November 28, 2011

Town of Topsfield Zoning Board of Appeals
Town of Topsfield
Town Hall
8 West Common Street
Topsfield, MA 01983

Re: Application for Special Permit for a Wireless Communications Facility ("WCF") at the existing WCF located at 285 Boston Street, Topsfield, MA (Town of Topsfield Map: 41 Lot: 90)

Property Address: 285 Boston Street, Topsfield, MA (the "Property")

Applicant: AT&T Wireless PCS, LLC ("AT&T Mobility"), formerly Cingular Wireless

Dear Chairman and Members of the Board:

As agent for and on behalf of AT&T Wireless PCS, LLC ("AT&T Mobility") the "Applicant", we respectfully submit the enclosed Application for a Special Permit for a Wireless Communications Facility ("WCF") from the Town of Topsfield Zoning Board of Appeals (the "Board").. Pursuant to Town of Topsfield Zoning By-Law Article XII, Section 12.04 c, 3, 4, the Special Permit granting authority shall be the Zoning Board of Appeals and the Board is vested with the authority to grant the requested Special Permit and site plan approval.

The Applicant seeks to continue to co-locate and operate its existing WCF that is owned by Skeff's, Inc. of Rockwood, Maine. AT&T Mobility antennas are located at a centerline of approximately 158 feet on the existing WCF. New antennas will be mounted with the top not to exceed current height. The WCF is shown on the plans submitted herewith and incorporated herein by reference (the "Plans").

In addition to the request for all necessary zoning approvals, AT&T Mobility includes the following supporting information:

A. Background

AT&T Mobility is licensed by the Federal Communications Commission to construct and operate a wireless telecommunications network in various markets throughout the country, including the Commonwealth of Massachusetts and, in particular, the Town of Topsfield. AT&T Mobility is in the process of designing and upgrading a telecommunications system to serve all of the Commonwealth of Massachusetts. One of the key design objectives of AT&T Mobility's system is to provide seamless coverage without gaps or dead spots. Such a system requires a grid of radio transmitting and receiving links located approximately 1.5 to 2.5 miles apart, depending on the location of existing and proposed installations in the surrounding area as well as the existing topography. The radio transmitting and receiving facilities operate on a line-of-sight basis, requiring a clear path from the facility to the user on the ground. This dynamic requires the antennas to be located above the tree-line, and in

Dick W. Man, 831 Beacon St., #259, Newton, MA 02459
Phone: (857) 891-2769 Email: dman43@bldgnet.com

a location where the signal is not obstructed or degraded by other buildings or by topographical features such as hills.

B. The Facility

As shown in the Plans, the WCF equipment is currently placed in an equipment shelter on the ground adjacent to the telecommunication tower. Six antennas are installed at approximately 158 feet in height. The antennas are connected to the equipment via coax cables.

AT&T Mobility is proposing to install 3 new antennas, a total of 9 antennas, at the same height. The top of the new antennas will not exceed the height of the top of existing antennas. The antennas will be connected to remote radio heads, surge arrestors and equipment via a single fiber optic cable and 2 DC cables contained within a 3 inch diameter flexible cable bundled together and mounted to lattice tower exterior. AT&T Mobility will be utilizing existing electrical power and telephone service.

After the modification, the facility will be unmanned and will only require twice a month maintenance visits. The traffic generated by the facility will remain at about two vehicle trips per month by maintenance personnel who will inspect the facility to ensure it remains in good working order. The facility will comply with all applicable local, state and federal safety codes.

C. Compliance with the Zoning Ordinance and Abbreviated Site Plan Review

As set forth above, the Applicant believes that it satisfies the requirements set forth in the Zoning By-Laws, and that the proposed addition meets all of the objectives of the Special Permit Renewal criteria for a WCF to the extent applicable, of the Town of Topsfield's Abbreviated Site Plan Review regulations.

The Applicant hopes that the Board agrees that the Property continues to be a sensible location for co-location of AT&T Mobility's personal wireless services facility and satisfies the Town of Topsfield's goal of rational siting of such facilities, as well as the Zoning By-Laws requirements for such facilities.

D. Conclusion

AT&T Mobility is one of a limited number companies licensed by the FCC to provide service to the residents and businesses of Town of Topsfield. As a licensee of the FCC, AT&T Mobility is mandated to build out and operate its systems such that adequate wireless service is provided to the general public. AT&T Mobility has determined that the proposed addition of antennas on its existing WCF at 285 Boston Street is needed to continue to provide wireless technology to the Town of Topsfield. Accordingly, AT&T Mobility respectfully requests that the requested Special Permit Renewal be granted pursuant to the submitted application. Due to the importance of this proposed modification and the construction time line, AT&T Mobility respectfully requests that the zoning approval process be completed at the Board's earliest convenience and as required by the Zoning By-Laws.

Please feel free to contact me at (857) 891-2769 regarding any questions or comments concerning this application.

Sincerely,

Dick W. Man
SAI Communications
Agent for AT&T Mobility

Encl:

Application for Special Permit with Fees
Certified Abutters List & 2 sets of stamped envelops
RF Affidavit
Structural Analysis
FCC License
Corporation Certification
Plans

Dick W. Man, 831 Beacon St., #259, Newton, MA 02459
Phone: (857) 891-2769 Email: dman43@bldgnet.com

Form A

Issue Date: 04/26/2011

NATURE OF APPLICATION:

__x__ Petition for Special Permit pursuant to Article XII, Section 12.04c,3, 4 of the Zoning Bylaw.

_____ Petition for Finding pursuant to Article ____, Section ____ of the Bylaw.

_____ Petition for a Variance from Article _____, Section _____, of the Zoning Bylaw.

_____ Petition for Site Plan Review pursuant to Article IX of the Zoning Bylaw (and the Guidelines and Performance Standards for Activities Subject to the Provisions of Article IX of the Topsfield Zoning Bylaw; and Supplement Form C for submitted requirements and formats).

