

**Existing and Remaining Appurtenances by Others:**

<b>RAD CENTER (FT) CARRIER</b>	<b>ANTENNA &amp; TMA</b>	<b>MOUNT</b>	<b>*FEED LINES</b>
182.1	(1) Lightning Rod	-	-
191.5	(3) 20' Omni	-	-
170 AT&T	(6) Powerwave 7770 Antenna (6) LGP 21400 TMAs (6) LGP 13519 (3) P65-17-XLH-RR Antenna (6) RRH (1) DC6-48-60-18-8F	(1) Low Profile Platform	(12) 1-5/8" + (1) Fiber Cable + (2) DC Power Cables
160	(6) APL 866513 Antenna (3) BXA 171063 Antenna (3) BXA 70063 Antenna (6) FD9R6004 Diplexers	(1) Low Profile Platform	(12) 1-5/8" (Inside Shaft)
138.6	20' Dipole	(1) 6' Standoff Mount	(1) 1-5/8"
132.5	8' Omni	(1) 6' Standoff Mount	(1) 1-5/8"
128.5	3' Yagi	(1) 6' Standoff Mount	(1) 1/2"
112.7	10' Dipole	(1) 6' Standoff Mount	(1) 1-5/8"

\*Feedlines Inside monopole shaft.

### 3.0 CODES AND LOADING

The monopole was analyzed per ANSI/TIA-222-F as referenced by the 2005 Connecticut Building Code with 2011 Supplement, which is the adopted building code in the county. The following wind loading was used in compliance with the standard for Hartford County, CT.

- Basic wind speed 80 mph (W) without ice.
- Basic wind speed 69.3 mph ( $W_i$ ) with 1/2" radial and escalating ice.

The following load combinations were used with wind blowing at 0°, 60° and 90°, measured from a line normal to the face of the monopole.

- D + W
- D +  $W_i$  + I

D: Dead Load of structure and appurtenances

W: Wind Load, without ice

W<sub>i</sub>: Wind Load, with ice  
I: Ice Gravity Load

#### 4.0 **STANDARD CONDITIONS FOR ENGINEERING SERVICES ON EXISTING STRUCTURES**

The analysis is based on the information provided to Atlantis Group and is assumed to be current and correct. Unless otherwise noted, the structure and the foundation system are assumed to be in good condition, free of defects and can achieve theoretical strength.

It is assumed that the structure has been maintained and shall be maintained during its service. The superstructure and the foundation system are assumed to be designed with proper engineering practice and fabricated, constructed and erected in accordance with the design documents. Atlantis Group will accept no liability which may arise due to any existing deficiency in design, material, fabrication, erection, construction, etc. or lack of maintenance. Contractor should inspect the condition of the existing structure, mounts and connections and notify Atlantis Group for any discrepancies and deficiencies before proceeding with the construction.

The analysis does not include a qualification of the mounts attached on the structure or their connections. The analysis is performed to verify the capacity of the main structural members, which is the current practice in the tower industry.

The evaluation results presented in this report are only applicable for the previously mentioned existing and proposed additions and alterations. Any deviation of the proposed equipment and placement, etc., will require Atlantis Group to generate an additional structural evaluation.

#### 5.0 **ANALYSIS and ASSUMPTIONS**

The monopole was analyzed by utilizing *tnxTower*, a non-linear 3-Dimensional finite element software, a product of Tower Numerics, Inc. Software output for this analysis is provided in Appendix-A of this report.



**6.0 RESULTS and CONCLUSION**

The existing monopole **will have adequate** structural capacity for the proposed loading by MetroPCS once it is upgraded per Atlantis Drawings dated 10/08/2014. For the aforementioned load combinations and as a maximum, the monopole shaft will be stressed to **78.4%** of capacity.

The base plate, anchor rods and the foundation system were assumed to be designed to have at least the capacity of the main structure, hence have adequate structural strength.

**Reactions:**

<b>Maximums</b>	<b>Hudson Analysis</b>	<b>Atlantis Analysis</b>
Base Shear (kips)	24.1	24.7
Base Compression (kip)	36.5	53.5
Base Moment (kip*ft)	3041	3188

Therefore, the proposed additions and alterations by MetroPCS can be implemented as intended with the conditions outlined in this report.

Should you have any questions or need any clarifications about this report, please contact Ahmet Colakoglu at (617) 965-0789.

Sincerely,  
Atlantis Group, Inc.  
10-8-2014

Ahmet Colakoglu, PE  
CT Professional Engineer  
License No: 27057



**APPENDIX A  
CALCULATIONS**



# 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	179 - 174	5		18	19.690	20.738	0.1875	A572-65	1.000
2	174 - 169	5		18	20.738	21.786	0.1875	A572-65	1.000
3	169 - 164	5		18	21.786	22.835	0.1875	A572-65	1.000
4	164 - 159	5		18	22.835	23.883	0.1875	A572-65	1.000
5	159 - 154	5		18	23.883	24.931	0.1875	A572-65	1.000
6	154 - 149	5		18	24.931	25.979	0.1875	A572-65	1.000
7	149 - 144.71	4.29		18	25.979	26.879	0.1875	A572-65	1.000
8	144.71 - 144.46	0.25		18	26.879	26.931	0.36875	A572-65	0.946
9	144.46 - 139.46	5		18	26.931	27.979	0.3625	A572-65	0.945
10	139.46 - 139.17	0.29	0	18	27.979	28.040	0.3625	A572-65	0.944
11	139.17 - 134.17	5		18	28.040	29.085	0.41875	A572-65	0.955
12	134.17 - 129.17	5		18	29.085	30.131	0.4125	A572-65	0.956
13	129.17 - 124.71	4.46		18	30.131	31.064	0.40625	A572-65	0.960
14	124.71 - 124.46	0.25		18	31.064	31.116	0.5625	A572-65	0.944
15	124.46 - 119.46	5		18	31.116	32.161	0.55	A572-65	0.948
16	119.46 - 114.46	5		18	32.161	33.207	0.5375	A572-65	0.954
17	114.46 - 109.46	5		18	33.207	34.252	0.53125	A572-65	0.949
18	109.46 - 104.46	5		18	34.252	35.298	0.525	A572-65	0.946
19	104.46 - 99.46	5		18	35.298	36.343	0.5125	A572-65	0.955
20	99.46 - 94.46	5		18	36.343	37.389	0.5	A572-65	0.965
21	94.46 - 93.21	1.25	0	18	37.389	37.650	0.5	A572-65	0.961
22	93.21 - 92.71	0.5		18	37.650	37.751	0.625	A572-65	0.971
23	92.71 - 92.46	0.25		18	37.751	37.801	0.375	A572-65	1.000
24	92.46 - 87.46	5		18	37.801	38.806	0.375	A572-65	1.000
25	87.46 - 82.46	5		18	38.806	39.811	0.375	A572-65	1.000
26	82.46 - 77.46	5		18	39.811	40.817	0.375	A572-65	1.000
27	77.46 - 72.46	5		18	40.817	41.822	0.375	A572-65	1.000
28	72.46 - 67.46	5		18	41.822	42.827	0.375	A572-65	1.000
29	67.46 - 62.46	5		18	42.827	43.833	0.375	A572-65	1.000
30	62.46 - 57.46	5		18	43.833	44.838	0.375	A572-65	1.000
31	57.46 - 52.46	5		18	44.838	45.843	0.375	A572-65	1.000
32	52.46 - 47.46	5		18	45.843	46.849	0.375	A572-65	1.000
33	47.46 - 46.21	1.25	0	18	46.819	47.100	0.375	A572-65	1.000
34	46.21 - 41.21	5		18	47.100	48.225	0.375	A572-65	1.000
35	41.21 - 36.21	5		18	48.225	49.351	0.375	A572-65	1.000
36	36.21 - 31.21	5		18	49.351	50.476	0.375	A572-65	1.000
37	31.21 - 26.21	5		18	50.476	51.601	0.375	A572-65	1.000
38	26.21 - 21.21	5		18	51.601	52.726	0.375	A572-65	1.000
39	21.21 - 16.21	5		18	52.726	53.852	0.375	A572-65	1.000
40	16.21 - 11.21	5		18	53.852	54.977	0.375	A572-65	1.000
41	11.21 - 6.21	5		18	54.977	56.102	0.375	A572-65	1.000
42	6.21 - 1.21	5		18	56.102	57.228	0.375	A572-65	1.000
43	1.21 - 0	1.21		18	57.228	57.500	0.375	A572-65	1.000



## TNX Section Forces

Increment (ft):		5	TNX Output		
	Section Height (ft)	$P_u$ (K)	$M_{ux}$ (kip-ft)	$V_u$ (K)	
1	179 - 174	6.3386	18.658	3.4994	
2	174 - 169	8.1151	39.397	6.9042	
3	169 - 164	8.4146	79.914	8.9525	
4	164 - 159	8.7215	125.37	9.2371	
5	159 - 154	10.72	185.84	13.161	
6	154 - 149	11.145	252.32	13.445	
7	149 - 144.71	11.527	310.49	13.688	
8	144.71 - 144.46	11.566	313.92	13.757	
9	144.46 - 139.46	12.216	383.22	14.036	
10	139.46 - 139.17	12.258	387.29	14.094	
11	139.17 - 134.17	13.045	460.26	14.743	
12	134.17 - 129.17	13.84	534.92	15.13	
13	129.17 - 124.71	14.689	605.01	15.948	
14	124.71 - 124.46	14.745	609.01	16.054	
15	124.46 - 119.46	15.78	689.75	16.354	
16	119.46 - 114.46	16.835	772.44	16.742	
17	114.46 - 109.46	17.921	857.71	17.29	
18	109.46 - 104.46	19.071	946.01	17.878	
19	104.46 - 99.46	20.183	1036.3	18.268	
20	99.46 - 94.46	21.314	1128.6	18.656	
21	94.46 - 93.21	21.598	1151.9	18.753	
22	93.21 - 92.71	21.742	1161.3	18.811	
23	92.71 - 92.46	21.79	1166	18.862	
24	92.46 - 87.46	22.756	1260.9	19.169	
25	87.46 - 82.46	23.75	1357.6	19.523	
26	82.46 - 77.46	24.767	1456	19.874	
27	77.46 - 72.46	25.807	1556.2	20.222	
28	72.46 - 67.46	26.869	1658.1	20.566	
29	67.46 - 62.46	27.953	1761.7	20.906	
30	62.46 - 57.46	29.06	1867	21.239	
31	57.46 - 52.46	30.189	1974	21.566	
32	52.46 - 47.46	31.34	2082.6	21.885	
33	47.46 - 46.21	31.629	2110	21.966	
34	46.21 - 41.21	32.811	2220.5	22.272	
35	41.21 - 36.21	34.014	2332.5	22.571	
36	36.21 - 31.21	35.241	2446	22.859	
37	31.21 - 26.21	36.492	2561	23.148	
38	26.21 - 21.21	37.766	2677.4	23.441	
39	21.21 - 16.21	39.1	2795.3	23.7	
40	16.21 - 11.21	40.4	2914.7	24.0	
41	11.21 - 6.21	41.6	3035.6	24.3	
42	6.21 - 1.21	42.9	3158.0	24.6	
43	1.21 - 0	43.2	3187.8	24.7	

## Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
179 - 174	Pole	TP20.738x19.69x0.1875	Pole	7.9%	Pass
174 - 169	Pole	TP21.786x20.738x0.1875	Pole	14.5%	Pass
169 - 164	Pole	TP22.835x21.786x0.1875	Pole	25.7%	Pass
164 - 159	Pole	TP23.883x22.835x0.1875	Pole	36.3%	Pass
159 - 154	Pole	TP24.931x23.883x0.1875	Pole	49.1%	Pass
154 - 149	Pole	TP25.979x24.931x0.1875	Pole	60.9%	Pass
149 - 144.71	Pole	TP26.879x25.979x0.1875	Pole	69.8%	Pass
144.71 - 144.46	Pole + Reinf.	TP26.931x26.879x0.3688	Reinf. 1 Bolt-Shaft Bearing	52.9%	Pass
144.46 - 139.46	Pole + Reinf.	TP27.979x26.931x0.3625	Reinf. 1 Compression	57.7%	Pass
139.46 - 139.17	Pole + Reinf.	TP28.04x27.979x0.3625	Reinf. 1 Compression	58.3%	Pass
139.17 - 134.17	Pole + Reinf.	TP29.085x28.04x0.4188	Reinf. 1 Compression	55.4%	Pass
134.17 - 129.17	Pole + Reinf.	TP30.131x29.085x0.4125	Reinf. 1 Compression	61.0%	Pass
129.17 - 124.71	Pole + Reinf.	TP31.064x30.131x0.4063	Reinf. 1 Compression	65.3%	Pass
124.71 - 124.46	Pole + Reinf.	TP31.116x31.064x0.5625	Reinf. 2 Compression	48.0%	Pass
124.46 - 119.46	Pole + Reinf.	TP32.161x31.116x0.55	Reinf. 2 Compression	51.6%	Pass
119.46 - 114.46	Pole + Reinf.	TP33.207x32.161x0.5375	Reinf. 2 Compression	55.3%	Pass
114.46 - 109.46	Pole + Reinf.	TP34.252x33.207x0.5313	Reinf. 2 Compression	58.6%	Pass
109.46 - 104.46	Pole + Reinf.	TP35.298x34.252x0.525	Reinf. 2 Compression	61.6%	Pass
104.46 - 99.46	Pole + Reinf.	TP36.343x35.298x0.5125	Reinf. 2 Compression	64.6%	Pass
99.46 - 94.46	Pole + Reinf.	TP37.389x36.343x0.5	Reinf. 2 Compression	67.6%	Pass
94.46 - 93.21	Pole + Reinf.	TP37.65x37.389x0.5	Reinf. 2 Compression	68.3%	Pass
93.21 - 92.71	Pole + Reinf.	TP37.751x37.65x0.625	Reinf. 2 Compression	54.8%	Pass
92.71 - 92.46	Pole	TP37.801x37.751x0.375	Pole	66.5%	Pass
92.46 - 87.46	Pole	TP38.806x37.801x0.375	Pole	68.1%	Pass
87.46 - 82.46	Pole	TP39.811x38.806x0.375	Pole	69.6%	Pass
82.46 - 77.46	Pole	TP40.817x39.811x0.375	Pole	71.0%	Pass
77.46 - 72.46	Pole	TP41.822x40.817x0.375	Pole	72.2%	Pass
72.46 - 67.46	Pole	TP42.827x41.822x0.375	Pole	73.3%	Pass
67.46 - 62.46	Pole	TP43.833x42.827x0.375	Pole	74.4%	Pass
62.46 - 57.46	Pole	TP44.838x43.833x0.375	Pole	75.3%	Pass
57.46 - 52.46	Pole	TP45.843x44.838x0.375	Pole	76.1%	Pass
52.46 - 47.46	Pole	TP46.849x45.843x0.375	Pole	76.8%	Pass
47.46 - 46.21	Pole	TP47.1x46.819x0.375	Pole	77.0%	Pass
46.21 - 41.21	Pole	TP48.225x47.1x0.375	Pole	77.3%	Pass
41.21 - 36.21	Pole	TP49.351x48.225x0.375	Pole	77.5%	Pass
36.21 - 31.21	Pole	TP50.476x49.351x0.375	Pole	77.6%	Pass
31.21 - 26.21	Pole	TP51.601x50.476x0.375	Pole	77.8%	Pass
26.21 - 21.21	Pole	TP52.726x51.601x0.375	Pole	77.8%	Pass
21.21 - 16.21	Pole	TP53.852x52.726x0.375	Pole	77.9%	Pass
16.21 - 11.21	Pole	TP54.977x53.852x0.375	Pole	77.9%	Pass
11.21 - 6.21	Pole	TP56.102x54.977x0.375	Pole	77.9%	Pass
6.21 - 1.21	Pole	TP57.228x56.102x0.375	Pole	78.3%	Pass
1.21 - 0	Pole	TP57.5x57.228x0.375	Pole	78.4%	Pass
				Summary	
			Pole	78.4%	Pass
			Reinforcement	68.3%	Pass
			Overall	78.4%	Pass

## Additional Calculations

Section Elevation (ft)	Moment of Inertia (in <sup>4</sup> )			Area (in <sup>2</sup> )			% Capacity	Axial (kips)	
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1	R2
179 - 174	652	n/a	652	12.23	n/a	12.23	7.9%		
174 - 169	757	n/a	757	12.85	n/a	12.85	14.5%		
169 - 164	873	n/a	873	13.48	n/a	13.48	25.7%		
164 - 159	1000	n/a	1000	14.10	n/a	14.10	36.3%		
159 - 154	1139	n/a	1139	14.72	n/a	14.72	49.1%		
154 - 149	1290	n/a	1290	15.35	n/a	15.35	60.9%		
149 - 144.71	1429	n/a	1429	15.88	n/a	15.88	69.8%		
144.71 - 144.46	1438	1328	2766	15.92	13.50	29.42	36.1%	87.4	
144.46 - 139.46	1613	1429	3042	16.54	13.50	30.04	42.0%	100.4	
139.46 - 139.17	1624	1435	3059	16.58	13.50	30.08	41.9%	101.1	
139.17 - 134.17	2403	1539	3942	22.88	13.50	36.38	40.4%	96.5	
134.17 - 129.17	2674	1647	4321	23.71	13.50	37.21	43.8%	105.7	
129.17 - 124.71	2932	1747	4679	24.45	13.50	37.95	47.7%	113.7	
124.71 - 124.46	2947	3505	6452	24.49	27.00	51.49	34.5%	83.1	83.1
124.46 - 119.46	3257	3735	6992	25.32	27.00	52.32	37.7%	89.7	89.7
119.46 - 114.46	3587	3973	7560	26.15	27.00	53.15	39.8%	95.8	95.8
114.46 - 109.46	3940	4218	8158	26.98	27.00	53.98	42.3%	101.6	101.6
109.46 - 104.46	4314	4471	8785	27.81	27.00	54.81	45.1%	107.1	107.1
104.46 - 99.46	4712	4730	9442	28.64	27.00	55.64	47.4%	112.3	112.3
99.46 - 94.46	5133	4998	10131	29.47	27.00	56.47	48.9%	117.2	117.2
94.46 - 93.21	5243	5066	10308	29.68	27.00	56.68	49.4%	118.3	118.3
93.21 - 92.71	7849	5092	12940	44.48	27.00	71.48	40.2%	95.3	95.3
92.71 - 92.46	7880	n/a	7880	44.54	n/a	44.54	66.5%		
92.46 - 87.46	8532	n/a	8532	45.74	n/a	45.74	68.1%		
87.46 - 82.46	9220	n/a	9220	46.94	n/a	46.94	69.6%		
82.46 - 77.46	9943	n/a	9943	48.13	n/a	48.13	71.0%		
77.46 - 72.46	10703	n/a	10703	49.33	n/a	49.33	72.2%		
72.46 - 67.46	11501	n/a	11501	50.53	n/a	50.53	73.3%		
67.46 - 62.46	12337	n/a	12337	51.72	n/a	51.72	74.4%		
62.46 - 57.46	13213	n/a	13213	52.92	n/a	52.92	75.3%		
57.46 - 52.46	14130	n/a	14130	54.12	n/a	54.12	76.1%		
52.46 - 47.46	15088	n/a	15088	55.31	n/a	55.31	76.8%		
47.46 - 46.21	15334	n/a	15334	55.61	n/a	55.61	77.0%		
46.21 - 41.21	16469	n/a	16469	56.95	n/a	56.95	77.3%		
41.21 - 36.21	17659	n/a	17659	58.29	n/a	58.29	77.5%		
36.21 - 31.21	18904	n/a	18904	59.63	n/a	59.63	77.6%		
31.21 - 26.21	20207	n/a	20207	60.97	n/a	60.97	77.8%		
26.21 - 21.21	21568	n/a	21568	62.31	n/a	62.31	77.8%		
21.21 - 16.21	22989	n/a	22989	63.65	n/a	63.65	77.9%		
16.21 - 11.21	24471	n/a	24471	64.99	n/a	64.99	77.9%		
11.21 - 6.21	26015	n/a	26015	66.33	n/a	66.33	77.9%		
6.21 - 1.21	27623	n/a	27623	67.67	n/a	67.67	78.3%		
1.21 - 0	28022	n/a	28022	67.99	n/a	67.99	78.4%		

Note: Section capacity checked in 5 degree increments.





# 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	179 - 174	5		18	19.690	20.738	0.1875	A572-65	1.000
2	174 - 169	5		18	20.738	21.786	0.1875	A572-65	1.000
3	169 - 164	5		18	21.786	22.835	0.1875	A572-65	1.000
4	164 - 159	5		18	22.835	23.883	0.1875	A572-65	1.000
5	159 - 154	5		18	23.883	24.931	0.1875	A572-65	1.000
6	154 - 149	5		18	24.931	25.979	0.1875	A572-65	1.000
7	149 - 145	4		18	25.979	26.818	0.1875	A572-65	1.000
8	145 - 144.75	0.25		18	26.818	26.870	0.30625	A572-65	0.964
9	144.75 - 139.75	5		18	26.870	27.918	0.3	A572-65	0.970
10	139.75 - 139.17	0.58	0	18	27.918	28.040	0.3	A572-65	0.968
11	139.17 - 138.17	1		18	28.040	28.249	0.3625	A572-65	0.973
12	138.17 - 137.92	0.25		18	28.249	28.301	0.25	A572-65	1.000
13	137.92 - 132.92	5		18	28.301	29.347	0.25	A572-65	1.000
14	132.92 - 127.92	5		18	29.347	30.392	0.25	A572-65	1.000
15	127.92 - 125.17	2.75		18	30.392	30.967	0.25	A572-65	1.000
16	125.17 - 124.92	0.25		18	30.967	31.020	0.5625	A572-65	0.946
17	124.92 - 119.92	5		18	31.020	32.065	0.55	A572-65	0.950
18	119.92 - 114.92	5		18	32.065	33.111	0.5375	A572-65	0.955
19	114.92 - 109.92	5		18	33.111	34.156	0.53125	A572-65	0.951
20	109.92 - 104.92	5		18	34.156	35.201	0.525	A572-65	0.947
21	104.92 - 99.92	5		18	35.201	36.247	0.5125	A572-65	0.956
22	99.92 - 94.92	5		18	36.247	37.292	0.5	A572-65	0.966
23	94.92 - 93.21	1.71	0	18	37.292	37.650	0.5	A572-65	0.961
24	93.21 - 92.21	1		18	37.650	37.851	0.625	A572-65	0.970
25	92.21 - 91.96	0.25		18	37.851	37.901	0.375	A572-65	1.000
26	91.96 - 86.96	5		18	37.901	38.907	0.375	A572-65	1.000
27	86.96 - 81.96	5		18	38.907	39.912	0.375	A572-65	1.000
28	81.96 - 76.96	5		18	39.912	40.917	0.375	A572-65	1.000
29	76.96 - 71.96	5		18	40.917	41.923	0.375	A572-65	1.000
30	71.96 - 66.96	5		18	41.923	42.928	0.375	A572-65	1.000
31	66.96 - 61.96	5		18	42.928	43.933	0.375	A572-65	1.000
32	61.96 - 56.96	5		18	43.933	44.939	0.375	A572-65	1.000
33	56.96 - 51.96	5		18	44.939	45.944	0.375	A572-65	1.000
34	51.96 - 46.96	5		18	45.944	46.949	0.375	A572-65	1.000
35	46.96 - 46.21	0.75	0	18	46.931	47.100	0.375	A572-65	1.000
36	46.21 - 41.21	5		18	47.100	48.225	0.375	A572-65	1.000
37	41.21 - 36.21	5		18	48.225	49.351	0.375	A572-65	1.000
38	36.21 - 31.21	5		18	49.351	50.476	0.375	A572-65	1.000
39	31.21 - 26.21	5		18	50.476	51.601	0.375	A572-65	1.000
40	26.21 - 21.21	5		18	51.601	52.726	0.375	A572-65	1.000
41	21.21 - 16.21	5		18	52.726	53.852	0.375	A572-65	1.000
42	16.21 - 11.21	5		18	53.852	54.977	0.375	A572-65	1.000
43	11.21 - 6.21	5		18	54.977	56.102	0.375	A572-65	1.000
44	6.21 - 1.21	5		18	56.102	57.228	0.375	A572-65	1.000
45	1.21 - 0	1.21		18	57.228	57.500	0.375	A572-65	1.000



## TNX Section Forces

Increment (ft):		TNX Output		
	5	P <sub>u</sub> (K)	M <sub>ux</sub> (kip-ft)	V <sub>u</sub> (K)
	Section Height (ft)			
1	179 - 174	6.3206	18.797	3.5324
2	174 - 169	8.0796	39.709	6.9463
3	169 - 164	8.3663	80.292	8.9982
4	164 - 159	8.6717	125.97	9.2844
5	159 - 154	10.649	186.71	13.218
6	154 - 149	11.073	253.48	13.505
7	149 - 145	11.428	307.92	13.733
8	145 - 144.75	11.463	311.36	13.806
9	144.75 - 139.75	12.044	380.86	14.07
10	139.75 - 139.17	12.115	389.02	14.114
11	139.17 - 138.17	12.279	403.66	14.514
12	138.17 - 137.92	12.31	407.29	14.577
13	137.92 - 132.92	12.87	480.67	14.84
14	132.92 - 127.92	13.55	556.02	15.481
15	127.92 - 125.17	13.937	599.44	15.862
16	125.17 - 124.92	13.999	603.41	15.973
17	124.92 - 119.92	15.033	683.72	16.267
18	119.92 - 114.92	16.086	765.97	16.656
19	114.92 - 109.92	17.171	850.74	17.205
20	109.92 - 104.92	18.318	938.53	17.794
21	104.92 - 99.92	19.43	1028.4	18.186
22	99.92 - 94.92	20.558	1120.3	18.576
23	94.92 - 93.21	20.945	1152.1	18.71
24	93.21 - 92.21	21.228	1170.9	18.793
25	92.21 - 91.96	21.278	1175.6	18.865
26	91.96 - 86.96	22.247	1270.5	19.169
27	86.96 - 81.96	23.243	1367.1	19.525
28	81.96 - 76.96	24.262	1465.6	19.878
29	76.96 - 71.96	25.303	1565.8	20.228
30	71.96 - 66.96	26.368	1667.7	20.574
31	66.96 - 61.96	27.454	1771.4	20.914
32	61.96 - 56.96	28.563	1876.7	21.25
33	56.96 - 51.96	29.694	1983.7	21.578
34	51.96 - 46.96	30.848	2092.4	21.898
35	46.96 - 46.21	31.024	2108.8	21.944
36	46.21 - 41.21	32.202	2219.3	22.256
37	41.21 - 36.21	33.405	2331.2	22.557
38	36.21 - 31.21	34.633	2444.7	22.847
39	31.21 - 26.21	35.9	2559.6	23.1
40	26.21 - 21.21	37.2	2676.0	23.4
41	21.21 - 16.21	38.5	2793.8	23.7
42	16.21 - 11.21	39.8	2913.2	24.0
43	11.21 - 6.21	41.0	3034.0	24.3
44	6.21 - 1.21	42.2	3156.4	24.6
45	1.21 - 0	42.5	3186.3	24.7

## Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
179 - 174	Pole	TP20.738x19.69x0.1875	Pole	8.0%	Pass
174 - 169	Pole	TP21.786x20.738x0.1875	Pole	14.6%	Pass
169 - 164	Pole	TP22.835x21.786x0.1875	Pole	25.8%	Pass
164 - 159	Pole	TP23.883x22.835x0.1875	Pole	36.4%	Pass
159 - 154	Pole	TP24.931x23.883x0.1875	Pole	49.3%	Pass
154 - 149	Pole	TP25.979x24.931x0.1875	Pole	61.2%	Pass
149 - 145	Pole	TP26.818x25.979x0.1875	Pole	69.5%	Pass
145 - 144.75	Pole + Reinf.	TP26.87x26.818x0.3063	Reinf. 1 Bolt-Shaft Bearing	62.4%	Pass
144.75 - 139.75	Pole + Reinf.	TP27.918x26.87x0.3	Reinf. 1 Tension Rupture	71.5%	Pass
139.75 - 139.17	Pole + Reinf.	TP28.04x27.918x0.3	Reinf. 1 Tension Rupture	72.3%	Pass
139.17 - 138.17	Pole + Reinf.	TP28.249x28.04x0.3625	Reinf. 1 Tension Rupture	61.6%	Pass
138.17 - 137.92	Pole	TP28.301x28.249x0.25	Pole	62.1%	Pass
137.92 - 132.92	Pole	TP29.347x28.301x0.25	Pole	68.0%	Pass
132.92 - 127.92	Pole	TP30.392x29.347x0.25	Pole	73.2%	Pass
127.92 - 125.17	Pole	TP30.967x30.392x0.25	Pole	76.0%	Pass
125.17 - 124.92	Pole + Reinf.	TP31.02x30.967x0.5625	Reinf. 2 Compression	47.7%	Pass
124.92 - 119.92	Pole + Reinf.	TP32.065x31.02x0.55	Reinf. 2 Compression	51.3%	Pass
119.92 - 114.92	Pole + Reinf.	TP33.111x32.065x0.5375	Reinf. 2 Compression	55.0%	Pass
114.92 - 109.92	Pole + Reinf.	TP34.156x33.111x0.5313	Reinf. 2 Compression	58.4%	Pass
109.92 - 104.92	Pole + Reinf.	TP35.201x34.156x0.525	Reinf. 2 Compression	61.5%	Pass
104.92 - 99.92	Pole + Reinf.	TP36.247x35.201x0.5125	Reinf. 2 Compression	64.3%	Pass
99.92 - 94.92	Pole + Reinf.	TP37.292x36.247x0.5	Reinf. 2 Compression	67.1%	Pass
94.92 - 93.21	Pole + Reinf.	TP37.65x37.292x0.5	Reinf. 2 Compression	68.3%	Pass
93.21 - 92.21	Pole + Reinf.	TP37.851x37.65x0.625	Reinf. 2 Compression	55.1%	Pass
92.21 - 91.96	Pole	TP37.901x37.851x0.375	Pole	66.6%	Pass
91.96 - 86.96	Pole	TP38.907x37.901x0.375	Pole	68.3%	Pass
86.96 - 81.96	Pole	TP39.912x38.907x0.375	Pole	69.7%	Pass
81.96 - 76.96	Pole	TP40.917x39.912x0.375	Pole	71.1%	Pass
76.96 - 71.96	Pole	TP41.923x40.917x0.375	Pole	72.3%	Pass
71.96 - 66.96	Pole	TP42.928x41.923x0.375	Pole	73.4%	Pass
66.96 - 61.96	Pole	TP43.933x42.928x0.375	Pole	74.4%	Pass
61.96 - 56.96	Pole	TP44.939x43.933x0.375	Pole	75.3%	Pass
56.96 - 51.96	Pole	TP45.944x44.939x0.375	Pole	76.1%	Pass
51.96 - 46.96	Pole	TP46.949x45.944x0.375	Pole	76.8%	Pass
46.96 - 46.21	Pole	TP47.1x46.931x0.375	Pole	76.9%	Pass
46.21 - 41.21	Pole	TP48.225x47.1x0.375	Pole	77.2%	Pass
41.21 - 36.21	Pole	TP49.351x48.225x0.375	Pole	77.4%	Pass
36.21 - 31.21	Pole	TP50.476x49.351x0.375	Pole	77.6%	Pass
31.21 - 26.21	Pole	TP51.601x50.476x0.375	Pole	77.7%	Pass
26.21 - 21.21	Pole	TP52.726x51.601x0.375	Pole	77.8%	Pass
21.21 - 16.21	Pole	TP53.852x52.726x0.375	Pole	77.8%	Pass
16.21 - 11.21	Pole	TP54.977x53.852x0.375	Pole	77.8%	Pass
11.21 - 6.21	Pole	TP56.102x54.977x0.375	Pole	77.8%	Pass
6.21 - 1.21	Pole	TP57.228x56.102x0.375	Pole	78.2%	Pass
1.21 - 0	Pole	TP57.5x57.228x0.375	Pole	78.4%	Pass
				Summary	
			Pole	78.4%	Pass
			Reinforcement	72.5%	Pass
			Overall	78.4%	Pass

## Additional Calculations

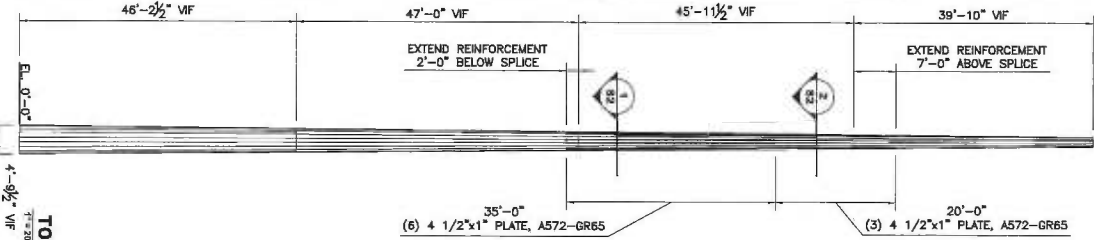
Section Elevation (ft)	Moment of Inertia (in <sup>4</sup> )			Area (in <sup>2</sup> )			% Capacity	Axial (kips)	
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1	R2
179 - 174	652	n/a	652	12.23	n/a	12.23	8.0%		
174 - 169	757	n/a	757	12.85	n/a	12.85	14.6%		
169 - 164	873	n/a	873	13.48	n/a	13.48	25.8%		
164 - 159	1000	n/a	1000	14.10	n/a	14.10	36.4%		
159 - 154	1139	n/a	1139	14.72	n/a	14.72	49.3%		
154 - 149	1290	n/a	1290	15.35	n/a	15.35	61.2%		
149 - 145	1419	n/a	1419	15.85	n/a	15.85	69.5%		
145 - 144.75	1428	864	2292	15.88	9.00	24.88	43.6%	68.9	
144.75 - 139.75	1603	931	2534	16.50	9.00	25.50	49.4%	79.0	
139.75 - 139.17	1624	939	2563	16.58	9.00	25.58	50.7%	80.1	
139.17 - 138.17	2200	952	3152	22.22	9.00	31.22	42.6%	68.0	
138.17 - 137.92	2212	n/a	2212	22.26	n/a	22.26	62.1%		
137.92 - 132.92	2469	n/a	2469	23.09	n/a	23.09	68.0%		
132.92 - 127.92	2744	n/a	2744	23.92	n/a	23.92	73.2%		
127.92 - 125.17	2905	n/a	2905	24.37	n/a	24.37	76.0%		
125.17 - 124.92	2919	3484	6404	24.41	27.00	51.41	34.3%		82.7
124.92 - 119.92	3227	3714	6941	25.24	27.00	52.24	37.5%		89.2
119.92 - 114.92	3556	3951	7507	26.07	27.00	53.07	39.7%		95.3
114.92 - 109.92	3906	4195	8101	26.90	27.00	53.90	42.1%		101.1
109.92 - 104.92	4279	4447	8726	27.73	27.00	54.73	44.4%		106.6
104.92 - 99.92	4674	4706	9381	28.56	27.00	55.56	47.1%		111.8
99.92 - 94.92	5094	4973	10066	29.39	27.00	56.39	49.2%		116.7
94.92 - 93.21	5243	5066	10308	29.68	27.00	56.68	49.4%		118.3
93.21 - 92.21	7912	5118	13030	44.60	27.00	71.60	39.9%		95.6
92.21 - 91.96	7944	n/a	7944	44.66	n/a	44.66	66.6%		
91.96 - 86.96	8600	n/a	8600	45.86	n/a	45.86	68.3%		
86.96 - 81.96	9290	n/a	9290	47.06	n/a	47.06	69.7%		
81.96 - 76.96	10017	n/a	10017	48.25	n/a	48.25	71.1%		
76.96 - 71.96	10781	n/a	10781	49.45	n/a	49.45	72.3%		
71.96 - 66.96	11583	n/a	11583	50.65	n/a	50.65	73.4%		
66.96 - 61.96	12423	n/a	12423	51.84	n/a	51.84	74.4%		
61.96 - 56.96	13303	n/a	13303	53.04	n/a	53.04	75.3%		
56.96 - 51.96	14224	n/a	14224	54.24	n/a	54.24	76.1%		
51.96 - 46.96	15186	n/a	15186	55.43	n/a	55.43	76.8%		
46.96 - 46.21	15334	n/a	15334	55.61	n/a	55.61	76.9%		
46.21 - 41.21	16469	n/a	16469	56.95	n/a	56.95	77.2%		
41.21 - 36.21	17659	n/a	17659	58.29	n/a	58.29	77.4%		
36.21 - 31.21	18904	n/a	18904	59.63	n/a	59.63	77.6%		
31.21 - 26.21	20207	n/a	20207	60.97	n/a	60.97	77.7%		
26.21 - 21.21	21568	n/a	21568	62.31	n/a	62.31	77.8%		
21.21 - 16.21	22989	n/a	22989	63.65	n/a	63.65	77.8%		
16.21 - 11.21	24471	n/a	24471	64.99	n/a	64.99	77.8%		
11.21 - 6.21	26015	n/a	26015	66.33	n/a	66.33	77.8%		
6.21 - 1.21	27623	n/a	27623	67.67	n/a	67.67	78.2%		
1.21 - 0	28022	n/a	28022	67.99	n/a	67.99	78.4%		

Note: Section capacity checked in 5 degree increments.



EXISTING MONOPOLE			
3/8" PLATE	3/8" PLATE	1/4" PLATE	3/16" PLATE
57.5000" BOT	47.1000" BOT	37.6500" BOT	28.0400" BOT
47.1000" TOP	37.6500" TOP	28.0400" TOP	19.6900" TOP

REINFORCING PLATE SCHEDULE			
N.A.	N.A.	4 1/2"x1" PLATE, A572-GR65	
N.A.	N.A.	ON 6 SIDES	ON 3 SIDES



TOWER ELEVATION

- NOTES:**
- MONOPOLE DIMENSIONS BASED ON STRUCTURAL ANALYSIS REPORT PREPARED BY HUDSON DESIGN GROUP, LLC DATED 9/26/2012.
  - UPGRADE DESIGN VALID FOR APPURTENANCES LISTED IN ATLANTIS ANALYSIS REPORT DATED 10/7/2014. CONTRACTOR TO REVIEW AND VERIFY.
  - CONTRACTOR TO REMOVE AND REATTACH EXISTING APPURTENANCES AND OTHER ACCESSORIES AS NEEDED TO INSTALL NEW REINFORCING PLATES.
  - CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS AND FIELD CONDITIONS BEFORE COMMENCEMENT OF WORK. ANY DISCREPANCY SHOULD BE REPORTED TO ATLANTIS IMMEDIATELY FOR FURTHER EVALUATION.
  - DO NOT PERFORM THE WORK ON THE TOWER WHEN WINDS GUST MORE THAN 15 MPH.
  - DO NOT USE STEEL SECTIONS LARGER OR SMALLER THAN LISTED. IF DESIGNED SIZE IS NOT AVAILABLE CONTACT ATLANTIS FOR VERIFICATION.
  - MONOPOLE UPGRADE REACTIONS:  
MOMENT: 3187.8 KIP - FT  
SHEAR: 24.7 KIP
  - CONTRACTOR TO TAKE ALL NECESSARY PRECAUTIONS FOR FIRE PREVENTION DURING WELDING, SUCH AS: INSTALLING 3000 (NFPA 701) FIRE BARRIERS AROUND COAX, MORE SPLATTER AND SPARKS SHOULD BE ANTICIPATED WHILE WELDING ON GALVANIZED SURFACE. COAX IS FLAMMABLE AND SHALL CATCH FIRE IF NOT PROTECTED.
  - CONTRACTOR TO DETACH AND REATTACH CLIMBING FEES. CONTRACTOR SHOULD CONSULT WITH AN ENGINEER FOR ATTACHMENT DESIGN.
  - CONTRACTOR TO HAVE THE SAFETY CLIMB INDICT AND FUNCTIONAL AFTER WORK IS COMPLETE.
  - WELDING ON GALVANIZED SURFACE SHOULD BE DONE WITH EXTREME CAUTION. IF THE WELD MATERIAL IS CONTAMINATED WITH ZINC, IT DOES MAKE A STRUCTURAL WELD. GROUND GALVANIZING BEFORE WELDING.

- 1. DESIGN INFORMATION AND GENERAL REQUIREMENTS**
- CODES
    - 2008 CONNECTICUT BUILDING CODE WITH 2011 SUPPLEMENT.
    - MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES, ASPEC 16-10, AMERICAN SOCIETY OF CIVIL ENGINEERS
    - STEEL CONSTRUCTION MANUAL, 15TH EDITION, AMERICAN INSTITUTE OF STEEL CONSTRUCTION
    - ATLANTIS SUPPLEMENTARY STRUCTURES, TA-222-F
  - MATERIALS
    - STRUCTURAL STEEL: . . . . . ASTM A992
    - PLATE: . . . . . ASTM 572-65
    - BOLTS: . . . . . STAINLESS STEEL GRADE 316
    - WELDING ELECTRODES: . . . . . AWS E51 (E60XX)
    - WELDING METALS: . . . . . AWS A5.1 (E60XX)
    - STEEL CONSTRUCTION SHALL CONFORM TO SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS, ANSI/AISC 360-05
    - WELDING SHALL CONFORM TO AWS D1.1/D1.3/D1.7 AS APPLICABLE.
    - THE FABRICATOR SHALL FURNISH CHECKED SHOP AND ERECTION DRAWINGS TO THE ENGINEER AND OBTAIN APPROVAL PRIOR TO COMMENCEMENT OF WORK.
    - CONFORM TO "DETAILING FOR STEEL CONSTRUCTION, 2ND EDITION"
  - CONNECTIONS
    - SHOP CONNECTIONS MAY BE BOLTED OR WELDED
    - FIELD CONNECTIONS SHALL BE WELDED
    - HARDENED WASHERS (INSTALLED SINCE THEE) UNLESS OTHERWISE SPECIFIED OR IF WELDED CONNECTIONS ARE NOTED ON DRAWINGS
    - CONNECTIONS NOT SHOWN ON DRAWINGS SHALL BE DESIGNED BY THE STEEL FABRICATOR. CONNECTIONS SHALL BE DESIGNED IN CONFORMANCE WITH THE SPECIFICATIONS FOR STRUCTURAL JOINTS PRACTICE FOR STEEL BUILDINGS AND BRIDGES
    - DO NOT FIELD CUT OR ALTER STRUCTURAL MEMBERS WITHOUT PRIOR WRITTEN APPROVAL OF ENGINEER
    - UNION PER HOLD-BOLTS SHOULD BE INSTALLED AS PER MANUFACTURER REQUIREMENTS.
  - FINISHES
    - STRUCTURAL STEEL SHALL BE HOT DIP GALVANIZED AFTER FABRICATION
    - BOLTS AND NUTS SHALL BE HOT DIP GALVANIZED PER ASTM A153
    - ALL SURFACES DAMAGED BY FIELD WELDING OR CUTTING SHALL BE PAINTED WITH ZINC RICH PAINTS
    - CLIMBING FEES CAN BE CUT AND REDONE AS PER REQUIREMENT.
  - WELDING
    - CONTRACTOR TO TAKE ALL NECESSARY PRECAUTIONS FOR FIRE PREVENTION DURING WELDING, SUCH AS: INSTALLING 3000 (NFPA 701) FIRE BARRIERS AROUND COAX, MORE SPLATTER AND SPARKS SHOULD BE ANTICIPATED WHILE WELDING ON GALVANIZED SURFACE. COAX IS FLAMMABLE AND SHALL CATCH FIRE IF NOT PROTECTED. WATER SHALL BE ON SITE OF ADEQUATE AMOUNT AND AVAILABLE AT SHORT NOTICE AT ALL TIMES DURING WELDING ACTIVITY
    - CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING PERMITS FOR WELDING ON GALVANIZED SURFACE. FIELD WELDING SHALL BE DONE WITH EXTREME CAUTION. IF THE WELD MATERIAL IS CONTAMINATED WITH ZINC, IT DOES NOT PROVIDE A STRUCTURAL WELD. GROUND GALVANIZING BEFORE WELDING. ALL WELDING SHALL BE DONE BY A LICENSED WELDER WHO HAS EXPERIENCE WITH GALVANIZED SURFACES.

