



STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
www.ct.gov/csc

July 6, 2012

Stephanie Wenderoth
Nexlink Global Services
Suite A, Building 2
800 Marshall Phelps Road
Windsor, CT 06095

RE: **EM-AT&T-078-120618** – AT&T Mobility notice of intent to modify an existing telecommunications facility located at 497 Middle Turnpike, Mansfield, Connecticut.

Dear Ms. Wenderoth:

The Connecticut Siting Council (Council) hereby acknowledges your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies with the following conditions:

- Any deviation from the proposed modification as specified in this notice and supporting materials with Council shall render this acknowledgement invalid;
- Any material changes to this modification as proposed shall require the filing of a new notice with the Council;
- Not less than 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;
- The validity of this action shall expire one year from the date of this letter; and
- The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration;

The proposed modifications including the placement of all necessary equipment and shelters within the tower compound are to be implemented as specified here and in your notice dated June 14, 2012. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change



with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Thank you for your attention and cooperation.

Very truly yours,

A handwritten signature in cursive script that reads "Linda Roberts" followed by a small flourish.

Linda Roberts
Executive Director

LR/CDM/cm

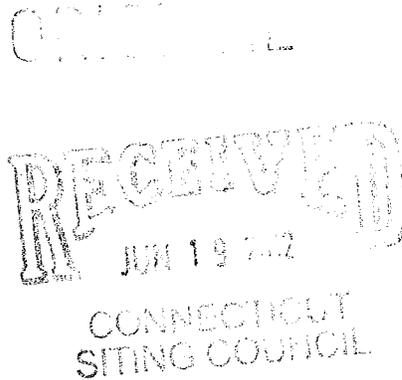
- c: The Honorable Elizabeth Patterson, Mayor, Town of Mansfield
- Matthew W. Hart, Town Manager, Town of Mansfield
- Linda M. Painter, Director of Planning and Development, Town of Mansfield

June 14, 2012

VIA UPS Overnight Delivery

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

RE: AT&T Mobility - Notice of Exempt Modification
497 Middle Turnpike, Storrs Mansfield



Dear Ms. Roberts:

This letter and attachments are submitted on behalf of AT&T Mobility ("AT&T"). AT&T is enhancing the capabilities of its wireless system in Connecticut by implementing LTE technology. In order to do so, AT&T will modify antenna and equipment configurations at a number of existing 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 attachments is being sent to the Town Manager of Windsor.

AT&T plans to modify the existing facility at 497 Middle Turnpike, owned by Bernard R. Brodin & AT&T Wireless Pcs LLC (coordinates 41-49-21.691 N, 72-17-10.676 W). Attached are drawings depicting the planned changes, and documentation of the structural sufficiency of the tower to accommodate the revised antenna configuration. Also included is a power density calculation reflecting the modification to AT&T's operations at the site.

The changes to the facility do not constitute a modification as defined in Connecticut General Statutes ("C.G.S.") Section 16-50i(d) because the general physical characteristics of the facility will not be significantly changed. Rather, the planned changes to the facility fall squarely within those activities explicitly provided for in R.C. S.A. Section | 6-50j-1 2(b)(2).

1. The height of the overall structure will be unaffected. The existing antennas will remain and AT&T will add three (3) new antennas, six (6) RRU's and one (1) surge arrestor. Additionally, AT&T will install one (1) fiber cable and two (2) DC control cables within the existing monopole.
2. The proposed changes will not extend the site boundaries. AT&T will install additional equipment in the existing equipment shelter. Thus, there will be no effect on the site compound.
3. The proposed changes will not increase the noise level at the existing facility by six decibels or more. The incremental effect of the proposed change will be negligible.
4. The changes to the facility 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 environment as calculated for a mixed frequency site. As indicated in the attached

power density calculations, AT&T's operations at the site will result in a power density of 2.16%; the combined site operations will result in a total power density of 15.9%.

Please feel free to call me with any questions or concerns regarding this matter.
Thank you for your consideration.

Respectfully submitted,



AT&T Mobility
Stephanie Wenderoth, Consultant
wenderoths@nexlinkgs.com
401.477.2938

Cc: Matthew Hart; Town Manager, 4 South Eagleville Road, Mansfield, CT 06268

**CONNECTICUT SITING COUNCIL
NOTICE OF INTENT TO MODIFY AN EXISTING TOWER FACILITY
EXEMPT MODIFICATION FILING FORM**

Public Utility Environmental Standards Act, Connecticut General Statutes §§ 16-50g - 16-50aa
Regulations of Connecticut State Agencies §§ 16-50j-72(b)(2) and 16-50j-73

TO BE COMPLETED BY FILER

Date: 6/14/12

Filer Name and Contact Information

Name: Stephanie Wenderoth

Address: Nexlink Global Services; Suite A Building 2
800 Marshall Phelps Road, Windsor, CT 06095

Phone Number: 401.477.2938

Wireless Carrier: AT&T

Tower Owner: AT&T

Tower Site Address: 497 Middle Turnpike, Storrs Mansfield

Municipality and Name of Chief Elected Official Provided A Copy Of This Notice:
Matthew Hart; Town Manager

Description of Exempt Modification (including antenna and equipment changes):
Add 3 LTE Antennas, new conduit, RRUs and surge arrestor.

Attachments

- Plans
- Power density calculations if applicable
- Tower structural report if applicable
- \$625.00 Filing Fee

If required:

Municipality w/i 2,500' & Name of Chief Elected Official Provided A Copy Of This Notice:

Underlying Property Owner Provided A Copy Of This Notice:

FOR STAFF USE ONLY

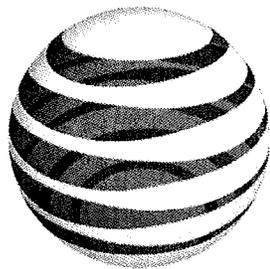
-
- Modification will not result in an increase in tower height
 - Modification is within existing site boundaries
 - Modification will not increase noise levels at the site boundary by 6 dbA or more, or to levels that exceed State & local criteria
 - Modification will meet FCC and DEEP MPE limits

- _____ Modification will not result in significant adverse change in physical or environmental characteristics of the site
- _____ Modification will not impair the structural integrity of the facility as determined by PE
- _____ If yes to all of the above, approval of acknowledgement letter



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

Calculated Radio Frequency Emissions



at&t

CT5822 – Mansfield Four Corners

497 Middle Turnpike, Storrs Mansfield, CT 06268

June 13, 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 497 Middle Turnpike in Storrs Mansfield, CT. The coordinates of the tower are 41-49-32.77 N, 72-16-54.45 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:

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

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
AT&T UMTS	120	880	1	500	0.0125	0.5867	2.13%
AT&T GSM	120	1900	2	427	0.0213	1.0000	2.13%
AT&T GSM	120	880	4	296	0.0296	0.5867	5.04%
Verizon	109	875	9	200	0.0545	0.5833	9.34%
Verizon PCS	109	1970	3	485	0.0440	1.0000	4.40%
AT&T UMTS	123	880	2	565	0.0027	0.5867	0.46%
AT&T UMTS	123	1900	2	875	0.0042	1.0000	0.42%
AT&T LTE	123	734	1	1375	0.0033	0.4893	0.67%
AT&T GSM	123	880	1	283	0.0007	0.5867	0.11%
AT&T GSM	123	1900	4	525	0.0050	1.0000	0.50%
						Total	15.90%

Table 1: Carrier Information^{1 2 3}

¹ The existing CSC filing for AT&T 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 GPD Group Structural Analysis Report dated 4/20/2012.

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 **15.90% 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 13, 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 Exposure⁴

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 Exposure⁵

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.

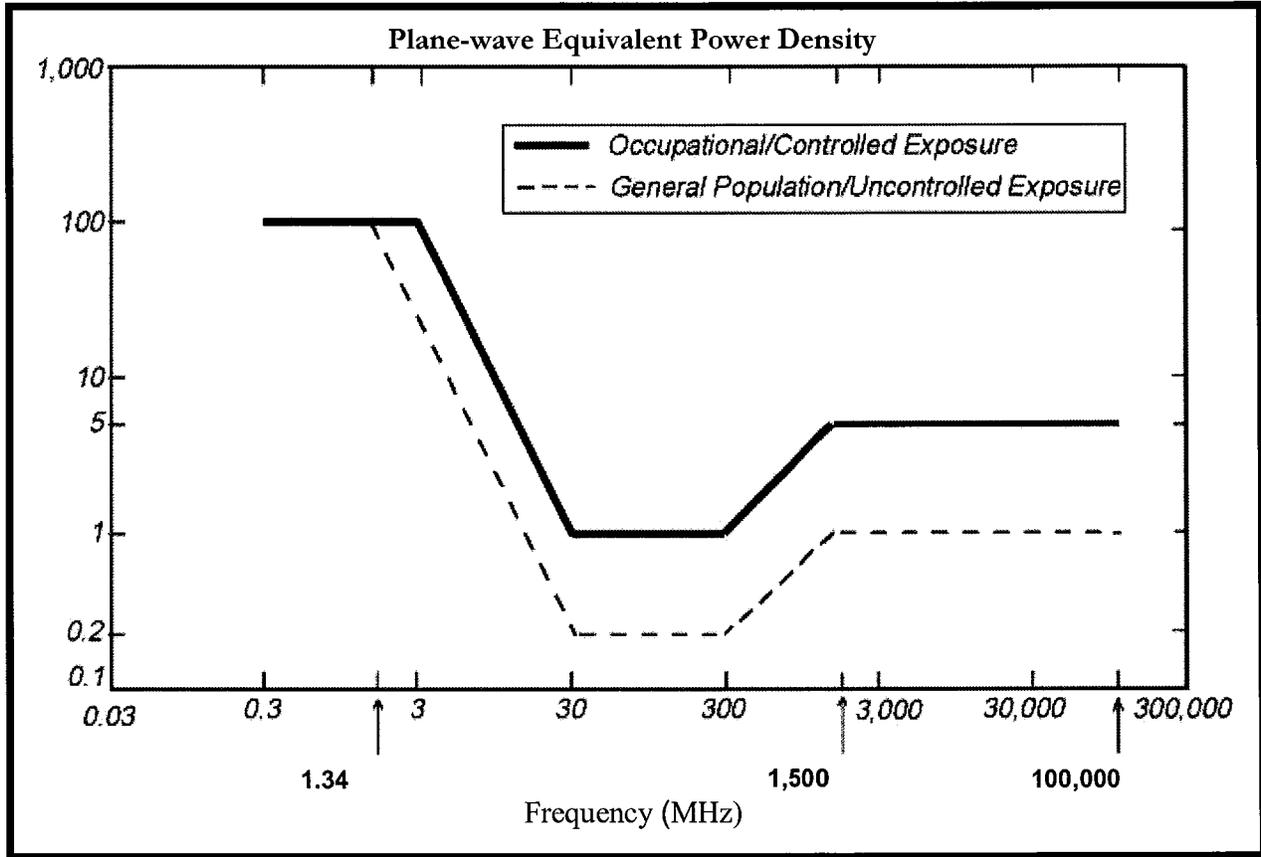
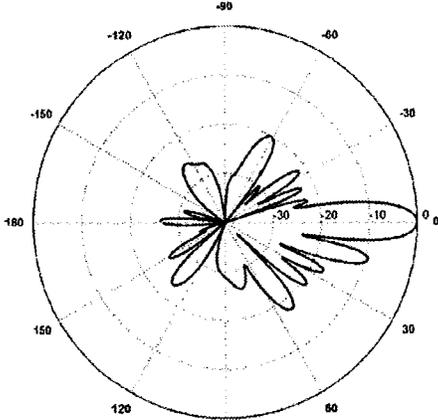
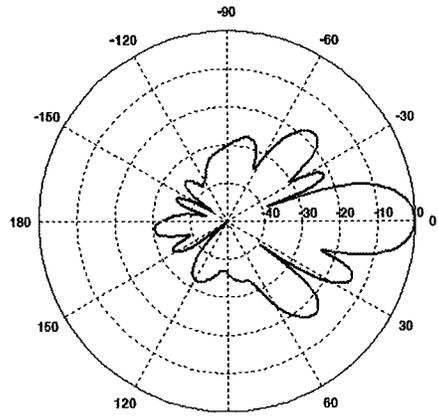
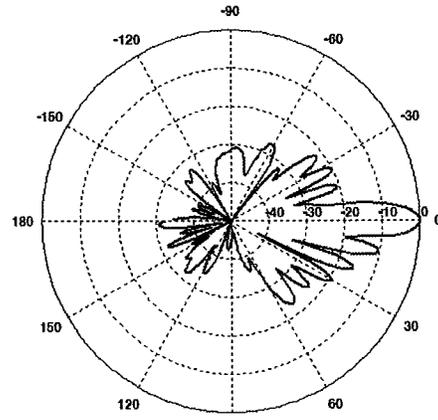


