EM-CING-014-120621

ORIGINAL

New Cingular Wireless PCS, LLC
147 Austin Ryer ln
Branford, CT 06405
Phone: (203)-410-4531
Douglas Talmadge
Real Estate Consultant

June 20, 2012

Hand Delivered

RECEIVED
JUN 21 2012
CONNECTICUT
SITING COUNCIL

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

RE: New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 10 Sylvia St, Branford, CT 06405.

Dear Ms. Roberts:

In order to accommodate technological changes, implement Uniform Mobile Telecommunications System ("UMTS") and/or Long Term Evolution ("LTE") capabilities, and enhance system performance in the state of Connecticut, New Cingular Wireless PCS, LLC ("AT&T") plans to modify the equipment configurations at many of its existing cell sites. Please accept this letter and attachments as notification, pursuant to R.C.S.A. Section 16-50j-73, of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2). In compliance with R.C.S.A. Section 16-50j-73, a copy of this letter and its attachments is being sent to the chief elected official of the municipality in which affected cell site is located.

UMTS offers services to mobile computer and phone users anywhere in the world. Based on the Global System for Mobile ("GSM") communication standard, UMTS is the planned worldwide standard for mobile users. UMTS, fully implemented, gives computer and phone users high-speed access to the internet as they travel. They have the same capabilities even when they roam, through both terrestrial wireless and satellite transmissions.

LTE is a new high-performance air interface for cellular mobile communications. It is designed to increase the capacity and speed of mobile telephone networks.

Attached is a summary of the planned modifications, including power density calculations reflecting the change in AT&T's operations at the site. Also included is documentation of the structural sufficiency of the tower to accommodate the revised antenna configuration.

The changes to the facility do not constitute modification as defined Connecticut General Statues ("C.G.S.") Section 16-50i(d) because the general physical characteristics of the facility will not be significantly changed or altered. Rather, the planned changes to the facility fall squarely within those activities explicitly provided for the R.C.S.A. Section 16-50j-72(b)(2).

1. The height of the overall structure will not be affected.
2. The proposed changes will not extend the site boundaries. The equipment cabinets will be installed on AT&T's existing concrete pad within the fenced in compound.
3. The proposed changes will not increase the noise level at the existing facility by 6 decibels or more.
4. Radio Frequency power density may increase due to the use of one or more GSM channels for UMTS transmissions. Moreover, LTE will utilize additional radio frequencies newly licensed by the FCC for cellular mobile communications. However, the changes will not increase the calculated "worst case" power density for the combined operations at the site to a level at or above the applicable standard for uncontrolled environments as calculated for a mixed frequency site.

For the foregoing reasons New Cingular Wireless PCS, LLC respectfully submits that the proposed changes at the referenced site constitute exempt modifications under R.C.S.A. Section 16-50j-72(b)(2).

Please feel free to call me at (203)-410-4531 or email DTalmadge@Transcendwireless.com with questions concerning this matter.
Thank you for your consideration.

Sincerely,

Douglas Talmadge
Real Estate Consultant

C Squared Systems, LLC
65 Dartmouth Drive, Unit A3
Auburn, NH 03032
(603) 644-2800
support@csquaredsystems.com

Calculated Radio Frequency Emissions

CT5199

(Branford E)

10 Sylvia Street, Branford, CT 06405

June 18, 2012

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1. Introduction

The purpose of this report is to investigate compliance with applicable FCC regulations for the proposed modifications to the existing AT&T antenna arrays mounted on the monopole tower located at 10 Sylvia Street in Branford, CT. The coordinates of the tower are 41-17-38.05 N, 72-47-8.51 W.

AT&T is proposing the following modifications:

1) Install three 700 MHz LTE antennas (one per sector).

2. FCC Guidelines for Evaluating RF Radiation Exposure Limits

In 1985, the FCC established rules to regulate radio frequency (RF) exposure from FCC licensed antenna facilities. In 1996, the FCC updated these rules, which were further amended in August 1997 by OET Bulletin 65 Edition 97-01. These new rules include Maximum Permissible Exposure (MPE) limits for transmitters operating between 300 kHz and 100 GHz. The FCC MPE limits are based upon those recommended by the National Council on Radiation Protection and Measurements (NCRP), developed by the Institute of Electrical and Electronics Engineers, Inc., (IEEE) and adopted by the American National Standards Institute (ANSI).

The FCC general population/uncontrolled limits set the maximum exposure to which most people may be subjected. General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

Public exposure to radio frequencies is regulated and enforced in units of milliwatts per square centimeter (mW/cm^2). The general population exposure limits for the various frequency ranges are defined in the attached "FCC Limits for Maximum Permissible Exposure (MPE)" in Attachment B of this report.

Higher exposure limits are permitted under the occupational/controlled exposure category, but only for persons who are exposed as a consequence of their employment and who have been made fully aware of the potential for exposure, and they must be able to exercise control over their exposure. General population/uncontrolled limits are five times more stringent than the levels that are acceptable for occupational, or radio frequency trained individuals. Attachment B contains excerpts from OET Bulletin 65 and defines the Maximum Exposure Limit.

Finally, it should be noted that the MPE limits adopted by the FCC for both general population/uncontrolled exposure and for occupational/controlled exposure incorporate a substantial margin of safety and have been established to be well below levels generally accepted as having the potential to cause adverse health effects.

3. RF Exposure Prediction Methods

The emission field calculation results displayed in the following figures were generated using the following formula as outlined in FCC bulletin OET 65:

$$\text{Power Density} = \left(\frac{1.6^2 \times EIRP}{4\pi \times R^2} \right) \text{x Off Beam Loss}$$

Where:

EIRP = Effective Isotropic Radiated Power

R = Radial Distance = $\sqrt{(H^2 + V^2)}$

H = Horizontal Distance from antenna in meters

V = Vertical Distance from radiation center of antenna in meters

Ground reflection factor of 1.6

Off Beam Loss is determined by the selected antenna pattern

These calculations assume that the antennas are operating at 100 percent capacity and power, and that all channels are transmitting simultaneously. Obstructions (trees, buildings, etc.) that would normally attenuate the signal are not taken into account. The calculations assume even terrain in the area of study and do not take into account actual terrain elevations which could attenuate the signal. As a result, the predicted signal levels reported below are much higher than the actual signal levels will be from the finished modifications.

4. Calculation Results

Table 1 below outlines the power density information for the site. Because the proposed AT&T antennas are directional in nature, the majority of the RF power is focused out towards the horizon. As a result, there will be less RF power directed below the antennas relative to the horizon, and consequently lower power density levels around the base of the tower. Please refer to Attachment C for the vertical pattern of the proposed AT&T antennas. The calculated results for AT&T in Table 1 include a nominal 10 dB off-beam pattern loss to account for the lower relative gain below the antennas.

Carrier	Antenna Height (Feet)	Operating Frequency (MHz)	Number of Trans.	ERP Per Transmitter (Watts)	Power Density (mw/cm^2)	Limit	%MPE
Cingular GSM	*100*	*1935*	*1*	*500*	*0.0180*	*1.0000*	*1.80%*
T-Mobile GSM	122	1945	8	129	0.0249	1.0000	2.49%
T-Mobile UMTS	122	2100	2	730	0.0353	1.0000	3.53%
Pocket	112	2130	3	631	0.0543	1.0000	5.43%
Clearwire	90	2496	2	153	0.0136	1.0000	1.36%
Clearwire	90	11000	1	211	0.0094	1.0000	0.94%
AT&T UMTS	100	880	2	565	0.0041	0.5867	0.69%
AT&T UMTS	100	1900	2	875	0.0063	1.0000	0.63%
AT&T LTE	100	734	1	1313	0.0047	0.4893	0.96%
AT&T GSM	100	880	1	283	0.0010	0.5867	0.17%
AT&T GSM	100	1900	4	525	0.0076	1.0000	0.76%
						Total	**16.96%**

Table 1: Carrier Information[1] [2] [3]

[1] The existing CSC filing for Cingular should be removed and replaced with the updated AT&T technologies and values provided in Table 1. The power density information for carriers other than AT&T was taken directly from the CSC database dated 3/29/2012. Please note that %MPE values listed are rounded to two decimal points. The total %MPE listed is a summation of each unrounded contribution. Therefore, summing each rounded value may not reflect the total value listed in the table.

[2] In the case where antenna models are not uniform across all 3 sectors for the same frequency band, the antenna model with the highest gain was used for the calculations to present a worse-case scenario.

[3] Antenna height listed for AT&T is in reference to the FDH Engineering, Inc. Structural Analysis Report dated June 7, 2012

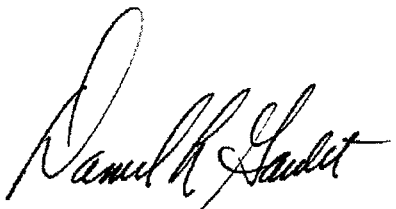
5. Conclusion

The above analysis verifies that emissions from the existing site will be below the maximum power density levels as outlined by the FCC in the OET Bulletin 65 Ed. 97-01. Even when using conservative methods, the cumulative power density from the proposed transmit antennas at the existing facility is well below the limits for the general public. The highest expected percent of Maximum Permissible Exposure at ground level is **16.96% of the FCC limit**.

As noted previously, obstructions (trees, buildings, etc.) that would normally attenuate the signal are not taken into account. As a result, the predicted signal levels are more conservative (higher) than the actual signal levels will be from the finished modifications.

6. Statement of Certification

I certify to the best of my knowledge that the statements in this report are true and accurate. The calculations follow guidelines set forth in ANSI/IEEE Std. C95.3, ANSI/IEEE Std. C95.1 and FCC OET Bulletin 65 Edition 97-01.



Daniel L. Goulet
C Squared Systems, LLC

June 18, 2012
Date

Attachment A: References

OET Bulletin 65 - Edition 97-01 - August 1997 Federal Communications Commission Office of Engineering & Technology

ANSI C95.1-1982, American National Standard Safety Levels With Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 300 kHz to 100 GHz. IEEE-SA Standards Board

IEEE Std C95.3-1991 (Reaff 1997), IEEE Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave. IEEE-SA Standards Board

Attachment B: FCC Limits for Maximum Permissible Exposure (MPE)

(A) Limits for Occupational/Controlled Exposure[4]

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	($900/f^2$)*	6
30-300	61.4	0.163	1.0	6
300-1500	-	-	f/300	6
1500-100,000	-	-	5	6

(B) Limits for General Population/Uncontrolled Exposure[5]

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	($180/f^2$)*	30
30-300	27.5	0.073	0.2	30
300-1500	-	-	f/1500	30
1500-100,000	-	-	1.0	30

f = frequency in MHz * Plane-wave equivalent power density

Table 2: FCC Limits for Maximum Permissible Exposure (MPE)

[4] Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure

[5] General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure

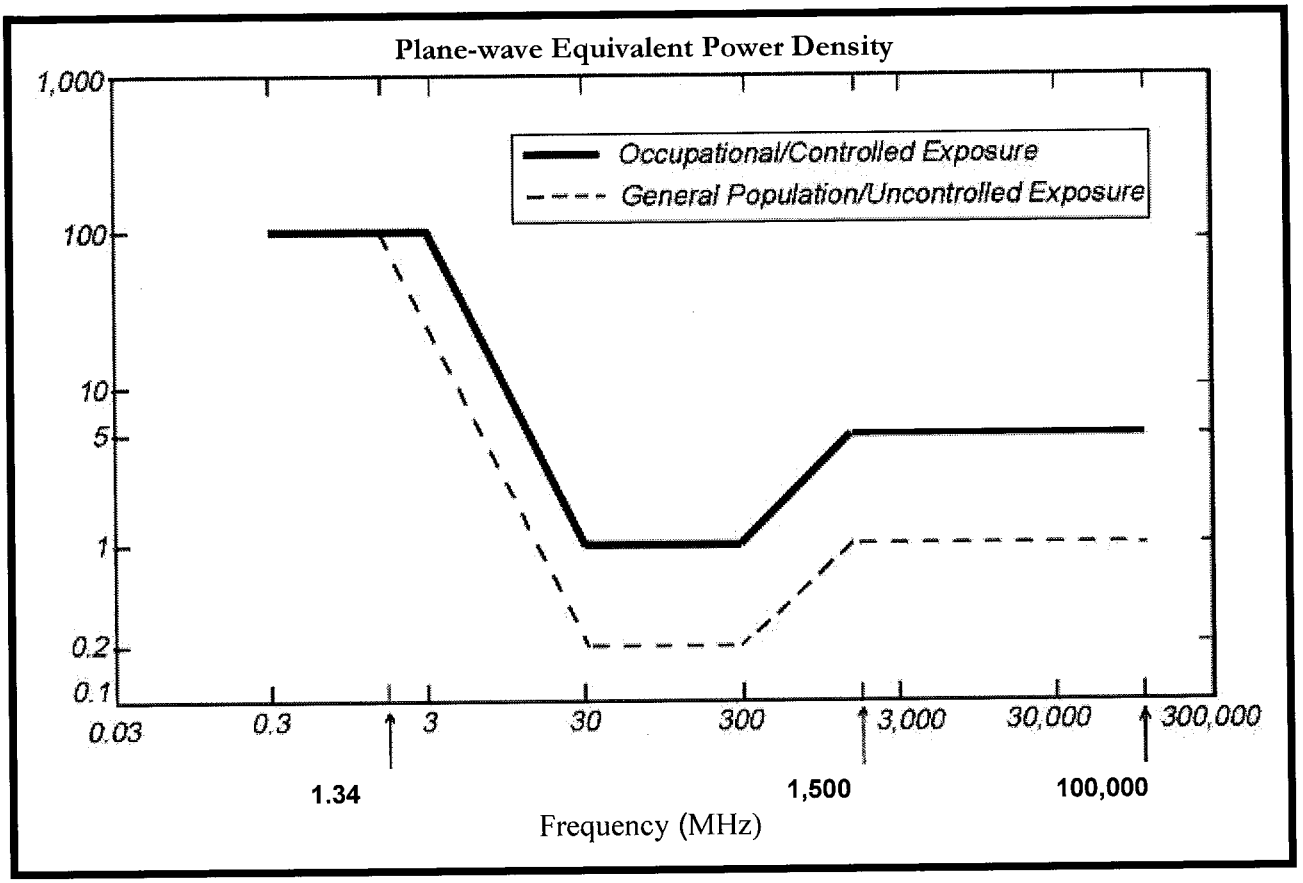
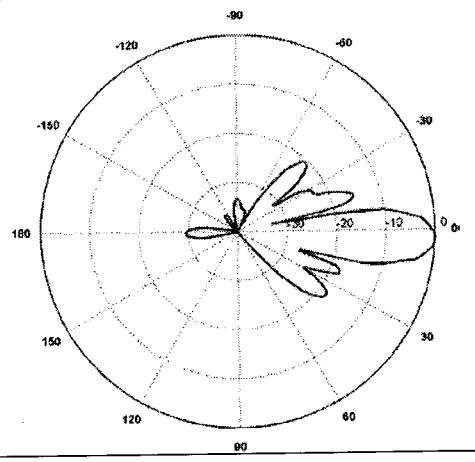


Figure 1: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

Attachment C: AT&T Antenna Data Sheets and Electrical Patterns

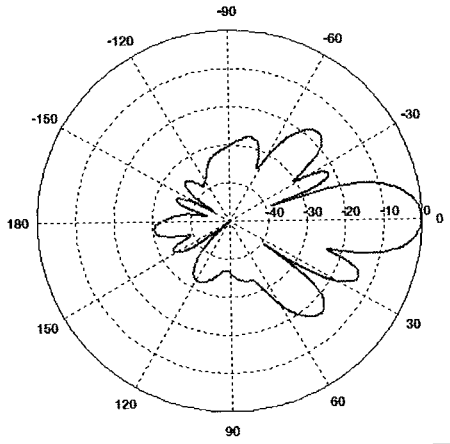
700 MHz

Manufacturer:	KMW Communications
Model #:	AM-X-CD-16-65-00T
Frequency Band:	698-806 MHz
Gain:	13.4 dBd
Vertical Beamwidth:	12.3°
Horizontal Beamwidth:	65°
Polarization:	Dual Slant ± 45°
Size L x W x D:	72.0" x 11.8" x 5.9"



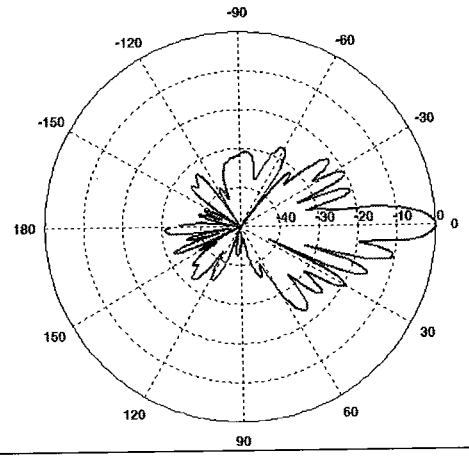
850 MHz

Manufacturer:	Powerwave
Model #:	7770.00
Frequency Band:	824-896 MHz
Gain:	11.4 dBd
Vertical Beamwidth:	15°
Horizontal Beamwidth:	85°
Polarization:	Dual Linear ±45°
Size L x W x D:	55.4" x 11.0" x 5.0"