DESIGNED: IK	CTHA539A MONOPOLE UPGRADE
DRAWN: IK	
CHECKED: AC	
DATE: 10/8/2014	
ISSUE FOR CONSTRUCTION	

ADDRESS: 719 GEORGE WASHINGTON TPKE  
BURLINGTON, CT 06013

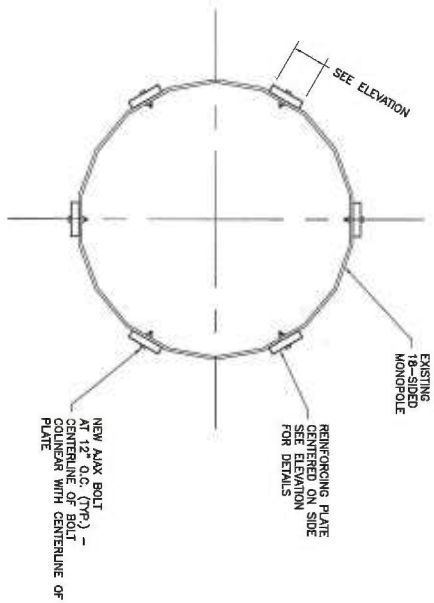
PREPARED FOR:  
metroPCS

1540 Center Street  
New Britain, CT 06108  
Office: 860-486-9999  
Fax: 860-486-9900

ATLANTIS GROUP

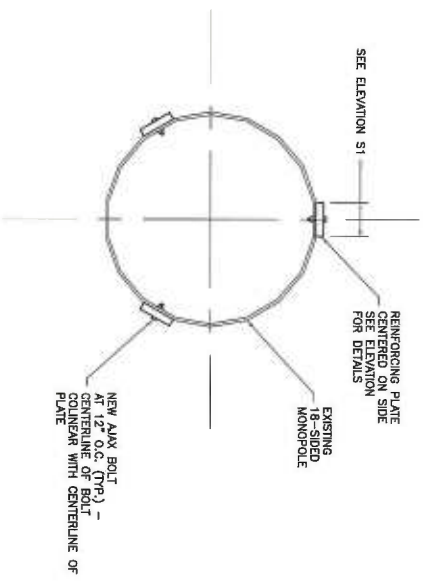
51 UPGRADE DESIGN

Amnet Consulting, PC  
CT License No. 27057



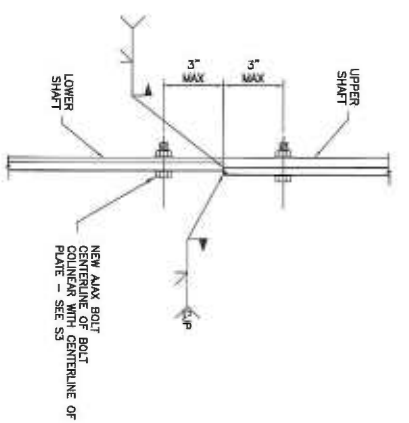
1  
S2 3/4" x 1/4"

**REINFORCING DETAIL**



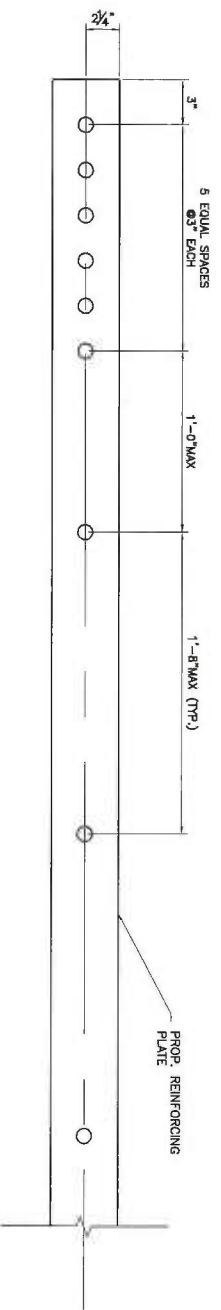
2  
S2 3/4" x 1/4"

**REINFORCING DETAIL**



3  
S2 3/8"

**SPICE DETAIL**



4  
S2 1 1/2" x 1/4"

**REINFORCING PLATE END BOLTING DETAIL**

Alphabet Consulting, PE  
 CT License No. 27057

**S2**  
**UPGRADE**  
**DETAILS**

CTHA539A MONOPOLE UPGRADE

ADDRESS: 719 GEORGE WASHINGTON TPKE  
 BURLINGTON, CT 06013

NUM	DATE	DESCRIPTION
1	10/8/2014	ISSUE FOR CONSTRUCTION

PREPARED FOR:

metroPCS

**ATLANTIS GROUP**

1340 Central Street  
 Norwalk, CT 06855  
 Phone: 203.861.1100  
 Fax: 203.861.1101



**BOLTS AND COMPONENTS SPECIFICATIONS:**  
**BOLT:**  
 AXAX M20 "ONE SIDE" BLIND BOLT

**SHEAR SLEEVE:**  
 F<sub>u</sub>=120 KSI (MINIMUM)  
 29MM O.D. X 20 mm ID  
 1.25" MINIMUM LENGTH  
 SLEEVE SHALL BE ROUND, WITH ENDS CUT SQUARE AND DEBURRED.

**SPECIAL WASHER:**  
 ASTM F959 SQUIRTER @ DT1 M20 (EQUIVALENT TO A325 BOLT)  
 APPLIED BOLTING TECHNOLOGY PRODUCTS, INC.  
 1413 ROCKINGHAM ROAD BELLOW FALLS, VERMONT, USA 05101  
 PHONE: (800) 592-1999  
 WEBSITE: WWW.APPLIEDBOLTING.COM

**DISTRIBUTORS OF SQUIRTER @ DT1'S:**  
 WWW.APPLIEDBOLTING.COM/APPLIED-BOLTING-DISTRIBUTORS.HTML  
**WASHER:**  
 ASTM F436 HARDENED FLAT WASHER M20

**BOLT ASSEMBLY FINISHING:**  
 SHEAR SLEEVE: COLD GALVANIZED WITH MIN. 3 MIL OF ZINC COLD GALVANIZING COMPOUND  
 ALL OTHER PARTS: HOT DIP GALVANIZED

**BOLT INSTALLATION ASSEMBLY:**  
 AS SHOWN ON THE DRAWING

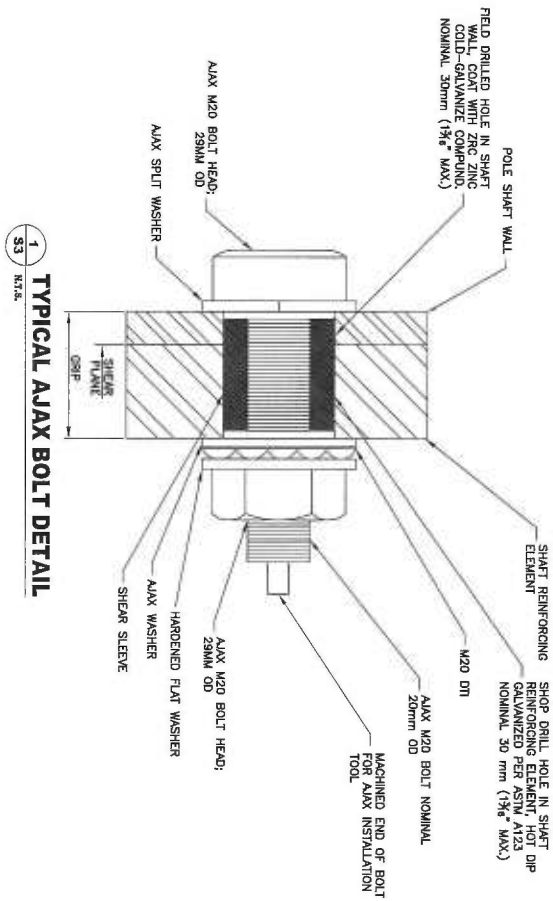
**INSTALLATION NOTES:**  
 BOLTS MUST BE PLACED DIRECTLY AGAINST THE OUTER AXAX WASHER WITH THE BAMPES FACING AWAY FROM THE AXAX WASHER. PLACE A HARDENED WASHER BETWEEN THE DT1 AND THE AXAX NUT. THE DT1 WASHER SHALL BEAR AGAINST THE UNDERSIDE OF A HARDENED FLAT WASHER, NEVER DIRECTLY AGAINST THE NUT.

**TIGHTEN THE BOLT ASSEMBLY UNTIL THE ORANGE SILICONE APPEARS FORM UNDER THE DT1'S SQUART LOCATIONS, THEN STOP TIGHTENING.**  
 FOLLOW DT1 MANUFACTURER'S INSTRUCTIONS FOR INSTALLATION, LUBRICATION, TIGHTENING AND INSPECTION.

**INSPECTION:**  
 ALL AXAX BOLTS WITH DT1'S SHALL BE VISUALLY INSPECTED ACCORDING TO THE DT1 MANUFACTURER'S INSTRUCTIONS BOLT INSPECTOR SHALL PROVIDE PHOTO DOCUMENTATION OF BOLTS AFTER TIGHTENING CLEARLY SHOWING THE CONDITION OF THE DT1'S.

INTERIOR OF POLE SHAFT

EXTERIOR OF POLE SHAFT

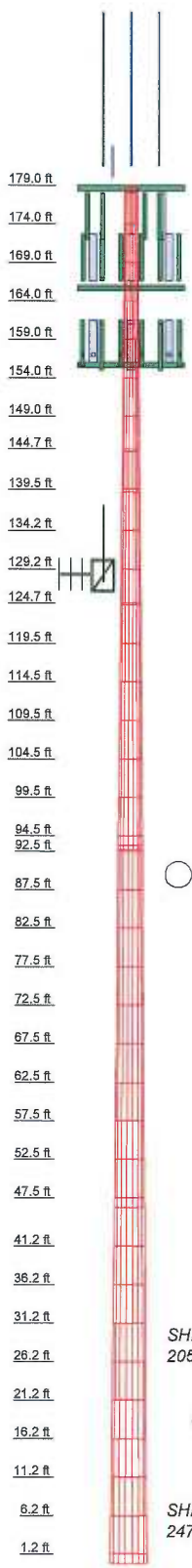


**1**  
**53**  
 M.T.L.  
**TYPICAL AXAX BOLT DETAIL**

Amnet, Colakoglu, PE  
 CT License No. 27057

1500 Collins Street Suite 475 North Andover, MA 01845 Phone: 978-686-0788 Fax: 978-686-0828	<b>ATLANTIS</b> <b>G R O U P</b>	metroPCS	PREPARED FOR:	DESCRIPTION: ISSUE FOR CONSTRUCTION	DATE: 10/8/2014	NUM: A
			ADDRESS: 719 GEORGE WASHINGTON TPKE BURLINGTON, CT 06013	DESIGNED: IK DRAWN: IK CHECKED: AC	IDG #: 1417030	S3 UPGRADE DETAILS

Section	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42					
Length (ft)	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00			
Number of Slats	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18		
Thickness (in)	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875			
Top Dia (in)	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00		
Bot Dia (in)	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00		
Grade																																															
Weight (lb)	2740.8	2740.8	2740.8	2740.8	2740.8	2740.8	2740.8	2740.8	2740.8	2740.8	2740.8	2740.8	2740.8	2740.8	2740.8	2740.8	2740.8	2740.8	2740.8	2740.8	2740.8	2740.8	2740.8	2740.8	2740.8	2740.8	2740.8	2740.8	2740.8	2740.8	2740.8	2740.8	2740.8	2740.8	2740.8	2740.8	2740.8	2740.8	2740.8	2740.8	2740.8	2740.8	2740.8	2740.8	2740.8	2740.8	2740.8



**DESIGNED APPURTENANCE LOADING**

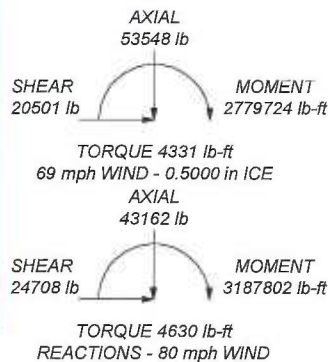
TYPE	ELEVATION	TYPE	ELEVATION
3" Dia 20" Omni	191.5	Ring Mount	167
3" Dia 20" Omni	191.5	14'-0" Platform	166
3" Dia 20" Omni	191.5	DC6-48-60-18-8F	164.5
3/4"x5' Lightning Rod	182.1	(2) APL866513 w/Mount Pipe	158.5
14'-0" Platform	179	BXA-171063-8BF-EDIN-2 w/ Mount Pipe	158.5
AIR21 B2A/B4P with pipe	175		
AIR21 B2A/B4P with pipe	175	(2) APL866513 w/Mount Pipe	158.5
AIR21 B2A/B4P with pipe	175	BXA-171063-8BF-EDIN-2 w/ Mount Pipe	158.5
AIR21 B4A/B2P with pipe	175		
AIR21 B4A/B2P with pipe	175	(2) APL866513 w/Mount Pipe	158.5
AIR21 B4A/B2P with pipe	175	BXA-171063-8BF-EDIN-2 w/ Mount Pipe	158.5
P65-17-XLH-RR with Pipe	170		
P65-17-XLH-RR with Pipe	170	BXA-70063/6CF w/ Mount Pipe	158
P65-17-XLH-RR with Pipe	170	BXA-70063/6CF w/ Mount Pipe	158
(2) Ericsson RRU	170	BXA-70063/6CF w/ Mount Pipe	158
(2) Ericsson RRU	170	(2) FRS FD9R6004 Diplexer	157
(2) Ericsson RRU	170	(2) FRS FD9R6004 Diplexer	157
(2) Powerwave LGP13519 diplexer	169.7	(2) FRS FD9R6004 Diplexer	157
(2) Powerwave LGP13519 diplexer	169.7	14'-0" Platform	156
(2) Powerwave LGP13519 diplexer	169.7	20' Dipole	138.6
(2) 7770.00 w/ Mount Pipe	169.7	Omni 1"x8"	132.5
(2) 7770.00 w/ Mount Pipe	169.7	3' Yagi	128.5
(2) 7770.00 w/ Mount Pipe	169.7	Pirot 6' Side Mount Standoff (1)	128.3
(2) Powerwave TMA LGP21400	169.7	Pirot 6' Side Mount Standoff (1)	127.5
(2) Powerwave TMA LGP21400	169.7	10' Dipole	112.7
(2) Powerwave TMA LGP21400	169.7	Pirot 6' Side Mount Standoff (1)	107.8

**MATERIAL STRENGTH**

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

**TOWER DESIGN NOTES**

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 69 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 78.4%



<p><b>Atlantis Group, Inc.</b> 1340 Centre Street, Suite 212 Newton, MA 02459 Phone: (617) 965-0789 FAX: (617) 213-3123</p>	Job: <b>CTHA539A</b>		
	Project: <b>CTHA539A</b>		
	Client: metroPCS	Drawn by: Ahmet Colakoglu	App'd:
	Code: TIA/EIA-222-F	Date: 10/08/14	Scale: NTS
	Path:	Dwg No. E-1	

<b>tnxTower</b>  <b>Atlantis Group, Inc.</b> 1340 Centre Street, Suite 212 Newton, MA 02459 Phone: Phone: (617) 965-0789 FAX: Fax: (617) 213-3123	Job	CTHA539A	Page	1 of 61
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	Client	metroPCS	Designed by	Ahmet Colakoglu

## Tower Input Data

There is a pole section.

This tower is designed using the TIA/EIA-222-F standard.

The following design criteria apply:

Tower is located in Hartford County, Connecticut.

Basic wind speed of 80 mph.

Nominal ice thickness of 0.5000 in.

Ice density of 56 pcf.

A wind speed of 69 mph is used in combination with ice.

Temperature drop of 50 °F.

Deflections calculated using a wind speed of 50 mph.

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

Pressures are calculated at each section.

Stress ratio used in pole design is 1.333.

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

## Options

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

## Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	179.00-174.00	5.00	0.00	18	19.6900	20.7382	0.1875	0.7500	A572-65 (65 ksi)
L2	174.00-169.00	5.00	0.00	18	20.7382	21.7864	0.1875	0.7500	A572-65 (65 ksi)
L3	169.00-164.00	5.00	0.00	18	21.7864	22.8346	0.1875	0.7500	A572-65 (65 ksi)
L4	164.00-159.00	5.00	0.00	18	22.8346	23.8828	0.1875	0.7500	A572-65 (65 ksi)
L5	159.00-154.00	5.00	0.00	18	23.8828	24.9310	0.1875	0.7500	A572-65 (65 ksi)

<p><b>tnxTower</b></p> <p><i>Atlantis Group, Inc.</i>  1340 Centre Street, Suite 212  Newton, MA 02459  Phone: (617) 965-0789  FAX: Fax: (617) 213-3123</p>	<b>Job</b>	CTHA539A	<b>Page</b>	2 of 61
	<b>Project</b>	CTHA539A	<b>Date</b>	09:30:37 10/08/14
	<b>Client</b>	metroPCS	<b>Designed by</b>	Ahmet Colakoglu

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
L6	154.00-149.00	5.00	0.00	18	24.9310	25.9792	0.1875	0.7500	A572-65 (65 ksi)
L7	149.00-144.71	4.29	0.00	18	25.9792	26.8786	0.1875	0.7500	A572-65 (65 ksi)
L8	144.71-144.46	0.25	0.00	18	26.8786	26.9310	0.3688	1.4750	A572-65 (65 ksi)
L9	144.46-139.46	5.00	0.00	18	26.9310	27.9792	0.3625	1.4500	A572-65 (65 ksi)
L10	139.46-139.17	0.29	0.00	18	27.9792	28.0400	0.3625	1.4500	A572-65 (65 ksi)
L11	139.17-134.17	5.00	0.00	18	28.0400	29.0855	0.4188	1.6750	A572-65 (65 ksi)
L12	134.17-129.17	5.00	0.00	18	29.0855	30.1309	0.4125	1.6500	A572-65 (65 ksi)
L13	129.17-124.71	4.46	0.00	18	30.1309	31.0635	0.4063	1.6250	A572-65 (65 ksi)
L14	124.71-124.46	0.25	0.00	18	31.0635	31.1158	0.5625	2.2500	A572-65 (65 ksi)
L15	124.46-119.46	5.00	0.00	18	31.1158	32.1613	0.5500	2.2000	A572-65 (65 ksi)
L16	119.46-114.46	5.00	0.00	18	32.1613	33.2067	0.5375	2.1500	A572-65 (65 ksi)
L17	114.46-109.46	5.00	0.00	18	33.2067	34.2522	0.5313	2.1250	A572-65 (65 ksi)
L18	109.46-104.46	5.00	0.00	18	34.2522	35.2977	0.5250	2.1000	A572-65 (65 ksi)
L19	104.46-99.46	5.00	0.00	18	35.2977	36.3432	0.5125	2.0500	A572-65 (65 ksi)
L20	99.46-94.46	5.00	0.00	18	36.3432	37.3886	0.5000	2.0000	A572-65 (65 ksi)
L21	94.46-93.21	1.25	0.00	18	37.3886	37.6500	0.5000	2.0000	A572-65 (65 ksi)
L22	93.21-92.71	0.50	0.00	18	37.6500	37.7505	0.6250	2.5000	A572-65 (65 ksi)
L23	92.71-92.46	0.25	0.00	18	37.7505	37.8008	0.3750	1.5000	A572-65 (65 ksi)
L24	92.46-87.46	5.00	0.00	18	37.8008	38.8061	0.3750	1.5000	A572-65 (65 ksi)
L25	87.46-82.46	5.00	0.00	18	38.8061	39.8114	0.3750	1.5000	A572-65 (65 ksi)
L26	82.46-77.46	5.00	0.00	18	39.8114	40.8168	0.3750	1.5000	A572-65 (65 ksi)
L27	77.46-72.46	5.00	0.00	18	40.8168	41.8221	0.3750	1.5000	A572-65 (65 ksi)
L28	72.46-67.46	5.00	0.00	18	41.8221	42.8274	0.3750	1.5000	A572-65 (65 ksi)
L29	67.46-62.46	5.00	0.00	18	42.8274	43.8327	0.3750	1.5000	A572-65 (65 ksi)
L30	62.46-57.46	5.00	0.00	18	43.8327	44.8380	0.3750	1.5000	A572-65 (65 ksi)
L31	57.46-52.46	5.00	0.00	18	44.8380	45.8434	0.3750	1.5000	A572-65 (65 ksi)
L32	52.46-47.46	5.00	0.00	18	45.8434	46.8487	0.3750	1.5000	A572-65 (65 ksi)
L33	47.46-46.21	1.25	0.00	18	46.8487	47.1000	0.3750	1.5000	A572-65 (65 ksi)
L34	46.21-41.21	5.00	0.00	18	47.1000	48.2253	0.3750	1.5000	A572-65 (65 ksi)
L35	41.21-36.21	5.00	0.00	18	48.2253	49.3506	0.3750	1.5000	A572-65 (65 ksi)
L36	36.21-31.21	5.00	0.00	18	49.3506	50.4759	0.3750	1.5000	A572-65



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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
L37	31.21-26.21	5.00	0.00	18	50.4759	51.6012	0.3750	1.5000	(65 ksi) A572-65
L38	26.21-21.21	5.00	0.00	18	51.6012	52.7265	0.3750	1.5000	(65 ksi) A572-65
L39	21.21-16.21	5.00	0.00	18	52.7265	53.8518	0.3750	1.5000	(65 ksi) A572-65
L40	16.21-11.21	5.00	0.00	18	53.8518	54.9771	0.3750	1.5000	(65 ksi) A572-65
L41	11.21-6.21	5.00	0.00	18	54.9771	56.1024	0.3750	1.5000	(65 ksi) A572-65
L42	6.21-1.21	5.00	0.00	18	56.1024	57.2277	0.3750	1.5000	(65 ksi) A572-65
L43	1.21-0.00	1.21		18	57.2277	57.5000	0.3750	1.5000	(65 ksi) A572-65

### Tapered Pole Properties

Section	Tip Dia. in	Area in <sup>2</sup>	I in <sup>4</sup>	r in	C in	I/C in <sup>3</sup>	J in <sup>4</sup>	I/Q in <sup>2</sup>	w in	w/t
L1	19.9937	11.6064	557.7204	6.9234	10.0025	55.7580	1116.1746	5.8043	3.1354	16.722
L2	21.0581	12.2302	652.5681	7.2955	10.5350	61.9428	1305.9948	6.1163	3.3199	17.706
	22.1225	12.8541	757.6020	7.6676	11.0675	68.4529	1516.2009	6.4282	3.5044	18.69
L3	22.1225	12.8541	757.6020	7.6676	11.0675	68.4529	1516.2009	6.4282	3.5044	18.69
	23.1869	13.4779	873.3419	8.0397	11.6000	75.2882	1747.8329	6.7402	3.6889	19.674
L4	23.1869	13.4779	873.3419	8.0397	11.6000	75.2882	1747.8329	6.7402	3.6889	19.674
	24.2513	14.1017	1000.3071	8.4118	12.1325	82.4487	2001.9304	7.0522	3.8734	20.658
L5	24.2513	14.1017	1000.3071	8.4118	12.1325	82.4487	2001.9304	7.0522	3.8734	20.658
	25.3156	14.7255	1139.0173	8.7840	12.6650	89.9345	2279.5333	7.3641	4.0579	21.642
L6	25.3156	14.7255	1139.0173	8.7840	12.6650	89.9345	2279.5333	7.3641	4.0579	21.642
	26.3800	15.3493	1289.9920	9.1561	13.1974	97.7456	2581.6815	7.6761	4.2423	22.626
L7	26.3800	15.3493	1289.9920	9.1561	13.1974	97.7456	2581.6815	7.6761	4.2423	22.626
	27.2932	15.8845	1429.6987	9.4753	13.6543	104.7067	2861.2787	7.9438	4.4006	23.47
L8	27.2932	15.8845	1429.6987	9.4753	13.6543	104.7067	2861.2787	7.9438	4.4006	23.47
	27.3465	31.0888	2771.2196	9.4296	13.6809	202.5605	5546.0857	15.5473	4.0909	11.094
L9	27.3465	30.5691	2726.1733	9.4318	13.6809	199.2679	5455.9337	15.2874	4.1019	11.315
	28.4108	31.7751	3061.7373	9.8039	14.2134	215.4115	6127.5033	15.8906	4.2863	11.824
L10	28.4108	31.7751	3061.7373	9.8039	14.2134	215.4115	6127.5033	15.8906	4.2863	11.824
	28.4726	31.8450	3082.0023	9.8255	14.2443	216.3671	6168.0600	15.9255	4.2970	11.854
L11	28.4726	36.7117	3538.5813	9.8055	14.2443	248.4205	7081.8188	18.3594	4.1980	10.025
	29.5342	38.1013	3955.7916	10.1767	14.7754	267.7278	7916.7883	19.0543	4.3820	10.465
L12	29.5342	37.5408	3899.2992	10.1789	14.7754	263.9044	7803.7292	18.7740	4.3930	10.65
	30.5958	38.9096	4341.5692	10.5500	15.3065	283.6418	8688.8512	19.4585	4.5770	11.096
L13	30.5958	38.3281	4278.4861	10.5523	15.3065	279.5205	8562.6020	19.1677	4.5880	11.294
	31.5427	39.5306	4693.9432	10.8833	15.7803	297.4566	9394.0629	19.7691	4.7522	11.698
L14	31.5427	54.4557	6400.4371	10.8279	15.7803	405.5976	12809.2961	27.2330	4.4772	7.959
	31.5958	54.5491	6433.4015	10.8464	15.8068	407.0017	12875.2681	27.2797	4.4864	7.976
L15	31.5958	53.3587	6298.1608	10.8509	15.8068	398.4458	12604.6089	26.6844	4.5084	8.197
	32.6574	55.1838	6966.7861	11.2220	16.3379	426.4182	13942.7392	27.5971	4.6924	8.532
L16	32.6574	53.9509	6816.5300	11.2264	16.3379	417.2214	13642.0293	26.9806	4.7144	8.771
	33.7190	55.7345	7515.1854	11.5976	16.8690	445.5022	15040.2595	27.8726	4.8984	9.113
L17	33.7190	55.0970	7432.0634	11.5998	16.8690	440.5747	14873.9062	27.5537	4.9094	9.241
	34.7806	56.8599	8168.5138	11.9709	17.4001	469.4515	16347.7759	28.4353	5.0934	9.588
L18	34.7806	56.2013	8076.9030	11.9732	17.4001	464.1866	16164.4338	28.1060	5.1044	9.723
	35.8422	57.9435	8851.5285	12.3443	17.9312	493.6377	17714.7040	28.9772	5.2884	10.073



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Section	Tip Dia. in	Area in <sup>2</sup>	I in <sup>4</sup>	r in	C in	I/C in <sup>3</sup>	J in <sup>4</sup>	Iv/Q in <sup>2</sup>	w in	w/t
L19	35.8422	56.5842	8650.0997	12.3487	17.9312	482.4043	17311.5813	28.2975	5.3104	10.362
	36.9038	58.2848	9453.7162	12.7199	18.4623	512.0545	18919.8718	29.1480	5.4944	10.721
L20	36.9038	56.8831	9232.7940	12.7243	18.4623	500.0884	18477.7367	28.4470	5.5164	11.033
	37.9654	58.5423	10064.4954	13.0955	18.9934	529.8937	20142.2339	29.2767	5.7004	11.401
L21	37.9654	58.5423	10064.4954	13.0955	18.9934	529.8937	20142.2339	29.2767	5.7004	11.401
	38.2308	58.9570	10279.9460	13.1883	19.1262	537.4798	20573.4185	29.4841	5.7464	11.493
L22	38.2308	73.4483	12720.6584	13.1439	19.1262	665.0907	25458.0550	36.7312	5.5264	8.842
	38.3329	73.6478	12824.5591	13.1796	19.1773	668.7375	25665.9931	36.8309	5.5441	8.871
L23	38.3329	44.4862	7851.2316	13.2683	19.1773	409.4030	15712.7940	22.2473	5.9841	15.958
	38.3839	44.5461	7882.9513	13.2862	19.2028	410.5104	15776.2752	22.2773	5.9929	15.981
L24	38.3839	44.5461	7882.9513	13.2862	19.2028	410.5104	15776.2752	22.2773	5.9929	15.981
	39.4048	45.7426	8535.4154	13.6430	19.7135	432.9729	17082.0620	22.8757	6.1699	16.453
L25	39.4048	45.7426	8535.4154	13.6430	19.7135	432.9729	17082.0620	22.8757	6.1699	16.453
	40.4256	46.9392	9222.9239	13.9999	20.2242	456.0338	18457.9835	23.4741	6.3468	16.925
L26	40.4256	46.9392	9222.9239	13.9999	20.2242	456.0338	18457.9835	23.4741	6.3468	16.925
	41.4464	48.1358	9946.3934	14.3568	20.7349	479.6931	19905.8745	24.0725	6.5237	17.397
L27	41.4464	48.1358	9946.3934	14.3568	20.7349	479.6931	19905.8745	24.0725	6.5237	17.397
	42.4672	49.3324	10706.7407	14.7137	21.2456	503.9506	21427.5696	24.6709	6.7007	17.868
L28	42.4672	49.3324	10706.7407	14.7137	21.2456	503.9506	21427.5696	24.6709	6.7007	17.868
	43.4881	50.5290	11504.8825	15.0706	21.7563	528.8066	23024.9034	25.2693	6.8776	18.34
L29	43.4881	50.5290	11504.8825	15.0706	21.7563	528.8066	23024.9034	25.2693	6.8776	18.34
	44.5089	51.7255	12341.7355	15.4275	22.2670	554.2608	24699.7106	25.8677	7.0546	18.812
L30	44.5089	51.7255	12341.7355	15.4275	22.2670	554.2608	24699.7106	25.8677	7.0546	18.812
	45.5297	52.9221	13218.2165	15.7844	22.7777	580.3134	26453.8259	26.4661	7.2315	19.284
L31	45.5297	52.9221	13218.2165	15.7844	22.7777	580.3134	26453.8259	26.4661	7.2315	19.284
	46.5506	54.1187	14135.2422	16.1413	23.2884	606.9644	28289.0839	27.0645	7.4084	19.756
L32	46.5506	54.1187	14135.2422	16.1413	23.2884	606.9644	28289.0839	27.0645	7.4084	19.756
	47.5714	55.3153	15093.7293	16.4982	23.7991	634.2136	30207.3192	27.6629	7.5854	20.228
L33	47.5714	55.3153	15093.7293	16.4982	23.7991	634.2136	30207.3192	27.6629	7.5854	20.228
	47.8266	55.6144	15339.9368	16.5874	23.9268	641.1194	30700.0583	27.8125	7.6296	20.346
L34	47.8266	55.6144	15339.9368	16.5874	23.9268	641.1194	30700.0583	27.8125	7.6296	20.346
	48.9693	56.9538	16475.1573	16.9869	24.4985	672.4979	32971.9929	28.4823	7.8277	20.874
L35	48.9693	56.9538	16475.1573	16.9869	24.4985	672.4979	32971.9929	28.4823	7.8277	20.874
	50.1119	58.2932	17665.0474	17.3863	25.0701	704.6261	35353.3388	29.1521	8.0257	21.402
L36	50.1119	58.2932	17665.0474	17.3863	25.0701	704.6261	35353.3388	29.1521	8.0257	21.402
	51.2546	59.6326	18910.8928	17.7858	25.6418	737.5039	37846.6690	29.8220	8.2238	21.93
L37	51.2546	59.6326	18910.8928	17.7858	25.6418	737.5039	37846.6690	29.8220	8.2238	21.93
	52.3972	60.9720	20213.9792	18.1853	26.2134	771.1314	40454.5564	30.4918	8.4218	22.458
L38	52.3972	60.9720	20213.9792	18.1853	26.2134	771.1314	40454.5564	30.4918	8.4218	22.458
	53.5399	62.3114	21575.5922	18.5848	26.7851	805.5086	43179.5742	31.1616	8.6199	22.986
L39	53.5399	62.3114	21575.5922	18.5848	26.7851	805.5086	43179.5742	31.1616	8.6199	22.986
	54.6825	63.6507	22997.0176	18.9843	27.3567	840.6354	46024.2953	31.8314	8.8179	23.514
L40	54.6825	63.6507	22997.0176	18.9843	27.3567	840.6354	46024.2953	31.8314	8.8179	23.514
	55.8252	64.9901	24479.5410	19.3837	27.9284	876.5120	48991.2928	32.5012	9.0160	24.043
L41	55.8252	64.9901	24479.5410	19.3837	27.9284	876.5120	48991.2928	32.5012	9.0160	24.043
	56.9679	66.3295	26024.4480	19.7832	28.5000	913.1382	52083.1397	33.1711	9.2140	24.571
L42	56.9679	66.3295	26024.4480	19.7832	28.5000	913.1382	52083.1397	33.1711	9.2140	24.571
	58.1105	67.6689	27633.0244	20.1827	29.0717	950.5141	55302.4090	33.8409	9.4121	25.099
L43	58.1105	67.6689	27633.0244	20.1827	29.0717	950.5141	55302.4090	33.8409	9.4121	25.099
	58.3870	67.9930	28032.0126	20.2794	29.2100	959.6718	56100.9104	34.0030	9.4600	25.227

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A <sub>f</sub>	Adjust. Factor A <sub>r</sub>	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals
ft	ft <sup>2</sup>	in					in	in
L1 179.00-174.00				1	1	1		
L2 174.00-169.00				1	1	1		
L3				1	1	1		



<b>tnxTower</b>  <b>Atlantis Group, Inc.</b> 1340 Centre Street, Suite 212 Newton, MA 02459 Phone: (617) 965-0789 FAX: Fax: (617) 213-3123	<b>Job</b> CTHA539A	<b>Page</b> 6 of 61
	<b>Project</b> CTHA539A	<b>Date</b> 09:30:37 10/08/14
	<b>Client</b> metroPCS	<b>Designed by</b> Ahmet Colakoglu

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	Double Angle Stitch Bolt Spacing Horizontals
ft	ft <sup>2</sup>	in					in	in
L33				1	1	1		
47.46-46.21								
L34				1	1	1		
46.21-41.21								
L35				1	1	1		
41.21-36.21								
L36				1	1	1		
36.21-31.21								
L37				1	1	1		
31.21-26.21								
L38				1	1	1		
26.21-21.21								
L39				1	1	1		
21.21-16.21								
L40				1	1	1		
16.21-11.21								
L41 11.21-6.21				1	1	1		
L42 6.21-1.21				1	1	1		
L43 1.21-0.00				1	1	1		

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

Description	Face or Leg	Allow Shield	Component Type	Placement	Total Number		$C_{AA}$	Weight
				ft			ft <sup>2</sup> /ft	plf
AL5-50(7/8)	A	No	Inside Pole	179.00 - 3.00	6	No Ice	0.00	0.26
						1/2" Ice	0.00	0.26
LDF7-50A (1-5/8 FOAM)	A	No	Inside Pole	170.00 - 7.00	12	No Ice	0.00	1.04
						1/2" Ice	0.00	1.04
LDF7-50A (1-5/8 FOAM)	A	No	Inside Pole	158.00 - 11.00	12	No Ice	0.00	1.04
						1/2" Ice	0.00	1.04
LDF7-50A (1-5/8 FOAM)	A	No	Inside Pole	128.30 - 11.00	1	No Ice	0.00	1.04
						1/2" Ice	0.00	1.04
LDF4-50A (1/2 FOAM)	A	No	Inside Pole	128.30 - 11.00	1	No Ice	0.00	0.25
						1/2" Ice	0.00	0.25
LDF7-50A (1-5/8 FOAM)	A	No	Inside Pole	127.50 - 11.00	1	No Ice	0.00	1.04
						1/2" Ice	0.00	1.04
LDF7-50A (1-5/8 FOAM)	A	No	Inside Pole	107.80 - 11.00	1	No Ice	0.00	1.04
						1/2" Ice	0.00	1.04
FB-L98B-002	C	No	Inside Pole	170.00 - 7.00	1	No Ice	0.00	0.25
						1/2" Ice	0.00	0.25
WR-VG112ST-BRDA	C	No	Inside Pole	170.00 - 7.00	2	No Ice	0.00	0.25
						1/2" Ice	0.00	0.25
HS Hybrid 5 Power x 6 Fiber 8 AWG	A	No	Inside Pole	175.00 - 3.00	1	No Ice	0.00	1.00
						1/2" Ice	0.00	1.00

### Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation	Face	$A_R$	$A_F$	$C_{AA}$	$C_{AA}$	Weight
	ft		ft <sup>2</sup>	ft <sup>2</sup>	In Face	Out Face	lb
					ft <sup>2</sup>	ft <sup>2</sup>	
L1	179.00-174.00	A	0.000	0.000	0.000	0.000	8.80

<p><b>tnxTower</b></p> <p><i>Atlantis Group, Inc.</i>  1340 Centre Street, Suite 212  Newton, MA 02459  Phone: Phone: (617) 965-0789  FAX: Fax: (617) 213-3123</p>	Job	CTHA539A	Page	7 of 61
	Project	CTHA539A	Date	09:30:37 10/08/14
	Client	metroPCS	Designed by	Ahmet Colakoglu

Tower Section	Tower Elevation ft	Face	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>	Weight lb
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L2	174.00-169.00	A	0.000	0.000	0.000	0.000	25.28
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.75
L3	169.00-164.00	A	0.000	0.000	0.000	0.000	75.20
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.75
L4	164.00-159.00	A	0.000	0.000	0.000	0.000	75.20
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.75
L5	159.00-154.00	A	0.000	0.000	0.000	0.000	125.12
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.75
L6	154.00-149.00	A	0.000	0.000	0.000	0.000	137.60
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.75
L7	149.00-144.71	A	0.000	0.000	0.000	0.000	118.06
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.22
L8	144.71-144.46	A	0.000	0.000	0.000	0.000	6.88
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.19
L9	144.46-139.46	A	0.000	0.000	0.000	0.000	137.60
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.75
L10	139.46-139.17	A	0.000	0.000	0.000	0.000	7.98
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.22
L11	139.17-134.17	A	0.000	0.000	0.000	0.000	137.60
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.75
L12	134.17-129.17	A	0.000	0.000	0.000	0.000	137.60
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.75
L13	129.17-124.71	A	0.000	0.000	0.000	0.000	130.27
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.35
L14	124.71-124.46	A	0.000	0.000	0.000	0.000	7.46
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.19
L15	124.46-119.46	A	0.000	0.000	0.000	0.000	149.25
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.75
L16	119.46-114.46	A	0.000	0.000	0.000	0.000	149.25
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.75
L17	114.46-109.46	A	0.000	0.000	0.000	0.000	149.25
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.75
L18	109.46-104.46	A	0.000	0.000	0.000	0.000	152.72
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.75
L19	104.46-99.46	A	0.000	0.000	0.000	0.000	154.45
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.75
L20	99.46-94.46	A	0.000	0.000	0.000	0.000	154.45
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.75
L21	94.46-93.21	A	0.000	0.000	0.000	0.000	38.61
		B	0.000	0.000	0.000	0.000	0.00



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	Project	CTHA539A	Date	09:30:37 10/08/14
	Client	metroPCS	Designed by	Ahmet Colakoglu

Tower Section	Tower Elevation ft	Face	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>	Weight lb
		C	0.000	0.000	0.000	0.000	0.94
L22	93.21-92.71	A	0.000	0.000	0.000	0.000	15.45
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.38
L23	92.71-92.46	A	0.000	0.000	0.000	0.000	7.72
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.19
L24	92.46-87.46	A	0.000	0.000	0.000	0.000	154.45
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.75
L25	87.46-82.46	A	0.000	0.000	0.000	0.000	154.45
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.75
L26	82.46-77.46	A	0.000	0.000	0.000	0.000	154.45
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.75
L27	77.46-72.46	A	0.000	0.000	0.000	0.000	154.45
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.75
L28	72.46-67.46	A	0.000	0.000	0.000	0.000	154.45
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.75
L29	67.46-62.46	A	0.000	0.000	0.000	0.000	154.45
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.75
L30	62.46-57.46	A	0.000	0.000	0.000	0.000	154.45
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.75
L31	57.46-52.46	A	0.000	0.000	0.000	0.000	154.45
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.75
L32	52.46-47.46	A	0.000	0.000	0.000	0.000	154.45
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.75
L33	47.46-46.21	A	0.000	0.000	0.000	0.000	38.61
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.94
L34	46.21-41.21	A	0.000	0.000	0.000	0.000	154.45
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.75
L35	41.21-36.21	A	0.000	0.000	0.000	0.000	154.45
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.75
L36	36.21-31.21	A	0.000	0.000	0.000	0.000	154.45
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.75
L37	31.21-26.21	A	0.000	0.000	0.000	0.000	154.45
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.75
L38	26.21-21.21	A	0.000	0.000	0.000	0.000	154.45
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.75
L39	21.21-16.21	A	0.000	0.000	0.000	0.000	154.45
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.75
L40	16.21-11.21	A	0.000	0.000	0.000	0.000	154.45
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.75
L41	11.21-6.21	A	0.000	0.000	0.000	0.000	68.67
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.16