_____ Petition for a Comprehensive Permit pursuant to G.L.c. 40B, Section 20-23.

_____ Appeal from the decision dated _____ of the Building Inspector or others pursuant to L.L. c. 40A, Section 15.

DESCRIPTION OF APPLICANT:

a. Name AT&T Mobility/SAI Communications

b. Address 831 Beacon St., #259, Newton, MA 02459

c. Phone Number (857) 891-2769

d. Interest in Premises (e.g., owner, tenant, prospective purchaser, etc.) Tenant
(Attach copy of lease and/or letter of authorization from owner, if applicable)

DESCRIPTION OF PREMISES:

a. Assessor's Map 41, Lot(s) 90, Zoning District IRA

b. Location of Premises (number and street) 285 Boston Street

c. Name and address of legal owner (if different from Applicant) Skeff, Inc.
PO Bx 185, Rockwood, ME 04478

d. Deed to the Premises recorded at (if known):
_____ Essex South District Registry of Deeds, Book _____ Page _____
_____ Essex South Registry District of the Land Court, Certificate Number _____

e. Prior zoning decisions affecting the Premises (if any):
Date of Decision _____ Name of Applicant _____
Nature of Decision _____

f. Present use of the Premises cell tower

g. Present structures conform to current Zoning Bylaw. __X__ Yes _____ No. If no, in what respect does it not conform. _____

PROPOSAL (attach additional sheets if necessary):

a. General Description:
Propose to add 3 new antennas on existing mount at 158' with radio heads, surge arrestors on tower, connected to equipment on ground in existing shelter via 1 fiber and 2 DC cables. Add 1 GPS antenna mounted on existing shelter within existing fenced-in area

b. If proposal is for construction or alteration of an existing structure, please state: N/A

	FRONT	REAR	SIDE(S)
1. Setbacks required per bylaw			
2. Existing setbacks			
3. Setbacks proposed			

	FRONTAGE	AREA
4. Frontage and area required by bylaw		
5. Existing frontage (s) and area		
6. Frontage (s) and area proposed		

	FEET	STORIES
7. Existing Height		
8. Height proposed		

c. Other town, state or federal permits or licenses required, if any: N/A

NECESSARY ACCOMPANYING DATA:

It is required that every application be accompanied by appropriate supporting data. Failure to submit appropriate and complete data could result in delay and/or denial of application for zoning relief. Place a check next to the applicable accompanying supporting data:

Variance of Special Permit Applications:
(See Zoning Board of Appeals Rules and Procedures Section III)
All required supporting data attached ____ Yes __X__ No

Site Plan Review Applications:
(See Town of Topsfield Zoning Bylaw, Article IX, Section 9.05. See also Guidelines and Performance Standards for Activities Subject to the Provisions of Article IX of the Topsfield Zoning Bylaw)
All required supporting data attached ____ Yes __X__ No

Comprehensive Permit Applications:
(See G.L.c. 40B, Sections 20-23)
All required supporting data attached ____ Yes __X__ No

Appeals from decisions of Building Inspector or Others:
(See Zoning Board of Appeals Rules and Procedures, Section III (1) (e))
All required supporting data attached ____ Yes __X__ No

If all required supporting data is not attached, why not:

9-26-2011
Date

Dick Man
Signature of Applicant

Property Owner Authorization

November 4, 2011

Via Mail

Mr. Richard Skeffington
Skeff's, Inc
PO Box 185
Rockwood, ME 04478

RE: AT&T Wireless Equipment at: 285 Boston Street, Topsfield, MA 01
Site #: MA3052 **Site Name: Topsfield**

Dear Mr. Skeffington:

New Cingular Wireless PCS, LLC by and through its manager AT&T Mobilit
("AT&T"), is currently working to modify its antenna installation on the above
order to maintain AT&T's commitment to the highest standards of service and

Please allow this letter to serve as notification that AT&T has contracted with
Inc., d/b/a SAI Communications, to provide services related to building and mo
equipment at AT&T's various wireless communications facilities. These servi
are not limited to, local government zoning and permitting for the modification
license and lease agreements, including amendments to such agreements, and n
installation of the proposed modifications to the site mentioned above. This au
includes acting on behalf of AT&T to apply for, execute, submit and prosecute
use approvals or permits from any and all regulatory agencies which may be ne
installation, operation and maintenance of the proposed modifications.

Please sign and return 1 original copy. If you should have any questions please
at (857) 891-2769.

Thank you in advance for your assistance.

Structural Report to be done by
P grad. no work to be done
until OK Structurals

Authorized by:

Sincerely,

Dick Man

Dick Man
Project Manager

Richard W Skeffington Jr

Skeff's, Inc.

11-11-11

Form B

TOWN OF TOPSFIELD, MA
ZONING BOARD OF APPEALS

Application Supplement Form B

Attach to this form a copy of the Assessor's map (scale 1" equals 200') showing the property and all other properties and roadways within 300 feet of any portion of the property. Also, show the lot number and lot owner's name on each lot within the 300'.

List below the lot owner names and mailing addresses as shown in the Assessors' records, beginning with the property of the Applicant (locus).

Applicant's Name, Mailing Address: 831 Beacon St., #259 Newton, MA 02459
agent for AT+T Mobility

(857) 891 2769
Telephone No.

Locus: 285 Boston Street

Map	Block	Location	Owner	*(If different from location)* Mailing Address

SEE ATTACHED LIST

If needed, attach additional sheets.

Assessor's Certification

To the Topsfield Zoning Board of Appeals:

This is to certify that, at the time of the last assessment for taxation made by the Town of Topsfield, the names and mailing addresses of the parties assessed as owners of land within 300' of the parcel of land shown in the attached sketch were as listed.

Authorized Signature
Assessors' Office Pauline M. Evans

Date of Verification 5/25/2011

41-90 285 BOSTON ST

Information on this Map is
Compiled and Maintained for
Assessing Purposes Only

GEOGRAPHIC INFORMATION SYSTEM
VISION APPRAISAL TECHNOLOGY

N

ABUTTERS LIST FOR ZBA WITHIN 300' 41-90 285 BOSTON ST
TOPSFIELD, MA

Map	Block	Lot	Lot Cut	St No	Street Name	Owner~s Name	Co-Owner~s Name	Mailing Address	City	St Zip
41	87			270	BOSTON ST	ALBRIGHT RICHARD C JR	ALBRIGHT PAMELA M	54 HIGH ST	TOPSFIELD	MA 01983
41	91			279	BOSTON ST	TOWN OF TOPSFIELD	HIGHWAY DEPT	279 BOSTON ST	TOPSFIELD	MA 01983
41	88			286	BOSTON ST	WOOD DONALD Y	WOOD ANDREA L	286 BOSTON ST	TOPSFIELD	MA 01983
34	78			293	BOSTON ST	GREEN ACRES REALTY INC	C/O RICHARD SKEFFINGTON	PO BOX 185	ROCKWOOD	ME 04478
41	89			288	BOSTON ST	TOWN OF TOPSFIELD	WATER DEPT TOWER	8 WEST COMMON ST	TOPSFIELD	MA 01983
41	93			8	DOVER HILL RD	GAUVIN DANIEL L	GAUVIN SUSAN K	8 DOVER HILL RD	TOPSFIELD	MA 01983
33	19			71	HOWLETT ST	STONEBERGER PATRICIA A		71 HOWLETT ST	TOPSFIELD	MA 01983

RF Affidavit

REPORT OF

RADIO FREQUENCY ENGINEER

The undersigned hereby states the following in support of the application by New Cingular Wireless PCS, LLC, by and through its manager, AT&T Mobility Corporation ("***AT&T***") to attach antennas to the existing monopole with associated equipment, cables and electronic equipment and other appurtenances (the "Facility") located at 285 Boston Street, Topsfield, Massachusetts (Assessor's Map 41 Lot 90) (the "Site").

1. I am a Radio Frequency Engineer employed by AT&T, with an office located at 550 Cochituate Road, Framingham, Massachusetts.

