



Via Overnight Delivery

December 13, 2012

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

Re: Tower Share Application
Property Address: 1249 Hartford Pike, East Killingly, CT 06243 (the
"Property")
Applicant: New Cingular Wireless PCS, LLC ("AT&T")

Dear Ms. Bachman:

On behalf of AT&T, enclosed in connection with the shared use of a tower located on the Property, please find an original and fifteen (15) copies of a tower sharing application package along with a check in the amount of six hundred and twenty five (\$625.00) dollars.

If you could please date stamp a copy of this letter and a copy of the check (both attached) and email them back to me, that would be greatly appreciated. If you have any questions, please contact me.

Sincerely,

Adam F. Braillard

Enclosures

Cc w/enclosures:

Bruce E. Benway, Town Manager: Town of Killingly

Chuck Kelleher, Quinebaug Valley Emergency Communications: Tower/Property Owner

CASH ONLY - ALL CHECKBOOK SECURITY FEATURES LISTED ON BACK INDICATE NO TAMPERING OR COPYING

SMARTLINK, LLC
1997 Annapolis Exchange Pkwy Suite 200
Annapolis, MD 21401

BRANCH BANKING AND TRUST COMPANY
85-330/550

0158

11/25/13

PAY TO THE
ORDER OF

Connecticut Sitng Council

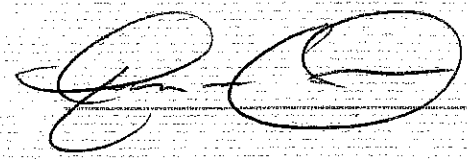
\$ 625.00

Six hundred twenty five

100

DOLLARS

MEMO Town Share App Fee 53573



⑈000158⑈ ⑆055003308⑆0005158694044⑈

SMARTLINK, LLC

0158

SMARTLINK, LLC

0158

APPLICATION TO THE CONNECTICUT SITING COUNCIL
FOR AN ORDER TO APPROVE THE SHARED USE OF AN EXISTING TOWER
PURSUANT TO CONNECTICUT GENERAL STATUTE §16-50aa

APPLICANT

New Cingular Wireless PCS, LLC (AT&T)
500 Enterprise Drive, Suite 3A
Rocky Hill, CT 06067

TOWER/PROPERTY ADDRESS

1249 Hartford Pike
East Killingly, CT 06243

PREPARED BY: Adam F. Brillard
Regional Land Use Manager
Smartlink, LLC
33 Boston Post Road West
Marlborough, Massachusetts 01752
508-954-7702
adam.brillard@smartlinkllc.com

DATE SUBMITTED: December 13, 2013

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APPLICANT

New Cingular Wireless PCS, LLC (AT&T)
500 Enterprise Drive, Suite 3A
Rocky Hill, CT 06067

TOWER/PROPERTY ADDRESS

1249 Hartford Pike
East Killingly, CT 06243

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TAB 1



December 13, 2013

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

Re: Request for an Order to Approve the Shared Use of an Existing Tower
Property Address: 1249 Hartford Pike, East Killingly, CT 06243 (the "Property")
Applicant: New Cingular Wireless PCS, LLC ("AT&T")

Dear Ms. Bachman:

On behalf of AT&T, please accept this request pursuant to Connecticut General Statutes §16-50aa, as amended (the "Statute"), for an order approving tower sharing at the above referenced tower site and facility.

I. The Facility

The property and tower are owned by Quinebaug Valley Emergency Communications, Inc., a non-profit corporation that administers an emergency notification and dispatch system in northeastern Connecticut ("QV Emergency"). The tower consists of a 150' lattice style tower (the "Tower") and is currently shared by a number of emergency services antennas at heights ranging from 150' to 120'. There is a 41' x 47' fenced compound at the base of the Tower with an equipment shed therein (Tower and compound, collectively the "Facility").

II. History of the Facility

It is our understanding that QV Emergency is a privately held organization and is not state owned or operated and that QV Emergency is not a public service company or a certified telecommunications provider. The Tower is not currently used in a cellular system, and no existing antennas on the Tower are owned by federally licensed personal wireless services providers. As such, we understand that pursuant to General Statutes § 16-50i, the development of the Facility was not under the jurisdiction of the Council and QV Emergency obtained the

authority to develop the Facility from the Town of Killingly (see attached municipal approvals). In this regard, the Council should also note that the entire property, which had been a church, was developed by QV Emergency into a dispatch center, with the tower and a garage as well. As such, the entire property is dedicated to an emergency communications site. AT&T is a federally licensed cellular provider and therefore, pursuant to the General Statutes § 16-50i, its proposed sharing of the Facility is within the jurisdiction of the Council.

III. The Tower Sharing

AT&T proposes to install a total of twelve (12) panel antennas (4 per sector) and eighteen (18) remote radio head ("RRHs") on the Tower (see attached plans). The antennas and RRHs will be mounted on the Tower at a centerline of 108'. Further, AT&T proposes to install an 11'.5" x 16' equipment shelter and a generator at the base of the Tower. Because of the size of the existing compound, AT&T proposes to expand the compound by an additional 15' x 20' and fence in the expansion so that it becomes included as part of the existing compound. The generator and equipment shelter will be juxtaposed on a 12' x 24' concrete pad. The Tower will not be increased in height. No upgrades to the access road or parking area will be necessary.

III. Technical Feasibility

It is technically feasible for AT&T to install its equipment on the Tower. To confirm the structural integrity of the Tower, AT&T and QV Emergency performed a structural analysis of the Tower with AT&T proposed modifications. The structural analysis, dated November 13, 2013 and attached herewith concludes that the "existing pole and foundation have sufficient capacity to support the existing, reserved and proposed antenna loads as detailed...". Consequently, the shared use of the Facility is technically feasible.

IV. Legal Feasibility

Pursuant to the Statute, the Council has the authority to issue an order approving the shared use of the Facility. By issuing an order approving AT&T's use of the Facility, AT&T will be able to proceed with obtaining a building permit from the Town of Killingly for the proposed installation on the Facility. Therefore, the shared use of the Facility is legally feasible.

V. Economic Feasibility

AT&T is a federally licensed cellular company providing service in areas of Connecticut, including the Town of Killingly. AT&T has entered into an agreement with QV Emergency for the purpose of locating AT&T equipment at the Facility. Consequently, the shared use of the Facility is economically feasible.

VI. Environmental Feasibility

Pursuant to the Statute, AT&T's proposed sharing of the Facility will be environmentally feasible for the following reasons:

- a. The proposal will not increase the height of the Tower or Site boundaries. Therefore, the proposed sharing of the Facility will have an insignificant incremental visual impact on the area surrounding the Tower and will no significant change or alter the physical or environmental characteristics of the Facility.
- b. The addition of AT&T equipment will not increase the noise levels by six (6) decibels or more.
- c. The addition of AT&T antennas will not exceed the RF emissions standard adopted by the Federal Communications Commission ("FCC"). The cumulative "worst-case" RF emissions for the operation of the existing T-Mobile antennas and the proposed AT&T antennas will be 18.5% of the FCC standards (see attached Power Density Table).
- d. The proposed installation will have no impact on the local wetlands or water resources.
- e. After installation, AT&T equipment will be unmanned and will only require monthly visits by maintenance personnel who will inspect the Facility to ensure it remains in good working order.
- f. AT&T's proposal will have no impact on water, sanitary or sewer systems or other municipal utilities. Additionally, the proposal complies with all applicable local, state and federal safety rules and regulations.

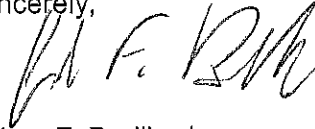
VII. Public Safety and Benefits

As referenced in Section III above, AT&T has performed a structural analysis of the Tower confirming that the Tower is structurally feasible to hold AT&T's additional equipment. Further, as referenced in Section VI.c above, AT&T has performed an analysis of the radio frequency emanating from its proposed antennas to ensure compliance with FCC standards. The analysis indicates that the maximum level of radio frequency energy emitting from the Facility after the installation of AT&T's antennas will be well below the FCC's exposure limits. Moreover, AT&T proposal is expected to enhance safety by improving wireless communications in the area of the Facility.

VII. Conclusion

For the aforementioned reasons, AT&T's proposed shared use of the Facility meets all of the requirements set forth in the Statute, and the proposal advances the Council's goal of preventing the unnecessary proliferation of towers in Connecticut. The proposal is technically, legally, economically and environmentally feasible and meets all public safety concerns. Consequently, AT&T respectfully requests that the Council issue an order approving the proposed sharing use of the Facility.

Sincerely,

A handwritten signature in black ink, appearing to read "A. F. Braillard", written over the word "Sincerely,".

Adam F. Braillard

TAB 2

CERTIFICATE OF SERVICE

This is to certify that on the 13th day of December, 2013, the foregoing application by AT&T for an Order to Approve the Shared Use of an Existing Tower was sent, via UPS, to the following:

Bruce E. Benway
Town Manager
Town of Killingly
172 Main Street
Danielson, CT 06239
860-779-5335

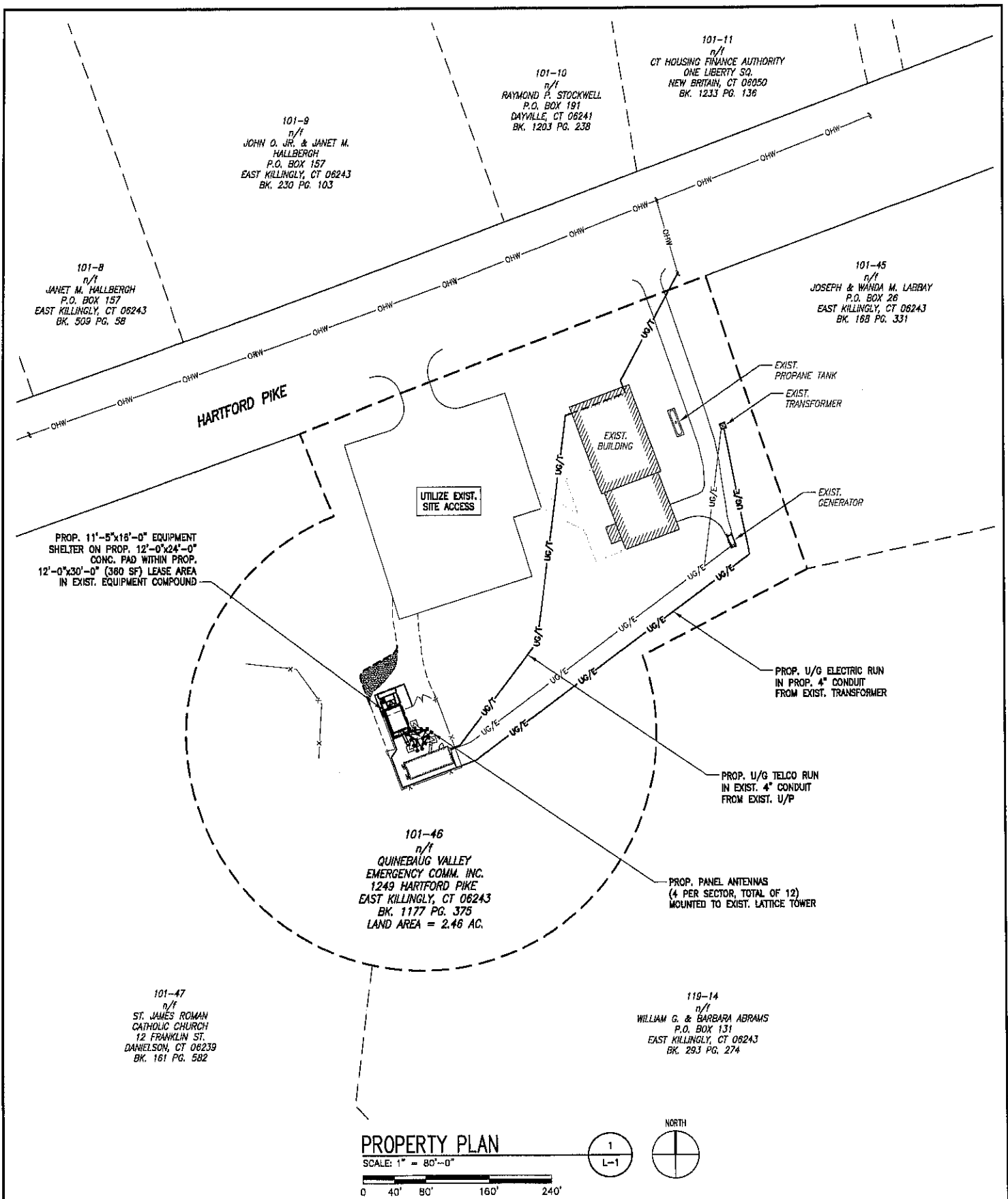
and

Chuck Kelleher
Associate Director
Quinebaug Valley Emergency Communications
1249 Hartford Pike
East Killingly, CT 06243
860-412-1499

By: _____


Adam F. Brillard

TAB 3



**CHAPPELL
ENGINEERING
ASSOCIATES, LLC**

Civil Structural Land Surveying

R.K. EXECUTIVE CENTRE
201 BOSTON POST ROAD WEST
SUITE 101
MARLBOROUGH, MA 01752
TEL: 508.481.7400
FAX: 508.481.7406



500 COCHITUATE ROAD, SUITE 13
FRAMINGHAM, MA 01701-4681



1997 ANNAPOLIS EXCHANGE PKWY, SUITE 200
ANNAPOLIS, MD 21401

TITLE: LEASE EXHIBIT
SITE NO: S3573-A
SITE NAME: KILLINGLY HARTFORD PIKE
ADDRESS: 1249 HARTFORD PIKE
EAST KILLINGLY, CT 06243

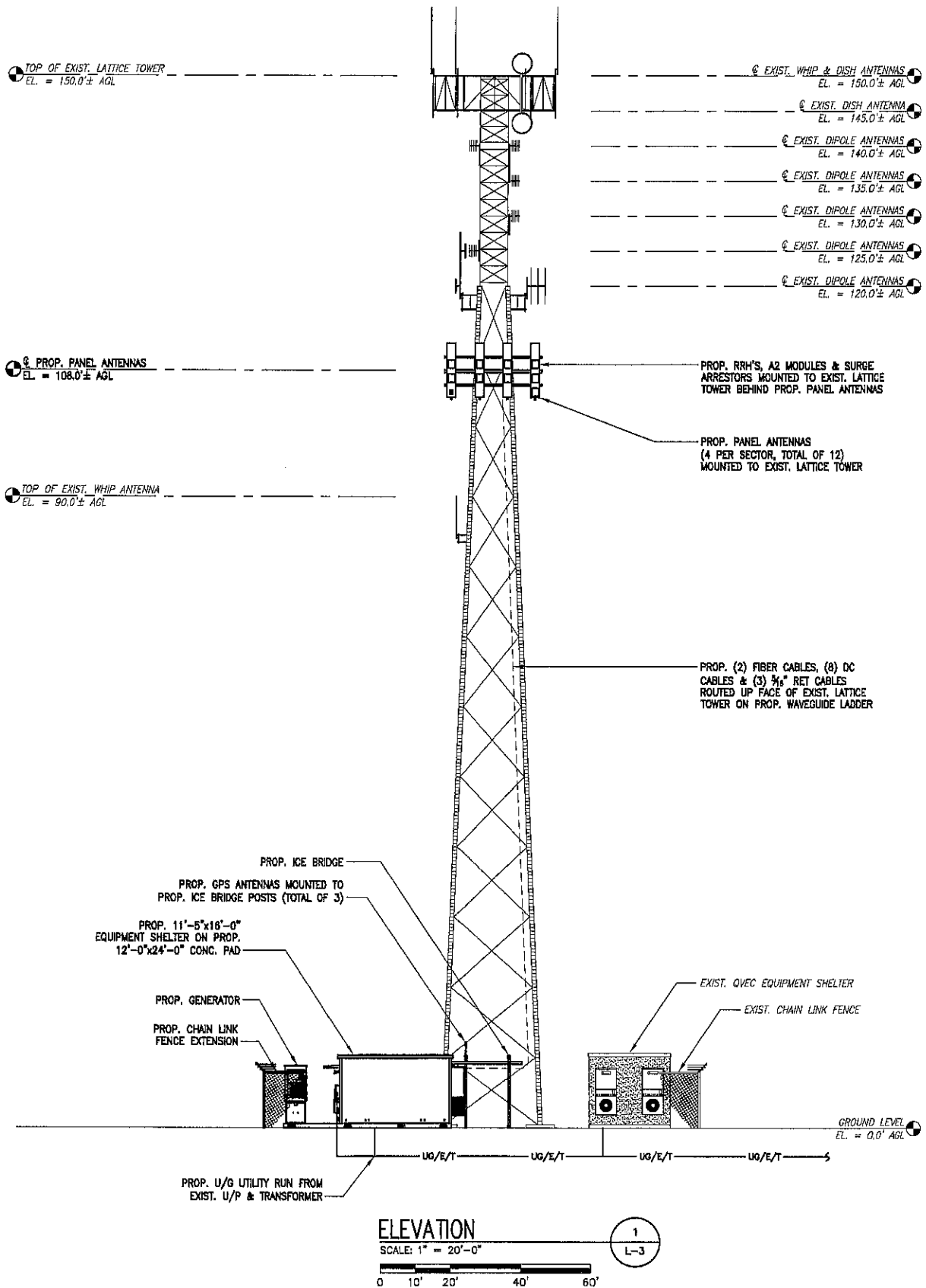
DATE: 12/11/2013

DRAWN BY: CMC

REVISION: 3

CEA #: 1325.033

SHEET: 1 OF 3



CHAPPELL
ENGINEERING
ASSOCIATES, LLC

Civil Structural Land Surveying

R.K. EXECUTIVE CENTRE
201 BOSTON POST ROAD WEST
SUITE 101
MARLBOROUGH, MA 01752
TEL: 508.461.7400
FAX: 508.461.7405



500 COCHITUATE ROAD, SUITE 13
FRAMINGHAM, MA 01701-4881



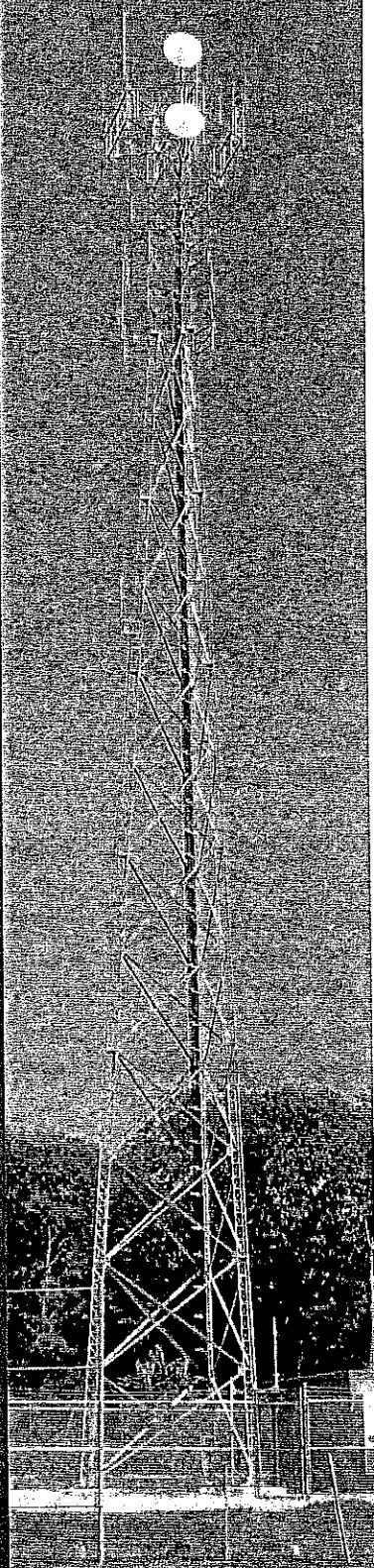
1997 ANNAPOLIS EXCHANGE PKWY, SUITE 200
ANNAPOLIS, MD 21401

TITLE: LEASE EXHIBIT
SITE NO: S3573-A
SITE NAME: KILLINGLY HARTFORD PIKE
ADDRESS: 1249 HARTFORD PIKE
EAST KILLINGLY, CT 06243