Figure 1: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

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

<p>700 MHz</p> <p>Manufacturer: Commscope Model #: SBNH-1D6565C Frequency Band: 698-806 MHz Gain: 13.6 dBd Vertical Beamwidth: 8.6° Horizontal Beamwidth: 71° Polarization: ±45° Size L x W x D: 96.4" x 11.6" x 7.1"</p>	
<p>850 MHz</p> <p>Manufacturer: Powerwave Model #: 7770.00 Frequency Band: 824-896 MHz Gain: 11.5 dBd Vertical Beamwidth: 15° Horizontal Beamwidth: 82° Polarization: Dual Linear ±45° Size L x W x D: 55.0" x 11.0" x 5.0"</p>	
<p>1900 MHz</p> <p>Manufacturer: Powerwave Model #: 7770.00 Frequency Band: 1850-1990 MHz Gain: 13.4 dBd Vertical Beamwidth: 7° Horizontal Beamwidth: 86° Polarization: Dual Linear ±45° Size L x W x D: 55.0" x 11.0" x 5.0"</p>	



Nexlink Global Services
 800 Marshall Phelps Rd, #2A
 Windsor, CT 06095
 (860) 640-4833



Jason Cheronis
 520 S. Main Street, Suite 2531
 Akron, OH 44311
 (330) 572-2137
jcheronis@gpdgroup.com

GPD# 2012801.04
 April 20, 2012

STRUCTURAL ANALYSIS REPORT

AT&T DESIGNATION: **Site USID:** **27067**
 Site FA: **10071108**
 Site Name: **MANSFIELD FOUR CORNERS**
 AT&T Project: **MOD LTE W3 012312**

ANALYSIS CRITERIA: **Codes:** **TIA/EIA-222-F, 2003 IBC, 2005 CT State Building Code, & ASCE 7-05**
 85-mph fastest mile with 0" ice
 28-mph fastest mile with 1" ice

SITE DATA: **497 Middle Turnpike, Storrs Mansfield, CT, 06268, Tolland County**
 Latitude 41° 49' 21.691" N, Longitude 72° 17' 10.676" W
 Market: New England
 120' PennSummit Monopole

Mr. Mark Roberts,

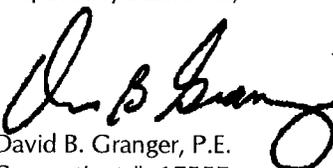
GPD is pleased to submit this Structural Analysis Report to determine the structural integrity of the aforementioned tower. The purpose of the analysis is to determine the suitability of the tower with the existing and proposed loading configuration detailed in the analysis report.

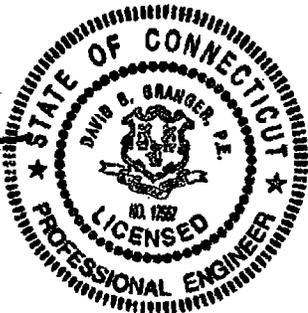
Analysis Results

Tower Stress Level with Proposed Equipment:	69.5%	Pass
Foundation Ratio with Proposed Equipment:	49.3%	Pass

We at GPD appreciate the opportunity of providing our continuing professional services to you and NexLink. If you have any questions or need further assistance on this or any other projects please do not hesitate to call.

Respectfully submitted,


 David B. Granger, P.E.
 Connecticut #: 17557



SUMMARY & RESULTS

The purpose of this analysis was to verify whether the existing structure is capable of carrying the proposed loading configuration as specified by AT&T to NexLink. This report was commissioned by Mr. Mark Roberts of NexLink.

All proposed coax shall be installed inside of a 3" flexible conduit internal to the monopole.

TOWER SUMMARY AND RESULTS

Member	Capacity	Results
Monopole	69.5%	Pass
Anchor Rods	36.5%	Pass
Base Plate	34.5%	Pass
Foundation	49.3%	Pass

ANALYSIS METHOD

tnxTower (Version 6.0.4.0), a commercially available software program, was used to create a three-dimensional model of the tower and calculate primary member stresses for various dead, live, wind, and ice load cases. Selected output from the analysis is included in Appendix B. The following table details the information provided to complete this structural analysis. This analysis is solely based on this information and is being completed without the benefit of a detailed site visit.

DOCUMENTS PROVIDED

Document	Remarks	Source
Equipment Modification Form	AT&T Internal Loading Document, uploaded 3/29/2012	Siterra
RF Data Sheet	Not Provided	N/A
Construction Drawings	Construction Document Rev. 0, dated 4/11/2012	NexLink
Tower Design	Not Provided	Siterra
Foundation Design	Not Provided	Siterra
Geotechnical Report	Not Provided	Siterra
Previous Structural Analysis	Paul J. Ford, Project #: 29207-104, dated 9/5/2007 (contains foundation, geotechnical and tower information)	Siterra
Previous Structural Analysis	GPD Job #: 2008013.31, dated 12/9/2008	Siterra

ASSUMPTIONS

This structural analysis is based on the theoretical capacity of the members and is not a condition assessment of the tower. This analysis is from information supplied, and therefore, its results are based on and are as accurate as that supplied data. GPD has made no independent determination, nor is it required to, of its accuracy. The following assumptions were made for this structural analysis.

1. The tower member sizes and shapes are considered accurate as supplied. The material grade is as per data supplied and/or as assumed and as stated in the materials section.
2. The antenna configuration is as supplied and/or as modeled in the analysis. It is assumed to be complete and accurate. All antennas, mounts, coax and waveguides are assumed to be properly installed and supported as per manufacturer requirements.
3. Some assumptions are made regarding antennas and mount sizes and their projected areas based on best interpretation of data supplied and of best knowledge of antenna type and industry practice.
4. All mounts, if applicable, are considered adequate to support the loading. No actual analysis of the mount(s) is performed. This analysis is limited to analyzing the tower only.
5. The soil parameters are as per data supplied or as assumed and stated in the calculations.
6. Foundations are properly designed and constructed to resist the original design loads indicated in the documents provided.
7. The tower and structures have been properly maintained in accordance with TIA Standards and/or with manufacturer's specifications.
8. All welds and connections are assumed to develop at least the member capacity unless determined otherwise and explicitly stated in this report.
9. Loading interpreted from photos is accurate to $\pm 5'$ AGL, antenna size accurate to ± 3.3 sf, and coax equal to the number of existing antennas without reserve.
10. All existing loading was obtained from GPD (Job #: 2008013.31, dated 12/9/2008), site photos, the provided Equipment Modification Form and the Construction Drawings and is assumed to be accurate.
11. The proposed loading listed within the Equipment Modification Form was found to vary from the proposed loading listed in the Construction Drawings. The proposed loading has been modeled based on the loading listed within the Construction Drawings.
12. All proposed coax shall be installed inside of a 3" flexible conduit internal to the monopole.

If any of these assumptions are not valid or have been made in error, this analysis may be affected, and GPD Group should be allowed to review any new information to determine its effect on the structural integrity of the tower.

DISCLAIMER OF WARRANTIES

GPD GROUP has not performed a site visit to the tower to verify the member sizes or antenna/coax loading. If the existing conditions are not as represented on the tower elevation contained in this report, we should be contacted immediately to evaluate the significance of the discrepancy. This is not a condition assessment of the tower or foundation. This report does not replace a full tower inspection. The tower and foundations are assumed to have been properly fabricated, erected, maintained, in good condition, twist free, and plumb.

The engineering services rendered by GPD GROUP in connection with this Structural Analysis are limited to a computer analysis of the tower structure and theoretical capacity of its main structural members. All tower components have been assumed to only resist dead loads when no other loads are applied. No allowance was made for any damaged, bent, missing, loose, or rusted members (above and below ground). No allowance was made for loose bolts or cracked welds.

GPD GROUP does not analyze the fabrication of the structure (including welding). It is not possible to have all the very detailed information needed to perform a thorough analysis of every structural sub-component and connection of an existing tower. GPD GROUP provides a limited scope of service in that we cannot verify the adequacy of every weld, plate connection detail, etc. The purpose of this report is to assess the feasibility of adding appurtenances usually accompanied by transmission lines to the structure.

It is the owner's responsibility to determine the amount of ice accumulation in excess of the specified code recommended amount, if any, that should be considered in the structural analysis.

The attached sketches are a schematic representation of the analyzed tower. If any material is fabricated from these sketches, the contractor shall be responsible for field verifying the existing conditions, proper fit, and clearance in the field. Any mentions of structural modifications are reasonable estimates and should not be used as a precise construction document. Precise modification drawings are obtainable from GPD GROUP, but are beyond the scope of this report.

Miscellaneous items such as antenna mounts, etc., have not been designed or detailed as a part of our work. We recommend that material of adequate size and strength be purchased from a reputable tower manufacturer.

GPD GROUP makes no warranties, expressed and/or implied, in connection with this report and disclaims any liability arising from material, fabrication, and erection of this tower. GPD GROUP will not be responsible whatsoever for, or on account of, consequential or incidental damages sustained by any person, firm, or organization as a result of any data or conclusions contained in this report. The maximum liability of GPD GROUP pursuant to this report will be limited to the total fee received for preparation of this report.

APPENDIX A

Tower Analysis Summary Form

APPENDIX B

tnxTower Output File

tnxTower GPD Group 520 S. Main St. Suite 2531 Akron, OH 44311 Phone: (330) 572-2100 FAX: (330) 572-2101	Job 27067 MANSFIELD FOUR CORNERS	Page 1 of 5
	Project 2012801.04	Date 10:14:43 04/20/12
	Client NexLink	Designed by T. Sheldon

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 Tolland County, Connecticut.

Basic wind speed of 85 mph.

Nominal ice thickness of 1.0000 in.

Ice thickness is considered to increase with height.

Ice density of 56 pcf.

A wind speed of 28 mph is used in combination with ice.

Temperature drop of 50 °F.

Deflections calculated using a wind speed of 50 mph.

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

Pressures are calculated at each section.

Stress ratio used in pole design is 1.333.

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

Options

<ul style="list-style-type: none"> Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification √ Use Code Stress Ratios √ Use Code Safety Factors - Guys √ Escalate Ice Always Use Max Kz Use Special Wind Profile Include Bolts In Member Capacity Leg Bolts Are At Top Of Section Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) Add IBC .6D+W Combination 	<ul style="list-style-type: none"> Distribute Leg Loads As Uniform Assume Legs Pinned √ Assume Rigid Index Plate Use Clear Spans For Wind Area Use Clear Spans For KL/r Retension Guys To Initial Tension √ Bypass Mast Stability Checks √ Use Azimuth Dish Coefficients √ Project Wind Area of Appurt. Autocalc Torque Arm Areas SR Members Have Cut Ends √ Sort Capacity Reports By Component Triangulate Diamond Inner Bracing 	<ul style="list-style-type: none"> Treat Feedline Bundles As Cylinder Use ASCE 10 X-Brace Ly Rules Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression All Leg Panels Have Same Allowable Offset Girt At Foundation √ Consider Feedline Torque Include Angle Block Shear Check <li style="text-align: center;">Poles √ Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets
--	--	---

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C _A A _A ft ² /ft	Weight plf
Climbing Pegs	C	No	CaAa (Out Of Face)	120.00 - 8.00	1	No Ice	0.01	0.31
						1/2" Ice	0.12	0.71
						1" Ice	0.22	1.71
						2" Ice	0.41	5.56
						4" Ice	0.82	20.59
Safety Line 3/8	C	No	CaAa (Out Of Face)	120.00 - 8.00	1	No Ice	0.04	0.22
						1/2" Ice	0.14	0.75
						1" Ice	0.24	1.28
						2" Ice	0.44	2.34
						4" Ice	0.84	4.46

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Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	C _A A _A		Weight plf
						ft ² /ft	plf	
LDF6-50A (1-1/4 FOAM)	C	No	Inside Pole	120.00 - 8.00	12	No Ice	0.00	0.66
						1/2" Ice	0.00	0.66
						1" Ice	0.00	0.66
						2" Ice	0.00	0.66
						4" Ice	0.00	0.66
3/8" Fiber Cable	C	No	Inside Pole	120.00 - 8.00	1	No Ice	0.00	0.10
						1/2" Ice	0.00	0.10
						1" Ice	0.00	0.10
						2" Ice	0.00	0.10
						4" Ice	0.00	0.10
7/8" DC Power Cable	C	No	Inside Pole	120.00 - 8.00	2	No Ice	0.00	0.60
						1/2" Ice	0.00	0.60
						1" Ice	0.00	0.60
						2" Ice	0.00	0.60
						4" Ice	0.00	0.60
3" Flex Conduit	A	No	Inside Pole	120.00 - 8.00	1	No Ice	0.00	0.48
						1/2" Ice	0.00	0.48
						1" Ice	0.00	0.48
						2" Ice	0.00	0.48
						4" Ice	0.00	0.48
LDF7-50A (1-5/8 FOAM)	A	No	Inside Pole	109.00 - 8.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment °	Placement ft	C _A A _A		Weight lb	
			Horz ft	Lateral ft			Front ft ²	Side ft ²		
MTS 12.5' LP Platform	C	None			0.0000	119.00	No Ice	14.66	14.66	1250.00
							1/2" Ice	18.87	18.87	1481.33
							1" Ice	23.08	23.08	1712.66
							2" Ice	31.50	31.50	2175.32
							4" Ice	48.34	48.34	3100.64
(2) 7770.00 w/Mount Pipe	A	From Leg	4.00		0.0000	119.00	No Ice	5.88	4.10	61.54
			0.00				1/2" Ice	6.31	4.73	107.08
			4.00				1" Ice	6.75	5.37	160.39
							2" Ice	7.66	6.70	289.46
							4" Ice	9.58	9.87	654.29
(2) 7770.00 w/Mount Pipe	B	From Leg	4.00		0.0000	119.00	No Ice	5.88	4.10	61.54
			0.00				1/2" Ice	6.31	4.73	107.08
			4.00				1" Ice	6.75	5.37	160.39
							2" Ice	7.66	6.70	289.46
							4" Ice	9.58	9.87	654.29
(2) 7770.00 w/Mount Pipe	C	From Leg	4.00		0.0000	119.00	No Ice	5.88	4.10	61.54
			0.00				1/2" Ice	6.31	4.73	107.08
			4.00				1" Ice	6.75	5.37	160.39
							2" Ice	7.66	6.70	289.46
							4" Ice	9.58	9.87	654.29
(2) LGP21401	A	From Leg	4.00		0.0000	119.00	No Ice	1.29	0.23	14.10
			0.00				1/2" Ice	1.45	0.31	21.26
			4.00				1" Ice	1.61	0.40	30.32