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	<b>Project</b>	CTHA539A	<b>Date</b>	09:30:37 10/08/14
	<b>Client</b>	metroPCS	<b>Designed by</b>	Ahmet Colakoglu

Tower Section	Tower Elevation ft	Face	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>	Weight lb
L42	6.21-1.21	A	0.000	0.000	0.000	0.000	8.22
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L43	1.21-0.00	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	0.00

### Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>	Weight lb
L1	179.00-174.00	A	0.500	0.000	0.000	0.000	0.000	8.80
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L2	174.00-169.00	A	0.500	0.000	0.000	0.000	0.000	25.28
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L3	169.00-164.00	A	0.500	0.000	0.000	0.000	0.000	75.20
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	3.75
L4	164.00-159.00	A	0.500	0.000	0.000	0.000	0.000	75.20
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	3.75
L5	159.00-154.00	A	0.500	0.000	0.000	0.000	0.000	125.12
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	3.75
L6	154.00-149.00	A	0.500	0.000	0.000	0.000	0.000	137.60
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	3.75
L7	149.00-144.71	A	0.500	0.000	0.000	0.000	0.000	118.06
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	3.22
L8	144.71-144.46	A	0.500	0.000	0.000	0.000	0.000	6.88
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.19
L9	144.46-139.46	A	0.500	0.000	0.000	0.000	0.000	137.60
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	3.75
L10	139.46-139.17	A	0.500	0.000	0.000	0.000	0.000	7.98
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.22
L11	139.17-134.17	A	0.500	0.000	0.000	0.000	0.000	137.60
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	3.75
L12	134.17-129.17	A	0.500	0.000	0.000	0.000	0.000	137.60
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	3.75
L13	129.17-124.71	A	0.500	0.000	0.000	0.000	0.000	130.27
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	3.35
L14	124.71-124.46	A	0.500	0.000	0.000	0.000	0.000	7.46
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.19
L15	124.46-119.46	A	0.500	0.000	0.000	0.000	0.000	149.25
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	3.75
L16	119.46-114.46	A	0.500	0.000	0.000	0.000	0.000	149.25

<p><b>tnxTower</b></p> <p><i>Atlantis Group, Inc.</i>  1340 Centre Street, Suite 212  Newton, MA 02459  Phone: Phone: (617) 965-0789  FAX: Fax: (617) 213-3123</p>	Job	CTHA539A	Page	10 of 61
	Project	CTHA539A	Date	09:30:37 10/08/14
	Client	metroPCS	Designed by	Ahmet Colakoglu

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	$A_R$ ft <sup>2</sup>	$A_F$ ft <sup>2</sup>	$C_A A_A$ In Face ft <sup>2</sup>	$C_A A_A$ Out Face ft <sup>2</sup>	Weight lb
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	3.75
L17	114.46-109.46	A	0.500	0.000	0.000	0.000	0.000	149.25
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	3.75
L18	109.46-104.46	A	0.500	0.000	0.000	0.000	0.000	152.72
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	3.75
L19	104.46-99.46	A	0.500	0.000	0.000	0.000	0.000	154.45
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	3.75
L20	99.46-94.46	A	0.500	0.000	0.000	0.000	0.000	154.45
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	3.75
L21	94.46-93.21	A	0.500	0.000	0.000	0.000	0.000	38.61
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.94
L22	93.21-92.71	A	0.500	0.000	0.000	0.000	0.000	15.45
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.38
L23	92.71-92.46	A	0.500	0.000	0.000	0.000	0.000	7.72
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.19
L24	92.46-87.46	A	0.500	0.000	0.000	0.000	0.000	154.45
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	3.75
L25	87.46-82.46	A	0.500	0.000	0.000	0.000	0.000	154.45
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	3.75
L26	82.46-77.46	A	0.500	0.000	0.000	0.000	0.000	154.45
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	3.75
L27	77.46-72.46	A	0.500	0.000	0.000	0.000	0.000	154.45
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	3.75
L28	72.46-67.46	A	0.500	0.000	0.000	0.000	0.000	154.45
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	3.75
L29	67.46-62.46	A	0.500	0.000	0.000	0.000	0.000	154.45
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	3.75
L30	62.46-57.46	A	0.500	0.000	0.000	0.000	0.000	154.45
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	3.75
L31	57.46-52.46	A	0.500	0.000	0.000	0.000	0.000	154.45
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	3.75
L32	52.46-47.46	A	0.500	0.000	0.000	0.000	0.000	154.45
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	3.75
L33	47.46-46.21	A	0.500	0.000	0.000	0.000	0.000	38.61
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.94
L34	46.21-41.21	A	0.500	0.000	0.000	0.000	0.000	154.45
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	3.75
L35	41.21-36.21	A	0.500	0.000	0.000	0.000	0.000	154.45
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	3.75
L36	36.21-31.21	A	0.500	0.000	0.000	0.000	0.000	154.45
		B		0.000	0.000	0.000	0.000	0.00

<b>tnxTower</b>  <b>Atlantis Group, Inc.</b> 1340 Centre Street, Suite 212 Newton, MA 02459 Phone: (617) 965-0789 FAX: (617) 213-3123	Job	CTHA539A	Page	11 of 61
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	Client	metroPCS	Designed by	Ahmet Colakoglu

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> In Face ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Out Face ft <sup>2</sup>	Weight lb
		C		0.000	0.000	0.000	0.000	3.75
L37	31.21-26.21	A	0.500	0.000	0.000	0.000	0.000	154.45
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	3.75
L38	26.21-21.21	A	0.500	0.000	0.000	0.000	0.000	154.45
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	3.75
L39	21.21-16.21	A	0.500	0.000	0.000	0.000	0.000	154.45
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	3.75
L40	16.21-11.21	A	0.500	0.000	0.000	0.000	0.000	154.45
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	3.75
L41	11.21-6.21	A	0.500	0.000	0.000	0.000	0.000	68.67
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	3.16
L42	6.21-1.21	A	0.500	0.000	0.000	0.000	0.000	8.22
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L43	1.21-0.00	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00

### Feed Line Center of Pressure

Section	Elevation ft	CP <sub>X</sub> in	CP <sub>Z</sub> in	CP <sub>X</sub> Ice in	CP <sub>Z</sub> Ice in
L1	179.00-174.00	0.0000	0.0000	0.0000	0.0000
L2	174.00-169.00	0.0000	0.0000	0.0000	0.0000
L3	169.00-164.00	0.0000	0.0000	0.0000	0.0000
L4	164.00-159.00	0.0000	0.0000	0.0000	0.0000
L5	159.00-154.00	0.0000	0.0000	0.0000	0.0000
L6	154.00-149.00	0.0000	0.0000	0.0000	0.0000
L7	149.00-144.71	0.0000	0.0000	0.0000	0.0000
L8	144.71-144.46	0.0000	0.0000	0.0000	0.0000
L9	144.46-139.46	0.0000	0.0000	0.0000	0.0000
L10	139.46-139.17	0.0000	0.0000	0.0000	0.0000
L11	139.17-134.17	0.0000	0.0000	0.0000	0.0000
L12	134.17-129.17	0.0000	0.0000	0.0000	0.0000
L13	129.17-124.71	0.0000	0.0000	0.0000	0.0000
L14	124.71-124.46	0.0000	0.0000	0.0000	0.0000
L15	124.46-119.46	0.0000	0.0000	0.0000	0.0000
L16	119.46-114.46	0.0000	0.0000	0.0000	0.0000
L17	114.46-109.46	0.0000	0.0000	0.0000	0.0000
L18	109.46-104.46	0.0000	0.0000	0.0000	0.0000
L19	104.46-99.46	0.0000	0.0000	0.0000	0.0000
L20	99.46-94.46	0.0000	0.0000	0.0000	0.0000
L21	94.46-93.21	0.0000	0.0000	0.0000	0.0000
L22	93.21-92.71	0.0000	0.0000	0.0000	0.0000
L23	92.71-92.46	0.0000	0.0000	0.0000	0.0000
L24	92.46-87.46	0.0000	0.0000	0.0000	0.0000
L25	87.46-82.46	0.0000	0.0000	0.0000	0.0000
L26	82.46-77.46	0.0000	0.0000	0.0000	0.0000
L27	77.46-72.46	0.0000	0.0000	0.0000	0.0000
L28	72.46-67.46	0.0000	0.0000	0.0000	0.0000
L29	67.46-62.46	0.0000	0.0000	0.0000	0.0000

<b>tnxTower</b>  <b>Atlantis Group, Inc.</b> 1340 Centre Street, Suite 212 Newton, MA 02459 Phone: (617) 965-0789 FAX: (617) 213-3123	<b>Job</b> CTHA539A	<b>Page</b> 12 of 61
	<b>Project</b> CTHA539A	<b>Date</b> 09:30:37 10/08/14
	<b>Client</b> metroPCS	<b>Designed by</b> Ahmet Colakoglu

Section	Elevation	CP <sub>x</sub>	CP <sub>z</sub>	CP <sub>x</sub>	CP <sub>z</sub>
	ft	in	in	Ice in	Ice in
L30	62.46-57.46	0.0000	0.0000	0.0000	0.0000
L31	57.46-52.46	0.0000	0.0000	0.0000	0.0000
L32	52.46-47.46	0.0000	0.0000	0.0000	0.0000
L33	47.46-46.21	0.0000	0.0000	0.0000	0.0000
L34	46.21-41.21	0.0000	0.0000	0.0000	0.0000
L35	41.21-36.21	0.0000	0.0000	0.0000	0.0000
L36	36.21-31.21	0.0000	0.0000	0.0000	0.0000
L37	31.21-26.21	0.0000	0.0000	0.0000	0.0000
L38	26.21-21.21	0.0000	0.0000	0.0000	0.0000
L39	21.21-16.21	0.0000	0.0000	0.0000	0.0000
L40	16.21-11.21	0.0000	0.0000	0.0000	0.0000
L41	11.21-6.21	0.0000	0.0000	0.0000	0.0000
L42	6.21-1.21	0.0000	0.0000	0.0000	0.0000
L43	1.21-0.00	0.0000	0.0000	0.0000	0.0000

### Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight lb	
						ft <sup>2</sup>	ft <sup>2</sup>		
3/4"x5' Lightning Rod	A	From Face	2.00 0.00 0.00	0.0000	182.10	No Ice 1/2" Ice	0.38 0.89	0.38 0.89	15.00 18.90
3" Dia 20' Omni	A	From Leg	3.50 0.00 0.00	0.0000	191.50	No Ice 1/2" Ice	4.00 6.00	4.00 6.00	55.00 100.00
3" Dia 20' Omni	B	From Leg	3.50 0.00 0.00	0.0000	191.50	No Ice 1/2" Ice	4.00 6.00	4.00 6.00	55.00 100.00
3" Dia 20' Omni	C	From Leg	3.50 0.00 0.00	0.0000	191.50	No Ice 1/2" Ice	4.00 6.00	4.00 6.00	55.00 100.00
14'-0" Platform	A	None	0.00 0.00 0.00	0.0000	179.00	No Ice 1/2" Ice	13.92 17.41	13.92 17.41	3200.00 4900.00
****									
(2) 7770.00 w/ Mount Pipe	A	From Leg	3.50 0.00 0.00	0.0000	169.70	No Ice 1/2" Ice	6.12 6.63	4.25 5.01	55.38 102.81
(2) 7770.00 w/ Mount Pipe	B	From Leg	3.50 0.00 0.00	0.0000	169.70	No Ice 1/2" Ice	6.12 6.63	4.25 5.01	55.38 102.81
(2) 7770.00 w/ Mount Pipe	C	From Leg	3.50 0.00 0.00	0.0000	169.70	No Ice 1/2" Ice	6.12 6.63	4.25 5.01	55.38 102.81
(2) Powerwave TMA LGP21400	A	From Leg	3.50 0.00 0.00	0.0000	169.70	No Ice 1/2" Ice	1.23 1.38	0.41 0.52	14.10 21.29
(2) Powerwave TMA LGP21400	B	From Leg	3.50 0.00 0.00	0.0000	169.70	No Ice 1/2" Ice	1.23 1.38	0.41 0.52	14.10 21.29
(2) Powerwave TMA LGP21400	C	From Leg	3.50 0.00 0.00	0.0000	169.70	No Ice 1/2" Ice	1.23 1.38	0.41 0.52	14.10 21.29



<b>tnxTower</b>  <b>Atlantis Group, Inc.</b> 1340 Centre Street, Suite 212 Newton, MA 02459 Phone: (617) 965-0789 FAX: Fax: (617) 213-3123	Job	CTHA539A	Page	13 of 61
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	Client	metroPCS	Designed by	Ahmet Colakoglu

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight lb
(2) Powerwave LGP13519 diplexer	A	From Leg	3.50 0.00 0.00	0.0000	169.70	No Ice 1/2" Ice	1.23 1.38	0.41 0.52	14.10 21.29
(2) Powerwave LGP13519 diplexer	B	From Leg	3.50 0.00 0.00	0.0000	169.70	No Ice 1/2" Ice	1.23 1.38	0.41 0.52	14.10 21.29
(2) Powerwave LGP13519 diplexer	C	From Leg	3.50 0.00 0.00	0.0000	169.70	No Ice 1/2" Ice	1.23 1.38	0.41 0.52	14.10 21.29
14'-0" Platform	A	None		0.0000	166.00	No Ice 1/2" Ice	13.92 17.41	13.92 17.41	3200.00 4900.00
*****									
P65-17-XLH-RR with Pipe	A	From Leg	3.50 0.00 0.00	0.0000	170.00	No Ice 1/2" Ice	11.70 12.42	8.94 10.45	102.85 188.61
P65-17-XLH-RR with Pipe	B	From Leg	3.50 0.00 0.00	0.0000	170.00	No Ice 1/2" Ice	11.70 12.42	8.94 10.45	102.85 188.61
P65-17-XLH-RR with Pipe	C	From Leg	3.50 0.00 0.00	0.0000	170.00	No Ice 1/2" Ice	11.70 12.42	8.94 10.45	102.85 188.61
(2) Ericsson RRU	A	From Face	1.00 0.00 0.00	0.0000	170.00	No Ice 1/2" Ice	2.07 2.26	1.08 1.23	44.00 58.64
(2) Ericsson RRU	B	From Face	1.00 0.00 0.00	0.0000	170.00	No Ice 1/2" Ice	2.07 2.26	1.08 1.23	44.00 58.64
(2) Ericsson RRU	C	From Face	1.00 0.00 0.00	0.0000	170.00	No Ice 1/2" Ice	2.07 2.26	1.08 1.23	44.00 58.64
DC6-48-60-18-8F	A	From Face	1.00 0.00 0.00	0.0000	164.50	No Ice 1/2" Ice	1.29 1.49	1.29 1.49	32.00 47.38
Ring Mount	A	None		0.0000	167.00	No Ice 1/2" Ice	1.40 2.40	1.40 2.40	90.00 130.00
*****									
(2) APL866513 w/Mount Pipe	A	From Leg	3.50 0.00 0.00	0.0000	158.50	No Ice 1/2" Ice	5.01 5.69	5.40 6.49	41.25 91.03
BXA-171063-8BF-EDIN-2 w/ Mount Pipe	A	From Leg	3.50 0.00 0.00	0.0000	158.50	No Ice 1/2" Ice	3.18 3.56	3.35 3.97	28.90 61.07
BXA-70063/6CF w/ Mount Pipe	A	From Leg	3.50 0.00 0.00	0.0000	158.00	No Ice 1/2" Ice	7.98 8.62	5.41 6.56	42.28 101.23
(2) FRS FD9R6004 Diplexer	A	From Leg	3.50 0.00 0.00	0.0000	157.00	No Ice 1/2" Ice	0.37 0.45	0.08 0.14	2.60 4.90
(2) APL866513 w/Mount Pipe	B	From Leg	3.50 0.00 0.00	0.0000	158.50	No Ice 1/2" Ice	5.01 5.69	5.40 6.49	41.25 91.03
BXA-171063-8BF-EDIN-2 w/ Mount Pipe	B	From Leg	3.50 0.00 0.00	0.0000	158.50	No Ice 1/2" Ice	3.18 3.56	3.35 3.97	28.90 61.07
BXA-70063/6CF w/ Mount Pipe	B	From Leg	3.50 0.00	0.0000	158.00	No Ice 1/2" Ice	7.98 8.62	5.41 6.56	42.28 101.23

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight lb
(2) FRS FD9R6004 Diplexer	B	From Leg	0.00 3.50 0.00 0.00	0.0000	157.00	No Ice 0.37 1/2" Ice 0.45	0.08 0.14	2.60 4.90
(2) APL866513 w/Mount Pipe	C	From Leg	0.00 3.50 0.00 0.00	0.0000	158.50	No Ice 5.01 1/2" Ice 5.69	5.40 6.49	41.25 91.03
BXA-171063-8BF-EDIN-2 w/ Mount Pipe	C	From Leg	0.00 3.50 0.00 0.00	0.0000	158.50	No Ice 3.18 1/2" Ice 3.56	3.35 3.97	28.90 61.07
BXA-70063/6CF w/ Mount Pipe	C	From Leg	0.00 3.50 0.00 0.00	0.0000	158.00	No Ice 7.98 1/2" Ice 8.62	5.41 6.56	42.28 101.23
(2) FRS FD9R6004 Diplexer	C	From Leg	0.00 3.50 0.00 0.00	0.0000	157.00	No Ice 0.37 1/2" Ice 0.45	0.08 0.14	2.60 4.90
14'-0" Platform	A	None	0.00	0.0000	156.00	No Ice 17.30 1/2" Ice 22.10	17.30 22.10	1500.00 2030.00
*****								
Pirod 6' Side Mount Standoff (1)	C	From Leg	0.00 3.00 0.00 0.00	0.0000	128.30	No Ice 4.97 1/2" Ice 6.12	4.97 6.12	70.00 130.00
3' Yagi	C	From Leg	0.00 5.00 0.00 0.00	0.0000	128.50	No Ice 2.08 1/2" Ice 3.79	2.08 3.79	30.95 52.87
Omni 1"x8'	C	From Leg	0.00 3.00 0.00 0.00	0.0000	132.50	No Ice 0.80 1/2" Ice 1.62	0.80 1.62	20.00 27.43
Pirod 6' Side Mount Standoff (1)	A	From Leg	0.00 3.00 0.00 0.00	0.0000	127.50	No Ice 4.97 1/2" Ice 6.12	4.97 6.12	70.00 130.00
20' Dipole	A	From Leg	0.00 6.00 0.00 0.00	0.0000	138.60	No Ice 8.00 1/2" Ice 10.04	8.00 10.04	60.00 115.61
Pirod 6' Side Mount Standoff (1)	A	From Leg	0.00 3.00 0.00 0.00	0.0000	107.80	No Ice 4.97 1/2" Ice 6.12	4.97 6.12	70.00 130.00
10' Dipole	A	From Leg	0.00 6.00 0.00 0.00	0.0000	112.70	No Ice 4.00 1/2" Ice 4.97	4.00 4.97	25.00 53.13
*****								
AIR21 B2A/B4P with pipe	A	From Leg	0.00 3.50 0.00 0.00	0.0000	175.00	No Ice 6.87 1/2" Ice 7.38	6.29 7.05	134.62 201.01
AIR21 B2A/B4P with pipe	B	From Leg	0.00 3.50 0.00 0.00	0.0000	175.00	No Ice 6.87 1/2" Ice 7.38	6.29 7.05	134.62 201.01
AIR21 B2A/B4P with pipe	C	From Leg	0.00 3.50 0.00 0.00	0.0000	175.00	No Ice 6.87 1/2" Ice 7.38	6.29 7.05	134.62 201.01
AIR21 B4A/B2P with pipe	A	From Leg	0.00 3.50 4.00 0.00	0.0000	175.00	No Ice 6.85 1/2" Ice 7.41	5.78 6.70	126.90 184.69
AIR21 B4A/B2P with pipe	B	From Leg	0.00 3.50 4.00 0.00	0.0000	175.00	No Ice 6.85 1/2" Ice 7.41	5.78 6.70	126.90 184.69
AIR21 B4A/B2P with pipe	C	From Leg	0.00 3.50 0.00	0.0000	175.00	No Ice 6.85	5.78	126.90

<b>tnxTower</b>  <b>Atlantis Group, Inc.</b> 1340 Centre Street, Suite 212 Newton, MA 02459 Phone: Phone: (617) 965-0789 FAX: Fax: (617) 213-3123	<b>Job</b> CTHA539A	<b>Page</b> 15 of 61
	<b>Project</b> CTHA539A	<b>Date</b> 09:30:37 10/08/14
	<b>Client</b> metroPCS	<b>Designed by</b> Ahmet Colakoglu

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement	C <sub>A</sub> A <sub>A</sub> Front	C <sub>A</sub> A <sub>A</sub> Side	Weight
			ft ft ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	lb
			4.00 0.00		1/2" Ice	7.41	6.70	184.69

### Tower Pressures - No Ice

$$G_H = 1.690$$

Section Elevation	z	K <sub>Z</sub>	q <sub>z</sub>	A <sub>G</sub>	F a c e	A <sub>F</sub>	A <sub>R</sub>	A <sub>leg</sub>	Leg %	C <sub>A</sub> A <sub>A</sub> In Face	C <sub>A</sub> A <sub>A</sub> Out Face
ft	ft		psf	ft <sup>2</sup>		ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>		ft <sup>2</sup>	ft <sup>2</sup>
L1 179.00-174.00	176.48	1.615	26	8.423	A	0.000	8.423	8.423	100.00	0.000	0.000
					B	0.000	8.423		100.00	0.000	0.000
					C	0.000	8.423		100.00	0.000	0.000
L2 174.00-169.00	171.48	1.601	26	8.859	A	0.000	8.859	8.859	100.00	0.000	0.000
					B	0.000	8.859		100.00	0.000	0.000
					C	0.000	8.859		100.00	0.000	0.000
L3 169.00-164.00	166.48	1.588	26	9.296	A	0.000	9.296	9.296	100.00	0.000	0.000
					B	0.000	9.296		100.00	0.000	0.000
					C	0.000	9.296		100.00	0.000	0.000
L4 164.00-159.00	161.48	1.574	26	9.733	A	0.000	9.733	9.733	100.00	0.000	0.000
					B	0.000	9.733		100.00	0.000	0.000
					C	0.000	9.733		100.00	0.000	0.000
L5 159.00-154.00	156.48	1.56	26	10.170	A	0.000	10.170	10.170	100.00	0.000	0.000
					B	0.000	10.170		100.00	0.000	0.000
					C	0.000	10.170		100.00	0.000	0.000
L6 154.00-149.00	151.48	1.546	25	10.606	A	0.000	10.606	10.606	100.00	0.000	0.000
					B	0.000	10.606		100.00	0.000	0.000
					C	0.000	10.606		100.00	0.000	0.000
L7 149.00-144.71	146.84	1.532	25	9.448	A	0.000	9.448	9.448	100.00	0.000	0.000
					B	0.000	9.448		100.00	0.000	0.000
					C	0.000	9.448		100.00	0.000	0.000
L8 144.71-144.46	144.58	1.525	25	0.561	A	0.000	0.561	0.561	100.00	0.000	0.000
					B	0.000	0.561		100.00	0.000	0.000
					C	0.000	0.561		100.00	0.000	0.000
L9 144.46-139.46	141.94	1.517	25	11.440	A	0.000	11.440	11.440	100.00	0.000	0.000
					B	0.000	11.440		100.00	0.000	0.000
					C	0.000	11.440		100.00	0.000	0.000
L10 139.46-139.17	139.31	1.509	25	0.677	A	0.000	0.677	0.677	100.00	0.000	0.000
					B	0.000	0.677		100.00	0.000	0.000
					C	0.000	0.677		100.00	0.000	0.000
L11 139.17-134.17	136.65	1.501	25	11.901	A	0.000	11.901	11.901	100.00	0.000	0.000
					B	0.000	11.901		100.00	0.000	0.000
					C	0.000	11.901		100.00	0.000	0.000
L12 134.17-129.17	131.66	1.485	24	12.337	A	0.000	12.337	12.337	100.00	0.000	0.000
					B	0.000	12.337		100.00	0.000	0.000
					C	0.000	12.337		100.00	0.000	0.000
L13 129.17-124.71	126.93	1.469	24	11.372	A	0.000	11.372	11.372	100.00	0.000	0.000
					B	0.000	11.372		100.00	0.000	0.000
					C	0.000	11.372		100.00	0.000	0.000

<p><b>tnxTower</b></p> <p><b>Atlantis Group, Inc.</b>  1340 Centre Street, Suite 212  Newton, MA 02459  Phone: Phone: (617) 965-0789  FAX: Fax: (617) 213-3123</p>	<b>Job</b> CTHA539A	<b>Page</b> 16 of 61
	<b>Project</b> CTHA539A	<b>Date</b> 09:30:37 10/08/14
	<b>Client</b> metroPCS	<b>Designed by</b> Ahmet Colakoglu

Section Elevation	z	K <sub>Z</sub>	q <sub>z</sub>	A <sub>G</sub>	F a c e	A <sub>F</sub>	A <sub>R</sub>	A <sub>log</sub>	Leg %	C <sub>A</sub> A <sub>A</sub> In Face ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Out Face ft <sup>2</sup>
ft	ft		psf	ft <sup>2</sup>		ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>			
L14	124.58	1.462	24	0.648	A	0.000	0.648	0.648	100.00	0.000	0.000
124.71-124.46					B	0.000	0.648		100.00	0.000	0.000
					C	0.000	0.648		100.00	0.000	0.000
L15	121.95	1.453	24	13.183	A	0.000	13.183	13.183	100.00	0.000	0.000
124.46-119.46					B	0.000	13.183		100.00	0.000	0.000
					C	0.000	13.183		100.00	0.000	0.000
L16	116.95	1.435	24	13.618	A	0.000	13.618	13.618	100.00	0.000	0.000
119.46-114.46					B	0.000	13.618		100.00	0.000	0.000
					C	0.000	13.618		100.00	0.000	0.000
L17	111.95	1.418	23	14.054	A	0.000	14.054	14.054	100.00	0.000	0.000
114.46-109.46					B	0.000	14.054		100.00	0.000	0.000
					C	0.000	14.054		100.00	0.000	0.000
L18	106.95	1.399	23	14.490	A	0.000	14.490	14.490	100.00	0.000	0.000
109.46-104.46					B	0.000	14.490		100.00	0.000	0.000
					C	0.000	14.490		100.00	0.000	0.000
L19	101.95	1.38	23	14.925	A	0.000	14.925	14.925	100.00	0.000	0.000
104.46-99.46					B	0.000	14.925		100.00	0.000	0.000
					C	0.000	14.925		100.00	0.000	0.000
L20	96.95	1.361	22	15.361	A	0.000	15.361	15.361	100.00	0.000	0.000
99.46-94.46					B	0.000	15.361		100.00	0.000	0.000
					C	0.000	15.361		100.00	0.000	0.000
L21	93.83	1.348	22	3.908	A	0.000	3.908	3.908	100.00	0.000	0.000
94.46-93.21					B	0.000	3.908		100.00	0.000	0.000
					C	0.000	3.908		100.00	0.000	0.000
L22	92.96	1.344	22	1.571	A	0.000	1.571	1.571	100.00	0.000	0.000
93.21-92.71					B	0.000	1.571		100.00	0.000	0.000
					C	0.000	1.571		100.00	0.000	0.000
L23	92.58	1.343	22	0.787	A	0.000	0.787	0.787	100.00	0.000	0.000
92.71-92.46					B	0.000	0.787		100.00	0.000	0.000
					C	0.000	0.787		100.00	0.000	0.000
L24	89.95	1.332	22	15.960	A	0.000	15.960	15.960	100.00	0.000	0.000
92.46-87.46					B	0.000	15.960		100.00	0.000	0.000
					C	0.000	15.960		100.00	0.000	0.000
L25	84.95	1.31	21	16.379	A	0.000	16.379	16.379	100.00	0.000	0.000
87.46-82.46					B	0.000	16.379		100.00	0.000	0.000
					C	0.000	16.379		100.00	0.000	0.000
L26	79.95	1.288	21	16.798	A	0.000	16.798	16.798	100.00	0.000	0.000
82.46-77.46					B	0.000	16.798		100.00	0.000	0.000
					C	0.000	16.798		100.00	0.000	0.000
L27	74.95	1.264	21	17.216	A	0.000	17.216	17.216	100.00	0.000	0.000
77.46-72.46					B	0.000	17.216		100.00	0.000	0.000
					C	0.000	17.216		100.00	0.000	0.000
L28	69.95	1.239	20	17.635	A	0.000	17.635	17.635	100.00	0.000	0.000
72.46-67.46					B	0.000	17.635		100.00	0.000	0.000
					C	0.000	17.635		100.00	0.000	0.000
L29	64.95	1.213	20	18.054	A	0.000	18.054	18.054	100.00	0.000	0.000
67.46-62.46					B	0.000	18.054		100.00	0.000	0.000
					C	0.000	18.054		100.00	0.000	0.000
L30	59.95	1.186	19	18.473	A	0.000	18.473	18.473	100.00	0.000	0.000
62.46-57.46					B	0.000	18.473		100.00	0.000	0.000
					C	0.000	18.473		100.00	0.000	0.000
L31	54.95	1.157	19	18.892	A	0.000	18.892	18.892	100.00	0.000	0.000
57.46-52.46					B	0.000	18.892		100.00	0.000	0.000
					C	0.000	18.892		100.00	0.000	0.000
L32	49.95	1.126	18	19.311	A	0.000	19.311	19.311	100.00	0.000	0.000
52.46-47.46					B	0.000	19.311		100.00	0.000	0.000
					C	0.000	19.311		100.00	0.000	0.000
L33	46.83	1.105	18	4.892	A	0.000	4.892	4.892	100.00	0.000	0.000
47.46-46.21					B	0.000	4.892		100.00	0.000	0.000
					C	0.000	4.892		100.00	0.000	0.000



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	<b>Project</b> CTHA539A	<b>Date</b> 09:30:37 10/08/14
	<b>Client</b> metroPCS	<b>Designed by</b> Ahmet Colakoglu

Section Elevation	z	K <sub>Z</sub>	q <sub>z</sub>	A <sub>G</sub>	F a c e	A <sub>F</sub>	A <sub>R</sub>	A <sub>leg</sub>	Leg %	C <sub>A</sub> A <sub>A</sub> In Face	C <sub>A</sub> A <sub>A</sub> Out Face
ft	ft		psf	ft <sup>2</sup>	e	ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>		ft <sup>2</sup>	ft <sup>2</sup>
L34 46.21-41.21	43.70	1.084	18	19.859	A	0.000	19.859	19.859	100.00	0.000	0.000
					B	0.000	19.859		100.00	0.000	0.000
					C	0.000	19.859		100.00	0.000	0.000
L35 41.21-36.21	38.70	1.047	17	20.328	A	0.000	20.328	20.328	100.00	0.000	0.000
					B	0.000	20.328		100.00	0.000	0.000
					C	0.000	20.328		100.00	0.000	0.000
L36 36.21-31.21	33.70	1.006	16	20.797	A	0.000	20.797	20.797	100.00	0.000	0.000
					B	0.000	20.797		100.00	0.000	0.000
					C	0.000	20.797		100.00	0.000	0.000
L37 31.21-26.21	28.70	1	16	21.266	A	0.000	21.266	21.266	100.00	0.000	0.000
					B	0.000	21.266		100.00	0.000	0.000
					C	0.000	21.266		100.00	0.000	0.000
L38 26.21-21.21	23.70	1	16	21.735	A	0.000	21.735	21.735	100.00	0.000	0.000
					B	0.000	21.735		100.00	0.000	0.000
					C	0.000	21.735		100.00	0.000	0.000
L39 21.21-16.21	18.70	1	16	22.204	A	0.000	22.204	22.204	100.00	0.000	0.000
					B	0.000	22.204		100.00	0.000	0.000
					C	0.000	22.204		100.00	0.000	0.000
L40 16.21-11.21	13.70	1	16	22.673	A	0.000	22.673	22.673	100.00	0.000	0.000
					B	0.000	22.673		100.00	0.000	0.000
					C	0.000	22.673		100.00	0.000	0.000
L41 11.21-6.21	8.70	1	16	23.142	A	0.000	23.142	23.142	100.00	0.000	0.000
					B	0.000	23.142		100.00	0.000	0.000
					C	0.000	23.142		100.00	0.000	0.000
L42 6.21-1.21	3.70	1	16	23.610	A	0.000	23.610	23.610	100.00	0.000	0.000
					B	0.000	23.610		100.00	0.000	0.000
					C	0.000	23.610		100.00	0.000	0.000
L43 1.21-0.00	0.60	1	16	5.784	A	0.000	5.784	5.784	100.00	0.000	0.000
					B	0.000	5.784		100.00	0.000	0.000
					C	0.000	5.784		100.00	0.000	0.000

### Tower Pressure - With Ice

$$G_H = 1.690$$

Section Elevation	z	K <sub>Z</sub>	q <sub>z</sub>	t <sub>z</sub>	A <sub>G</sub>	F a c e	A <sub>F</sub>	A <sub>R</sub>	A <sub>leg</sub>	Leg %	C <sub>A</sub> A <sub>A</sub> In Face	C <sub>A</sub> A <sub>A</sub> Out Face
ft	ft		psf	in	ft <sup>2</sup>	e	ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>		ft <sup>2</sup>	ft <sup>2</sup>
L1 179.00-174.00	176.48	1.615	20	0.5000	8.839	A	0.000	8.839	8.839	100.00	0.000	0.000
						B	0.000	8.839		100.00	0.000	0.000
						C	0.000	8.839		100.00	0.000	0.000
L2 174.00-169.00	171.48	1.601	20	0.5000	9.276	A	0.000	9.276	9.276	100.00	0.000	0.000
						B	0.000	9.276		100.00	0.000	0.000
						C	0.000	9.276		100.00	0.000	0.000
L3 169.00-164.00	166.48	1.588	20	0.5000	9.713	A	0.000	9.713	9.713	100.00	0.000	0.000
						B	0.000	9.713		100.00	0.000	0.000
						C	0.000	9.713		100.00	0.000	0.000
L4 164.00-159.00	161.48	1.574	19	0.5000	10.149	A	0.000	10.149	10.149	100.00	0.000	0.000
						B	0.000	10.149		100.00	0.000	0.000
						C	0.000	10.149		100.00	0.000	0.000
L5 159.00-154.00	156.48	1.56	19	0.5000	10.586	A	0.000	10.586	10.586	100.00	0.000	0.000
						B	0.000	10.586		100.00	0.000	0.000
						C	0.000	10.586		100.00	0.000	0.000
L6 154.00-149.00	151.48	1.546	19	0.5000	11.023	A	0.000	11.023	11.023	100.00	0.000	0.000
						B	0.000	11.023		100.00	0.000	0.000

<b>tnxTower</b>  <b>Atlantis Group, Inc.</b> 1340 Centre Street, Suite 212 Newton, MA 02459 Phone: (617) 965-0789 FAX: (617) 213-3123	Job	CTHA539A	Page	18 of 61
	Project	CTHA539A	Date	09:30:37 10/08/14
	Client	metroPCS	Designed by	Ahmet Colakoglu

Section Elevation	z	K <sub>z</sub>	q <sub>z</sub>	t <sub>z</sub>	A <sub>G</sub>	F a c e	A <sub>F</sub>	A <sub>R</sub>	A <sub>leg</sub>	Leg %	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>
ft	ft		psf	in	ft <sup>2</sup>		ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>			
L7	146.84	1.532	19	0.5000	9.806	C	0.000	11.023		100.00	0.000	0.000
149.00-144.71						A	0.000	9.806	9.806	100.00	0.000	0.000
						B	0.000	9.806		100.00	0.000	0.000
						C	0.000	9.806		100.00	0.000	0.000
L8	144.58	1.525	19	0.5000	0.581	A	0.000	0.581	0.581	100.00	0.000	0.000
144.71-144.46						B	0.000	0.581		100.00	0.000	0.000
						C	0.000	0.581		100.00	0.000	0.000
L9	141.94	1.517	19	0.5000	11.856	A	0.000	11.856	11.856	100.00	0.000	0.000
144.46-139.46						B	0.000	11.856		100.00	0.000	0.000
						C	0.000	11.856		100.00	0.000	0.000
L10	139.31	1.509	19	0.5000	0.701	A	0.000	0.701	0.701	100.00	0.000	0.000
139.46-139.17						B	0.000	0.701		100.00	0.000	0.000
						C	0.000	0.701		100.00	0.000	0.000
L11	136.65	1.501	18	0.5000	12.318	A	0.000	12.318	12.318	100.00	0.000	0.000
139.17-134.17						B	0.000	12.318		100.00	0.000	0.000
						C	0.000	12.318		100.00	0.000	0.000
L12	131.66	1.485	18	0.5000	12.753	A	0.000	12.753	12.753	100.00	0.000	0.000
134.17-129.17						B	0.000	12.753		100.00	0.000	0.000
						C	0.000	12.753		100.00	0.000	0.000
L13	126.93	1.469	18	0.5000	11.744	A	0.000	11.744	11.744	100.00	0.000	0.000
129.17-124.71						B	0.000	11.744		100.00	0.000	0.000
						C	0.000	11.744		100.00	0.000	0.000
L14	124.58	1.462	18	0.5000	0.669	A	0.000	0.669	0.669	100.00	0.000	0.000
124.71-124.46						B	0.000	0.669		100.00	0.000	0.000
						C	0.000	0.669		100.00	0.000	0.000
L15	121.95	1.453	18	0.5000	13.599	A	0.000	13.599	13.599	100.00	0.000	0.000
124.46-119.46						B	0.000	13.599		100.00	0.000	0.000
						C	0.000	13.599		100.00	0.000	0.000
L16	116.95	1.435	18	0.5000	14.035	A	0.000	14.035	14.035	100.00	0.000	0.000
119.46-114.46						B	0.000	14.035		100.00	0.000	0.000
						C	0.000	14.035		100.00	0.000	0.000
L17	111.95	1.418	17	0.5000	14.471	A	0.000	14.471	14.471	100.00	0.000	0.000
114.46-109.46						B	0.000	14.471		100.00	0.000	0.000
						C	0.000	14.471		100.00	0.000	0.000
L18	106.95	1.399	17	0.5000	14.906	A	0.000	14.906	14.906	100.00	0.000	0.000
109.46-104.46						B	0.000	14.906		100.00	0.000	0.000
						C	0.000	14.906		100.00	0.000	0.000
L19	101.95	1.38	17	0.5000	15.342	A	0.000	15.342	15.342	100.00	0.000	0.000
104.46-99.46						B	0.000	15.342		100.00	0.000	0.000
						C	0.000	15.342		100.00	0.000	0.000
L20	99.46-94.46	96.95	1.361	17	0.5000	15.777	A	0.000	15.777	15.777	100.00	0.000
						B	0.000	15.777		100.00	0.000	0.000
						C	0.000	15.777		100.00	0.000	0.000
L21	94.46-93.21	93.83	1.348	17	0.5000	4.012	A	0.000	4.012	4.012	100.00	0.000
						B	0.000	4.012		100.00	0.000	0.000
						C	0.000	4.012		100.00	0.000	0.000
L22	93.21-92.71	92.96	1.344	17	0.5000	1.613	A	0.000	1.613	1.613	100.00	0.000
						B	0.000	1.613		100.00	0.000	0.000
						C	0.000	1.613		100.00	0.000	0.000
L23	92.71-92.46	92.58	1.343	17	0.5000	0.808	A	0.000	0.808	0.808	100.00	0.000
						B	0.000	0.808		100.00	0.000	0.000
						C	0.000	0.808		100.00	0.000	0.000
L24	92.46-87.46	89.95	1.332	16	0.5000	16.376	A	0.000	16.376	16.376	100.00	0.000
						B	0.000	16.376		100.00	0.000	0.000
						C	0.000	16.376		100.00	0.000	0.000
L25	87.46-82.46	84.95	1.31	16	0.5000	16.795	A	0.000	16.795	16.795	100.00	0.000
						B	0.000	16.795		100.00	0.000	0.000
						C	0.000	16.795		100.00	0.000	0.000
L26	82.46-77.46	79.95	1.288	16	0.5000	17.214	A	0.000	17.214	17.214	100.00	0.000
						B	0.000	17.214		100.00	0.000	0.000

<b>tnxTower</b>  <b>Atlantis Group, Inc.</b> 1340 Centre Street, Suite 212 Newton, MA 02459 Phone: Phone: (617) 965-0789 FAX: Fax: (617) 213-3123	<b>Job</b> CTHA539A	<b>Page</b> 19 of 61
	<b>Project</b> CTHA539A	<b>Date</b> 09:30:37 10/08/14
	<b>Client</b> metroPCS	<b>Designed by</b> Ahmet Colakoglu