1900 MHz

Manufacturer:	Powerwave
Model #:	7770.00
Frequency Band:	1850-1990 MHz
Gain:	13.4 dBd
Vertical Beamwidth:	7°
Horizontal Beamwidth:	90°
Polarization:	Dual Linear ±45°
Size L x W x D:	55.4" x 11.0" x 5.0"



FDH Engineering, Inc., 6521 Meridien Drive Raleigh, NC 27616, Ph. 919.755.1012

Structural Analysis for T-Mobile Towers

125' Monopole Tower

T-Mobile Towers Site Name: Branford/I-95/X55/Dtn 1
T-Mobile Towers Site ID: CT11025B
AT&T Site ID: Branford East
AT&T Site Name: 5199

FDH Project Number 12-05542E S1 (R1)

Analysis Results

Tower Components	52.1%	Sufficient
Foundation	63.0%	Sufficient

Prepared By:

Jordan Weatherburne

Jordan Weatherburne
Structural Engineering Intern

Reviewed By:

Christopher M. Murphy

Christopher M Murphy, PE
President
CT PE License No. 25842

FDH Engineering, Inc.
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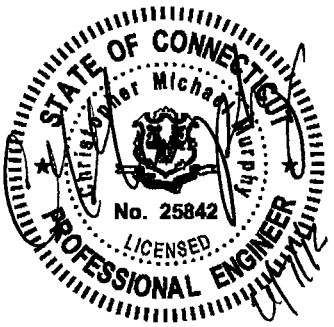

June 7, 2012

Prepared pursuant to TIA/EIA-222-F Structural Standard for Antenna Supporting Structures and Antennas & 2005 Connecticut Building Code

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EXECUTIVE SUMMARY

At the request of T-Mobile Towers, FDH Engineering, Inc. performed a structural analysis of the monopole located in Branford, CT to determine whether the tower is structurally adequate to support both the existing and proposed loads pursuant to the *Structural Standard for Antenna Supporting Structures and Antennas, TIA/EIA-222-F & 2005 Connecticut Building Code (CBC).* Information pertaining to the existing/proposed antenna loading, current tower geometry, geotechnical data, and member sizes was obtained from:

- Pirod, Inc. (Eng. File No. A-1 15233) original design drawings dated January 14, 1999
- French and Parrello Associates, P.A. (Job No. 98AI91ER1) Report of Subsurface Exploration and Geotechnical Evaluation dated October 12, 1998
- T-Mobile Towers

The *basic design wind speed* per the *TIA/EIA-222-F* standard2005 CBC is 85 mph without ice and 64 mph with 1/2" radial ice. Ice is considered to increase in thickness with height.

Conclusions

With the existing and proposed antennas from AT&T Towers in place at 100 ft, the tower meets the requirements of the TIA/EIA-222-F standard & 2005 CBC provided the **Recommendations** listed below are satisfied. Furthermore, provided the foundations were designed and constructed to support the original design reactions (see Pirod Eng File No. A-115233), the foundations should have the necessary capacity to support the existing and proposed loading. For a more detailed description of the analysis of the tower, see the Results section of this report.

Our structural analysis has been performed assuming all information provided to FDH Engineering, Inc. is accurate (i.e., the steel data, tower layout, existing antenna loading, and proposed antenna loading) and that the tower has been properly erected and maintained per the original design drawings.

Recommendations

To ensure the requirements of the *TIA/EIA-222-F* standard & 2005 CBC are met with the existing and proposed loading in place, we have the following recommendations:

1. The proposed coax should be installed inside the pole's shaft.
2. The proposed TMAs /RRUs should be installed directly behind the proposed panel antennas.

APPURTENANCE LISTING

The proposed and existing antennas with their corresponding cables/coax lines are shown in **Table 1**. *If the actual layout determined in the field deviates from the layout, FDH Engineering, Inc. should be contacted to perform a revised analysis.*

Table 1 - Appurtenance Loading

Existing Loading:

Antenna Elevation (ft)	Description	Coax and Lines	Carrier	Mount Elevation (ft)	Mount Type
122	(9) Ericsson AIR 21 (3) Ericsson AIR 33 (3) ETW190VS12UB TMA (1) HCS Fiber/DC Box (1) 2' MW Dish	(25) 1-5/8" (2) 1-5/8" Hybrid	T-Mobile	122	(1) Low Profile Platform
112	(3) Kathrein 742 213 w/ Mount Pipe	(6) 1-5/8"	Pocket	112	Flush Mount
100	(6) Powerwave 7770.00A	(12) 1-1/4"	AT&T	100	(3) T-Arms
90	(3) Argus LLPX310R w/Mount Pipe (3) Samsung C2-RRH (3) Dragonwave AIRPAIR ODU (3) Dragonwave A-ANT-18G-2-C Dishes	(3) 1/2" (3) 1/4" (3) 5/8" (3) 5/16"	Clearwire	90	(3) T-Arms

Final Loading:

Antenna Elevation (ft)	Description	Coax and Lines	Carrier	Mount Elevation (ft)	Mount Type
122	(9) Ericsson AIR 21 (3) Ericsson AIR 33 (3) ETW190VS12UB TMA (1) HCS Fiber/DC Box (1) 2' MW Dish	(25) 1-5/8" (2) 1-5/8" Hybrid	T-Mobile	122	Low Profile Platform
112	(3) Kathrein 742 213 w/ Mount Pipe	(6) 1-5/8"	Pocket	112	Flush Mount
100	(3) KMW AM-X-CD-16-65-00T-RET w/ Mount Pipe (6) Ericsson RRUS-11 (1) Raycap DC6-48-60-18-8F (12) Powerwave LGP21401 TMA (6) Powerwave 7770.00A	(12) 1-1/4" (1) 7/16" (2) 3/8"	AT&T	100	(3) T-Arms
90	(3) Argus LLPX310R w/Mount Pipe (3) Samsung C2-RRH (3) Dragonwave AIRPAIR ODU (3) Dragonwave A-ANT-18G-2-C Dishes	(3) 1/2" (3) 1/4" (3) 5/8" (3) 5/16"	Clearwire	90	(3) T-Arms

RESULTS

The following yield strength of steel for individual members was used for analysis:

Table 2 - Material Strength

Member Type	Yield Strength
Tower Shaft Sections	42 ksi
Flange Plate	36 ksi
Flange Bolts	Fu = 120 ksi
Base Plate	36 ksi
Anchor Bolts	105 ksi

Table 3 displays the summary of the ratio (as a percentage) of force in the member to their capacities. Values greater than 100% indicate locations where the maximum force in the member exceeds its capacity. *Note: Capacities up to 105% are considered acceptable.* **Table 4** displays the maximum foundation reactions.

If the assumptions outlined in this report differ from actual field conditions, FDH Engineering, Inc. should be contacted to perform a revised analysis. Furthermore, as no information pertaining to the allowable twist and sway requirements for the existing or proposed appurtenances was provided, deflection and rotation were not taken into consideration when performing this analysis.

See the **Appendix** for detailed modeling information

Table 3 - Summary of Working Percentage of Structural Components

Section No.	Elevation ft	Component Type	Size	% Capacity	Pass Fail
L1	125 - 100	Pole	P24x3/8	15.9	Pass
	100	Flange Bolts	(20) 1" ϕ w/ BC = 27"	14.1	Pass
	100	Flange Plate	PL 30" ϕ x 1.25" Thick	18.9	Pass
L2	100 - 80	Pole	P30x3/8	32.0	Pass
	80	Flange Bolts	(24) 1" ϕ w/ BC = 33"	28.0	Pass
	80	Flange Plate	PL 36" ϕ x 1.25" Thick	36.0	Pass
L3	80 - 60	Pole	P36x3/8	41.2	Pass
	60	Flange Bolts	(28) 1" ϕ w/ BC = 39"	36.1	Pass
	60	Flange Plate	PL 42" ϕ x 1.25" Thick	45.9	Pass
L4	60 - 40	Pole	P42x3/8	46.6	Pass
	40	Flange Bolts	(32) 1" ϕ w/ BC = 45"	40.6	Pass
	40	Flange Plate	PL 48" ϕ x 1.25" Thick	51.4	Pass
L5	40 - 20	Pole	P48x3/8	50.0	Pass
	20	Flange Bolts	(36) 1" ϕ w/ BC = 51"	43.1	Pass
	20	Flange Plate	PL 54" ϕ x 1.25" Thick	65.1	Pass
L6	20 - 0	Pole	P54x3/8	52.1	Pass
		Anchor Bolts	(48) 1" ϕ w/ BC = 57"	33.0	Pass
		Base Plate	PL 60" ϕ x 2" Thick	21.0	Pass

Table 4 - Maximum Base Reactions

Base Reactions	Current Analysis *(TIA/EIA-222-F)*	Original Design *(TIA/EIA-222-F)*
Axial	29 k	30 k
Shear	12 k	16 k
Moment	1,010 k-ft	1,602 k-ft

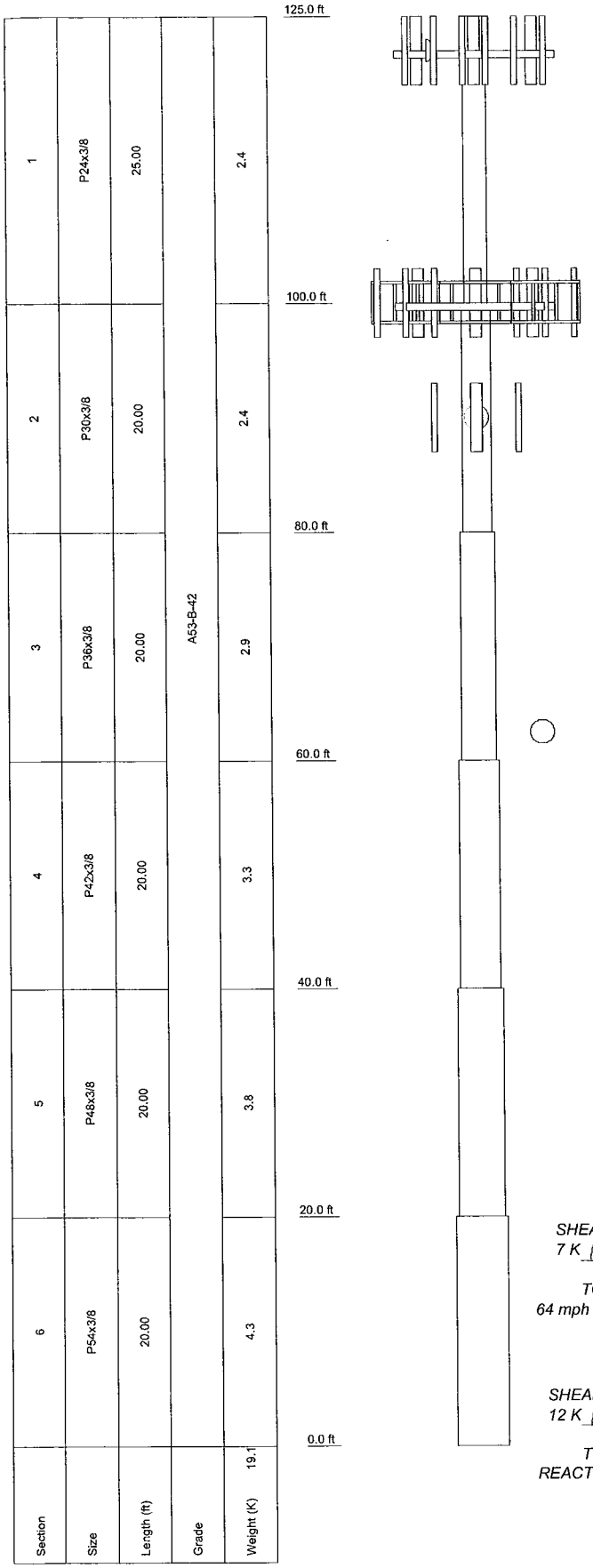
GENERAL COMMENTS

This engineering analysis is based upon the theoretical capacity of the structure. It is not a condition assessment of the tower and its foundation. It is the responsibility of T-Mobile to verify that the tower modeled and analyzed is the correct structure (with accurate antenna loading information) modeled. If there are substantial modifications to be made or the assumptions made in this analysis are not accurate, FDH Engineering, Inc. should be notified immediately to perform a revised analysis.

LIMITATIONS

All opinions and conclusions are considered accurate to a reasonable degree of engineering certainty based upon the evidence available at the time of this report. All opinions and conclusions are subject to revision based upon receipt of new or additional/updated information. All services are provided exercising a level of care and diligence equivalent to the standard and care of our profession. No other warranty or guarantee, expressed or implied, is offered. Our services are confidential in nature and we will not release this report to any other party without the client's consent. The use of this engineering work is limited to the express purpose for which it was commissioned and it may not be reused, copied, or distributed for any other purpose without the written consent of FDH Engineering, Inc.

APPENDIX



DESIGNED APPURTENANCE LOADING

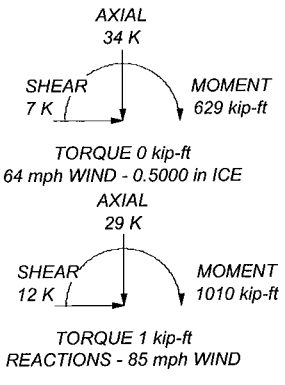
TYPE	ELEVATION	TYPE	ELEVATION
(3) AIR 21	122	(2) RRUS-11	100
(3) AIR 21	122	(2) RRUS-11	100
(3) AIR 21	122	(2) RRUS-11	100
AIR 33	122	DC6-48-60-18-8F	100
AIR 33	122	(4) LGP21401 TMA	100
AIR 33	122	(4) LGP21401 TMA	100
ETW190VS12UB TMA	122	(4) LGP21401 TMA	100
ETW190VS12UB TMA	122	(3) T-Arms	100
ETW190VS12UB TMA	122	(2) 7770.00A	100
HCS Fiber/ DC Box	122	LLPX310R w/Mount Pipe	90
Low Profile Platform	122	LLPX310R w/Mount Pipe	90
2' MW Dish	122	C2-RRH	90
742 213 w/ Mount Pipe	112	C2-RRH	90
742 213 w/ Mount Pipe	112	C2-RRH	90
742 213 w/ Mount Pipe	112	AIRPAIR ODU	90
(2) 7770.00A	100	AIRPAIR ODU	90
(2) 7770.00A	100	AIRPAIR ODU	90
AM-X-CD-16-65-00T-RET w/ Mount Pipe	100	(3) T-Arms	90
		LLPX310R w/Mount Pipe	90
AM-X-CD-16-65-00T-RET w/ Mount Pipe	100	A-ANT-18G-2-C	90
AM-X-CD-16-65-00T-RET w/ Mount Pipe	100		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-42	42 ksi	63 ksi			

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 64 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 52.1%



FDH Engineering, Inc.
6521 Meridian Drive
Raleigh, NC 27616
Phone: 919-7551012
FAX: 919-7551031
Tower Analysis

Job: CT11025B - Branford/I-95/X55/Dtn 1			
Project: 12-05542E S1			
Client: T-Mobile Towers	Drawn by: Jordan Weatherburne	App'd:	
Code: TIA/EIA-222-F	Date: 06/06/12	Scale: NTS	
Path:		Dwg No. E-1	

tnxTower	Job	Page
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FDH Engineering, Inc. 6521 Meridian Drive Raleigh, NC 27616 Phone: 919-7551012 FAX: 919-7551031	**Project** 12-05542E S1	**Date** 13:36:51 06/06/12
	Client T-Mobile Towers	**Designed by** Jordan Weatherburne

Tower Input Data

There is a pole section.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

- Tower is located in New Haven County, Connecticut.
- Basic wind speed of 85 mph.
- Nominal ice thickness of 0.5000 in.
- Ice density of 56 pcf.
- A wind speed of 64 mph is used in combination with ice.
- Temperature drop of 50 °F.
- Deflections calculated using a wind speed of 50 mph.
- User specified elevation for calculation of G_h is 220.00 ft.
- A non-linear (P-delta) analysis was used.
- Pressures are calculated at each section.
- Stress ratio used in pole design is 1.333.
- Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

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	Retension 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		