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _A A _A Front ft ²	C _A A _A Side ft ²	Weight lb	
(2) LGP21401	B	From Leg	4.00 0.00 4.00	0.0000	119.00	2" Ice	1.97	0.61	54.89
						4" Ice	2.79	1.12	135.29
						No Ice	1.29	0.23	14.10
						1/2" Ice	1.45	0.31	21.26
						1" Ice	1.61	0.40	30.32
						2" Ice	1.97	0.61	54.89
(2) LGP21401	C	From Leg	4.00 0.00 4.00	0.0000	119.00	4" Ice	2.79	1.12	135.29
						No Ice	1.29	0.23	14.10
						1/2" Ice	1.45	0.31	21.26
						1" Ice	1.61	0.40	30.32
						2" Ice	1.97	0.61	54.89
						4" Ice	2.79	1.12	135.29
(2) LGP21903 Diplexer	A	From Leg	4.00 0.00 4.00	0.0000	119.00	No Ice	0.00	0.18	10.00
						1/2" Ice	0.00	0.25	13.44
						1" Ice	0.00	0.32	16.93
						2" Ice	0.00	0.49	27.95
						4" Ice	0.00	0.94	71.54
						No Ice	0.00	0.18	10.00
(2) LGP21903 Diplexer	B	From Leg	4.00 0.00 4.00	0.0000	119.00	No Ice	0.00	0.18	11.02
						1/2" Ice	0.00	0.25	13.44
						1" Ice	0.00	0.32	16.93
						2" Ice	0.00	0.49	27.95
						4" Ice	0.00	0.94	71.54
						No Ice	0.00	0.18	10.00
(2) LGP21903 Diplexer	C	From Leg	4.00 0.00 4.00	0.0000	119.00	1/2" Ice	0.00	0.25	13.44
						1" Ice	0.00	0.32	16.93
						2" Ice	0.00	0.49	27.95
						4" Ice	0.00	0.94	71.54
						No Ice	0.00	0.18	10.00
						1/2" Ice	0.00	0.25	13.44
2.5" x 6' mount pipe	A	From Leg	4.00 0.00 4.00	0.0000	119.00	1" Ice	2.34	2.34	46.69
						2" Ice	3.10	3.10	90.27
						4" Ice	4.75	4.75	233.04
						No Ice	1.50	1.50	20.00
						1/2" Ice	1.97	1.97	31.31
						1" Ice	2.34	2.34	46.69
2.5" x 6' mount pipe	B	From Leg	4.00 0.00 4.00	0.0000	119.00	2" Ice	3.10	3.10	90.27
						4" Ice	4.75	4.75	233.04
						No Ice	1.50	1.50	20.00
						1/2" Ice	1.97	1.97	31.31
						1" Ice	2.34	2.34	46.69
						2" Ice	3.10	3.10	90.27
2.5" x 6' mount pipe	C	From Leg	4.00 0.00 4.00	0.0000	119.00	4" Ice	4.75	4.75	233.04
						No Ice	1.50	1.50	20.00
						1/2" Ice	1.97	1.97	31.31
						1" Ice	2.34	2.34	46.69
						2" Ice	3.10	3.10	90.27
						4" Ice	4.75	4.75	233.04
AM-X-CD-16-65-00T w/ 2"x78" Mount Pipe	A	From Leg	4.00 0.00 4.00	0.0000	119.00	No Ice	7.09	5.68	56.73
						1/2" Ice	7.71	6.69	112.77
						1" Ice	8.28	7.51	179.35
						2" Ice	9.45	9.18	335.57
						4" Ice	11.92	12.75	772.87
						No Ice	7.09	5.68	56.73
AM-X-CD-16-65-00T w/ 2"x78" Mount Pipe	B	From Leg	4.00 0.00 4.00	0.0000	119.00	1/2" Ice	7.71	6.69	112.77
						1" Ice	8.28	7.51	179.35
						2" Ice	9.45	9.18	335.57
						4" Ice	11.92	12.75	772.87
						No Ice	7.09	5.68	56.73
						1/2" Ice	7.71	6.69	112.77
SBNH-1D6565C w/ Mount Pipe	C	From Leg	4.00 0.00 4.00	0.0000	119.00	1" Ice	8.28	7.51	179.35
						2" Ice	9.45	9.18	335.57
						4" Ice	11.92	12.75	772.87
						No Ice	11.45	9.12	82.70
						1/2" Ice	12.06	10.21	162.03
						1" Ice	12.69	11.18	254.15
2" Ice	14.03	13.17	469.01						
4" Ice	17.05	17.35	1051.99						

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	Client	NexLink	Designed by	T. Sheldon

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _A A _A		Weight	
			Horz	Lateral			Front	Side		
			ft	ft	°	ft	ft ²	ft ²	lb	
(2) RRUS 11	A	From Leg	4.00		0.0000	119.00	No Ice	2.94	1.25	55.00
			0.00				1/2" Ice	3.17	1.41	74.32
			4.00				1" Ice	3.41	1.59	96.56
							2" Ice	3.91	1.96	150.56
							4" Ice	5.02	2.82	302.12
(2) RRUS 11	B	From Leg	4.00		0.0000	119.00	No Ice	2.94	1.25	55.00
			0.00				1/2" Ice	3.17	1.41	74.32
			4.00				1" Ice	3.41	1.59	96.56
							2" Ice	3.91	1.96	150.56
							4" Ice	5.02	2.82	302.12
(2) RRUS 11	C	From Leg	4.00		0.0000	119.00	No Ice	2.94	1.25	55.00
			0.00				1/2" Ice	3.17	1.41	74.32
			4.00				1" Ice	3.41	1.59	96.56
							2" Ice	3.91	1.96	150.56
							4" Ice	5.02	2.82	302.12
DC6-48-60-18-8F Surge Suppression Unit	C	From Leg	1.00		0.0000	119.00	No Ice	1.47	1.47	32.80
			0.00				1/2" Ice	1.67	1.67	50.52
			4.00				1" Ice	1.88	1.88	70.72
							2" Ice	2.33	2.33	119.24
							4" Ice	3.38	3.38	252.92
2.5" x 3.5' Mount Pipe	C	From Leg	1.00		0.0000	119.00	No Ice	0.74	0.74	20.00
			0.00				1/2" Ice	0.96	0.96	26.73
			4.00				1" Ice	1.18	1.18	36.00
							2" Ice	1.66	1.66	62.79
							4" Ice	2.92	2.92	153.63
MTS 12.5' LP Platform	C	None			0.0000	109.00	No Ice	14.66	14.66	1250.00
							1/2" Ice	18.87	18.87	1481.33
							1" Ice	23.08	23.08	1712.66
							2" Ice	31.50	31.50	2175.32
							4" Ice	48.34	48.34	3100.64
(2) LPA-80080/6CF w/ Mount Pipe	A	From Leg	3.76		20.0000	109.00	No Ice	4.35	10.51	42.90
			1.37				1/2" Ice	4.79	11.56	104.60
			0.00				1" Ice	5.25	12.49	177.42
							2" Ice	6.17	14.40	348.65
							4" Ice	8.11	18.43	824.28
(2) LPA-80080/6CF w/ Mount Pipe	B	From Leg	3.76		20.0000	109.00	No Ice	4.35	10.51	42.90
			1.37				1/2" Ice	4.79	11.56	104.60
			0.00				1" Ice	5.25	12.49	177.42
							2" Ice	6.17	14.40	348.65
							4" Ice	8.11	18.43	824.28
(2) LPA-80080/6CF w/ Mount Pipe	C	From Leg	3.76		20.0000	109.00	No Ice	4.35	10.51	42.90
			1.37				1/2" Ice	4.79	11.56	104.60
			0.00				1" Ice	5.25	12.49	177.42
							2" Ice	6.17	14.40	348.65
							4" Ice	8.11	18.43	824.28
(2) LPA-185080/12CF w/ Mount Pipe	A	From Leg	3.76		20.0000	109.00	No Ice	3.79	6.23	36.05
			1.37				1/2" Ice	4.33	7.40	78.20
			0.00				1" Ice	4.84	8.28	131.70
							2" Ice	5.87	10.09	263.48
							4" Ice	8.05	13.93	660.48
(2) LPA-185080/12CF w/ Mount Pipe	B	From Leg	3.76		20.0000	109.00	No Ice	3.79	6.23	36.05
			1.37				1/2" Ice	4.33	7.40	78.20
			0.00				1" Ice	4.84	8.28	131.70
							2" Ice	5.87	10.09	263.48
							4" Ice	8.05	13.93	660.48
(2) LPA-185080/12CF w/ Mount Pipe	C	From Leg	3.76		20.0000	109.00	No Ice	3.79	6.23	36.05
			1.37				1/2" Ice	4.33	7.40	78.20

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	Client	NexLink	Designed by	T. Sheldon

Description	Face or Leg	Offset Type	Offsets: Horz Lateral	Azimuth Adjustment	Placement	C _A A _A Front	C _A A _A Side	Weight
			ft ft ft	°	ft	ft ²	ft ²	lb
			0.00			1" Ice 4.84	8.28	131.70
						2" Ice 5.87	10.09	263.48
						4" Ice 8.05	13.93	660.48
(2) TMA	A	From Leg	3.76	20.0000	109.00	No Ice 0.00	0.12	1.20
			1.37			1/2" Ice 0.00	0.17	3.05
			0.00			1" Ice 0.00	0.24	5.87
						2" Ice 0.00	0.39	15.20
						4" Ice 0.00	0.81	54.09
(2) TMA	B	From Leg	3.76	20.0000	109.00	No Ice 0.00	0.12	1.20
			1.37			1/2" Ice 0.00	0.17	3.05
			0.00			1" Ice 0.00	0.24	5.87
						2" Ice 0.00	0.39	15.20
						4" Ice 0.00	0.81	54.09
(2) TMA	C	From Leg	3.76	20.0000	109.00	No Ice 0.00	0.12	1.20
			1.37			1/2" Ice 0.00	0.17	3.05
			0.00			1" Ice 0.00	0.24	5.87
						2" Ice 0.00	0.39	15.20
						4" Ice 0.00	0.81	54.09

Critical Deflections and Radius of Curvature - Service Wind

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
119.00	MTS 12.5' LP Platform	35	13.816	1.2212	0.0063	28785
109.00	MTS 12.5' LP Platform	35	11.464	1.0823	0.0048	13084

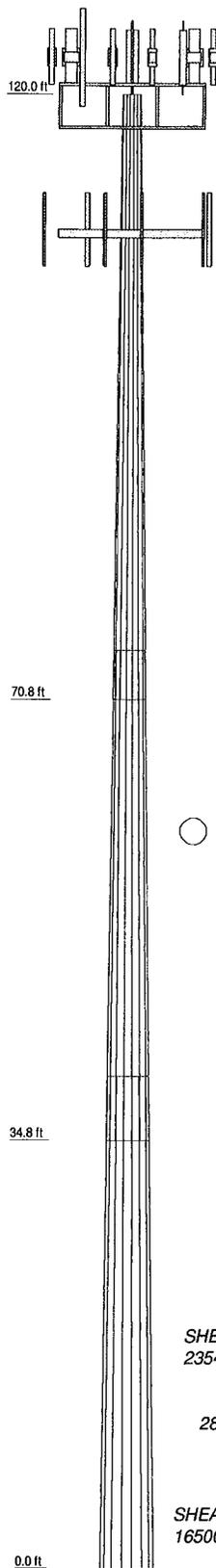
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	SF*P _{allow} lb	% Capacity	Pass Fail
L1	120 - 70.75	Pole	TP32.283x18x0.1875	1	-6816.23	916122.87	69.5	Pass
L2	70.75 - 34.75	Pole	TP42.348x30.748x0.3125	2	-12083.30	2089037.52	48.1	Pass
L3	34.75 - 0	Pole	TP51.8x40.2005x0.375	3	-21042.20	3182057.49	43.0	Pass
Summary								
Pole (L1)							69.5	Pass
RATING =							69.5	Pass

APPENDIX C

Tower Elevation Drawing

Section	1	2	3
Length (ft)	49.25	40.00	40.00
Number of Sides	18	18	18
Thickness (in)	0.1875	0.3125	0.3750
Socket Length (ft)	4.00	5.25	40.2005
Top Dia (in)	18.0000	30.7480	51.8000
Bot Dia (in)	32.2830	42.3480	7391.6
Grade		A607-65	
Weight (lb)	2488.8	4892.0	14772.4