DATE: 12/11/2013
DRAWN BY: CMC
REVISION: 3
CEA #: 1325.033
SHEET: 3 OF 3

TAB 4

Chappell Engineering Associates, LLC



at&t



smartlink

500 Cochituate Road
Suite 13
Framingham, MA 01701

1997 Annapolis Exchange Pkwy
Suite 200
Annapolis, MD 21401

Tower Structural Analysis
AT&T New Site Build

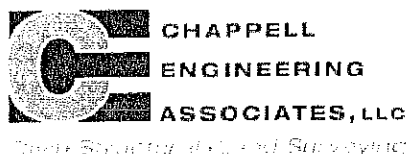
Site Name: Killingly Hartford Pike (S3573)

Address:
1249 Hartford Pike
East Killingly, CT 06243

November 12, 2013



201 Boston Post Road West, Suite 101
Marlborough, Massachusetts 01752



November 12, 2013

Mr. Jerry Bruno
Smartlink
Annapolis Exchange Parkway
Suite 200
Annapolis, MD 21401

Reference: **Tower Structural Analysis**
Tower Data: Valmont
Build Date: 2011
Original Design Criteria: EIA/TIA-222-F
Tower Owner: Quinebaug Comm. , Inc.
Tower Address: 1249 Hartford Pike
East Killingly, CT 06243

Dear Mr. Bruno:

Chappell Engineering Associates, LLC has performed a structural analysis of the above-referenced tower to evaluate the effect of the proposed **AT&T New Site Build** antenna configuration on the subject structure.

The proposed antenna configuration is detailed on the design drawings completed by Chappell Engineering Associates, LLC and are included in this structural report

Based on the results of the analysis, it has been determined that the structure is:

Structurally Acceptable – Tower Rating 94.3% (Diagonals Controlling)

If you have any questions, please do not hesitate to call.

Very truly yours,

CHAPPELL ENGINEERING ASSOCIATES


Clement J. Salek, P.E.

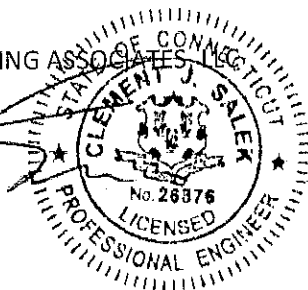


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- Appendix A – Site Location Map and Terrain Classification
- Appendix B – Proposed Antenna Plan & Cut Sheets
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Introduction

The subject tower has been modeled using tnxTower 6.0 software developed by Tower Numerics, Inc. tnxTower 6.0 is a general-purpose modeling, analysis, and design program created specifically for the analysis and design of communication towers using the TIA-222-G Standard, as well as any of the previous TIA/EIA Standards back to RS-222 (1959). Steel design is checked using the AISC ASD 9th Edition or the AISC LRFD Specifications.

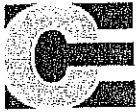
This particular tower analysis has been performed by Chappell Engineering Associates, LLC to determine the structural capacity of the tower under the current **TIA-222-G** Standard given the proposed antenna loading detailed in this report.

Assumptions

The structural analysis is based upon the tower inventory completed by the tower owner as well as from the photos included in this report. All proposed antenna changes or reconfigurations have been provided by others and have been incorporated into this report based upon this information. Any modifications made to the tower which are not represented within this report shall invalidate the report.

This report is not intended as nor shall be considered a condition assessment of the tower. This report is provided without the benefit of an inspection of the structure and considers the structure to have been properly maintained and in like new condition. Chappell Engineering has made no independent determination, nor is it required to, of the accuracy of the information provided. The following assumptions were made unless specifically informed differently by the customer for this structural analysis.

- The structure is erected and maintained in accordance with the manufacturer's plans and specifications.
- The structure depicted on tower drawings, if available, are accurate.
- The structure members consist of the configuration, sizes, and materials as specified in the information provided.
- The structure has been maintained properly and in like new condition.
- There is no damage, natural or manmade, to the structure.
- The soil parameters exist as stated within supplied information, or as stated elsewhere in the structural analysis. If no data is available the foundation is assumed to support the structure with the proposed installation.
- All prior structural modifications are assumed to be properly installed, fully effective, and as specified in supplied data.
- Assumptions made in regards to existing and proposed antennas, mounts, etc. is based upon our best interpretation of the information provided and our knowledge of industry practice.



- Mounts/platforms are considered to be structurally adequate for the existing/proposed loading. No analysis of the mounts/platforms has been completed.
- All welds and connections of guyed wires and members assumed to develop at least the guy/member capacity unless specified otherwise in this report.

If any of the above assumptions are made in error this structural analysis may be invalidated. Chappell Engineering recommends that a qualified professional assess the physical condition of the structure per industry standard practice. Chappell Engineering should be contacted to review any changes in information to determine its effect.

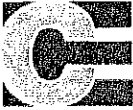
Tower Information

	SOURCE	INFORMATION
Structure	Valmont	Tower Analysis for Construction Services of Brandford dated 05/18/2011)
Foundation	Valmont	Valmont Base Reactions 2011
Current Inventory	Tower Owner Mapping	Antenna Inventory by Tower Owner transmitted to Smartlink, & 08/21/2013 Site Visit
Proposed Condition	Chappell Engineering	Antenna Design Sheets, Chappell Engineering Construction Drawings

Analysis Criteria

Table 1: CURRENT Antenna Loads

ANTENNA MODEL/ DESCRIPTION	CARRIER	QUANTITY	ELEV. (FT AGL)	MOUNT TYPE	FEED LINE QTY
(2) Celwave PD1142	Quinnebaug	2	150	Halo Mount	(2) 1/2"
(1) Andrew DB222	Valley	1	150		(1) 1/2"
(3) Station Master 201 Omni	Emergency	3	150		(2) 7/8" + (1) 1/2"
(1) Andrew DB420 Dipole	Communications	1	150		(1) 1/2"
(1) Radiowave SP4-4.7 Dish	(QVEC)	1	150		(1) 7/8"
(1) Radiowave SP4-4.7 Dish	QVEC	1	140	Halo Mount	(1) 7/8"
(4) Andrew DB438 Yagi	QVEC	4	135+/-	3' Stand-off	(4) 1/2"
(2) Andrew DB438 Yagi	QVEC	2	132+/-	3' Stand-off	(2) 1/2"
(1) Diamond D130J Discone		1	133		(1) 1/2"
(1) Andrew DB438 Yagi	QVEC	1	127	3' Stand-off	(1) 1/2"
(1) Andrew DB222 Dipole	QVEC	1	118	3' Stand-off	(1) 1/2"
(1) Andrew DB225		1	118		(1) 1/2"
(1) 3' Omni	QVEC	1	85	Pipe	(1) 1/2"



AT&T New Site Build, Killingly Hartford Pike (53573)
1249 Hartford Pike, East Killingly CT, 06243

Table 2: PROPOSED Antenna Loads

ANTENNA MODEL/ DESCRIPTION	CARRIER	QUANTITY	ELEV. (FT AGL)	MOUNT TYPE	FEED LINE QTY
(6) Ericsson KRC 118 054 Panels	AT&T	6	108	12' T-Frame	(2) Fiber Cables
(3) Ericsson KRC 118 048 Panels		3	108		(8) DC Cables
(3) Andrew SBNH-1D6565 Panels		3	108		(3) 5/16" RET
(18) Ericsson RRUS-11 RRH		18	108		Cables, Enclosed in
(3) Raycap DC6-48-69-18-8F Surge		3	108		(2) 2.375" +/-
(3) Kathrein 860 RET		3	106		Innerduct



Analysis Results

The following table summarizes the **major tower component** stress ratios:

LOCATION ON TOWER, FT. AGL	LEGS		DIAGONALS	
	STRESS RATIO	PASS/FAIL	STRESS RATIO	PASS/FAIL
150-140	16.2 %	Pass	78.0 %	Pass
140-120	39.8 %	Pass	57.1 %	Pass
120-100	34.6 %	Pass	44.8 %	Pass
100-80	58.6 %	Pass	64.6 %	Pass
80-60	51.5 %	Pass	66.8 %	Pass
60-40	62.4 %	Pass	78.3 %	Pass
40-20	72.3 %	Pass	94.3 %	Pass
20-0	57.9 %	Pass	75.4 %	Pass

Note:

- (b) indicates that the bolt stress governs member capacity

The following table summarizes the tower's **serviceability** requirements:

SERVICEABILITY CRITERIA	ACTUAL	EIA/TIA ALLOWABLE	PASS/FAIL
Twist/Sway	.093Deg	4 Deg	Pass
Horizontal Displacement	3.3in= .18% of Hgt	5% of Height	Pass

The following table summarizes the **foundation capacity** analysis:

LOAD	2011 FOUNDATION DESIGN	PROPOSED FOUNDATION LOADS	% OF CAPACITY	PASS/FAIL
Max Comp. Leg Force (k)	261.9k	180k	68.7%	Pass
Max Uplift Leg Force (k)	234.9k	162k	68.9%	Pass

Note:

- For a comparative analysis to the proposed tower leg loads, the original service load reactions have been factored by 1.35 (Section 15.5.1, EIA/TIA-222-G)

Conclusions and Recommendations

Under the proposed loading considered in this analysis, the existing structure is rated at 94.3% (Diagonals Controlling). As such, it does conform to the loading criteria set forth in the IBC/ TIA-222 Rev G.



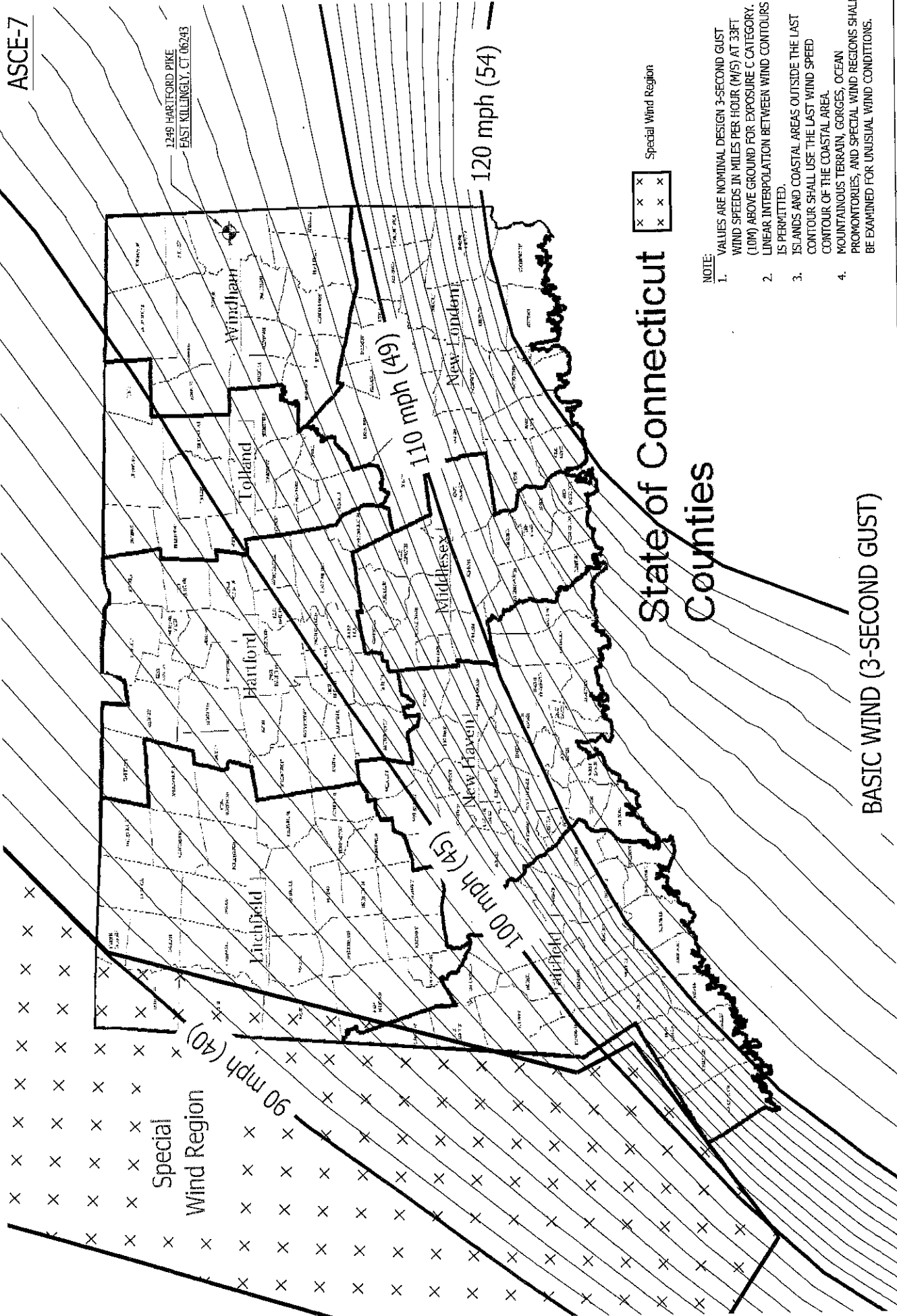
Limitations

Our analysis has been based upon the assumptions listed in this report. Any modifications made to the structure or to the listed appurtenances for which Chappell Engineering was not made aware of shall invalidate this report. Modifications made to the structure which have occurred after the date of this analysis shall invalidate this report. Modifications include (but are not limited to):

1. The addition of or reconfiguration of antennas or other appurtenances
2. The addition of or reconfiguration of coax cables or other feed lines
3. Modifications to the structure
4. Local damage or structural deficiencies not specifically identified in this report