Pole Section Geometry

Section	*Elevation*	*Section Length*	*Pole Size*	*Pole Grade*	*Socket Length*
	ft	*ft*			*ft*
L1	125.00-100.00	25.00	P24x3/8	A53-B-42 (42 ksi)	
L2	100.00-80.00	20.00	P30x3/8	A53-B-42 (42 ksi)	
L3	80.00-60.00	20.00	P36x3/8	A53-B-42 (42 ksi)	
L4	60.00-40.00	20.00	P42x3/8	A53-B-42 (42 ksi)	
L5	40.00-20.00	20.00	P48x3/8	A53-B-42	

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FDH Engineering, Inc. 6521 Meridian Drive Raleigh, NC 27616 Phone: 919-7551012 FAX: 919-7551031	**Project** 12-05542E S1	**Date** 13:36:51 06/06/12
	Client T-Mobile Towers	**Designed by** Jordan Weatherburne

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L6	20.00-0.00	20.00	P54x3/8	(42 ksi) A53-B-42 (42 ksi)	

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
L1 125.00-100.00				1	1	1		
L2 100.00-80.00				1	1	1		
L3 80.00-60.00				1	1	1		
L4 60.00-40.00				1	1	1		
L5 40.00-20.00				1	1	1		
L6 20.00-0.00				1	1	1		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
1-5/8"	C	No	Inside Pole	122.00 - 0.00	25	No Ice	0.00	1.04
						1/2" Ice	0.00	1.04
1-5/8"	C	No	Inside Pole	122.00 - 0.00	2	No Ice	0.00	1.04
						1/2" Ice	0.00	1.04
***								
1-5/8"	C	No	Inside Pole	112.00 - 0.00	6	No Ice	0.00	1.04
						1/2" Ice	0.00	1.04
***								
1-1/4"	C	No	Inside Pole	100.00 - 0.00	12	No Ice	0.00	0.66
						1/2" Ice	0.00	0.66
1/2"	C	No	Inside Pole	100.00 - 0.00	1	No Ice	0.00	0.25
						1/2" Ice	0.00	0.25
3/8"	C	No	Inside Pole	100.00 - 0.00	2	No Ice	0.00	0.18
						1/2" Ice	0.00	0.18
***								
1/2"	C	No	Inside Pole	90.00 - 0.00	3	No Ice	0.00	0.25
						1/2" Ice	0.00	0.25
1/4"	C	No	Inside Pole	90.00 - 0.00	3	No Ice	0.00	0.25
						1/2" Ice	0.00	0.25
5/8"	C	No	Inside Pole	90.00 - 0.00	3	No Ice	0.00	0.40
						1/2" Ice	0.00	0.40
5/16"	C	No	Inside Pole	90.00 - 0.00	3	No Ice	0.00	0.20
						1/2" Ice	0.00	0.20

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	125.00-100.00	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	0.69
L2	100.00-80.00	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	0.89
L3	80.00-60.00	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	0.92
L4	60.00-40.00	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	0.92
L5	40.00-20.00	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	0.92
L6	20.00-0.00	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	0.92

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	125.00-100.00	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	0.69
L2	100.00-80.00	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	0.89
L3	80.00-60.00	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	0.92
L4	60.00-40.00	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	0.92
L5	40.00-20.00	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	0.92
L6	20.00-0.00	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	0.92

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	125.00-100.00	0.0000	0.0000	0.0000	0.0000
L2	100.00-80.00	0.0000	0.0000	0.0000	0.0000
L3	80.00-60.00	0.0000	0.0000	0.0000	0.0000
L4	60.00-40.00	0.0000	0.0000	0.0000	0.0000
L5	40.00-20.00	0.0000	0.0000	0.0000	0.0000
L6	20.00-0.00	0.0000	0.0000	0.0000	0.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(3) AIR 21	A	From Leg	3.00 0.00 0.00	0.0000	122.00	No Ice 1/2" Ice	6.42 6.86	4.28 4.69	0.08 0.12
(3) AIR 21	B	From Leg	3.00 0.00 0.00	0.0000	122.00	No Ice 1/2" Ice	6.42 6.86	4.28 4.69	0.08 0.12
(3) AIR 21	C	From Leg	3.00 0.00 0.00	0.0000	122.00	No Ice 1/2" Ice	6.42 6.86	4.28 4.69	0.08 0.12
AIR 33	A	From Leg	3.00 0.00 0.00	0.0000	122.00	No Ice 1/2" Ice	6.42 6.86	4.28 4.69	0.08 0.12
AIR 33	B	From Leg	3.00 0.00 0.00	0.0000	122.00	No Ice 1/2" Ice	6.42 6.86	4.28 4.69	0.08 0.12
AIR 33	C	From Leg	3.00 0.00 0.00	0.0000	122.00	No Ice 1/2" Ice	6.42 6.86	4.28 4.69	0.08 0.12
ETW190VS12UB TMA	A	From Leg	3.00 0.00 0.00	0.0000	122.00	No Ice 1/2" Ice	0.66 0.78	0.37 0.46	0.01 0.02
ETW190VS12UB TMA	B	From Leg	3.00 0.00 0.00	0.0000	122.00	No Ice 1/2" Ice	0.66 0.78	0.37 0.46	0.01 0.02
ETW190VS12UB TMA	C	From Leg	3.00 0.00 0.00	0.0000	122.00	No Ice 1/2" Ice	0.66 0.78	0.37 0.46	0.01 0.02
HCS Fiber/ DC Box	C	From Leg	3.00 0.00 0.00	0.0000	122.00	No Ice 1/2" Ice	1.40 1.56	0.70 0.82	0.01 0.02
Low Profile Platform	C	None		0.0000	122.00	No Ice 1/2" Ice	17.46 22.44	17.46 22.44	1.35 1.62
***									
742 213 w/ Mount Pipe	A	From Leg	0.00 0.00 0.00	0.0000	112.00	No Ice 1/2" Ice	5.37 5.95	4.62 6.00	0.05 0.09
742 213 w/ Mount Pipe	B	From Leg	0.00 0.00 0.00	0.0000	112.00	No Ice 1/2" Ice	5.37 5.95	4.62 6.00	0.05 0.09
742 213 w/ Mount Pipe	C	From Leg	0.00 0.00 0.00	0.0000	112.00	No Ice 1/2" Ice	5.37 5.95	4.62 6.00	0.05 0.09
***									
(2) 7770.00A	A	From Leg	3.00 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice	5.30 5.73	2.92 3.27	0.03 0.06
(2) 7770.00A	B	From Leg	3.00 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice	5.30 5.73	2.92 3.27	0.03 0.06
(2) 7770.00A	C	From Leg	3.00	0.0000	100.00	No Ice	5.30	2.92	0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1/2" Ice	5.73	3.27	0.06
			0.00						
AM-X-CD-16-65-00T-RET	A	From Leg	3.00	0.0000	100.00	No Ice	7.09	5.68	0.06
w/ Mount Pipe			0.00			1/2" Ice	7.71	6.69	0.11
			0.00						
AM-X-CD-16-65-00T-RET	B	From Leg	3.00	0.0000	100.00	No Ice	7.09	5.68	0.06
w/ Mount Pipe			0.00			1/2" Ice	7.71	6.69	0.11
			0.00						
AM-X-CD-16-65-00T-RET	C	From Leg	3.00	0.0000	100.00	No Ice	7.09	5.68	0.06
w/ Mount Pipe			0.00			1/2" Ice	7.71	6.69	0.11
			0.00						
(2) RRUS-11	A	From Leg	3.00	0.0000	100.00	No Ice	2.94	1.52	0.05
			0.00			1/2" Ice	3.17	1.69	0.08
			0.00						
(2) RRUS-11	B	From Leg	3.00	0.0000	100.00	No Ice	2.94	1.52	0.05
			0.00			1/2" Ice	3.17	1.69	0.08
			0.00						
(2) RRUS-11	C	From Leg	3.00	0.0000	100.00	No Ice	2.94	1.52	0.05
			0.00			1/2" Ice	3.17	1.69	0.08
			0.00						
DC6-48-60-18-8F	A	From Leg	3.00	0.0000	100.00	No Ice	2.57	4.32	0.02
			0.00			1/2" Ice	2.80	4.60	0.05
			0.00						
(4) LGP21401 TMA	A	From Leg	3.00	0.0000	100.00	No Ice	0.95	0.37	0.02
			0.00			1/2" Ice	1.09	0.48	0.02
			0.00						
(4) LGP21401 TMA	B	From Leg	3.00	0.0000	100.00	No Ice	0.95	0.37	0.02
			0.00			1/2" Ice	1.09	0.48	0.02
			0.00						
(4) LGP21401 TMA	C	From Leg	3.00	0.0000	100.00	No Ice	0.95	0.37	0.02
			0.00			1/2" Ice	1.09	0.48	0.02
			0.00						
(3) T-Arms	C	None		0.0000	100.00	No Ice	11.59	11.59	0.77
						1/2" Ice	15.44	15.44	0.99
***									
LLPX310R w/Mount Pipe	A	From Leg	3.00	0.0000	90.00	No Ice	5.69	3.63	0.05
			0.00			1/2" Ice	6.41	4.63	0.09
			0.00						
LLPX310R w/Mount Pipe	B	From Leg	3.00	0.0000	90.00	No Ice	5.69	3.63	0.05
			0.00			1/2" Ice	6.41	4.63	0.09
			0.00						
LLPX310R w/Mount Pipe	C	From Leg	3.00	0.0000	90.00	No Ice	5.69	3.63	0.05
			0.00			1/2" Ice	6.41	4.63	0.09
			0.00						
C2-RRH	A	From Leg	3.00	0.0000	90.00	No Ice	3.45	1.94	0.06
			0.00			1/2" Ice	3.70	2.14	0.09
			0.00						
C2-RRH	B	From Leg	3.00	0.0000	90.00	No Ice	3.45	1.94	0.06
			0.00			1/2" Ice	3.70	2.14	0.09
			0.00						
C2-RRH	C	From Leg	3.00	0.0000	90.00	No Ice	3.45	1.94	0.06
			0.00			1/2" Ice	3.70	2.14	0.09
			0.00						
AIRPAIR ODU	A	From Leg	3.00	0.0000	90.00	No Ice	1.18	0.49	0.01
			0.00			1/2" Ice	1.33	0.62	0.02
			0.00						
AIRPAIR ODU	B	From Leg	3.00	0.0000	90.00	No Ice	1.18	0.49	0.01

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00 0.00			1/2" Ice	1.33	0.62	0.02
AIRPAIR ODU	C	From Leg	3.00 0.00 0.00	0.0000	90.00	No Ice 1/2" Ice	1.18 1.33	0.49 0.62	0.01 0.02
(3) T-Arms	C	None		0.0000	90.00	No Ice 1/2" Ice	3.00 3.48	3.00 3.48	0.08 0.11

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
2' MW Dish	C	Paraboloid w/o Radome	From Leg	3.00 0.00 0.00	0.0000		122.00	2.00	No Ice 1/2" Ice	3.14 3.41	0.03 0.07
***											
A-ANT-18G-2-C	A	Paraboloid w/o Radome	From Leg	3.00 0.00 0.00	0.0000		90.00	2.17	No Ice 1/2" Ice	3.72 4.01	0.03 0.05

Tower Pressures - No Ice

$G_H = 1.108$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1	112.50	1.42	26	50.000	A	0.000	50.000	50.000	100.00	0.000	0.000
125.00-100.00					B	0.000	50.000		100.00	0.000	0.000
					C	0.000	50.000		100.00	0.000	0.000
L2	90.00	1.332	25	50.000	A	0.000	50.000	50.000	100.00	0.000	0.000
100.00-80.00					B	0.000	50.000		100.00	0.000	0.000
					C	0.000	50.000		100.00	0.000	0.000
L3 80.00-60.00	70.00	1.24	23	60.000	A	0.000	60.000	60.000	100.00	0.000	0.000
					B	0.000	60.000		100.00	0.000	0.000
					C	0.000	60.000		100.00	0.000	0.000
L4 60.00-40.00	50.00	1.126	21	70.000	A	0.000	70.000	70.000	100.00	0.000	0.000
					B	0.000	70.000		100.00	0.000	0.000
					C	0.000	70.000		100.00	0.000	0.000
L5 40.00-20.00	30.00	1	18	80.000	A	0.000	80.000	80.000	100.00	0.000	0.000
					B	0.000	80.000		100.00	0.000	0.000
					C	0.000	80.000		100.00	0.000	0.000
L6 20.00-0.00	10.00	1	18	90.000	A	0.000	90.000	90.000	100.00	0.000	0.000

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	Client T-Mobile Towers	Designed by Jordan Weatherburne

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
					B	0.000	90.000		100.00	0.000	0.000
					C	0.000	90.000		100.00	0.000	0.000

Tower Pressure - With Ice

$G_H = 1.108$

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 125.00-100.00	112.50	1.42	15	0.5000	52.083	A	0.000	52.083	52.083	100.00	0.000	0.000
						B	0.000	52.083		100.00	0.000	0.000
						C	0.000	52.083		100.00	0.000	0.000
L2 100.00-80.00	90.00	1.332	14	0.5000	51.667	A	0.000	51.667	51.667	100.00	0.000	0.000
						B	0.000	51.667		100.00	0.000	0.000
						C	0.000	51.667		100.00	0.000	0.000
L3 80.00-60.00	70.00	1.24	13	0.5000	61.667	A	0.000	61.667	61.667	100.00	0.000	0.000
						B	0.000	61.667		100.00	0.000	0.000
						C	0.000	61.667		100.00	0.000	0.000
L4 60.00-40.00	50.00	1.126	12	0.5000	71.667	A	0.000	71.667	71.667	100.00	0.000	0.000
						B	0.000	71.667		100.00	0.000	0.000
						C	0.000	71.667		100.00	0.000	0.000
L5 40.00-20.00	30.00	1	10	0.5000	81.667	A	0.000	81.667	81.667	100.00	0.000	0.000
						B	0.000	81.667		100.00	0.000	0.000
						C	0.000	81.667		100.00	0.000	0.000
L6 20.00-0.00	10.00	1	10	0.5000	91.667	A	0.000	91.667	91.667	100.00	0.000	0.000
						B	0.000	91.667		100.00	0.000	0.000
						C	0.000	91.667		100.00	0.000	0.000