Section Elevation	z	$K_z$	$q_z$	$t_z$	$A_G$	F a c e	$A_F$	$A_R$	$A_{leg}$	Leg %	$C_{AA}$ In Face ft <sup>2</sup>	$C_{AA}$ Out Face ft <sup>2</sup>
ft	ft		psf	in	ft <sup>2</sup>		ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>			
L27 77.46-72.46	74.95	1.264	16	0.5000	17.633	C	0.000	17.214		100.00	0.000	0.000
						A	0.000	17.633	17.633	100.00	0.000	0.000
						B	0.000	17.633		100.00	0.000	0.000
						C	0.000	17.633		100.00	0.000	0.000
L28 72.46-67.46	69.95	1.239	15	0.5000	18.052	A	0.000	18.052	18.052	100.00	0.000	0.000
						B	0.000	18.052		100.00	0.000	0.000
						C	0.000	18.052		100.00	0.000	0.000
L29 67.46-62.46	64.95	1.213	15	0.5000	18.471	A	0.000	18.471	18.471	100.00	0.000	0.000
						B	0.000	18.471		100.00	0.000	0.000
						C	0.000	18.471		100.00	0.000	0.000
L30 62.46-57.46	59.95	1.186	15	0.5000	18.890	A	0.000	18.890	18.890	100.00	0.000	0.000
						B	0.000	18.890		100.00	0.000	0.000
						C	0.000	18.890		100.00	0.000	0.000
L31 57.46-52.46	54.95	1.157	14	0.5000	19.309	A	0.000	19.309	19.309	100.00	0.000	0.000
						B	0.000	19.309		100.00	0.000	0.000
						C	0.000	19.309		100.00	0.000	0.000
L32 52.46-47.46	49.95	1.126	14	0.5000	19.728	A	0.000	19.728	19.728	100.00	0.000	0.000
						B	0.000	19.728		100.00	0.000	0.000
						C	0.000	19.728		100.00	0.000	0.000
L33 47.46-46.21	46.83	1.105	14	0.5000	4.996	A	0.000	4.996	4.996	100.00	0.000	0.000
						B	0.000	4.996		100.00	0.000	0.000
						C	0.000	4.996		100.00	0.000	0.000
L34 46.21-41.21	43.70	1.084	13	0.5000	20.276	A	0.000	20.276	20.276	100.00	0.000	0.000
						B	0.000	20.276		100.00	0.000	0.000
						C	0.000	20.276		100.00	0.000	0.000
L35 41.21-36.21	38.70	1.047	13	0.5000	20.745	A	0.000	20.745	20.745	100.00	0.000	0.000
						B	0.000	20.745		100.00	0.000	0.000
						C	0.000	20.745		100.00	0.000	0.000
L36 36.21-31.21	33.70	1.006	12	0.5000	21.214	A	0.000	21.214	21.214	100.00	0.000	0.000
						B	0.000	21.214		100.00	0.000	0.000
						C	0.000	21.214		100.00	0.000	0.000
L37 31.21-26.21	28.70	1	12	0.5000	21.683	A	0.000	21.683	21.683	100.00	0.000	0.000
						B	0.000	21.683		100.00	0.000	0.000
						C	0.000	21.683		100.00	0.000	0.000
L38 26.21-21.21	23.70	1	12	0.5000	22.152	A	0.000	22.152	22.152	100.00	0.000	0.000
						B	0.000	22.152		100.00	0.000	0.000
						C	0.000	22.152		100.00	0.000	0.000
L39 21.21-16.21	18.70	1	12	0.5000	22.620	A	0.000	22.620	22.620	100.00	0.000	0.000
						B	0.000	22.620		100.00	0.000	0.000
						C	0.000	22.620		100.00	0.000	0.000
L40 16.21-11.21	13.70	1	12	0.5000	23.089	A	0.000	23.089	23.089	100.00	0.000	0.000
						B	0.000	23.089		100.00	0.000	0.000
						C	0.000	23.089		100.00	0.000	0.000
L41 11.21-6.21	8.70	1	12	0.5000	23.558	A	0.000	23.558	23.558	100.00	0.000	0.000
						B	0.000	23.558		100.00	0.000	0.000
						C	0.000	23.558		100.00	0.000	0.000
L42 6.21-1.21	3.70	1	12	0.5000	24.027	A	0.000	24.027	24.027	100.00	0.000	0.000
						B	0.000	24.027		100.00	0.000	0.000
						C	0.000	24.027		100.00	0.000	0.000
L43 1.21-0.00	0.60	1	12	0.5000	5.885	A	0.000	5.885	5.885	100.00	0.000	0.000
						B	0.000	5.885		100.00	0.000	0.000
						C	0.000	5.885		100.00	0.000	0.000

### Tower Pressure - Service

$$G_H = 1.690$$

<p><b>tnxTower</b></p> <p><i>Atlantis Group, Inc.</i>  1340 Centre Street, Suite 212  Newton, MA 02459  Phone: (617) 965-0789  FAX: Fax: (617) 213-3123</p>	<b>Job</b> CTHA539A	<b>Page</b> 20 of 61
	<b>Project</b> CTHA539A	<b>Date</b> 09:30:37 10/08/14
	<b>Client</b> metroPCS	<b>Designed by</b> Ahmet Colakoglu

Section Elevation	z	Kz	qz	AG	F a c e	AF	AR	Aleg	Leg %	CAA In Face	CAA Out Face
ft	ft		psf	ft <sup>2</sup>		ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>		ft <sup>2</sup>	ft <sup>2</sup>
L1 179.00-174.00	176.48	1.615	10	8.423	A	0.000	8.423	8.423	100.00	0.000	0.000
					B	0.000	8.423		100.00	0.000	0.000
					C	0.000	8.423		100.00	0.000	0.000
L2 174.00-169.00	171.48	1.601	10	8.859	A	0.000	8.859	8.859	100.00	0.000	0.000
					B	0.000	8.859		100.00	0.000	0.000
					C	0.000	8.859		100.00	0.000	0.000
L3 169.00-164.00	166.48	1.588	10	9.296	A	0.000	9.296	9.296	100.00	0.000	0.000
					B	0.000	9.296		100.00	0.000	0.000
					C	0.000	9.296		100.00	0.000	0.000
L4 164.00-159.00	161.48	1.574	10	9.733	A	0.000	9.733	9.733	100.00	0.000	0.000
					B	0.000	9.733		100.00	0.000	0.000
					C	0.000	9.733		100.00	0.000	0.000
L5 159.00-154.00	156.48	1.56	10	10.170	A	0.000	10.170	10.170	100.00	0.000	0.000
					B	0.000	10.170		100.00	0.000	0.000
					C	0.000	10.170		100.00	0.000	0.000
L6 154.00-149.00	151.48	1.546	10	10.606	A	0.000	10.606	10.606	100.00	0.000	0.000
					B	0.000	10.606		100.00	0.000	0.000
					C	0.000	10.606		100.00	0.000	0.000
L7 149.00-144.71	146.84	1.532	10	9.448	A	0.000	9.448	9.448	100.00	0.000	0.000
					B	0.000	9.448		100.00	0.000	0.000
					C	0.000	9.448		100.00	0.000	0.000
L8 144.71-144.46	144.58	1.525	10	0.561	A	0.000	0.561	0.561	100.00	0.000	0.000
					B	0.000	0.561		100.00	0.000	0.000
					C	0.000	0.561		100.00	0.000	0.000
L9 144.46-139.46	141.94	1.517	10	11.440	A	0.000	11.440	11.440	100.00	0.000	0.000
					B	0.000	11.440		100.00	0.000	0.000
					C	0.000	11.440		100.00	0.000	0.000
L10 139.46-139.17	139.31	1.509	10	0.677	A	0.000	0.677	0.677	100.00	0.000	0.000
					B	0.000	0.677		100.00	0.000	0.000
					C	0.000	0.677		100.00	0.000	0.000
L11 139.17-134.17	136.65	1.501	10	11.901	A	0.000	11.901	11.901	100.00	0.000	0.000
					B	0.000	11.901		100.00	0.000	0.000
					C	0.000	11.901		100.00	0.000	0.000
L12 134.17-129.17	131.66	1.485	10	12.337	A	0.000	12.337	12.337	100.00	0.000	0.000
					B	0.000	12.337		100.00	0.000	0.000
					C	0.000	12.337		100.00	0.000	0.000
L13 129.17-124.71	126.93	1.469	9	11.372	A	0.000	11.372	11.372	100.00	0.000	0.000
					B	0.000	11.372		100.00	0.000	0.000
					C	0.000	11.372		100.00	0.000	0.000
L14 124.71-124.46	124.58	1.462	9	0.648	A	0.000	0.648	0.648	100.00	0.000	0.000
					B	0.000	0.648		100.00	0.000	0.000
					C	0.000	0.648		100.00	0.000	0.000
L15 124.46-119.46	121.95	1.453	9	13.183	A	0.000	13.183	13.183	100.00	0.000	0.000
					B	0.000	13.183		100.00	0.000	0.000
					C	0.000	13.183		100.00	0.000	0.000
L16 119.46-114.46	116.95	1.435	9	13.618	A	0.000	13.618	13.618	100.00	0.000	0.000
					B	0.000	13.618		100.00	0.000	0.000
					C	0.000	13.618		100.00	0.000	0.000
L17 114.46-109.46	111.95	1.418	9	14.054	A	0.000	14.054	14.054	100.00	0.000	0.000
					B	0.000	14.054		100.00	0.000	0.000
					C	0.000	14.054		100.00	0.000	0.000
L18 109.46-104.46	106.95	1.399	9	14.490	A	0.000	14.490	14.490	100.00	0.000	0.000
					B	0.000	14.490		100.00	0.000	0.000
					C	0.000	14.490		100.00	0.000	0.000
L19 104.46-99.46	101.95	1.38	9	14.925	A	0.000	14.925	14.925	100.00	0.000	0.000
					B	0.000	14.925		100.00	0.000	0.000
					C	0.000	14.925		100.00	0.000	0.000
L20	96.95	1.361	9	15.361	A	0.000	15.361	15.361	100.00	0.000	0.000



<p><b>tnxTower</b></p> <p><i>Atlantis Group, Inc.</i>  1340 Centre Street, Suite 212  Newton, MA 02459  Phone: Phone: (617) 965-0789  FAX: Fax: (617) 213-3123</p>	<b>Job</b>	CTHA539A	<b>Page</b>	21 of 61
	<b>Project</b>	CTHA539A	<b>Date</b>	09:30:37 10/08/14
	<b>Client</b>	metroPCS	<b>Designed by</b>	Ahmet Colakoglu

Section Elevation	z	Kz	qz	AG	F a c e	AF	AR	Aleg	Leg %	CAA <sub>A</sub> In Face ft <sup>2</sup>	CAA <sub>A</sub> Out Face ft <sup>2</sup>
ft	ft		psf	ft <sup>2</sup>		ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>			
99.46-94.46					B	0.000	15.361		100.00	0.000	0.000
					C	0.000	15.361		100.00	0.000	0.000
L21	93.83	1.348	9	3.908	A	0.000	3.908	3.908	100.00	0.000	0.000
94.46-93.21					B	0.000	3.908		100.00	0.000	0.000
					C	0.000	3.908		100.00	0.000	0.000
L22	92.96	1.344	9	1.571	A	0.000	1.571	1.571	100.00	0.000	0.000
93.21-92.71					B	0.000	1.571		100.00	0.000	0.000
					C	0.000	1.571		100.00	0.000	0.000
L23	92.58	1.343	9	0.787	A	0.000	0.787	0.787	100.00	0.000	0.000
92.71-92.46					B	0.000	0.787		100.00	0.000	0.000
					C	0.000	0.787		100.00	0.000	0.000
L24	89.95	1.332	9	15.960	A	0.000	15.960	15.960	100.00	0.000	0.000
92.46-87.46					B	0.000	15.960		100.00	0.000	0.000
					C	0.000	15.960		100.00	0.000	0.000
L25	84.95	1.31	8	16.379	A	0.000	16.379	16.379	100.00	0.000	0.000
87.46-82.46					B	0.000	16.379		100.00	0.000	0.000
					C	0.000	16.379		100.00	0.000	0.000
L26	79.95	1.288	8	16.798	A	0.000	16.798	16.798	100.00	0.000	0.000
82.46-77.46					B	0.000	16.798		100.00	0.000	0.000
					C	0.000	16.798		100.00	0.000	0.000
L27	74.95	1.264	8	17.216	A	0.000	17.216	17.216	100.00	0.000	0.000
77.46-72.46					B	0.000	17.216		100.00	0.000	0.000
					C	0.000	17.216		100.00	0.000	0.000
L28	69.95	1.239	8	17.635	A	0.000	17.635	17.635	100.00	0.000	0.000
72.46-67.46					B	0.000	17.635		100.00	0.000	0.000
					C	0.000	17.635		100.00	0.000	0.000
L29	64.95	1.213	8	18.054	A	0.000	18.054	18.054	100.00	0.000	0.000
67.46-62.46					B	0.000	18.054		100.00	0.000	0.000
					C	0.000	18.054		100.00	0.000	0.000
L30	59.95	1.186	8	18.473	A	0.000	18.473	18.473	100.00	0.000	0.000
62.46-57.46					B	0.000	18.473		100.00	0.000	0.000
					C	0.000	18.473		100.00	0.000	0.000
L31	54.95	1.157	7	18.892	A	0.000	18.892	18.892	100.00	0.000	0.000
57.46-52.46					B	0.000	18.892		100.00	0.000	0.000
					C	0.000	18.892		100.00	0.000	0.000
L32	49.95	1.126	7	19.311	A	0.000	19.311	19.311	100.00	0.000	0.000
52.46-47.46					B	0.000	19.311		100.00	0.000	0.000
					C	0.000	19.311		100.00	0.000	0.000
L33	46.83	1.105	7	4.892	A	0.000	4.892	4.892	100.00	0.000	0.000
47.46-46.21					B	0.000	4.892		100.00	0.000	0.000
					C	0.000	4.892		100.00	0.000	0.000
L34	43.70	1.084	7	19.859	A	0.000	19.859	19.859	100.00	0.000	0.000
46.21-41.21					B	0.000	19.859		100.00	0.000	0.000
					C	0.000	19.859		100.00	0.000	0.000
L35	38.70	1.047	7	20.328	A	0.000	20.328	20.328	100.00	0.000	0.000
41.21-36.21					B	0.000	20.328		100.00	0.000	0.000
					C	0.000	20.328		100.00	0.000	0.000
L36	33.70	1.006	6	20.797	A	0.000	20.797	20.797	100.00	0.000	0.000
36.21-31.21					B	0.000	20.797		100.00	0.000	0.000
					C	0.000	20.797		100.00	0.000	0.000
L37	28.70	1	6	21.266	A	0.000	21.266	21.266	100.00	0.000	0.000
31.21-26.21					B	0.000	21.266		100.00	0.000	0.000
					C	0.000	21.266		100.00	0.000	0.000
L38	23.70	1	6	21.735	A	0.000	21.735	21.735	100.00	0.000	0.000
26.21-21.21					B	0.000	21.735		100.00	0.000	0.000
					C	0.000	21.735		100.00	0.000	0.000
L39	18.70	1	6	22.204	A	0.000	22.204	22.204	100.00	0.000	0.000
21.21-16.21					B	0.000	22.204		100.00	0.000	0.000
					C	0.000	22.204		100.00	0.000	0.000
L40	13.70	1	6	22.673	A	0.000	22.673	22.673	100.00	0.000	0.000

<b>tnxTower</b>  <b>Atlantis Group, Inc.</b> 1340 Centre Street, Suite 212 Newton, MA 02459 Phone: Phone: (617) 965-0789 FAX: Fax: (617) 213-3123	Job	CTHA539A	Page	22 of 61
	Project	CTHA539A	Date	09:30:37 10/08/14
	Client	metroPCS	Designed by	Ahmet Colakoglu

Section Elevation	z	K <sub>Z</sub>	q <sub>z</sub>	A <sub>G</sub>	F <sub>a c e</sub>	A <sub>F</sub>	A <sub>R</sub>	A <sub>leg</sub>	Leg %	C <sub>AA</sub> <sub>In</sub> Face	C <sub>AA</sub> <sub>Out</sub> Face
ft	ft		psf	ft <sup>2</sup>		ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>		ft <sup>2</sup>	ft <sup>2</sup>
16.21-11.21					B	0.000	22.673		100.00	0.000	0.000
					C	0.000	22.673		100.00	0.000	0.000
L41 11.21-6.21	8.70	1	6	23.142	A	0.000	23.142	23.142	100.00	0.000	0.000
					B	0.000	23.142		100.00	0.000	0.000
					C	0.000	23.142		100.00	0.000	0.000
L42 6.21-1.21	3.70	1	6	23.610	A	0.000	23.610	23.610	100.00	0.000	0.000
					B	0.000	23.610		100.00	0.000	0.000
					C	0.000	23.610		100.00	0.000	0.000
L43 1.21-0.00	0.60	1	6	5.784	A	0.000	5.784	5.784	100.00	0.000	0.000
					B	0.000	5.784		100.00	0.000	0.000
					C	0.000	5.784		100.00	0.000	0.000

### Tower Forces - No Ice - Wind Normal To Face

Section Elevation	Add Weight	Self Weight	F <sub>a c e</sub>	e	C <sub>F</sub>	R <sub>R</sub>	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub>	F	w	Ctrl. Face
ft	lb	lb							ft <sup>2</sup>	lb	plf	
L1	8.80	202.78	A	1	0.65	1	1	1	8.423	244.75	48.95	C
179.00-174.00			B	1	0.65	1	1	1	8.423			
			C	1	0.65	1	1	1	8.423			
L2	26.03	213.39	A	1	0.65	1	1	1	8.859	255.33	51.07	C
174.00-169.00			B	1	0.65	1	1	1	8.859			
			C	1	0.65	1	1	1	8.859			
L3	78.95	224.01	A	1	0.65	1	1	1	9.296	265.66	53.13	C
169.00-164.00			B	1	0.65	1	1	1	9.296			
			C	1	0.65	1	1	1	9.296			
L4	78.95	234.62	A	1	0.65	1	1	1	9.733	275.73	55.15	C
164.00-159.00			B	1	0.65	1	1	1	9.733			
			C	1	0.65	1	1	1	9.733			
L5	128.87	245.23	A	1	0.65	1	1	1	10.170	285.53	57.11	C
159.00-154.00			B	1	0.65	1	1	1	10.170			
			C	1	0.65	1	1	1	10.170			
L6	141.35	255.85	A	1	0.65	1	1	1	10.606	295.04	59.01	C
154.00-149.00			B	1	0.65	1	1	1	10.606			
			C	1	0.65	1	1	1	10.606			
L7	121.28	227.98	A	1	0.65	1	1	1	9.448	260.50	60.72	C
149.00-144.71			B	1	0.65	1	1	1	9.448			
			C	1	0.65	1	1	1	9.448			
L8	7.07	25.00	A	1	0.65	1	1	1	0.561	15.39	61.54	C
144.71-144.46			B	1	0.65	1	1	1	0.561			
			C	1	0.65	1	1	1	0.561			
L9	141.35	501.40	A	1	0.65	1	1	1	11.440	312.36	62.47	C
144.46-139.46			B	1	0.65	1	1	1	11.440			
			C	1	0.65	1	1	1	11.440			
L10	8.20	29.65	A	1	0.65	1	1	1	0.677	18.38	63.40	C
139.46-139.17			B	1	0.65	1	1	1	0.677			
			C	1	0.65	1	1	1	0.677			
L11	141.35	607.70	A	1	0.65	1	1	1	11.901	321.46	64.29	C
139.17-134.17			B	1	0.65	1	1	1	11.901			
			C	1	0.65	1	1	1	11.901			
L12	141.35	621.97	A	1	0.65	1	1	1	12.337	329.70	65.94	C
134.17-129.17			B	1	0.65	1	1	1	12.337			
			C	1	0.65	1	1	1	12.337			
L13	133.62	567.20	A	1	0.65	1	1	1	11.372	300.75	67.43	C
129.17-124.71			B	1	0.65	1	1	1	11.372			
			C	1	0.65	1	1	1	11.372			

<b>tnxTower</b>  <b>Atlantis Group, Inc.</b> 1340 Centre Street, Suite 212 Newton, MA 02459 Phone: (617) 965-0789 FAX: (617) 213-3123	<b>Job</b> CTHA539A	<b>Page</b> 23 of 61
	<b>Project</b> CTHA539A	<b>Date</b> 09:30:37 10/08/14
	<b>Client</b> metroPCS	<b>Designed by</b> Ahmet Colakoglu

Section Elevation	Add Weight	Self Weight	F a c e	e	C <sub>F</sub>	R <sub>R</sub>	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub>	F	w	Ctrl. Face
ft	lb	lb							ft <sup>2</sup>	lb	plf	
L14 124.71-124.46	7.65	43.77	A	1	0.65	1	1	1	0.648	17.04	68.16	C
			B	1	0.65	1	1	1	0.648			
			C	1	0.65	1	1	1	0.648			
L15 124.46-119.46	153.00	875.49	A	1	0.65	1	1	1	13.183	344.68	68.94	C
			B	1	0.65	1	1	1	13.183			
			C	1	0.65	1	1	1	13.183			
L16 119.46-114.46	153.00	889.86	A	1	0.65	1	1	1	13.618	351.83	70.37	C
			B	1	0.65	1	1	1	13.618			
			C	1	0.65	1	1	1	13.618			
L17 114.46-109.46	153.00	904.21	A	1	0.65	1	1	1	14.054	358.58	71.72	C
			B	1	0.65	1	1	1	14.054			
			C	1	0.65	1	1	1	14.054			
L18 109.46-104.46	156.47	918.54	A	1	0.65	1	1	1	14.490	364.90	72.98	C
			B	1	0.65	1	1	1	14.490			
			C	1	0.65	1	1	1	14.490			
L19 104.46-99.46	158.20	932.86	A	1	0.65	1	1	1	14.925	370.77	74.15	C
			B	1	0.65	1	1	1	14.925			
			C	1	0.65	1	1	1	14.925			
L20 99.46-94.46	158.20	947.17	A	1	0.65	1	1	1	15.361	376.14	75.23	C
			B	1	0.65	1	1	1	15.361			
			C	1	0.65	1	1	1	15.361			
L21 94.46-93.21	39.55	240.23	A	1	0.65	1	1	1	3.908	94.81	75.85	C
			B	1	0.65	1	1	1	3.908			
			C	1	0.65	1	1	1	3.908			
L22 93.21-92.71	15.82	121.46	A	1	0.65	1	1	1	1.571	38.01	76.01	C
			B	1	0.65	1	1	1	1.571			
			C	1	0.65	1	1	1	1.571			
L23 92.71-92.46	7.91	37.87	A	1	0.65	1	1	1	0.787	19.02	76.08	C
			B	1	0.65	1	1	1	0.787			
			C	1	0.65	1	1	1	0.787			
L24 92.46-87.46	158.20	768.08	A	1	0.65	1	1	1	15.960	382.53	76.51	C
			B	1	0.65	1	1	1	15.960			
			C	1	0.65	1	1	1	15.960			
L25 87.46-82.46	158.20	788.44	A	1	0.65	1	1	1	16.379	386.21	77.24	C
			B	1	0.65	1	1	1	16.379			
			C	1	0.65	1	1	1	16.379			
L26 82.46-77.46	158.20	808.80	A	1	0.65	1	1	1	16.798	389.28	77.86	C
			B	1	0.65	1	1	1	16.798			
			C	1	0.65	1	1	1	16.798			
L27 77.46-72.46	158.20	829.16	A	1	0.65	1	1	1	17.216	391.70	78.34	C
			B	1	0.65	1	1	1	17.216			
			C	1	0.65	1	1	1	17.216			
L28 72.46-67.46	158.20	849.52	A	1	0.65	1	1	1	17.635	393.39	78.68	C
			B	1	0.65	1	1	1	17.635			
			C	1	0.65	1	1	1	17.635			
L29 67.46-62.46	158.20	869.88	A	1	0.65	1	1	1	18.054	394.29	78.86	C
			B	1	0.65	1	1	1	18.054			
			C	1	0.65	1	1	1	18.054			
L30 62.46-57.46	158.20	890.24	A	1	0.65	1	1	1	18.473	394.31	78.86	C
			B	1	0.65	1	1	1	18.473			
			C	1	0.65	1	1	1	18.473			
L31 57.46-52.46	158.20	910.59	A	1	0.65	1	1	1	18.892	393.34	78.67	C
			B	1	0.65	1	1	1	18.892			
			C	1	0.65	1	1	1	18.892			
L32 52.46-47.46	158.20	930.95	A	1	0.65	1	1	1	19.311	391.25	78.25	C
			B	1	0.65	1	1	1	19.311			
			C	1	0.65	1	1	1	19.311			
L33 47.46-46.21	39.55	235.84	A	1	0.65	1	1	1	4.892	97.30	77.84	C
			B	1	0.65	1	1	1	4.892			
			C	1	0.65	1	1	1	4.892			

<b>tnxTower</b>  <b>Atlantis Group, Inc.</b> 1340 Centre Street, Suite 212 Newton, MA 02459 Phone: Phone: (617) 965-0789 FAX: Fax: (617) 213-3123	Job	CTHA539A	Page	24 of 61
	Project	CTHA539A	Date	09:30:37 10/08/14
	Client	metroPCS	Designed by	Ahmet Colakoglu

Section Elevation	Add Weight	Self Weight	F a c e	e	C <sub>F</sub>	R <sub>R</sub>	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub>	F	w	Ctrl. Face
ft	lb	lb							ft <sup>2</sup>	lb	plf	
L34 46.21-41.21	158.20	957.62	A	1	0.65	1	1	1	19.859	387.29	77.46	C
			B	1	0.65	1	1	1	19.859			
			C	1	0.65	1	1	1	19.859			
L35 41.21-36.21	158.20	980.40	A	1	0.65	1	1	1	20.328	382.91	76.58	C
			B	1	0.65	1	1	1	20.328			
			C	1	0.65	1	1	1	20.328			
L36 36.21-31.21	158.20	1003.19	A	1	0.65	1	1	1	20.797	376.56	75.31	C
			B	1	0.65	1	1	1	20.797			
			C	1	0.65	1	1	1	20.797			
L37 31.21-26.21	158.20	1025.98	A	1	0.65	1	1	1	21.266	382.74	76.55	C
			B	1	0.65	1	1	1	21.266			
			C	1	0.65	1	1	1	21.266			
L38 26.21-21.21	158.20	1048.77	A	1	0.65	1	1	1	21.735	391.18	78.24	C
			B	1	0.65	1	1	1	21.735			
			C	1	0.65	1	1	1	21.735			
L39 21.21-16.21	158.20	1071.56	A	1	0.65	1	1	1	22.204	399.62	79.92	C
			B	1	0.65	1	1	1	22.204			
			C	1	0.65	1	1	1	22.204			
L40 16.21-11.21	158.20	1094.35	A	1	0.65	1	1	1	22.673	408.06	81.61	C
			B	1	0.65	1	1	1	22.673			
			C	1	0.65	1	1	1	22.673			
L41 11.21-6.21	71.83	1117.13	A	1	0.65	1	1	1	23.142	416.50	83.30	C
			B	1	0.65	1	1	1	23.142			
			C	1	0.65	1	1	1	23.142			
L42 6.21-1.21	8.22	1139.92	A	1	0.65	1	1	1	23.610	424.94	84.99	C
			B	1	0.65	1	1	1	23.610			
			C	1	0.65	1	1	1	23.610			
L43 1.21-0.00	0.00	279.29	A	1	0.65	1	1	1	5.784	104.10	86.04	C
			B	1	0.65	1	1	1	5.784			
			C	1	0.65	1	1	1	5.784			
Sum Weight:	4810.76	27467.94						OTM	1064108.5 0 lb-ft	12803.89		

### Tower Forces - No Ice - Wind 60 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C <sub>F</sub>	R <sub>R</sub>	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub>	F	w	Ctrl. Face
ft	lb	lb							ft <sup>2</sup>	lb	plf	
L1 179.00-174.00	8.80	202.78	A	1	0.65	1	1	1	8.423	244.75	48.95	C
			B	1	0.65	1	1	1	8.423			
			C	1	0.65	1	1	1	8.423			
L2 174.00-169.00	26.03	213.39	A	1	0.65	1	1	1	8.859	255.33	51.07	C
			B	1	0.65	1	1	1	8.859			
			C	1	0.65	1	1	1	8.859			
L3 169.00-164.00	78.95	224.01	A	1	0.65	1	1	1	9.296	265.66	53.13	C
			B	1	0.65	1	1	1	9.296			
			C	1	0.65	1	1	1	9.296			
L4 164.00-159.00	78.95	234.62	A	1	0.65	1	1	1	9.733	275.73	55.15	C
			B	1	0.65	1	1	1	9.733			
			C	1	0.65	1	1	1	9.733			
L5 159.00-154.00	128.87	245.23	A	1	0.65	1	1	1	10.170	285.53	57.11	C
			B	1	0.65	1	1	1	10.170			
			C	1	0.65	1	1	1	10.170			
L6 154.00-149.00	141.35	255.85	A	1	0.65	1	1	1	10.606	295.04	59.01	C
			B	1	0.65	1	1	1	10.606			
			C	1	0.65	1	1	1	10.606			



<p><b>tnxTower</b></p> <p><i>Atlantis Group, Inc.</i>  1340 Centre Street, Suite 212  Newton, MA 02459  Phone: (617) 965-0789  FAX: (617) 213-3123</p>	<b>Job</b> CTHA539A	<b>Page</b> 25 of 61
	<b>Project</b> CTHA539A	<b>Date</b> 09:30:37 10/08/14
	<b>Client</b> metroPCS	<b>Designed by</b> Ahmet Colakoglu

Section Elevation	Add Weight	Self Weight	F a c e	e	C <sub>F</sub>	R <sub>R</sub>	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub>	F	w	Ctrl. Face
ft	lb	lb							ft <sup>2</sup>	lb	plf	
L7	121.28	227.98	C	1	0.65	1	1	1	10.606			
149.00-144.71			A	1	0.65	1	1	1	9.448	260.50	60.72	C
			B	1	0.65	1	1	1	9.448			
			C	1	0.65	1	1	1	9.448			
L8	7.07	25.00	A	1	0.65	1	1	1	0.561	15.39	61.54	C
144.71-144.46			B	1	0.65	1	1	1	0.561			
			C	1	0.65	1	1	1	0.561			
L9	141.35	501.40	A	1	0.65	1	1	1	11.440	312.36	62.47	C
144.46-139.46			B	1	0.65	1	1	1	11.440			
			C	1	0.65	1	1	1	11.440			
L10	8.20	29.65	A	1	0.65	1	1	1	0.677	18.38	63.40	C
139.46-139.17			B	1	0.65	1	1	1	0.677			
			C	1	0.65	1	1	1	0.677			
L11	141.35	607.70	A	1	0.65	1	1	1	11.901	321.46	64.29	C
139.17-134.17			B	1	0.65	1	1	1	11.901			
			C	1	0.65	1	1	1	11.901			
L12	141.35	621.97	A	1	0.65	1	1	1	12.337	329.70	65.94	C
134.17-129.17			B	1	0.65	1	1	1	12.337			
			C	1	0.65	1	1	1	12.337			
L13	133.62	567.20	A	1	0.65	1	1	1	11.372	300.75	67.43	C
129.17-124.71			B	1	0.65	1	1	1	11.372			
			C	1	0.65	1	1	1	11.372			
L14	7.65	43.77	A	1	0.65	1	1	1	0.648	17.04	68.16	C
124.71-124.46			B	1	0.65	1	1	1	0.648			
			C	1	0.65	1	1	1	0.648			
L15	153.00	875.49	A	1	0.65	1	1	1	13.183	344.68	68.94	C
124.46-119.46			B	1	0.65	1	1	1	13.183			
			C	1	0.65	1	1	1	13.183			
L16	153.00	889.86	A	1	0.65	1	1	1	13.618	351.83	70.37	C
119.46-114.46			B	1	0.65	1	1	1	13.618			
			C	1	0.65	1	1	1	13.618			
L17	153.00	904.21	A	1	0.65	1	1	1	14.054	358.58	71.72	C
114.46-109.46			B	1	0.65	1	1	1	14.054			
			C	1	0.65	1	1	1	14.054			
L18	156.47	918.54	A	1	0.65	1	1	1	14.490	364.90	72.98	C
109.46-104.46			B	1	0.65	1	1	1	14.490			
			C	1	0.65	1	1	1	14.490			
L19	158.20	932.86	A	1	0.65	1	1	1	14.925	370.77	74.15	C
104.46-99.46			B	1	0.65	1	1	1	14.925			
			C	1	0.65	1	1	1	14.925			
L20	158.20	947.17	A	1	0.65	1	1	1	15.361	376.14	75.23	C
99.46-94.46			B	1	0.65	1	1	1	15.361			
			C	1	0.65	1	1	1	15.361			
L21	39.55	240.23	A	1	0.65	1	1	1	3.908	94.81	75.85	C
94.46-93.21			B	1	0.65	1	1	1	3.908			
			C	1	0.65	1	1	1	3.908			
L22	15.82	121.46	A	1	0.65	1	1	1	1.571	38.01	76.01	C
93.21-92.71			B	1	0.65	1	1	1	1.571			
			C	1	0.65	1	1	1	1.571			
L23	7.91	37.87	A	1	0.65	1	1	1	0.787	19.02	76.08	C
92.71-92.46			B	1	0.65	1	1	1	0.787			
			C	1	0.65	1	1	1	0.787			
L24	158.20	768.08	A	1	0.65	1	1	1	15.960	382.53	76.51	C
92.46-87.46			B	1	0.65	1	1	1	15.960			
			C	1	0.65	1	1	1	15.960			
L25	158.20	788.44	A	1	0.65	1	1	1	16.379	386.21	77.24	C
87.46-82.46			B	1	0.65	1	1	1	16.379			
			C	1	0.65	1	1	1	16.379			
L26	158.20	808.80	A	1	0.65	1	1	1	16.798	389.28	77.86	C
82.46-77.46			B	1	0.65	1	1	1	16.798			

<b>tnxTower</b>  <b>Atlantis Group, Inc.</b> 1340 Centre Street, Suite 212 Newton, MA 02459 Phone: Phone: (617) 965-0789 FAX: Fax: (617) 213-3123	Job	CTHA539A	Page	26 of 61
	Project	CTHA539A	Date	09:30:37 10/08/14
	Client	metroPCS	Designed by	Ahmet Colakoglu

Section Elevation	Add Weight	Self Weight	F a c e	e	C <sub>F</sub>	R <sub>R</sub>	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub>	F	w	Ctrl. Face
ft	lb	lb							ft <sup>2</sup>	lb	plf	
L27	158.20	829.16	C	1	0.65	1	1	1	16.798			
77.46-72.46			A	1	0.65	1	1	1	17.216	391.70	78.34	C
			B	1	0.65	1	1	1	17.216			
L28	158.20	849.52	C	1	0.65	1	1	1	17.216			
72.46-67.46			A	1	0.65	1	1	1	17.635	393.39	78.68	C
			B	1	0.65	1	1	1	17.635			
			C	1	0.65	1	1	1	17.635			
L29	158.20	869.88	A	1	0.65	1	1	1	18.054	394.29	78.86	C
67.46-62.46			B	1	0.65	1	1	1	18.054			
			C	1	0.65	1	1	1	18.054			
L30	158.20	890.24	A	1	0.65	1	1	1	18.473	394.31	78.86	C
62.46-57.46			B	1	0.65	1	1	1	18.473			
			C	1	0.65	1	1	1	18.473			
L31	158.20	910.59	A	1	0.65	1	1	1	18.892	393.34	78.67	C
57.46-52.46			B	1	0.65	1	1	1	18.892			
			C	1	0.65	1	1	1	18.892			
L32	158.20	930.95	A	1	0.65	1	1	1	19.311	391.25	78.25	C
52.46-47.46			B	1	0.65	1	1	1	19.311			
			C	1	0.65	1	1	1	19.311			
L33	39.55	235.84	A	1	0.65	1	1	1	4.892	97.30	77.84	C
47.46-46.21			B	1	0.65	1	1	1	4.892			
			C	1	0.65	1	1	1	4.892			
L34	158.20	957.62	A	1	0.65	1	1	1	19.859	387.29	77.46	C
46.21-41.21			B	1	0.65	1	1	1	19.859			
			C	1	0.65	1	1	1	19.859			
L35	158.20	980.40	A	1	0.65	1	1	1	20.328	382.91	76.58	C
41.21-36.21			B	1	0.65	1	1	1	20.328			
			C	1	0.65	1	1	1	20.328			
L36	158.20	1003.19	A	1	0.65	1	1	1	20.797	376.56	75.31	C
36.21-31.21			B	1	0.65	1	1	1	20.797			
			C	1	0.65	1	1	1	20.797			
L37	158.20	1025.98	A	1	0.65	1	1	1	21.266	382.74	76.55	C
31.21-26.21			B	1	0.65	1	1	1	21.266			
			C	1	0.65	1	1	1	21.266			
L38	158.20	1048.77	A	1	0.65	1	1	1	21.735	391.18	78.24	C
26.21-21.21			B	1	0.65	1	1	1	21.735			
			C	1	0.65	1	1	1	21.735			
L39	158.20	1071.56	A	1	0.65	1	1	1	22.204	399.62	79.92	C
21.21-16.21			B	1	0.65	1	1	1	22.204			
			C	1	0.65	1	1	1	22.204			
L40	158.20	1094.35	A	1	0.65	1	1	1	22.673	408.06	81.61	C
16.21-11.21			B	1	0.65	1	1	1	22.673			
			C	1	0.65	1	1	1	22.673			
L41	71.83	1117.13	A	1	0.65	1	1	1	23.142	416.50	83.30	C
11.21-6.21			B	1	0.65	1	1	1	23.142			
			C	1	0.65	1	1	1	23.142			
L42 6.21-1.21	8.22	1139.92	A	1	0.65	1	1	1	23.610	424.94	84.99	C
			B	1	0.65	1	1	1	23.610			
			C	1	0.65	1	1	1	23.610			
L43 1.21-0.00	0.00	279.29	A	1	0.65	1	1	1	5.784	104.10	86.04	C
			B	1	0.65	1	1	1	5.784			
			C	1	0.65	1	1	1	5.784			
Sum Weight:	4810.76	27467.94						OTM	1064108.5 0 lb-ft	12803.89		

**Tower Forces - No Ice - Wind 90 To Face**

<p><b>tnxTower</b></p> <p><i>Atlantis Group, Inc.</i>  1340 Centre Street, Suite 212  Newton, MA 02459  Phone: Phone: (617) 965-0789  FAX: Fax: (617) 213-3123</p>	Job	CTHA539A	Page	27 of 61
	Project	CTHA539A	Date	09:30:37 10/08/14
	Client	metroPCS	Designed by	Ahmet Colakoglu

Section Elevation	Add Weight	Self Weight	F a c e	e	C <sub>F</sub>	R <sub>R</sub>	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub>	F	w	Ctrl. Face
ft	lb	lb							ft <sup>2</sup>	lb	plf	
L1 179.00-174.00	8.80	202.78	A	1	0.65	1	1	1	8.423	244.75	48.95	C
			B	1	0.65	1	1	1	8.423			
			C	1	0.65	1	1	1	8.423			
L2 174.00-169.00	26.03	213.39	A	1	0.65	1	1	1	8.859	255.33	51.07	C
			B	1	0.65	1	1	1	8.859			
			C	1	0.65	1	1	1	8.859			
L3 169.00-164.00	78.95	224.01	A	1	0.65	1	1	1	9.296	265.66	53.13	C
			B	1	0.65	1	1	1	9.296			
			C	1	0.65	1	1	1	9.296			
L4 164.00-159.00	78.95	234.62	A	1	0.65	1	1	1	9.733	275.73	55.15	C
			B	1	0.65	1	1	1	9.733			
			C	1	0.65	1	1	1	9.733			
L5 159.00-154.00	128.87	245.23	A	1	0.65	1	1	1	10.170	285.53	57.11	C
			B	1	0.65	1	1	1	10.170			
			C	1	0.65	1	1	1	10.170			
L6 154.00-149.00	141.35	255.85	A	1	0.65	1	1	1	10.606	295.04	59.01	C
			B	1	0.65	1	1	1	10.606			
			C	1	0.65	1	1	1	10.606			
L7 149.00-144.71	121.28	227.98	A	1	0.65	1	1	1	9.448	260.50	60.72	C
			B	1	0.65	1	1	1	9.448			
			C	1	0.65	1	1	1	9.448			
L8 144.71-144.46	7.07	25.00	A	1	0.65	1	1	1	0.561	15.39	61.54	C
			B	1	0.65	1	1	1	0.561			
			C	1	0.65	1	1	1	0.561			
L9 144.46-139.46	141.35	501.40	A	1	0.65	1	1	1	11.440	312.36	62.47	C
			B	1	0.65	1	1	1	11.440			
			C	1	0.65	1	1	1	11.440			
L10 139.46-139.17	8.20	29.65	A	1	0.65	1	1	1	0.677	18.38	63.40	C
			B	1	0.65	1	1	1	0.677			
			C	1	0.65	1	1	1	0.677			
L11 139.17-134.17	141.35	607.70	A	1	0.65	1	1	1	11.901	321.46	64.29	C
			B	1	0.65	1	1	1	11.901			
			C	1	0.65	1	1	1	11.901			
L12 134.17-129.17	141.35	621.97	A	1	0.65	1	1	1	12.337	329.70	65.94	C
			B	1	0.65	1	1	1	12.337			
			C	1	0.65	1	1	1	12.337			
L13 129.17-124.71	133.62	567.20	A	1	0.65	1	1	1	11.372	300.75	67.43	C
			B	1	0.65	1	1	1	11.372			
			C	1	0.65	1	1	1	11.372			
L14 124.71-124.46	7.65	43.77	A	1	0.65	1	1	1	0.648	17.04	68.16	C
			B	1	0.65	1	1	1	0.648			
			C	1	0.65	1	1	1	0.648			
L15 124.46-119.46	153.00	875.49	A	1	0.65	1	1	1	13.183	344.68	68.94	C
			B	1	0.65	1	1	1	13.183			
			C	1	0.65	1	1	1	13.183			
L16 119.46-114.46	153.00	889.86	A	1	0.65	1	1	1	13.618	351.83	70.37	C
			B	1	0.65	1	1	1	13.618			
			C	1	0.65	1	1	1	13.618			
L17 114.46-109.46	153.00	904.21	A	1	0.65	1	1	1	14.054	358.58	71.72	C
			B	1	0.65	1	1	1	14.054			
			C	1	0.65	1	1	1	14.054			
L18 109.46-104.46	156.47	918.54	A	1	0.65	1	1	1	14.490	364.90	72.98	C
			B	1	0.65	1	1	1	14.490			
			C	1	0.65	1	1	1	14.490			
L19 104.46-99.46	158.20	932.86	A	1	0.65	1	1	1	14.925	370.77	74.15	C
			B	1	0.65	1	1	1	14.925			
			C	1	0.65	1	1	1	14.925			
L20 99.46-94.46	158.20	947.17	A	1	0.65	1	1	1	15.361	376.14	75.23	C
			B	1	0.65	1	1	1	15.361			

<b>tnxTower</b>  <b>Atlantis Group, Inc.</b> 1340 Centre Street, Suite 212 Newton, MA 02459 Phone: Phone: (617) 965-0789 FAX: Fax: (617) 213-3123	<b>Job</b> CTHA539A	<b>Page</b> 28 of 61
	<b>Project</b> CTHA539A	<b>Date</b> 09:30:37 10/08/14
	<b>Client</b> metroPCS	<b>Designed by</b> Ahmet Colakoglu