Appendix A – Site Location Map and Terrain Classification

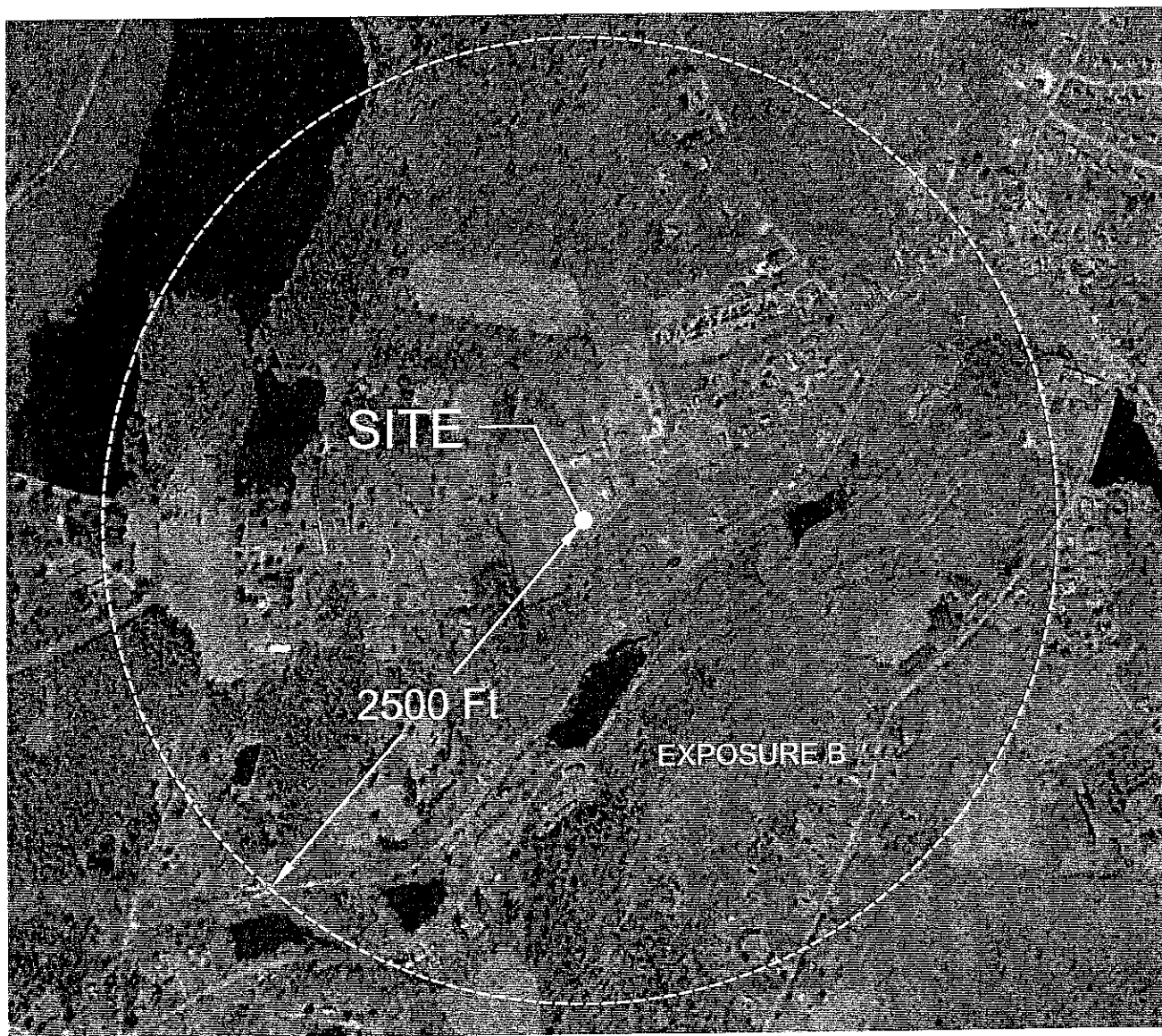
1249 HARTFORD PIKE
EAST KILLINGLY, CT 06243



- NOTE:
1. VALUES ARE NOMINAL DESIGN 3-SECOND GUST WIND SPEEDS IN MILES PER HOUR (M/S) AT 33FT (10M) ABOVE GROUND FOR EXPOSURE C CATEGORY. LINEAR INTERPOLATION BETWEEN WIND CONTOURS IS PERMITTED.
 2. ISLANDS AND COASTAL AREAS OUTSIDE THE LAST CONTOUR SHALL USE THE LAST WIND SPEED CONTOUR OF THE COASTAL AREA.
 3. MOUNTAINOUS TERRAIN, GORGES, OCEAN PROMONTORIES, AND SPECIAL WIND REGIONS SHALL BE EXAMINED FOR UNUSUAL WIND CONDITIONS.

BASIC WIND (3-SECOND GUST)

ASCE-7 MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES
MID AND NORTHERN ATLANTIC HURRICANE COASTLINE



TERRAIN CLASSIFICATION MAP

SCALE: NTS



2.6.5 EXPOSURE CATEGORIES

2.6.5.1 GENERAL

AN EXPOSURE CATEGORY THAT ADEQUATELY REFLECTS THE CHARACTERISTICS OF GROUND SURFACE IRREGULARITIES AT THE SITE SHALL BE DETERMINED. ACCOUNT SHALL BE TAKEN OF VARIATIONS IN GROUND SURFACE ROUGHNESS THAT ARISE FROM NATURAL TOPOGRAPHY AND VEGETATION AS WELL AS FROM CONSTRUCTED FEATURES. THE EXPOSURE CATEGORY FOR A STRUCTURE SHALL BE ASSESSED AS BEING ONE OF THE FOLLOWING:

1. **EXPOSURE B:** URBAN AND SUBURBAN AREAS, WOODED AREAS, OR OTHER TERRAIN WITH NUMEROUS CLOSELY SPACED OBSTRUCTIONS HAVING THE SIZE OF SINGLE-FAMILY DWELLINGS OR LARGER. USE OF THIS EXPOSURE SHALL BE LIMITED TO THOSE AREAS FOR WHICH TERRAIN REPRESENTATIVE OF EXPOSURE B SURROUNDS THE STRUCTURE IN ALL DIRECTIONS FOR A DISTANCE OF AT LEAST 2,630 FT [800 M] OR TEN TIMES THE HEIGHT OF THE STRUCTURE, WHICHEVER IS GREATER.
2. **EXPOSURE C:** OPEN TERRAIN WITH SCATTERED OBSTRUCTIONS HAVING HEIGHTS GENERALLY LESS THAN 30 FT [9.1 M]. THIS CATEGORY INCLUDES FLAT, OPEN COUNTRY, GRASSLANDS AND SHORELINES IN HURRICANE PRONE REGIONS.
3. **EXPOSURE D:** FLAT, UNOBSTRUCTED SHORELINES EXPOSED TO WIND FLOWING OVER OPEN WATER (EXCLUDING SHORELINES IN HURRICANE PRONE REGIONS) FOR A DISTANCE OF AT LEAST 1 MILE [1.61 KM]. SHORELINES IN EXPOSURE D INCLUDE INLAND WATERWAYS, LAKES AND NON-HURRICANE COASTAL AREAS. EXPOSURE D EXTENDS INLAND A DISTANCE OF 660 FT [200 M] OR TEN TIMES THE HEIGHT OF THE STRUCTURE, WHICHEVER IS GREATER. SMOOTH MUD FLATS, SALT FLATS AND OTHER SIMILAR TERRAIN SHALL BE CONSIDERED AS EXPOSURE D.

2.6.6.2 TOPOGRAPHIC CATEGORIES

THE TOPOGRAPHIC CATEGORY FOR A STRUCTURE SHALL BE ASSESSED AS BEING ONE OF THE FOLLOWING:

CATEGORY 1: NO ABRUPT CHANGES IN GENERAL TOPOGRAPHY, E.G. FLAT OR ROLLING TERRAIN. NO WIND SPEED-UP CONSIDERATION SHALL BE REQUIRED.

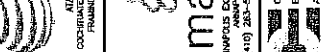
CATEGORY 2: STRUCTURES LOCATED AT OR NEAR THE CREST OF AN ESCARPMENT. WIND SPEED-UP SHALL BE CONSIDERED TO OCCUR IN ALL DIRECTIONS. STRUCTURES LOCATED VERTICALLY ON THE LOWER HALF OF AN ESCARPMENT OR HORIZONTALLY BEYOND 8 TIMES THE HEIGHT OF THE ESCARPMENT FROM ITS CREST, SHALL BE PERMITTED TO BE CONSIDERED AS TOPOGRAPHIC CATEGORY 1.

CATEGORY 3: STRUCTURES LOCATED IN THE UPPER HALF OF A HILL. WIND SPEED-UP SHALL BE CONSIDERED TO OCCUR IN ALL DIRECTIONS. STRUCTURES LOCATED VERTICALLY ON THE LOWER HALF OF A HILL SHALL BE PERMITTED TO BE CONSIDERED AS TOPOGRAPHIC CATEGORY 1.

CATEGORY 4: STRUCTURES LOCATED IN THE UPPER HALF OF A RIDGE. WIND SPEED-UP SHALL BE CONSIDERED TO OCCUR IN ALL DIRECTIONS. STRUCTURES LOCATED VERTICALLY ON THE LOWER HALF OF A RIDGE SHALL BE PERMITTED TO BE CONSIDERED AS TOPOGRAPHIC CATEGORY 1.

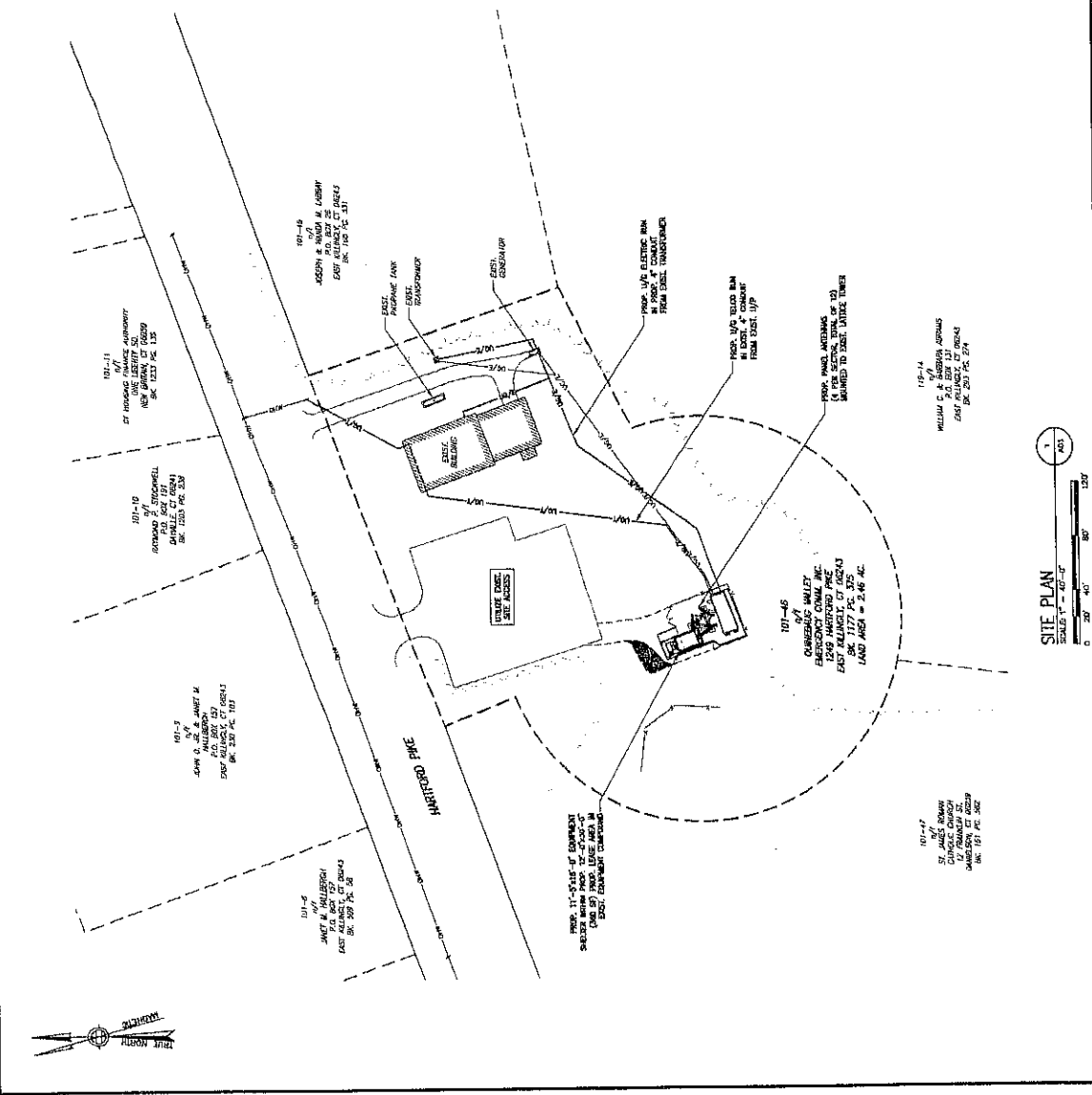
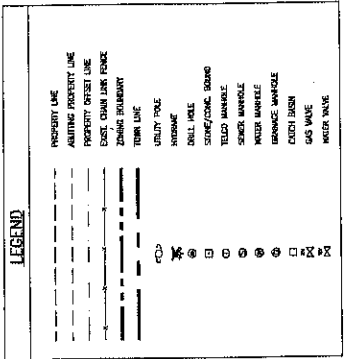
CATEGORY 5: WIND SPEED-UP CRITERIA BASED ON A SITE-SPECIFIC INVESTIGATION.

Appendix B – Proposed Antenna Plan & Cut Sheets

		A&T MOBILITY 550 COCHRANE ROAD, SUITES 13 & 14 FRAMINGHAM, MA 01701	
		1807 ANNAPOLIS EXCHANGE PARKWAY, SUITE 200 ANNAPOLIS, MD 21401 TEL (410) 283-5465 FAX (410) 283-5470	
		124 EAST COASTWAY, SUITE 101 MORGENTHAU, NJ 07033 TEL (201) 481-7100 FAX (201) 481-7468	
THE INFORMATION CONTAINED IN THIS SET OF DRAWINGS IS PROPRIETARY & CONFIDENTIAL TO A&T MOBILITY. ANY USE OR REPRODUCTION OF THIS INFORMATION WITHOUT THE WRITTEN PERMISSION OF A&T MOBILITY IS PROHIBITED.			
DATE	10/13/13	ISSUED FOR CONSTRUCTION	
REV		REVISION DESCRIPTION	
			
PROJECT LOCATION:		S3573 KILLINGLY HARTFORD PIKE 1249 HARTFORD PIKE EAST KILLINGLY, CT 06243	
DRAWN BY	NWC	CHECKED BY	JMT
SHEET TITLE		SITE PLAN	
SHEET NUMBER		A01	
		REVISION	
		0	

NOTES:

- [illegible]



SITE PLAN
 SCALES 1" = 40'-0"
 0 20' 40' 80' 120'

[illegible]

[illegible]

Product Specifications

COMMScope®

SBNH-1D6565C

Andrew® Dual Band Antenna, 698–896 MHz and 1710–2180 MHz, 65° horizontal beamwidth, RET compatible

POWERED BY

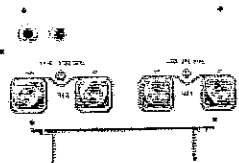


Electrical Specifications

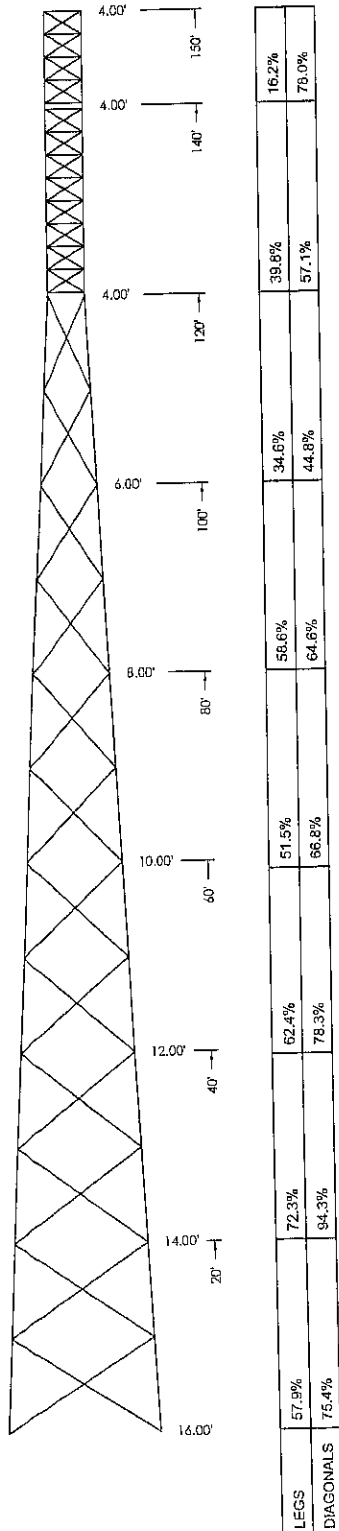
	698–806	806–896	1710–1880	1850–1990	1920–2180
Frequency Band, MHz	15.7	16.4	18.0	18.0	18.0
Gain, dBi	71	67	58	57	59
Beamwidth, Horizontal, degrees	8.6	7.8	5.5	5.1	4.8
Beamwidth, Vertical, degrees	0–11	0–11	0–7	0–7	0–7
Beam Tilt, degrees	15	15	16	16	16
USLS, typical, dB	25	28	34	31	31
Front-to-Back Ratio at 180°, dB	21	22	30	27	26
Front-to-Back Total Power at 180° ± 20°, dB	24	21	17	17	17
CPR at Boresight, dB	11	8	9	8	9
CPR at Sector, dB	30	30	30	30	30
Isolation, dB	35	35	35	35	35
Isolation, Intersystem, dB	1.5 14.0	1.5 14.0	1.5 14.0	1.5 14.0	1.5 14.0
VSWR Return Loss, dB	-150	-150	-150	-150	-150
PIM, 3rd Order, 2 x 20 W, dBc	400	400	300	300	300
Input Power per Port, maximum, watts	±45°	±45°	±45°	±45°	±45°
Polarization					

Mechanical Specifications

Color Radome Material	Light gray Fiberglass, UV resistant
Connector Interface Location Quantity	7-16 DIN Female Bottom 4
Wind Loading, maximum	879.0 N @ 150 km/h 197.6 lbf @ 150 km/h
Wind Speed, maximum	241.0 km/h 149.8 mph
Antenna Dimensions, L x W x D	2449.0 mm x 301.0 mm x 181.0 mm 96.4 in x 11.9 in x 7.1 in
Net Weight	27.6 kg 60.8 lb