DESIGNED APPURTENANCE LOADING

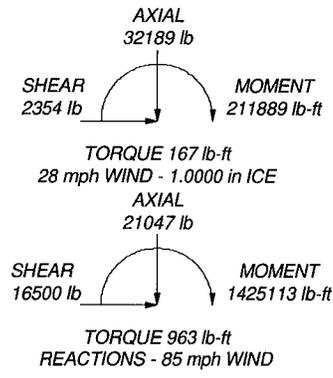
TYPE	ELEVATION	TYPE	ELEVATION
MTS 12.5' LP Platform	119	SBNH-1D6565C w/ Mount Pipe	119
(2) 7770.00 w/Mount Pipe	119	(2) RRUS 11	119
(2) 7770.00 w/Mount Pipe	119	(2) RRUS 11	119
(2) 7770.00 w/Mount Pipe	119	(2) RRUS 11	119
(2) LGP21401	119	DC6-48-60-18-8F Surge Suppression Unit	119
(2) LGP21401	119		
(2) LGP21401	119	2.5" x 3.5' Mount Pipe	119
(2) LGP21903 Diplexer	119	MTS 12.5' LP Platform	109
(2) LGP21903 Diplexer	119	(2) LPA-80080/6CF w/ Mount Pipe	109
(2) LGP21903 Diplexer	119	(2) LPA-80080/6CF w/ Mount Pipe	109
2.5" x 6' mount pipe	119	(2) LPA-80080/6CF w/ Mount Pipe	109
2.5" x 6' mount pipe	119	(2) LPA-185080/12CF w/ Mount Pipe	109
2.5" x 6' mount pipe	119	(2) LPA-185080/12CF w/ Mount Pipe	109
AM-X-CD-16-65-00T w/ 2"x78" Mount Pipe	119	(2) LPA-185080/12CF w/ Mount Pipe	109
AM-X-CD-16-65-00T w/ 2"x78" Mount Pipe	119	(2) TMA	109
		(2) TMA	109
		(2) TMA	109

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in Tolland 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 28 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 69.5%



 GPD Group 520 S. Main St. Suite 2531 Akron, OH 44311 Phone: (330) 572-2100 FAX: (330) 572-2101	Job: 27067 MANSFIELD FOUR CORNERS Project: 2012801.04	
	Client: NexLink Code: TIA/EIA-222-F	Drawn by: T. Sheldon Date: 04/20/12
	Path: C:\2012\2012801\04\TNX\27067 MANSFIELD FOUR CORNERS - TNX.dwg	App'd: Scale: NTS Dwg No. E-1

Feedline Distribution Chart

0' - 120'

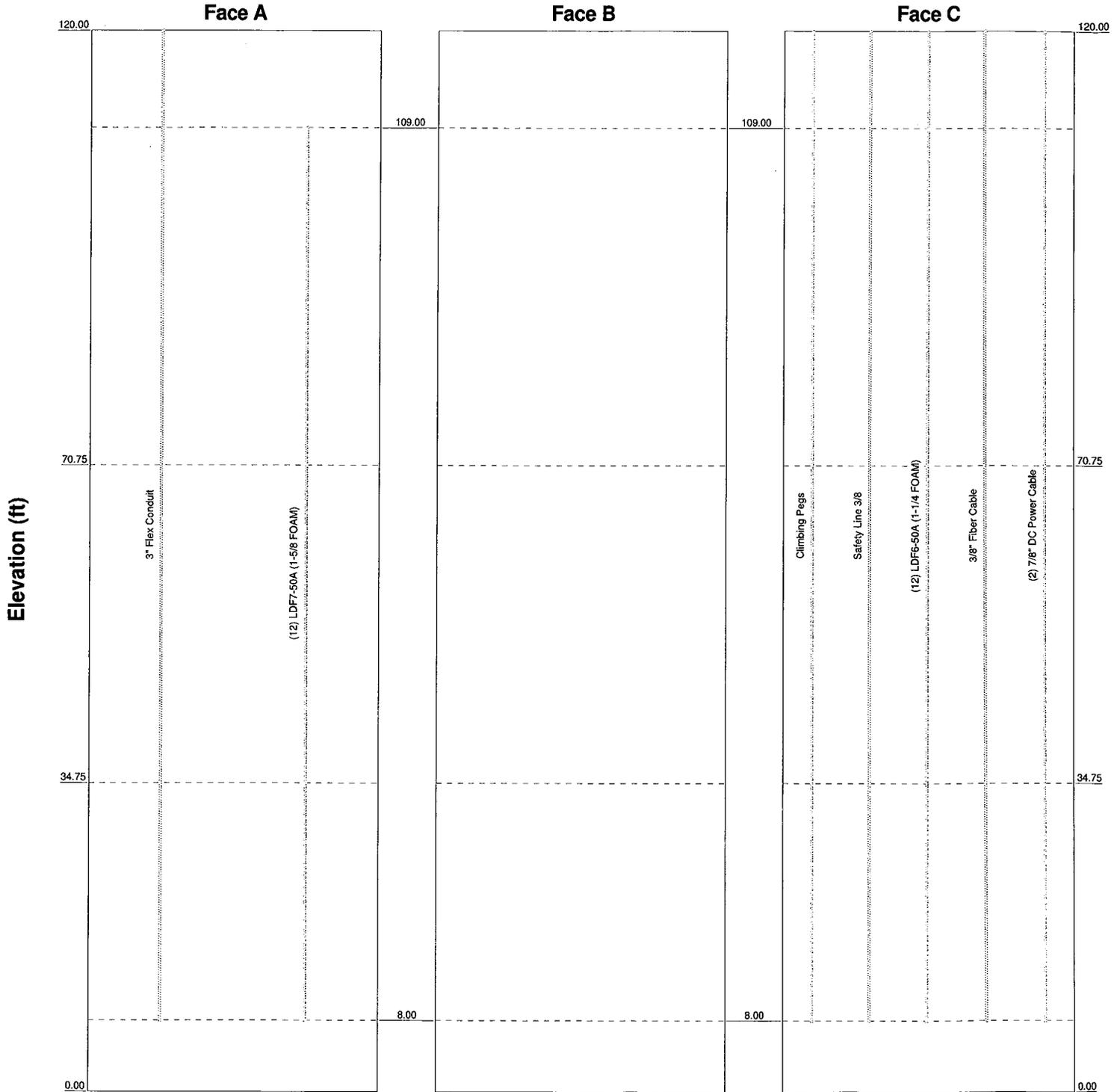
Round

Flat

App In Face

App Out Face

Truss Leg



 GPD GROUP	GPD Group		Job: 27067 MANSFIELD FOUR CORNERS		
	520 S. Main St. Suite 2531		Project: 2012801.04		
	Akron, OH 44311		Client: NexLink	Drawn by: T. Sheldon	App'd:
	Phone: (330) 572-2100		Code: TIA/EIA-222-F	Date: 04/20/12	Scale: NTS
	FAX: (330) 572-2101		Path: O:\2012\2012801\04\TNX\27067 MANSFIELD FOUR CORNERS - TNX.et	Dwg No. E-7	



COAX PLACEMENT

NOT TO SCALE

SHEET
1 OF 1

27067 MANSFIELD FOUR CORNERS
NexLink

JOB NO.
2012801.04
DATE
4/20/2012

GPD GROUP

ENGINEERS • ARCHITECTS • PLANNERS

520 South Main Street • Suite 2531 • Akron Ohio 44311-1010 • Tel: 330-572-2100 • Fax: 330-572-2101

APPENDIX D

Base Plate & Anchor Rod Analysis



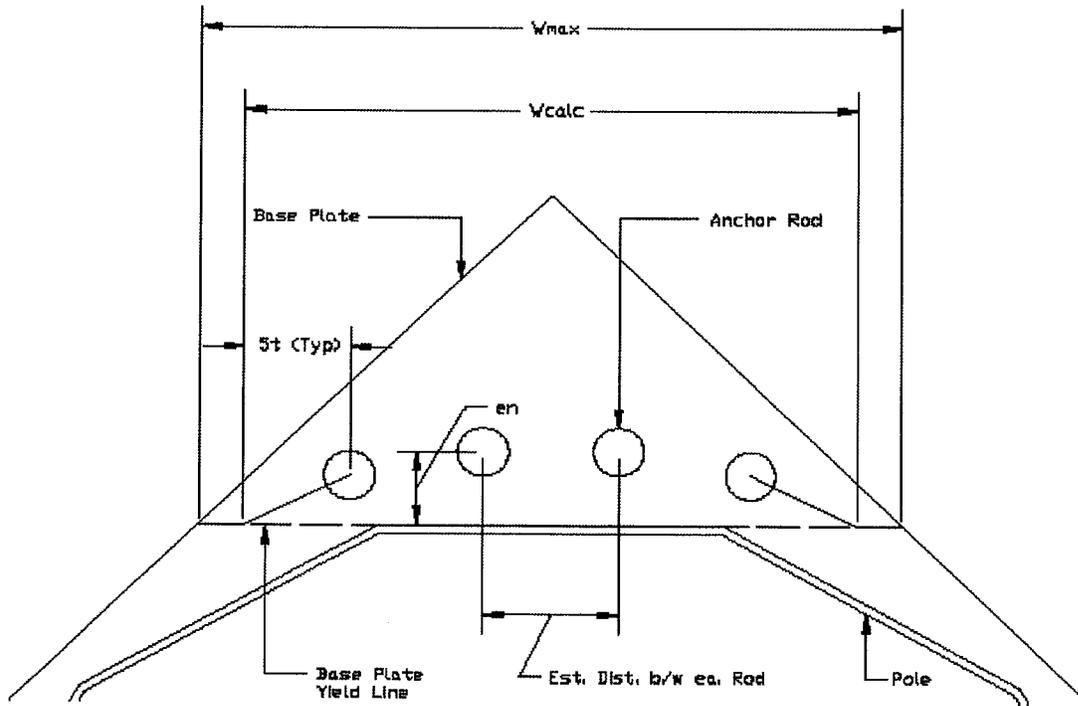
Anchor Rod and Base Plate Stresses
27067 MANSFIELD FOUR CORNERS
2012801.04

Overturning Moment =	1425.11	k*ft
Axial Force =	21.05	k
Shear Force =	16.50	k

Acceptable Stress Ratio =	100.0%
---------------------------	--------

Anchor Rods		
Pole Diameter =	51.8	in
Number of Rods =	16	
Type =	Upset Rod	
Rod Yield Strength (Fy) =	75	ksi
ASIF =	1.333	
Rod Circle =	59	in
Rod Diameter =	2.25	in
Net Tensile Area =	3.25	in ²
Max Tension on Rod =	71.10	kips
Max Compression on Rod =	73.73	kips
Allow. Rod Force =	195.00	kips
Anchor Rod Capacity =	36.5%	OK

Base Plate		
Plate Strength (Fy) =	55	ksi
Plate Thickness =	3	in
Plate Width =	57	in
Est. Dist. b/w ea. Rod =	6	in
W _{calc} =	47.752	in
W _{max} =	28.810	in
w =	28.81	in
S =	43.22	in ³
fb =	18.97	ksi
Fb =	55	ksi
Base Plate Capacity =	34.5%	OK



APPENDIX E

Foundation Analysis



CAISSON ANALYSIS WORKSHEET

Client: NexLink
 Site ID: 27067
 Site Name: MANSFIELD FOUR CORNERS
 Location: Tolland County, Connecticut
 Loading Type: Wind

Job No.: 2012801.04
 Sheet No.: 1 Of 1
 Made By: TS Date: 4/20/2012
 Crk'd By: Code: F

FOUNDATION DATA

Diameter = 7 ft
 Length = 22.5 ft
 Rebar Size = #11
 # of bars = 20
 Tie Size = #4
 Clear Cover = 3 inches
 Edge to Bar Center = 4.205 inches
 f'c = 3 ksi

PILE TYPE 2 ANALYSIS FOR REINFORCING CAPACITY

Min = 67949.00 in-k
 Min = 5662.42 ft-k
 Load Factor = 1.3
 ϕ (flexure) = 0.9
 ϕ Mn = 5096.18 ft-k

RISA Reactions (Service)

Moment = 1426 ft-k
 Axial = 21.05 kips
 Shear = 16.5 kips

MOMENT FROM CAISSON PROGRAM USING ADJUSTED S.F. AND ACTUAL CAISSON LENGTH

Moment = 1519.3 ft-k (max. moment along caisson)

REINFORCING STEEL CAPACITY

Capacity = $\frac{\text{LF*Moment from Caisson}}{\phi Mn} = \frac{1975.09 \text{ ft-k}}{5096.18 \text{ ft-k}} = 38.8\% \text{ O.K.}$

SOIL CAPACITY FROM CAISSON PROGRAM USING ADDITIONAL SAFETY FACTORS

ADDITIONAL SAFETY FACTOR FROM CAISSON = 4.06

Capacity = $\frac{\text{Safety Factor of 2}}{\text{Additional Safety Factor}} = \frac{2.00}{4.06} = 49.3\% \text{ O.K.}$