Tower Pressure - Service

$G_H = 1.108$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 125.00-100.00	112.50	1.42	9	50.000	A	0.000	50.000	50.000	100.00	0.000	0.000
					B	0.000	50.000		100.00	0.000	0.000
					C	0.000	50.000		100.00	0.000	0.000
L2 100.00-80.00	90.00	1.332	9	50.000	A	0.000	50.000	50.000	100.00	0.000	0.000
					B	0.000	50.000		100.00	0.000	0.000
					C	0.000	50.000		100.00	0.000	0.000
L3 80.00-60.00	70.00	1.24	8	60.000	A	0.000	60.000	60.000	100.00	0.000	0.000
					B	0.000	60.000		100.00	0.000	0.000
					C	0.000	60.000		100.00	0.000	0.000
L4 60.00-40.00	50.00	1.126	7	70.000	A	0.000	70.000	70.000	100.00	0.000	0.000
					B	0.000	70.000		100.00	0.000	0.000
					C	0.000	70.000		100.00	0.000	0.000
L5 40.00-20.00	30.00	1	6	80.000	A	0.000	80.000	80.000	100.00	0.000	0.000
					B	0.000	80.000		100.00	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L6 20.00-0.00	10.00	1	6	90.000	C	0.000	80.000		100.00	0.000	0.000
					A	0.000	90.000	90.000	100.00	0.000	0.000
					B	0.000	90.000		100.00	0.000	0.000
					C	0.000	90.000		100.00	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.69	2.37	A	1	0.59	1	1	1	50.000	0.86	34.32	C
125.00-100.00			B	1	0.59	1	1	1	50.000			
			C	1	0.59	1	1	1	50.000			
L2	0.89	2.38	A	1	0.59	1	1	1	50.000	0.80	40.25	C
100.00-80.00			B	1	0.59	1	1	1	50.000			
			C	1	0.59	1	1	1	50.000			
L3	0.92	2.86	A	1	0.59	1	1	1	60.000	0.90	44.95	C
80.00-60.00			B	1	0.59	1	1	1	60.000			
			C	1	0.59	1	1	1	60.000			
L4	0.92	3.34	A	1	0.59	1	1	1	70.000	0.95	47.63	C
60.00-40.00			B	1	0.59	1	1	1	70.000			
			C	1	0.59	1	1	1	70.000			
L5	0.92	3.82	A	1	0.59	1	1	1	80.000	0.97	48.35	C
40.00-20.00			B	1	0.59	1	1	1	80.000			
			C	1	0.59	1	1	1	80.000			
L6 20.00-0.00	0.92	4.30	A	1	0.59	1	1	1	90.000	1.09	54.39	C
			B	1	0.59	1	1	1	90.000			
			C	1	0.59	1	1	1	90.000			
Sum Weight:	5.27	19.05						OTM	319.41 kip-ft	5.57		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.69	2.37	A	1	0.59	1	1	1	50.000	0.86	34.32	C
125.00-100.00			B	1	0.59	1	1	1	50.000			
			C	1	0.59	1	1	1	50.000			
L2	0.89	2.38	A	1	0.59	1	1	1	50.000	0.80	40.25	C
100.00-80.00			B	1	0.59	1	1	1	50.000			
			C	1	0.59	1	1	1	50.000			
L3	0.92	2.86	A	1	0.59	1	1	1	60.000	0.90	44.95	C
80.00-60.00			B	1	0.59	1	1	1	60.000			
			C	1	0.59	1	1	1	60.000			
L4	0.92	3.34	A	1	0.59	1	1	1	70.000	0.95	47.63	C
60.00-40.00			B	1	0.59	1	1	1	70.000			
			C	1	0.59	1	1	1	70.000			
L5	0.92	3.82	A	1	0.59	1	1	1	80.000	0.97	48.35	C
40.00-20.00			B	1	0.59	1	1	1	80.000			
			C	1	0.59	1	1	1	80.000			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L6 20.00-0.00	0.92	4.30	A	1	0.59	1	1	1	90.000	1.09	54.39	C
			B	1	0.59	1	1	1	90.000			
			C	1	0.59	1	1	1	90.000			
Sum Weight:	5.27	19.05						OTM	319.41 kip-ft	5.57		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.69	2.37	A	1	0.59	1	1	1	50.000	0.86	34.32	C
125.00-100.00			B	1	0.59	1	1	1	50.000			
			C	1	0.59	1	1	1	50.000			
L2	0.89	2.38	A	1	0.59	1	1	1	50.000	0.80	40.25	C
100.00-80.00			B	1	0.59	1	1	1	50.000			
			C	1	0.59	1	1	1	50.000			
L3	0.92	2.86	A	1	0.59	1	1	1	60.000	0.90	44.95	C
80.00-60.00			B	1	0.59	1	1	1	60.000			
			C	1	0.59	1	1	1	60.000			
L4	0.92	3.34	A	1	0.59	1	1	1	70.000	0.95	47.63	C
60.00-40.00			B	1	0.59	1	1	1	70.000			
			C	1	0.59	1	1	1	70.000			
L5	0.92	3.82	A	1	0.59	1	1	1	80.000	0.97	48.35	C
40.00-20.00			B	1	0.59	1	1	1	80.000			
			C	1	0.59	1	1	1	80.000			
L6 20.00-0.00	0.92	4.30	A	1	0.59	1	1	1	90.000	1.09	54.39	C
			B	1	0.59	1	1	1	90.000			
			C	1	0.59	1	1	1	90.000			
Sum Weight:	5.27	19.05						OTM	319.41 kip-ft	5.57		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.69	2.74	A	1	0.59	1	1	1	52.083	0.50	20.11	C
125.00-100.00			B	1	0.59	1	1	1	52.083			
			C	1	0.59	1	1	1	52.083			
L2	0.89	2.75	A	1	0.59	1	1	1	51.667	0.47	23.39	C
100.00-80.00			B	1	0.59	1	1	1	51.667			
			C	1	0.59	1	1	1	51.667			
L3	0.92	3.30	A	1	0.59	1	1	1	61.667	0.52	25.99	C
80.00-60.00			B	1	0.59	1	1	1	61.667			
			C	1	0.59	1	1	1	61.667			
L4	0.92	3.86	A	1	0.59	1	1	1	71.667	0.55	27.43	C
60.00-40.00			B	1	0.59	1	1	1	71.667			
			C	1	0.59	1	1	1	71.667			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L5	0.92	4.41	A	1	0.59	1	1	1	81.667	0.56	27.76	C
40.00-20.00			B	1	0.59	1	1	1	81.667			
			C	1	0.59	1	1	1	81.667			
L6 20.00-0.00	0.92	4.97	A	1	0.59	1	1	1	91.667	0.62	31.16	C
			B	1	0.59	1	1	1	91.667			
			C	1	0.59	1	1	1	91.667			
Sum Weight:	5.27	22.02						OTM	185.36 kip-ft	3.22		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.69	2.74	A	1	0.59	1	1	1	52.083	0.50	20.11	C
125.00-100.00			B	1	0.59	1	1	1	52.083			
			C	1	0.59	1	1	1	52.083			
L2	0.89	2.75	A	1	0.59	1	1	1	51.667	0.47	23.39	C
100.00-80.00			B	1	0.59	1	1	1	51.667			
			C	1	0.59	1	1	1	51.667			
L3	0.92	3.30	A	1	0.59	1	1	1	61.667	0.52	25.99	C
80.00-60.00			B	1	0.59	1	1	1	61.667			
			C	1	0.59	1	1	1	61.667			
L4	0.92	3.86	A	1	0.59	1	1	1	71.667	0.55	27.43	C
60.00-40.00			B	1	0.59	1	1	1	71.667			
			C	1	0.59	1	1	1	71.667			
L5	0.92	4.41	A	1	0.59	1	1	1	81.667	0.56	27.76	C
40.00-20.00			B	1	0.59	1	1	1	81.667			
			C	1	0.59	1	1	1	81.667			
L6 20.00-0.00	0.92	4.97	A	1	0.59	1	1	1	91.667	0.62	31.16	C
			B	1	0.59	1	1	1	91.667			
			C	1	0.59	1	1	1	91.667			
Sum Weight:	5.27	22.02						OTM	185.36 kip-ft	3.22		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.69	2.74	A	1	0.59	1	1	1	52.083	0.50	20.11	C
125.00-100.00			B	1	0.59	1	1	1	52.083			
			C	1	0.59	1	1	1	52.083			
L2	0.89	2.75	A	1	0.59	1	1	1	51.667	0.47	23.39	C
100.00-80.00			B	1	0.59	1	1	1	51.667			
			C	1	0.59	1	1	1	51.667			
L3	0.92	3.30	A	1	0.59	1	1	1	61.667	0.52	25.99	C
80.00-60.00			B	1	0.59	1	1	1	61.667			
			C	1	0.59	1	1	1	61.667			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L4	0.92	3.86	A	1	0.59	1	1	1	71.667	0.55	27.43	C
60.00-40.00			B	1	0.59	1	1	1	71.667			
			C	1	0.59	1	1	1	71.667			
L5	0.92	4.41	A	1	0.59	1	1	1	81.667	0.56	27.76	C
40.00-20.00			B	1	0.59	1	1	1	81.667			
			C	1	0.59	1	1	1	81.667			
L6 20.00-0.00	0.92	4.97	A	1	0.59	1	1	1	91.667	0.62	31.16	C
			B	1	0.59	1	1	1	91.667			
			C	1	0.59	1	1	1	91.667			
Sum Weight:	5.27	22.02						OTM	185.36 kip-ft	3.22		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.69	2.37	A	1	0.59	1	1	1	50.000	0.30	11.87	C
125.00-100.00			B	1	0.59	1	1	1	50.000			
			C	1	0.59	1	1	1	50.000			
L2	0.89	2.38	A	1	0.59	1	1	1	50.000	0.28	13.93	C
100.00-80.00			B	1	0.59	1	1	1	50.000			
			C	1	0.59	1	1	1	50.000			
L3	0.92	2.86	A	1	0.59	1	1	1	60.000	0.31	15.55	C
80.00-60.00			B	1	0.59	1	1	1	60.000			
			C	1	0.59	1	1	1	60.000			
L4	0.92	3.34	A	1	0.59	1	1	1	70.000	0.33	16.48	C
60.00-40.00			B	1	0.59	1	1	1	70.000			
			C	1	0.59	1	1	1	70.000			
L5	0.92	3.82	A	1	0.59	1	1	1	80.000	0.33	16.73	C
40.00-20.00			B	1	0.59	1	1	1	80.000			
			C	1	0.59	1	1	1	80.000			
L6 20.00-0.00	0.92	4.30	A	1	0.59	1	1	1	90.000	0.38	18.82	C
			B	1	0.59	1	1	1	90.000			
			C	1	0.59	1	1	1	90.000			
Sum Weight:	5.27	19.05						OTM	110.52 kip-ft	1.93		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.69	2.37	A	1	0.59	1	1	1	50.000	0.30	11.87	C
125.00-100.00			B	1	0.59	1	1	1	50.000			
			C	1	0.59	1	1	1	50.000			
L2	0.89	2.38	A	1	0.59	1	1	1	50.000	0.28	13.93	C
100.00-80.00			B	1	0.59	1	1	1	50.000			
			C	1	0.59	1	1	1	50.000			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L3	0.92	2.86	A	1	0.59	1	1	1	60.000	0.31	15.55	C
80.00-60.00			B	1	0.59	1	1	1	60.000			
			C	1	0.59	1	1	1	60.000			
L4	0.92	3.34	A	1	0.59	1	1	1	70.000	0.33	16.48	C
60.00-40.00			B	1	0.59	1	1	1	70.000			
			C	1	0.59	1	1	1	70.000			
L5	0.92	3.82	A	1	0.59	1	1	1	80.000	0.33	16.73	C
40.00-20.00			B	1	0.59	1	1	1	80.000			
			C	1	0.59	1	1	1	80.000			
L6 20.00-0.00	0.92	4.30	A	1	0.59	1	1	1	90.000	0.38	18.82	C
			B	1	0.59	1	1	1	90.000			
			C	1	0.59	1	1	1	90.000			
Sum Weight:	5.27	19.05						OTM	110.52 kip-ft	1.93		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1	0.69	2.37	A	1	0.59	1	1	1	50.000	0.30	11.87	C
125.00-100.00			B	1	0.59	1	1	1	50.000			
			C	1	0.59	1	1	1	50.000			
L2	0.89	2.38	A	1	0.59	1	1	1	50.000	0.28	13.93	C
100.00-80.00			B	1	0.59	1	1	1	50.000			
			C	1	0.59	1	1	1	50.000			
L3	0.92	2.86	A	1	0.59	1	1	1	60.000	0.31	15.55	C
80.00-60.00			B	1	0.59	1	1	1	60.000			
			C	1	0.59	1	1	1	60.000			
L4	0.92	3.34	A	1	0.59	1	1	1	70.000	0.33	16.48	C
60.00-40.00			B	1	0.59	1	1	1	70.000			
			C	1	0.59	1	1	1	70.000			
L5	0.92	3.82	A	1	0.59	1	1	1	80.000	0.33	16.73	C
40.00-20.00			B	1	0.59	1	1	1	80.000			
			C	1	0.59	1	1	1	80.000			
L6 20.00-0.00	0.92	4.30	A	1	0.59	1	1	1	90.000	0.38	18.82	C
			B	1	0.59	1	1	1	90.000			
			C	1	0.59	1	1	1	90.000			
Sum Weight:	5.27	19.05						OTM	110.52 kip-ft	1.93		

Force Totals

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Leg Weight	19.05					
Bracing Weight	0.00					
Total Member Self-Weight	19.05			-0.13	0.14	

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Total Weight	29.02			-0.13	0.14	
Wind 0 deg - No Ice		0.13	-11.69	-985.59	-15.86	-0.15
Wind 30 deg - No Ice		5.95	-10.10	-851.18	-505.03	-0.46
Wind 60 deg - No Ice		10.18	-5.87	-496.12	-860.15	-0.65
Wind 90 deg - No Ice		11.71	-0.09	-10.51	-988.41	-0.64
Wind 120 deg - No Ice		10.17	5.85	488.99	-859.43	-0.36
Wind 150 deg - No Ice		5.78	10.13	851.87	-485.58	0.02
Wind 180 deg - No Ice		-0.02	11.70	985.20	3.15	0.27
Wind 210 deg - No Ice		-5.82	10.18	857.77	491.33	0.43
Wind 240 deg - No Ice		-10.12	5.97	503.92	853.56	0.51
Wind 270 deg - No Ice		-11.66	0.01	1.42	983.37	0.45
Wind 300 deg - No Ice		-10.10	-5.80	-487.28	851.13	0.38
Wind 330 deg - No Ice		-5.82	-10.05	-844.85	489.95	0.20
Member Ice	2.97					
Total Weight Ice	34.05			-0.23	0.31	
Wind 0 deg - Ice		0.08	-7.14	-612.19	-9.44	-0.09
Wind 30 deg - Ice		3.63	-6.17	-528.75	-313.16	-0.28
Wind 60 deg - Ice		6.22	-3.59	-308.19	-533.69	-0.39
Wind 90 deg - Ice		7.15	-0.05	-6.55	-613.38	-0.38
Wind 120 deg - Ice		6.21	3.57	303.51	-533.28	-0.21
Wind 150 deg - Ice		3.53	6.19	528.84	-301.33	0.02
Wind 180 deg - Ice		-0.01	7.15	611.62	2.13	0.17
Wind 210 deg - Ice		-3.56	6.22	532.43	305.27	0.26
Wind 240 deg - Ice		-6.18	3.65	312.60	530.14	0.30
Wind 270 deg - Ice		-7.12	0.01	0.69	610.76	0.27
Wind 300 deg - Ice		-6.17	-3.54	-302.82	528.66	0.22
Wind 330 deg - Ice		-3.56	-6.14	-524.90	304.44	0.11
Total Weight	29.02			-0.13	0.14	
Wind 0 deg - Service		0.05	-4.05	-341.12	-5.40	-0.05
Wind 30 deg - Service		2.06	-3.50	-294.61	-174.66	-0.16
Wind 60 deg - Service		3.52	-2.03	-171.75	-297.54	-0.22
Wind 90 deg - Service		4.05	-0.03	-3.72	-341.92	-0.22
Wind 120 deg - Service		3.52	2.02	169.12	-297.29	-0.12
Wind 150 deg - Service		2.00	3.51	294.68	-167.93	0.01
Wind 180 deg - Service		-0.01	4.05	340.82	1.18	0.09
Wind 210 deg - Service		-2.01	3.52	296.72	170.10	0.15
Wind 240 deg - Service		-3.50	2.07	174.28	295.44	0.17
Wind 270 deg - Service		-4.04	0.00	0.41	340.36	0.16
Wind 300 deg - Service		-3.50	-2.01	-168.69	294.60	0.13
Wind 330 deg - Service		-2.01	-3.48	-292.42	169.62	0.07

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

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	125 - 100	Pole	Max Tension	5	0.00	-0.00	-0.00
			Max. Compression	14	-6.97	0.31	-0.18
			Max. Mx	5	-5.51	-75.82	1.81
			Max. My	2	-5.51	-2.79	75.03
			Max. Vy	5	4.05	-75.82	1.81
			Max. Vx	2	-4.01	-2.79	75.03
			Max. Torque	12			0.27
L2	100 - 80	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-13.82	0.31	0.23
			Max. Mx	5	-10.88	-219.37	3.75
			Max. My	2	-10.88	-5.48	217.75
			Max. Vy	5	7.99	-219.37	3.75
			Max. Vx	8	7.98	1.20	-216.37
			Max. Torque	4			0.65
L3	80 - 60	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-18.05	0.31	0.23
			Max. Mx	5	-14.69	-388.19	5.51
			Max. My	2	-14.69	-8.18	386.25
			Max. Vy	5	8.89	-388.19	5.51
			Max. Vx	8	8.88	1.71	-385.11
			Max. Torque	4			0.65
L4	60 - 40	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-22.83	0.31	0.23
			Max. Mx	5	-18.98	-575.20	7.26
			Max. My	2	-18.98	-10.86	572.93
			Max. Vy	5	9.81	-575.20	7.26

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	8	9.80	2.21	-572.03
			Max. Torque	4			0.65
L5	40 - 20	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-28.16	0.31	0.23
			Max. Mx	5	-23.76	-780.46	8.99
			Max. My	2	-23.76	-13.53	777.89
			Max. Vy	5	10.71	-780.46	8.99
			Max. Vx	8	10.71	2.71	-777.22
			Max. Torque	4			0.65
L6	20 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-34.05	0.31	0.23
			Max. Mx	5	-29.02	-1004.73	10.71
			Max. My	2	-29.02	-16.17	1001.85
			Max. Vy	5	11.71	-1004.73	10.71
			Max. Vx	8	11.71	3.21	-1001.42
			Max. Torque	4			0.65

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	14	34.05	0.00	0.00
	Max. H_x	11	29.02	11.66	-0.01
	Max. H_z	2	29.02	-0.13	11.69
	Max. M_x	2	1001.85	-0.13	11.69
	Max. M_z	5	1004.73	-11.71	0.09
	Max. Torsion	4	0.65	-10.18	5.87
	Min. Vert	5	29.02	-11.71	0.09
	Min. H_x	5	29.02	-11.71	0.09
	Min. H_z	8	29.02	0.02	-11.70
	Min. M_x	8	-1001.42	0.02	-11.70
	Min. M_z	11	-999.60	11.66	-0.01
	Min. Torsion	10	-0.51	10.11	-5.97