Appendix C – Calculations

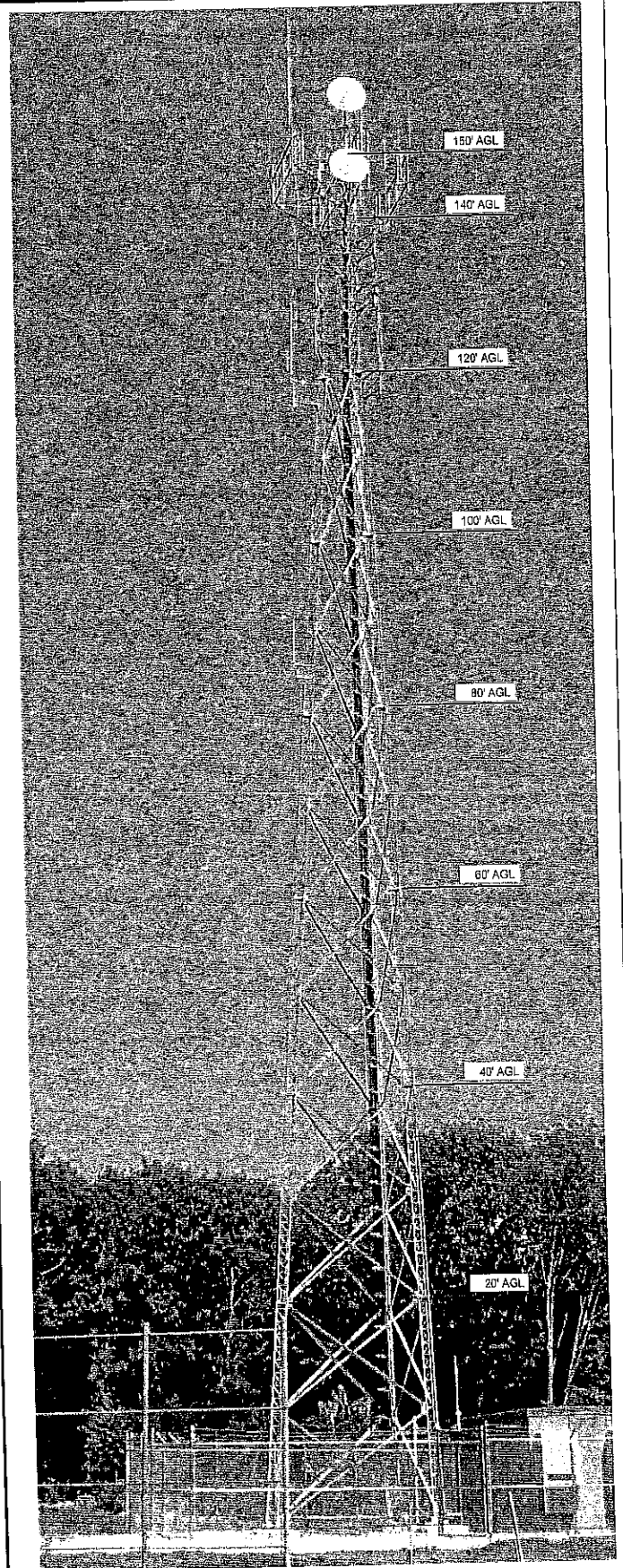


TOWER ELEVATION & STRESS RATIOS

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

1

SDC



TOWER PICTURE

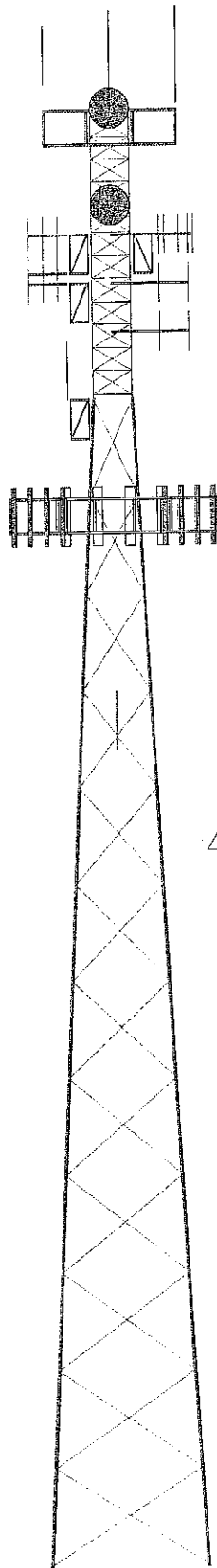
SCALE: N.T.S.

2

SDC

Section	T8	T7	T6	T5	T4	T3	T2	T1
Legs	12TL1.75x5Z (Prod 195557)		12TL1.5x5Z (Prod 207629)	A572-50			SR 1 3/4	SR 1 1/2
Leg Grade	L3x3x3/16		L2 1/2x2 1/2x3/16				SR 3/4	SR 5/8
Diagonals			A36				A572-50	
Diagonal Grade			N.A.				SR 7/8	
Top Girts			N.A.				SR 7/8	N.A.
Mid Girts			N.A.					
Bottom Girts			N.A.				SR 7/8	
Horizontalis			N.A.				SR 3/4	
Face Width (ft)	14	12	10	8	6			4
# Panels @ (ft)		12 @ 10					B @ 2.36021	4 @ 2.28042
Weight (K)	2.8	2.9	1.9	1.9	1.5	1.8	1.0	0.4

150.0 ft
140.0 ft
120.0 ft
100.0 ft
80.0 ft
60.0 ft
40.0 ft
20.0 ft
0.0 ft



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(2) PD1142-1	150	3'x3' Standoff Mount	129
DB222	150	4' Yagi	127
StationMaster 201	150	3'x3' Standoff Mount	125
StationMaster 201	150	DB225-A	118
StationMaster 201	150	3'x3' Standoff Mount	118
DB420	150	3'x3' Standoff Mount	118
Dish Pipe Mount	150	DB222	118
(3) Rayco DC6-46-80-18-8F Surge Arrestor	150 - 108	PIROD 12' T-Frame	108
G4-2.4	150	SBNH-1D6565C	108
6-Arm Halo Mount	148	(2) KRC 118 054	108
G4-2.4	140	(6) Ericsson RRUS-11	108
4' Yagi	137	SBNH-1D6565C	108
4' Yagi	137	(2) KRC 118 054	108
4' Yagi	137	KRC 118 048	108
3'x3' Standoff Mount	135	(6) Ericsson RRUS-11	108
3'x3' Standoff Mount	135	SBNH-1D6565C	108
3'x3' Standoff Mount	135	(2) KRC 118 054	108
Brush Antenna	133	KRC 118 048	108
4' Yagi	133	(6) Ericsson RRUS-11	108
4' Yagi	132	PIROD 12' T-Frame	108
4' Yagi	132	PIROD 12' T-Frame	108
3'x3' Standoff Mount	130	(3) TMA 860	106
3'x3' Standoff Mount	130	3' Omni	85

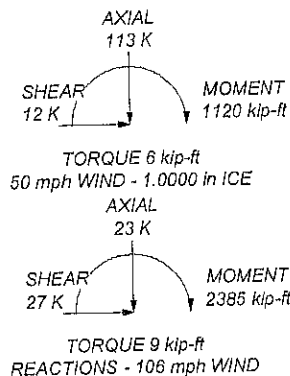
TOWER DESIGN NOTES

1. Tower is located in Windham County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 106 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 94.3%

ALL REACTIONS
ARE FACTORED

MAX. CORNER REACTIONS AT BASE:

DOWN: 180 K
UPLIFT: -162 K
SHEAR: 18 K



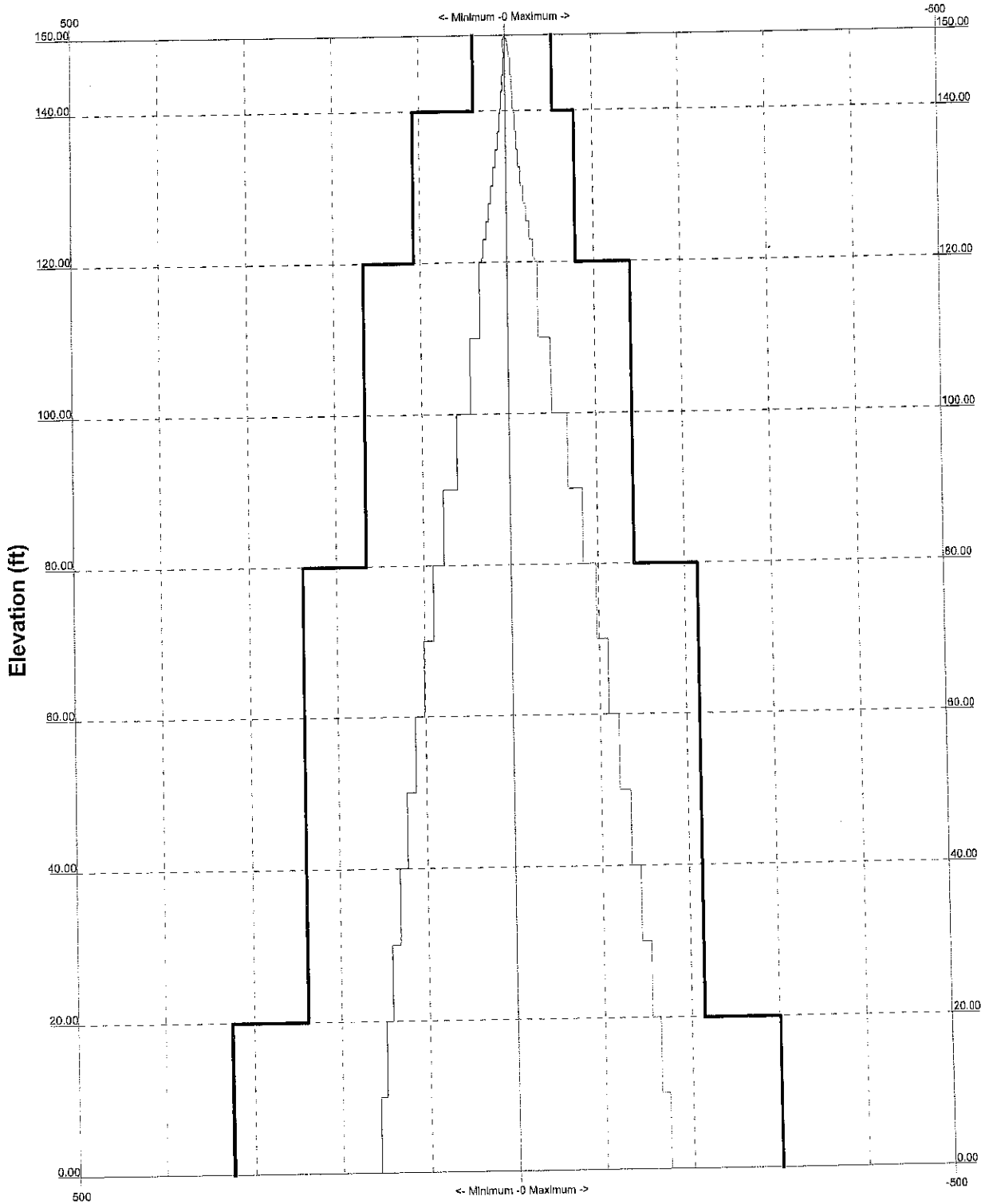
Chappell Engineering Assoc. LLC
201 Boston Post Road West
Marlborough, MA 01752
Phone: (508) 481-7400
FAX: (508) 481-7406

Job: **Killingly Hartford Pike (S3573)**
Project: **1249 Hartford Pike, East Killingly, CT 06243**
Client: **AT&T-Smartlink New Site Build** Drawn by: **CS** App'd:
Code: **TIA-222-G** Date: **11/12/13** Scale:
Path: **W:\NewTower Files\AT&T Smartlink Killingly CT S3573.dwg** Dwg No

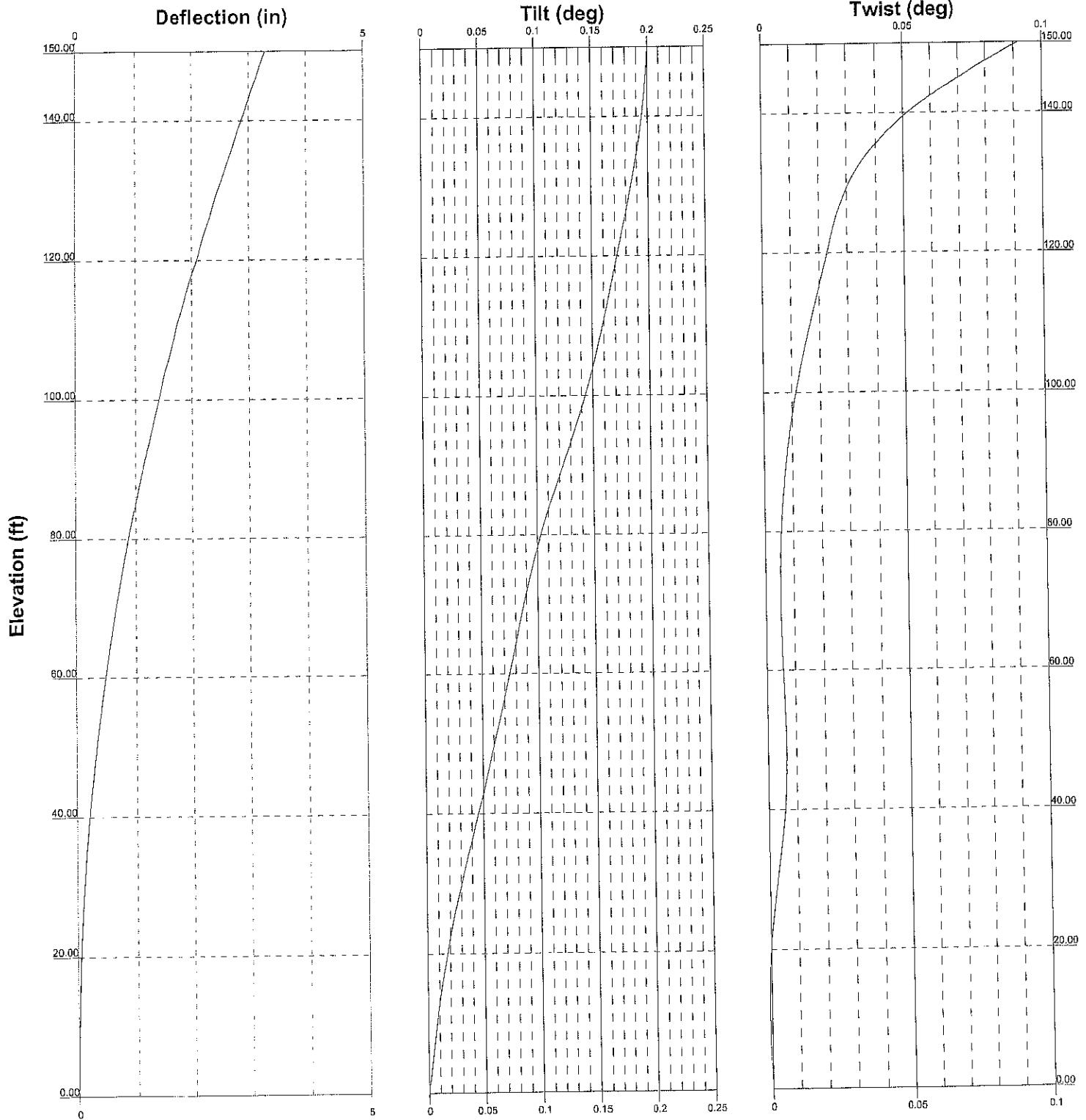
TIA-222-G - 106 mph/50 mph 1.0000 in Ice Exposure B

Leg Capacity ———

Leg Compression (K)



 Chappell Engineering Assoc. LLC	Chappell Engineering Assoc. LLC		Job: Killingly Hartford Pike (S3573)		
	201 Boston Post Road West		Project: 1249 Hartford Pike, East Killingly, CT 06243		
	Marlborough, MA 01752		Client: AT&T-Smartlink New Site Build	Drawn by: CS	App'd:
	Phone: (508) 481-7400		Code: TIA-222-G	Date: 11/12/13	Scale: N
	FAX: (508) 481-7406		Path: W:\InxTower Files\AT&T Smartlink Killingly CT S3573.ed		
Chappell Engineering		Dwg No.			



Chappell Engineering

Chappell Engineering Assoc. LLC201 Boston Post Road West
Marlborough, MA 01752

Phone: (508) 481-7400

FAX: (508) 481-7406

Job: Killingly Hartford Pike (S3573)**Project: 1249 Hartford Pike, East Killingly, CT 06243**

Client: AT&T-Smartlink New Site Build Drawn by: CS App'd:

Code: TIA-222-G Date: 11/12/13 Scale: N

Path: W:\Tower Files\AT&T Smartlink Killingly CT S3573.plt Dwg No. 1

tnxTower Chappell Engineering Assoc. LLC 201 Boston Post Road West Marlborough, MA 01752 Phone: (508) 481-7400 FAX: (508) 481-7406	Job	Killingly Hartford Pike (S3573)	Page 1 of 14
	Project	1249 Hartford Pike, East Killingly, CT 06243	Date 15:24:55 11/12/13
	Client	AT&T-Smartlink New Site Build	Designed by CS

Tower Input Data

The main tower is a 3x free standing tower with an overall height of 150.00 ft above the ground line.

The base of the tower is set at an elevation of 0.00 ft above the ground line.

The face width of the tower is 4.00 ft at the top and 16.00 ft at the base.

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

The following design criteria apply:

Tower is located in Windham County, Connecticut.

Basic wind speed of 106 mph.

Structure Class II.

Exposure Category B.

Topographic Category 1.

Crest Height 0.00 ft.

Nominal ice thickness of 1.0000 in.

Ice thickness is considered to increase with height.

Ice density of 56 pcf.

A wind speed of 50 mph is used in combination with ice.

Temperature drop of 50 °F.

Deflections calculated using a wind speed of 60 mph.