2. My primary responsibilities include radio frequency design and planning in the State Massachusetts, including the Town of Topsfield and surrounding communities.

3. As enabled under its Federal Communications Commission ("FCC") License, AT&T seeks to design its wireless network to provide reliable and adequate wireless services to its customers, whether those customers are on the street, in a vehicle, or in a building. Providing reliable and adequate service to its customers in each context is critical for AT&T to provide the quality of wireless service that customers demand, and to meet the objectives of Congress that a robust, competitive and low cost wireless communications capacity be developed to serve the entire nation.

4. I have thoroughly reviewed the radio frequency engineering studies, reports and computer models prepared by AT&T with respect to the Facility.

5. In order to build out and enhance its network and meet customer demand for voice and data services, AT&T must have in place a system of low power 'cell sites' to serve portable wireless communication handsets and mobile telephones. A typical cell site, such as the one proposed, consists of antennas mounted to a building, tower, church or other structure. The antennas are connected to radio operating equipment housed at or near the structure.

6. To maintain effective, reliable and uninterrupted service, there must be a continuous series of cell sites located within close proximity to each other so as to overlap in a system comparable to a honeycomb pattern. If there is no cell site available to accept/receive the signal, network service to the mobile telephone/data service will terminate involuntarily. Accordingly, the overlap of coverage is necessary for the signal to transfer from one cell site to another cell site seamlessly and without involuntary termination.

7. A number of factors determine the distance between cell sites, including, but not limited to, topography, physical obstructions, foliage, antenna height, operating frequency and line-of-sight.

8. Based on the radio frequency studies, reports and computer models prepared in connection with this project, it is my professional assertion that there are inadequate network service and capacity available to AT&T customers within the Town of Topsfield, especially along Route 1and State Route 97 vicinity.

9. Based on the radio frequency studies, reports and computer models prepared in connection with this Facility, it is my further professional opinion that AT&T would be able to achieve the coverage objective by providing adequate coverage and capacity through the installation of additional antennas of the Facility at the Site.

10. The Facility will enhance AT&T's ability to provide adequate coverage and enhances wireless services in the area and will increase its capacity to better serve the residents and businesses around these areas of the Town of Topsfield and to individuals traveling through these areas.

11. The Facility will be in compliance with the FCC Guidelines for Evaluating the Environmental Effects of Radio Frequency Radiation. It is the responsibility of AT&T to make radio frequency field measurements once the Facility is in service to determine compliance with the FCC guidelines.

12. The Facility will be installed, erected, maintained and used in compliance with all applicable Federal, State and local regulations, including, but not limited to: the radio frequency emissions regulations set forth by the FCC, and other applicable regulations administered by the Federal Aviation Administration and the FCC.

13. The Facility will not interfere with public safety communications and the usual and customary transmission or reception of radio, television or other communications services used by adjacent properties.

14. Based upon the best radio frequency technology available at this time, it is my professional opinion that the Facility is at the minimum height that is needed to ensure adequate service to area residents and businesses within the geographic area described above.

Executed this 29th day of June, 2011.

Kevin Breuer
RF ENGINEER, AT&T

Structural Analysis

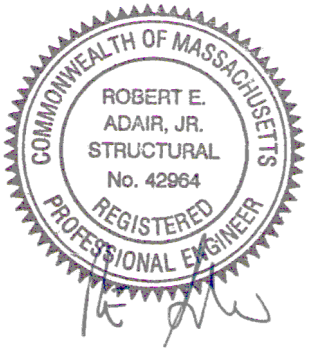
ALL-POINTS TECHNOLOGY CORPORATION, P.C.

STRUCTURAL ANALYSIS REPORT
160' SELF-SUPPORTING TOWER
TOPSFIELD, MASSACHUSETTS

Prepared for
SAI Communications, Inc.

AT&T Site #MA3052

June 2, 2011



APT Project #MA193710

3 SADDLEBROOK DRIVE · KILLINGWORTH, CT 06419 · PHONE 860-663-1697 · FAX 860-663-0935
⊗ P.O. BOX 504 · 116 GRANDVIEW ROAD · CONWAY, NH 03818 · PHONE 603-496-5853 · FAX 603-447-2124

STRUCTURAL ANALYSIS REPORT
U-24 x 160' PiROD TOWER
TOPSFIELD, MASSACHUSETTS
prepared for
SAI Communications, Inc.

EXECUTIVE SUMMARY:

All-Points Technology Corporation, P.C. (APT) performed a mapping and structural analysis of this 160-foot PiROD self-supporting tower. The analysis was performed for AT&T Mobility's proposed installation of three Kathrein panel antennas and associated equipment as detailed below.

Our analysis indicates the tower meets the requirements of the Massachusetts State Building Code and TIA-222 with the equipment proposed by AT&T Mobility.

Foundations could not be evaluated, as information on their design or construction was not available to APT. Given the significant available tower capacity, they are likely to be adequate.

INTRODUCTION:

A mapping and structural analysis was performed on this 160' communications tower by APT for SAI Communications, Inc. The tower, a 160-foot PiROD Model U-24 galvanized steel structure, is located at 293 Boston Street in Topsfield, Massachusetts. The tower features galvanized solid rod legs and angle steel bracing members.

APT previously visited the tower site on August 8, 2007. The tower was climbed in its entirety to compile data necessary to conduct the structural analysis. This analysis also relied on a tower mapping conducted by Green Mountain Communications dated November 9, 2010 and tower photographs supplied by Green Mountain Communications and ProTerra Design Group. LLC. APT revisited the site on May 30, 2011 to verify the current antenna inventory.

The analysis was conducted using the following antenna inventory (proposed changes in **bold** text, reserved equipment in *italic* text):

Antenna	Elev.	Mount	Coax.
(3) 16' omnidirectional whips	160'	Legs	(3) 7/8"
(6) 800-10121 panels, (12) TMAs, **(3) 800-10766 panels, (6) Ericsson RRUS-11, (1) DC6-48 surge suppressor**	158'	(3) 15' sector mounts	**(2) power (1) fiber** (12) 1-5/8"
(6) ALP 7129.16, (6) 932DG90VT2E-M	152'	(3) 15' sector mounts	(12) 1-1/4"
(6) PCSA090-13 panels	141'	(3) 15' sector mounts	(6) 1-5/8"
(12) FV90-12-05DBL2 panels	130'	(3) 12' sector mounts	(12) 1-5/8"
(6) APX16DWV-16DWVS panels, (6) Twin TMAs [1]	118'	(3) 15' sector mounts	(12) 1-1/4"
(2) 3' high performance dishes	*115'*	*Pipes on legs*	*(2) 3/8"*
3' high performance dish, 2' dish	113'	Pipe on leg	(2) 3/8"
(12) 800-10504 panels	107'	(3) 15' sector mounts	(12) 1-5/8"
15' omnidirectional whip	87'	4' sidearm	1/2"
GPS antenna	74'	3' standoff	(2) 1/2"
(2) GPS antennas	72'	3' double standoff	1/2"
GPS/BMR antenna	31'	1' standoff	1/2"
E911 omni antenna	17'	1' standoff	1/2"

[1] Six DAPA 48210 panel antennas and six TMAs currently installed.
[2] Three 800-10504 panels with six 1-5/8" lines currently installed at 107'.