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	29.02	-0.00	-0.00	-0.13	0.14	0.00
Dead+Wind 0 deg - No Ice	29.02	0.13	-11.69	-1001.85	-16.17	-0.15
Dead+Wind 30 deg - No Ice	29.02	5.95	-10.10	-865.31	-513.45	-0.46
Dead+Wind 60 deg - No Ice	29.02	10.18	-5.87	-504.39	-874.48	-0.65
Dead+Wind 90 deg - No Ice	29.02	11.71	-0.09	-10.71	-1004.73	-0.65
Dead+Wind 120 deg - No Ice	29.02	10.17	5.85	497.05	-873.73	-0.36
Dead+Wind 150 deg - No Ice	29.02	5.78	10.13	865.98	-493.64	0.01
Dead+Wind 180 deg - No Ice	29.02	-0.02	11.70	1001.42	3.21	0.27
Dead+Wind 210 deg - No Ice	29.02	-5.82	10.18	872.04	499.52	0.43
Dead+Wind 240 deg - No Ice	29.02	-10.11	5.97	512.27	867.75	0.51
Dead+Wind 270 deg - No Ice	29.02	-11.66	0.01	1.45	999.60	0.46
Dead+Wind 300 deg - No Ice	29.02	-10.10	-5.80	-495.37	865.29	0.38
Dead+Wind 330 deg - No Ice	29.02	-5.82	-10.05	-858.86	498.07	0.20

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead+Ice+Temp	34.05	-0.00	-0.00	-0.23	0.31	0.00
Dead+Wind 0 deg+Ice+Temp	34.05	0.08	-7.14	-624.94	-9.67	-0.09
Dead+Wind 30 deg+Ice+Temp	34.05	3.63	-6.17	-539.75	-319.70	-0.28
Dead+Wind 60 deg+Ice+Temp	34.05	6.22	-3.59	-314.62	-544.82	-0.40
Dead+Wind 90 deg+Ice+Temp	34.05	7.15	-0.05	-6.72	-626.15	-0.39
Dead+Wind 120 deg+Ice+Temp	34.05	6.21	3.57	309.78	-544.40	-0.22
Dead+Wind 150 deg+Ice+Temp	34.05	3.53	6.19	539.83	-307.59	0.01
Dead+Wind 180 deg+Ice+Temp	34.05	-0.01	7.15	624.33	2.19	0.17
Dead+Wind 210 deg+Ice+Temp	34.05	-3.56	6.22	543.50	311.64	0.26
Dead+Wind 240 deg+Ice+Temp	34.05	-6.18	3.65	319.09	541.19	0.31
Dead+Wind 270 deg+Ice+Temp	34.05	-7.12	0.01	0.71	623.48	0.28
Dead+Wind 300 deg+Ice+Temp	34.05	-6.17	-3.54	-309.12	539.67	0.23
Dead+Wind 330 deg+Ice+Temp	34.05	-3.56	-6.14	-535.81	310.77	0.12
Dead+Wind 0 deg - Service	29.02	0.05	-4.04	-346.67	-5.50	-0.05
Dead+Wind 30 deg - Service	29.02	2.06	-3.49	-299.40	-177.51	-0.16
Dead+Wind 60 deg - Service	29.02	3.52	-2.03	-174.55	-302.38	-0.23
Dead+Wind 90 deg - Service	29.02	4.05	-0.03	-3.79	-347.48	-0.22
Dead+Wind 120 deg - Service	29.02	3.52	2.02	171.85	-302.13	-0.13
Dead+Wind 150 deg - Service	29.02	2.00	3.50	299.46	-170.66	0.00
Dead+Wind 180 deg - Service	29.02	-0.01	4.05	346.35	1.20	0.09
Dead+Wind 210 deg - Service	29.02	-2.01	3.52	301.54	172.87	0.15
Dead+Wind 240 deg - Service	29.02	-3.50	2.06	177.11	300.25	0.18
Dead+Wind 270 deg - Service	29.02	-4.03	0.00	0.41	345.90	0.16
Dead+Wind 300 deg - Service	29.02	-3.49	-2.01	-171.43	299.39	0.13
Dead+Wind 330 deg - Service	29.02	-2.01	-3.48	-297.17	172.38	0.07

Solution Summary

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
1	0.00	-29.02	0.00	0.00	29.02	0.00	0.000%
2	0.13	-29.02	-11.69	-0.13	29.02	11.69	0.005%
3	5.95	-29.02	-10.10	-5.95	29.02	10.10	0.002%
4	10.18	-29.02	-5.87	-10.18	29.02	5.87	0.001%
5	11.71	-29.02	-0.09	-11.71	29.02	0.09	0.005%
6	10.17	-29.02	5.85	-10.17	29.02	-5.85	0.002%
7	5.78	-29.02	10.13	-5.78	29.02	-10.13	0.002%
8	-0.02	-29.02	11.70	0.02	29.02	-11.70	0.005%
9	-5.82	-29.02	10.18	5.82	29.02	-10.18	0.001%
10	-10.12	-29.02	5.97	10.11	29.02	-5.97	0.002%
11	-11.66	-29.02	0.01	11.66	29.02	-0.01	0.005%
12	-10.10	-29.02	-5.80	10.10	29.02	5.80	0.001%
13	-5.82	-29.02	-10.05	5.82	29.02	10.05	0.002%
14	0.00	-34.05	0.00	0.00	34.05	0.00	0.000%
15	0.08	-34.05	-7.14	-0.08	34.05	7.14	0.000%
16	3.63	-34.05	-6.17	-3.63	34.05	6.17	0.000%
17	6.22	-34.05	-3.59	-6.22	34.05	3.59	0.000%
18	7.15	-34.05	-0.05	-7.15	34.05	0.05	0.000%
19	6.21	-34.05	3.57	-6.21	34.05	-3.57	0.000%
20	3.53	-34.05	6.19	-3.53	34.05	-6.19	0.000%
21	-0.01	-34.05	7.15	0.01	34.05	-7.15	0.000%
22	-3.56	-34.05	6.22	3.56	34.05	-6.22	0.000%
23	-6.18	-34.05	3.65	6.18	34.05	-3.65	0.000%
24	-7.12	-34.05	0.01	7.12	34.05	-0.01	0.000%
25	-6.17	-34.05	-3.54	6.17	34.05	3.54	0.000%
26	-3.56	-34.05	-6.14	3.56	34.05	6.14	0.000%
27	0.05	-29.02	-4.05	-0.05	29.02	4.04	0.006%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
28	2.06	-29.02	-3.50	-2.06	29.02	3.49	0.006%
29	3.52	-29.02	-2.03	-3.52	29.02	2.03	0.006%
30	4.05	-29.02	-0.03	-4.05	29.02	0.03	0.006%
31	3.52	-29.02	2.02	-3.52	29.02	-2.02	0.006%
32	2.00	-29.02	3.51	-2.00	29.02	-3.50	0.006%
33	-0.01	-29.02	4.05	0.01	29.02	-4.05	0.006%
34	-2.01	-29.02	3.52	2.01	29.02	-3.52	0.006%
35	-3.50	-29.02	2.07	3.50	29.02	-2.06	0.006%
36	-4.04	-29.02	0.00	4.03	29.02	-0.00	0.006%
37	-3.50	-29.02	-2.01	3.49	29.02	2.01	0.006%
38	-2.01	-29.02	-3.48	2.01	29.02	3.48	0.006%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	11	0.00010884	0.00008782
3	Yes	12	0.00000001	0.00014498
4	Yes	13	0.00000001	0.00007266
5	Yes	11	0.00010886	0.00013580
6	Yes	12	0.00000001	0.00014124
7	Yes	12	0.00000001	0.00014764
8	Yes	11	0.00010881	0.00009844
9	Yes	13	0.00000001	0.00006778
10	Yes	12	0.00000001	0.00014289
11	Yes	11	0.00010885	0.00010792
12	Yes	13	0.00000001	0.00006500
13	Yes	12	0.00000001	0.00014261
14	Yes	6	0.00000001	0.00000001
15	Yes	14	0.00000001	0.00006314
16	Yes	14	0.00000001	0.00006837
17	Yes	14	0.00000001	0.00006874
18	Yes	14	0.00000001	0.00006335
19	Yes	14	0.00000001	0.00006787
20	Yes	14	0.00000001	0.00006722
21	Yes	14	0.00000001	0.00006293
22	Yes	14	0.00000001	0.00006818
23	Yes	14	0.00000001	0.00006840
24	Yes	14	0.00000001	0.00006307
25	Yes	14	0.00000001	0.00006763
26	Yes	14	0.00000001	0.00006719
27	Yes	10	0.00000001	0.00008983
28	Yes	10	0.00000001	0.00007460
29	Yes	10	0.00000001	0.00008582
30	Yes	10	0.00000001	0.00009339
31	Yes	10	0.00000001	0.00007515
32	Yes	10	0.00000001	0.00007597
33	Yes	10	0.00000001	0.00009013
34	Yes	10	0.00000001	0.00008197
35	Yes	10	0.00000001	0.00007480
36	Yes	10	0.00000001	0.00009111
37	Yes	10	0.00000001	0.00008041
38	Yes	10	0.00000001	0.00007469

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	125 - 100	6.748	29	0.4548	0.0010
L2	100 - 80	4.425	29	0.4155	0.0008
L3	80 - 60	2.814	29	0.3410	0.0005
L4	60 - 40	1.556	29	0.2512	0.0003
L5	40 - 20	0.679	29	0.1617	0.0001
L6	20 - 0	0.169	29	0.0776	0.0001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
122.00	2' MW Dish	29	6.462	0.4518	0.0010	95992
112.00	742 213 w/ Mount Pipe	29	5.515	0.4399	0.0010	36920
100.00	(2) 7770.00A	29	4.425	0.4155	0.0009	19472
90.00	A-ANT-18G-2-C	29	3.581	0.3823	0.0008	15539

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	125 - 100	19.510	4	1.3159	0.0028
L2	100 - 80	12.790	4	1.2014	0.0022
L3	80 - 60	8.135	4	0.9859	0.0013
L4	60 - 40	4.499	4	0.7261	0.0008
L5	40 - 20	1.964	4	0.4675	0.0004
L6	20 - 0	0.490	4	0.2243	0.0002

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
122.00	2' MW Dish	4	18.681	1.3071	0.0028	33149
112.00	742 213 w/ Mount Pipe	4	15.944	1.2721	0.0029	12749
100.00	(2) 7770.00A	4	12.790	1.2014	0.0027	6722
90.00	A-ANT-18G-2-C	4	10.351	1.1053	0.0023	5370

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
L1	125 - 100 (1)	P24x3/8	25.00	0.00	0.0	25.200	27.8325	-5.50	701.38	0.008
L2	100 - 80 (2)	P30x3/8	20.00	0.00	0.0	25.075	34.9011	-10.88	875.15	0.012
L3	80 - 60 (3)	P36x3/8	20.00	0.00	0.0	23.696	41.9697	-14.69	994.51	0.015
L4	60 - 40 (4)	P42x3/8	20.00	0.00	0.0	22.711	49.0383	-18.98	1113.69	0.017
L5	40 - 20 (5)	P48x3/8	20.00	0.00	0.0	21.972	56.1069	-23.76	1232.77	0.019
L6	20 - 0 (6)	P54x3/8	20.00	0.00	0.0	21.397	63.1755	-29.02	1351.78	0.021

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	125 - 100 (1)	P24x3/8	76.39	5.663	27.720	0.204	0.00	0.000	27.720	0.000
L2	100 - 80 (2)	P30x3/8	220.63	10.371	25.075	0.414	0.00	0.000	25.075	0.000
L3	80 - 60 (3)	P36x3/8	390.34	12.662	23.696	0.534	0.00	0.000	23.696	0.000
L4	60 - 40 (4)	P42x3/8	578.23	13.719	22.711	0.604	0.00	0.000	22.711	0.000
L5	40 - 20 (5)	P48x3/8	784.38	14.200	21.972	0.646	0.00	0.000	21.972	0.000
L6	20 - 0 (6)	P54x3/8	1009.52	14.403	21.397	0.673	0.00	0.000	21.397	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	125 - 100 (1)	P24x3/8	4.07	0.293	16.800	0.017	0.00	0.000	16.800	0.000
L2	100 - 80 (2)	P30x3/8	8.03	0.460	16.800	0.027	0.65	0.015	15.644	0.001
L3	80 - 60 (3)	P36x3/8	8.93	0.426	16.800	0.025	0.65	0.011	12.270	0.001
L4	60 - 40 (4)	P42x3/8	9.85	0.402	16.800	0.024	0.65	0.008	10.930	0.001
L5	40 - 20 (5)	P48x3/8	10.76	0.383	16.800	0.023	0.65	0.006	9.889	0.001
L6	20 - 0 (6)	P54x3/8	11.75	0.372	16.800	0.022	0.65	0.005	9.053	0.001

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	125 - 100 (1)	0.008	0.204	0.000	0.017	0.000	0.212	1.333	H1-3+VT ✓
L2	100 - 80 (2)	0.012	0.414	0.000	0.027	0.001	0.427	1.333	H1-3+VT ✓

Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L3	80 - 60 (3)	0.015	0.534	0.000	0.025	0.001	0.550	1.333	H1-3+VT
L4	60 - 40 (4)	0.017	0.604	0.000	0.024	0.001	0.622	1.333	H1-3+VT
L5	40 - 20 (5)	0.019	0.646	0.000	0.023	0.001	0.666	1.333	H1-3+VT
L6	20 - 0 (6)	0.021	0.673	0.000	0.022	0.001	0.695	1.333	H1-3+VT

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	125 - 100	Pole	P24x3/8	1	-5.50	934.94	15.9	Pass
L2	100 - 80	Pole	P30x3/8	2	-10.88	1166.57	32.0	Pass
L3	80 - 60	Pole	P36x3/8	3	-14.69	1325.68	41.2	Pass
L4	60 - 40	Pole	P42x3/8	4	-18.98	1484.55	46.6	Pass
L5	40 - 20	Pole	P48x3/8	5	-23.76	1643.28	50.0	Pass
L6	20 - 0	Pole	P54x3/8	6	-29.02	1801.92	52.1	Pass
							Summary	
						Pole (L6)	52.1	Pass
						RATING =	**52.1**	**Pass**

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

Site Data

Site Name:
App #:

Pole Manufacturer:	Other

Reactions		
Moment:	76.39	ft-kips
Axial:	5.5	kips
Shear:	4.07	kips
Elevation:	100	feet

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

Bolt Data			
Qty:	20		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	75	<-- Disregard	Bolt Fty: 44.00
N/A:	55	<-- Disregard	
Circle (in.):	27		

Plate Data		
Diam:	30	in
Thick, t:	1.25	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	3.77	in

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

Pole Data		
Diam:	24	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

Flange Bolt Results

		Rigid
Bolt Tension Capacity, **B**:	46.07 kips	Service, ASD
Max Bolt directly applied T:	6.52 Kips	Fty*ASIF
Min. PL "tc" for **B** cap. **w/o** Pry:	1.427 in	
Min PL "treq" for actual **T w/ Pry**:	0.409 in	
Min PL "t1" for actual **T w/o Pry**:	0.537 in	
T allowable with Prying:	42.49 kips	0≤α'≤1 case
Prying Force, Q:	0.00 kips	
Total Bolt Tension=T+Q:	6.52 kips	
Prying Bolt Stress Ratio=(T+Q)/(B):	14.1%	

Exterior Flange Plate Results Flexural Check

		Rigid
Compression Side Plate Stress:	6.8 ksi	Service ASD
Allowable Plate Stress:	36.0 ksi	0.75*Fy*ASIF
Compression Plate Stress Ratio:	18.9%	Comp. Y.L. Length:
No Prying		12.37
Tension Side Stress Ratio, (treq/t)^2:	10.7%	

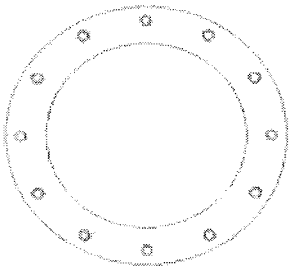
n/a

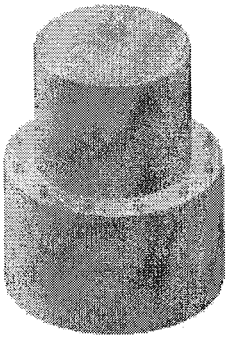
Stiffener Results

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

Pole Results

Pole Punching Shear Check: n/a





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

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

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

Site Data

Site Name:
App #:

Manufacturer:	Other

Reactions		
Moment:	76.39	ft-kips
Axial:	5.5	kips
Shear:	4.07	kips
Exterior Flange Run, T+Q:	4.09	kips

Elevation: 100 feet

Bolt Data			
Qty:	20		
Diam:	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	100	<-- Disregard	Bolt Fty: 44.00
N/A:	75	<-- Disregard	
Circle:	27	in	