Section Elevation	Add Weight	Self Weight	F a c e	e	C <sub>F</sub>	R <sub>R</sub>	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub>	F	w	Ctrl. Face
ft	lb	lb							ft <sup>2</sup>	lb	plf	
L21	39.55	240.23	C	1	0.65	1	1	1	15.361			
94.46-93.21			A	1	0.65	1	1	1	3.908	94.81	75.85	C
			B	1	0.65	1	1	1	3.908			
L22	15.82	121.46	C	1	0.65	1	1	1	3.908			
93.21-92.71			A	1	0.65	1	1	1	1.571	38.01	76.01	C
			B	1	0.65	1	1	1	1.571			
			C	1	0.65	1	1	1	1.571			
L23	7.91	37.87	A	1	0.65	1	1	1	0.787	19.02	76.08	C
92.71-92.46			B	1	0.65	1	1	1	0.787			
			C	1	0.65	1	1	1	0.787			
L24	158.20	768.08	A	1	0.65	1	1	1	15.960	382.53	76.51	C
92.46-87.46			B	1	0.65	1	1	1	15.960			
			C	1	0.65	1	1	1	15.960			
L25	158.20	788.44	A	1	0.65	1	1	1	16.379	386.21	77.24	C
87.46-82.46			B	1	0.65	1	1	1	16.379			
			C	1	0.65	1	1	1	16.379			
L26	158.20	808.80	A	1	0.65	1	1	1	16.798	389.28	77.86	C
82.46-77.46			B	1	0.65	1	1	1	16.798			
			C	1	0.65	1	1	1	16.798			
L27	158.20	829.16	A	1	0.65	1	1	1	17.216	391.70	78.34	C
77.46-72.46			B	1	0.65	1	1	1	17.216			
			C	1	0.65	1	1	1	17.216			
L28	158.20	849.52	A	1	0.65	1	1	1	17.635	393.39	78.68	C
72.46-67.46			B	1	0.65	1	1	1	17.635			
			C	1	0.65	1	1	1	17.635			
L29	158.20	869.88	A	1	0.65	1	1	1	18.054	394.29	78.86	C
67.46-62.46			B	1	0.65	1	1	1	18.054			
			C	1	0.65	1	1	1	18.054			
L30	158.20	890.24	A	1	0.65	1	1	1	18.473	394.31	78.86	C
62.46-57.46			B	1	0.65	1	1	1	18.473			
			C	1	0.65	1	1	1	18.473			
L31	158.20	910.59	A	1	0.65	1	1	1	18.892	393.34	78.67	C
57.46-52.46			B	1	0.65	1	1	1	18.892			
			C	1	0.65	1	1	1	18.892			
L32	158.20	930.95	A	1	0.65	1	1	1	19.311	391.25	78.25	C
52.46-47.46			B	1	0.65	1	1	1	19.311			
			C	1	0.65	1	1	1	19.311			
L33	39.55	235.84	A	1	0.65	1	1	1	4.892	97.30	77.84	C
47.46-46.21			B	1	0.65	1	1	1	4.892			
			C	1	0.65	1	1	1	4.892			
L34	158.20	957.62	A	1	0.65	1	1	1	19.859	387.29	77.46	C
46.21-41.21			B	1	0.65	1	1	1	19.859			
			C	1	0.65	1	1	1	19.859			
L35	158.20	980.40	A	1	0.65	1	1	1	20.328	382.91	76.58	C
41.21-36.21			B	1	0.65	1	1	1	20.328			
			C	1	0.65	1	1	1	20.328			
L36	158.20	1003.19	A	1	0.65	1	1	1	20.797	376.56	75.31	C
36.21-31.21			B	1	0.65	1	1	1	20.797			
			C	1	0.65	1	1	1	20.797			
L37	158.20	1025.98	A	1	0.65	1	1	1	21.266	382.74	76.55	C
31.21-26.21			B	1	0.65	1	1	1	21.266			
			C	1	0.65	1	1	1	21.266			
L38	158.20	1048.77	A	1	0.65	1	1	1	21.735	391.18	78.24	C
26.21-21.21			B	1	0.65	1	1	1	21.735			
			C	1	0.65	1	1	1	21.735			
L39	158.20	1071.56	A	1	0.65	1	1	1	22.204	399.62	79.92	C
21.21-16.21			B	1	0.65	1	1	1	22.204			
			C	1	0.65	1	1	1	22.204			
L40	158.20	1094.35	A	1	0.65	1	1	1	22.673	408.06	81.61	C
16.21-11.21			B	1	0.65	1	1	1	22.673			



<b>tnxTower</b>  <b>Atlantis Group, Inc.</b> 1340 Centre Street, Suite 212 Newton, MA 02459 Phone: Phone: (617) 965-0789 FAX: Fax: (617) 213-3123	Job	CTHA539A	Page	29 of 61
	Project	CTHA539A	Date	09:30:37 10/08/14
	Client	metroPCS	Designed by	Ahmet Colakoglu

Section Elevation	Add Weight	Self Weight	F a c e	e	C <sub>F</sub>	R <sub>R</sub>	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub>	F	w	Ctrl. Face
ft	lb	lb							ft <sup>2</sup>	lb	plf	
L41	71.83	1117.13	C	1	0.65	1	1	1	22.673			
11.21-6.21			A	1	0.65	1	1	1	23.142	416.50	83.30	C
			B	1	0.65	1	1	1	23.142			
			C	1	0.65	1	1	1	23.142			
L42 6.21-1.21	8.22	1139.92	A	1	0.65	1	1	1	23.610	424.94	84.99	C
			B	1	0.65	1	1	1	23.610			
			C	1	0.65	1	1	1	23.610			
L43 1.21-0.00	0.00	279.29	A	1	0.65	1	1	1	5.784	104.10	86.04	C
			B	1	0.65	1	1	1	5.784			
			C	1	0.65	1	1	1	5.784			
Sum Weight:	4810.76	27467.94						OTM	1064108.5	12803.89		
									0 lb-ft			

### Tower Forces - With Ice - Wind Normal To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C <sub>F</sub>	R <sub>R</sub>	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub>	F	w	Ctrl. Face
ft	lb	lb							ft <sup>2</sup>	lb	plf	
L1	8.80	266.70	A	1	0.65	1	1	1	8.839	192.64	38.53	C
179.00-174.00			B	1	0.65	1	1	1	8.839			
			C	1	0.65	1	1	1	8.839			
L2	26.03	280.55	A	1	0.65	1	1	1	9.276	200.50	40.10	C
174.00-169.00			B	1	0.65	1	1	1	9.276			
			C	1	0.65	1	1	1	9.276			
L3	78.95	294.39	A	1	0.65	1	1	1	9.713	208.18	41.64	C
169.00-164.00			B	1	0.65	1	1	1	9.713			
			C	1	0.65	1	1	1	9.713			
L4	78.95	308.24	A	1	0.65	1	1	1	10.149	215.65	43.13	C
164.00-159.00			B	1	0.65	1	1	1	10.149			
			C	1	0.65	1	1	1	10.149			
L5	128.87	322.09	A	1	0.65	1	1	1	10.586	222.92	44.58	C
159.00-154.00			B	1	0.65	1	1	1	10.586			
			C	1	0.65	1	1	1	10.586			
L6	141.35	335.94	A	1	0.65	1	1	1	11.023	229.97	45.99	C
154.00-149.00			B	1	0.65	1	1	1	11.023			
			C	1	0.65	1	1	1	11.023			
L7	121.28	299.27	A	1	0.65	1	1	1	9.806	202.77	47.27	C
149.00-144.71			B	1	0.65	1	1	1	9.806			
			C	1	0.65	1	1	1	9.806			
L8	7.07	29.23	A	1	0.65	1	1	1	0.581	11.97	47.87	C
144.71-144.46			B	1	0.65	1	1	1	0.581			
			C	1	0.65	1	1	1	0.581			
L9	141.35	587.67	A	1	0.65	1	1	1	11.856	242.81	48.56	C
144.46-139.46			B	1	0.65	1	1	1	11.856			
			C	1	0.65	1	1	1	11.856			
L10	8.20	34.75	A	1	0.65	1	1	1	0.701	14.28	49.24	C
139.46-139.17			B	1	0.65	1	1	1	0.701			
			C	1	0.65	1	1	1	0.701			
L11	141.35	697.39	A	1	0.65	1	1	1	12.318	249.54	49.91	C
139.17-134.17			B	1	0.65	1	1	1	12.318			
			C	1	0.65	1	1	1	12.318			
L12	141.35	714.88	A	1	0.65	1	1	1	12.753	255.62	51.12	C
134.17-129.17			B	1	0.65	1	1	1	12.753			
			C	1	0.65	1	1	1	12.753			
L13	133.62	652.80	A	1	0.65	1	1	1	11.744	232.94	52.23	C

<p><b>tnxTower</b></p> <p><i>Atlantis Group, Inc.</i>  1340 Centre Street, Suite 212  Newton, MA 02459  Phone: (617) 965-0789  FAX: (617) 213-3123</p>	Job	CTHA539A	Page	30 of 61
	Project	CTHA539A	Date	09:30:37 10/08/14
	Client	metroPCS	Designed by	Ahmet Colakoglu

Section Elevation	Add Weight	Self Weight	F a c e	e	C <sub>F</sub>	R <sub>R</sub>	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub>	F	w	Ctrl. Face
ft	lb	lb							ft <sup>2</sup>	lb	plf	
129.17-124.71			B	1	0.65	1	1	1	11.744			
			C	1	0.65	1	1	1	11.744			
L14	7.65	48.64	A	1	0.65	1	1	1	0.669	13.19	52.76	C
124.71-124.46			B	1	0.65	1	1	1	0.669			
			C	1	0.65	1	1	1	0.669			
L15	153.00	974.67	A	1	0.65	1	1	1	13.599	266.68	53.34	C
124.46-119.46			B	1	0.65	1	1	1	13.599			
			C	1	0.65	1	1	1	13.599			
L16	153.00	992.26	A	1	0.65	1	1	1	14.035	271.95	54.39	C
119.46-114.46			B	1	0.65	1	1	1	14.035			
			C	1	0.65	1	1	1	14.035			
L17	153.00	1009.83	A	1	0.65	1	1	1	14.471	276.91	55.38	C
114.46-109.46			B	1	0.65	1	1	1	14.471			
			C	1	0.65	1	1	1	14.471			
L18	156.47	1027.39	A	1	0.65	1	1	1	14.906	281.55	56.31	C
109.46-104.46			B	1	0.65	1	1	1	14.906			
			C	1	0.65	1	1	1	14.906			
L19	158.20	1044.94	A	1	0.65	1	1	1	15.342	285.84	57.17	C
104.46-99.46			B	1	0.65	1	1	1	15.342			
			C	1	0.65	1	1	1	15.342			
L20	158.20	1062.48	A	1	0.65	1	1	1	15.777	289.76	57.95	C
99.46-94.46			B	1	0.65	1	1	1	15.777			
			C	1	0.65	1	1	1	15.777			
L21	39.55	269.56	A	1	0.65	1	1	1	4.012	73.01	58.40	C
94.46-93.21			B	1	0.65	1	1	1	4.012			
			C	1	0.65	1	1	1	4.012			
L22	15.82	133.25	A	1	0.65	1	1	1	1.613	29.26	58.52	C
93.21-92.71			B	1	0.65	1	1	1	1.613			
			C	1	0.65	1	1	1	1.613			
L23	7.91	43.78	A	1	0.65	1	1	1	0.808	14.64	58.57	C
92.71-92.46			B	1	0.65	1	1	1	0.808			
			C	1	0.65	1	1	1	0.808			
L24	158.20	887.83	A	1	0.65	1	1	1	16.376	294.39	58.88	C
92.46-87.46			B	1	0.65	1	1	1	16.376			
			C	1	0.65	1	1	1	16.376			
L25	158.20	911.29	A	1	0.65	1	1	1	16.795	297.03	59.41	C
87.46-82.46			B	1	0.65	1	1	1	16.795			
			C	1	0.65	1	1	1	16.795			
L26	158.20	934.75	A	1	0.65	1	1	1	17.214	299.20	59.84	C
82.46-77.46			B	1	0.65	1	1	1	17.214			
			C	1	0.65	1	1	1	17.214			
L27	158.20	958.21	A	1	0.65	1	1	1	17.633	300.88	60.18	C
77.46-72.46			B	1	0.65	1	1	1	17.633			
			C	1	0.65	1	1	1	17.633			
L28	158.20	981.67	A	1	0.65	1	1	1	18.052	302.01	60.40	C
72.46-67.46			B	1	0.65	1	1	1	18.052			
			C	1	0.65	1	1	1	18.052			
L29	158.20	1005.13	A	1	0.65	1	1	1	18.471	302.54	60.51	C
67.46-62.46			B	1	0.65	1	1	1	18.471			
			C	1	0.65	1	1	1	18.471			
L30	158.20	1028.59	A	1	0.65	1	1	1	18.890	302.40	60.48	C
62.46-57.46			B	1	0.65	1	1	1	18.890			
			C	1	0.65	1	1	1	18.890			
L31	158.20	1052.05	A	1	0.65	1	1	1	19.309	301.51	60.30	C
57.46-52.46			B	1	0.65	1	1	1	19.309			
			C	1	0.65	1	1	1	19.309			
L32	158.20	1075.51	A	1	0.65	1	1	1	19.728	299.77	59.95	C
52.46-47.46			B	1	0.65	1	1	1	19.728			
			C	1	0.65	1	1	1	19.728			
L33	39.55	272.46	A	1	0.65	1	1	1	4.996	74.53	59.62	C

<b>tnxTower</b>  <b>Atlantis Group, Inc.</b> 1340 Centre Street, Suite 212 Newton, MA 02459 Phone: (617) 965-0789 FAX: Fax: (617) 213-3123	Job	CTHA539A	Page	31 of 61
	Project	CTHA539A	Date	09:30:37 10/08/14
	Client	metroPCS	Designed by	Ahmet Colakoglu

Section Elevation	Add Weight	Self Weight	F a c e	e	C <sub>F</sub>	R <sub>R</sub>	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub>	F	w	Ctrl. Face
ft	lb	lb							ft <sup>2</sup>	lb	plf	
47.46-46.21			B	1	0.65	1	1	1	4.996			
			C	1	0.65	1	1	1	4.996			
L34	158.20	1106.24	A	1	0.65	1	1	1	20.276	296.56	59.31	C
46.21-41.21			B	1	0.65	1	1	1	20.276			
			C	1	0.65	1	1	1	20.276			
L35	158.20	1132.50	A	1	0.65	1	1	1	20.745	293.07	58.61	C
41.21-36.21			B	1	0.65	1	1	1	20.745			
			C	1	0.65	1	1	1	20.745			
L36	158.20	1158.76	A	1	0.65	1	1	1	21.214	288.08	57.62	C
36.21-31.21			B	1	0.65	1	1	1	21.214			
			C	1	0.65	1	1	1	21.214			
L37	158.20	1185.02	A	1	0.65	1	1	1	21.683	292.68	58.54	C
31.21-26.21			B	1	0.65	1	1	1	21.683			
			C	1	0.65	1	1	1	21.683			
L38	158.20	1211.28	A	1	0.65	1	1	1	22.152	299.01	59.80	C
26.21-21.21			B	1	0.65	1	1	1	22.152			
			C	1	0.65	1	1	1	22.152			
L39	158.20	1237.54	A	1	0.65	1	1	1	22.620	305.34	61.07	C
21.21-16.21			B	1	0.65	1	1	1	22.620			
			C	1	0.65	1	1	1	22.620			
L40	158.20	1263.80	A	1	0.65	1	1	1	23.089	311.67	62.33	C
16.21-11.21			B	1	0.65	1	1	1	23.089			
			C	1	0.65	1	1	1	23.089			
L41	71.83	1290.06	A	1	0.65	1	1	1	23.558	318.00	63.60	C
11.21-6.21			B	1	0.65	1	1	1	23.558			
			C	1	0.65	1	1	1	23.558			
L42 6.21-1.21	8.22	1316.32	A	1	0.65	1	1	1	24.027	324.33	64.87	C
			B	1	0.65	1	1	1	24.027			
			C	1	0.65	1	1	1	24.027			
L43 1.21-0.00	0.00	322.50	A	1	0.65	1	1	1	5.885	79.44	65.65	C
			B	1	0.65	1	1	1	5.885			
			C	1	0.65	1	1	1	5.885			
Sum Weight:	4810.76	31762.18						OTM	823713.63 lb-ft	9865.02		

### Tower Forces - With Ice - Wind 60 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C <sub>F</sub>	R <sub>R</sub>	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub>	F	w	Ctrl. Face
ft	lb	lb							ft <sup>2</sup>	lb	plf	
L1	8.80	266.70	A	1	0.65	1	1	1	8.839	192.64	38.53	C
179.00-174.00			B	1	0.65	1	1	1	8.839			
			C	1	0.65	1	1	1	8.839			
L2	26.03	280.55	A	1	0.65	1	1	1	9.276	200.50	40.10	C
174.00-169.00			B	1	0.65	1	1	1	9.276			
			C	1	0.65	1	1	1	9.276			
L3	78.95	294.39	A	1	0.65	1	1	1	9.713	208.18	41.64	C
169.00-164.00			B	1	0.65	1	1	1	9.713			
			C	1	0.65	1	1	1	9.713			
L4	78.95	308.24	A	1	0.65	1	1	1	10.149	215.65	43.13	C
164.00-159.00			B	1	0.65	1	1	1	10.149			
			C	1	0.65	1	1	1	10.149			
L5	128.87	322.09	A	1	0.65	1	1	1	10.586	222.92	44.58	C
159.00-154.00			B	1	0.65	1	1	1	10.586			
			C	1	0.65	1	1	1	10.586			

<b>tnxTower</b>  <b>Atlantis Group, Inc.</b> 1340 Centre Street, Suite 212 Newton, MA 02459 Phone: Phone: (617) 965-0789 FAX: Fax: (617) 213-3123	<b>Job</b> CTHA539A	<b>Page</b> 32 of 61
	<b>Project</b> CTHA539A	<b>Date</b> 09:30:37 10/08/14
	<b>Client</b> metroPCS	<b>Designed by</b> Ahmet Colakoglu

Section Elevation	Add Weight	Self Weight	F a c e	e	C <sub>F</sub>	R <sub>R</sub>	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub>	F	w	Ctrl. Face
ft	lb	lb							ft <sup>2</sup>	lb	plf	
L6 154.00-149.00	141.35	335.94	A	1	0.65	1	1	1	11.023	229.97	45.99	C
			B	1	0.65	1	1	1	11.023			
			C	1	0.65	1	1	1	11.023			
L7 149.00-144.71	121.28	299.27	A	1	0.65	1	1	1	9.806	202.77	47.27	C
			B	1	0.65	1	1	1	9.806			
			C	1	0.65	1	1	1	9.806			
L8 144.71-144.46	7.07	29.23	A	1	0.65	1	1	1	0.581	11.97	47.87	C
			B	1	0.65	1	1	1	0.581			
			C	1	0.65	1	1	1	0.581			
L9 144.46-139.46	141.35	587.67	A	1	0.65	1	1	1	11.856	242.81	48.56	C
			B	1	0.65	1	1	1	11.856			
			C	1	0.65	1	1	1	11.856			
L10 139.46-139.17	8.20	34.75	A	1	0.65	1	1	1	0.701	14.28	49.24	C
			B	1	0.65	1	1	1	0.701			
			C	1	0.65	1	1	1	0.701			
L11 139.17-134.17	141.35	697.39	A	1	0.65	1	1	1	12.318	249.54	49.91	C
			B	1	0.65	1	1	1	12.318			
			C	1	0.65	1	1	1	12.318			
L12 134.17-129.17	141.35	714.88	A	1	0.65	1	1	1	12.753	255.62	51.12	C
			B	1	0.65	1	1	1	12.753			
			C	1	0.65	1	1	1	12.753			
L13 129.17-124.71	133.62	652.80	A	1	0.65	1	1	1	11.744	232.94	52.23	C
			B	1	0.65	1	1	1	11.744			
			C	1	0.65	1	1	1	11.744			
L14 124.71-124.46	7.65	48.64	A	1	0.65	1	1	1	0.669	13.19	52.76	C
			B	1	0.65	1	1	1	0.669			
			C	1	0.65	1	1	1	0.669			
L15 124.46-119.46	153.00	974.67	A	1	0.65	1	1	1	13.599	266.68	53.34	C
			B	1	0.65	1	1	1	13.599			
			C	1	0.65	1	1	1	13.599			
L16 119.46-114.46	153.00	992.26	A	1	0.65	1	1	1	14.035	271.95	54.39	C
			B	1	0.65	1	1	1	14.035			
			C	1	0.65	1	1	1	14.035			
L17 114.46-109.46	153.00	1009.83	A	1	0.65	1	1	1	14.471	276.91	55.38	C
			B	1	0.65	1	1	1	14.471			
			C	1	0.65	1	1	1	14.471			
L18 109.46-104.46	156.47	1027.39	A	1	0.65	1	1	1	14.906	281.55	56.31	C
			B	1	0.65	1	1	1	14.906			
			C	1	0.65	1	1	1	14.906			
L19 104.46-99.46	158.20	1044.94	A	1	0.65	1	1	1	15.342	285.84	57.17	C
			B	1	0.65	1	1	1	15.342			
			C	1	0.65	1	1	1	15.342			
L20 99.46-94.46	158.20	1062.48	A	1	0.65	1	1	1	15.777	289.76	57.95	C
			B	1	0.65	1	1	1	15.777			
			C	1	0.65	1	1	1	15.777			
L21 94.46-93.21	39.55	269.56	A	1	0.65	1	1	1	4.012	73.01	58.40	C
			B	1	0.65	1	1	1	4.012			
			C	1	0.65	1	1	1	4.012			
L22 93.21-92.71	15.82	133.25	A	1	0.65	1	1	1	1.613	29.26	58.52	C
			B	1	0.65	1	1	1	1.613			
			C	1	0.65	1	1	1	1.613			
L23 92.71-92.46	7.91	43.78	A	1	0.65	1	1	1	0.808	14.64	58.57	C
			B	1	0.65	1	1	1	0.808			
			C	1	0.65	1	1	1	0.808			
L24 92.46-87.46	158.20	887.83	A	1	0.65	1	1	1	16.376	294.39	58.88	C
			B	1	0.65	1	1	1	16.376			
			C	1	0.65	1	1	1	16.376			
L25 87.46-82.46	158.20	911.29	A	1	0.65	1	1	1	16.795	297.03	59.41	C
			B	1	0.65	1	1	1	16.795			
			C	1	0.65	1	1	1	16.795			



<b>tnxTower</b>  <b>Atlantis Group, Inc.</b> 1340 Centre Street, Suite 212 Newton, MA 02459 Phone: (617) 965-0789 FAX: (617) 213-3123	Job	CTHA539A	Page	33 of 61
	Project	CTHA539A	Date	09:30:37 10/08/14
	Client	metroPCS	Designed by	Ahmet Colakoglu

Section Elevation	Add Weight	Self Weight	F a c e	e	C <sub>F</sub>	R <sub>R</sub>	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub>	F	w	Ctrl. Face
ft	lb	lb							ft <sup>2</sup>	lb	plf	
L26 82.46-77.46	158.20	934.75	A	1	0.65	1	1	1	17.214	299.20	59.84	C
			B	1	0.65	1	1	1	17.214			
			C	1	0.65	1	1	1	17.214			
L27 77.46-72.46	158.20	958.21	A	1	0.65	1	1	1	17.633	300.88	60.18	C
			B	1	0.65	1	1	1	17.633			
			C	1	0.65	1	1	1	17.633			
L28 72.46-67.46	158.20	981.67	A	1	0.65	1	1	1	18.052	302.01	60.40	C
			B	1	0.65	1	1	1	18.052			
			C	1	0.65	1	1	1	18.052			
L29 67.46-62.46	158.20	1005.13	A	1	0.65	1	1	1	18.471	302.54	60.51	C
			B	1	0.65	1	1	1	18.471			
			C	1	0.65	1	1	1	18.471			
L30 62.46-57.46	158.20	1028.59	A	1	0.65	1	1	1	18.890	302.40	60.48	C
			B	1	0.65	1	1	1	18.890			
			C	1	0.65	1	1	1	18.890			
L31 57.46-52.46	158.20	1052.05	A	1	0.65	1	1	1	19.309	301.51	60.30	C
			B	1	0.65	1	1	1	19.309			
			C	1	0.65	1	1	1	19.309			
L32 52.46-47.46	158.20	1075.51	A	1	0.65	1	1	1	19.728	299.77	59.95	C
			B	1	0.65	1	1	1	19.728			
			C	1	0.65	1	1	1	19.728			
L33 47.46-46.21	39.55	272.46	A	1	0.65	1	1	1	4.996	74.53	59.62	C
			B	1	0.65	1	1	1	4.996			
			C	1	0.65	1	1	1	4.996			
L34 46.21-41.21	158.20	1106.24	A	1	0.65	1	1	1	20.276	296.56	59.31	C
			B	1	0.65	1	1	1	20.276			
			C	1	0.65	1	1	1	20.276			
L35 41.21-36.21	158.20	1132.50	A	1	0.65	1	1	1	20.745	293.07	58.61	C
			B	1	0.65	1	1	1	20.745			
			C	1	0.65	1	1	1	20.745			
L36 36.21-31.21	158.20	1158.76	A	1	0.65	1	1	1	21.214	288.08	57.62	C
			B	1	0.65	1	1	1	21.214			
			C	1	0.65	1	1	1	21.214			
L37 31.21-26.21	158.20	1185.02	A	1	0.65	1	1	1	21.683	292.68	58.54	C
			B	1	0.65	1	1	1	21.683			
			C	1	0.65	1	1	1	21.683			
L38 26.21-21.21	158.20	1211.28	A	1	0.65	1	1	1	22.152	299.01	59.80	C
			B	1	0.65	1	1	1	22.152			
			C	1	0.65	1	1	1	22.152			
L39 21.21-16.21	158.20	1237.54	A	1	0.65	1	1	1	22.620	305.34	61.07	C
			B	1	0.65	1	1	1	22.620			
			C	1	0.65	1	1	1	22.620			
L40 16.21-11.21	158.20	1263.80	A	1	0.65	1	1	1	23.089	311.67	62.33	C
			B	1	0.65	1	1	1	23.089			
			C	1	0.65	1	1	1	23.089			
L41 11.21-6.21	71.83	1290.06	A	1	0.65	1	1	1	23.558	318.00	63.60	C
			B	1	0.65	1	1	1	23.558			
			C	1	0.65	1	1	1	23.558			
L42 6.21-1.21	8.22	1316.32	A	1	0.65	1	1	1	24.027	324.33	64.87	C
			B	1	0.65	1	1	1	24.027			
			C	1	0.65	1	1	1	24.027			
L43 1.21-0.00	0.00	322.50	A	1	0.65	1	1	1	5.885	79.44	65.65	C
			B	1	0.65	1	1	1	5.885			
			C	1	0.65	1	1	1	5.885			
Sum Weight:	4810.76	31762.18						OTM	823713.63 lb-ft	9865.02		

<b>tnxTower</b>  <b>Atlantis Group, Inc.</b> 1340 Centre Street, Suite 212 Newton, MA 02459 Phone: (617) 965-0789 FAX: Fax: (617) 213-3123	<b>Job</b> CTHA539A	<b>Page</b> 34 of 61
	<b>Project</b> CTHA539A	<b>Date</b> 09:30:37 10/08/14
	<b>Client</b> metroPCS	<b>Designed by</b> Ahmet Colakoglu

**Tower Forces - With Ice - Wind 90 To Face**

Section Elevation	Add Weight	Self Weight	F a c e	e	C <sub>F</sub>	R <sub>R</sub>	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub>	F	w	Ctrl. Face
ft	lb	lb							ft <sup>2</sup>	lb	plf	
L1	8.80	266.70	A	1	0.65	1	1	1	8.839	192.64	38.53	C
179.00-174.00			B	1	0.65	1	1	1	8.839			
			C	1	0.65	1	1	1	8.839			
L2	26.03	280.55	A	1	0.65	1	1	1	9.276	200.50	40.10	C
174.00-169.00			B	1	0.65	1	1	1	9.276			
			C	1	0.65	1	1	1	9.276			
L3	78.95	294.39	A	1	0.65	1	1	1	9.713	208.18	41.64	C
169.00-164.00			B	1	0.65	1	1	1	9.713			
			C	1	0.65	1	1	1	9.713			
L4	78.95	308.24	A	1	0.65	1	1	1	10.149	215.65	43.13	C
164.00-159.00			B	1	0.65	1	1	1	10.149			
			C	1	0.65	1	1	1	10.149			
L5	128.87	322.09	A	1	0.65	1	1	1	10.586	222.92	44.58	C
159.00-154.00			B	1	0.65	1	1	1	10.586			
			C	1	0.65	1	1	1	10.586			
L6	141.35	335.94	A	1	0.65	1	1	1	11.023	229.97	45.99	C
154.00-149.00			B	1	0.65	1	1	1	11.023			
			C	1	0.65	1	1	1	11.023			
L7	121.28	299.27	A	1	0.65	1	1	1	9.806	202.77	47.27	C
149.00-144.71			B	1	0.65	1	1	1	9.806			
			C	1	0.65	1	1	1	9.806			
L8	7.07	29.23	A	1	0.65	1	1	1	0.581	11.97	47.87	C
144.71-144.46			B	1	0.65	1	1	1	0.581			
			C	1	0.65	1	1	1	0.581			
L9	141.35	587.67	A	1	0.65	1	1	1	11.856	242.81	48.56	C
144.46-139.46			B	1	0.65	1	1	1	11.856			
			C	1	0.65	1	1	1	11.856			
L10	8.20	34.75	A	1	0.65	1	1	1	0.701	14.28	49.24	C
139.46-139.17			B	1	0.65	1	1	1	0.701			
			C	1	0.65	1	1	1	0.701			
L11	141.35	697.39	A	1	0.65	1	1	1	12.318	249.54	49.91	C
139.17-134.17			B	1	0.65	1	1	1	12.318			
			C	1	0.65	1	1	1	12.318			
L12	141.35	714.88	A	1	0.65	1	1	1	12.753	255.62	51.12	C
134.17-129.17			B	1	0.65	1	1	1	12.753			
			C	1	0.65	1	1	1	12.753			
L13	133.62	652.80	A	1	0.65	1	1	1	11.744	232.94	52.23	C
129.17-124.71			B	1	0.65	1	1	1	11.744			
			C	1	0.65	1	1	1	11.744			
L14	7.65	48.64	A	1	0.65	1	1	1	0.669	13.19	52.76	C
124.71-124.46			B	1	0.65	1	1	1	0.669			
			C	1	0.65	1	1	1	0.669			
L15	153.00	974.67	A	1	0.65	1	1	1	13.599	266.68	53.34	C
124.46-119.46			B	1	0.65	1	1	1	13.599			
			C	1	0.65	1	1	1	13.599			
L16	153.00	992.26	A	1	0.65	1	1	1	14.035	271.95	54.39	C
119.46-114.46			B	1	0.65	1	1	1	14.035			
			C	1	0.65	1	1	1	14.035			
L17	153.00	1009.83	A	1	0.65	1	1	1	14.471	276.91	55.38	C
114.46-109.46			B	1	0.65	1	1	1	14.471			
			C	1	0.65	1	1	1	14.471			
L18	156.47	1027.39	A	1	0.65	1	1	1	14.906	281.55	56.31	C
109.46-104.46			B	1	0.65	1	1	1	14.906			
			C	1	0.65	1	1	1	14.906			
L19	158.20	1044.94	A	1	0.65	1	1	1	15.342	285.84	57.17	C
104.46-99.46			B	1	0.65	1	1	1	15.342			
			C	1	0.65	1	1	1	15.342			

<b>tnxTower</b>  <b>Atlantis Group, Inc.</b> 1340 Centre Street, Suite 212 Newton, MA 02459 Phone: (617) 965-0789 FAX: (617) 213-3123	<b>Job</b> CTHA539A	<b>Page</b> 35 of 61
	<b>Project</b> CTHA539A	<b>Date</b> 09:30:37 10/08/14
	<b>Client</b> metroPCS	<b>Designed by</b> Ahmet Colakoglu

Section Elevation	Add Weight	Self Weight	F a c e	e	C <sub>F</sub>	R <sub>R</sub>	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub>	F	w	Ctrl. Face
ft	lb	lb							ft <sup>2</sup>	lb	plf	
L20 99.46-94.46	158.20	1062.48	A	1	0.65	1	1	1	15.777	289.76	57.95	C
			B	1	0.65	1	1	1	15.777			
			C	1	0.65	1	1	1	15.777			
L21 94.46-93.21	39.55	269.56	A	1	0.65	1	1	1	4.012	73.01	58.40	C
			B	1	0.65	1	1	1	4.012			
			C	1	0.65	1	1	1	4.012			
L22 93.21-92.71	15.82	133.25	A	1	0.65	1	1	1	1.613	29.26	58.52	C
			B	1	0.65	1	1	1	1.613			
			C	1	0.65	1	1	1	1.613			
L23 92.71-92.46	7.91	43.78	A	1	0.65	1	1	1	0.808	14.64	58.57	C
			B	1	0.65	1	1	1	0.808			
			C	1	0.65	1	1	1	0.808			
L24 92.46-87.46	158.20	887.83	A	1	0.65	1	1	1	16.376	294.39	58.88	C
			B	1	0.65	1	1	1	16.376			
			C	1	0.65	1	1	1	16.376			
L25 87.46-82.46	158.20	911.29	A	1	0.65	1	1	1	16.795	297.03	59.41	C
			B	1	0.65	1	1	1	16.795			
			C	1	0.65	1	1	1	16.795			
L26 82.46-77.46	158.20	934.75	A	1	0.65	1	1	1	17.214	299.20	59.84	C
			B	1	0.65	1	1	1	17.214			
			C	1	0.65	1	1	1	17.214			
L27 77.46-72.46	158.20	958.21	A	1	0.65	1	1	1	17.633	300.88	60.18	C
			B	1	0.65	1	1	1	17.633			
			C	1	0.65	1	1	1	17.633			
L28 72.46-67.46	158.20	981.67	A	1	0.65	1	1	1	18.052	302.01	60.40	C
			B	1	0.65	1	1	1	18.052			
			C	1	0.65	1	1	1	18.052			
L29 67.46-62.46	158.20	1005.13	A	1	0.65	1	1	1	18.471	302.54	60.51	C
			B	1	0.65	1	1	1	18.471			
			C	1	0.65	1	1	1	18.471			
L30 62.46-57.46	158.20	1028.59	A	1	0.65	1	1	1	18.890	302.40	60.48	C
			B	1	0.65	1	1	1	18.890			
			C	1	0.65	1	1	1	18.890			
L31 57.46-52.46	158.20	1052.05	A	1	0.65	1	1	1	19.309	301.51	60.30	C
			B	1	0.65	1	1	1	19.309			
			C	1	0.65	1	1	1	19.309			
L32 52.46-47.46	158.20	1075.51	A	1	0.65	1	1	1	19.728	299.77	59.95	C
			B	1	0.65	1	1	1	19.728			
			C	1	0.65	1	1	1	19.728			
L33 47.46-46.21	39.55	272.46	A	1	0.65	1	1	1	4.996	74.53	59.62	C
			B	1	0.65	1	1	1	4.996			
			C	1	0.65	1	1	1	4.996			
L34 46.21-41.21	158.20	1106.24	A	1	0.65	1	1	1	20.276	296.56	59.31	C
			B	1	0.65	1	1	1	20.276			
			C	1	0.65	1	1	1	20.276			
L35 41.21-36.21	158.20	1132.50	A	1	0.65	1	1	1	20.745	293.07	58.61	C
			B	1	0.65	1	1	1	20.745			
			C	1	0.65	1	1	1	20.745			
L36 36.21-31.21	158.20	1158.76	A	1	0.65	1	1	1	21.214	288.08	57.62	C
			B	1	0.65	1	1	1	21.214			
			C	1	0.65	1	1	1	21.214			
L37 31.21-26.21	158.20	1185.02	A	1	0.65	1	1	1	21.683	292.68	58.54	C
			B	1	0.65	1	1	1	21.683			
			C	1	0.65	1	1	1	21.683			
L38 26.21-21.21	158.20	1211.28	A	1	0.65	1	1	1	22.152	299.01	59.80	C
			B	1	0.65	1	1	1	22.152			
			C	1	0.65	1	1	1	22.152			
L39 21.21-16.21	158.20	1237.54	A	1	0.65	1	1	1	22.620	305.34	61.07	C
			B	1	0.65	1	1	1	22.620			
			C	1	0.65	1	1	1	22.620			

<b>tnxTower</b>  <b>Atlantis Group, Inc.</b> 1340 Centre Street, Suite 212 Newton, MA 02459 Phone: (617) 965-0789 FAX: (617) 213-3123	<b>Job</b> CTHA539A	<b>Page</b> 36 of 61
	<b>Project</b> CTHA539A	<b>Date</b> 09:30:37 10/08/14
	<b>Client</b> metroPCS	<b>Designed by</b> Ahmet Colakoglu

Section Elevation	Add Weight	Self Weight	F a c e	e	C <sub>F</sub>	R <sub>R</sub>	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub>	F	w	Ctrl. Face
ft	lb	lb							ft <sup>2</sup>	lb	plf	
L40 16.21-11.21	158.20	1263.80	A	1	0.65	1	1	1	23.089	311.67	62.33	C
			B	1	0.65	1	1	1	23.089			
			C	1	0.65	1	1	1	23.089			
L41 11.21-6.21	71.83	1290.06	A	1	0.65	1	1	1	23.558	318.00	63.60	C
			B	1	0.65	1	1	1	23.558			
			C	1	0.65	1	1	1	23.558			
L42 6.21-1.21	8.22	1316.32	A	1	0.65	1	1	1	24.027	324.33	64.87	C
			B	1	0.65	1	1	1	24.027			
			C	1	0.65	1	1	1	24.027			
L43 1.21-0.00	0.00	322.50	A	1	0.65	1	1	1	5.885	79.44	65.65	C
			B	1	0.65	1	1	1	5.885			
			C	1	0.65	1	1	1	5.885			
Sum Weight:	4810.76	31762.18						OTM	823713.63 lb-ft	9865.02		

### Tower Forces - Service - Wind Normal To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C <sub>F</sub>	R <sub>R</sub>	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub>	F	w	Ctrl. Face
ft	lb	lb							ft <sup>2</sup>	lb	plf	
L1 179.00-174.00	8.80	202.78	A	1	0.65	1	1	1	8.423	95.60	19.12	C
			B	1	0.65	1	1	1	8.423			
			C	1	0.65	1	1	1	8.423			
L2 174.00-169.00	26.03	213.39	A	1	0.65	1	1	1	8.859	99.74	19.95	C
			B	1	0.65	1	1	1	8.859			
			C	1	0.65	1	1	1	8.859			
L3 169.00-164.00	78.95	224.01	A	1	0.65	1	1	1	9.296	103.77	20.75	C
			B	1	0.65	1	1	1	9.296			
			C	1	0.65	1	1	1	9.296			
L4 164.00-159.00	78.95	234.62	A	1	0.65	1	1	1	9.733	107.71	21.54	C
			B	1	0.65	1	1	1	9.733			
			C	1	0.65	1	1	1	9.733			
L5 159.00-154.00	128.87	245.23	A	1	0.65	1	1	1	10.170	111.53	22.31	C
			B	1	0.65	1	1	1	10.170			
			C	1	0.65	1	1	1	10.170			
L6 154.00-149.00	141.35	255.85	A	1	0.65	1	1	1	10.606	115.25	23.05	C
			B	1	0.65	1	1	1	10.606			
			C	1	0.65	1	1	1	10.606			
L7 149.00-144.71	121.28	227.98	A	1	0.65	1	1	1	9.448	101.76	23.72	C
			B	1	0.65	1	1	1	9.448			
			C	1	0.65	1	1	1	9.448			
L8 144.71-144.46	7.07	25.00	A	1	0.65	1	1	1	0.561	6.01	24.04	C
			B	1	0.65	1	1	1	0.561			
			C	1	0.65	1	1	1	0.561			
L9 144.46-139.46	141.35	501.40	A	1	0.65	1	1	1	11.440	122.02	24.40	C
			B	1	0.65	1	1	1	11.440			
			C	1	0.65	1	1	1	11.440			
L10 139.46-139.17	8.20	29.65	A	1	0.65	1	1	1	0.677	7.18	24.76	C
			B	1	0.65	1	1	1	0.677			
			C	1	0.65	1	1	1	0.677			
L11 139.17-134.17	141.35	607.70	A	1	0.65	1	1	1	11.901	125.57	25.11	C
			B	1	0.65	1	1	1	11.901			
			C	1	0.65	1	1	1	11.901			
L12 134.17-129.17	141.35	621.97	A	1	0.65	1	1	1	12.337	128.79	25.76	C
			B	1	0.65	1	1	1	12.337			



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	<b>Project</b> CTHA539A	<b>Date</b> 09:30:37 10/08/14
	<b>Client</b> metroPCS	<b>Designed by</b> Ahmet Colakoglu