STRUCTURAL ANALYSIS:

Methodology:

The structural analysis was done in accordance with TIA-222, Revision G (TIA), Structural Standards for Antenna Supporting Structures and Antennas.

The analysis was conducted using a 3-second gust wind speed of 100 miles per hour with no ice and 40-mph with ¾" radial ice in accordance with the TIA-222-G standard for Essex County, Massachusetts. The following additional design criteria were used:

Structure Class: II
Topographic Category: 1
Exposure Category: B

Analysis:

The following table summarizes the results of the analysis based on stresses of individual leg and bracing members:

Elevation	Leg Capacity	Bracing Capacity
140'-160'	37%	24%
120'-140'	20%	42%
100'-120'	28%	74%
80'-100'	34%	79%
60'-80'	47%	71%
40'-60'	47%	65%
20'-40'	57%	82%
0'-20'	68%	52%

Base Foundation:

Evaluation of the existing foundations was not performed, as information on their design or construction was not available to APT. Given the significant remaining tower capacity, they are likely to be adequate.

Factored base reactions imposed with the additional antennas were calculated as follows:

Tension:	311.9 kips
Compression:	359.6 kips
Shear:	48.6 kips
Overturning Moment:	7006 ft-kips

CONCLUSIONS AND RECOMMENDATIONS:

Our structural analysis indicates the 160-foot PiROD tower located on Boston Street in Topsfield, Massachusetts meets the requirements of the Massachusetts State Building Code and TIA-222 with the equipment proposed by AT&T Mobility.

Evaluation of the existing foundations could not be performed, as information on their design or construction was not available to APT. Given the significant remaining tower capacity, they are likely to be adequate.

LIMITATIONS:

This report is based on the following:

1. Tower is properly installed and maintained.
2. All members are in an undeteriorated condition.
3. All required members are in place.
4. All bolts are in place and are properly tightened.
5. Tower is in plumb condition.
6. All tower members were properly designed, detailed, fabricated, and installed and have been properly maintained since erection.

All-Points Technology Corporation, P.C. (APT) is not responsible for any modifications completed prior to or hereafter which APT is not or was not directly involved. Modifications include but are not limited to:

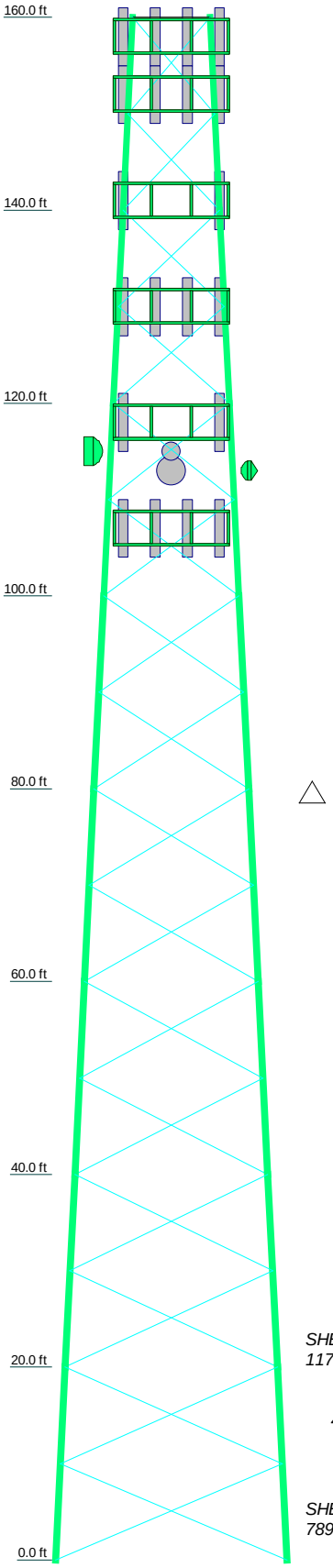
1. Replacing or strengthening bracing members.
2. Reinforcing vertical members in any manner.
3. Installing antenna mounting gates or side arms.
4. Extending tower.

APT hereby states that this document represents the entire report and that it assumes no liability for any factual changes that may occur after the date of this report. All representations, recommendations, and conclusions are based upon the information contained and set forth herein. If you are aware of any information which is contrary to that which is contained herein, or you are aware of any defects arising from the original design, material, fabrication and erection deficiencies, you should disregard this report and immediately contact APT. APT disclaims all liability for any representation, recommendation, or conclusion not expressly stated herein.

Appendix A

Tower Schematic

Section	Legs	Leg Grade	Diagonals	Diagonal Grade	Top Girts	Face Width (ft)	# Panels @ (ft)	Weight (lb) 38918.6
T1	Pirod 105216	A572-50	L3x3x1/4	A36	L3x3x1/4	8	16 @ 10	2374.5
T2	Pirod 105217		L3x3x5/16		N.A.	10		2898.4
T3	Pirod 105218					12		3422.1
T4	Pirod 105219		L3 1/2x3 1/2x1/4			14		4568.8
T5			L4x4x1/4			16		4903.0
T6						18		6427.9
T7	Pirod 105220		L4x4x3/8			20		6647.1
T8			L5x5x3/8			22		7676.9
						24		



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
16' x 2.5" omni whip	160	(4) FV90-12-05DBL2	130
16' x 2.5" omni whip	160	12' sector mount	130
16' x 2.5" omni whip	160	12' sector mount	130
(4) 800-10121	158	12' sector mount	130
(4) 800-10121	158	(2) APX16DWV-16DWVS	118
(4) 800-10121	158	(2) APX16DWV-16DWVS	118
(4) LGP2140X TMA	158	(2) APX16DWV-16DWVS	118
(4) LGP2140X TMA	158	(2) RFS twin TMA	118
(4) LGP2140X TMA	158	(2) RFS twin TMA	118
15' sector mount	158	(2) RFS twin TMA	118
15' sector mount	158	15' sector mount	118
15' sector mount	158	15' sector mount	118
(2) 7129.16.05.00	152	15' sector mount	118
(2) 7129.16.05.00	152	3' HP dish	115
(2) 7129.16.05.00	152	2' HP dish	115
(2) 932DG90VTE-M	152	3' HP dish	113
(2) 932DG90VTE-M	152	2' dish with radome	113
(2) 932DG90VTE-M	152	15' sector mount	107
15' sector mount	152	15' sector mount	107
15' sector mount	152	(4) 800-10504	107
15' sector mount	152	15' sector mount	107
(2) PCSA090-13-0	141	(4) 800-10504	107
(2) PCSA090-13-0	141	(4) 800-10504	107
(2) PCSA090-13-0	141	15' x 2.5" omni whip	87
15' sector mount	141	4' sidearm	87
15' sector mount	141	GPS on 3' standoff	74
15' sector mount	141	(2) GPS on 3' standoff	72
(4) FV90-12-05DBL2	130	GPS on 3' standoff	31
(4) FV90-12-05DBL2	130	E911 omni	17