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

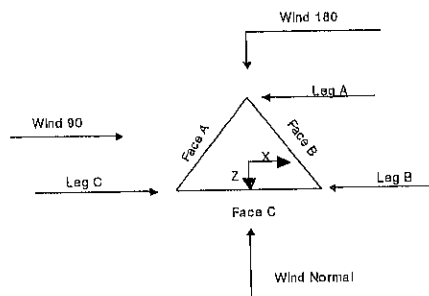
Pressures are calculated at each section.

Stress ratio used in tower member design is 1.

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 Retention 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 Poles Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets |
|--|--|---|



Triangular Tower

tnxTower Chappell Engineering Assoc. LLC 201 Boston Post Road West Marlborough, MA 01752 Phone: (508) 481-7400 FAX: (508) 481-7406	Job	Killingly Hartford Pike (S3573)	Page	2 of 14
	Project	1249 Hartford Pike, East Killingly, CT 06243	Date	15:24:55 11/12/13
	Client	AT&T-Smartlink New Site Build	Designed by	CS

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	150.00-140.00			4.00	1	10.00
T2	140.00-120.00			4.00	1	20.00
T3	120.00-100.00			4.00	1	20.00
T4	100.00-80.00			6.00	1	20.00
T5	80.00-60.00			8.00	1	20.00
T6	60.00-40.00			10.00	1	20.00
T7	40.00-20.00			12.00	1	20.00
T8	20.00-0.00			14.00	1	20.00

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	ft	ft				in	in
T1	150.00-140.00	2.26	X Brace	No	Steps	9.0000	2.5000
T2	140.00-120.00	2.38	X Brace	No	Steps	4.5000	7.0000
T3	120.00-100.00	10.00	X Brace	No	No	0.0000	0.0000
T4	100.00-80.00	10.00	X Brace	No	No	0.0000	0.0000
T5	80.00-60.00	10.00	X Brace	No	No	0.0000	0.0000
T6	60.00-40.00	10.00	X Brace	No	No	0.0000	0.0000
T7	40.00-20.00	10.00	X Brace	No	No	0.0000	0.0000
T8	20.00-0.00	10.00	X Brace	No	No	0.0000	0.0000

Tower Elevation	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
ft						
T1 150.00-140.00	Solid Round	1 1/2	A572-50 (50 ksi)	Solid Round	5/8	A572-50 (50 ksi)
T2 140.00-120.00	Solid Round	1 3/4	A572-50 (50 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T3 120.00-100.00	Truss Leg	12TL1.25x.5Z (Pirod 207628)	A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T4 100.00-80.00	Truss Leg	12TL1.25x.5Z (Pirod 207628)	A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T5 80.00-60.00	Truss Leg	12TL1.5x.5Z (Pirod 207629)	A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T6 60.00-40.00	Truss Leg	12TL1.5x.5Z (Pirod 207629)	A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T7 40.00-20.00	Truss Leg	12TL1.5x.5Z (Pirod 207629)	A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T8 20.00-0.00	Truss Leg	12TL1.75x.5Z (Pirod 195557)	A572-50 (50 ksi)	Single Angle	L3x3x3/16	A36 (36 ksi)

Tower Elevation	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
ft						
T1 150.00-140.00	Solid Round	7/8	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T2 140.00-120.00	Solid Round	7/8	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)

tnxTower Chappell Engineering Assoc. LLC 201 Boston Post Road West Marlborough, MA 01752 Phone: (508) 481-7400 FAX: (508) 481-7406	Job	Killingly Hartford Pike (S3573)	Page	3 of 14
	Project	1249 Hartford Pike, East Killingly, CT 06243	Date	15:24:55 11/12/13
	Client	AT&T-Smartlink New Site Build	Designed by	CS

Tower Section Geometry (cont'd)

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 150.00-140.00	None	Flat Bar		A36 (36 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T2 140.00-120.00	1	Solid Round	7/8	A36 (36 ksi)	Solid Round	3/4	A572-50 (50 ksi)

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 150.00-140.00	Sleeve DS	0.6250	4	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
T2 140.00-120.00	Flange	A325N	6	A325N	0	A325N	0	A325N	0	A325N	0	A325N	0	A325N	0
T3 120.00-100.00	Flange	1.0000	6	1.0000	1	1.0000	0	1.0000	0	1.0000	0	1.0000	0	1.0000	0
T4 100.00-80.00	Flange	A325N	6	A325N	1	A325N	0	A325N	0	A325N	0	A325N	0	A325N	0
T5 80.00-60.00	Flange	1.0000	6	1.0000	1	1.0000	0	1.0000	0	1.0000	0	1.0000	0	1.0000	0
T6 60.00-40.00	Flange	A325N	6	A325N	1	A325N	0	A325N	0	A325N	0	A325N	0	A325N	0
T7 40.00-20.00	Flange	1.0000	6	1.0000	1	1.0000	0	1.0000	0	1.0000	0	1.0000	0	1.0000	0
T8 20.00-0.00	Flange	A325N	6	A325N	1	A325N	0	A325N	0	A325N	0	A325N	0	A325N	0
		1.0000	6	1.0000	1	1.0000	0	1.0000	0	1.0000	0	1.0000	0	1.0000	0
		F1554-105		A325N		A325N		A325N		A325N		A325N		A325N	

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
Safety Line 3/8	B	No	Ar (CaAa)	150.00 - 0.00	12.0000	0.5	1	1	0.3750	0.3750		0.22
LDF4P-50A (1/2 FOAM)	B	Yes	Ar (CaAa)	150.00 - 0.00	-4.0000	0.45	5	5	0.6300	0.6300		0.15
LDF5-50A (7/8 FOAM)	B	No	Ar (CaAa)	150.00 - 0.00	-6.0000	0.45	4	4	0.7500	1.0900		0.33
LDF4-50A (1/2 FOAM)	B	Yes	Ar (CaAa)	135.00 - 0.00	-4.0000	0.4	5	5	0.6300	0.6300		0.15
LDF4-50A (1/2 FOAM)	B	No	Ar (CaAa)	130.00 - 0.00	-6.0000	0.4	5	5	0.6300	0.6300		0.15
LDF4-50A (1/2 FOAM)	A	Yes	Ar (CaAa)	130.00 - 0.00	-6.0000	-0.45	1	1	0.6300	0.6300		0.15
LDF4-50A (1/2 FOAM) 2.375" Innerduct	C	No	Ar (CaAa)	108.00 - 0.00	0.0000	0.45	2	2	2.3750	2.3750		3.00

tnxTower Chappell Engineering Assoc. LLC 201 Boston Post Road West Marlborough, MA 01752 Phone: (508) 481-7400 FAX: (508) 481-7406	Job	Killingly Hartford Pike (S3573)	Page	4 of 14
	Project	1249 Hartford Pike, East Killingly, CT 06243	Date	15:24:55 11/12/13
	Client	AT&T-Smartlink New Site Build	Designed by	CS

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#		C _A A _A ft ² /ft	Weight plf
T-Bracket	B	No	CaAa (In Face)	150.00 - 8.00	-6.0000	0.45	1	No Ice	0.04	0.22
								1/2" Ice	0.14	0.75
								1" Ice	0.24	1.28

Discrete Tower Loads

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 K
6-Arm Halo Mount	C	None		0.0000	148.00	No Ice	45.75	45.75	2.00
						1/2" Ice	66.00	66.00	3.00
						1" Ice	86.25	86.25	4.00
(2) PD1142-1	C	From	8.00	0.0000	150.00	No Ice	1.32	1.32	0.01
		Centroid-Fa	0.00			1/2" Ice	3.21	3.21	0.02
		ce	5.00			1" Ice	5.12	5.12	0.05
DB222	B	From	8.00	0.0000	150.00	No Ice	1.60	1.60	0.02
		Centroid-Fa	0.00			1/2" Ice	2.88	2.88	0.02
		ce	5.50			1" Ice	4.16	4.16	0.03
StationMaster 201	A	From	8.00	0.0000	150.00	No Ice	0.08	0.08	0.01
		Centroid-Fa	0.00			1/2" Ice	0.14	0.14	0.01
		ce	5.50			1" Ice	0.21	0.21	0.01
StationMaster 201	B	From	8.00	0.0000	150.00	No Ice	0.08	0.08	0.01
		Centroid-Fa	0.00			1/2" Ice	0.14	0.14	0.01
		ce	5.50			1" Ice	0.21	0.21	0.01
StationMaster 201	C	From	8.00	0.0000	150.00	No Ice	0.08	0.08	0.01
		Centroid-Fa	0.00			1/2" Ice	0.14	0.14	0.01
		ce	5.50			1" Ice	0.21	0.21	0.01
DB420	C	From	8.00	0.0000	150.00	No Ice	3.33	3.33	0.03
		Centroid-Fa	0.00			1/2" Ice	5.99	5.99	0.04
		ce	5.50			1" Ice	8.66	8.66	0.05
Dish Pipe Mount	C	From	8.00	0.0000	150.00	No Ice	0.00	3.25	0.09
		Centroid-Fa	0.00			1/2" Ice	0.00	4.75	0.11
		ce	0.00			1" Ice	0.00	6.25	0.13
3'x3' Standoff Mount	A	From Leg	1.50	0.0000	135.00	No Ice	2.20	3.50	0.06
			0.00			1/2" Ice	2.86	4.55	0.07
			0.00			1" Ice	3.52	5.60	0.08
3'x3' Standoff Mount	B	From Leg	1.50	0.0000	135.00	No Ice	2.20	3.50	0.06
			0.00			1/2" Ice	2.86	4.55	0.07
			0.00			1" Ice	3.52	5.60	0.08
3'x3' Standoff Mount	C	From Leg	1.50	0.0000	135.00	No Ice	2.20	3.50	0.06
			0.00			1/2" Ice	2.86	4.55	0.07
			0.00			1" Ice	3.52	5.60	0.08
4' Yagi	A	From Leg	3.00	0.0000	137.00	No Ice	0.50	0.50	0.03
			0.00			1/2" Ice	0.86	0.86	0.03
			0.00			1" Ice	1.22	1.22	0.04
4' Yagi	B	From Leg	3.00	0.0000	137.00	No Ice	0.50	0.50	0.03
			0.00			1/2" Ice	0.86	0.86	0.03
			0.00			1" Ice	1.22	1.22	0.04
4' Yagi	C	From Leg	3.00	0.0000	137.00	No Ice	0.50	0.50	0.03
			0.00			1/2" Ice	0.86	0.86	0.03
			0.00			1" Ice	1.22	1.22	0.04
4' Yagi	C	From Leg	3.00	0.0000	133.00	No Ice	0.50	0.50	0.03

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _A A ₁ Front ft ²	C _A A ₂ Side ft ²	Weight K
3'x3' Standoff Mount	C	From Leg	0.00	0.0000	130.00	1/2" Ice	0.86	0.03
			0.00			1" Ice	1.22	0.04
			1.50			No Ice	2.20	0.06
			0.00			1/2" Ice	2.86	0.07
			0.00			1" Ice	3.52	0.08
4' Yagi	C	From Leg	3.00	0.0000	132.00	No Ice	0.50	0.03
			0.00			1/2" Ice	0.86	0.03
			0.00			1" Ice	1.22	0.04
			0.00			No Ice	2.20	0.06
			1.50			1/2" Ice	2.86	0.07
3'x3' Standoff Mount	A	From Leg	0.00	0.0000	130.00	1" Ice	3.52	0.08
			0.00			No Ice	0.50	0.03
			3.00			1/2" Ice	0.86	0.03
			0.00			1" Ice	1.22	0.04
			0.00			No Ice	2.20	0.06
4' Yagi	A	From Leg	1.50	0.0000	129.00	1/2" Ice	2.86	0.07
			0.00			1" Ice	3.52	0.08
			0.00			No Ice	0.50	0.03
			3.00			1/2" Ice	0.86	0.03
			0.00			1" Ice	1.22	0.04
3'x3' Standoff Mount	A	From Leg	1.50	0.0000	129.00	No Ice	2.20	0.06
			0.00			1/2" Ice	2.86	0.07
			0.00			1" Ice	3.52	0.08
			0.00			No Ice	1.20	0.03
			1.50			1/2" Ice	2.02	0.04
Brush Antenna	A	From Leg	0.00	0.0000	133.00	1" Ice	2.84	0.04
			0.00			No Ice	2.20	0.06
			1.50			1/2" Ice	2.86	0.07
			0.00			1" Ice	3.52	0.08
			0.00			No Ice	0.50	0.03
3'x3' Standoff Mount	A	From Leg	3.00	0.0000	127.00	1/2" Ice	0.86	0.03
			0.00			1" Ice	1.22	0.04
			0.00			No Ice	2.20	0.06
			1.50			1/2" Ice	2.86	0.07
			0.00			1" Ice	3.52	0.08
3'x3' Standoff Mount	A	From Leg	3.00	0.0000	118.00	No Ice	0.50	0.03
			0.00			1/2" Ice	0.86	0.03
			0.00			1" Ice	1.22	0.04
			0.00			No Ice	2.20	0.06
			1.50			1/2" Ice	2.86	0.07
DB222	A	From Leg	0.00	0.0000	118.00	1" Ice	3.52	0.08
			3.00			No Ice	1.60	0.02
			0.00			1/2" Ice	2.88	0.02
			5.00			1" Ice	4.16	0.03
			0.00			No Ice	2.20	0.06
3'x3' Standoff Mount	C	From Leg	1.50	0.0000	118.00	1/2" Ice	2.86	0.07
			0.00			1" Ice	3.52	0.08
			0.00			No Ice	3.21	0.04
			3.00			1/2" Ice	5.78	0.05
			0.00			1" Ice	8.35	0.06
DB225-A	C	From Leg	5.00	0.0000	118.00	No Ice	0.60	0.01
			1.00			1/2" Ice	1.00	0.03
			0.00			1" Ice	1.40	0.04
			2.00			No Ice	12.20	0.36
			4.00			1/2" Ice	17.60	0.49
PiROD 12' T-Frame	A	From Leg	0.00	0.0000	108.00	1" Ice	23.00	0.62
			0.00			No Ice	12.20	0.36
			4.00			1/2" Ice	17.60	0.49
			0.00			1" Ice	23.00	0.62
			0.00			No Ice	12.20	0.36
PiROD 12' T-Frame	B	From Leg	4.00	0.0000	108.00	1/2" Ice	17.60	0.49
			0.00			1" Ice	23.00	0.62
			0.00			No Ice	12.20	0.36
			4.00			1/2" Ice	17.60	0.49
			0.00			1" Ice	23.00	0.62
PiROD 12' T-Frame	C	From Leg	4.00	0.0000	108.00	No Ice	12.20	0.36
			0.00			1/2" Ice	17.60	0.49
			0.00			1" Ice	23.00	0.62
			0.00			No Ice	11.45	0.06
			4.00			1/2" Ice	12.06	0.13
SBNH-ID6565C	A	From Leg	0.00	0.0000	108.00	1" Ice	12.69	0.20
			0.00			No Ice	11.54	0.12
			4.00			1/2" Ice	12.16	0.19
			0.00			1" Ice	12.79	0.27
			0.00			No Ice	11.54	0.12
(2) KRC 118 054	A	From Leg	4.00	0.0000	108.00	No Ice	11.54	0.12
KRC 118 048	A	From Leg	4.00	0.0000	108.00	No Ice	11.54	0.12

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _A A ₁ Front ft ²	C _A A ₁ Side ft ²	Weight K
(6) Ericsson RRUS-11	A	From Leg	0.00	0.0000	108.00	1/2" Ice	12.16	0.19
			0.00			1" Ice	12.79	0.27
			4.00			No Ice	2.94	0.00
			0.00			1/2" Ice	3.17	0.02
			0.00			1" Ice	3.41	0.04
SBNH-1D6565C	B	From Leg	0.00	0.0000	108.00	No Ice	11.45	0.06
			4.00			1/2" Ice	12.06	0.13
			0.00			1" Ice	12.69	0.20
			0.00			No Ice	11.54	0.12
			4.00			1/2" Ice	12.16	0.19
(2) KRC 118 054	B	From Leg	0.00	0.0000	108.00	1" Ice	12.79	0.27
			0.00			No Ice	11.54	0.12
			4.00			1/2" Ice	12.16	0.19
			0.00			1" Ice	12.79	0.27
			0.00			No Ice	2.94	0.00
KRC 118 048	B	From Leg	4.00	0.0000	108.00	1/2" Ice	3.17	0.02
			0.00			1" Ice	3.41	0.04
			0.00			No Ice	11.45	0.06
			4.00			1/2" Ice	12.06	0.13
			0.00			1" Ice	12.69	0.20
(6) Ericsson RRUS-11	B	From Leg	0.00	0.0000	108.00	No Ice	11.54	0.12
			4.00			1/2" Ice	12.16	0.19
			0.00			1" Ice	12.79	0.27
			0.00			No Ice	11.54	0.12
			4.00			1/2" Ice	12.16	0.19
SBNH-1D6565C	C	From Leg	0.00	0.0000	108.00	1" Ice	12.79	0.27
			4.00			No Ice	11.54	0.12
			0.00			1/2" Ice	12.16	0.19
			0.00			1" Ice	12.79	0.27
			0.00			No Ice	2.94	0.00
(2) KRC 118 054	C	From Leg	4.00	0.0000	108.00	1/2" Ice	3.17	0.02
			0.00			1" Ice	3.41	0.04
			0.00			No Ice	11.45	0.06
			4.00			1/2" Ice	12.06	0.13
			0.00			1" Ice	12.69	0.20
KRC 118 048	C	From Leg	0.00	0.0000	108.00	No Ice	11.54	0.12
			4.00			1/2" Ice	12.16	0.19
			0.00			1" Ice	12.79	0.27
			0.00			No Ice	11.54	0.12
			4.00			1/2" Ice	12.16	0.19
(6) Ericsson RRUS-11	C	From Leg	0.00	0.0000	108.00	1" Ice	12.79	0.27
			4.00			No Ice	2.94	0.00
			0.00			1/2" Ice	3.17	0.02
			0.00			1" Ice	3.41	0.04
			0.00			No Ice	1.33	0.00
(3) Rayco DC6-48-60-18-8F Surge Arrestor	C	None	0.0000	150.00 - 108.00		1/2" Ice	1.53	0.02
						1" Ice	1.73	0.03
						No Ice	0.16	0.00
(3) TMA 860	C	None	0.0000	106.00		1/2" Ice	0.23	0.00
						1" Ice	0.30	0.01
						No Ice	0.14	0.00