 * PIER FOUNDATIONS ANALYSIS AND DESIGN - (C) 1995, POWER LINE SYSTEMS, INC.*

*** ANALYSIS IDENTIFICATION : 27067 MANSFIELD FOUR CORNERS
 NOTES : 2012801.04

*** PIER PROPERTIES CONCRETE STRENGTH (ksi) = 3.00 STEEL STRENGTH (ksi) = 60.00
 DIAMETER (ft) = 7.000 DISTANCE FROM TOP OF PIER TO GROUND LEVEL (ft) = 0.50

*** SOIL PROPERTIES	LAYER	TYPE	THICKNESS (ft)	DEPTH AT TOP OF LAYER (ft)	DENSITY (pcf)	CU (psf)	KP	PHI (degrees)
	1	C	4.00	0.00	100.0	0.0		
	2	S	9.00	4.00	130.0		3.255	32.00
	3	S	24.00	13.00	57.0		3.255	32.00

*** DESIGN (FACTORED) LOADS AT TOP OF PIER MOMENT (ft-k) = 1425.1 VERTICAL (k) = 21.0 SHEAR (k) = 16.5
 ADDITIONAL SAFETY FACTOR AGAINST SOIL FAILURE = 4.06

*** CALCULATED PIER LENGTH (ft) = 22.500

*** CHECK OF SOILS PROPERTIES AND ULTIMATE RESISTING FORCES ALONG PIER

TYPE	TOP OF LAYER BELOW TOP OF PIER (ft)	THICKNESS (ft)	DENSITY (pcf)	CU (psf)	KP	FORCE (k)	ARM (ft)
C	0.50	4.00	100.0	0.0		0.00	2.50
S	4.50	9.00	130.0		3.255	605.89	9.89
S	13.50	2.60	57.0		3.255	292.34	14.82
S	16.10	6.40	57.0		3.255	-831.17	19.40

*** SHEAR AND MOMENTS ALONG PIER

DISTANCE BELOW TOP OF PIER (ft)	WITH THE ADDITIONAL SAFETY FACTOR		WITHOUT ADDITIONAL SAFETY FACTOR	
	SHEAR (k)	MOMENT (ft-k)	SHEAR (k)	MOMENT (ft-k)
0.00	67.1	5801.9	16.5	1429.0
2.25	67.1	5952.8	16.5	1466.2
4.50	67.1	6103.7	16.5	1503.4
6.75	-16.9	6168.5	-4.2	1519.3
9.00	-145.9	5993.7	-35.9	1476.3
11.25	-319.9	5478.1	-78.8	1349.3
13.50	-538.8	4520.5	-132.7	1113.4
15.75	-790.1	3029.1	-194.6	746.1
18.00	-601.2	1382.3	-148.1	340.5
20.25	-310.5	353.0	-76.5	86.9
22.50	0.0	0.0	0.0	0.0

*** TOTAL REINFORCEMENT PCI = 0.32 REINFORCEMENT AREA (in^2) = 17.73
 *** USABLE AXIAL CAP. (k) = 21.0 USABLE MOMENT CAP. (ft-k) = 2788.1

 *** US Standard Re-Bars (Select one of the following):
 89 BARS #4 (AREA = 0.20 in^2 DIA = 0.500 in) AT SPACING (in) = 2.61
 58 BARS #5 (AREA = 0.31 in^2 DIA = 0.625 in) AT SPACING (in) = 4.01
 41 BARS #6 (AREA = 0.44 in^2 DIA = 0.750 in) AT SPACING (in) = 5.67
 30 BARS #7 (AREA = 0.60 in^2 DIA = 0.875 in) AT SPACING (in) = 7.75
 23 BARS #8 (AREA = 0.79 in^2 DIA = 1.000 in) AT SPACING (in) = 10.11
 18 BARS #9 (AREA = 1.00 in^2 DIA = 1.128 in) AT SPACING (in) = 12.92
 14 BARS #10 (AREA = 1.27 in^2 DIA = 1.270 in) AT SPACING (in) = 16.61
 12 BARS #11 (AREA = 1.56 in^2 DIA = 1.410 in) AT SPACING (in) = 19.37
 8 BARS #14 (AREA = 2.25 in^2 DIA = 1.693 in) AT SPACING (in) = 29.06

 *** PRESSURE UNDER CAISSON DUE TO DESIGN AXIAL LOAD (psf) = 546.9

Lpile.txt

=====

LPILE Plus for Windows, Version 5.0 (5.0.39)
Analysis of Individual Piles and Drilled Shafts
Subjected to Lateral Loading Using the p-y Method
(c) 1985-2007 by Ensoft, Inc.
All Rights Reserved

=====

This program is licensed to:

Path to file locations: C:\Documents and Settings\tsheldon\Desktop\
Name of input data file: 2012801.04.lpd
Name of output file: 2012801.04.lpo
Name of plot output file: 2012801.04.lpp
Name of runtime file: 2012801.04.lpr

Time and Date of Analysis

Date: April 19, 2012 Time: 9:15:21

Problem Title

New LPILE Plus 5.0 Data File

Program Options

Units Used in Computations - US Customary Units: Inches, Pounds

Basic Program Options:

Analysis Type 2:

- Computation of Ultimate Bending Moment of Cross Section (Section Design)

Computations of Nominal Moment Capacity and Nonlinear Bending Stiffness

Number of sections = 1

Pile Section No. 1

The sectional shape is a circular drilled shaft (bored pile).

Lpile.txt

Outside Diameter = 84.0000 in

Material Properties:

Compressive Strength of Concrete = 3.000 kip/in**2
 Yield Stress of Reinforcement = 60. kip/in**2
 Modulus of Elasticity of Reinforcement = 29000. kip/in**2
 Number of Reinforcing Bars = 20
 Area of Single Bar = 1.5600 in**2
 Number of Rows of Reinforcing Bars = 11
 Area of Steel = 31.200 in**2
 Area of Shaft = 5541.769 in**2
 Percentage of Steel Reinforcement = .563 percent
 Cover Thickness (edge to bar center) = 4.200 in

Unfactored Axial Squash Load Capacity = 15923.95 kip

Distribution and Area of Steel Reinforcement

Row Number	Area of Reinforcement in**2	Distance to Centroidal Axis in
1	1.560	37.800
2	3.120	35.950
3	3.120	30.581
4	3.120	22.218
5	3.120	11.681
6	3.120	0.000
7	3.120	-11.681
8	3.120	-22.218
9	3.120	-30.581
10	3.120	-35.950
11	1.560	-37.800

Axial Thrust Force = 21047.00 lbs

Unfactored (Nominal) Moment Capacity at Concrete Strain of 0.003 = 67949.00273 in-kip

The analysis ended normally.

PROJECT INFORMATION

SCOPE OF WORK: UNMANNED TELECOMMUNICATIONS FACILITY MODIFICATIONS
 SITE ADDRESS: 497 MIDDLE TURNPIKE
 MANSFIELD, CT 06268
 LATITUDE: 41.8254 N 41° 49' 32.72" N
 LONGITUDE: 72.2816 W 72° 16' 54.46" W
 JURISDICTION: NATIONAL, STATE & LOCAL CODES OR ORDINANCES
 CURRENT USE: TELECOMMUNICATIONS FACILITY
 PROPOSED USE: TELECOMMUNICATIONS FACILITY



SITE NUMBER: CT5822
SITE NAME: MANSFIELD FOUR CORNERS

DRAWING INDEX

REV

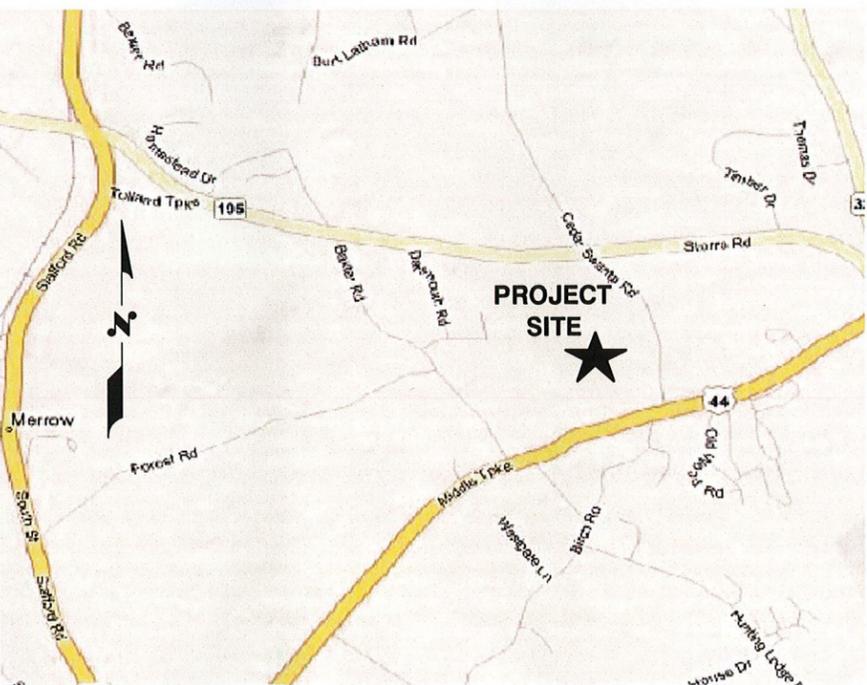
VICINITY MAP

GENERAL NOTES

- T-1 TITLE SHEET
- GN-1 GENERAL NOTES
- A-1 COMPOUND & EQUIPMENT PLAN
- A-2 ANTENNA & ELEVATION PLAN
- A-3 DETAILS
- A-4 DETAILS
- G-1 PLUMBING DIAGRAM & GROUNDING DETAILS

- 1
- 1
- 1
- 1
- 1
- 1
- 1

DIRECTIONS TO SITE:
 START OUT GOING NORTHEAST ON ENTERPRISE DR TOWARD CAPITOL BLVD. 0.4 MI. TURN LEFT ONTO CAPITOL BLVD. 0.3 MI. TURN LEFT ONTO WEST ST. 0.2 MI. MERGE ONTO I-91 N VIA THE RAMP ON THE LEFT TOWARD HARTFORD. 7.8 MI. MERGE ONTO CT-15 N VIA EXIT 29 TOWARD I-84 E/E. HARTFORD/BOSTON. 2.1 MI. CT-15 N BECOMES I-84 E. 16.0 MI. TAKE THE CT-195 EXIT, EXIT 68, TOWARD TOLLAND/MANSFIELD. 0.2 MI. TURN RIGHT ONTO MERROW RD/CT-195. CONTINUE TO FOLLOW CT-195. 5.7 MI. TURN RIGHT ONTO MIDDLE TURNPIKE/US-44. 0.7 MI. END AT 497 MIDDLE TPKE. MANSFIELD, CT 06268.



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

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 BEFORE YOU DIG
 CALL TOLL FREE 800-922-4455

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 1600 OSGOOD STREET
 BUILDING 20 NORTH, SUITE 2-101
 N. ANDOVER, MA 01845
 TEL: (978) 557-5553
 FAX: (978) 336-5586