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 359592 lb
UPLIFT: -311900 lb
SHEAR: 48627 lb

AXIAL 187617 lb
SHEAR 11777 lb *MOMENT 1085299 lb-ft*
TORQUE 310 lb-ft
40 mph WIND - 0.7500 in ICE

AXIAL 67516 lb
SHEAR 78964 lb *MOMENT 7006307 lb-ft*
TORQUE 1773 lb-ft
REACTIONS - 100 mph WIND

All-Points Technology Corporation
P.O. Box 504
Conway, NH 03818
Phone: (603) 496-5853
FAX: (603) 447-2124

Job:	***160' PiROD Tower***		
Project:	***MA193710 Topsfield***		
Client: SAI; AT&T Site #MA3052	Drawn by: Rob Adair	App'd:	
Code: TIA-222-G	Date: 06/02/11	Scale: NTS	
Path: C:\Documents and Settings\Rob Adair\My Documents\Jobs\MA193710 Topsfield\MA193710 Topsfield.eri		Dwg No. E-1	

Appendix B

Photographs

SAI COMMUNICATIONS, INC.
160' SELF-SUPPORTING TOWER
TOPSFIELD, MASSACHUSETTS
AT&T SITE #MA3052

Overview of 160' self-supporting tower.

Photos taken by All-Points Technology Corporation, P.C. on May 30, 2011.

SAI COMMUNICATIONS, INC.
160' SELF-SUPPORTING TOWER
TOPSFIELD, MASSACHUSETTS
AT&T SITE #MA3052

Photo showing existing antennas.

Photos taken by All-Points Technology Corporation, P.C. on May 30, 2011.

Appendix C

Calculations

All-Points Technology Corporation
P.O. Box 504
Conway, NH 03818
Phone: (603) 496-5853
FAX: (603) 447-2124

Tower Input Data

The main tower is a 3x free standing tower with an overall height of 160.00 ft above the ground line.
The face width of the tower is 8.00 ft at the top and 24.00 ft at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Basic wind speed of 100 mph.
Structure Class II.
Exposure Category B.
Topographic Category 1.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 40 mph is used in combination with ice.
Deflections calculated using a wind speed of 60 mph.
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.

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	160.00-140.00	pirod	U10.0 105216 L3x1/4	8.00	1	20.00
T2	140.00-120.00	pirod	U12.0 105217	10.00	1	20.00
T3	120.00-100.00	pirod	U14.0 105218 L3x5/16	12.00	1	20.00
T4	100.00-80.00	pirod	U16.0 105219 L3.5x1/4	14.00	1	20.00
T5	80.00-60.00	pirod	U18.0 105219 L4x1/4	16.00	1	20.00
T6	60.00-40.00	pirod	U20.0 105220 L4x3/8	18.00	1	20.00
T7	40.00-20.00	pirod	U22.0 105220 L4x3/8	20.00	1	20.00
T8	20.00-0.00	pirod	U24.0 105220 L5x3/8	22.00	1	20.00

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	160.00-140.00	10.00	X Brace	No	No	0.0000	0.0000
T2	140.00-120.00	10.00	X Brace	No	No	0.0000	0.0000
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 ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 160.00-140.00	Truss Leg	Pirod 105216	A572-50 (50 ksi)	Single Angle	L3x3x1/4	A36 (36 ksi)
T2 140.00-120.00	Truss Leg	Pirod 105217	A572-50 (50 ksi)	Single Angle	L3x3x5/16	A36 (36 ksi)
T3 120.00-100.00	Truss Leg	Pirod 105218	A572-50	Single Angle	L3x3x5/16	A36

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Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T4 100.00-80.00	Truss Leg	Pirod 105219	(50 ksi) A572-50	Single Angle	L3 1/2x3 1/2x1/4	(36 ksi) A36
T5 80.00-60.00	Truss Leg	Pirod 105219	(50 ksi) A572-50	Equal Angle	L4x4x1/4	(36 ksi) A36
T6 60.00-40.00	Truss Leg	Pirod 105220	(50 ksi) A572-50	Single Angle	L4x4x3/8	(36 ksi) A36
T7 40.00-20.00	Truss Leg	Pirod 105220	(50 ksi) A572-50	Equal Angle	L4x4x3/8	(36 ksi) A36
T8 20.00-0.00	Truss Leg	Pirod 105220	(50 ksi) A572-50	Single Angle	L5x5x3/8	(36 ksi) A36
			(50 ksi)			(36 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 160.00-140.00	Flange	1.0000 A325N	6	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 140.00-120.00	Flange	1.0000 A325N	6	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 120.00-100.00	Flange	1.0000 A325N	6	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 100.00-80.00	Flange	1.2500 A325N	6	1.2500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 80.00-60.00	Flange	1.2500 A325N	6	1.2500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T6 60.00-40.00	Flange	1.2500 A325N	6	1.2500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 40.00-20.00	Flange	1.2500 A325N	6	1.2500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8 20.00-0.00	Flange	1.2500 A325N	6	1.2500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	Number Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
1/2	A	Yes	Ar (CaAa)	17.00 - 8.00	1	1	0.0000	0.5800		0.25
1/2	A	Yes	Ar (CaAa)	31.00 - 8.00	1	1	0.0000	0.5800		0.25
1/2	A	Yes	Ar (CaAa)	72.00 - 8.00	2	1	0.0000	0.5800		0.25
1/2	C	Yes	Ar (CaAa)	74.00 - 8.00	1	1	0.0000	0.5800		0.25
1/2	C	Yes	Ar (CaAa)	87.00 - 8.00	1	1	0.0000	0.5800		0.25
1 5/8	A	Yes	Ar (CaAa)	107.00 - 8.00	12	6	0.0000	1.9800		1.04
1 1/4	C	Yes	Ar (CaAa)	118.00 - 8.00	12	6	0.0000	1.5500		0.66
1 5/8	C	Yes	Ar (CaAa)	130.00 - 8.00	12	6	0.0000	1.9800		1.04
1 5/8	A	Yes	Ar (CaAa)	141.00 - 8.00	6	6	0.0000	1.9800		1.04
1 1/4	A	Yes	Ar (CaAa)	152.00 - 8.00	12	6	0.0000	1.5500		0.66
1 5/8	A	Yes	Ar (CaAa)	158.00 - 8.00	12	6	0.0000	1.9800		1.04
7/8	C	Yes	Ar (CaAa)	160.00 - 8.00	3	3	0.0000	1.1100		0.54
3/8	C	Yes	Ar (CaAa)	115.00 - 8.00	7	4	0.0000	0.4400		0.08
1/4"	B	Yes	Ar (CaAa)	107.00 - 8.00	1	1	0.0000	0.3300		0.25
5/8 power	B	Yes	Ar (CaAa)	158.00 - 8.00	2	2	0.8800	0.8800		0.40
Fiber line	B	Yes	Ar (CaAa)	158.00 - 8.00	1	1	1.5500	1.5500		0.66