Interior Flange Bolt Results

Maximum Bolt Tension:	6.5 Kips, Ext. T=Interior T
Allowable Tension:	46.1 Kips
Bolt Stress Ratio:	14.1%

Plate Data		
Plate Outer Diam:	30	in
Plate Inner Diam:	27.5	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	4.59	in

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	7.1 Kips, Ext. C= Interior C
Plate Stress:	6.6 ksi
Allowable Plate Stress:	36.0 ksi
Plate Stress Ratio:	18.5%

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	Fillet	
Groove Depth:	0.375	<-- Disregard
Groove Angle:	45	<-- Disregard
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	3	in
Height:	18	in
Thick:	0.75	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

n/a

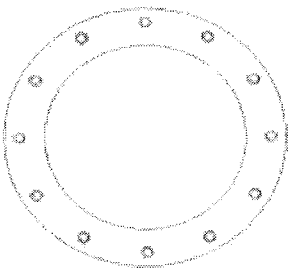
Stiffener Results

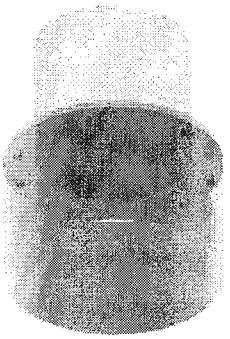
Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

Pole Punching Shear Check: n/a

Pole Data		
Pole OuterDiam:	30	in
Thick:	0.375	in
Pole Inner Diam:	29.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi





Stress Increase Factor		
ASIF:	1.333	

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

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

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

Site Data

Site Name:
App #:

Pole Manufacturer:	Other

Reactions		
Moment:	220.63	ft-kips
Axial:	10.88	kips
Shear:	8.03	kips
Elevation:	80	feet

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

Bolt Data			
Qty:	24		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	75	<-- Disregard	Bolt Fty: 44.00
N/A:	55	<-- Disregard	
Circle (in.):	33		

Plate Data		
Diam:	36	in
Thick, t:	1.25	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	3.93	in

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

Pole Data		
Diam:	30	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

Flange Bolt Results

			Rigid
Bolt Tension Capacity, **B**:	46.07	kips	Service, ASD
Max Bolt directly applied T:	12.92	Kips	Fty*ASIF
Min. PL "tc" for **B** cap. **w/o** Pry:	1.398	in	
Min PL "treq" for actual **T w/ Pry**:	0.563	in	
Min PL "t1" for actual **T w/o Pry**:	0.741	in	
T allowable with Prying:	42.98	kips	0≤α'≤1 case
Prying Force, Q:	0.00	kips	
Total Bolt Tension=T+Q:	12.92	kips	
Prying Bolt Stress Ratio=(T+Q)/(B):	28.0%		

Exterior Flange Plate Results Flexural Check

			Rigid
Compression Side Plate Stress:	12.8	ksi	Service ASD
Allowable Plate Stress:	36.0	ksi	0.75*Fy*ASIF
Compression Plate Stress Ratio:	35.6%		Comp. Y.L. Length:
No Prying			13.75
Tension Side Stress Ratio, (treq/t)^2:	20.3%		

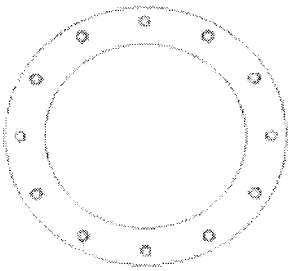
n/a

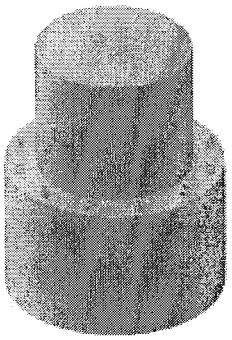
Stiffener Results

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

Pole Results

Pole Punching Shear Check: n/a





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

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

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

Site Data

Site Name:
App #:

Manufacturer:	Other

Reactions		
Moment:	220.63	ft-kips
Axial:	10.88	kips
Shear:	8.03	kips
Exterior Flange Run, T+Q:	7.75	kips

Elevation: 80 feet

Bolt Data			
Qty:	24		
Diam:	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	100	<-- Disregard	Bolt Fty: 44.00
N/A:	75	<-- Disregard	
Circle:	33	in	

Plate Data		
Plate Outer Diam:	36	in
Plate Inner Diam:	33.5	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	4.61	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	Fillet	
Groove Depth:	0.375	<-- Disregard
Groove Angle:	45	<-- Disregard
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	3	in
Height:	18	in
Thick:	0.75	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

Pole Data		
Pole OuterDiam:	36	in
Thick:	0.375	in
Pole Inner Diam:	35.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi

Stress Increase Factor		
ASIF:	1.333	

Interior Flange Bolt Results

Maximum Bolt Tension:	12.9 Kips, Ext. T=Interior T
Allowable Tension:	46.1 Kips
Bolt Stress Ratio:	28.0%

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	13.8 Kips, Ext. C= Interior C
Plate Stress:	12.9 ksi
Allowable Plate Stress:	36.0 ksi
Plate Stress Ratio:	36.0%

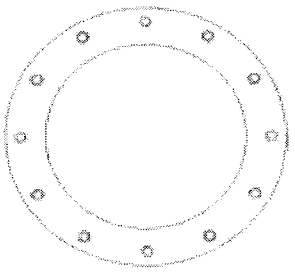
n/a

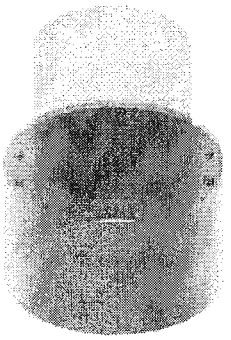
Stiffener Results

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

Pole Results

Pole Punching Shear Check: n/a





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

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

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

Site Data

Site Name:
App #:

Pole Manufacturer:	Other

Bolt Data			
Qty:	28		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	75	<-- Disregard	Bolt Fty: 44.00
N/A:	55	<-- Disregard	
Circle (in.):	39		

Plate Data		
Diam:	42	in
Thick, t:	1.25	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	4.04	in

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

Pole Data		
Diam:	36	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

Reactions		
Moment:	390.34	ft-kips
Axial:	14.69	kips
Shear:	8.93	kips
Elevation:	60	feet

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

Flange Bolt Results

		Rigid
Bolt Tension Capacity, **B**:	46.07 kips	Service, ASD
Max Bolt directly applied T:	16.63 Kips	Fty*ASIF
Min. PL "tc" for **B** cap. **w/o** Pry:	1.379 in	
Min PL "treq" for actual **T w/ Pry:**	0.629 in	
Min PL "t1" for actual **T w/o Pry:**	0.829 in	
T allowable with Prying:	43.33 kips	0≤α'≤1 case
Prying Force, Q:	0.00 kips	
Total Bolt Tension=T+Q:	16.63 kips	
Prying Bolt Stress Ratio=(T+Q)/(B):	36.1%	

Exterior Flange Plate Results Flexural Check

		Rigid
Compression Side Plate Stress:	15.9 ksi	Service ASD
Allowable Plate Stress:	36.0 ksi	0.75*Fy*ASIF
Compression Plate Stress Ratio:	44.1%	Comp. Y.L. Length:
No Prying		15.00
Tension Side Stress Ratio, (treq/t)^2:	25.3%	

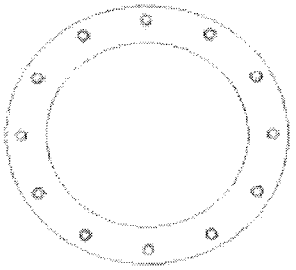
n/a

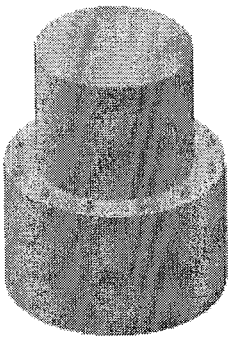
Stiffener Results

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

Pole Results

Pole Punching Shear Check: n/a





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

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

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

Site Data

Site Name:
App #:

Manufacturer:	Other

Reactions		
Moment:	390.34	ft-kips
Axial:	14.69	kips
Shear:	8.93	kips
Exterior Flange Run, T+Q:	9.12	kips

Elevation: 60 feet

Bolt Data			
Qty:	28		
Diam:	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	100	<-- Disregard	Bolt Fty: 44.00
N/A:	75	<-- Disregard	
Circle:	39	in	

Interior Flange Bolt Results

Maximum Bolt Tension:	16.6 Kips, Ext. T=Interior T
Allowable Tension:	46.1 Kips
Bolt Stress Ratio:	36.1%

Plate Data		
Plate Outer Diam:	42	in
Plate Inner Diam:	39.5	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	4.63	in

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	17.7 Kips, Ext. C= Interior C
Plate Stress:	16.5 ksi
Allowable Plate Stress:	36.0 ksi
Plate Stress Ratio:	45.9%

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	Fillet	
Groove Depth:	0.375	<-- Disregard
Groove Angle:	45	<-- Disregard
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	3	in
Height:	18	in
Thick:	0.75	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

n/a

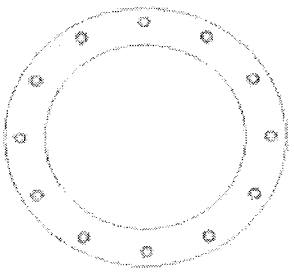
Stiffener Results

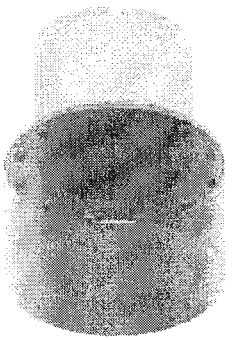
Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

Pole Punching Shear Check: n/a

Pole Data		
Pole OuterDiam:	42	in
Thick:	0.375	in
Pole Inner Diam:	41.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi





Stress Increase Factor	
ASIF:	1.333

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

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

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

Site Data

Site Name:
App #:

Pole Manufacturer:	Other

Reactions		
Moment:	578.23	ft-kips
Axial:	18.98	kips
Shear:	9.85	kips
Elevation:	40	feet

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

Bolt Data			
Qty:	32		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	75	<-- Disregard	Bolt Fty: 44.00
N/A:	55	<-- Disregard	
Circle (in.):	45		

Plate Data		
Diam:	48	in
Thick, t:	1.25	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	4.12	in

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

Pole Data		
Diam:	42	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

Flange Bolt Results — Rigid (Service, ASD; Fty*ASIF)

Bolt Tension Capacity, **B**:	46.07 kips	
Max Bolt directly applied T:	18.68 Kips	
Min. PL "tc" for **B** cap. **w/o Pry**:	1.365 in	
Min PL "treq" for actual **T w/ Pry**:	0.658 in	
Min PL "t1" for actual **T w/o Pry**:	0.869 in	
T allowable with Prying:	43.59 kips	0≤α'≤1 case
Prying Force, Q:	0.00 kips	
Total Bolt Tension=T+Q:	18.68 kips	
Prying Bolt Stress Ratio=(T+Q)/(B):	40.6%	

Exterior Flange Plate Results — Flexural Check — Rigid (Service ASD; 0.75*Fy*ASIF; Comp. Y.L. Length: 16.16)

Compression Side Plate Stress:	17.9 ksi
Allowable Plate Stress:	36.0 ksi
Compression Plate Stress Ratio:	49.7%
No Prying	
Tension Side Stress Ratio, (treq/t)^2:	27.7%

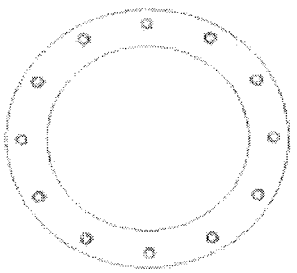
n/a

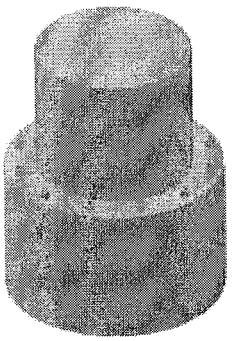
Stiffener Results

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

Pole Results

Pole Punching Shear Check: n/a





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

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

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

Site Data

Site Name:
App #:

Manufacturer:	Other

Reactions		
Moment:	578.23	ft-kips
Axial:	18.98	kips
Shear:	9.85	kips
Exterior Flange Run, T+Q:	10.1	kips

Elevation: 40 feet

Bolt Data			
Qty:	32		
Diam:	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	100	<-- Disregard	Bolt Fty: 44.00
N/A:	75	<-- Disregard	
Circle:	45	in	

Interior Flange Bolt Results

Maximum Bolt Tension:	18.7 Kips, Ext. T=Interior T
Allowable Tension:	46.1 Kips
Bolt Stress Ratio:	40.6%

Plate Data		
Plate Outer Diam:	48	in
Plate Inner Diam:	45.5	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	4.64	in

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	19.9 Kips, Ext. C= Interior C
Plate Stress:	18.5 ksi
Allowable Plate Stress:	36.0 ksi
Plate Stress Ratio:	51.4%

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	Fillet	
Groove Depth:	0.375	<-- Disregard
Groove Angle:	45	<-- Disregard
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	3	in
Height:	18	in
Thick:	0.75	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

n/a

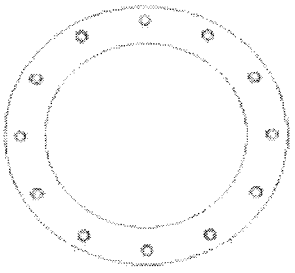
Stiffener Results

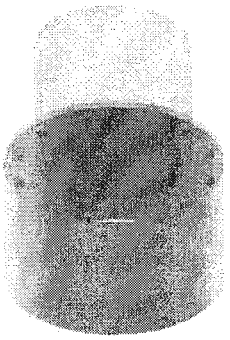
Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

Pole Punching Shear Check: n/a

Pole Data		
Pole OuterDiam:	48	in
Thick:	0.375	in
Pole Inner Diam:	47.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi





Stress Increase Factor		
ASIF:	1.333	

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

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

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

Site Data

Site Name:
App #:

Pole Manufacturer:	Other

Reactions		
Moment:	784.38	ft-kips
Axial:	23.76	kips
Shear:	10.76	kips
Elevation:	20	feet

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

Bolt Data			
Qty:	36		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	75	<-- Disregard	Bolt Fty: 44.00
N/A:	55	<-- Disregard	
Circle (in.):	51		

Plate Data		
Diam:	54	in
Thick, t:	1.25	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	4.19	in

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

Pole Data		
Diam:	48	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

Flange Bolt Results

		Rigid
Bolt Tension Capacity, **B**:	46.07 kips	Service, ASD
Max Bolt directly applied T:	19.85 Kips	Fty*ASIF
Min. PL "tc" for **B** cap. **w/o** Pry:	1.354 in	
Min PL "treq" for actual **T w/ Pry:**	0.673 in	
Min PL "t1" for actual **T w/o Pry:**	0.889 in	
T allowable with Prying:	43.80 kips	0≤α'≤1 case
Prying Force, Q:	0.00 kips	
Total Bolt Tension=T+Q:	19.85 kips	
Prying Bolt Stress Ratio=(T+Q)/(B):	43.1%	

Exterior Flange Plate Results Flexural Check

		Rigid
Compression Side Plate Stress:	18.9 ksi	Service ASD
Allowable Plate Stress:	36.0 ksi	0.75*Fy*ASIF
Compression Plate Stress Ratio:	52.6%	Comp. Y.L. Length: 17.23
No Prying		
Tension Side Stress Ratio, (treq/t)^2:	28.9%	

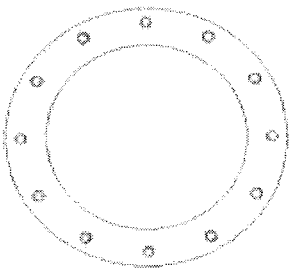
n/a

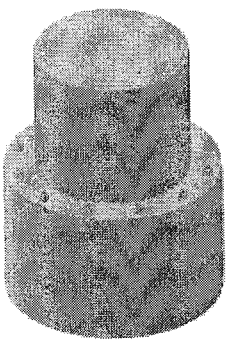
Stiffener Results

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

Pole Results

Pole Punching Shear Check: n/a





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

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

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

Site Data

Site Name:
App #:

Manufacturer:	Other

Reactions		
Moment:	784.38	ft-kips
Axial:	23.76	kips
Shear:	10.76	kips
Exterior Flange Run, T+Q:	10.63	kips

Elevation: 20 feet

Bolt Data			
Qty:	36		
Diam:	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	100	<-- Disregard	Bolt Fty: 44.00
N/A:	75	<-- Disregard	
Circle:	51	in	

Interior Flange Bolt Results

Maximum Bolt Tension:	19.8 Kips, Ext. T=Interior T
Allowable Tension:	46.1 Kips
Bolt Stress Ratio:	43.1%