NEXLINK
 GLOBAL SERVICES
 a UniTek GLOBAL SERVICES company
 800 MARSHALL PHELPS ROAD UNIT#: 2A
 WINDSOR, CT 06095

SITE NUMBER: CT5822
SITE NAME: MANSFIELD
FOUR CORNERS
 497 MIDDLE TURNPIKE
 MANSFIELD, CT 06268
 TOLLAND COUNTY

500 ENTERPRISE DRIVE
 ROCKY HILL, CT 06067

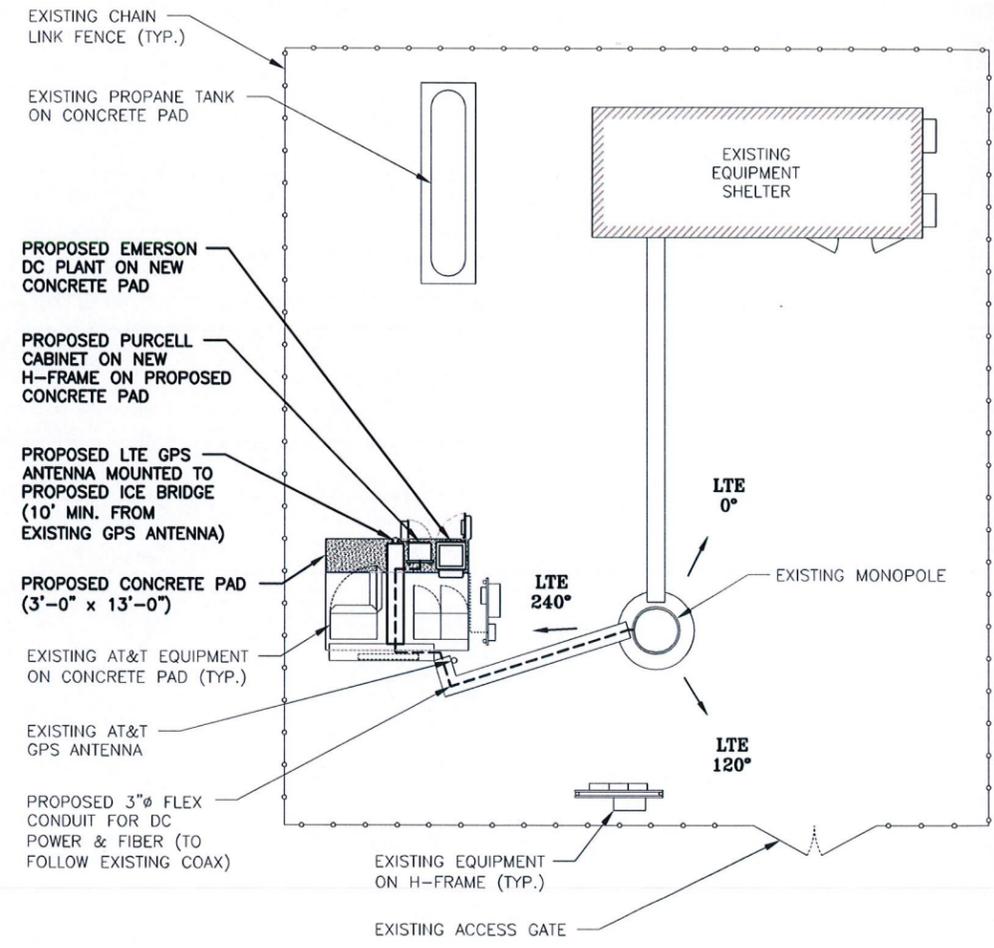
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		TITLE SHEET (LTE)	
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0	04/11/12	ISSUED FOR REVIEW	
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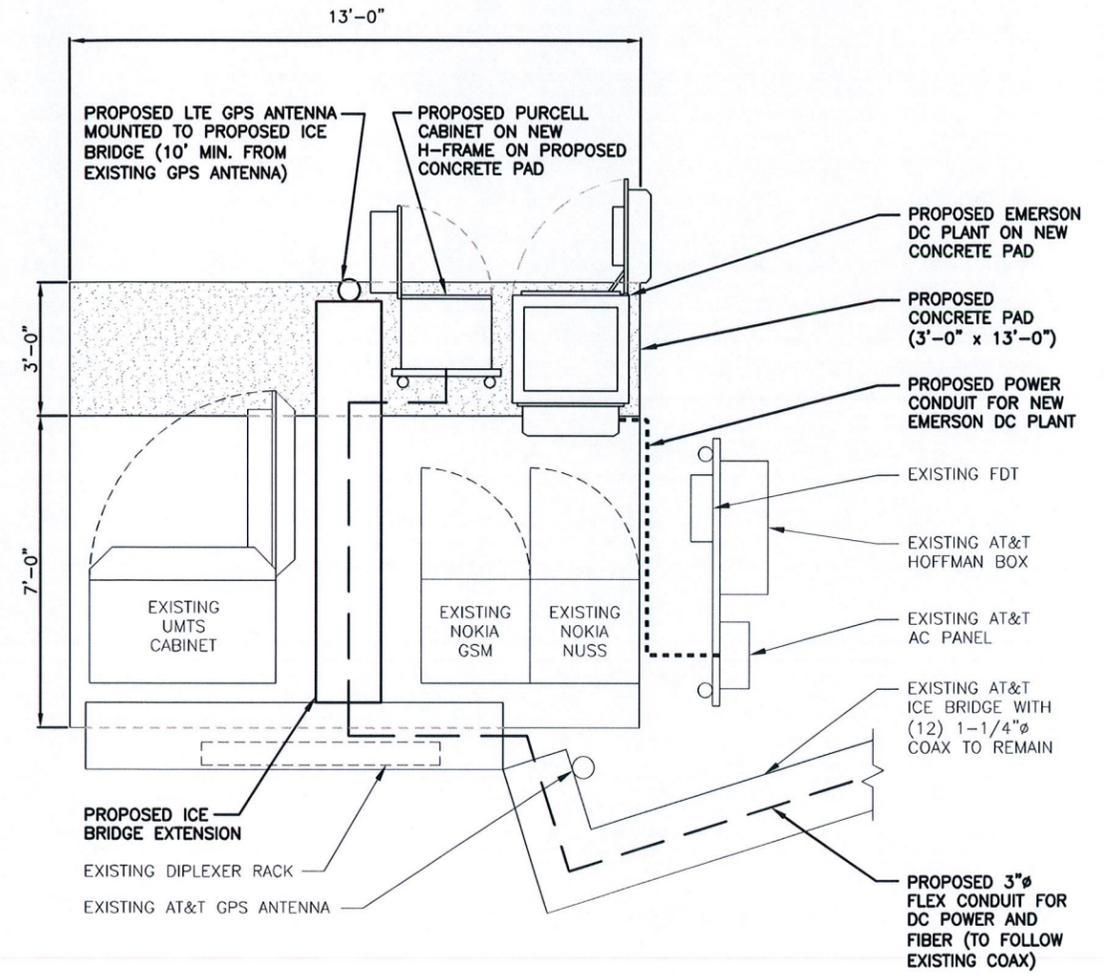


NOTE:
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

NOTE:
AN ANALYSIS FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION.



COMPOUND PLAN
SCALE: 1/8"=1'-0"
0 4'-0" 8'-0" 16'-0" 24'-0"



EQUIPMENT PLAN
SCALE: 1/2"=1'-0"
0 1'-0" 2'-0" 4'-0" 6'-0"

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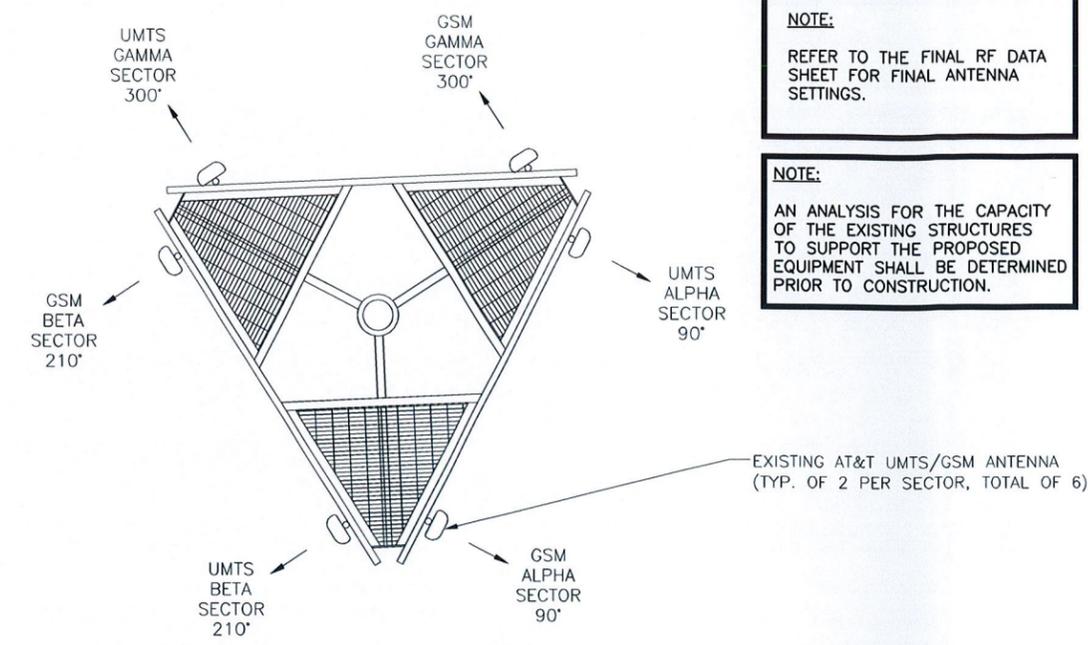
497 MIDDLE TURNPIKE
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TOLLAND COUNTY

at&t

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NO.		DATE	REVISIONS	BY	CHKD BY	DESIGNED BY: DC	DRAWN BY: SF	PROJECT NUMBER: 5822.01	DRAWING NUMBER: A-1	REV: 1
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0	04/11/12	ISSUED FOR REVIEW		SF	DC					



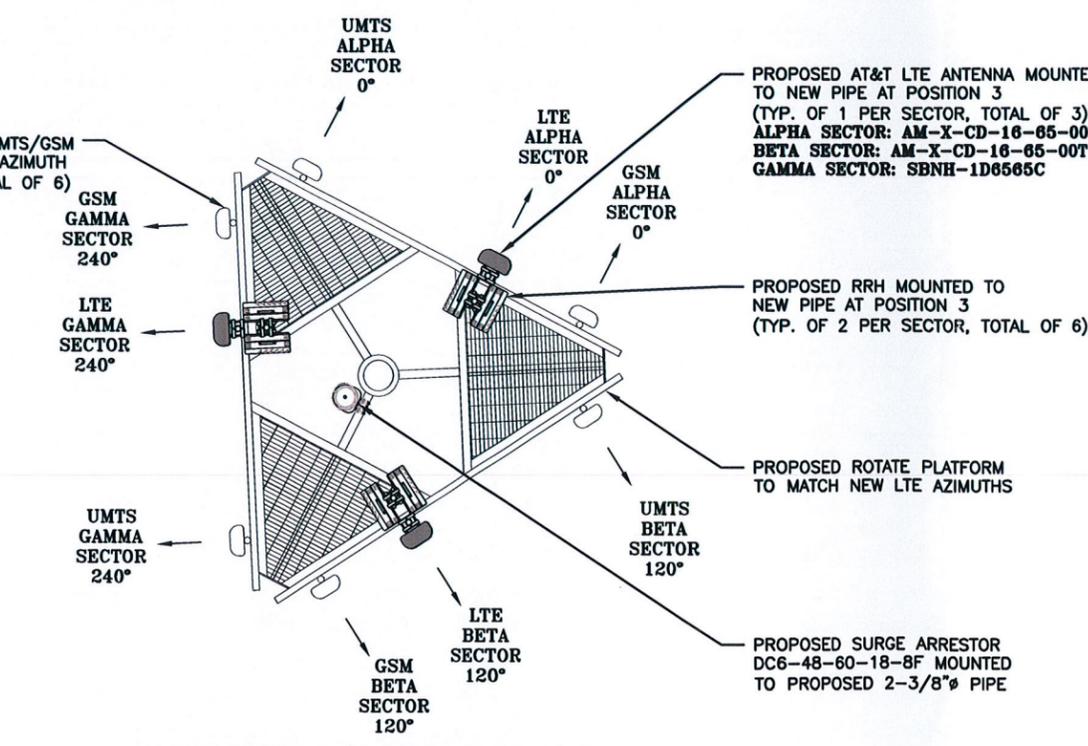


NOTE:
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

NOTE:
AN ANALYSIS FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION.

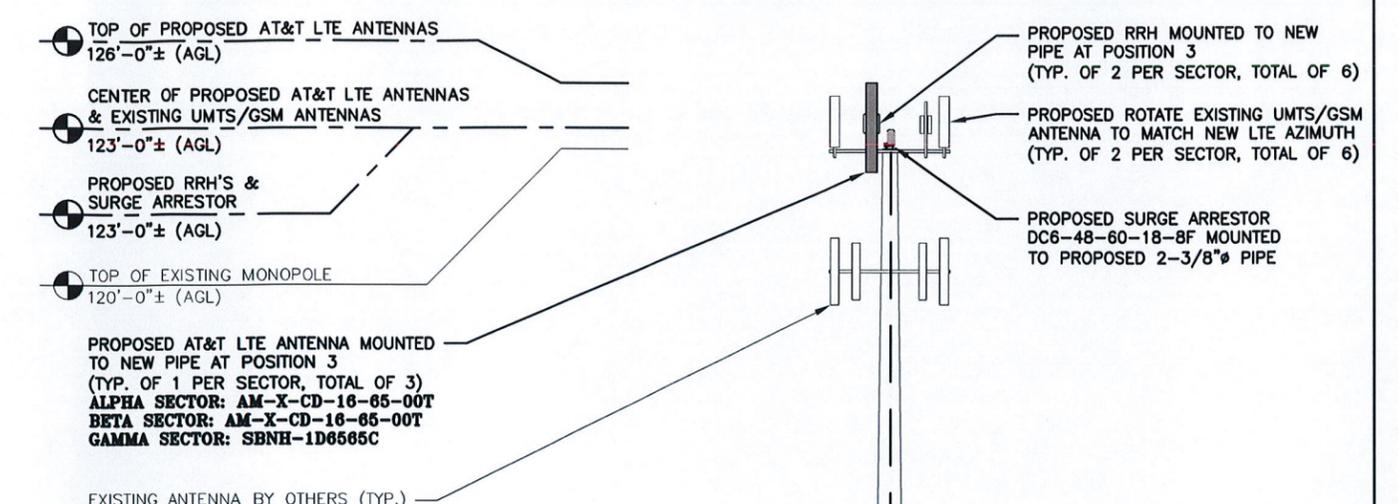
EXISTING UMTS/GSM ANTENNA PLAN

N.T.S.