Discrete Tower Loads

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft*	*Azimuth Adjustment* *°*	*Placement* *ft*		C_AA_A *Front* *ft²*	C_AA_A *Side* *ft²*	*Weight* *lb*
16' x 2.5" omni whip	A	None		0.0000	160.00	No Ice	4.00	4.00	60.00
						1/2" Ice	5.63	5.63	89.63
						1" Ice	7.28	7.28	129.45
16' x 2.5" omni whip	B	None		0.0000	160.00	No Ice	4.00	4.00	60.00
						1/2" Ice	5.63	5.63	89.63
						1" Ice	7.28	7.28	129.45
16' x 2.5" omni whip	C	None		0.0000	160.00	No Ice	4.00	4.00	60.00
						1/2" Ice	5.63	5.63	89.63
						1" Ice	7.28	7.28	129.45
(2) 800-10121	A	From Leg	4.00	0.0000	158.00	No Ice	5.46	3.29	50.00
			0.00			1/2" Ice	5.88	3.64	82.91
			0.00			1" Ice	6.31	3.99	120.59
(2) 800-10121	B	From Leg	4.00	0.0000	158.00	No Ice	5.46	3.29	50.00
			0.00			1/2" Ice	5.88	3.64	82.91
			0.00			1" Ice	6.31	3.99	120.59
(2) 800-10121	C	From Leg	4.00	0.0000	158.00	No Ice	5.46	3.29	50.00
			0.00			1/2" Ice	5.88	3.64	82.91
			0.00			1" Ice	6.31	3.99	120.59
(4) LGP2140X TMA	C	From Leg	4.00	0.0000	158.00	No Ice	1.26	0.38	20.00
			0.00			1/2" Ice	1.42	0.49	27.13
			0.00			1" Ice	1.58	0.62	36.14
(4) LGP2140X TMA	C	From Leg	4.00	0.0000	158.00	No Ice	1.26	0.38	20.00
			0.00			1/2" Ice	1.42	0.49	27.13
			0.00			1" Ice	1.58	0.62	36.14
(4) LGP2140X TMA	C	From Leg	4.00	0.0000	158.00	No Ice	1.26	0.38	20.00
			0.00			1/2" Ice	1.42	0.49	27.13
			0.00			1" Ice	1.58	0.62	36.14
15' sector mount	A	None		0.0000	158.00	No Ice	9.10	9.10	465.00
						1/2" Ice	12.56	12.56	600.00
						1" Ice	15.54	15.54	735.00
15' sector mount	B	None		0.0000	158.00	No Ice	9.10	9.10	465.00
						1/2" Ice	12.56	12.56	600.00
						1" Ice	15.54	15.54	735.00
15' sector mount	C	None		0.0000	158.00	No Ice	9.10	9.10	465.00
						1/2" Ice	12.56	12.56	600.00
						1" Ice	15.54	15.54	735.00
(2) 7129.16.05.00	A	From Leg	4.00	0.0000	152.00	No Ice	6.57	5.76	17.60
			0.00			1/2" Ice	7.00	6.18	66.03
			0.00			1" Ice	7.43	6.60	119.61
(2) 7129.16.05.00	B	From Leg	4.00	0.0000	152.00	No Ice	6.57	5.76	17.60
			0.00			1/2" Ice	7.00	6.18	66.03
			0.00			1" Ice	7.43	6.60	119.61
(2) 7129.16.05.00	C	From Leg	4.00	0.0000	152.00	No Ice	6.57	5.76	17.60
			0.00			1/2" Ice	7.00	6.18	66.03
			0.00			1" Ice	7.43	6.60	119.61
(2) 932DG90VTE-M	A	From Leg	4.00	0.0000	152.00	No Ice	3.49	1.84	11.00
			0.00			1/2" Ice	3.85	2.15	30.22
			0.00			1" Ice	4.24	2.47	53.58
(2) 932DG90VTE-M	B	From Leg	4.00	0.0000	152.00	No Ice	3.49	1.84	11.00
			0.00			1/2" Ice	3.85	2.15	30.22
			0.00			1" Ice	4.24	2.47	53.58
(2) 932DG90VTE-M	C	From Leg	4.00	0.0000	152.00	No Ice	3.49	1.84	11.00
			0.00			1/2" Ice	3.85	2.15	30.22
			0.00			1" Ice	4.24	2.47	53.58

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
15' sector mount	A	None		0.0000	152.00	No Ice	9.10	9.10	465.00
						1/2" Ice	12.56	12.56	600.00
						1" Ice	15.54	15.54	735.00
15' sector mount	B	None		0.0000	152.00	No Ice	9.10	9.10	465.00
						1/2" Ice	12.56	12.56	600.00
						1" Ice	15.54	15.54	735.00
15' sector mount	C	None		0.0000	152.00	No Ice	9.10	9.10	465.00
						1/2" Ice	12.56	12.56	600.00
						1" Ice	15.54	15.54	735.00
(2) PCSA090-13-0	A	From Leg	4.00	0.0000	141.00	No Ice	4.71	3.21	16.70
			0.00			1/2" Ice	5.11	3.53	46.95
			0.00			1" Ice	5.51	3.88	81.73
(2) PCSA090-13-0	B	From Leg	4.00	0.0000	141.00	No Ice	4.71	3.21	16.70
			0.00			1/2" Ice	5.11	3.53	46.95
			0.00			1" Ice	5.51	3.88	81.73
(2) PCSA090-13-0	C	From Leg	4.00	0.0000	141.00	No Ice	4.71	3.21	16.70
			0.00			1/2" Ice	5.11	3.53	46.95
			0.00			1" Ice	5.51	3.88	81.73
15' sector mount	A	None		0.0000	141.00	No Ice	9.10	9.10	465.00
						1/2" Ice	12.56	12.56	600.00
						1" Ice	15.54	15.54	735.00
15' sector mount	B	None		0.0000	141.00	No Ice	9.10	9.10	465.00
						1/2" Ice	12.56	12.56	600.00
						1" Ice	15.54	15.54	735.00
15' sector mount	C	None		0.0000	141.00	No Ice	9.10	9.10	465.00
						1/2" Ice	12.56	12.56	600.00
						1" Ice	15.54	15.54	735.00
(4) FV90-12-05DBL2	A	From Leg	4.00	0.0000	130.00	No Ice	8.40	5.28	30.00
			0.00			1/2" Ice	8.95	5.74	80.04
			0.00			1" Ice	9.51	6.20	136.17
(4) FV90-12-05DBL2	B	From Leg	4.00	0.0000	130.00	No Ice	8.40	5.28	30.00
			0.00			1/2" Ice	8.95	5.74	80.04
			0.00			1" Ice	9.51	6.20	136.17
(4) FV90-12-05DBL2	C	From Leg	4.00	0.0000	130.00	No Ice	8.40	5.28	30.00
			0.00			1/2" Ice	8.95	5.74	80.04
			0.00			1" Ice	9.51	6.20	136.17
12' sector mount	A	None		0.0000	130.00	No Ice	7.45	3.77	325.00
						1/2" Ice	11.75	5.87	450.00
						1" Ice	15.85	7.92	575.00
12' sector mount	B	None		0.0000	130.00	No Ice	7.45	3.77	325.00
						1/2" Ice	11.75	5.87	450.00
						1" Ice	15.85	7.92	575.00
12' sector mount	C	None		0.0000	130.00	No Ice	7.45	3.77	325.00
						1/2" Ice	11.75	5.87	450.00
						1" Ice	15.85	7.92	575.00
(2) APX16DWV-16DWVS	A	From Leg	4.00	0.0000	118.00	No Ice	6.70	2.00	25.00
			0.00			1/2" Ice	7.13	2.33	56.34
			0.00			1" Ice	7.57	2.66	92.36
(2) APX16DWV-16DWVS	B	From Leg	4.00	0.0000	118.00	No Ice	6.70	2.00	25.00
			0.00			1/2" Ice	7.13	2.33	56.34
			0.00			1" Ice	7.57	2.66	92.36
(2) APX16DWV-16DWVS	C	From Leg	4.00	0.0000	118.00	No Ice	6.70	2.00	25.00
			0.00			1/2" Ice	7.13	2.33	56.34
			0.00			1" Ice	7.57	2.66	92.36
(2) RFS twin TMA	A	From Leg	4.00	0.0000	118.00	No Ice	1.17	0.47	13.00
			0.00			1/2" Ice	1.31	0.57	20.62
			0.00			1" Ice	1.47	0.69	30.11
(2) RFS twin TMA	B	From Leg	4.00	0.0000	118.00	No Ice	1.17	0.47	13.00
			0.00			1/2" Ice	1.31	0.57	20.62