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft	Aperture Area ft ²	Weight K
G4-2.4	C	Paraboloid w/Radome	From Face	8.00 0.00 0.00	0.0000		150.00	4.33	No Ice 1/2" Ice 1" Ice	3.83 15.31 26.80
G4-2.4	C	Paraboloid w/Radome	From Face	8.00 0.00 0.00	0.0000		140.00	4.33	No Ice 1/2" Ice 1" Ice	3.83 15.31 26.80

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Truss-Leg Properties

Section Designation	Area <i>in²</i>	Area Ice <i>in²</i>	Self Weight <i>K</i>	Ice Weight <i>K</i>	Equiv. Diameter <i>in</i>	Equiv. Diameter Ice <i>in</i>	Leg Area <i>in²</i>
12TL1.25x.5Z (Pirod 207628)	1199.0103	5650.0376	0.34	2.32	4.1632	19.6182	3.6816
12TL1.25x.5Z (Pirod 207628)	1199.0103	5624.2224	0.34	2.30	4.1632	19.5286	3.6816
12TL1.5x.5Z (Pirod 207629)	1338.1186	5664.6144	0.46	2.32	4.6462	19.6688	5.3014
12TL1.5x.5Z (Pirod 207629)	1338.1186	5623.5208	0.46	2.29	4.6462	19.5261	5.3014
12TL1.5x.5Z (Pirod 207629)	1338.1186	5563.7175	0.46	2.24	4.6462	19.3185	5.3014
12TL1.75x.5Z (Pirod 195357)	1475.5793	5516.9986	0.59	2.19	5.1235	19.1562	7.2158

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 90 deg - No Ice
5	0.9 Dead+1.6 Wind 90 deg - No Ice
6	1.2 Dead+1.6 Wind 180 deg - No Ice
7	0.9 Dead+1.6 Wind 180 deg - No Ice
8	1.2 Dead+1.0 Ice+1.0 Temp
9	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
10	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
11	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
12	Dead+Wind 0 deg - Service
13	Dead+Wind 90 deg - Service
14	Dead+Wind 180 deg - Service

Maximum Tower Deflections - Service Wind

Section No.	Elevation <i>ft</i>	Horz. Deflection <i>in</i>	Gov. Load Comb.	Tilt <i>°</i>	Twist <i>°</i>
T1	150 - 140	3.297	14	0.2020	0.0934
T2	140 - 120	2.873	14	0.1972	0.0505
T3	120 - 100	2.079	13	0.1696	0.0252
T4	100 - 80	1.413	13	0.1405	0.0129
T5	80 - 60	0.882	12	0.1036	0.0082
T6	60 - 40	0.490	12	0.0758	0.0053
T7	40 - 20	0.215	12	0.0477	0.0032
T8	20 - 0	0.056	12	0.0199	0.0014

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Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
150.00	G4-2.4	14	3.297	0.2020	0.0934	205076
148.00	6-Arm Halo Mount	14	3.211	0.2014	0.0838	205076
144.75	(3) Rayco DC6-48-60-18-8F Surge	14	3.073	0.2001	0.0689	195310
	Arrestor					
140.00	G4-2.4	14	2.873	0.1972	0.0505	101284
139.50	(3) Rayco DC6-48-60-18-8F Surge	14	2.852	0.1968	0.0489	96149
	Arrestor					
137.00	4' Yagi	14	2.748	0.1943	0.0422	76216
135.00	3'x3' Standoff Mount	14	2.665	0.1920	0.0379	65133
134.25	(3) Rayco DC6-48-60-18-8F Surge	14	2.634	0.1910	0.0366	61754
	Arrestor					
133.00	4' Yagi	14	2.583	0.1894	0.0346	56840
132.00	4' Yagi	14	2.542	0.1880	0.0332	53437
130.00	3'x3' Standoff Mount	13	2.462	0.1851	0.0310	47724
129.00	3'x3' Standoff Mount	13	2.423	0.1836	0.0301	45302
127.00	4' Yagi	13	2.344	0.1805	0.0286	41128
125.00	3'x3' Standoff Mount	13	2.267	0.1773	0.0274	37659
123.75	(3) Rayco DC6-48-60-18-8F Surge	13	2.219	0.1754	0.0268	35796
	Arrestor					
118.50	(3) Rayco DC6-48-60-18-8F Surge	13	2.024	0.1673	0.0244	31951
	Arrestor					
118.00	3'x3' Standoff Mount	13	2.006	0.1666	0.0241	31950
113.25	(3) Rayco DC6-48-60-18-8F Surge	13	1.839	0.1600	0.0212	33193
	Arrestor					
108.00	PIROD 12' T-Frame	13	1.663	0.1527	0.0177	35027
106.00	(3) TMA 860	13	1.599	0.1498	0.0164	35780
85.00	3' Omni	12	1.002	0.1125	0.0088	33083

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	150 - 140	16.483	4	0.9880	0.5251
T2	140 - 120	14.396	4	0.9731	0.3099
T3	120 - 100	10.438	2	0.8478	0.1539
T4	100 - 80	7.108	2	0.7049	0.0649
T5	80 - 60	4.437	2	0.5201	0.0408
T6	60 - 40	2.464	2	0.3814	0.0265
T7	40 - 20	1.080	2	0.2402	0.0157
T8	20 - 0	0.281	2	0.1001	0.0068

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
150.00	G4-2.4	4	16.483	0.9880	0.5251	33318
148.00	6-Arm Halo Mount	4	16.064	0.9867	0.4775	33318
144.75	(3) Rayco DC6-48-60-18-8F Surge	4	15.385	0.9835	0.4031	31732
	Arrestor					
140.00	G4-2.4	4	14.396	0.9731	0.3099	17368
139.50	(3) Rayco DC6-48-60-18-8F Surge	4	14.293	0.9715	0.3017	16731

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Elevation	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
ft						
137.00	Arrestor	4	13.777	0.9613	0.2657	14481
135.00	4' Yagi	4	13.366	0.9512	0.2423	13274
134.25	3'x3' Standoff Mount	4	13.213	0.9470	0.2346	12882
	(3) Rayco DC6-48-60-18-8F Surge					
133.00	Arrestor	4	12.959	0.9397	0.2230	12276
132.00	4' Yagi	4	12.757	0.9334	0.2147	11832
130.00	4' Yagi	4	12.355	0.9203	0.2004	10648
129.00	3'x3' Standoff Mount	2	12.157	0.9134	0.1943	10003
127.00	3'x3' Standoff Mount	2	11.765	0.8991	0.1835	8922
125.00	4' Yagi	2	11.378	0.8844	0.1743	8052
123.75	3'x3' Standoff Mount	2	11.139	0.8752	0.1691	7591
	(3) Rayco DC6-48-60-18-8F Surge					
118.50	Arrestor	2	10.164	0.8372	0.1474	6634
	(3) Rayco DC6-48-60-18-8F Surge					
118.00	Arrestor	2	10.074	0.8337	0.1451	6627
113.25	3'x3' Standoff Mount	2	9.238	0.8014	0.1227	6814
	(3) Rayco DC6-48-60-18-8F Surge					
108.00	Arrestor	2	8.359	0.7657	0.0974	7105
106.00	PiROD 12' T-Frame	2	8.037	0.7515	0.0883	7222
85.00	(3) TMA 860	2	5.039	0.5644	0.0441	6601
	3' Omni	2				

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load Allowable	Allowable Ratio	Criteria
T1	150	Leg	A325N	0.6250	4	2.20	24.85	0.089	1	Bolt DS
T2	140	Leg	A325N	1.0000	6	4.81	53.01	0.091	1	Bolt Tension
T3	120	Leg	A325N	1.0000	6	7.38	53.01	0.139	1	Bolt Tension
		Diagonal	A325N	1.0000	1	5.57	15.33	0.363	1	Member Bearing
T4	100	Leg	A325N	1.0000	6	12.71	53.01	0.240	1	Bolt Tension
		Diagonal	A325N	1.0000	1	6.92	15.33	0.451	1	Member Bearing
T5	80	Leg	A325N	1.0000	6	16.87	53.01	0.318	1	Bolt Tension
		Diagonal	A325N	1.0000	1	5.81	15.33	0.379	1	Member Bearing
T6	60	Leg	A325N	1.0000	6	20.40	53.01	0.385	1	Bolt Tension
		Diagonal	A325N	1.0000	1	5.46	15.33	0.356	1	Member Bearing
T7	40	Leg	A325N	1.0000	6	23.53	53.01	0.444	1	Bolt Tension
		Diagonal	A325N	1.0000	1	5.34	15.33	0.348	1	Member Bearing
T8	20	Leg	F1554-10	1.0000	6	26.20	55.22	0.474	1	Bolt Tension
		5								
		Diagonal	A325N	1.0000	1	5.47	15.33	0.357	1	Member Bearing

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _n ft	Kl/r	A in ²	P _u K	φP _u K	Ratio P _u φP _u
T1	150 - 140	1 1/2	10.00	2.26	72.3	1.7672	-8.80	54.24	0.162 ¹
					K=1.00				
T2	140 - 120	1 3/4	20.00	2.38	65.3	2.4053	-31.58	79.26	0.398 ¹

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Section No.	Elevation ft	Size	L ft	L _n ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T3	120 - 100	12TL1.25x.5Z (Pirod 207628)	20.03	10.02	K=1.00 45.4	3.6816	-49.26	142.49	0.346 ¹
T4	100 - 80	12TL1.25x.5Z (Pirod 207628)	20.03	10.02	K=1.00 45.4	3.6816	-83.48	142.49	0.586 ¹
T5	80 - 60	12TL1.5x.5Z (Pirod 207629)	20.03	10.02	K=1.00 37.8	5.3014	-110.65	214.86	0.515 ¹
T6	60 - 40	12TL1.5x.5Z (Pirod 207629)	20.03	10.02	K=1.00 37.8	5.3014	-134.13	214.86	0.624 ¹
T7	40 - 20	12TL1.5x.5Z (Pirod 207629)	20.03	10.02	K=1.00 37.8	5.3014	-155.31	214.86	0.723 ¹
T8	20 - 0	12TL1.75x.5Z (Pirod 195557)	20.03	10.02	K=1.00 32.4	7.2158	-174.14	300.68	0.579 ¹

¹ P_u / φP_n controls

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L _d ft	Kl/r	φP _n K	A in ²	V _u K	φV _n K	Stress Ratio
T3	120 - 100	0.5	1.48	92.6	165.67	0.1963	1.41	4.54	0.310
T4	100 - 80	0.5	1.48	92.6	165.67	0.1963	0.61	4.54	0.135
T5	80 - 60	0.5	1.47	91.8	238.57	0.1963	0.62	4.57	0.136
T6	60 - 40	0.5	1.47	91.8	238.57	0.1963	0.62	4.57	0.135
T7	40 - 20	0.5	1.47	91.8	238.57	0.1963	0.61	4.57	0.133
T8	20 - 0	0.5	1.46	91.0	324.71	0.1963	0.69	4.60	0.149

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _n ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T1	150 - 140	5/8	4.59	2.23	170.9 K=1.00	0.3068	-1.85	2.37	0.780 ¹
T2	140 - 120	3/4	4.65	2.24	143.5 K=1.00	0.4418	-2.77	4.85	0.571 ¹
T3	120 - 100	L2 1/2x2 1/2x3/16	11.42	5.19	125.8 K=1.00	0.9020	-5.69	12.70	0.448 ¹
T4	100 - 80	L2 1/2x2 1/2x3/16	11.93	5.59	135.5 K=1.00	0.9020	-7.17	11.09	0.646 ¹
T5	80 - 60	L2 1/2x2 1/2x3/16	13.13	6.22	150.9 K=1.00	0.9020	-5.98	8.95	0.668 ¹
T6	60 - 40	L2 1/2x2 1/2x3/16	14.50	6.93	168.1 K=1.00	0.9020	-5.64	7.21	0.783 ¹
T7	40 - 20	L2 1/2x2 1/2x3/16	16.01	7.70	186.7 K=1.00	0.9020	-5.51	5.84	0.943 ¹
T8	20 - 0	L3x3x3/16	18.45	8.93	179.7 K=1.00	1.0900	-5.75	7.62	0.754 ¹

¹ P_u / φP_n controls

tnxTower Chappell Engineering Assoc. LLC 201 Boston Post Road West Marlborough, MA 01752 Phone: (508) 481-7400 FAX: (508) 481-7406	Job	Killingly Hartford Pike (S3573)	Page	11 of 14
	Project	1249 Hartford Pike, East Killingly, CT 06243	Date	15:24:55 11/12/13
	Client	AT&T-Smartlink New Site Build	Designed by	CS

Horizontal Design Data (Compression)

Section No.	Elevation	Size	L	L _u	KL/r	A	P _u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in ²	K	K	$\frac{\phi P_n}{\phi P_n}$
T1	150 - 140	3/4	4.00	3.88	248.0 K=1.00	0.4418	-0.05	1.62	0.030 ¹
T2	140 - 120	KL/R > 200 (C) - 30 3/4	4.00	3.85	246.7 K=1.00	0.4418	-0.43	1.64	0.261 ¹
		KL/R > 200 (C) - 55							

¹ P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation	Size	L	L _u	KL/r	A	P _u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in ²	K	K	$\frac{\phi P_n}{\phi P_n}$
T1	150 - 140	7/8	4.00	3.88	212.6 K=1.00	0.6013	-0.19	3.01	0.064 ¹
T2	140 - 120	KL/R > 200 (C) - 4 7/8	4.00	3.85	211.4 K=1.00	0.6013	-0.50	3.04	0.165 ¹
		KL/R > 200 (C) - 41							

¹ P_u / ϕP_n controls

Bottom Girt Design Data (Compression)

Section No.	Elevation	Size	L	L _u	KL/r	A	P _u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in ²	K	K	$\frac{\phi P_n}{\phi P_n}$
T1	150 - 140	7/8	4.00	3.88	212.6 K=1.00	0.6013	-0.49	3.01	0.162 ¹
T2	140 - 120	KL/R > 200 (C) - 7 7/8	4.00	3.85	211.4 K=1.00	0.6013	-0.40	3.04	0.130 ¹
		KL/R > 200 (C) - 43							

¹ P_u / ϕP_n controls

Mid Girt Design Data (Compression)

Section No.	Elevation	Size	L	L _u	KL/r	A	P _u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in ²	K	K	$\frac{\phi P_n}{\phi P_n}$
T2	140 - 120	7/8	4.00	3.85	211.4 K=1.00	0.6013	-0.23	3.04	0.074 ¹
		KL/R > 200 (C) - 46							

P_u / ϕP_n controls

tnxTower Chappell Engineering Assoc. LLC 201 Boston Post Road West Marlborough, MA 01752 Phone: (508) 481-7400 FAX: (508) 481-7406	Job	Killingly Hartford Pike (S3573)	Page	12 of 14
	Project	1249 Hartford Pike, East Killingly, CT 06243	Date	15:24:55 11/12/13
	Client	AT&T-Smartlink New Site Build	Designed by	CS

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _n ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T1	150 - 140	1 1/2	10.00	2.26	72.3	0.7732	6.08	37.70	0.161 ¹
T2	140 - 120	1 3/4	20.00	2.38	65.3	2.4053	28.85	108.24	0.267 ¹
T3	120 - 100	12TL1.25x.5Z (Pirod 207628)	20.03	10.02	45.4	3.6816	44.27	165.67	0.267 ¹
T4	100 - 80	12TL1.25x.5Z (Pirod 207628)	20.03	10.02	45.4	3.6816	76.26	165.67	0.460 ¹
T5	80 - 60	12TL1.5x.5Z (Pirod 207629)	20.03	10.02	37.8	5.3014	101.22	238.57	0.424 ¹
T6	60 - 40	12TL1.5x.5Z (Pirod 207629)	20.03	10.02	37.8	5.3014	122.40	238.57	0.513 ¹
T7	40 - 20	12TL1.5x.5Z (Pirod 207629)	20.03	10.02	37.8	5.3014	141.20	238.57	0.592 ¹
T8	20 - 0	12TL1.75x.5Z (Pirod 195557)	20.03	10.02	32.4	7.2158	157.22	324.71	0.484 ¹

¹ P_u / φP_n controls

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L _d ft	Kl/r	φP _n K	A in ²	V _n K	φV _n K	Stress Ratio
T3	120 - 100	0.5	1.48	92.6	165.67	0.1963	1.41	4.54	0.310
T4	100 - 80	0.5	1.48	92.6	165.67	0.1963	0.61	4.54	0.135
T5	80 - 60	0.5	1.47	91.8	238.57	0.1963	0.62	4.57	0.136
T6	60 - 40	0.5	1.47	91.8	238.57	0.1963	0.62	4.57	0.135
T7	40 - 20	0.5	1.47	91.8	238.57	0.1963	0.61	4.57	0.133
T8	20 - 0	0.5	1.46	91.0	324.71	0.1963	0.69	4.60	0.149