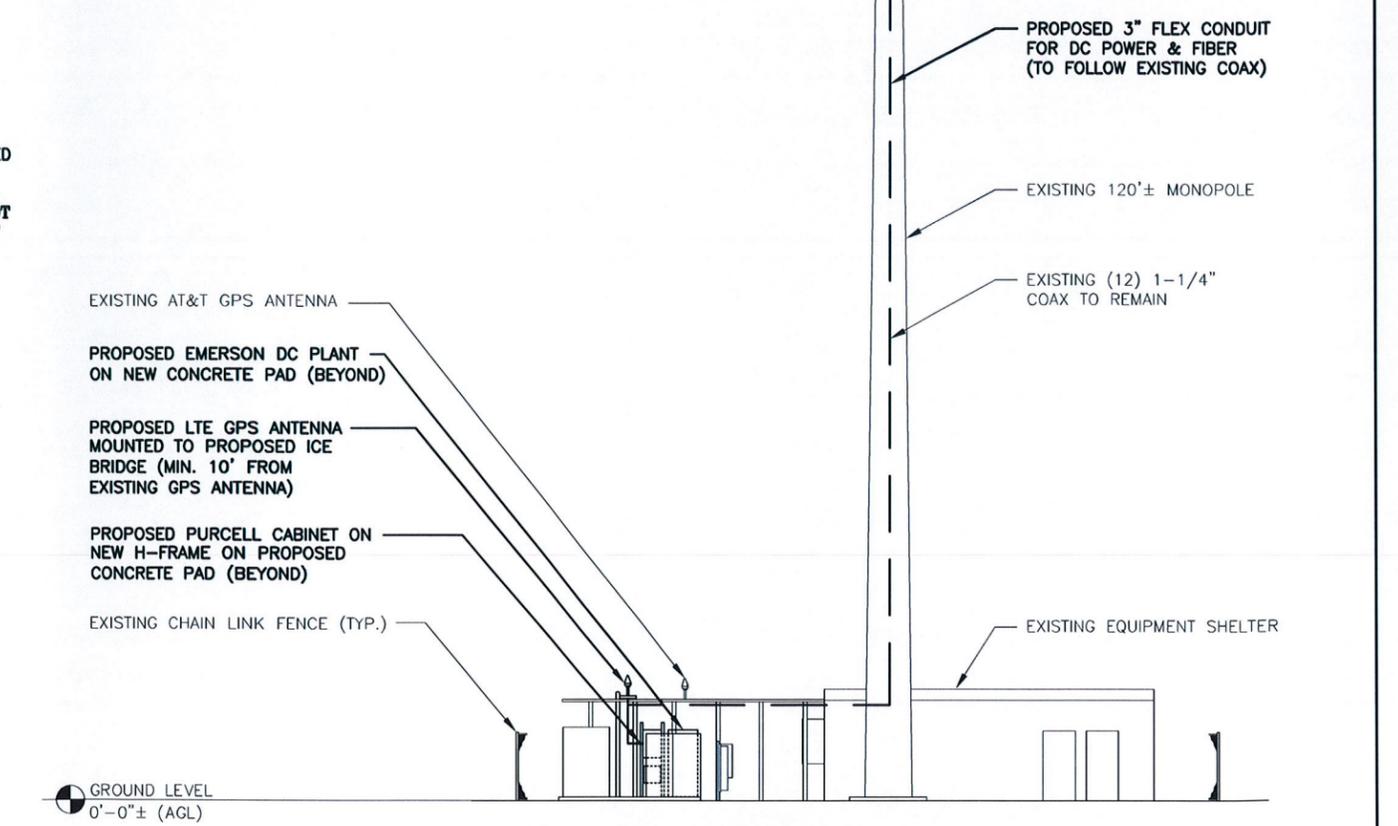


PROPOSED LTE ANTENNA PLAN

N.T.S.



PROPOSED AT&T LTE ANTENNA MOUNTED TO NEW PIPE AT POSITION 3 (TYP. OF 1 PER SECTOR, TOTAL OF 3)
ALPHA SECTOR: AM-X-CD-16-65-00T
BETA SECTOR: AM-X-CD-16-65-00T
GAMMA SECTOR: SBNH-1D6565C



NORTH ELEVATION

SCALE: 1/8"=1'-0"



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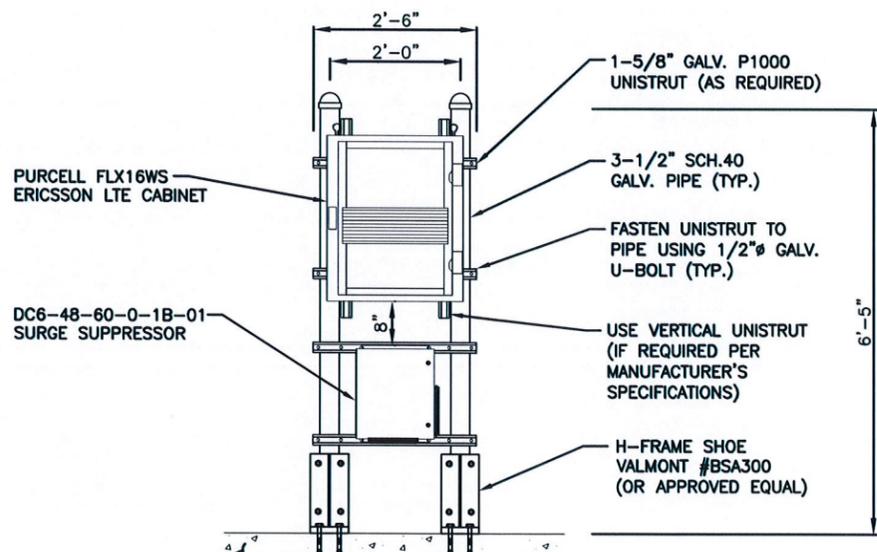
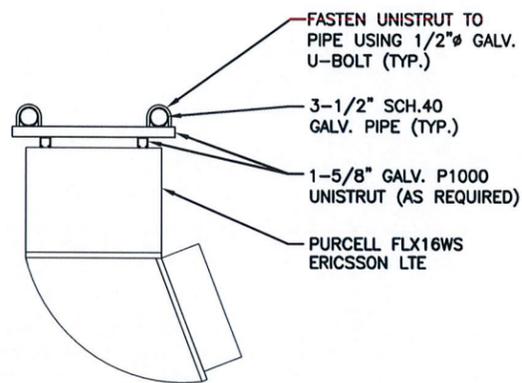
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SITE NAME: MANSFIELD
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TOLLAND COUNTY

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		AT&T	
		ANTENNA & ELEVATION PLAN (LTE)	
NO.	DATE	REVISIONS	BY
1	04/17/12	ISSUED FOR CONSTRUCTION	SF DC
0	04/11/12	ISSUED FOR REVIEW	SF DC
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PROJECT NUMBER: 5822.01		DRAWING NUMBER: A-2	
		REV: 1	

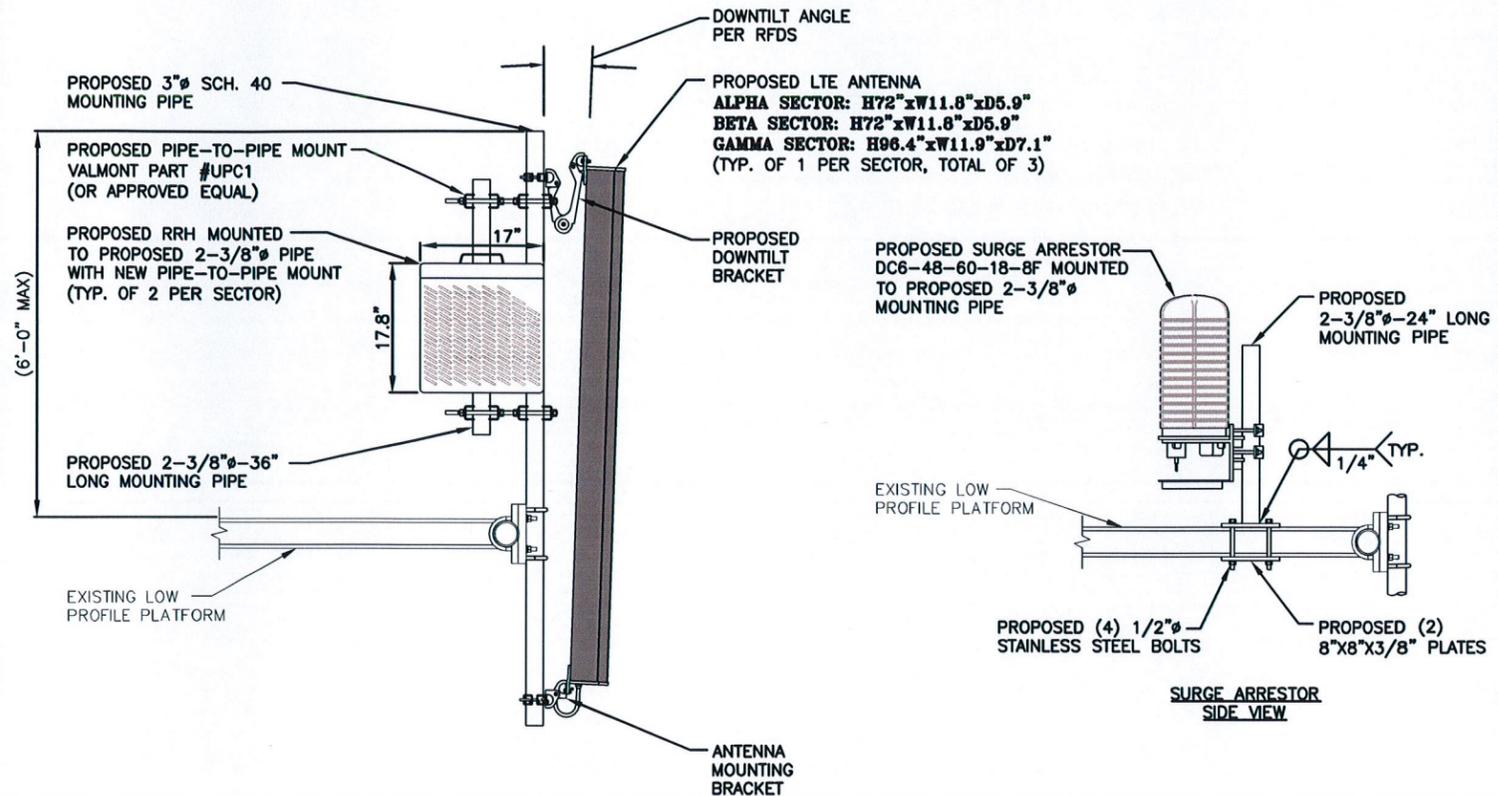
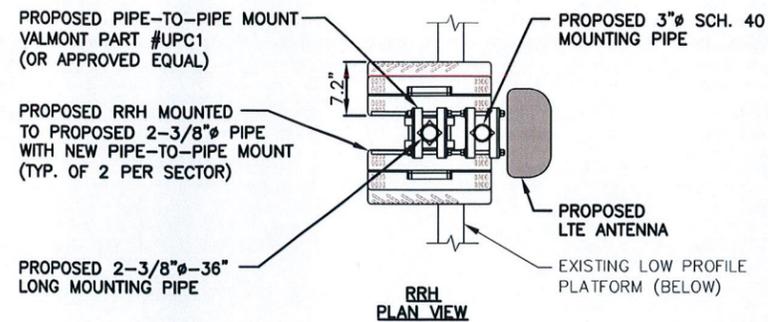




NOTE:
MOUNT PROPOSED EQUIPMENT PER
MANUFACTURER'S SPECIFICATIONS

PROPOSED EQUIPMENT MOUNTING DETAIL

SCALE: N.T.S.



PROPOSED LTE ANTENNA, RRH & SURGE ARRESTOR MOUNTING DETAIL

SCALE: N.T.S.

NOTE:
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

NOTE:
AN ANALYSIS FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION.

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NO.		DATE	REVISIONS	BY	CHK	APP	JOB NUMBER	DRAWING NUMBER	REV
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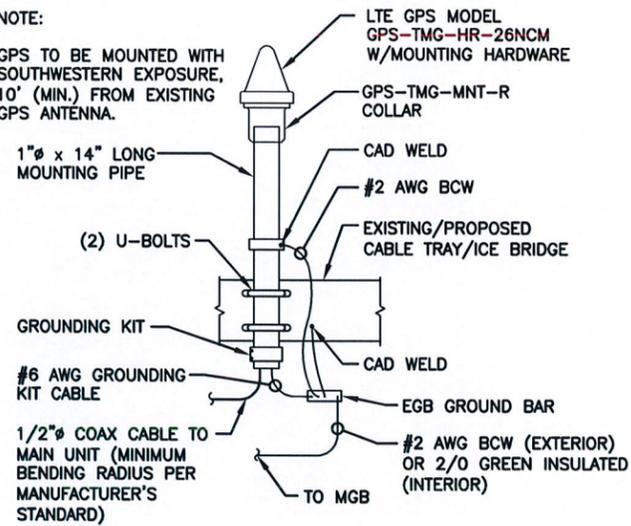


AT&T

DETAILS
(LTE)

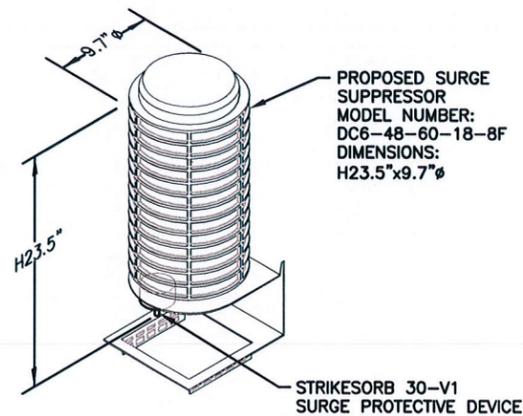
NOTE:

GPS TO BE MOUNTED WITH SOUTHWESTERN EXPOSURE, 10' (MIN.) FROM EXISTING GPS ANTENNA.