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00			1" Ice	1.47	0.69	30.11
(2) RFS twin TMA	C	From Leg	4.00	0.0000	118.00	No Ice	1.17	0.47	13.00
			0.00			1/2" Ice	1.31	0.57	20.62
			0.00			1" Ice	1.47	0.69	30.11
15' sector mount	A	None		0.0000	118.00	No Ice	9.10	9.10	465.00
						1/2" Ice	12.56	12.56	600.00
						1" Ice	15.54	15.54	735.00
15' sector mount	B	None		0.0000	118.00	No Ice	9.10	9.10	465.00
						1/2" Ice	12.56	12.56	600.00
						1" Ice	15.54	15.54	735.00
15' sector mount	C	None		0.0000	118.00	No Ice	9.10	9.10	465.00
						1/2" Ice	12.56	12.56	600.00
						1" Ice	15.54	15.54	735.00
(4) 800-10504	A	From Leg	4.00	0.0000	107.00	No Ice	3.35	1.86	25.00
			0.00			1/2" Ice	3.70	2.19	43.03
			0.00			1" Ice	4.05	2.52	65.34
(4) 800-10504	B	From Leg	4.00	0.0000	107.00	No Ice	3.35	1.86	25.00
			0.00			1/2" Ice	3.70	2.19	43.03
			0.00			1" Ice	4.05	2.52	65.34
(4) 800-10504	C	From Leg	4.00	0.0000	107.00	No Ice	3.35	1.86	25.00
			0.00			1/2" Ice	3.70	2.19	43.03
			0.00			1" Ice	4.05	2.52	65.34
15' sector mount	A	None		0.0000	107.00	No Ice	9.10	9.10	465.00
						1/2" Ice	12.56	12.56	600.00
						1" Ice	15.54	15.54	735.00
15' sector mount	B	None		0.0000	107.00	No Ice	9.10	9.10	465.00
						1/2" Ice	12.56	12.56	600.00
						1" Ice	15.54	15.54	735.00
15' sector mount	C	None		0.0000	107.00	No Ice	9.10	9.10	465.00
						1/2" Ice	12.56	12.56	600.00
						1" Ice	15.54	15.54	735.00
15' x 2.5" omni whip	A	From Leg	4.00	0.0000	87.00	No Ice	3.75	3.75	50.00
			0.00			1/2" Ice	5.28	5.28	77.80
			0.00			1" Ice	6.83	6.83	115.17
4' sidearm	A	None		0.0000	87.00	No Ice	2.43	1.22	50.00
						1/2" Ice	3.50	1.75	100.00
						1" Ice	4.50	2.25	175.00
GPS on 3' standoff	C	None		0.0000	74.00	No Ice	0.60	0.60	50.00
						1/2" Ice	0.79	0.79	55.81
						1" Ice	0.99	0.99	63.86
(2) GPS on 3' standoff	A	None		0.0000	72.00	No Ice	0.60	0.60	50.00
						1/2" Ice	0.79	0.79	55.81
						1" Ice	0.99	0.99	63.86
GPS on 3' standoff	C	None		0.0000	31.00	No Ice	0.60	0.60	50.00
						1/2" Ice	0.79	0.79	55.81
						1" Ice	0.99	0.99	63.86
E911 omni	B	None		0.0000	17.00	No Ice	0.11	0.11	10.00
						1/2" Ice	0.20	0.20	11.32
						1" Ice	0.30	0.30	13.72
800-10766	A	From Leg	4.00	0.0000	158.00	No Ice	11.31	6.80	60.00
			0.00			1/2" Ice	11.93	7.38	121.39
			0.00			1" Ice	12.55	7.98	190.36
800-10766	B	From Leg	4.00	0.0000	158.00	No Ice	11.31	6.80	60.00
			0.00			1/2" Ice	11.93	7.38	121.39
			0.00			1" Ice	12.55	7.98	190.36
800-10766	C	From Leg	4.00	0.0000	158.00	No Ice	11.31	6.80	60.00
			0.00			1/2" Ice	11.93	7.38	121.39
			0.00			1" Ice	12.55	7.98	190.36
(2) Ericsson RRUS-11	A	From Leg	4.00	0.0000	158.00	No Ice	2.94	1.19	55.00

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00			1/2" Ice	3.17	1.35	74.32
			0.00			1" Ice	3.41	1.52	96.56
(2) Ericsson RRUS-11	B	From Leg	4.00	0.0000	158.00	No Ice	2.94	1.19	55.00
			0.00			1/2" Ice	3.17	1.35	74.32
			0.00			1" Ice	3.41	1.52	96.56
(2) Ericsson RRUS-11	C	From Leg	4.00	0.0000	158.00	No Ice	2.94	1.19	55.00
			0.00			1/2" Ice	3.17	1.35	74.32
			0.00			1" Ice	3.41	1.52	96.56
DC6-48 surge suppressor	B	None		0.0000	158.00	No Ice	1.19	1.19	30.00
						1/2" Ice	1.37	1.37	44.34
						1" Ice	1.56	1.56	60.93