Plate Data		
Plate Outer Diam:	54	in
Plate Inner Diam:	51.5	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	-6.50	in

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	21.2 Kips, Ext. C= Interior C
Plate Stress:	23.4 ksi
Allowable Plate Stress:	36.0 ksi
Plate Stress Ratio:	65.1%

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	Fillet	
Groove Depth:	0.375	<-- Disregard
Groove Angle:	45	<-- Disregard
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	3	in
Height:	18	in
Thick:	0.75	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

n/a

Stiffener Results

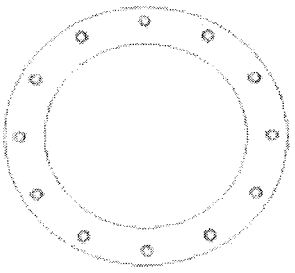
Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	n/a
Plate Comp. (AISC Bracket):	n/a

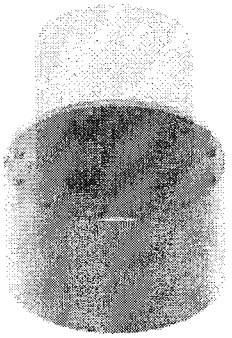
Pole Results

Pole Punching Shear Check: n/a

Pole Data		
Pole OuterDiam:	54	in
Thick:	0.375	in
Pole Inner Diam:	47.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi

Stress Increase Factor		
ASIF:	1.333	





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

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

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

TIA Rev F

Site Data

Site Name:
App #:

Pole Manufacturer:	*Other*

Reactions		
Moment:	1010	ft-kips
Axial:	29	kips
Shear:	12	kips

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

Anchor Rod Data		
Qty:	48	
Diam:	1	in
Rod Material:	Other	
Strength (Fu):	150	ksi
Yield (Fy):	105	ksi
Bolt Circle:	57	in

Anchor Rod Results

Maximum Rod Tension:	17.1 Kips	Rigid
Allowable Tension:	51.8 Kips	Service, ASD
Anchor Rod Stress Ratio:	33.0%	Fty*ASIF

Plate Data		
Diam:	60	in
Thick:	2	in
Grade:	36	ksi
Single-Rod B-eff:	3.53	in

Base Plate Results

	Flexural Check	Rigid
Base Plate Stress:	7.6 ksi	Service ASD
Allowable Plate Stress:	36.0 ksi	0.75*Fy*ASIF
Base Plate Stress Ratio:	21.0%	Y.L. Length: 18.25

Stiffener Data (Welding at both sides)		
Config:	0	*
Weld Type:	Both	
Groove Depth:	0	in **
Groove Angle:	45	degrees
Fillet H. Weld:	0.1875	in
Fillet V. Weld:	0.3125	in
Width:	6	in
Height:	18	in
Thick:	1	in
Notch:	1	in
Grade:	50	ksi
Weld str.:	70	ksi

n/a

Stiffener Results

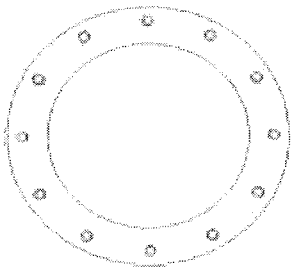
Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	n/a
Plate Comp. (AISC Bracket):	n/a

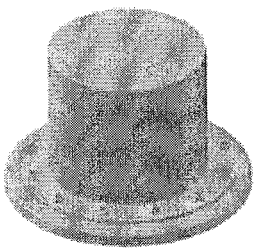
Pole Results

Pole Punching Shear Check:	n/a

Pole Data		
Diam:	54	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	





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

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

WIRELESS COMMUNICATIONS FACILITY

CT5199
BRANFORD EAST
10 SILVIA STREET
BRANFORD, CT 06405

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2005 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2009 CONNECTICUT SUPPLEMENT, INCLUDING THE TIA/EIA-222 REVISION "F" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES." 2005 CONNECTICUT FIRE SAFETY CODE AND 2009 AMENDMENTS, NATIONAL ELECTRICAL CODE AND LOCAL CODES.
2. THE COMPOUND, TOWER, PRIMARY GROUND RING, ELECTRICAL SERVICE TO THE METER BANK AND TELEPHONE SERVICE TO THE DEMARCATION POINT ARE PROVIDED BY SITE OWNER. AS BUILT FIELD CONDITIONS REGARDING THESE ITEMS SHALL BE CONFIRMED BY THE CONTRACTOR. SHOULD ANY FIELD CONDITIONS PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL NOT PROCEED WITH ANY AFFECTED WORK.
3. CONTRACTOR SHALL REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUBCONTRACTORS AND ALL RELATED PARTIES. THE SUBCONTRACTORS SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT AFFECTS THEIR WORK.
4. CONTRACTOR SHALL PROVIDE A COMPLETE BUILD-OUT WITH ALL FINISHES, STRUCTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS AND PROVIDE ALL ITEMS AS SHOWN OR INDICATED ON THE DRAWINGS OR IN THE WRITTEN SPECIFICATIONS.
5. CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.
6. CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND ALL INSPECTIONS REQUIRED AND SHALL ALSO PAY FEES REQUIRED FOR THE GENERAL CONSTRUCTION, PLUMBING, ELECTRICAL AND HVAC. PERMITS SHALL BE PAID FOR BY THE RESPECTIVE SUBCONTRACTORS.
7. CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION OF NEW DRAWINGS TO SUBCONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. THE CONTRACTOR SHALL FURNISH AN "AS-BUILT" SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.
8. LOCATION OF EQUIPMENT, AND WORK SUPPLIED BY OTHERS THAT IS DIAGRAMMATICALLY INDICATED ON THE DRAWINGS SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL DETERMINE LOCATIONS AND DIMENSIONS SUBJECT TO STRUCTURAL CONDITIONS AND WORK OF THE SUBCONTRACTORS.
9. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY. MAINTAIN EXISTING BUILDING'S/PROPERTY'S OPERATIONS, COORDINATE WORK WITH BUILDING/PROPERTY OWNER.
10. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
11. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
12. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUBCONTRACTORS FOR ANY CONDITION PER MFR.'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
13. ANY AND ALL ERRORS, DISCREPANCIES, AND 'MISSED" ITEMS ARE TO BE BROUGHT TO THE ATTENTION OF THE AT&T CONSTRUCTION MANAGER DURING THE BIDDING PROCESS BY THE CONTRACTOR. ALL THESE ITEMS ARE TO BE INCLUDED IN THE BID. NO 'EXTRA' WILL BE ALLOWED FOR MISSED ITEMS.
14. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
15. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE CONSTRUCTION MANAGER FOR REVIEW.
16. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA.
17. COORDINATION, LAYOUT, FURNISHING AND INSTALLATION OF CONDUIT AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
18. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUB-CONTRACTORS FOR ANY CONDITION PER THE MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
19. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
20. THE CONTRACTOR SHALL CONTACT "CALL BEFORE YOU DIG" AT LEAST 48 HOURS PRIOR TO ANY EXCAVATIONS AT 1-800-922-4455. ALL UTILITIES SHALL BE IDENTIFIED AND CLEARLY MARKED PRIOR TO ANY EXCAVATION WORK. CONTRACTOR SHALL MAINTAIN AND PROTECT MARKED UTILITIES THROUGHOUT PROJECT COMPLETION.
21. CONTRACTOR SHALL COMPLY WITH OWNERS ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.

SITE DIRECTIONS

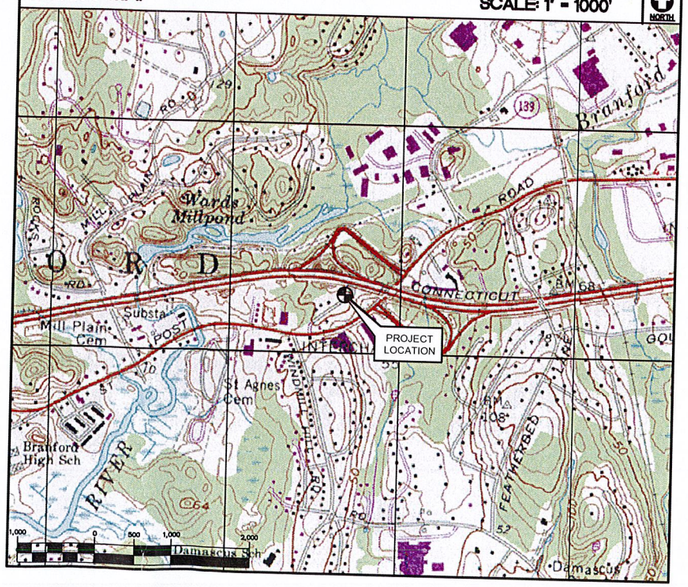
FROM: 500 ENTERPRISE DRIVE
ROCKY HILL, CONNECTICUT

TO: 10 SILVIA STREET
BRANFORD, CT 06405

1.	Take ramp left for I-91 South	
2.	Take ramp left for I-95 North toward New London	29.0 mi
3.	At exit 55, take ramp right for US-1 toward North Branford	7.7 mi
4.	Turn left onto US-1 / E Main St	0.3 mi
5.	Turn right onto Sylvia St	0.2 mi
	Arrive at Sylvia St, BRANFORD, CT 06405	0.1 mi

VICINITY MAP

SCALE: 1" = 1000'



PROJECT SUMMARY

1. THE PROPOSED SCOPE OF WORK GENERALLY CONSISTS OF THE MODIFICATION OF THE EXISTING T-ARM MOUNT TO ACCOMMODATE THE INSTALLATION OF 3 LTE ANTENNAS (1 PER SECTOR) AND THE RELOCATION OF SIX (6) CSM/UMTS ANTENNAS (2 PER SECTOR). THE EXISTING NUSS WILL BE REPLACED WITH A LTE BASEBAND EQUIPMENT UNIT (RBS) AND AN EMERSON POWER CABINET WILL BE INSTALLED ON A PROPOSED CONCRETE PAD.
2. ADDITIONALLY, (2) REMOTE RADIO UNITS (RRUs) PER SECTOR WILL BE INSTALLED. SURGE ARRESTORS WILL BE INSTALLED AT BOTH AT&T RRU AND EQUIPMENT LOCATIONS. REFER TO THESE ACCOMPANYING DRAWINGS FOR FURTHER INFORMATION.

PROJECT INFORMATION

AT&T SITE NUMBER:	CT5199
AT&T SITE NAME:	BRANFORD EAST
SITE ADDRESS:	10 SILVIA STREET BRANFORD, CT 06405
LESSEE/APPLICANT:	AT&T MOBILITY 500 ENTERPRISE DRIVE, SUITE 3A ROCKY HILL, CT 06067
ENGINEER:	CENTEK ENGINEERING, INC. 63-2 NORTH BRANFORD RD. BRANFORD, CT. 06405
PROJECT COORDINATES:	LATITUDE: 41°-17'-38.2"N LONGITUDE: 72°-47'-08.5"W GROUND ELEVATION: ±50'AMSL

SHEET INDEX

SHT. NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	1
N-1	NOTES AND SPECIFICATIONS	1
C-1	PLAN, ELEVATION & DETAIL	1
C-2	LTE EQUIPMENT DETAILS	1
E-1	ELECTRICAL DETAILS AND NOTES	1
E-2	ELECTRICAL DETAILS	1

DESIGNED BY:	DEB
DRAWN BY:	FLO
CHK'D BY:	CFC

REV.	DATE	DRAWN BY	CHK'D BY	
0	6/21/12	DEB	CFC	CONSTRUCTION
1	4/28/12	FLO	DEB	CONSTRUCTION - CLIENT REVIEW

PROFESSIONAL ENGINEER SEAL

STATE OF CONNECTICUT
CARLO C. DE TORE
No. 16604
LICENSED
PROFESSIONAL ENGINEER

at&t

NEXLINK

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(203) 488-8587 Fax
63-2 North Branford Road
Branford, CT 06405
www.CentekEng.com

AT&T MOBILITY

WIRELESS COMMUNICATIONS FACILITY / LTE UPGRADE

CT5199
BRANFORD EAST

10 SILVIA STREET
BRANFORD, CT 06405

DATE:	03/30/12
SCALE:	AS NOTED
JOB NO.	11118.C049

TITLE SHEET

T-1

STRUCTURAL SPECIFICATIONS

DESIGN BASIS

GOVERNING CODE: 2003 INTERNATIONAL BUILDING CODE (IBC) AS MODIFIED BY THE 2005 CONNECTICUT STATE BUILDING CODE AND 2009 AMENDMENTS.

1. DESIGN CRITERIA:
   - WIND LOAD: PER EIA/TIA 222 F-96 (ANTENNA MOUNTS): 90 MPH (FASTEST MILE), EQUIVALENT TO 110 MPH (3 SECOND GUST).
   - BASIC WIND SPEED (OTHER STRUCTURE): 110 MPH (3 SECOND GUST) (EXPOSURE B/IMPORTANCE FACTOR 1.0 BASED ON ASCE 7-02) PER 2003 INTERNATIONAL BUILDING CODE (IBC) AS MODIFIED BY THE 2005 CONNECTICUT SUPPLEMENT AND 2009 AMMENDMENT.
   - SEISMIC LOAD (DOES NOT CONTROL): PER ASCE 7-95 MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES.

GENERAL NOTES

1. IF ANY FIELD CONDITIONS EXIST WHICH PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL PROCEED WITH AFFECTED WORK AFTER CONFLICT IS SATISFACTORILY RESOLVED.
2. DIMENSIONS AND DETAILS SHALL BE CHECKED AGAINST THE PRE MANUFACTURED EQUIPMENT BUILDING SHOP DRAWINGS.
3. THE CONTRACTOR SHALL VERIFY AND COORDINATE THE SIZE AND LOCATION OF ALL OPENINGS, SLEEVES AND ANCHOR BOLTS AS REQUIRED BY ALL TRADES.
4. REFER TO DRAWING T1 FOR ADDITIONAL NOTES AND REQUIREMENTS.

SITE NOTES

1. THE CONTRACTOR SHALL CALL UTILITIES PRIOR TO THE START OF CONSTRUCTION.
2. ACTIVE EXISTING UTILITIES, WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES. THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY, PRIOR TO PROCEEDING, SHOULD ANY UNCOVERED EXISTING UTILITY PRECLUDE COMPLETION OF THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
3. ALL RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED OFF SITE AND BE LEGALLY DISPOSED, AT NO ADDITIONAL COST.
4. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE EQUIPMENT AND TOWER AREAS.
5. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.
6. THE SUBGRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
7. THE AREAS OF THE COMPOUND DISTURBED BY THE WORK SHALL BE RETURNED TO THEIR ORIGINAL CONDITION.
8. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.

EARTHWORK NOTES

1. COMPACTED GRAVEL FILL SHALL BE FURNISHED AND PLACED AS A FOUNDATION FOR STRUCTURES, WHERE SHOWN ON THE CONTRACT DRAWINGS OR DIRECTED BY THE ENGINEER.
2. CRUSHED STONE FILL SHALL BE PLACED IN 12" MAX. LIFTS AND CONSOLIDATED USING A HAND OPERATED VIBRATORY PLATE COMPACTOR WITH A MINIMUM OF 2 PAOSSES OF COMPACTOR PER LIFT.
3. COMPACTED GRAVEL FILL TO BE WELL GRADED BANK RUN GRAVEL MEETING THE FOLLOWING GRADATION REQUIREMENTS:

SIEVE DESIGNATION	% PASSING
1 ½"	100
No. 4	40-70
No. 100	5-20
No. 200	4-8

4. CRUSHED STONE TO BE UNIFORMLY GRADED, CLEAN, HARD PROCESS AGGREGATE MEETING THE FOLLOWING GRADATION REQUIREMENTS:

SIEVE DESIGNATION	% PASSING
1"	100
¾"	90-100
½"	0-15
⅜"	0-5

5. SELECT BACKFILL FOR FOUNDATION WALLS SHALL BE FREE OF ORGANIC MATERIAL, TOPSOIL, DEBRIS AND BOULDERS LARGER THAN 6".
6. GRAVEL AND GRANULAR FILL SHALL BE INSTALLED IN 8" MAX. LIFTS. COMPACTED TO 95% MIN. AT MAX. DRY DENSITY.
7. NON WOVEN GEOTEXTILE FOR SEPARATION PURPOSES SHALL BE MIRAFI 140N, OR ENGINEER APPROVED EQUAL.