GPS MOUNTING DETAIL

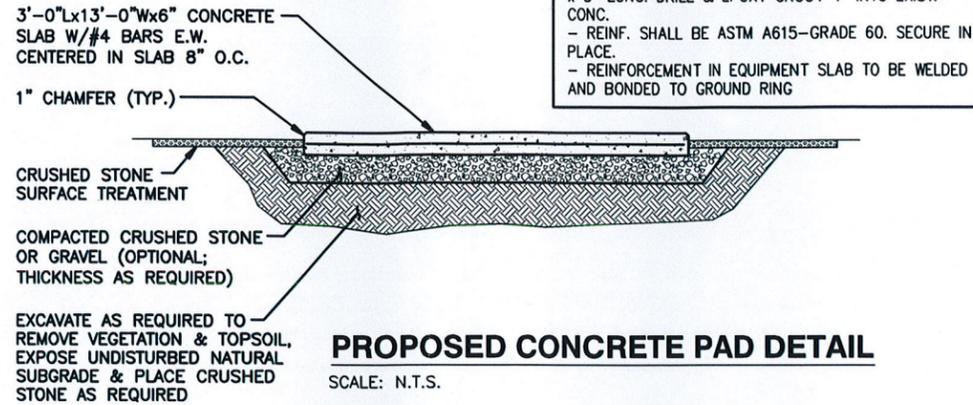
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NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

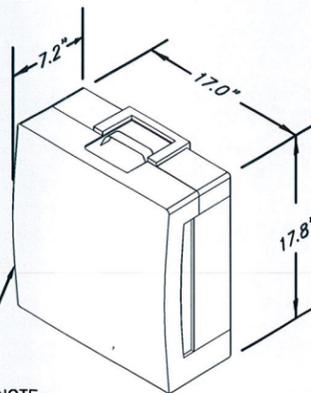
DC SURGE SUPPRESSOR DETAIL

SCALE: N.T.S.



PROPOSED CONCRETE PAD DETAIL

SCALE: N.T.S.



NOTE:
MOUNT PER MANUFACTURER'S
SPECIFICATIONS.

RRH DETAIL

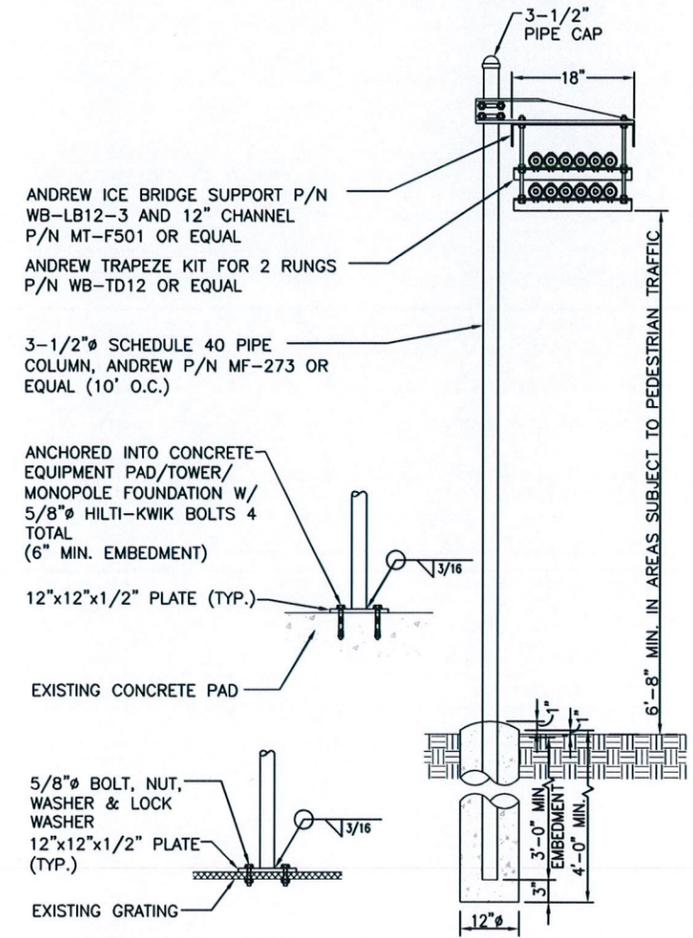
SCALE: N.T.S.

NOTE:

REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

NOTE:

AN ANALYSIS FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION.



NOTE:
ALL STEEL IS GALVANIZED. ALL BOLTS TO BE FURNISHED W/ WASHERS AND NUTS.

COAX ICE BRIDGE DETAIL

SCALE: N.T.S.

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SITE NUMBER: CT5822
SITE NAME: MANSFIELD
FOUR CORNERS

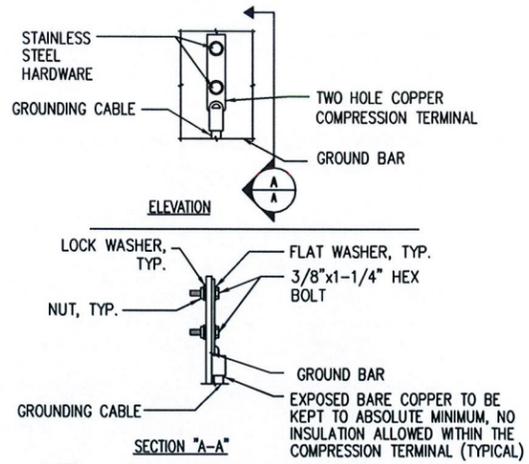
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										AT&T	
										DETAILS (LTE)	
NO.	DATE	REVISIONS	BY	CHK	APP'D	JOB NUMBER		DRAWING NUMBER		REV	
1	04/17/12	ISSUED FOR CONSTRUCTION	SF	DC	DPH	05-01		A-4		1	
0	04/11/12	ISSUED FOR REVIEW	SF	DC	DPH						
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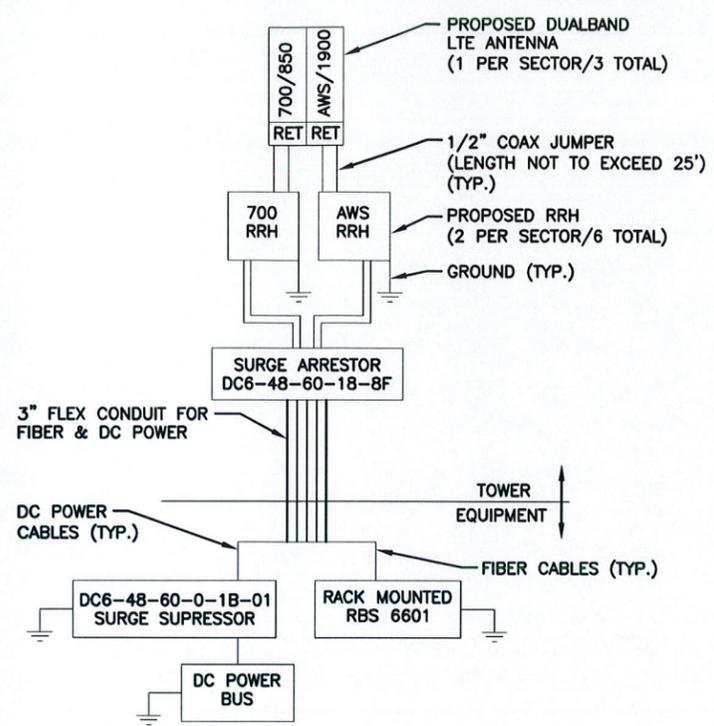




- NOTE:
- "DOUBLING UP" OR "STACKING" OF CONNECTION IS NOT PERMITTED.
 - OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
 - CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB, AND MGB.

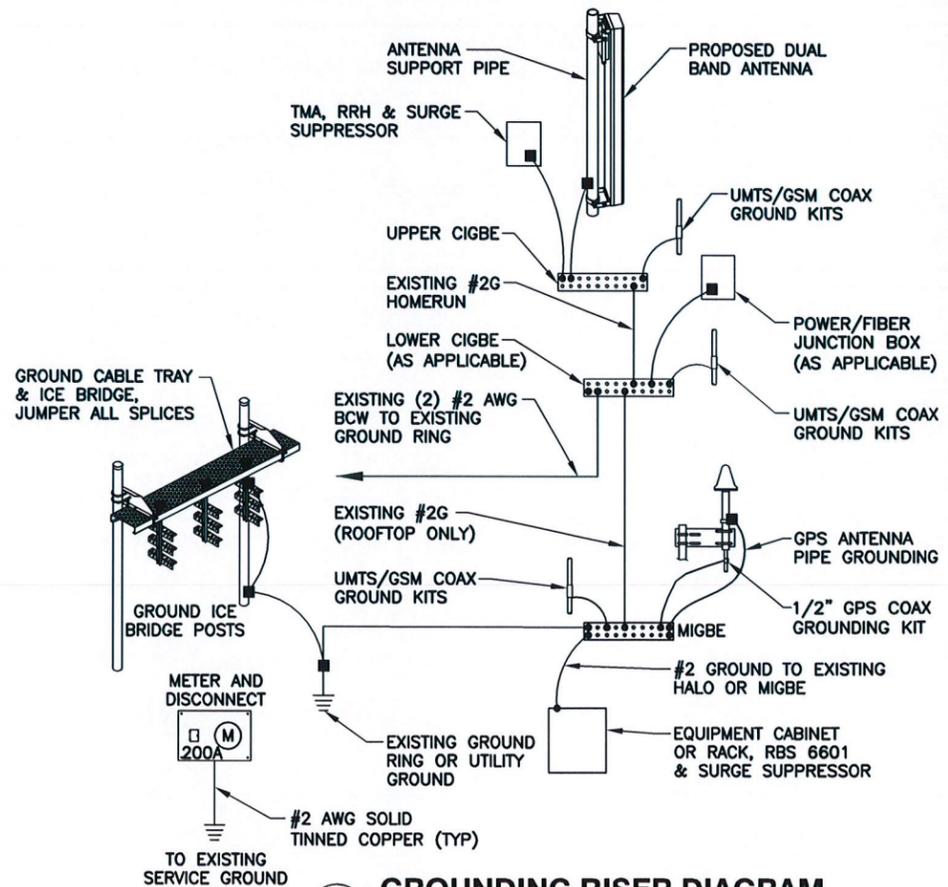
TYPICAL GROUND BAR CONNECTION DETAIL

1
-
N.T.S.



- NOTES:
- CONTRACTOR TO CONFIRM ALL PARTS.
 - INSTALL ALL EQUIPMENT TO MANUFACTURER'S RECOMMENDATIONS.

2
-
PLUMBING DIAGRAM
N.T.S.



3
-
GROUNDING RISER DIAGRAM
N.T.S.

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

SECTION "P" - SURGE PRODUCERS

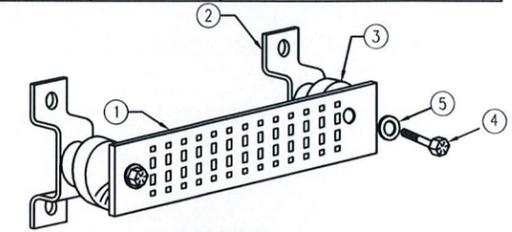
- CABLE ENTRY PORTS (HATCH PLATES) (#2)
- GENERATOR FRAMEWORK (IF AVAILABLE) (#2)
- TELCO GROUND BAR
- COMMERCIAL POWER COMMON NEUTRAL/GROUND BOND (#2)
- +24V POWER SUPPLY RETURN BAR (#2)
- 48V POWER SUPPLY RETURN BAR (#2)
- RECTIFIER FRAMES.

SECTION "A" - SURGE ABSORBERS

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

4
-
GROUND BAR - DETAIL
N.T.S.

WIRELESS SOLUTIONS INC.			
NO.	REQ.	PART NO.	DESCRIPTION
①	1	HLGB-0420-IS	SOLID GND. BAR (20"x4"x1/4")
②	2		WALL MTG. BRKT.
③	2		INSULATORS
④	4		5/8"-11x1" H.H.C.S.
⑤	4		5/8 LOCKWASHER



Hudson Design Group
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 2-101
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

NEXLINK GLOBAL SERVICES
a UniTek GLOBAL SERVICES company
800 MARSHALL PHELPS ROAD UNIT#: 2A
WINDSOR, CT 06095

SITE NUMBER: CT5822
SITE NAME: MANSFIELD FOUR CORNERS
497 MIDDLE TURNPIKE
MANSFIELD, CT 06268
TOLLAND COUNTY

at&t
500 ENTERPRISE DRIVE
ROCKY HILL, CT 06067

AT&T
PLUMBING DIAGRAM & GROUNDING DETAILS (LTE)

NO.	DATE	REVISIONS	BY	CHK	APP'D	ISSUE NUMBER	DRAWING NUMBER	REV
1	04/17/12	ISSUED FOR CONSTRUCTION	SF	DC				
0	04/11/12	ISSUED FOR REVIEW	SF	DC				

SCALE: AS SHOWN DESIGNED BY: DC DRAWN BY: SF

STATE OF CONNECTICUT
DANIEL P. FLANNERY
No. 24178
LICENSED PROFESSIONAL ENGINEER