Section Elevation	Add Weight	Self Weight	F a c e	e	C <sub>F</sub>	R <sub>R</sub>	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub>	F	w	Ctrl. Face
ft	lb	lb							ft <sup>2</sup>	lb	plf	
L13	133.62	567.20	C	1	0.65	1	1	1	12.337			
129.17-124.71			A	1	0.65	1	1	1	11.372	117.48	26.34	C
			B	1	0.65	1	1	1	11.372			
			C	1	0.65	1	1	1	11.372			
L14	7.65	43.77	A	1	0.65	1	1	1	0.648	6.66	26.62	C
124.71-124.46			B	1	0.65	1	1	1	0.648			
			C	1	0.65	1	1	1	0.648			
L15	153.00	875.49	A	1	0.65	1	1	1	13.183	134.64	26.93	C
124.46-119.46			B	1	0.65	1	1	1	13.183			
			C	1	0.65	1	1	1	13.183			
L16	153.00	889.86	A	1	0.65	1	1	1	13.618	137.43	27.49	C
119.46-114.46			B	1	0.65	1	1	1	13.618			
			C	1	0.65	1	1	1	13.618			
L17	153.00	904.21	A	1	0.65	1	1	1	14.054	140.07	28.01	C
114.46-109.46			B	1	0.65	1	1	1	14.054			
			C	1	0.65	1	1	1	14.054			
L18	156.47	918.54	A	1	0.65	1	1	1	14.490	142.54	28.51	C
109.46-104.46			B	1	0.65	1	1	1	14.490			
			C	1	0.65	1	1	1	14.490			
L19	158.20	932.86	A	1	0.65	1	1	1	14.925	144.83	28.97	C
104.46-99.46			B	1	0.65	1	1	1	14.925			
			C	1	0.65	1	1	1	14.925			
L20	158.20	947.17	A	1	0.65	1	1	1	15.361	146.93	29.39	C
99.46-94.46			B	1	0.65	1	1	1	15.361			
			C	1	0.65	1	1	1	15.361			
L21	39.55	240.23	A	1	0.65	1	1	1	3.908	37.04	29.63	C
94.46-93.21			B	1	0.65	1	1	1	3.908			
			C	1	0.65	1	1	1	3.908			
L22	15.82	121.46	A	1	0.65	1	1	1	1.571	14.85	29.69	C
93.21-92.71			B	1	0.65	1	1	1	1.571			
			C	1	0.65	1	1	1	1.571			
L23	7.91	37.87	A	1	0.65	1	1	1	0.787	7.43	29.72	C
92.71-92.46			B	1	0.65	1	1	1	0.787			
			C	1	0.65	1	1	1	0.787			
L24	158.20	768.08	A	1	0.65	1	1	1	15.960	149.43	29.89	C
92.46-87.46			B	1	0.65	1	1	1	15.960			
			C	1	0.65	1	1	1	15.960			
L25	158.20	788.44	A	1	0.65	1	1	1	16.379	150.86	30.17	C
87.46-82.46			B	1	0.65	1	1	1	16.379			
			C	1	0.65	1	1	1	16.379			
L26	158.20	808.80	A	1	0.65	1	1	1	16.798	152.06	30.41	C
82.46-77.46			B	1	0.65	1	1	1	16.798			
			C	1	0.65	1	1	1	16.798			
L27	158.20	829.16	A	1	0.65	1	1	1	17.216	153.01	30.60	C
77.46-72.46			B	1	0.65	1	1	1	17.216			
			C	1	0.65	1	1	1	17.216			
L28	158.20	849.52	A	1	0.65	1	1	1	17.635	153.67	30.73	C
72.46-67.46			B	1	0.65	1	1	1	17.635			
			C	1	0.65	1	1	1	17.635			
L29	158.20	869.88	A	1	0.65	1	1	1	18.054	154.02	30.80	C
67.46-62.46			B	1	0.65	1	1	1	18.054			
			C	1	0.65	1	1	1	18.054			
L30	158.20	890.24	A	1	0.65	1	1	1	18.473	154.03	30.81	C
62.46-57.46			B	1	0.65	1	1	1	18.473			
			C	1	0.65	1	1	1	18.473			
L31	158.20	910.59	A	1	0.65	1	1	1	18.892	153.65	30.73	C
57.46-52.46			B	1	0.65	1	1	1	18.892			
			C	1	0.65	1	1	1	18.892			
L32	158.20	930.95	A	1	0.65	1	1	1	19.311	152.83	30.57	C
52.46-47.46			B	1	0.65	1	1	1	19.311			

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	<b>Project</b> CTHA539A	<b>Date</b> 09:30:37 10/08/14
	<b>Client</b> metroPCS	<b>Designed by</b> Ahmet Colakoglu

Section Elevation	Add Weight	Self Weight	F a c e	e	C <sub>F</sub>	R <sub>R</sub>	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub>	F	w	Ctrl. Face
ft	lb	lb							ft <sup>2</sup>	lb	plf	
L33 47.46-46.21	39.55	235.84	C	1	0.65	1	1	1	19.311	38.01	30.41	C
			A	1	0.65	1	1	1	4.892			
			B	1	0.65	1	1	1	4.892			
L34 46.21-41.21	158.20	957.62	C	1	0.65	1	1	1	4.892	151.28	30.26	C
			A	1	0.65	1	1	1	19.859			
			B	1	0.65	1	1	1	19.859			
L35 41.21-36.21	158.20	980.40	C	1	0.65	1	1	1	19.859	149.57	29.91	C
			A	1	0.65	1	1	1	20.328			
			B	1	0.65	1	1	1	20.328			
L36 36.21-31.21	158.20	1003.19	C	1	0.65	1	1	1	20.328	147.09	29.42	C
			A	1	0.65	1	1	1	20.797			
			B	1	0.65	1	1	1	20.797			
L37 31.21-26.21	158.20	1025.98	C	1	0.65	1	1	1	20.797	149.51	29.90	C
			A	1	0.65	1	1	1	21.266			
			B	1	0.65	1	1	1	21.266			
L38 26.21-21.21	158.20	1048.77	C	1	0.65	1	1	1	21.266	152.81	30.56	C
			A	1	0.65	1	1	1	21.735			
			B	1	0.65	1	1	1	21.735			
L39 21.21-16.21	158.20	1071.56	C	1	0.65	1	1	1	21.735	156.10	31.22	C
			A	1	0.65	1	1	1	22.204			
			B	1	0.65	1	1	1	22.204			
L40 16.21-11.21	158.20	1094.35	C	1	0.65	1	1	1	22.204	159.40	31.88	C
			A	1	0.65	1	1	1	22.673			
			B	1	0.65	1	1	1	22.673			
L41 11.21-6.21	71.83	1117.13	C	1	0.65	1	1	1	22.673	162.69	32.54	C
			A	1	0.65	1	1	1	23.142			
			B	1	0.65	1	1	1	23.142			
L42 6.21-1.21	8.22	1139.92	C	1	0.65	1	1	1	23.142	165.99	33.20	C
			A	1	0.65	1	1	1	23.610			
			B	1	0.65	1	1	1	23.610			
L43 1.21-0.00	0.00	279.29	C	1	0.65	1	1	1	23.610	40.67	33.61	C
			A	1	0.65	1	1	1	5.784			
			B	1	0.65	1	1	1	5.784			
Sum Weight:	4810.76	27467.94	C	1	0.65	1	1	1	5.784	5001.52		
								OTM	415667.38			
									lb-ft			

### Tower Forces - Service - Wind 60 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C <sub>F</sub>	R <sub>R</sub>	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub>	F	w	Ctrl. Face
ft	lb	lb							ft <sup>2</sup>	lb	plf	
L1 179.00-174.00	8.80	202.78	A	1	0.65	1	1	1	8.423	95.60	19.12	C
			B	1	0.65	1	1	1	8.423			
			C	1	0.65	1	1	1	8.423			
L2 174.00-169.00	26.03	213.39	A	1	0.65	1	1	1	8.859	99.74	19.95	C
			B	1	0.65	1	1	1	8.859			
			C	1	0.65	1	1	1	8.859			
L3 169.00-164.00	78.95	224.01	A	1	0.65	1	1	1	9.296	103.77	20.75	C
			B	1	0.65	1	1	1	9.296			
			C	1	0.65	1	1	1	9.296			
L4 164.00-159.00	78.95	234.62	A	1	0.65	1	1	1	9.733	107.71	21.54	C
			B	1	0.65	1	1	1	9.733			
			C	1	0.65	1	1	1	9.733			
L5	128.87	245.23	A	1	0.65	1	1	1	10.170	111.53	22.31	C

<b>tnxTower</b>  <b>Atlantis Group, Inc.</b> 1340 Centre Street, Suite 212 Newton, MA 02459 Phone: (617) 965-0789 FAX: Fax: (617) 213-3123	<b>Job</b> CTHA539A	<b>Page</b> 39 of 61
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	<b>Client</b> metroPCS	<b>Designed by</b> Ahmet Colakoglu

Section Elevation	Add Weight	Self Weight	F a c e	e	C <sub>F</sub>	R <sub>R</sub>	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub>	F	w	Ctrl. Face
ft	lb	lb							ft <sup>2</sup>	lb	plf	
159.00-154.00			B	1	0.65	1	1	1	10.170			
			C	1	0.65	1	1	1	10.170			
L6	141.35	255.85	A	1	0.65	1	1	1	10.606	115.25	23.05	C
154.00-149.00			B	1	0.65	1	1	1	10.606			
			C	1	0.65	1	1	1	10.606			
L7	121.28	227.98	A	1	0.65	1	1	1	9.448	101.76	23.72	C
149.00-144.71			B	1	0.65	1	1	1	9.448			
			C	1	0.65	1	1	1	9.448			
L8	7.07	25.00	A	1	0.65	1	1	1	0.561	6.01	24.04	C
144.71-144.46			B	1	0.65	1	1	1	0.561			
			C	1	0.65	1	1	1	0.561			
L9	141.35	501.40	A	1	0.65	1	1	1	11.440	122.02	24.40	C
144.46-139.46			B	1	0.65	1	1	1	11.440			
			C	1	0.65	1	1	1	11.440			
L10	8.20	29.65	A	1	0.65	1	1	1	0.677	7.18	24.76	C
139.46-139.17			B	1	0.65	1	1	1	0.677			
			C	1	0.65	1	1	1	0.677			
L11	141.35	607.70	A	1	0.65	1	1	1	11.901	125.57	25.11	C
139.17-134.17			B	1	0.65	1	1	1	11.901			
			C	1	0.65	1	1	1	11.901			
L12	141.35	621.97	A	1	0.65	1	1	1	12.337	128.79	25.76	C
134.17-129.17			B	1	0.65	1	1	1	12.337			
			C	1	0.65	1	1	1	12.337			
L13	133.62	567.20	A	1	0.65	1	1	1	11.372	117.48	26.34	C
129.17-124.71			B	1	0.65	1	1	1	11.372			
			C	1	0.65	1	1	1	11.372			
L14	7.65	43.77	A	1	0.65	1	1	1	0.648	6.66	26.62	C
124.71-124.46			B	1	0.65	1	1	1	0.648			
			C	1	0.65	1	1	1	0.648			
L15	153.00	875.49	A	1	0.65	1	1	1	13.183	134.64	26.93	C
124.46-119.46			B	1	0.65	1	1	1	13.183			
			C	1	0.65	1	1	1	13.183			
L16	153.00	889.86	A	1	0.65	1	1	1	13.618	137.43	27.49	C
119.46-114.46			B	1	0.65	1	1	1	13.618			
			C	1	0.65	1	1	1	13.618			
L17	153.00	904.21	A	1	0.65	1	1	1	14.054	140.07	28.01	C
114.46-109.46			B	1	0.65	1	1	1	14.054			
			C	1	0.65	1	1	1	14.054			
L18	156.47	918.54	A	1	0.65	1	1	1	14.490	142.54	28.51	C
109.46-104.46			B	1	0.65	1	1	1	14.490			
			C	1	0.65	1	1	1	14.490			
L19	158.20	932.86	A	1	0.65	1	1	1	14.925	144.83	28.97	C
104.46-99.46			B	1	0.65	1	1	1	14.925			
			C	1	0.65	1	1	1	14.925			
L20	158.20	947.17	A	1	0.65	1	1	1	15.361	146.93	29.39	C
99.46-94.46			B	1	0.65	1	1	1	15.361			
			C	1	0.65	1	1	1	15.361			
L21	39.55	240.23	A	1	0.65	1	1	1	3.908	37.04	29.63	C
94.46-93.21			B	1	0.65	1	1	1	3.908			
			C	1	0.65	1	1	1	3.908			
L22	15.82	121.46	A	1	0.65	1	1	1	1.571	14.85	29.69	C
93.21-92.71			B	1	0.65	1	1	1	1.571			
			C	1	0.65	1	1	1	1.571			
L23	7.91	37.87	A	1	0.65	1	1	1	0.787	7.43	29.72	C
92.71-92.46			B	1	0.65	1	1	1	0.787			
			C	1	0.65	1	1	1	0.787			
L24	158.20	768.08	A	1	0.65	1	1	1	15.960	149.43	29.89	C
92.46-87.46			B	1	0.65	1	1	1	15.960			
			C	1	0.65	1	1	1	15.960			
L25	158.20	788.44	A	1	0.65	1	1	1	16.379	150.86	30.17	C

<b>tnxTower</b>  <b>Atlantis Group, Inc.</b> 1340 Centre Street, Suite 212 Newton, MA 02459 Phone: Phone: (617) 965-0789 FAX: Fax: (617) 213-3123	<b>Job</b> CTHA539A	<b>Page</b> 40 of 61
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	<b>Client</b> metroPCS	<b>Designed by</b> Ahmet Colakoglu

Section Elevation	Add Weight	Self Weight	F a c e	e	C <sub>F</sub>	R <sub>R</sub>	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub>	F	w	Ctrl. Face
ft	lb	lb							ft <sup>2</sup>	lb	plf	
87.46-82.46			B	1	0.65	1	1	1	16.379			
			C	1	0.65	1	1	1	16.379			
L26	158.20	808.80	A	1	0.65	1	1	1	16.798	152.06	30.41	C
82.46-77.46			B	1	0.65	1	1	1	16.798			
			C	1	0.65	1	1	1	16.798			
L27	158.20	829.16	A	1	0.65	1	1	1	17.216	153.01	30.60	C
77.46-72.46			B	1	0.65	1	1	1	17.216			
			C	1	0.65	1	1	1	17.216			
L28	158.20	849.52	A	1	0.65	1	1	1	17.635	153.67	30.73	C
72.46-67.46			B	1	0.65	1	1	1	17.635			
			C	1	0.65	1	1	1	17.635			
L29	158.20	869.88	A	1	0.65	1	1	1	18.054	154.02	30.80	C
67.46-62.46			B	1	0.65	1	1	1	18.054			
			C	1	0.65	1	1	1	18.054			
L30	158.20	890.24	A	1	0.65	1	1	1	18.473	154.03	30.81	C
62.46-57.46			B	1	0.65	1	1	1	18.473			
			C	1	0.65	1	1	1	18.473			
L31	158.20	910.59	A	1	0.65	1	1	1	18.892	153.65	30.73	C
57.46-52.46			B	1	0.65	1	1	1	18.892			
			C	1	0.65	1	1	1	18.892			
L32	158.20	930.95	A	1	0.65	1	1	1	19.311	152.83	30.57	C
52.46-47.46			B	1	0.65	1	1	1	19.311			
			C	1	0.65	1	1	1	19.311			
L33	39.55	235.84	A	1	0.65	1	1	1	4.892	38.01	30.41	C
47.46-46.21			B	1	0.65	1	1	1	4.892			
			C	1	0.65	1	1	1	4.892			
L34	158.20	957.62	A	1	0.65	1	1	1	19.859	151.28	30.26	C
46.21-41.21			B	1	0.65	1	1	1	19.859			
			C	1	0.65	1	1	1	19.859			
L35	158.20	980.40	A	1	0.65	1	1	1	20.328	149.57	29.91	C
41.21-36.21			B	1	0.65	1	1	1	20.328			
			C	1	0.65	1	1	1	20.328			
L36	158.20	1003.19	A	1	0.65	1	1	1	20.797	147.09	29.42	C
36.21-31.21			B	1	0.65	1	1	1	20.797			
			C	1	0.65	1	1	1	20.797			
L37	158.20	1025.98	A	1	0.65	1	1	1	21.266	149.51	29.90	C
31.21-26.21			B	1	0.65	1	1	1	21.266			
			C	1	0.65	1	1	1	21.266			
L38	158.20	1048.77	A	1	0.65	1	1	1	21.735	152.81	30.56	C
26.21-21.21			B	1	0.65	1	1	1	21.735			
			C	1	0.65	1	1	1	21.735			
L39	158.20	1071.56	A	1	0.65	1	1	1	22.204	156.10	31.22	C
21.21-16.21			B	1	0.65	1	1	1	22.204			
			C	1	0.65	1	1	1	22.204			
L40	158.20	1094.35	A	1	0.65	1	1	1	22.673	159.40	31.88	C
16.21-11.21			B	1	0.65	1	1	1	22.673			
			C	1	0.65	1	1	1	22.673			
L41	71.83	1117.13	A	1	0.65	1	1	1	23.142	162.69	32.54	C
11.21-6.21			B	1	0.65	1	1	1	23.142			
			C	1	0.65	1	1	1	23.142			
L42 6.21-1.21	8.22	1139.92	A	1	0.65	1	1	1	23.610	165.99	33.20	C
			B	1	0.65	1	1	1	23.610			
			C	1	0.65	1	1	1	23.610			
L43 1.21-0.00	0.00	279.29	A	1	0.65	1	1	1	5.784	40.67	33.61	C
			B	1	0.65	1	1	1	5.784			
			C	1	0.65	1	1	1	5.784			
Sum Weight:	4810.76	27467.94						OTM	415667.38 lb-ft	5001.52		



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### Tower Forces - Service - Wind 90 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C <sub>F</sub>	R <sub>R</sub>	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub>	F	w	Ctrl. Face
ft	lb	lb							ft <sup>2</sup>	lb	plf	
L1	8.80	202.78	A	1	0.65	1	1	1	8.423	95.60	19.12	C
179.00-174.00			B	1	0.65	1	1	1	8.423			
			C	1	0.65	1	1	1	8.423			
L2	26.03	213.39	A	1	0.65	1	1	1	8.859	99.74	19.95	C
174.00-169.00			B	1	0.65	1	1	1	8.859			
			C	1	0.65	1	1	1	8.859			
L3	78.95	224.01	A	1	0.65	1	1	1	9.296	103.77	20.75	C
169.00-164.00			B	1	0.65	1	1	1	9.296			
			C	1	0.65	1	1	1	9.296			
L4	78.95	234.62	A	1	0.65	1	1	1	9.733	107.71	21.54	C
164.00-159.00			B	1	0.65	1	1	1	9.733			
			C	1	0.65	1	1	1	9.733			
L5	128.87	245.23	A	1	0.65	1	1	1	10.170	111.53	22.31	C
159.00-154.00			B	1	0.65	1	1	1	10.170			
			C	1	0.65	1	1	1	10.170			
L6	141.35	255.85	A	1	0.65	1	1	1	10.606	115.25	23.05	C
154.00-149.00			B	1	0.65	1	1	1	10.606			
			C	1	0.65	1	1	1	10.606			
L7	121.28	227.98	A	1	0.65	1	1	1	9.448	101.76	23.72	C
149.00-144.71			B	1	0.65	1	1	1	9.448			
			C	1	0.65	1	1	1	9.448			
L8	7.07	25.00	A	1	0.65	1	1	1	0.561	6.01	24.04	C
144.71-144.46			B	1	0.65	1	1	1	0.561			
			C	1	0.65	1	1	1	0.561			
L9	141.35	501.40	A	1	0.65	1	1	1	11.440	122.02	24.40	C
144.46-139.46			B	1	0.65	1	1	1	11.440			
			C	1	0.65	1	1	1	11.440			
L10	8.20	29.65	A	1	0.65	1	1	1	0.677	7.18	24.76	C
139.46-139.17			B	1	0.65	1	1	1	0.677			
			C	1	0.65	1	1	1	0.677			
L11	141.35	607.70	A	1	0.65	1	1	1	11.901	125.57	25.11	C
139.17-134.17			B	1	0.65	1	1	1	11.901			
			C	1	0.65	1	1	1	11.901			
L12	141.35	621.97	A	1	0.65	1	1	1	12.337	128.79	25.76	C
134.17-129.17			B	1	0.65	1	1	1	12.337			
			C	1	0.65	1	1	1	12.337			
L13	133.62	567.20	A	1	0.65	1	1	1	11.372	117.48	26.34	C
129.17-124.71			B	1	0.65	1	1	1	11.372			
			C	1	0.65	1	1	1	11.372			
L14	7.65	43.77	A	1	0.65	1	1	1	0.648	6.66	26.62	C
124.71-124.46			B	1	0.65	1	1	1	0.648			
			C	1	0.65	1	1	1	0.648			
L15	153.00	875.49	A	1	0.65	1	1	1	13.183	134.64	26.93	C
124.46-119.46			B	1	0.65	1	1	1	13.183			
			C	1	0.65	1	1	1	13.183			
L16	153.00	889.86	A	1	0.65	1	1	1	13.618	137.43	27.49	C
119.46-114.46			B	1	0.65	1	1	1	13.618			
			C	1	0.65	1	1	1	13.618			
L17	153.00	904.21	A	1	0.65	1	1	1	14.054	140.07	28.01	C
114.46-109.46			B	1	0.65	1	1	1	14.054			
			C	1	0.65	1	1	1	14.054			
L18	156.47	918.54	A	1	0.65	1	1	1	14.490	142.54	28.51	C
109.46-104.46			B	1	0.65	1	1	1	14.490			
			C	1	0.65	1	1	1	14.490			

<b>tnxTower</b>  <b>Atlantis Group, Inc.</b> 1340 Centre Street, Suite 212 Newton, MA 02459 Phone: (617) 965-0789 FAX: Fax: (617) 213-3123	<b>Job</b> CTHA539A	<b>Page</b> 42 of 61
	<b>Project</b> CTHA539A	<b>Date</b> 09:30:37 10/08/14
	<b>Client</b> metroPCS	<b>Designed by</b> Ahmet Colakoglu

Section Elevation	Add Weight	Self Weight	F a c e	e	C <sub>F</sub>	R <sub>R</sub>	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub>	F	w	Ctrl. Face
ft	lb	lb							ft <sup>2</sup>	lb	plf	
L19 104.46-99.46	158.20	932.86	A	1	0.65	1	1	1	14.925	144.83	28.97	C
			B	1	0.65	1	1	1	14.925			
			C	1	0.65	1	1	1	14.925			
L20 99.46-94.46	158.20	947.17	A	1	0.65	1	1	1	15.361	146.93	29.39	C
			B	1	0.65	1	1	1	15.361			
			C	1	0.65	1	1	1	15.361			
L21 94.46-93.21	39.55	240.23	A	1	0.65	1	1	1	3.908	37.04	29.63	C
			B	1	0.65	1	1	1	3.908			
			C	1	0.65	1	1	1	3.908			
L22 93.21-92.71	15.82	121.46	A	1	0.65	1	1	1	1.571	14.85	29.69	C
			B	1	0.65	1	1	1	1.571			
			C	1	0.65	1	1	1	1.571			
L23 92.71-92.46	7.91	37.87	A	1	0.65	1	1	1	0.787	7.43	29.72	C
			B	1	0.65	1	1	1	0.787			
			C	1	0.65	1	1	1	0.787			
L24 92.46-87.46	158.20	768.08	A	1	0.65	1	1	1	15.960	149.43	29.89	C
			B	1	0.65	1	1	1	15.960			
			C	1	0.65	1	1	1	15.960			
L25 87.46-82.46	158.20	788.44	A	1	0.65	1	1	1	16.379	150.86	30.17	C
			B	1	0.65	1	1	1	16.379			
			C	1	0.65	1	1	1	16.379			
L26 82.46-77.46	158.20	808.80	A	1	0.65	1	1	1	16.798	152.06	30.41	C
			B	1	0.65	1	1	1	16.798			
			C	1	0.65	1	1	1	16.798			
L27 77.46-72.46	158.20	829.16	A	1	0.65	1	1	1	17.216	153.01	30.60	C
			B	1	0.65	1	1	1	17.216			
			C	1	0.65	1	1	1	17.216			
L28 72.46-67.46	158.20	849.52	A	1	0.65	1	1	1	17.635	153.67	30.73	C
			B	1	0.65	1	1	1	17.635			
			C	1	0.65	1	1	1	17.635			
L29 67.46-62.46	158.20	869.88	A	1	0.65	1	1	1	18.054	154.02	30.80	C
			B	1	0.65	1	1	1	18.054			
			C	1	0.65	1	1	1	18.054			
L30 62.46-57.46	158.20	890.24	A	1	0.65	1	1	1	18.473	154.03	30.81	C
			B	1	0.65	1	1	1	18.473			
			C	1	0.65	1	1	1	18.473			
L31 57.46-52.46	158.20	910.59	A	1	0.65	1	1	1	18.892	153.65	30.73	C
			B	1	0.65	1	1	1	18.892			
			C	1	0.65	1	1	1	18.892			
L32 52.46-47.46	158.20	930.95	A	1	0.65	1	1	1	19.311	152.83	30.57	C
			B	1	0.65	1	1	1	19.311			
			C	1	0.65	1	1	1	19.311			
L33 47.46-46.21	39.55	235.84	A	1	0.65	1	1	1	4.892	38.01	30.41	C
			B	1	0.65	1	1	1	4.892			
			C	1	0.65	1	1	1	4.892			
L34 46.21-41.21	158.20	957.62	A	1	0.65	1	1	1	19.859	151.28	30.26	C
			B	1	0.65	1	1	1	19.859			
			C	1	0.65	1	1	1	19.859			
L35 41.21-36.21	158.20	980.40	A	1	0.65	1	1	1	20.328	149.57	29.91	C
			B	1	0.65	1	1	1	20.328			
			C	1	0.65	1	1	1	20.328			
L36 36.21-31.21	158.20	1003.19	A	1	0.65	1	1	1	20.797	147.09	29.42	C
			B	1	0.65	1	1	1	20.797			
			C	1	0.65	1	1	1	20.797			
L37 31.21-26.21	158.20	1025.98	A	1	0.65	1	1	1	21.266	149.51	29.90	C
			B	1	0.65	1	1	1	21.266			
			C	1	0.65	1	1	1	21.266			
L38 26.21-21.21	158.20	1048.77	A	1	0.65	1	1	1	21.735	152.81	30.56	C
			B	1	0.65	1	1	1	21.735			
			C	1	0.65	1	1	1	21.735			

<p><b>tnxTower</b></p> <p><b>Atlantis Group, Inc.</b> 1340 Centre Street, Suite 212 Newton, MA 02459 Phone: Phone: (617) 965-0789 FAX: Fax: (617) 213-3123</p>	Job	CTHA539A	Page	43 of 61
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Section Elevation	Add Weight	Self Weight	F a c e	e	C <sub>F</sub>	R <sub>R</sub>	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub>	F	w	Ctrl. Face
ft	lb	lb							ft <sup>2</sup>	lb	plf	
L39 21.21-16.21	158.20	1071.56	A	1	0.65	1	1	1	22.204	156.10	31.22	C
			B	1	0.65	1	1	1	22.204			
			C	1	0.65	1	1	1	22.204			
L40 16.21-11.21	158.20	1094.35	A	1	0.65	1	1	1	22.673	159.40	31.88	C
			B	1	0.65	1	1	1	22.673			
			C	1	0.65	1	1	1	22.673			
L41 11.21-6.21	71.83	1117.13	A	1	0.65	1	1	1	23.142	162.69	32.54	C
			B	1	0.65	1	1	1	23.142			
			C	1	0.65	1	1	1	23.142			
L42 6.21-1.21	8.22	1139.92	A	1	0.65	1	1	1	23.610	165.99	33.20	C
			B	1	0.65	1	1	1	23.610			
			C	1	0.65	1	1	1	23.610			
L43 1.21-0.00	0.00	279.29	A	1	0.65	1	1	1	5.784	40.67	33.61	C
			B	1	0.65	1	1	1	5.784			
			C	1	0.65	1	1	1	5.784			
Sum Weight:	4810.76	27467.94						OTM	415667.38 lb-ft	5001.52		

### Force Totals

Load Case	Vertical Forces	Sum of Forces X	Sum of Forces Z	Sum of Overturning Moments, M <sub>x</sub>	Sum of Overturning Moments, M <sub>z</sub>	Sum of Torques
	lb	lb	lb	lb-ft	lb-ft	lb-ft
Leg Weight	27467.94					
Bracing Weight	0.00					
Total Member Self-Weight	27467.94			-989.13	590.06	
Total Weight	43161.88			-989.13	590.06	
Wind 0 deg - No Ice		0.00	-24708.02	-3016154.59	590.06	-1467.45
Wind 30 deg - No Ice		12354.01	-21397.77	-2612199.02	-1506992.67	-3566.31
Wind 60 deg - No Ice		21397.77	-12354.01	-1508571.86	-2610619.83	-4709.58
Wind 90 deg - No Ice		24708.02	0.00	-989.13	-3014575.41	-4590.92
Wind 120 deg - No Ice		21397.77	12354.01	1506593.60	-2610619.83	-3242.13
Wind 150 deg - No Ice		12354.01	21397.77	2610220.76	-1506992.67	-1024.61
Wind 180 deg - No Ice		0.00	24708.02	3014176.34	590.06	1467.45
Wind 210 deg - No Ice		-12354.01	21397.77	2610220.76	1508172.79	3566.31
Wind 240 deg - No Ice		-21397.77	12354.01	1506593.60	2611799.95	4709.58
Wind 270 deg - No Ice		-24708.02	0.00	-989.13	3015755.52	4590.92
Wind 300 deg - No Ice		-21397.77	-12354.01	-1508571.86	2611799.95	3242.13
Wind 330 deg - No Ice		-12354.01	-21397.77	-2612199.02	1508172.79	1024.61
Member Ice	4294.24					
Total Weight Ice	53547.87			-1927.13	993.05	
Wind 0 deg - Ice		0.00	-20500.75	-2567214.15	993.05	-1659.45
Wind 30 deg - Ice		10250.38	-17754.17	-2223530.85	-1281650.46	-3512.31
Wind 60 deg - Ice		17754.17	-10250.38	-1284570.64	-2220610.68	-4424.06
Wind 90 deg - Ice		20500.75	0.00	-1927.13	-2564293.97	-4150.38
Wind 120 deg - Ice		17754.17	10250.38	1280716.38	-2220610.68	-2764.62
Wind 150 deg - Ice		10250.38	17754.17	2219676.60	-1281650.46	-638.07
Wind 180 deg - Ice		0.00	20500.75	2563359.89	993.05	1659.45
Wind 210 deg - Ice		-10250.38	17754.17	2219676.60	1283636.56	3512.31
Wind 240 deg - Ice		-17754.17	10250.38	1280716.38	2222596.77	4424.06
Wind 270 deg - Ice		-20500.75	0.00	-1927.13	2566280.07	4150.38
Wind 300 deg - Ice		-17754.17	-10250.38	-1284570.64	2222596.77	2764.62
Wind 330 deg - Ice		-10250.38	-17754.17	-2223530.85	1283636.56	638.07
Total Weight	43161.88			-989.13	590.06	
Wind 0 deg - Service		0.00	-9651.57	-1178788.14	590.06	-573.22

<p><b>tnxTower</b></p> <p><b>Atlantis Group, Inc.</b> 1340 Centre Street, Suite 212 Newton, MA 02459 Phone: (617) 965-0789 FAX: (617) 213-3123</p>	Job	CTHA539A	Page	44 of 61
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Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, $M_x$ lb-ft	Sum of Overturning Moments, $M_z$ lb-ft	Sum of Torques lb-ft
Wind 30 deg - Service		4825.79	-8358.51	-1020992.99	-588309.45	-1393.09
Wind 60 deg - Service		8358.51	-4825.79	-589888.63	-1019413.80	-1839.68
Wind 90 deg - Service		9651.57	0.00	-989.13	-1177208.95	-1793.33
Wind 120 deg - Service		8358.51	4825.79	587910.38	-1019413.80	-1266.46
Wind 150 deg - Service		4825.79	8358.51	1019014.73	-588309.45	-400.24
Wind 180 deg - Service		0.00	9651.57	1176809.88	590.06	573.22
Wind 210 deg - Service		-4825.79	8358.51	1019014.73	589489.56	1393.09
Wind 240 deg - Service		-8358.51	4825.79	587910.38	1020593.92	1839.68
Wind 270 deg - Service		-9651.57	0.00	-989.13	1178389.07	1793.33
Wind 300 deg - Service		-8358.51	-4825.79	-589888.63	1020593.92	1266.46
Wind 330 deg - Service		-4825.79	-8358.51	-1020992.99	589489.56	400.24

## Load Combinations

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



<b>tnxTower</b>  <b>Atlantis Group, Inc.</b> 1340 Centre Street, Suite 212 Newton, MA 02459 Phone: (617) 965-0789 FAX: (617) 213-3123	<b>Job</b> CTHA539A	<b>Page</b> 45 of 61
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	<b>Client</b> metroPCS	<b>Designed by</b> Ahmet Colakoglu

### Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
L1	179 - 174	Pole	Max Tension	27	0.00	-0.26	-0.05
			Max. Compression	14	-6651.50	48.26	29.90
			Max. Mx	24	-6338.83	18649.20	30.67
			Max. My	15	-6338.67	43.25	18630.94
			Max. Vy	11	-3616.42	17166.39	24.84
			Max. Vx	2	-3616.43	34.99	17150.93
			Max. Torque	16			88.99
L2	174 - 169	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-8748.13	50.42	33.21
			Max. Mx	24	-8115.48	39385.90	39.94
			Max. My	15	-8115.15	48.31	39369.21
			Max. Vy	11	-7585.28	39067.66	32.58
			Max. Vx	2	-7585.27	38.44	39052.00
			Max. Torque	16			88.98
L3	169 - 164	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-14198.85	133.52	84.35
			Max. Mx	11	-8414.86	79896.62	72.24
			Max. My	2	-8414.76	88.48	79858.04
			Max. Vy	11	-8950.40	79896.62	72.24
			Max. Vx	2	-8950.42	88.48	79858.04
			Max. Torque	22			-179.18
L4	164 - 159	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-14586.04	137.51	90.75
			Max. Mx	11	-8721.76	125346.24	88.07
			Max. My	2	-8721.65	95.15	125307.24
			Max. Vy	11	-9234.88	125346.24	88.07
			Max. Vx	2	-9234.87	95.15	125307.24
			Max. Torque	22			-179.16
L5	159 - 154	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-18129.46	141.72	97.79
			Max. Mx	11	-10720.07	185819.28	108.90
			Max. My	2	-10719.90	103.44	185779.76
			Max. Vy	11	-13158.30	185819.28	108.90
			Max. Vx	2	-13158.31	103.44	185779.76
			Max. Torque	22			-179.02
L6	154 - 149	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-18606.75	146.05	105.28
			Max. Mx	11	-11144.97	252296.86	131.72
			Max. My	2	-11144.78	112.26	252256.73
			Max. Vy	11	-13442.67	252296.86	131.72
			Max. Vx	2	-13442.67	112.26	252256.73
			Max. Torque	22			-178.77
L7	149 - 144.71	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-19027.31	149.51	111.48
			Max. Mx	11	-11526.91	310460.71	151.62
			Max. My	2	-11526.70	119.73	310419.95
			Max. Vy	11	-13685.69	310460.71	151.62
			Max. Vx	2	-13685.66	119.73	310419.95
			Max. Torque	22			-178.37
L8	144.71 - 144.46	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-19063.60	151.53	114.94
			Max. Mx	11	-11566.30	313882.69	157.25
			Max. My	2	-11566.09	123.77	313842.09
			Max. Vy	11	-13698.09	313882.69	157.25
			Max. Vx	2	-13700.02	123.77	313842.09

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
L9	144.46 - 139.46	Pole	Max. Torque	22			-177.96
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-19792.62	153.84	119.44
			Max. Mx	11	-12216.78	383189.24	177.29
			Max. My	2	-12216.56	129.59	383147.58
			Max. Vy	11	-14032.14	383189.24	177.29
			Max. Vx	2	-14032.11	129.59	383147.58
			Max. Torque	22			-177.92
L10	139.46 - 139.17	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-19835.56	155.38	122.08
			Max. Mx	11	-12258.49	387260.39	182.05
			Max. My	2	-12258.27	132.80	387218.86
			Max. Vy	11	-14050.17	387260.39	182.05
			Max. Vx	2	-14051.72	132.80	387218.86
			Max. Torque	22			-177.57
			Max Tension	1	0.00	0.00	0.00
L11	139.17 - 134.17	Pole	Max. Compression	14	-20789.91	158.01	956.34
			Max. Mx	11	-13045.73	459864.14	424.94
			Max. My	2	-13045.52	139.60	460249.40
			Max. Vy	11	-14738.26	459864.14	424.94
			Max. Vx	2	-14738.19	139.60	460249.40
			Max. Torque	5			2444.52
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-21673.57	262.26	905.00
L12	134.17 - 129.17	Pole	Max. Mx	11	-13840.63	534599.70	410.11
			Max. My	2	-13840.45	212.22	534868.69
			Max. Vy	11	-15124.78	534599.70	410.11
			Max. Vx	2	-15124.67	212.22	534868.69
			Max. Torque	5			2443.57
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-22772.85	1032.14	1023.12
			Max. Mx	11	-14688.91	604819.12	469.46
L13	129.17 - 124.71	Pole	Max. My	2	-14688.72	548.35	604714.52
			Max. Vy	11	-15943.95	604819.12	469.46
			Max. Vx	2	-15943.82	548.35	604714.52
			Max. Torque	4			2918.73
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-22829.14	1035.13	1028.20
			Max. Mx	11	-14745.46	608806.43	477.69
			Max. My	2	-14745.26	554.93	608702.06
L14	124.71 - 124.46	Pole	Max. Vy	11	-15961.35	608806.43	477.69
			Max. Vx	2	-15964.17	554.93	608702.06
			Max. Torque	4			2917.99
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-23956.72	1034.84	1028.06
			Max. Mx	11	-15780.40	689557.43	492.75
			Max. My	2	-15780.19	557.50	689451.25
			Max. Vy	11	-16347.95	689557.43	492.75
L15	124.46 - 119.46	Pole	Max. Vx	2	-16347.86	557.50	689451.25
			Max. Torque	4			2917.86
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-25101.99	1032.30	1023.74
			Max. Mx	11	-16835.65	772242.67	513.88
			Max. My	2			
			Max. Vy	11			
			Max. Vx	2			
L16	119.46 - 114.46	Pole	Max. Torque	4			2917.86
			Max Tension	1	0.00	0.00	0.00

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
L17	114.46 - 109.46	Pole	Max. My	2	-16835.43	565.22	772134.94
			Max. Vy	11	-16735.92	772242.67	513.88
			Max. Vx	2	-16735.85	565.22	772134.94
			Max. Torque	4			2916.84
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-26317.96	1029.68	1412.39
			Max. Mx	11	-17921.62	857383.45	634.70
			Max. My	2	-17921.39	572.63	857458.59
			Max. Vy	11	-17283.95	857383.45	634.70
			Max. Vx	2	-17283.90	572.63	857458.59
L18	109.46 - 104.46	Pole	Max. Torque	4			3919.76
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-27631.83	1026.99	1985.22
			Max. Mx	11	-19071.24	945410.25	904.81
			Max. My	2	-19071.01	579.75	945793.66
			Max. Vy	11	-17871.71	945410.25	904.81
			Max. Vx	2	-17871.66	579.75	945793.66
			Max. Torque	4			4652.48
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-28834.98	1024.22	1980.51
L19	104.46 - 99.46	Pole	Max. Mx	11	-20183.87	1035713.73	922.51
			Max. My	2	-20183.66	586.48	1036095.36
			Max. Vy	11	-18261.79	1035713.73	922.51
			Max. Vx	2	-18261.74	586.48	1036095.36
			Max. Torque	4			4651.33
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-30055.67	1021.40	1975.71
			Max. Mx	11	-21313.96	1127962.81	939.15
			Max. My	2	-21313.75	592.85	1128342.54
			Max. Vy	11	-18650.81	1127962.81	939.15
L20	99.46 - 94.46	Pole	Max. Vx	2	-18650.76	592.85	1128342.54
			Max. Torque	4			4649.90
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-30364.78	1020.54	1974.25
			Max. Mx	11	-21598.86	1151329.38	942.90
			Max. My	2	-21598.66	594.14	1151708.57
			Max. Vy	11	-18749.56	1151329.38	942.90
			Max. Vx	2	-18749.39	594.14	1151708.57
			Max. Torque	4			4648.40
			Max Tension	1	0.00	0.00	0.00
L21	94.46 - 93.21	Pole	Max. Compression	14	-30513.84	1021.50	1975.89
			Max. Mx	11	-21742.09	1160710.91	947.49
			Max. My	2	-21741.89	597.22	1161090.12
			Max. Vy	11	-18787.07	1160710.91	947.49
			Max. Vx	2	-18788.07	597.22	1161090.12
			Max. Torque	4			4648.17
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-30565.55	1021.83	1976.45
			Max. Mx	11	-21790.43	1165409.29	949.26
			Max. My	2	-21790.23	598.32	1165788.77
L22	93.21 - 92.71	Pole	Max. Vy	11	-18807.70	1165409.29	949.26
			Max. Vx	2	-18813.09	598.32	1165788.77
			Max. Torque	4			4648.06
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-31611.58	1017.20	1968.57
			Max. Mx	11	-22756.45	1260302.95	959.18
			Max. My	2	-22756.26	600.46	1260679.77
			Max. Vy	11	-19165.59	1260302.95	959.18
			Max. Vx	2	-19165.54	600.46	1260679.77

<p><b>tnxTower</b></p> <p><b>Atlantis Group, Inc.</b>  1340 Centre Street, Suite 212  Newton, MA 02459  Phone: Phone: (617) 965-0789  FAX: Fax: (617) 213-3123</p>	Job	CTHA539A	Page	48 of 61
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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
L25	87.46 - 82.46	Pole	Max. Torque	4			4647.82
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-32681.07	1014.28	1963.59
			Max. Mx	11	-23750.52	1356970.34	971.80
			Max. My	2	-23750.35	605.44	1357344.91
			Max. Vy	11	-19519.64	1356970.34	971.80
			Max. Vx	2	-19519.57	605.44	1357344.91
L26	82.46 - 77.46	Pole	Max. Torque	4			4645.95
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-33774.02	1011.33	1958.57
			Max. Mx	11	-24767.34	1455400.07	983.15
			Max. My	2	-24767.19	609.95	1455772.26
			Max. Vy	11	-19871.17	1455400.07	983.15
			Max. Vx	2	-19871.08	609.95	1455772.26
L27	77.46 - 72.46	Pole	Max. Torque	4			4644.16
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-34890.43	1008.36	1953.51
			Max. Mx	11	-25806.80	1555577.88	993.28
			Max. My	2	-25806.65	614.01	1555947.56
			Max. Vy	11	-20219.49	1555577.88	993.28
			Max. Vx	2	-20219.39	614.01	1555947.56
L28	72.46 - 67.46	Pole	Max. Torque	4			4642.45
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-36030.30	1005.37	1948.42
			Max. Mx	11	-26868.79	1657485.95	1002.24
			Max. My	2	-26868.65	617.65	1657852.99
			Max. Vy	11	-20563.86	1657485.95	1002.24
			Max. Vx	2	-20563.74	617.65	1657852.99
L29	67.46 - 62.46	Pole	Max. Torque	4			4640.83
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-37193.64	1002.38	1943.32
			Max. Mx	11	-27953.21	1761102.54	1010.08
			Max. My	2	-27953.09	620.86	1761466.85
			Max. Vy	11	-20903.46	1761102.54	1010.08
			Max. Vx	2	-20903.32	620.86	1761466.85
L30	62.46 - 57.46	Pole	Max. Torque	4			4639.31
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-38380.43	999.37	1938.20
			Max. Mx	11	-29059.98	1866401.59	1016.84
			Max. My	2	-29059.86	623.68	1866763.06
			Max. Vy	11	-21237.38	1866401.59	1016.84
			Max. Vx	2	-21237.22	623.68	1866763.06
L31	57.46 - 52.46	Pole	Max. Torque	4			4637.89
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-39590.68	996.36	1933.07
			Max. Mx	11	-30188.99	1973352.24	1022.55
			Max. My	2	-30188.89	626.10	1973710.77
			Max. Vy	11	-21564.61	1973352.24	1022.55
			Max. Vx	2	-21564.42	626.10	1973710.77
L32	52.46 - 47.46	Pole	Max. Torque	4			4636.58
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-40824.39	993.35	1927.94
			Max. Mx	11	-31340.16	2081918.19	1027.24
			Max. My	2	-31340.06	628.14	2082273.70
			Max. Vy	11	-21883.99	2081918.19	1027.24
			Max. Vx	2	-21883.78	628.14	2082273.70
L33	47.46 - 46.21	Pole	Max. Torque	4			4635.38
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-41136.40	992.57	1926.60
			Max. Mx	11	-31629.36	2109308.51	1028.29
Max. My	2	-31629.27	628.56	2109663.21			