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _n ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T1	150 - 140	5/8	4.59	2.23	170.9	0.3068	1.79	13.81	0.130 ¹
T2	140 - 120	3/4	4.65	2.24	143.5	0.4418	2.66	19.88	0.134 ¹
T3	120 - 100	L2 1/2x2 1/2x3/16	11.42	5.19	80.1	0.5183	5.57	22.55	0.247 ¹
T4	100 - 80	L2 1/2x2 1/2x3/16	11.93	5.59	86.2	0.5183	6.92	22.55	0.307 ¹
T5	80 - 60	L2 1/2x2 1/2x3/16	13.13	6.22	96.0	0.5183	5.81	22.55	0.258 ¹
T6	60 - 40	L2 1/2x2 1/2x3/16	14.50	6.93	107.0	0.5183	5.46	22.55	0.242 ¹
T7	40 - 20	L2 1/2x2 1/2x3/16	16.01	7.70	118.8	0.5183	5.34	22.55	0.237 ¹
T8	20 - 0	L3x3x3/16	18.45	8.93	114.1	0.6593	5.47	28.68	0.191 ¹

¹ P_u / φP_n controls

tnxTower Chappell Engineering Assoc. LLC 201 Boston Post Road West Marlborough, MA 01752 Phone: (508) 481-7400 FAX: (508) 481-7406	Job	Killingly Hartford Pike (S3573)	Page	13 of 14
	Project	1249 Hartford Pike, East Killingly, CT 06243	Date	15:24:55 11/12/13
	Client	AT&T-Smartlink New Site Build	Designed by	CS

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T1	150 - 140	3/4	4.00	3.88	248.0	0.4418	0.21	19.88	0.011 ¹
T2	140 - 120	3/4	4.00	3.85	246.7	0.4418	0.66	19.88	0.033 ¹

¹ P_u / φP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T1	150 - 140	7/8	4.00	3.88	212.6	0.6013	0.22	27.06	0.008 ¹
T2	140 - 120	7/8	4.00	3.85	211.4	0.6013	0.49	27.06	0.018 ¹

¹ P_u / φP_n controls

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T1	150 - 140	7/8	4.00	3.88	212.6	0.6013	0.53	27.06	0.020 ¹
T2	140 - 120	7/8	4.00	3.85	211.4	0.6013	0.41	27.06	0.015 ¹

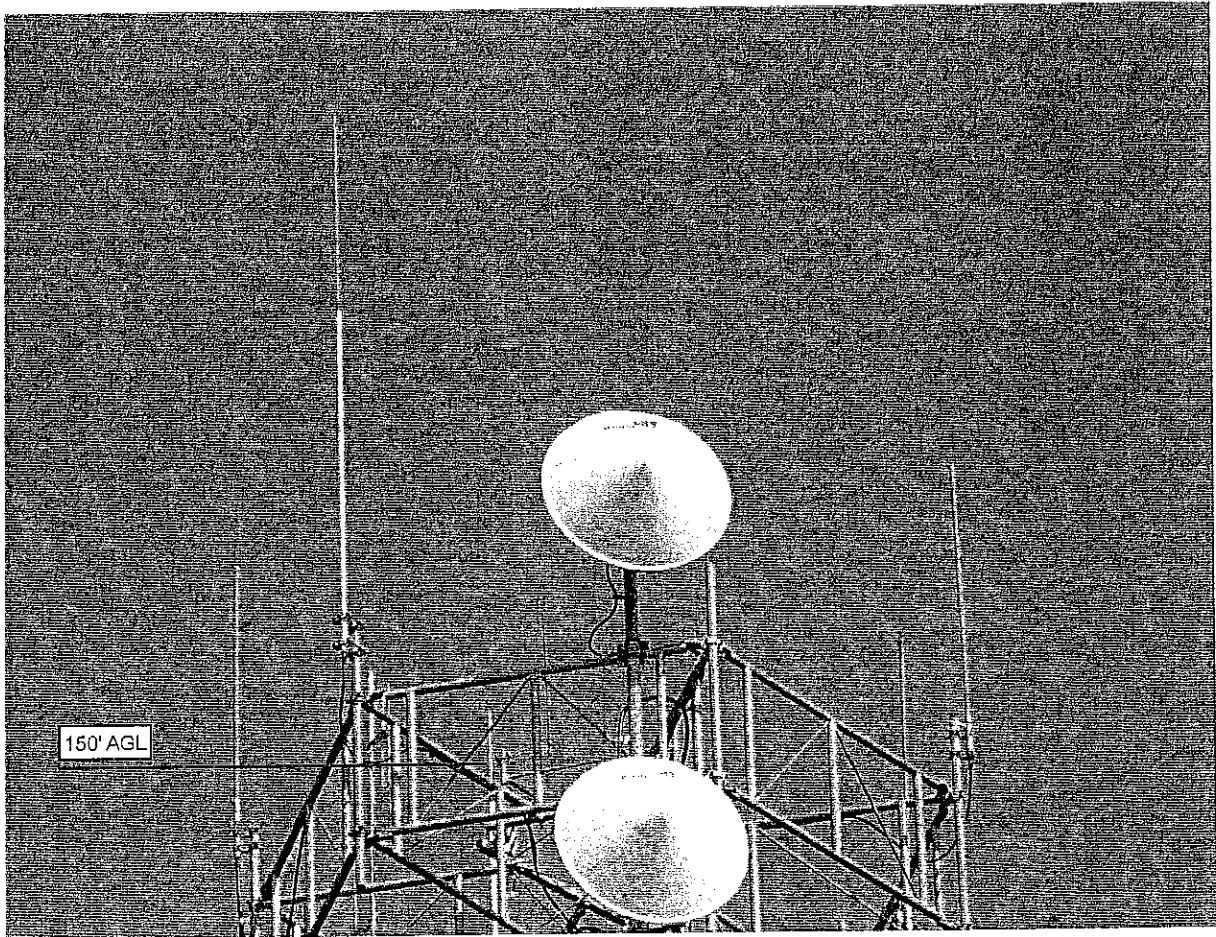
¹ P_u / φP_n controls

Mid Girt Design Data (Tension)

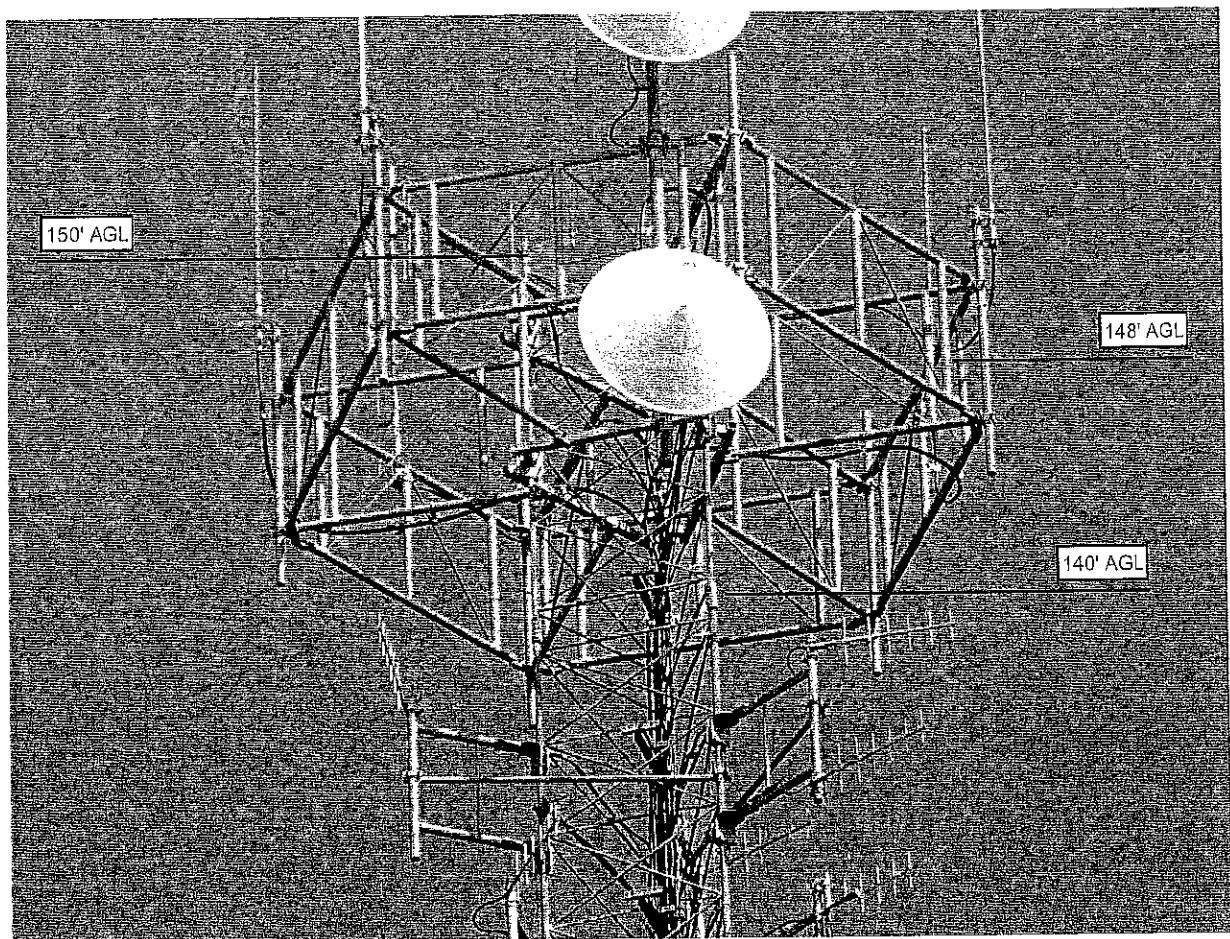
Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T2	140 - 120	7/8	4.00	3.85	211.4	0.6013	0.47	19.48	0.024 ¹