CONCRETE CONSTRUCTION NOTES

1. CONCRETE CONSTRUCTION SHALL CONFORM TO THE FOLLOWING STANDARDS:
   - ACI 211 – STANDARD PRACTICE FOR SELECTING PROPORTIONS FOR NORMAL AND HEAVYWEIGHT CONCRETE.
   - ACI 301 – SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS.
   - ACI 302 – GUIDE FOR CONCRETE FLOOR AND SLAB CONSTRUCTION
   - ACI 304 – RECOMMENDED PRACTICE FOR MEASURING, MIXING, TRANSPORTING, AND PLACING CONCRETE.
   - ACI 306.1 STANDARD SPECIFICATION FOR COLD WEATHER CONCRETING
   - ACI 318 – BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE.
2. CONCRETE SHALL DEVELOP COMPRESSIVE STRENGTH IN 28 DAYS AS FOLLOWS:

   SLABS ON GRADE 4,000 PSI
   ALL OTHER CONCRETE 3,000 PSI

   - PORTLAND CEMENT: ASTM C150, TYPE II, (540 LBS/CUBIC YARD)
   - AGGREGATE: ASTM C33, No. 67, TYPICAL
   - WATER: POTABLE WITH MAXIMUM WATER CEMENT RATIO OF .55
   - SLUMP: 3" TO 4"
   - ADMIXTURES: USE AIR ENTRAINING ADGENT CONFORMING TO ASTM C260 WITH 4 TO 6% TOTAL AIR. USE WATER REDUCING AGENT CONFORMING TO ASTM C494, TYPE A, IN ALL CONCRETE. CALCIUM CHLORIDE MAY NOT BE USED TO ACCELERATE THE CONCRETE SETTING TIME.
3. REINFORCING STEEL SHALL BE 60,000 PSI YIELD STRENGTH.
4. WELDED WIRE FABRIC SHALL CONFORM TO ASTM- A-185.
5. ALL DETAILING, FABRICATION, AND ERECTION OF REINFORCING BARS, UNLESS OTHERWISE NOTED, MUST FOLLOW THE LATEST ACI CODE AND LATEST ACI "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES".
6. CONCRETE COVER OVER REINFORCING SHALL CONFORM TO THE FOLLOWING, UNLESS OTHERWISE SHOWN:

   BOTTOM OF FOOTINGS 3 INCHES

   SURFACES NOT EXPOSED TO EARTH OR WEATHER 1-1/2 INCHES
7. NO STEEL WIRE, METAL FORM TIES, OR ANY OTHER METAL SHALL REMAIN WITHIN THE REQUIRED COVER OF ANY CONCRETE SURFACE.
8. ALL REINFORCEMENT SHALL BE CONTINUOUS UNLESS OTHERWISE NOTED. SPLICES SHALL BE WELL STAGGERED. ADDITIONAL BARS AND SPECIAL BENDING DETAILS ARE REQUIRED AT INTERSECTING WALLS AND AT JOINTS. SUCH DETAILS SHALL COMPLY WITH ACI 315 RECOMMENDATIONS UNLESS OTHERWISE SHOWN.
9. NO TACK WELDING OF REINFORCING WILL BE PERMITTED.
10. NO CALCIUM CHLORIDE OR ADMIXTURES CONTAINING MORE THAN 1% CHLORIDE BY WEIGHT OF ADMIXTURE SHALL BE USED IN THE CONCRETE.
11. UNLESS OTHERWISE NOTED, ALL LAP SPLICES SHALL BE 48 BAR DIAMETERS.
12. SLAB ON GRADE FINISHES:

    EXTERIOR SLAB: NON-SLIP BROOM FINISH
    INTERIOR SLAB: STEEL TROWEL FINISH

FOUNDATION CONSTRUCTION NOTES

1. ALL FOOTINGS SHALL BE PLACED ON SUITABLE, COMPACTED SOIL HAVING ADEQUATE BEARING CAPACITY AND FREE OF ORGANIC CONTENT, CLAY, OR OTHER UNSUITABLE MATERIAL. ADDITIONAL EXCAVATION MAY BE REQUIRED BELOW FOOTING ELEVATIONS INDICATED IF UNSUITABLE MATERIAL IS ENCOUNTERED.
2. SUBGRADE PREPARATION: IF UNSUITABLE SOIL IS ENCOUNTERED, REMOVE ALL UNSUITABLE MATERIALS FROM BELOW PROPOSED STRUCTURE FOUNDATIONS AND COMPACT EXPOSED SOIL SURFACES. PLACE AND COMPACT APPROVED GRAVEL FILL. PLACEMENT OF ALL COMPACTED FILL MUST BE UNDER SUPERVISION OF AN APPROVED TESTING LABORATORY. FILL SHALL BE COMPACTED IN LAYERS NOT TO EXCEED 10" BEFORE COMPACTION. DETERMINE MAXIMUM DRY DENSITY IN ACCORDANCE WITH ASTM D1557-70 AND MAKE ONE (1) FIELD DENSITY TEST IN ACCORDANCE WITH ASTM D2167-66 FOR EACH 50 CUBIC YARDS OF COMPACTED FILL. BUT NOT LESS THAN ONE (1) PER LAYER, TO INSURE COMPACTION TO 95% OF MAX. DRY DENSITY.
3. ALL SOIL SURROUNDING AND UNDER ALL FOOTINGS SHALL BE KEPT REASONABLY DRY AND PROTECTED FROM FREEZING AND FROST ACTION DURING THE COURSE OF CONSTRUCTION.
4. WHERE GROUNDWATER IS ENCOUNTERED, DEWATERING SHALL BE ACCOMPLISHED CONTINUOUSLY AND COMPLETELY DURING FOUNDATION CONSTRUCTION. PROVIDE CRUSHED STONE AS REQUIRED TO STABILIZE FOOTING SUBGRADE.
5. ALL FOOTINGS ARE TO REST ON FIRM SOIL, REGARDLESS OF ELEVATIONS SHOWN ON THE DRAWINGS, BUT IN NO CASE MAY FOOTING ELEVATIONS BE HIGHER THAN INDICATED ON THE FOUNDATION PLAN, UNLESS SPECIFICALLY DIRECTED BY THE ENGINEER.

STRUCTURAL STEEL

1. ALL STRUCTURAL STEEL IS DESIGNED BY ALLOWABLE STRESS DESIGN (ASD)
   - A. STRUCTURAL STEEL (W SHAPES)---ASTM A992 (FY = 50 KSI)
   - B. STRUCTURAL STEEL (OTHER SHAPES)---ASTM A36 (FY = 36 KSI)
   - C. STRUCTURAL HSS (RECTANGULAR SHAPES)---ASTM A500 GRADE B, (FY = 46 KSI)
   - D. STRUCTURAL HSS (ROUND SHAPES)---ASTM A500 GRADE B, (FY = 42 KSI)
   - E. PIPE---ASTM A53 (FY = 35 KSI)
   - F. CONNECTION BOLTS---ASTM A325-N
   - G. U-BOLTS---ASTM A36
   - H. ANCHOR RODS---ASTM F 1554
   - I. WELDING ELECTRODE---ASTM E 70XX
2. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITALS BEFORE SUBMITTING TO THE ENGINEER FOR REVIEW. SHOP DRAWINGS SHALL INCLUDE THE FOLLOWING: SECTION PROFILES, SIZES, CONNECTION ATTACHMENTS, REINFORCING, ANCHORAGE, SIZE AND TYPE OF FASTENERS AND ACCESSORIES. INCLUDE ERECTION DRAWINGS, ELEVATIONS AND DETAILS.
3. STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST PROVISIONS OF AISC MANUAL OF STEEL CONSTRUCTION.
4. PROVIDE ALL PLATES, CLIP ANGLES, CLOSURE PIECES, STRAP ANCHORS, MISCELLANEOUS PIECES AND HOLES REQUIRED TO COMPLETE THE STRUCTURE.
5. FIT AND SHOP ASSEMBLE FABRICATIONS IN THE LARGEST PRACTICAL SECTIONS FOR DELIVERY TO SITE.
6. INSTALL FABRICATIONS PLUMB AND LEVEL, ACCURATELY FITTED, AND FREE FROM DISTORTIONS OR DEFECTS.
7. AFTER ERECTION OF STRUCTURES, TOUCHUP ALL WELDS, ABRASIONS AND NON-GALVANIZED SURFACES WITH A 95% ORGANIC ZINC RICH PAINT IN ACCORDANCE WITH ASTM 780.
8. ALL STEEL MATERIAL (EXPOSED TO WEATHER) SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT DIPPED GALVANIZED) COATINGS" ON IRONS AND STEEL PRODUCTS.
9. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC COATING (HOT-DIP) ON IRON AND STEEL HARDWARE".
10. CONTRACTOR SHALL COMPLY WITH AWS CODE FOR PROCEDURES APPEARANCE AND QUALITY OF WELDS, AND WELDING PROCESSES SHALL BE QUALIFIED IN ACCORDANCE WITH AWS "STANDARD QUALIFICATION PROCEDURES". ALL WELDING SHALL BE DONE USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC AND D1.1 WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLET J2.4 IN THE AISC "MANUAL OF STEEL CONSTRUCTION" 9TH EDITION. AT THE COMPLETION OF WELDING, ALL DAMAGE TO GALVANIZED COATING SHALL BE REPAIRED.
11. THE ENGINEER SHALL BE NOTIFIED OF ANY INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NON CONFORMING MATERIALS OR CONDITIONS TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE ENGINEER REVIEW.
12. CONNECTION ANGLES SHALL HAVE A MINIMUM THICKNESS OF 1/4 INCHES.
13. STRUCTURAL CONNECTION BOLTS SHALL CONFORM TO ASTM A325. ALL BOLTS SHALL BE 3/4" DIAMETER MINIMUM AND SHALL HAVE A MINIMUM OF TWO BOLTS, UNLESS OTHERWISE ON THE DRAWINGS.
14. CONNECTIONS SHALL CONFORM TO ALL REQUIREMENTS OF THE "AISC SPECIFICATION FOR THE DESIGN, FABRICATION, AND ERECTION OF STRUCTURAL STEEL FOR SHELTERS", LATEST EDITION, AND THE "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS", LATEST EDITION.
15. LOCK WASHER ARE NOT PERMITTED FOR A325 STEEL ASSEMBLIES.
16. SHOP CONNECTIONS SHALL BE WELDED OR HIGH STRENGTH BOLTED.
17. MILL BEARING ENDS OF COLUMNS, STIFFENERS, AND OTHER BEARING SURFACES TO TRANSFER LOAD OVER ENTIRE CROSS SECTION.
18. FABRICATE BEAMS WITH MILL CAMBER UP.
19. LEVEL AND PLUMB INDIVIDUAL MEMBERS OF THE STRUCTURE TO AN ACCURACY OF 1:500, BUT NOT TO EXCEED 1/4" IN THE FULL HEIGHT OF THE COLUMN.
20. COMMENCEMENT OF STRUCTURAL STEEL WORK WITHOUT NOTIFYING THE ENGINEER OF ANY DISCREPANCIES WILL BE CONSIDERED ACCEPTANCE OF PRECEDING WORK.
21. INSPECTION AND TESTING OF ALL WELDING AND HIGH STRENGTH BOLTING SHALL BE PERFORMED BY AN INDEPENDENT TESTING LABORATORY.
22. FOUR COPIES OF ALL INSPECTION TEST REPORTS SHALL BE SUBMITTED TO THE ENGINEER WITHIN TEN (10) WORKING DAYS OF THE DATE OF INSPECTION.

DESIGNED BY:	DEB
DRAWN BY:	FLO
CHK'D BY:	CFC

REV.	DATE	DRAWN BY	CHK'D BY	
1	8/21/12	DEB	CFC	CONSTRUCTION - CLIENT REVIEW
0	4/28/12	FLO	DEB	CONSTRUCTION

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DATE:	03/30/12
SCALE:	AS NOTED
JOB NO.	11118.C049

NOTES AND SPECIFICATIONS

N-1

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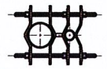
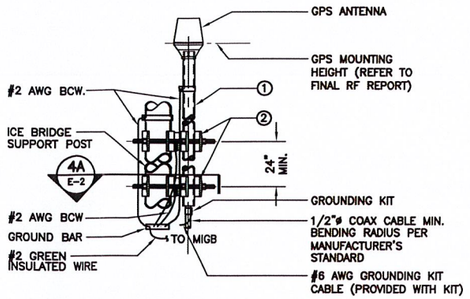
BILL OF MATERIALS		
ITEM	DESCRIPTION	QUANTITY
1	2-1/2"ø SCH. 40 x 8'-0" LG. MAX SS OR GALV. PIPE	1
2	UNIVERSAL CLAMP SET.	2



4A / E-2 PLAN VIEW
NOT TO SCALE

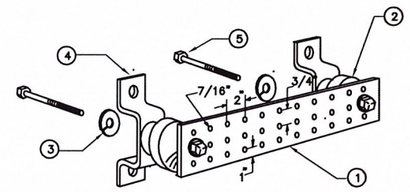
NOTES:

1. THE ELEVATION AND LOCATION OF THE GPS ANTENNA SHALL BE IN ACCORDANCE WITH THE FINAL RF REPORT AND COORDINATED WITH AT&T CONSTRUCTION MANAGER.
2. THE GPS ANTENNA MOUNT IS DESIGNED TO FASTEN TO A STANDARD 2-1/2" DIAMETER, SCHEDULE 40, GALVANIZED STEEL OR STAINLESS STEEL PIPE. THE PIPE MUST NOT BE THREADED AT THE ANTENNA MOUNT END. THE PIPE SHALL BE CUT TO THE REQUIRED LENGTH (MINIMUM OF 24 INCHES) USING A HAND OR ROTARY PIPE CUTTER TO ASSURE A SMOOTH AND PERPENDICULAR CUT. A HACK SAW SHALL NOT BE USED. THE CUT PIPE END SHALL BE DEBURRED AND SMOOTH IN ORDER TO SEAL AGAINST THE NEOPRENE GASKET ATTACHED TO THE ANTENNA MOUNT.
3. ATTACH TO ICE BRIDGE POST NEAREST ANTENNA CABLE PORT AT EQUIPMENT.
4. PRIOR TO INSTALLATION CONTRACTOR SHALL TEST GPS LOCATION WITH HAND HELD AND MOVE GPS ANTENNA TO OTHER ICE BRIDGE POSTS AS REQUIRED TO ACHIEVE ADEQUATE SIGNAL. FAILURE TO ACHIEVE ADEQUATE SIGNAL WITH A HAND HELD GPS SHALL BE REPORTED TO CONSTRUCTION MANAGER AND ENGINEER TO DETERMINE ALTERNATE INSTALLATION LOCATION FOR GPS ANTENNA.



GPS ANTENNA MOUNTING BRACKET

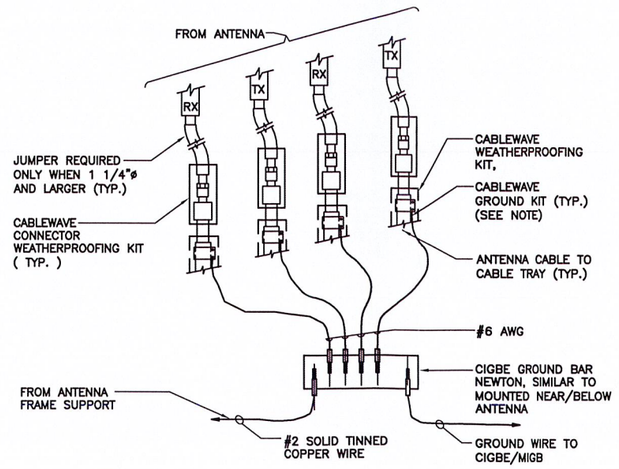
4 / E-2 GPS GROUNDING/MOUNTING BRACKET DETAILS
NOT TO SCALE



LEGEND

1. TINNED COPPER GROUND BAR, 1/4"x 4"x 20", NEWTON INSTRUMENT CO. HOLE CENTERS TO MATCH NEMA DOUBLE LUG .
2. INSULATORS, NEWTON INSTRUMENT CAT. NO. 2. 3061-4.
3. 3. 5/8" LOCK WASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015-8.
4. WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. 4. CAT NO. A-6056.
5. STAINLESS STEEL SECURITY SCREWS.

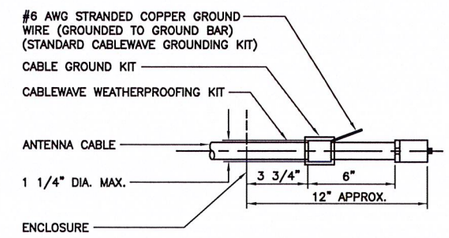
1 / E-2 GROUND BAR DETAIL
NOT TO SCALE



NOTE:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE

3 / E-2 CONNECTION OF GROUND WIRES TO GROUND BAR
NOT TO SCALE



NOTE:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.

2 / E-2 ANTENNA CABLE GROUNDING DETAIL
NOT TO SCALE

DESIGNED BY:	CKD
DRAWN BY:	TJB
CHK'D BY:	CKD

REV.	DATE	DRAWN BY	CHK'D BY	
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0	4/26/12	FLO	DEB	CONSTRUCTION - CLIENT REVIEW

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ELECTRICAL DETAILS

E-2

Sheet No. 6 of 6