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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
L34	46.21 - 41.21	Pole	Max. Vy	11	-21965.15	2109308.51	1028.29
			Max. Vx	2	-21964.79	628.56	2109663.21
			Max. Torque	4			4634.27
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-42400.84	989.59	1921.53
			Max. Mx	11	-32810.86	2219835.58	1031.74
			Max. My	2	-32810.77	630.17	2220187.20
			Max. Vy	11	-22271.21	2219835.58	1031.74
L35	41.21 - 36.21	Pole	Max. Vx	2	-22270.96	630.17	2220187.20
			Max. Torque	4			4634.04
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-43691.54	986.58	1916.40
			Max. Mx	11	-34014.33	2331881.56	1034.29
			Max. My	2	-34014.25	631.41	2332229.97
			Max. Vy	11	-22570.49	2331881.56	1034.29
			Max. Vx	2	-22570.20	631.41	2332229.97
L36	36.21 - 31.21	Pole	Max. Torque	4			4633.10
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-45008.50	983.58	1911.28
			Max. Mx	11	-35241.49	2445395.08	1035.96
			Max. My	2	-35241.42	632.30	2445740.22
			Max. Vy	11	-22858.47	2445395.08	1035.96
			Max. Vx	2	-22858.15	632.30	2445740.22
			Max. Torque	4			4632.28
L37	31.21 - 26.21	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-46351.72	980.58	1906.17
			Max. Mx	11	-36492.03	2560350.91	1036.77
			Max. My	2	-36491.96	632.87	2560692.70
			Max. Vy	11	-23147.68	2560350.91	1036.77
			Max. Vx	2	-23147.31	632.87	2560692.70
			Max. Torque	4			4631.58
			Max Tension	1	0.00	0.00	0.00
L38	26.21 - 21.21	Pole	Max. Compression	14	-47721.20	977.58	1901.06
			Max. Mx	11	-37765.90	2676760.76	1036.73
			Max. My	2	-37765.84	633.11	2677099.15
			Max. Vy	11	-23440.35	2676760.76	1036.73
			Max. Vx	2	-23439.93	633.11	2677099.15
			Max. Torque	4			4630.99
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-49116.94	974.59	1895.97
L39	21.21 - 16.21	Pole	Max. Mx	11	-39063.13	2794641.90	1035.89
			Max. My	2	-39063.07	633.04	2794976.82
			Max. Vy	11	-23736.44	2794641.90	1035.89
			Max. Vx	2	-23735.96	633.04	2794976.82
			Max. Torque	4			4630.52
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-50538.94	971.61	1890.88
			Max. Mx	11	-40383.73	2914011.43	1034.24
L40	16.21 - 11.21	Pole	Max. My	2	-40383.68	632.66	2914342.82
			Max. Vy	11	-24035.94	2914011.43	1034.24
			Max. Vx	2	-24035.39	632.66	2914342.82
			Max. Torque	4			4630.15
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-51900.83	968.64	1885.81
			Max. Mx	11	-41641.37	3034885.37	1031.82
			Max. My	2	-41641.32	631.98	3035213.17
L41	11.21 - 6.21	Pole	Max. Vy	11	-24338.47	3034885.37	1031.82
			Max. Vx	2	-24337.85	631.98	3035213.17
			Max. Torque	4			4629.89
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-53225.37	965.67	1880.75
			Max. Mx	11	-41641.37	3034885.37	1031.82
			Max. My	2	-41641.32	631.98	3035213.17
			Max. Vy	11	-24338.47	3034885.37	1031.82
L42	6.21 - 1.21	Pole	Max. Vx	2	-24337.85	631.98	3035213.17
			Max. Torque	4			4629.89
			Max Tension	1	0.00	0.00	0.00

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
L43	1.21 - 0	Pole	Max. Mx	11	-42858.82	3157280.95	1028.64
			Max. My	2	-42858.77	631.00	3157605.11
			Max. Vy	11	-24644.78	3157280.95	1028.64
			Max. Vx	2	-24644.08	631.00	3157605.11
			Max. Torque	4			4629.73
			Max. Tension	1	0.00	0.00	0.00
			Max. Compression	14	-53547.87	964.95	1879.53
			Max. Mx	11	-43153.44	3187131.73	1027.84
			Max. My	2	-43153.40	630.75	3187455.01
			Max. Vy	11	-24722.22	3187131.73	1027.84
			Max. Vx	2	-24721.50	630.75	3187455.01
			Max. Torque	4			4629.66

### Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	14	53547.87	-0.60	-1.02
	Max. H <sub>x</sub>	11	43161.85	24707.52	0.00
	Max. H <sub>z</sub>	2	43161.81	0.00	24706.80
	Max. M <sub>x</sub>	2	3187455.01	0.00	24706.80
	Max. M <sub>z</sub>	5	3185843.48	-24707.52	0.00
	Max. Torsion	4	4629.67	-21397.70	12353.97
	Min. Vert	2	43161.81	0.00	24706.80
	Min. H <sub>x</sub>	5	43161.85	-24707.52	0.00
	Min. H <sub>z</sub>	8	43161.81	0.00	-24706.80
	Min. M <sub>x</sub>	8	-3185307.15	0.00	-24706.80
	Min. M <sub>z</sub>	11	-3187131.73	24707.52	0.00
	Min. Torsion	10	-4629.64	21397.70	-12353.97

### Tower Mast Reaction Summary

Load Combination	Vertical lb	Shear <sub>x</sub> lb	Shear <sub>z</sub> lb	Overturing Moment, M <sub>x</sub> lb-ft	Overturing Moment, M <sub>z</sub> lb-ft	Torque lb-ft
Dead Only	43161.88	-0.00	-0.00	-989.15	590.07	0.00
Dead+Wind 0 deg - No Ice	43161.81	-0.00	-24706.80	-3187455.01	630.60	-1444.29
Dead+Wind 30 deg - No Ice	43161.88	12353.97	-21397.70	-2760689.08	-1592661.36	-3506.76
Dead+Wind 60 deg - No Ice	43161.88	21397.70	-12353.97	-1594307.86	-2759012.31	-4629.67
Dead+Wind 90 deg - No Ice	43161.85	24707.52	-0.00	-1027.43	-3185843.48	-4512.06
Dead+Wind 120 deg - No Ice	43161.88	21397.70	12353.97	1592230.07	-2758971.73	-3185.41
Dead+Wind 150 deg - No Ice	43161.88	12353.97	21397.70	2758564.47	-1592620.77	-1005.23
Dead+Wind 180 deg - No Ice	43161.81	-0.00	24706.80	3185307.15	630.63	1444.32
Dead+Wind 210 deg - No Ice	43161.88	-12353.97	21397.70	2758576.37	1593888.50	3506.82
Dead+Wind 240 deg - No Ice	43161.88	-21397.70	12353.97	1592241.99	2760253.17	4629.64
Dead+Wind 270 deg - No Ice	43161.85	-24707.52	-0.00	-1027.38	3187131.73	4511.96
Dead+Wind 300 deg - No Ice	43161.88	-21397.70	-12353.97	-1594319.70	2760293.73	3185.30
Dead+Wind 330 deg - No Ice	43161.88	-12353.97	-21397.70	-2760700.95	1593929.06	1005.17
Dead+Ice+Temp	53547.87	0.60	1.02	-1879.53	964.95	0.02
Dead+Wind 0 deg+Ice+Temp	53547.85	-0.00	-20500.45	-2779411.86	1109.12	-1632.87
Dead+Wind 30 deg+Ice+Temp	53547.86	10250.34	-17754.10	-2407344.14	-1387545.82	-3443.43
Dead+Wind 60 deg+Ice+Temp	53547.86	17754.10	-10250.34	-1390765.06	-2404088.05	-4331.39

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Load Combination	Vertical lb	Shear <sub>x</sub> lb	Shear <sub>z</sub> lb	Overturning Moment, M <sub>x</sub> lb-ft	Overturning Moment, M <sub>z</sub> lb-ft	Torque lb-ft
Dead+Wind 90 deg+Ice+Temp	53547.85	20500.46	-0.00	-2123.78	-2776105.48	-4058.78
Dead+Wind 120 deg+Ice+Temp	53547.86	17754.10	10250.34	1386491.28	-2404042.25	-2698.57
Dead+Wind 150 deg+Ice+Temp	53547.86	10250.34	17754.10	2403017.56	-1387499.98	-615.27
Dead+Wind 180 deg+Ice+Temp	53547.85	-0.00	20500.46	2775058.99	1109.22	1632.92
Dead+Wind 210 deg+Ice+Temp	53547.86	-10250.34	17754.10	2403035.70	1389728.77	3443.51
Dead+Wind 240 deg+Ice+Temp	53547.86	-17754.10	10250.34	1386509.47	2406291.90	4331.35
Dead+Wind 270 deg+Ice+Temp	53547.85	-20500.45	-0.00	-2123.66	2778365.50	4058.60
Dead+Wind 300 deg+Ice+Temp	53547.86	-17754.10	-10250.34	-1390783.06	2406337.63	2698.38
Dead+Wind 330 deg+Ice+Temp	53547.86	-10250.34	-17754.10	-2407362.19	1389774.47	615.16
Dead+Wind 0 deg - Service	43161.82	0.00	-9648.66	-1247153.53	647.59	-569.23
Dead+Wind 30 deg - Service	43161.88	4825.63	-8358.23	-1080541.11	-622581.64	-1381.73
Dead+Wind 60 deg - Service	43161.88	8358.33	-4825.68	-624312.55	-1078828.95	-1824.01
Dead+Wind 90 deg - Service	43161.85	9650.36	-0.00	-1076.33	-1245671.54	-1777.55
Dead+Wind 120 deg - Service	43161.88	8358.23	4825.63	622147.82	-1078807.92	-1254.79
Dead+Wind 150 deg - Service	43161.88	4825.68	8358.33	1078392.59	-622583.95	-395.81
Dead+Wind 180 deg - Service	43161.82	0.00	9648.66	1244987.73	647.60	569.22
Dead+Wind 210 deg - Service	43161.88	-4825.68	8358.33	1078394.41	623880.56	1381.72
Dead+Wind 240 deg - Service	43161.88	-8358.23	4825.63	622149.65	1080106.60	1823.99
Dead+Wind 270 deg - Service	43161.86	-9650.79	-0.00	-1076.30	1247035.10	1777.52
Dead+Wind 300 deg - Service	43161.88	-8358.33	-4825.68	-624314.35	1080127.65	1254.76
Dead+Wind 330 deg - Service	43161.88	-4825.68	-8358.33	-1080557.77	623886.77	395.79

## Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	
1	0.00	-43161.88	0.00	0.00	43161.88	0.00	0.000%
2	0.00	-43161.88	-24708.02	0.00	43161.81	24706.80	0.002%
3	12354.01	-43161.88	-21397.77	-12353.97	43161.88	21397.70	0.000%
4	21397.77	-43161.88	-12354.01	-21397.70	43161.88	12353.97	0.000%
5	24708.02	-43161.88	0.00	-24707.52	43161.85	0.00	0.001%
6	21397.77	-43161.88	12354.01	-21397.70	43161.88	-12353.97	0.000%
7	12354.01	-43161.88	21397.77	-12353.97	43161.88	-21397.70	0.000%
8	0.00	-43161.88	24708.02	0.00	43161.81	-24706.80	0.002%
9	-12354.01	-43161.88	21397.77	12353.97	43161.88	-21397.70	0.000%
10	-21397.77	-43161.88	12354.01	21397.70	43161.88	-12353.97	0.000%
11	-24708.02	-43161.88	0.00	24707.52	43161.85	0.00	0.001%
12	-21397.77	-43161.88	-12354.01	21397.70	43161.88	12353.97	0.000%
13	-12354.01	-43161.88	-21397.77	12353.97	43161.88	21397.70	0.000%
14	0.00	-53547.87	0.00	-0.60	53547.87	-1.02	0.002%
15	0.00	-53547.87	-20500.75	0.00	53547.85	20500.45	0.001%
16	10250.38	-53547.87	-17754.17	-10250.34	53547.86	17754.10	0.000%
17	17754.17	-53547.87	-10250.38	-17754.10	53547.86	10250.34	0.000%
18	20500.75	-53547.87	0.00	-20500.46	53547.85	0.00	0.001%
19	17754.17	-53547.87	10250.38	-17754.10	53547.86	-10250.34	0.000%
20	10250.38	-53547.87	17754.17	-10250.34	53547.86	-17754.10	0.000%
21	0.00	-53547.87	20500.75	0.00	53547.85	-20500.46	0.001%
22	-10250.38	-53547.87	17754.17	10250.34	53547.86	-17754.10	0.000%
23	-17754.17	-53547.87	10250.38	17754.10	53547.86	-10250.34	0.000%
24	-20500.75	-53547.87	0.00	20500.45	53547.85	0.00	0.001%
25	-17754.17	-53547.87	-10250.38	17754.10	53547.86	10250.34	0.000%
26	-10250.38	-53547.87	-17754.17	10250.34	53547.86	17754.10	0.000%
27	0.00	-43161.88	-9651.57	-0.00	43161.82	9648.66	0.007%
28	4825.79	-43161.88	-8358.51	-4825.63	43161.88	8358.23	0.001%
29	8358.51	-43161.88	-4825.79	-8358.33	43161.88	4825.68	0.000%
30	9651.57	-43161.88	0.00	-9650.36	43161.85	0.00	0.003%
31	8358.51	-43161.88	4825.79	-8358.23	43161.88	-4825.63	0.001%

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Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	
32	4825.79	-43161.88	8358.51	-4825.68	43161.88	-8358.33	0.000%
33	0.00	-43161.88	9651.57	-0.00	43161.82	-9648.66	0.007%
34	-4825.79	-43161.88	8358.51	4825.68	43161.88	-8358.33	0.000%
35	-8358.51	-43161.88	4825.79	8358.23	43161.88	-4825.63	0.001%
36	-9651.57	-43161.88	0.00	9650.79	43161.86	0.00	0.002%
37	-8358.51	-43161.88	-4825.79	8358.33	43161.88	4825.68	0.000%
38	-4825.79	-43161.88	-8358.51	4825.68	43161.88	8358.33	0.000%

### Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	25	0.00002015	0.00011545
3	Yes	31	0.00000001	0.00000000
4	Yes	31	0.00000001	0.00000000
5	Yes	27	0.00000001	0.00014053
6	Yes	31	0.00000001	0.00000000
7	Yes	31	0.00000001	0.00000000
8	Yes	25	0.00002015	0.00011533
9	Yes	31	0.00000001	0.00000000
10	Yes	31	0.00000001	0.00000000
11	Yes	27	0.00000001	0.00014062
12	Yes	31	0.00000001	0.00000000
13	Yes	31	0.00000001	0.00000000
14	Yes	6	0.00000001	0.00006501
15	Yes	29	0.00000001	0.00011478
16	Yes	32	0.00000001	0.00000000
17	Yes	32	0.00000001	0.00000000
18	Yes	29	0.00000001	0.00013228
19	Yes	32	0.00000001	0.00000000
20	Yes	32	0.00000001	0.00000000
21	Yes	29	0.00000001	0.00011452
22	Yes	32	0.00000001	0.00000000
23	Yes	32	0.00000001	0.00000000
24	Yes	29	0.00000001	0.00013245
25	Yes	32	0.00000001	0.00000000
26	Yes	32	0.00000001	0.00000000
27	Yes	21	0.00012074	0.00012555
28	Yes	26	0.00000001	0.00014198
29	Yes	27	0.00000001	0.00011615
30	Yes	23	0.00005090	0.00014976
31	Yes	26	0.00000001	0.00014227
32	Yes	27	0.00000001	0.00010249
33	Yes	21	0.00012073	0.00012518
34	Yes	27	0.00000001	0.00011180
35	Yes	26	0.00000001	0.00013888
36	Yes	24	0.00000001	0.00009823
37	Yes	27	0.00000001	0.00011098
38	Yes	27	0.00000001	0.00009820

### Maximum Tower Deflections - Service Wind



<p><b>tnxTower</b></p> <p><i>Atlantis Group, Inc.</i> 1340 Centre Street, Suite 212 Newton, MA 02459 Phone: (617) 965-0789 FAX: (617) 213-3123</p>	Job	CTHA539A	Page	53 of 61
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	Client	metroPCS	Designed by	Ahmet Colakoglu

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	179 - 174	48.096	38	2.4489	0.0082
L2	174 - 169	45.537	38	2.4386	0.0081
L3	169 - 164	42.995	38	2.4176	0.0081
L4	164 - 159	40.483	38	2.3775	0.0080
L5	159 - 154	38.025	38	2.3165	0.0079
L6	154 - 149	35.641	38	2.2361	0.0078
L7	149 - 144.71	33.351	38	2.1356	0.0077
L8	144.71 - 144.46	31.477	38	2.0365	0.0077
L9	144.46 - 139.46	31.370	38	2.0333	0.0077
L10	139.46 - 139.17	29.276	38	1.9661	0.0076
L11	139.17 - 134.17	29.157	38	1.9621	0.0076
L12	134.17 - 129.17	27.136	38	1.8989	0.0073
L13	129.17 - 124.71	25.183	38	1.8314	0.0069
L14	124.71 - 124.46	23.502	38	1.7681	0.0065
L15	124.46 - 119.46	23.410	38	1.7655	0.0065
L16	119.46 - 114.46	21.590	38	1.7108	0.0062
L17	114.46 - 109.46	19.829	38	1.6538	0.0059
L18	109.46 - 104.46	18.128	38	1.5954	0.0056
L19	104.46 - 99.46	16.488	38	1.5359	0.0052
L20	99.46 - 94.46	14.912	38	1.4748	0.0048
L21	94.46 - 93.21	13.401	38	1.4121	0.0045
L22	93.21 - 92.71	13.033	38	1.3966	0.0044
L23	92.71 - 92.46	12.887	38	1.3916	0.0044
L24	92.46 - 87.46	12.815	38	1.3875	0.0043
L25	87.46 - 82.46	11.405	38	1.3049	0.0039
L26	82.46 - 77.46	10.082	38	1.2226	0.0036
L27	77.46 - 72.46	8.845	38	1.1407	0.0032
L28	72.46 - 67.46	7.693	38	1.0594	0.0029
L29	67.46 - 62.46	6.626	38	0.9786	0.0026
L30	62.46 - 57.46	5.643	38	0.8986	0.0023
L31	57.46 - 52.46	4.744	38	0.8195	0.0020
L32	52.46 - 47.46	3.927	38	0.7412	0.0018
L33	47.46 - 46.21	3.191	38	0.6638	0.0016
L34	46.21 - 41.21	3.020	38	0.6448	0.0015
L35	41.21 - 36.21	2.385	38	0.5689	0.0013
L36	36.21 - 31.21	1.828	38	0.4945	0.0011
L37	31.21 - 26.21	1.348	38	0.4217	0.0009
L38	26.21 - 21.21	0.944	38	0.3504	0.0007
L39	21.21 - 16.21	0.614	38	0.2806	0.0006
L40	16.21 - 11.21	0.356	38	0.2122	0.0004
L41	11.21 - 6.21	0.169	38	0.1452	0.0003
L42	6.21 - 1.21	0.051	38	0.0795	0.0002
L43	1.21 - 0	0.002	38	0.0153	0.0000

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

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
191.50	3" Dia 20' Omni	38	48.096	2.4489	0.0082	18925
182.10	3/4"x5' Lightning Rod	38	48.096	2.4489	0.0082	18925
179.00	14'-0" Platform	38	48.096	2.4489	0.0082	18925
175.00	AIR21 B2A/B4P with pipe	38	46.048	2.4412	0.0081	18925
170.00	P65-17-XLH-RR with Pipe	38	43.501	2.4231	0.0081	10892
169.70	(2) 7770.00 w/ Mount Pipe	38	43.349	2.4215	0.0081	10507
167.00	Ring Mount	38	41.985	2.4040	0.0081	7620

<b>tnxTower</b>  <b>Atlantis Group, Inc.</b> 1340 Centre Street, Suite 212 Newton, MA 02459 Phone: (617) 965-0789 FAX: (617) 213-3123	<b>Job</b>	CTHA539A	<b>Page</b>	54 of 61
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	<b>Client</b>	metroPCS	<b>Designed by</b>	Ahmet Colakoglu

Elevation	Appurtenance	Gov. Load	Deflection	Tilt	Twist	Radius of Curvature
ft		Comb.	in	°	°	ft
166.00	14'-0" Platform	38	41.483	2.3960	0.0080	6832
164.50	DC6-48-60-18-8F	38	40.733	2.3825	0.0080	5908
158.50	(2) APL866513 w/Mount Pipe	38	37.783	2.3092	0.0079	3968
158.00	BXA-70063/6CF w/ Mount Pipe	38	37.542	2.3017	0.0079	3861
157.00	(2) FRS FD9R6004 Diplexer	38	37.061	2.2862	0.0079	3662
156.00	14'-0" Platform	38	36.584	2.2700	0.0079	3480
138.60	20' Dipole	38	28.923	1.9543	0.0076	4411
132.50	Omni 1"x8'	38	26.476	1.8778	0.0071	4299
128.50	3' Yagi	38	24.927	1.8212	0.0068	4149
128.30	Pirod 6' Side Mount Standoff (1)	38	24.851	1.8181	0.0068	4152
127.50	Pirod 6' Side Mount Standoff (1)	38	24.547	1.8058	0.0067	4188
112.70	10' Dipole	38	19.223	1.6334	0.0058	4935
107.80	Pirod 6' Side Mount Standoff (1)	38	17.576	1.5759	0.0054	4832

### Maximum Tower Deflections - Design Wind

Section No.	Elevation	Horz. Deflection	Gov. Load	Tilt	Twist
	ft	in	Comb.	°	°
L1	179 - 174	122.588	2	6.2440	0.0207
L2	174 - 169	116.075	2	6.2177	0.0206
L3	169 - 164	109.603	2	6.1642	0.0205
L4	164 - 159	103.210	2	6.0623	0.0203
L5	159 - 154	96.951	2	5.9070	0.0201
L6	154 - 149	90.879	2	5.7024	0.0199
L7	149 - 144.71	85.048	2	5.4462	0.0197
L8	144.71 - 144.46	80.273	2	5.1938	0.0195
L9	144.46 - 139.46	80.002	2	5.1858	0.0195
L10	139.46 - 139.17	74.668	2	5.0145	0.0194
L11	139.17 - 134.17	74.364	2	5.0042	0.0194
L12	134.17 - 129.17	69.214	2	4.8434	0.0185
L13	129.17 - 124.71	64.238	2	4.6716	0.0175
L14	124.71 - 124.46	59.954	2	4.5104	0.0165
L15	124.46 - 119.46	59.719	2	4.5037	0.0165
L16	119.46 - 114.46	55.080	2	4.3644	0.0157
L17	114.46 - 109.46	50.591	2	4.2193	0.0149
L18	109.46 - 104.46	46.254	2	4.0706	0.0141
L19	104.46 - 99.46	42.075	2	3.9190	0.0132
L20	99.46 - 94.46	38.056	2	3.7632	0.0122
L21	94.46 - 93.21	34.202	2	3.6036	0.0113
L22	93.21 - 92.71	33.264	2	3.5642	0.0111
L23	92.71 - 92.46	32.892	2	3.5513	0.0111
L24	92.46 - 87.46	32.706	2	3.5408	0.0110
L25	87.46 - 82.46	29.111	2	3.3305	0.0100
L26	82.46 - 77.46	25.736	2	3.1207	0.0090
L27	77.46 - 72.46	22.579	2	2.9119	0.0081
L28	72.46 - 67.46	19.640	2	2.7043	0.0073
L29	67.46 - 62.46	16.917	2	2.4984	0.0065
L30	62.46 - 57.46	14.409	13	2.2944	0.0058
L31	57.46 - 52.46	12.113	13	2.0924	0.0052
L32	52.46 - 47.46	10.028	13	1.8926	0.0045
L33	47.46 - 46.21	8.150	13	1.6951	0.0040
L34	46.21 - 41.21	7.712	13	1.6465	0.0038
L35	41.21 - 36.21	6.090	13	1.4528	0.0033
L36	36.21 - 31.21	4.669	13	1.2631	0.0028
L37	31.21 - 26.21	3.444	13	1.0772	0.0023

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Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L38	26.21 - 21.21	2.412	13	0.8950	0.0019
L39	21.21 - 16.21	1.568	13	0.7167	0.0015
L40	16.21 - 11.21	0.909	13	0.5420	0.0011
L41	11.21 - 6.21	0.432	13	0.3708	0.0007
L42	6.21 - 1.21	0.131	13	0.2032	0.0004
L43	1.21 - 0	0.005	13	0.0390	0.0001

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

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
191.50	3" Dia 20' Omni	2	122.588	6.2440	0.0207	7022
182.10	3/4"x5' Lightning Rod	2	122.588	6.2440	0.0207	7022
179.00	14'-0" Platform	2	122.588	6.2440	0.0207	7022
175.00	AIR21 B2A/B4P with pipe	2	117.376	6.2243	0.0206	7022
170.00	P65-17-XLH-RR with Pipe	2	110.893	6.1783	0.0205	4274
169.70	(2) 7770.00 w/ Mount Pipe	2	110.505	6.1743	0.0205	4140
167.00	Ring Mount	2	107.033	6.1297	0.0204	3051
166.00	14'-0" Platform	2	105.754	6.1094	0.0204	2736
164.50	DC6-48-60-18-8F	2	103.844	6.0748	0.0204	2365
158.50	(2) APL866513 w/Mount Pipe	2	96.334	5.8884	0.0201	1587
158.00	BXA-70063/6CF w/ Mount Pipe	2	95.720	5.8694	0.0200	1544
157.00	(2) FRS FD9R6004 Diplexer	2	94.497	5.8298	0.0200	1463
156.00	14'-0" Platform	2	93.282	5.7886	0.0199	1390
138.60	20' Dipole	2	73.768	4.9844	0.0194	1754
132.50	Omni 1"x8'	2	67.532	4.7896	0.0181	1708
128.50	3' Yagi	2	63.585	4.6456	0.0173	1647
128.30	Pirod 6' Side Mount Standoff (1)	2	63.391	4.6377	0.0173	1649
127.50	Pirod 6' Side Mount Standoff (1)	2	62.617	4.6064	0.0171	1663
112.70	10' Dipole	2	49.047	4.1673	0.0147	1955
107.80	Pirod 6' Side Mount Standoff (1)	2	44.849	4.0208	0.0138	1913

### Compression Checks

### Pole Design Data

Section No.	Elevation ft	Size	L ft	L <sub>n</sub> ft	KI/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P lb	Allow. P <sub>a</sub> lb	Ratio P P <sub>a</sub>
L1	179 - 174 (1)	TP20.7382x19.69x0.1875	5.00	0.00	0.0	39.000	12.2302	-6338.65	476979.00	0.013
L2	174 - 169 (2)	TP21.7864x20.7382x0.1875	5.00	0.00	0.0	39.000	12.8541	-8115.11	501308.00	0.016
L3	169 - 164 (3)	TP22.8346x21.7864x0.1875	5.00	0.00	0.0	39.000	13.4779	-8414.61	525637.00	0.016
L4	164 - 159 (4)	TP23.8828x22.8346x0.1875	5.00	0.00	0.0	39.000	14.1017	-8721.51	549965.00	0.016
L5	159 - 154 (5)	TP24.931x23.8828x0.1875	5.00	0.00	0.0	39.000	14.7255	-10719.70	574294.00	0.019
L6	154 - 149 (6)	TP25.9792x24.931x0.1875	5.00	0.00	0.0	39.000	15.3493	-11144.60	598623.00	0.019
L7	149 - 144.71 (7)	TP26.8786x25.9792x0.1875	4.29	0.00	0.0	39.000	15.8845	-11526.60	619497.00	0.019
L8	144.71 - 144.46 (8)	TP26.931x26.8786x0.3688	0.25	0.00	0.0	39.000	31.0888	-11565.90	1212460.00	0.010
L9	144.46 - 139.46	TP27.9792x26.931x0.3625	5.00	0.00	0.0	39.000	31.7751	-12216.40	1239230.00	0.010

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	Client	metroPCS	Designed by	Ahmet Colakoglu

Section No.	Elevation ft	Size	L ft	L <sub>w</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P lb	Allow. P <sub>a</sub> lb	Ratio P P <sub>a</sub>
	(9)									
L10	139.46 - 139.17	TP28.04x27.9792x0.3625	0.29	0.00	0.0	39.000	31.8450	-12258.10	1241960.00	0.010
	(10)									
L11	139.17 - 134.17	TP29.0855x28.04x0.4188	5.00	0.00	0.0	39.000	38.1013	-13045.30	1485950.00	0.009
	(11)									
L12	134.17 - 129.17	TP30.1309x29.0855x0.4125	5.00	0.00	0.0	39.000	38.9096	-13840.20	1517480.00	0.009
	(12)									
L13	129.17 - 124.71	TP31.0635x30.1309x0.4063	4.46	0.00	0.0	39.000	39.5306	-14688.60	1541690.00	0.010
	(13)									
L14	124.71 - 124.46	TP31.1158x31.0635x0.5625	0.25	0.00	0.0	39.000	54.5491	-14745.10	2127410.00	0.007
	(14)									
L15	124.46 - 119.46	TP32.1613x31.1158x0.55	5.00	0.00	0.0	39.000	55.1838	-15780.10	2152170.00	0.007
	(15)									
L16	119.46 - 114.46	TP33.2067x32.1613x0.5375	5.00	0.00	0.0	39.000	55.7345	-16835.30	2173650.00	0.008
	(16)									
L17	114.46 - 109.46	TP34.2522x33.2067x0.5313	5.00	0.00	0.0	39.000	56.8599	-17921.20	2217530.00	0.008
	(17)									
L18	109.46 - 104.46	TP35.2977x34.2522x0.525	5.00	0.00	0.0	39.000	57.9435	-19070.80	2259800.00	0.008
	(18)									
L19	104.46 - 99.46	TP36.3432x35.2977x0.5125	5.00	0.00	0.0	39.000	58.2848	-20183.50	2273110.00	0.009
	(19)									
L20	99.46 - 94.46	TP37.3886x36.3432x0.5	5.00	0.00	0.0	39.000	58.5423	-21313.60	2283150.00	0.009
	(20)									
L21	94.46 - 93.21	TP37.65x37.3886x0.5	1.25	0.00	0.0	39.000	58.9571	-21598.50	2299330.00	0.009
	(21)									
L22	93.21 - 92.71	TP37.7505x37.65x0.625	0.50	0.00	0.0	39.000	73.6478	-21741.70	2872260.00	0.008
	(22)									
L23	92.71 - 92.46	TP37.8008x37.7505x0.375	0.25	0.00	0.0	39.000	44.5461	-21790.00	1737300.00	0.013
	(23)									
L24	92.46 - 87.46	TP38.8061x37.8008x0.375	5.00	0.00	0.0	39.000	45.7426	-22756.10	1783960.00	0.013
	(24)									
L25	87.46 - 82.46	TP39.8114x38.8061x0.375	5.00	0.00	0.0	39.000	46.9392	-23750.20	1830630.00	0.013
	(25)									
L26	82.46 - 77.46	TP40.8168x39.8114x0.375	5.00	0.00	0.0	39.000	48.1358	-24767.00	1877300.00	0.013
	(26)									
L27	77.46 - 72.46	TP41.8221x40.8168x0.375	5.00	0.00	0.0	39.000	49.3324	-25806.50	1923960.00	0.013
	(27)									
L28	72.46 - 67.46	TP42.8274x41.8221x0.375	5.00	0.00	0.0	39.000	50.5290	-26868.50	1970630.00	0.014
	(28)									
L29	67.46 - 62.46	TP43.8327x42.8274x0.375	5.00	0.00	0.0	39.000	51.7255	-27953.00	2017300.00	0.014
	(29)									
L30	62.46 - 57.46	TP44.838x43.8327x0.375	5.00	0.00	0.0	39.000	52.9221	-29059.80	2063960.00	0.014
	(30)									
L31	57.46 - 52.46	TP45.8434x44.838x0.375	5.00	0.00	0.0	39.000	54.1187	-30188.80	2110630.00	0.014
	(31)									
L32	52.46 - 47.46	TP46.8487x45.8434x0.375	5.00	0.00	0.0	39.000	55.3153	-31340.00	2157300.00	0.015
	(32)									
L33	47.46 - 46.21	TP47.1x46.8187x0.375	1.25	0.00	0.0	39.000	55.6144	-31629.20	2168960.00	0.015
	(33)									
L34	46.21 - 41.21	TP48.2253x47.1x0.375	5.00	0.00	0.0	39.000	56.9538	-32810.70	2221200.00	0.015
	(34)									
L35	41.21 - 36.21	TP49.3506x48.2253x0.375	5.00	0.00	0.0	39.000	58.2932	-34014.20	2273440.00	0.015
	(35)									
L36	36.21 - 31.21	TP50.4759x49.3506x0.375	5.00	0.00	0.0	39.000	59.6326	-35241.40	2325670.00	0.015
	(36)									
L37	31.21 - 26.21	TP51.6012x50.4759x0.375	5.00	0.00	0.0	39.000	60.9720	-36492.00	2377910.00	0.015
	(37)									
L38	26.21 - 21.21	TP52.7265x51.6012x0.375	5.00	0.00	0.0	39.000	62.3114	-37765.80	2430140.00	0.016
	(38)									
L39	21.21 - 16.21	TP53.8518x52.7265x0.375	5.00	0.00	0.0	39.000	63.6507	-39063.10	2482380.00	0.016



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Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P lb	Allow. P <sub>a</sub> lb	Ratio $\frac{P}{P_a}$
L40	16.21 - 11.21 (39)	TP54.9771x53.8518x0.375	5.00	0.00	0.0	39.000	64.9901	-40383.70	2534620.00	0.016
L41	11.21 - 6.21 (41)	TP56.1024x54.9771x0.375	5.00	0.00	0.0	39.000	64.9901	-40397.90	2534620.00	0.016
L42	6.21 - 1.21 (42)	TP57.2277x56.1024x0.375	5.00	0.00	0.0	38.828	67.6689	-42858.80	2627470.00	0.016
L43	1.21 - 0 (43)	TP57.5x57.2277x0.375	1.21	0.00	0.0	38.747	67.9930	-43153.50	2634530.00	0.016

### Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M <sub>x</sub> lb-ft	Actual f <sub>bx</sub> ksi	Allow. F <sub>bx</sub> ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M <sub>y</sub> lb-ft	Actual f <sub>by</sub> ksi	Allow. F <sub>by</sub> ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	179 - 174 (1)	TP20.7382x19.69x0.1875	18658.4	-3.615	39.000	0.093	0.00	0.000	39.000	0.000
L2	174 - 169 (2)	TP21.7864x20.7382x0.1875	39397.1	-6.906	39.000	0.177	0.00	0.000	39.000	0.000
L3	169 - 164 (3)	TP22.8346x21.7864x0.1875	79914.2	-12.737	39.000	0.327	0.00	0.000	39.000	0.000
L4	164 - 159 (4)	TP23.8828x22.8346x0.1875	125365.83	-18.246	39.000	0.468	0.00	0.000	39.000	0.000
L5	159 - 154 (5)	TP24.931x23.8828x0.1875	185840.83	-24.797	39.000	0.636	0.00	0.000	39.000	0.000
L6	154 - 149 (6)	TP25.9792x24.931x0.1875	252320.83	-30.977	39.000	0.794	0.00	0.000	39.000	0.000
L7	149 - 144.71 (7)	TP26.8786x25.9792x0.1875	310486.67	-35.584	39.000	0.912	0.00	0.000	39.000	0.000
L8	144.71 - 144.46 (8)	TP26.931x26.8786x0.3688	313915.00	-18.597	39.000	0.477	0.00	0.000	39.000	0.000
L9	144.46 - 139.46 (9)	TP27.9792x26.931x0.3625	383219.17	-21.348	39.000	0.547	0.00	0.000	39.000	0.000
L10	139.46 - 139.17 (10)	TP28.04x27.9792x0.3625	387295.00	-21.480	39.000	0.551	0.00	0.000	39.000	0.000
L11	139.17 - 134.17 (11)	TP29.0855x28.04x0.4188	460256.67	-20.629	39.000	0.529	0.00	0.000	39.000	0.000
L12	134.17 - 129.17 (12)	TP30.1309x29.0855x0.4125	534922.50	-22.631	39.000	0.580	0.00	0.000	39.000	0.000
L13	129.17 - 124.71 (13)	TP31.0635x30.1309x0.4063	605010.00	-24.407	39.000	0.626	0.00	0.000	39.000	0.000
L14	124.71 - 124.46 (14)	TP31.1158x31.0635x0.5625	609006.67	-17.956	39.000	0.460	0.00	0.000	39.000	0.000
L15	124.46 - 119.46 (15)	TP32.1613x31.1158x0.55	689752.50	-19.411	39.000	0.498	0.00	0.000	39.000	0.000
L16	119.46 - 114.46 (16)	TP33.2067x32.1613x0.5375	772440.83	-20.806	39.000	0.533	0.00	0.000	39.000	0.000
L17	114.46 - 109.46 (17)	TP34.2522x33.2067x0.5313	857716.67	-21.925	39.000	0.562	0.00	0.000	39.000	0.000
L18	109.46 - 104.46 (18)	TP35.2977x34.2522x0.525	946016.67	-22.997	39.000	0.590	0.00	0.000	39.000	0.000
L19	104.46 - 99.46 (19)	TP36.3432x35.2977x0.5125	1036316.67	-24.286	39.000	0.623	0.00	0.000	39.000	0.000
L20	99.46 - 94.46 (20)	TP37.3886x36.3432x0.5	1128575.00	-25.558	39.000	0.655	0.00	0.000	39.000	0.000
L21	94.46 - 93.21 (21)	TP37.65x37.3886x0.5	1151941.67	-25.719	39.000	0.659	0.00	0.000	39.000	0.000
L22	93.21 - 92.71 (22)	TP37.7505x37.65x0.625	1161325.00	-20.839	39.000	0.534	0.00	0.000	39.000	0.000

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	<b>Client</b> metroPCS	<b>Designed by</b> Ahmet Colakoglu

Section No.	Elevation ft	Size	Actual $M_x$ lb-ft	Actual $f_{bx}$ ksi	Allow. $F_{bx}$ ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual $M_y$ lb-ft	Actual $f_{by}$ ksi	Allow. $F_{by}$ ksi	Ratio $\frac{f_{by}}{F_{by}}$
L23	92.71 - 92.46 (23)	TP37.8008x37.7505x0.375	1166025.00	-34.085	39.000	0.874	0.00	0.000	39.000	0.000
L24	92.46 - 87.46 (24)	TP38.8061x37.8008x0.375	1260916.67	-34.947	39.000	0.896	0.00	0.000	39.000	0.000
L25	87.46 - 82.46 (25)	TP39.8114x38.8061x0.375	1357591.67	-35.723	39.000	0.916	0.00	0.000	39.000	0.000
L26	82.46 - 77.46 (26)	TP40.8168x39.8114x0.375	1456025.00	-36.424	39.000	0.934	0.00	0.000	39.000	0.000
L27	77.46 - 72.46 (27)	TP41.8221x40.8168x0.375	1556208.33	-37.056	39.000	0.950	0.00	0.000	39.000	0.000
L28	72.46 - 67.46 (28)	TP42.8274x41.8221x0.375	1658116.67	-37.627	39.000	0.965	0.00	0.000	39.000	0.000
L29	67.46 - 62.46 (29)	TP43.8327x42.8274x0.375	1761733.33	-38.142	39.000	0.978	0.00	0.000	39.000	0.000
L30	62.46 - 57.46 (30)	TP44.838x43.8327x0.375	1867041.67	-38.608	39.000	0.990	0.00	0.000	39.000	0.000
L31	57.46 - 52.46 (31)	TP45.8434x44.838x0.375	1973991.67	-39.027	39.000	1.001	0.00	0.000	39.000	0.000
L32	52.46 - 47.46 (32)	TP46.8487x45.8434x0.375	2082566.67	-39.404	39.000	1.010	0.00	0.000	39.000	0.000
L33	47.46 - 46.21 (33)	TP47.1x46.8187x0.375	2109950.00	-39.493	39.000	1.013	0.00	0.000	39.000	0.000
L34	46.21 - 41.21 (34)	TP48.2253x47.1x0.375	2220483.33	-39.622	39.000	1.016	0.00	0.000	39.000	0.000
L35	41.21 - 36.21 (35)	TP49.3506x48.2253x0.375	2332533.33	-39.724	39.000	1.019	0.00	0.000	39.000	0.000
L36	36.21 - 31.21 (36)	TP50.4759x49.3506x0.375	2446050.00	-39.800	39.000	1.021	0.00	0.000	39.000	0.000
L37	31.21 - 26.21 (37)	TP51.6012x50.4759x0.375	2561008.33	-39.853	39.000	1.022	0.00	0.000	39.000	0.000
L38	26.21 - 21.21 (38)	TP52.7265x51.6012x0.375	2677416.67	-39.887	39.000	1.023	0.00	0.000	39.000	0.000
L39	21.21 - 16.21 (39)	TP53.8518x52.7265x0.375	2795308.33	-39.903	39.000	1.023	0.00	0.000	39.000	0.000
L40	16.21 - 11.21 (40)	TP54.9771x53.8518x0.375	2914675.00	-39.904	39.000	1.023	0.00	0.000	39.000	0.000
L41	11.21 - 6.21 (41)	TP56.1024x54.9771x0.375	2914675.00	-39.904	39.000	1.023	0.00	0.000	39.000	0.000
L42	6.21 - 1.21 (42)	TP57.2277x56.1024x0.375	3157950.00	-39.868	38.828	1.027	0.00	0.000	38.828	0.000
L43	1.21 - 0 (43)	TP57.5x57.2277x0.375	3187800.00	-39.861	38.747	1.029	0.00	0.000	38.747	0.000