¹ P_u / φP_n controls

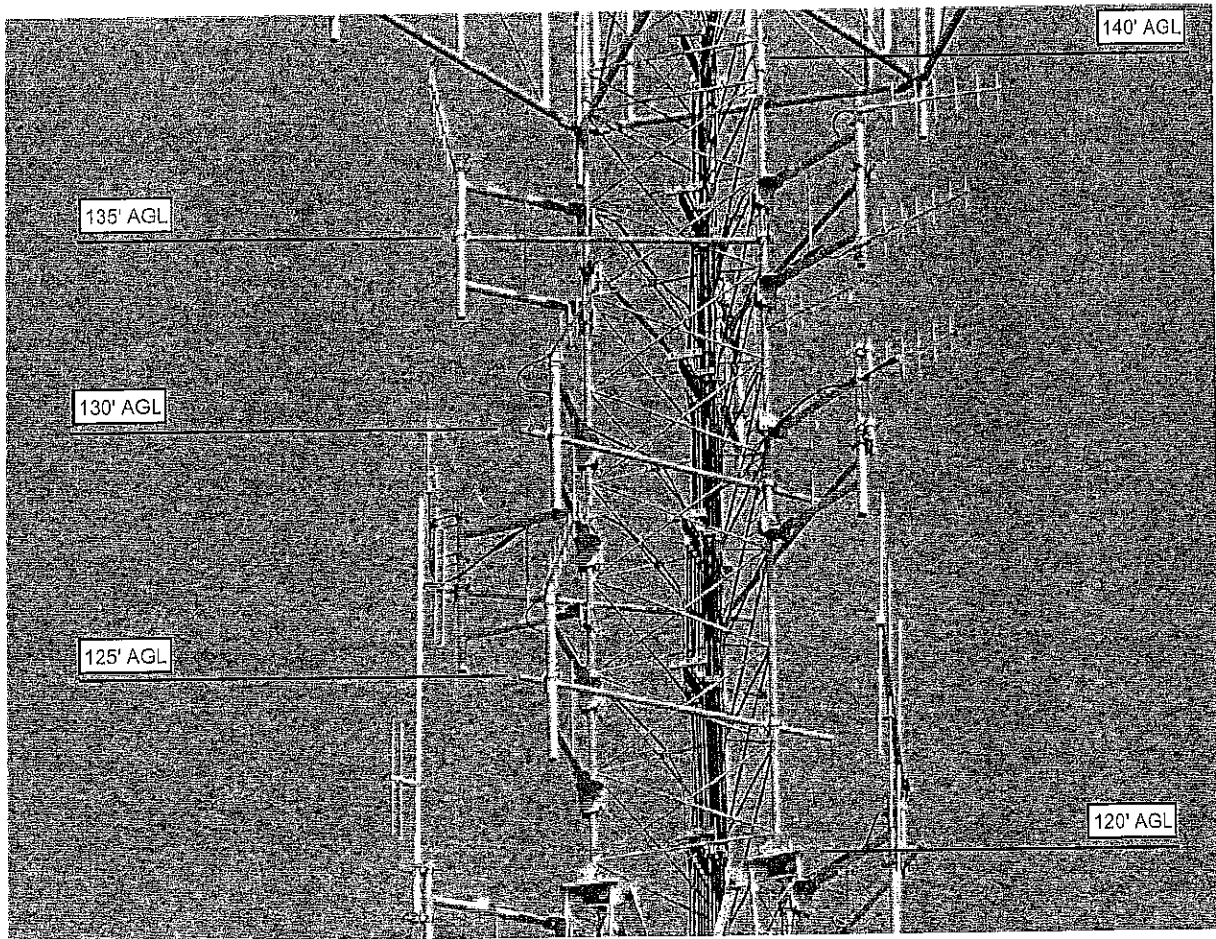
Appendix D – Photos



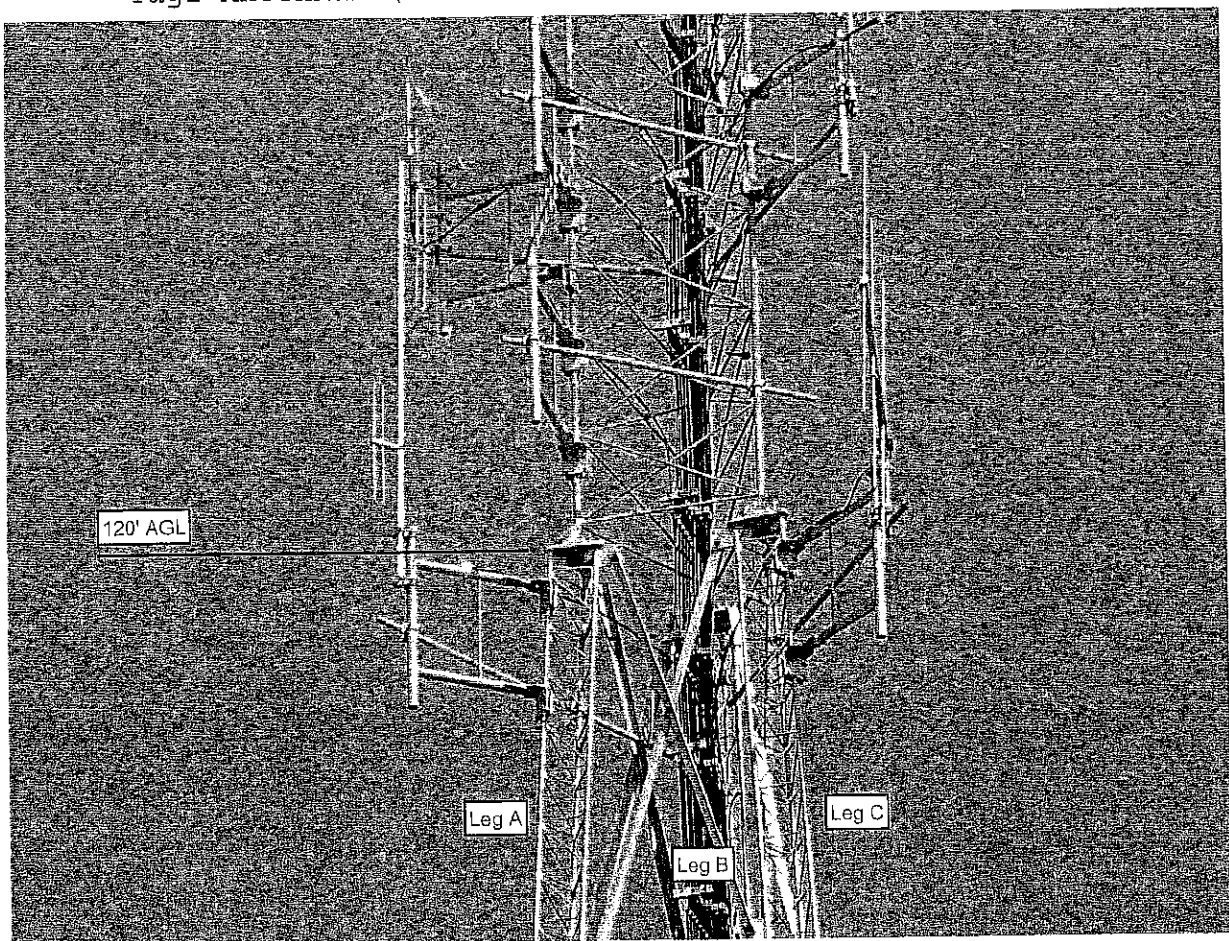
4ft Dish Antennas



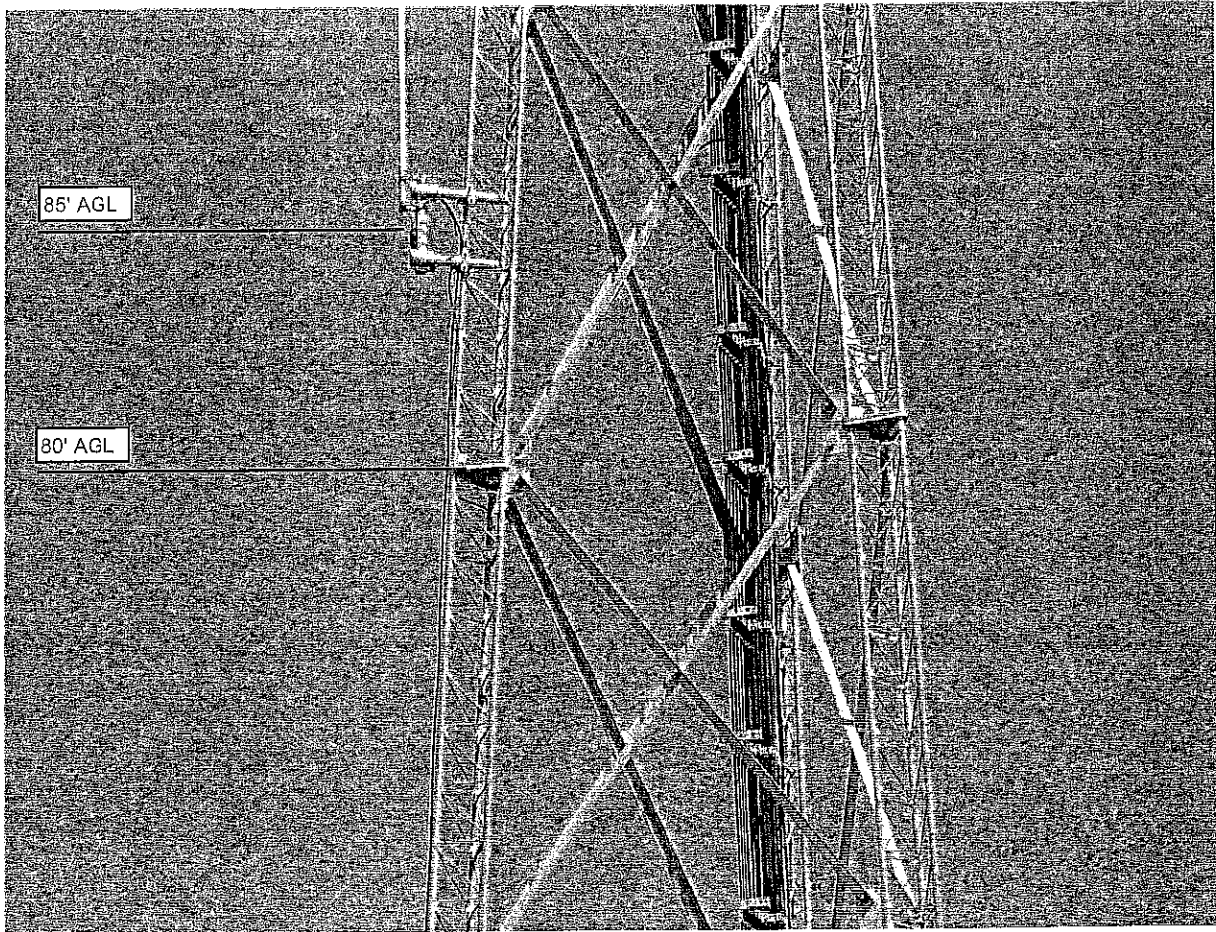
Halo Mount with Omni Antennas



Yagi Antennas (135ft and 130ft) on Sidearm Mounts



Dipole Antenna on Sidearm Mount

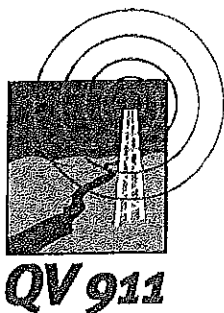


Omni Antenna - 85ft AGL



Base of Tower

TAB 5



**Quinebaug Valley
Emergency
Communications, Inc.**

1249 Hartford Pike
East Killingly, CT 06243
860.774.7555

LETTER OF AUTHORIZATION

**To: Connecticut Siting Council
New Britain, Connecticut**

TOWER SHARE APPLICATION

Quinebaug Valley Emergency Communications, Inc., ("**QV Emergency**"), as owner of the below-described property and tower, does hereby appoint New Cingular Wireless PCS, LLC ("**AT&T**") as agent for the purpose of consummating any governmental application necessary to ensure AT&T's ability to use and/or construct improvements to the tower and property that will be leased to AT&T for the purpose of constructing a telecommunications communications site.

AT&T understands and acknowledges that any construction of improvements is subject to the full execution of a lease agreement with QV Emergency, and that any action on the part of AT&T to proceed with any applications with governmental agencies is at AT&T's sole risk and liability.

**Property and Tower Location: 1249 Hartford Pike
East Killingly, CT 06243**

**Signature of Property/Tower Owner: Quinebaug Valley Emergency
Communications, Inc.,**

By: _____

Chuck Kelleher

Title: Associate Director

Date: _____

11/21/2013

TAB 6



POWER DENSITY REPORT

Calculated Radio Frequency Emissions

December 12, 2013

Prepared By: Amro Hussein

Reviewed By: Neil Arceo

Site Information:

Site Name: KILLINGLY - Hartford Pike

Site FA: 10578210

Site Address : 1249 Hartford Pike, East Killingly, CT 06243

Latitude: 41.845475, Longitude: -71.82814167

Structure: Tower

7545 Irvine Center Drive
Suite 200, Irvine, CA 92618

P: 949.623.3550

F: 949.769.2790

www.pramira.com

Prepared for:



1. Executive Summary

PRAMIRA has been contracted by AT&T Mobility, LLC to conduct a Power Density study for the following proposed AT&T facility:

Site Name:	KILLINGLY - Hartford Pike
Site FA :	10578210
Address:	1249 Hartford Pike, East Killingly, CT 06243
Latitude / Longitude:	Latitude: 41.845475, Longitude: -71.82814167
Structure Type:	Tower

PRAMIRA has determined RF-EME exposure levels from proposed AT&T wireless communications equipment at this site. The Federal Communications Commission (FCC) has developed Maximum Permissible Exposure (MPE) Limits for general public exposures and occupational exposures. A site is considered out of compliance with FCC regulations if there are areas that exceed the FCC exposure limits and there are no RF hazard mitigation measures in place. Any carrier which has an installation that contributes more than 5% of the applicable MPE must participate in mitigating these RF hazards. This report summarizes the results of RF-EME modeling in relation to relevant FCC RF-EME compliance standards for limiting human exposure to RF- EME fields.

This report contains a detailed summary of the RF EME analysis for the site, including the following:

- ✓ Site Configuration
- ✓ Predictive Modeling Analysis
- ✓ Statement of Compliance

Antenna specifications presented herein are based on information provided from the site manager or building manager, information from the licensees, educated estimates by the field technician or a combination of some or all of these sources.

Federal Communications Commission (FCC) Requirements

The FCC has established Maximum Permissible Exposure (MPE) limits for human exposure to Radiofrequency Electromagnetic (RF-EME) energy fields, based on exposure limits recommended by the National Council on Radiation Protection and Measurements (NCRP) and, over a wide range of frequencies, the exposure limits developed by the Institute of Electrical and Electronics Engineers, Inc. (IEEE) and adopted by the American National Standards Institute (ANSI) to replace the 1982 ANSI guidelines. Limits for localized absorption are based on recommendations of both ANSI/IEEE and NCRP.

The potential hazard associated with the RF electromagnetic fields is discussed in OET Bulletin No. 56 "Questions and Answers about the Biological Effects and Potential Hazards of RF Electromagnetic Fields". This document can be obtained on the FCC website at <http://www.fcc.gov>.

The FCC guidelines incorporate two separate tiers of exposure limits that are based upon occupational/controlled exposure limits (for workers) and general public/uncontrolled exposure limits for members of the general public.

December 12, 2013

Page: 2

Based on the above, the most restrictive thresholds for exposures of unlimited duration to RF energy for several personal wireless services are summarized below:

Table 6: MPE Thresholds			
Personal Wireless Service	Approximate Frequency	Occupational MPE	Public MPE
Personal Communication (PCS)	1,950 MHz	5.00 mW/cm ²	1.00 mW/cm ²
Cellular Telephone	870 MHz	2.90 mW/cm ²	0.58 mW/cm ²
Specialized Mobile Radio	855 MHz	2.85 mW/cm ²	0.57 mW/cm ²
Most Restrictive Freq. Range	30-300 MHz	1.00 mW/cm ²	0.20 mW/cm ²

MPE limits are designed to provide a substantial margin of safety. These limits apply for continuous exposures and are intended to provide a prudent margin of safety for all persons, regardless of age, gender, size, or health.

1.1. Site Configuration

AT&T current site configuration:

Currently AT&T doesn't have any equipment at this site (unmanned 150 ft tower). Other dipole antennas, whip antennas and microwave antennas are currently mounted on the tower legs and top. The total ERP value of the 13 dipole and whip antennas is 560 watts. These antennas are mounted on different heights from ground from 150 ft to 120 ft above ground. The total ERP of the 2 existing microwaves is 10 watts. The two microwaves are mounted at 150 ft and 140 ft high.

AT&T proposed site configuration:

AT&T is proposing to mount four 8ft antennas per sector with three sectors, total of twelve antennas. The total ERP per sector is 11315.22 watts. The antennas are mounted at 104ft high. Sector Alpha will be facing north-eastward at 0°, sector Beta will be facing south-eastward at 120° and sector Gamma will be facing south-westward at 240°.

2. Predictive Modeling Analysis

For this report, PRAMIRA utilized antenna and power data provided by AT&T, and compared the resultant worst-case MPE levels to the FCC's occupational/controlled exposure limits outlined in OET Bulletin 65. The assumptions used in the modeling are based upon information provided by AT&T, and information gathered from other sources.

Based on worst-case predictive modeling, there are no areas at ground level related to the proposed AT&T antennas that exceed the FCC's occupational or general public exposure limits at this site. At ground level, the maximum power density generated by the AT&T antennas is approximately 3.3 percent of the FCC's general public limit (0.66 percent of the FCC's occupational limit).

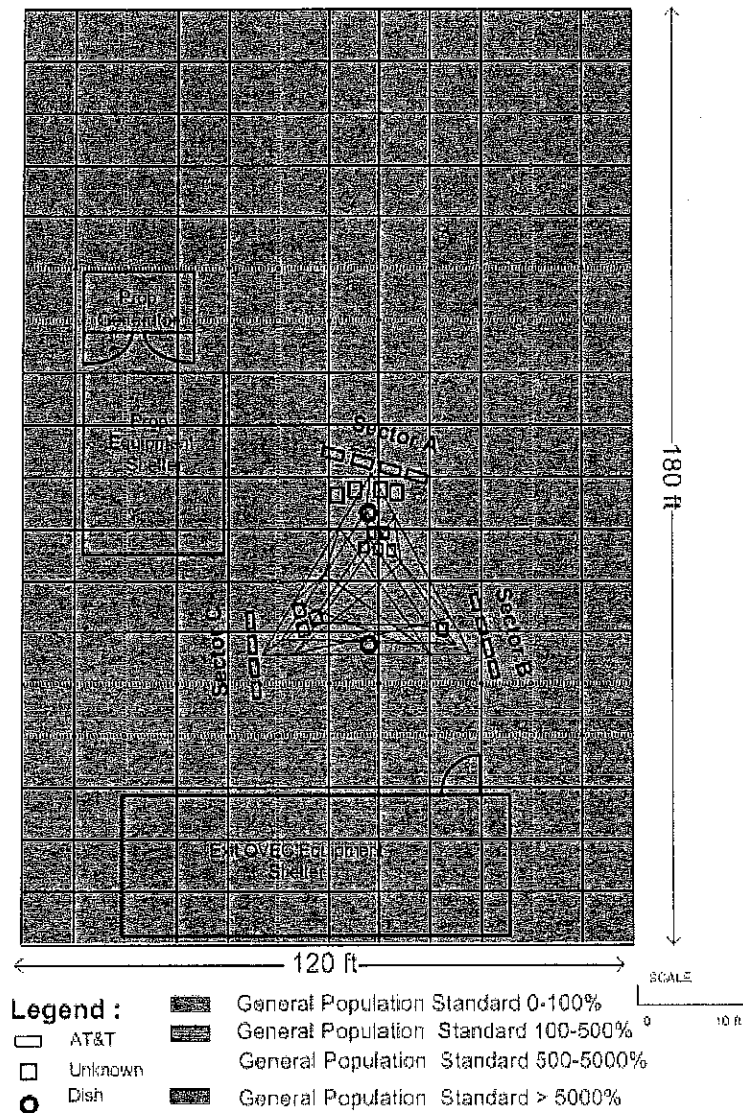
Carrier	Channel/sec	ERP/channel	Antenna H.(ft)	Power Density	Frequency (MHz)	Limit	% MPE
AT&T	2	2032.778	96	0.0189	850	0.5867	1.0
AT&T	3	2871.375	96	0.0267	1900	1	1.1
AT&T	2	1016.389	96	0.00945	700	0.4667	1.2



Existing Antennas	Channel	ERP	Antenna H.(ft)	Power Density	Frequency (MHz)	% MPE
Celwave PD1142	1	80	150	0.000381	72.68	1.451
Celwave PD1142	1	85	150	0.000301	33.90	1.01
Andrew DB222	1	110	150	0.000389	150-170	1.019
RFS Station Master 201	1	10	150	0.000035	465.60	0.91
RFS Station Master 201	1	10	150	0.000035	458.38	1.12
RFS Station Master 201	1	15	150	0.000053	450-470	1.13
Andrew DB420	1	N/A Rx only	150	-	460.60	0.96
Radiowaves SP4-4.7	1	5	150	0.000018	4.90	0.83
Radiowaves SP4-4.7	1	5	140	0.000020	4.90	0.34
Andrew DB438	1	30	135	0.000131	465.03	0.63
Andrew DB438	1	20	135	0.000087	458.81	0.58
Andrew DB438	1	30	135	0.000131	468.19	0.63
Andrew DB438	1	30	130	0.000141	469.48	0.63
Andrew DB438	1	30	130	0.000141	458.59	0.63
Diamond D130J	1	N/A Rx only	130	-	33-800	0.63
Andrew DB438	1	30	125	0.000153	465.54	0.63
Andrew DB222	1	N/A Rx only	120	-	152.01	0.63
Andrew DB225	1	80	120	0.000442	72.68	1.44

The total MPE percentage of AT&T and the collocation antennas is 18.5% which is well below the FCC standard for general public. These limits are considered protective of these populations.

A graphical representation of the RoofView® modeling results is presented below.



3. Statement of Compliance

PRAMIRA has conducted predictive modeling to estimate the worst-case power density from AT&T antennas to document potential MPE levels at this location and ensure that site control measures are adequate to meet FCC and OSHA requirements, as well as AT&T's corporate RF safety policies.

As presented in the preceding sections, based on worst-case predictive modeling, there are no modeled exposures on any accessible ground-level walking/working surface related to proposed equipment in the area that exceed the FCC's occupational and general public exposure limits at this site. As such, the proposed AT&T project is in compliance with FCC rules and regulations.

Based on the predictive model, the AT&T equipment at the site is in compliance with FCC guidelines for General Population environments.

December 12, 2013

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4. Conclusions

PRAMIRA has prepared this Radiofrequency Emissions Compliance Report for the proposed AT&T telecommunications equipment at the site located at 1249 Hartford Pike, East Killingly, CT 06243 proposed by AT&T Mobility is in compliance with the FCC standard. The analysis and procedure used to provide the report is according to FCC OET Bulletin 65 and other industry standards.

TAB 7

TOWN OF KILLINGLY

The Killingly Zoning Board of Appeals, in accordance with the provisions of Public Act Number 75-317, State of Connecticut, took the following action on November 12, 2009:

Approved Variance #09-747 of QVEC – Jeff Otto

Said action is hereby submitted to the Office of the Killingly Town Clerk for recording within the Killingly Land Records (and indexing within the grantor's index).

1. Description of premises:
1249 Hartford Pike, G.I.S. #101, Lots 46 & 47, Low Density zone
2. Nature of application:
To allow for a 150 ft. radio tower
3. Condition of Approval: None
4. Zoning by-law, ordinances or regulation which is varied, altered, or to which special exception is granted:
Section 450.3 Table 'A', Height of Structures (max. 35 ft.)
5. Name of Owner of record:
Quinebaug Valley Emergency Communications
Jeff Otto
55 Westcott Road
Danielson, CT 06239

This information is certified by:

Alice A. Boucher
Authorized Signature

12-8-09
Date

Executive Assistant
Position

Alice Boucher

RECEIVED FOR RECORD

12/08/2009 11:08:34AM
TOWN OF KILLINGLY, CT

Town Clerk Elizabeth M Wilson
BK: 01179 PG: 00405

TOWN OF KILLINGLY

The Killingly Planning and Zoning Commission, in accordance with the provisions of Public Act Number 75-317, State of Connecticut, took the following action on November 16, 2009:

Approved Special Permit Application #09-965 of Quinebaug Valley Emergency Communications, Inc.
Said action is hereby submitted to the Office of the Killingly Town Clerk for recording within the Killingly Land Records (and indexing within the grantor's index).

1. Description of premises:
1249 Hartford Pike Low Density Zone
2. Nature of application:
Conversion of church to a dispatch center and appurtenances to include radio tower and garage
3. Condition of Approval: NONE
4. Zoning by-law, ordinances or regulation which is varied, altered, or to which special exception is granted: Section 410.2.2g – Public Service Corporation
5. Name of Owner of record:
Quinebaug Valley Emergency Communications
Jeff Otto
55 Westcott Road
Danielson, CT 06239

This information is certified by:

Alice Boucher
Authorized Signature
Alice Boucher

12-8-09
Date

Executive Assistant
Position

RECEIVED FOR RECORD
12/08/2009 11:53:45AM
TOWN OF KILLINGLY, CT

Town Clerk Elizabeth M Wilson
BK: 01179 PG: 00406