### Pole Interaction Design Data

Section No.	Elevation ft	Size	Ratio $P$	Ratio $f_{bx}$	Ratio $f_{by}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
			$P_a$	$F_{bx}$	$F_{by}$			
L1	179 - 174 (1)	TP20.7382x19.69x0.1875	0.013	0.093	0.000	0.106	1.333	H1-3 ✓
L2	174 - 169 (2)	TP21.7864x20.7382x0.1875	0.016	0.177	0.000	0.193	1.333	H1-3 ✓
L3	169 - 164 (3)	TP22.8346x21.7864x0.1875	0.016	0.327	0.000	0.343	1.333	H1-3 ✓
L4	164 - 159 (4)	TP23.8828x22.8346x0.1875	0.016	0.468	0.000	0.484	1.333	H1-3 ✓

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Section No.	Elevation ft	Size	Ratio	Ratio	Ratio	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
			$P$	$f_{bx}$	$f_{by}$			
			$P_a$	$F_{bx}$	$F_{by}$			
L5	159 - 154 (5)	TP24.931x23.8828x0.1875	0.019	0.636	0.000	0.654	1.333	H1-3 ✓
L6	154 - 149 (6)	TP25.9792x24.931x0.1875	0.019	0.794	0.000	0.813	1.333	H1-3 ✓
L7	149 - 144.71 (7)	TP26.8786x25.9792x0.1875	0.019	0.912	0.000	0.931	1.333	H1-3 ✓
L8	144.71 - 144.46 (8)	TP26.931x26.8786x0.3688	0.010	0.477	0.000	0.486	1.333	H1-3 ✓
L9	144.46 - 139.46 (9)	TP27.9792x26.931x0.3625	0.010	0.547	0.000	0.557	1.333	H1-3 ✓
L10	139.46 - 139.17 (10)	TP28.04x27.9792x0.3625	0.010	0.551	0.000	0.561	1.333	H1-3 ✓
L11	139.17 - 134.17 (11)	TP29.0855x28.04x0.4188	0.009	0.529	0.000	0.538	1.333	H1-3 ✓
L12	134.17 - 129.17 (12)	TP30.1309x29.0855x0.4125	0.009	0.580	0.000	0.589	1.333	H1-3 ✓
L13	129.17 - 124.71 (13)	TP31.0635x30.1309x0.4063	0.010	0.626	0.000	0.635	1.333	H1-3 ✓
L14	124.71 - 124.46 (14)	TP31.1158x31.0635x0.5625	0.007	0.460	0.000	0.467	1.333	H1-3 ✓
L15	124.46 - 119.46 (15)	TP32.1613x31.1158x0.55	0.007	0.498	0.000	0.505	1.333	H1-3 ✓
L16	119.46 - 114.46 (16)	TP33.2067x32.1613x0.5375	0.008	0.533	0.000	0.541	1.333	H1-3 ✓
L17	114.46 - 109.46 (17)	TP34.2522x33.2067x0.5313	0.008	0.562	0.000	0.570	1.333	H1-3 ✓
L18	109.46 - 104.46 (18)	TP35.2977x34.2522x0.525	0.008	0.590	0.000	0.598	1.333	H1-3 ✓
L19	104.46 - 99.46 (19)	TP36.3432x35.2977x0.5125	0.009	0.623	0.000	0.632	1.333	H1-3 ✓
L20	99.46 - 94.46 (20)	TP37.3886x36.3432x0.5	0.009	0.655	0.000	0.665	1.333	H1-3 ✓
L21	94.46 - 93.21 (21)	TP37.65x37.3886x0.5	0.009	0.659	0.000	0.669	1.333	H1-3 ✓
L22	93.21 - 92.71 (22)	TP37.7505x37.65x0.625	0.008	0.534	0.000	0.542	1.333	H1-3 ✓
L23	92.71 - 92.46 (23)	TP37.8008x37.7505x0.375	0.013	0.874	0.000	0.887	1.333	H1-3 ✓
L24	92.46 - 87.46 (24)	TP38.8061x37.8008x0.375	0.013	0.896	0.000	0.909	1.333	H1-3 ✓
L25	87.46 - 82.46 (25)	TP39.8114x38.8061x0.375	0.013	0.916	0.000	0.929	1.333	H1-3 ✓
L26	82.46 - 77.46 (26)	TP40.8168x39.8114x0.375	0.013	0.934	0.000	0.947	1.333	H1-3 ✓
L27	77.46 - 72.46 (27)	TP41.8221x40.8168x0.375	0.013	0.950	0.000	0.964	1.333	H1-3 ✓
L28	72.46 - 67.46 (28)	TP42.8274x41.8221x0.375	0.014	0.965	0.000	0.978	1.333	H1-3 ✓
L29	67.46 - 62.46 (29)	TP43.8327x42.8274x0.375	0.014	0.978	0.000	0.992	1.333	H1-3 ✓
L30	62.46 - 57.46 (30)	TP44.838x43.8327x0.375	0.014	0.990	0.000	1.004	1.333	H1-3 ✓

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Section No.	Elevation ft	Size	Ratio	Ratio	Ratio	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
			$\frac{P}{P_a}$	$\frac{f_{bx}}{F_{bx}}$	$\frac{f_{by}}{F_{by}}$			
L31	57.46 - 52.46 (31)	TP45.8434x44.838x0.375	0.014	1.001	0.000	✓ 1.015	1.333	HI-3 ✓
L32	52.46 - 47.46 (32)	TP46.8487x45.8434x0.375	0.015	1.010	0.000	✓ 1.025	1.333	HI-3 ✓
L33	47.46 - 46.21 (33)	TP47.1x46.8187x0.375	0.015	1.013	0.000	✓ 1.027	1.333	HI-3 ✓
L34	46.21 - 41.21 (34)	TP48.2253x47.1x0.375	0.015	1.016	0.000	✓ 1.031	1.333	HI-3 ✓
L35	41.21 - 36.21 (35)	TP49.3506x48.2253x0.375	0.015	1.019	0.000	✓ 1.034	1.333	HI-3 ✓
L36	36.21 - 31.21 (36)	TP50.4759x49.3506x0.375	0.015	1.021	0.000	✓ 1.036	1.333	HI-3 ✓
L37	31.21 - 26.21 (37)	TP51.6012x50.4759x0.375	0.015	1.022	0.000	✓ 1.037	1.333	HI-3 ✓
L38	26.21 - 21.21 (38)	TP52.7265x51.6012x0.375	0.016	1.023	0.000	✓ 1.038	1.333	HI-3 ✓
L39	21.21 - 16.21 (39)	TP53.8518x52.7265x0.375	0.016	1.023	0.000	✓ 1.039	1.333	HI-3 ✓
L40	16.21 - 11.21 (40)	TP54.9771x53.8518x0.375	0.016	1.023	0.000	✓ 1.039	1.333	HI-3 ✓
L41	11.21 - 6.21 (41)	TP56.1024x54.9771x0.375	0.016	1.023	0.000	✓ 1.039	1.333	HI-3 ✓
L42	6.21 - 1.21 (42)	TP57.2277x56.1024x0.375	0.016	1.027	0.000	✓ 1.043	1.333	HI-3 ✓
L43	1.21 - 0 (43)	TP57.5x57.2277x0.375	0.016	1.029	0.000	✓ 1.045	1.333	HI-3 ✓

### Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	SF*P <sub>allow</sub> lb	% Capacity	Pass Fail
L1	179 - 174	Pole	TP20.7382x19.69x0.1875	1	-6338.65	635812.98	7.9	Pass
L2	174 - 169	Pole	TP21.7864x20.7382x0.1875	2	-8115.11	668243.54	14.5	Pass
L3	169 - 164	Pole	TP22.8346x21.7864x0.1875	3	-8414.61	700674.09	25.7	Pass
L4	164 - 159	Pole	TP23.8828x22.8346x0.1875	4	-8721.51	733103.31	36.3	Pass
L5	159 - 154	Pole	TP24.931x23.8828x0.1875	5	-10719.70	765533.87	49.1	Pass
L6	154 - 149	Pole	TP25.9792x24.931x0.1875	6	-11144.60	797964.43	61.0	Pass
L7	149 - 144.71	Pole	TP26.8786x25.9792x0.1875	7	-11526.60	825789.47	69.8	Pass
L8	144.71 - 144.46	Pole	TP26.931x26.8786x0.3688	8	-11565.90	1616209.11	36.5	Pass
L9	144.46 - 139.46	Pole	TP27.9792x26.931x0.3625	9	-12216.40	1651893.52	41.8	Pass
L10	139.46 - 139.17	Pole	TP28.04x27.9792x0.3625	10	-12258.10	1655532.61	42.1	Pass
L11	139.17 - 134.17	Pole	TP29.0855x28.04x0.4188	11	-13045.30	1980771.27	40.3	Pass
L12	134.17 - 129.17	Pole	TP30.1309x29.0855x0.4125	12	-13840.20	2022800.76	44.2	Pass
L13	129.17 - 124.71	Pole	TP31.0635x30.1309x0.4063	13	-14688.60	2055072.68	47.7	Pass
L14	124.71 - 124.46	Pole	TP31.1158x31.0635x0.5625	14	-14745.10	2835837.41	35.1	Pass
L15	124.46 - 119.46	Pole	TP32.1613x31.1158x0.55	15	-15780.10	2868842.49	37.9	Pass
L16	119.46 - 114.46	Pole	TP33.2067x32.1613x0.5375	16	-16835.30	2897475.33	40.6	Pass
L17	114.46 - 109.46	Pole	TP34.2522x33.2067x0.5313	17	-17921.20	2955967.37	42.8	Pass
L18	109.46 - 104.46	Pole	TP35.2977x34.2522x0.525	18	-19070.80	3012313.28	44.9	Pass
L19	104.46 - 99.46	Pole	TP36.3432x35.2977x0.5125	19	-20183.50	3030055.50	47.4	Pass
L20	99.46 - 94.46	Pole	TP37.3886x36.3432x0.5	20	-21313.60	3043438.82	49.9	Pass



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Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	SF*P <sub>allow</sub> lb	% Capacity	Pass Fail	
L21	94.46 - 93.21	Pole	TP37.65x37.3886x0.5	21	-21598.50	3065006.76	50.2	Pass	
L22	93.21 - 92.71	Pole	TP37.7505x37.65x0.625	22	-21741.70	3828722.42	40.7	Pass	
L23	92.71 - 92.46	Pole	TP37.8008x37.7505x0.375	23	-21790.00	2315820.80	66.5	Pass	
L24	92.46 - 87.46	Pole	TP38.8061x37.8008x0.375	24	-22756.10	2378018.58	68.2	Pass	
L25	87.46 - 82.46	Pole	TP39.8114x38.8061x0.375	25	-23750.20	2440229.69	69.7	Pass	
L26	82.46 - 77.46	Pole	TP40.8168x39.8114x0.375	26	-24767.00	2502440.80	71.1	Pass	
L27	77.46 - 72.46	Pole	TP41.8221x40.8168x0.375	27	-25806.50	2564638.57	72.3	Pass	
L28	72.46 - 67.46	Pole	TP42.8274x41.8221x0.375	28	-26868.50	2626849.68	73.4	Pass	
L29	67.46 - 62.46	Pole	TP43.8327x42.8274x0.375	29	-27953.00	2689060.79	74.4	Pass	
L30	62.46 - 57.46	Pole	TP44.838x43.8327x0.375	30	-29059.80	2751258.57	75.3	Pass	
L31	57.46 - 52.46	Pole	TP45.8434x44.838x0.375	31	-30188.80	2813469.67	76.1	Pass	
L32	52.46 - 47.46	Pole	TP46.8487x45.8434x0.375	32	-31340.00	2875680.78	76.9	Pass	
L33	47.46 - 46.21	Pole	TP47.1x46.8187x0.375	33	-31629.20	2891223.56	77.1	Pass	
L34	46.21 - 41.21	Pole	TP48.2253x47.1x0.375	34	-32810.70	2960859.48	77.3	Pass	
L35	41.21 - 36.21	Pole	TP49.3506x48.2253x0.375	35	-34014.20	3030495.39	77.5	Pass	
L36	36.21 - 31.21	Pole	TP50.4759x49.3506x0.375	36	-35241.40	3100117.98	77.7	Pass	
L37	31.21 - 26.21	Pole	TP51.6012x50.4759x0.375	37	-36492.00	3169753.90	77.8	Pass	
L38	26.21 - 21.21	Pole	TP52.7265x51.6012x0.375	38	-37765.80	3239376.49	77.9	Pass	
L39	21.21 - 16.21	Pole	TP53.8518x52.7265x0.375	39	-39063.10	3309012.40	77.9	Pass	
L40	16.21 - 11.21	Pole	TP54.9771x53.8518x0.375	40	-40383.70	3378648.32	78.0	Pass	
L41	11.21 - 6.21	Pole	TP56.1024x54.9771x0.375	41	-40397.90	3378648.32	78.0	Pass	
L42	6.21 - 1.21	Pole	TP57.2277x56.1024x0.375	42	-42858.80	3502417.36	78.3	Pass	
L43	1.21 - 0	Pole	TP57.5x57.2277x0.375	43	-43153.50	3511828.34	78.4	Pass	
							Summary		
							Pole (L43)	78.4	Pass
							<b>RATING =</b>	<b>78.4</b>	<b>Pass</b>

**STRUCTURAL ANALYSIS REPORT – UPGRADE  
MONOPOLE**

**EXHIBIT B1**



Prepared For:



**35 Griffin Road South  
Bloomfield, CT 06002**



**Monopole Rating**

**Monopole: Pass (78.4 %)**  
**Foundation: Pass**

Sincerely,  
Atlantis Group, Inc.  
10-8-2014



Ahmet Colakoglu, PE  
CT Professional Engineer  
License No: 27057

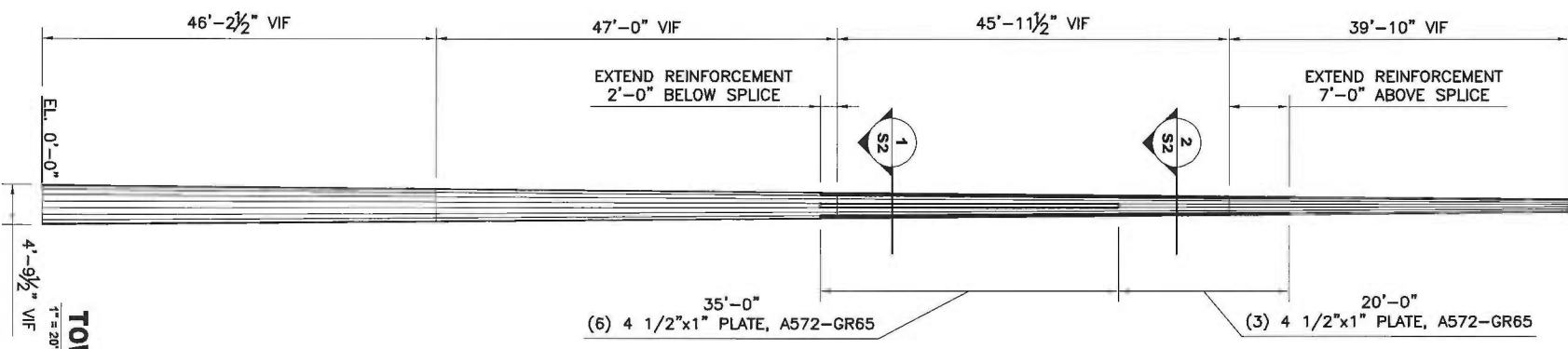
**Site ID: CTHA539A**  
**Site Name: Burlington Fire Dep., Monopole**  
**719 George Washington TPKE.**  
**Burlington, CT 06013**

October 8, 2014

Prepared By:  
Atlantis Group, Inc.  
1340 Centre Street, Suite 212  
Newton, Massachusetts 02459  
Phone: 617-965-0789, Fax: 617-213-3123

EXISTING MONOPOLE			
3/8" PLATE	3/8" PLATE	1/4" PLATE	3/16" PLATE
57.5000"Ø BOT	47.1000"Ø BOT	37.6500"Ø BOT	28.0400"Ø BOT
47.1000"Ø TOP	37.6500"Ø TOP	28.0400"Ø TOP	19.6900"Ø TOP

REINFORCING PLATE SCHEDULE			
N.A.	N.A.	4 1/2"x1" PLATE, A572-GR65	
N.A.	N.A.	ON 6 SIDES	ON 3 SIDES



**TOWER ELEVATION**

**NOTES:**

- MONOPOLE DIMENSIONS BASED ON STRUCTURAL ANALYSIS REPORT PREPARED BY HUDSON DESIGN GROUP, LLC DATED 9/26/2012.
- UPGRADE DESIGN VALID FOR APPURTENANCES LISTED IN ATLANTIS ANALYSIS REPORT DATED 10/7/2014. CONTRACTOR TO REVIEW AND VERIFY.
- CONTRACTOR TO REMOVE AND REATTACH EXISTING APPURTENANCES AND OTHER ACCESSORIES AS NEEDED TO INSTALL NEW REINFORCING PLATES.
- CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS AND FIELD CONDITIONS BEFORE COMMENCEMENT OF WORK. ANY DISCREPANCY SHOULD BE REPORTED TO ATLANTIS IMMEDIATELY FOR FURTHER EVALUATION.
- DO NOT PERFORM THE WORK ON THE TOWER WHEN WINDS GUST MORE THAN 15 MPH.
- DO NOT USE STEEL SECTIONS LARGER OR SMALLER THAN LISTED. IF DESIGNED SIZE IS NOT AVAILABLE CONTACT ATLANTIS FOR VERIFICATION.
- MONOPOLE UPGRADE REACTIONS:  
MOMENT: 3187.8 KIP - FT  
SHEAR: 24.7 KIP
- CONTRACTOR TO TAKE ALL NECESSARY PRECAUTIONS FOR FIRE PREVENTION DURING WELDING, SUCH AS: INSTALLING 3000 (NFPA 701) FIRE BLANKET AROUND COAX. MORE SPLATTER AND SPARKS SHOULD BE ANTICIPATED WHILE WELDING ON GALVANIZED SURFACE. COAX IS FLAMMABLE AND SHALL CATCH FIRE IF NOT PROTECTED.
- CONTRACTOR TO DETACH AND REATTACH CLIMBING PEGS. CONTRACTOR SHOULD CONSULT WITH AN ENGINEER FOR ATTACHMENT DESIGN.
- CONTRACTOR TO HAVE THE SAFETY CLIMB INTACT AND FUNCTIONAL AFTER WORK IS COMPLETE.
- WELDING ON GALVANIZED SURFACE SHOULD BE DONE WITH EXTREME CAUTION. IF THE WELD MATERIAL IS CONTAMINATED WITH ZINC, IT DOES NOT PROVIDE A STRUCTURAL WELD. GROUND GALVANIZING BEFORE WELDING.

**1. DESIGN INFORMATION AND GENERAL REQUIREMENTS**

- CODES
  - 2005 CONNECTICUT BUILDING CODE WITH 2011 SUPPLEMENT.
  - MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES, ASCE/SEI 7-05, AMERICAN SOCIETY OF CIVIL ENGINEERS
  - STEEL CONSTRUCTION MANUAL, 13TH EDITION, AMERICAN INSTITUTE OF STEEL CONSTRUCTION
  - STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES, TIA-222-F

**2. STRUCTURAL STEEL**

- MATERIALS
  - STRUCTURAL STEEL . . . . . ASTM A992
  - PLATE . . . . . ASTM 572-65
  - BOLTS . . . . . STAINLESS STEEL GRADE 316
  - WELDING ELECTRODES . . . . . AWS A5.1 (E80XX)
  - STEEL CONSTRUCTION SHALL CONFORM TO "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS, ANSI/AISC 360-05"
  - STEEL CONSTRUCTION SHALL CONFORM TO "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS, ANSI/AISC 360-05"
  - WELDING SHALL CONFORM TO AWS D1.1/D1.3/D1.7 AS APPLICABLE.
  - THE FABRICATOR SHALL FURNISH CHECKED SHOP AND ERECTION DRAWINGS TO THE ENGINEER, AND OBTAIN APPROVAL PRIOR TO FABRICATING ANY STRUCTURAL STEEL. SHOP DRAWINGS SHALL CONFORM TO "DETAILING FOR STEEL CONSTRUCTION, 2ND EDITION"

**2.2 CONNECTIONS**

- SHOP CONNECTIONS MAY BE BOLTED OR WELDED.
- FIELD CONNECTIONS SHALL BE BOLTED WITH A325-N BOLTS AND HARDENED WASHERS, (INSTALLED SNUG TIGHT) UNLESS OTHERWISE SPECIFIED OR IF WELDED CONNECTIONS ARE NOTED ON DRAWINGS
- CONNECTIONS NOT SHOWN ON DRAWINGS SHALL BE DESIGNED BY THE STEEL FABRICATOR. CONNECTIONS SHALL BE DESIGNED IN ACCORDANCE WITH AISC "SPECIFICATIONS FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS AND "AISC CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES"
- DO NOT FIELD CUT OR ALTER STRUCTURAL MEMBERS WITHOUT PRIOR WRITTEN APPROVAL OF ENGINEER.
- LINDBERGER HOLLOW-BOLTS SHOULD BE INSTALLED AS PER MANUFACTURER REQUIREMENTS.

**2.3 FINISHES**

- STRUCTURAL STEEL SHALL BE HOT DIP GALVANIZED AFTER FABRICATION PER ASTM A123
- BOLTS AND NUTS SHALL BE HOT DIP GALVANIZED PER ASTM A153.
- ALL SURFACES DAMAGED BY FIELD WELDING OR CUTTING SHALL BE PAINTED WITH ZINC RICH PAINTS
- CLIMBING PEGS CAN BE CUT AND REDONE AS PER REQUIREMENT.

**2.4 WELDING**

- CONTRACTOR TO TAKE ALL NECESSARY PRECAUTIONS FOR FIRE PREVENTION, DURING WELDING, SUCH AS: INSTALLING 3000 (NFPA 701) FIRE BLANKET AROUND COAX. MORE SPLATTER AND SPARKS SHOULD BE ANTICIPATED WHILE WELDING ON GALVANIZED SURFACE. COAX IS FLAMMABLE AND SHALL CATCH FIRE IF NOT PROTECTED. WATER SHALL BE ON SITE OF ADEQUATE AMOUNT AND AVAILABLE AT SHORT NOTICE AT ALL TIMES DURING WELDING ACTIVITY. CONTRACTOR SHOULD BE ABLE TO TRANSPORT THE WATER TO THE HEIGHT WELDING BEING PERFORMED.
- IF THE WELD MATERIAL IS CONTAMINATED WITH ZINC, IT DOES NOT PROVIDE A STRUCTURAL WELD. GROUND GALVANIZING BEFORE WELDING. ALL WELDING SHALL BE PERFORMED BY AWS QUALIFIED WELDER WHO HAS EXPERIENCE WITH GALVANIZED SURFACES.

CTHA539A MONOPOLE UPGRADE

ADDRESS: 719 GEORGE WASHINGTON TPKE  
BURLINGTON, CT 06013

DESIGNED: IK  
DRAWN: IK  
CHECKED: AC

JOB #: 1417030

S1  
UPGRADE  
DESIGN

Ahmet Colakoglu, PE  
CT License No: 27057

NUM	DATE	DESCRIPTION:
A	10/8/2014	ISSUE FOR CONSTRUCTION

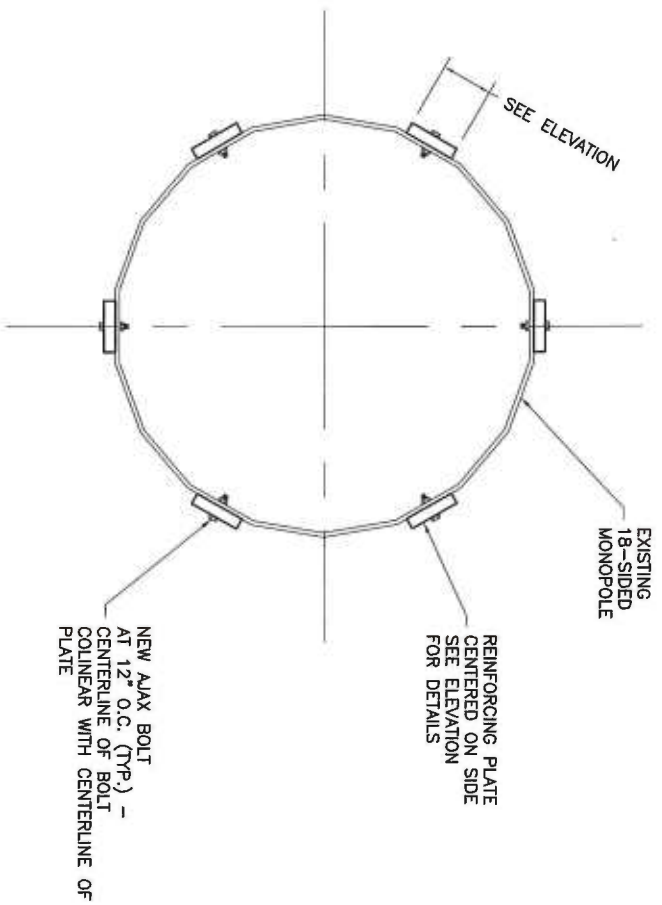
PREPARED FOR:

metroPCS

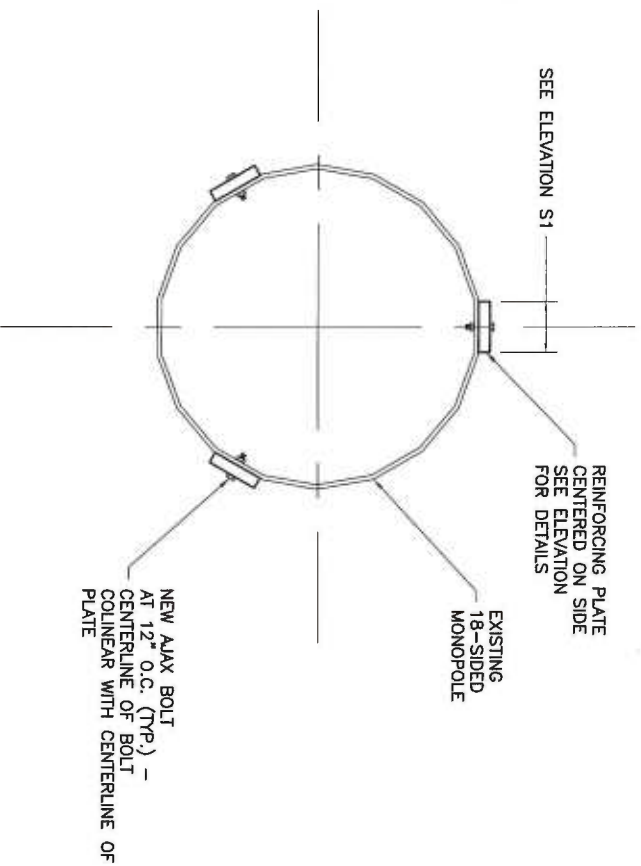
1440 Centre Street  
Suite 212  
Newton, MA 02459  
Phone: 617-552-0888  
Fax: 617-552-0889

ATLANTIS  
GROUP

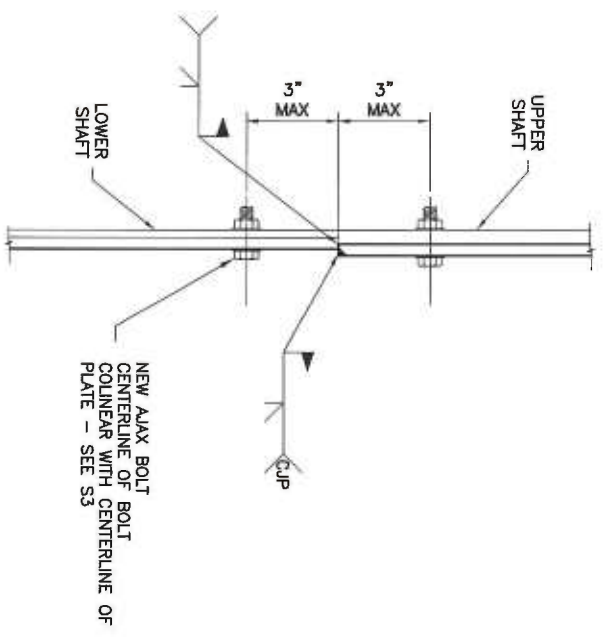




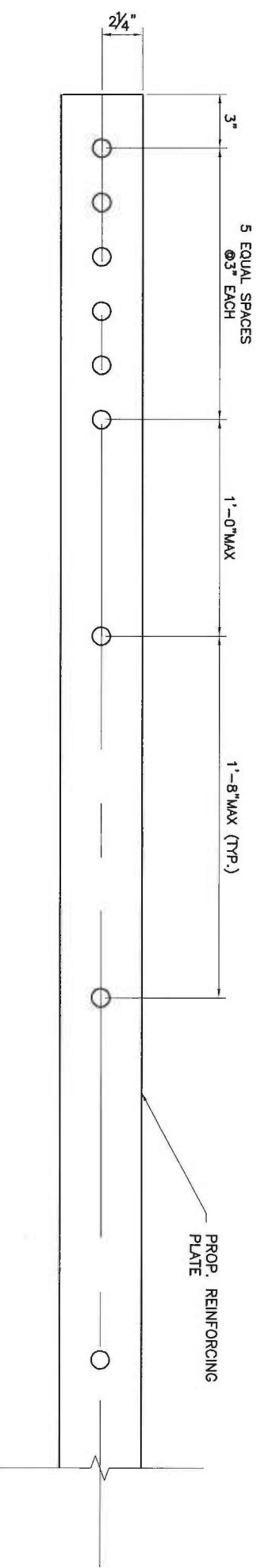
1  
S2 3/4" = 1'-0"  
**REINFORCING DETAIL**



2  
S2 3/4" = 1'-0"  
**REINFORCING DETAIL**



3  
S2 NTS  
**SPLICE DETAIL**



4  
S2 1 1/2" = 1'-0"  
**REINFORCING PLATE END BOLTING DETAIL**

**ATLANTIS GROUP**  
1340 Centre Street  
Newtown, MA 02459  
Office: 617-855-0789  
Fax: 617-215-5055

metroPCS

PREPARED FOR:

NUM	DATE	DESCRIPTION:
A	10/8/2014	ISSUE FOR CONSTRUCTION

CTHA539A MONOPOLE UPGRADE  
ADDRESS: 719 GEORGE WASHINGTON TPKE  
BURLINGTON, CT 06013

DESIGNED: IK  
DRAWN: IK  
CHECKED: AC

JOB #: 1417030

Ahmet Calkokoglu, PE  
CT License No: 27057

**S2 UPGRADE DETAILS**



**BOLTS AND COMPONENTS SPECIFICATIONS:**

**BOLT:**  
AJAX M20 "ONE SIDE" BLIND BOLT

**SHEAR SLEEVE:**  
Fu=120 KSI (MINIMUM)  
29MM O.D. X 20 mm I.D.  
LENGTH = NOMINAL [GRIP-6mm] = [GRIP - 0.25"] (TOLERANCE: -0" +1/32")  
SLEEVE SHALL BE ROUND, WITH ENDS CUT SQUARE AND DEBURRED.

**SPECIAL WASHER:**  
ASTM F959 SQUIRTER @ DTI M20 (EQUIVALENT TO A325 BOLT)  
MANUFACTURER:  
APPLIED BOLTING TECHNOLOGY PRODUCTS, INC.  
1413 ROCKINGHAM ROAD BELLOW FALLS, VERMONT, USA 05101  
PHONE: (800) 552-1999  
WEBSITE: WWW.APPLIEDBOLTING.COM

**DISTRIBUTORS OF SQUIRTER @ DTI'S:**  
HTTP://WWW.APPLIEDBOLTING.COM/APPLIED-BOLTING-DISTRIBUTORS.HTML

**WASHER:**  
ASTM F436 HARDENED FLAT WASHER M20

**BOLT ASSEMBLY FINISHING:**  
SHEAR SLEEVE: COLD GALVANIZED WITH MIN. 3 MIL OF ZRC COLD GALVANIZING COMPOUND  
ALL OTHER PARTS: HOT DIP GALVANIZED

**BOLT INSTALLATION ASSEMBLY:**  
AS SHOWN ON THE DRAWING

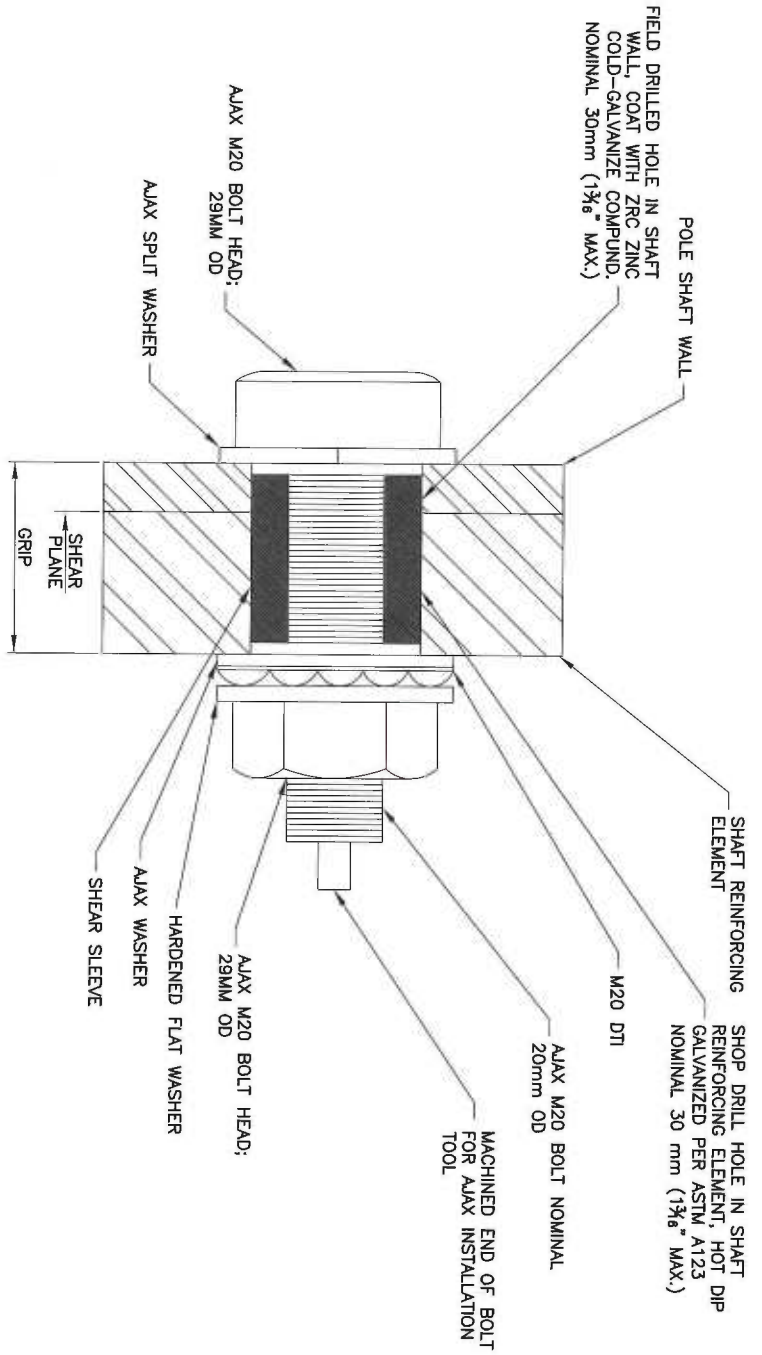
**INSTALLATION NOTES:**  
DTI WASHERS MUST BE PLACED DIRECTLY AGAINST THE OUTER AJAX WASHER WITH THE BUMPS FACING AWAY FROM THE AJAX WASHER. PLACE A HARDENED WASHER BETWEEN THE DTI AND THE AJAX NUT. THE DTI BUMPS SHALL BEAR AGAINST THE UNDERSIDE OF A HARDENED FLAT WASHER, NEVER DIRECTLY AGAINST THE NUT.

TIGHTEN THE BOLT ASSEMBLY UNTIL THE ORANGE SILICONE APPEARS FORM UNDER THE DTI'S SQUIRT LOCATIONS, THEN STOP TIGHTENING.  
FOLLOW DTI MANUFACTURER'S INSTRUCTIONS FOR INSTALLATION, LUBRICATION, TIGHTENING AND INSPECTION.

**INSPECTION:**  
ALL AJAX BOLTS WITH DTI'S SHALL BE VISUALLY INSPECTED ACCORDING TO THE DTI MANUFACTURER'S INSTRUCTIONS BOLT INSPECTOR SHALL PROVIDE PHOTO DOCUMENTATION OF BOLTS AFTER TIGHTENING CLEARLY SHOWING THE CONDITION OF THE DTI'S.

**INTERIOR OF POLE SHAFT**

**EXTERIOR OF POLE SHAFT**



**1**  
**S3**  
**TYPICAL AJAX BOLT DETAIL**  
N.T.S.

PREPARED FOR:  
**metroPCS**

NUM	DATE	DESCRIPTION:
A	10/8/2014	ISSUE FOR CONSTRUCTION

CTHA539A MONOPOLE UPGRADE  
ADDRESS: 719 GEORGE WASHINGTON TPKE  
BURLINGTON, CT 06013

DESIGNED: IK  
DRAWN: IK  
CHECKED: AC  
JOB #: 1417030

# **EXHIBIT C**

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

MetroPCS Existing Facility

Site ID: CTHA539A

Burlington Fire Dept. Monopole  
791 George Washington Turnpike  
Burlington, CT 06013

**September 11, 2014**

**EBI Project Number: 62143640**

September 11, 2014

MetroPCS  
Attn: Jason Overbey, RF Manager  
35 Griffin Road South  
Bloomfield, CT 06002

Re: Emissions Values for Site: **CTHA539A - Burlington Fire Dept. Monopole**

EBI Consulting was directed to analyze the proposed MetroPCS facility located at 791 George Washington Turnpike, Burlington, CT, for the purpose of determining whether the emissions from the Proposed MetroPCS 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 public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general public would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ( $\mu\text{W}/\text{cm}^2$ ). The general population exposure limit for the cellular band is  $567 \mu\text{W}/\text{cm}^2$ , and the general population exposure limit for the PCS and AWS 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 done for the proposed MetroPCS Wireless antenna facility located at 791 George Washington Turnpike, Burlington, CT, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since MetroPCS is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, the actual antenna pattern gain value in the direction of the sample area was used. For this report the sample point is a 6 foot person standing at the base of the tower

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

- 1) 2 GSM channels (1935.000 MHz—to 1945.000 MHz) were considered for each sector of the proposed installation.
- 2) 2 UMTS channels (2110.000 MHz to 2120.000 MHz / 2140.000 MHz to 2145.000 MHz) were considered for each sector of the proposed installation.
- 3) 2 LTE channels (2110.000 MHz to 2120.000 MHz / 2140.000 MHz to 2145.000 MHz) were considered for each sector of the proposed installation.
- 4) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
- 5) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The actual gain in this direction was used per the manufactures supplied specifications.
- 6) The antenna used in this modeling is the Ericsson AIR21 for LTE, UMTS and GSM. This is based on feedback from the carrier with regards to anticipated antenna selection. This antenna has a 15.6 dBd gain value at its main lobe. Actual antenna gain values were used for all calculations as per the manufacturers specifications.

- 
- 7) The antenna mounting height centerline of the proposed antennas is **175 feet** above ground level (AGL).
  - 8) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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

Site ID	CTHA539A - Burlington Fire Dept. Monopole
Site Address	791 George Washington Turnpike, Burlington, CT 06013
Site Type	Monopole

Antenna Number	Antenna Make	Antenna Model	Status	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain in direction of sample point (dBd)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss	ERP	Power Density Value	Power Density Percentage
1a	Ericsson	AIR21 B4A/B2P	Active	AWS - 2100 MHz	LTE	60	2	120	-3.95	175	169	None	0	0	48.326044	0.608294	0.06083%
1b	Ericsson	AIR21 B4A/B2P	Not Used	-	-	-	-	0	-3.95	175	169	None	0	0	0	0	0.00000%
2a	Ericsson	AIR21 B2A / B4P	Active	PCS - 1950 MHz	GSM / UMTS	30	2	60	-3.95	175	169	1-5/8"	0	0	24.163022	0.304147	0.03041%
2b	Ericsson	AIR21 B2A / B4P	Passive	AWS - 2100 MHz	UMTS	30	2	60	-3.95	175	169	1-5/8"	0	0	24.163022	0.304147	0.03041%
Sector total Power Density Value: 0.122%																	

Antenna Number	Antenna Make	Antenna Model	Status	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain in direction of sample point (dBd)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss	ERP	Power Density Value	Power Density Percentage
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1b	Ericsson	AIR21 B4A/B2P	Not Used	-	-	-	-	0	-3.95	175	169	None	0	0	0	0	0.00000%
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Sector total Power Density Value: 0.122%																	

Site Composite MPE %	
Carrier	MPE %
MetroPCS	0.965%
Public Safety AT&T	7.620%
Verizon Wireless	11.920%
Pocket	13.820%
	2.220%
<b>Total Site MPE %</b>	<b>35.945%</b>

## Summary

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

The anticipated Maximum Composite contributions from the MetroPCS facility are **0.365% (0.122% from each sector)** of the allowable FCC established general public limit considering all three sectors simultaneously sampled at the ground level.

The anticipated composite MPE value for this site assuming all carriers present is **35.945%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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



Scott Heffernan  
RF Engineering Director

### **EBI Consulting**

21 B Street  
Burlington, MA 01803