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight lb
3' HP dish	A	Paraboloid w/Shroud (HP)	From Leg	1.00	0.0000		113.00	3.00	No Ice	7.07	75.00
				0.00					1/2" Ice	7.47	113.33
				0.00					1" Ice	7.86	153.33
2' dish with radome	B	Paraboloid w/Radome	From Leg	1.00	0.0000		113.00	2.00	No Ice	3.14	50.00
				0.00					1/2" Ice	3.41	67.50
				0.00					1" Ice	3.68	85.00
3' HP dish	C	Paraboloid w/Shroud (HP)	From Leg	1.00	0.0000		115.00	3.00	No Ice	7.07	75.00
				0.00					1/2" Ice	7.47	113.33
				0.00					1" Ice	7.86	153.33
2' HP dish	A	Paraboloid w/Shroud (HP)	From Leg	1.00	0.0000		115.00	2.00	No Ice	3.14	50.00
				0.00					1/2" Ice	3.41	67.50
				0.00					1" Ice	3.68	85.00

Solution Summary

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	160 - 140	2.063	12	0.0918	0.0015
T2	140 - 120	1.673	12	0.0897	0.0010
T3	120 - 100	1.297	12	0.0825	0.0008
T4	100 - 80	0.950	12	0.0724	0.0005
T5	80 - 60	0.640	12	0.0611	0.0004
T6	60 - 40	0.383	12	0.0464	0.0002
T7	40 - 20	0.192	12	0.0326	0.0001
T8	20 - 0	0.060	12	0.0170	0.0000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
160.00	16' x 2.5" omni whip	12	2.063	0.0918	0.0015	Inf
158.00	(2) 800-10121	12	2.024	0.0917	0.0015	Inf
152.00	(2) 7129.16.05.00	12	1.907	0.0913	0.0013	755394
141.00	(2) PCSA090-13-0	12	1.692	0.0899	0.0011	318436
130.00	(4) FV90-12-05DBL2	12	1.482	0.0867	0.0009	205045
118.00	(2) APX16DWV-16DWVS	12	1.261	0.0815	0.0008	152813
115.00	3' HP dish	12	1.207	0.0801	0.0007	149616
113.00	3' HP dish	12	1.172	0.0791	0.0007	147937
107.00	(4) 800-10504	12	1.068	0.0760	0.0006	143119
87.00	15' x 2.5" omni whip	12	0.743	0.0654	0.0004	103684
74.00	GPS on 3' standoff	12	0.556	0.0569	0.0003	81161
72.00	(2) GPS on 3' standoff	12	0.530	0.0554	0.0003	78222
31.00	GPS on 3' standoff	12	0.124	0.0259	0.0001	70052
17.00	E911 omni	12	0.047	0.0145	0.0000	57948

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	160	Leg	A325N	1.0000	6	377.82	53014.40	0.007 ✓	1	Bolt Tension
		Diagonal	A325N	1.0000	1	4426.03	20445.00	0.216 ✓	1	Member Bearing
T2	140	Leg	A325N	1.0000	6	3270.98	53014.40	0.062 ✓	1	Bolt Tension
		Diagonal	A325N	1.0000	1	7540.76	25556.30	0.295 ✓	1	Member Bearing
T3	120	Leg	A325N	1.0000	6	8483.99	53014.40	0.160 ✓	1	Bolt Tension
		Diagonal	A325N	1.0000	1	10784.10	25556.30	0.422 ✓	1	Member Bearing
T4	100	Leg	A325N	1.2500	6	15298.50	82835.00	0.185 ✓	1	Bolt Tension
		Diagonal	A325N	1.2500	1	10784.10	25556.30	0.422 ✓	1	Member Bearing
T5	80	Leg	A325N	1.2500	6	22918.10	82835.00	0.277 ✓	1	Bolt Tension
		Diagonal	A325N	1.2500	1	14174.20	26535.00	0.534 ✓	1	Member Bearing
T6	60	Leg	A325N	1.2500	6	30773.70	82835.00	0.372 ✓	1	Bolt Tension
		Diagonal	A325N	1.2500	1	15799.60	39802.50	0.397 ✓	1	Member Bearing
T7	40	Leg	A325N	1.2500	6	38660.60	82835.00	0.467 ✓	1	Bolt Tension
		Diagonal	A325N	1.2500	1	16834.30	39802.50	0.423 ✓	1	Member Bearing
T8	20	Leg	A325N	1.2500	6	46427.90	82835.00	0.560 ✓	1	Bolt Tension
		Diagonal	A325N	1.2500	1	18088.20	39802.50	0.454 ✓	1	Member Bearing

All-Points Technology Corporation
P.O. Box 504
Conway, NH 03818
Phone: (603) 496-5853
FAX: (603) 447-2124

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T1	**160 - 140**	**Leg**	**Pirod 105216**	**1**	**-6800.68**	**142493.00**	**37.0**	**Pass**
		Diagonal	L3x3x1/4	8	-4521.29	18521.60	24.4	Pass
		Top Girt	L3x3x1/4	4	-413.71	16158.00	2.6	Pass
T2	**140 - 120**	**Leg**	**Pirod 105217**	**21**	**-42529.20**	**214859.00**	**19.8**	**Pass**
		Diagonal	L3x3x5/16	23	-7668.25	18229.00	42.1	Pass
T3	**120 - 100**	**Leg**	**Pirod 105218**	**36**	**-85360.70**	**300681.00**	**28.4**	**Pass**
		Diagonal	L3x3x5/16	38	-10926.50	14801.00	73.8	Pass
T4	**100 - 80**	**Leg**	**Pirod 105219**	**51**	**-134930.00**	**399868.00**	**33.7**	**Pass**
		Diagonal	L3 1/2x3 1/2x1/4	53	-12731.00	16025.40	79.4	Pass
T5	**80 - 60**	**Leg**	**Pirod 105219**	**66**	**-186773.00**	**399868.00**	**46.7**	**Pass**
		Diagonal	L4x4x1/4	68	-14301.30	20066.10	71.3	Pass
T6	**60 - 40**	**Leg**	**Pirod 105220**	**81**	**-240510.00**	**512375.00**	**46.9**	**Pass**
		Diagonal	L4x4x3/8	83	-15903.10	24438.30	65.1	Pass
T7	**40 - 20**	**Leg**	**Pirod 105220**	**96**	**-293978.00**	**512375.00**	**57.4**	**Pass**
		Diagonal	L4x4x3/8	98	-17081.00	20772.90	82.2	Pass
T8	**20 - 0**	**Leg**	**Pirod 105220**	**111**	**-346011.00**	**512375.00**	**67.5**	**Pass**
		Diagonal	L5x5x3/8	113	-18512.90	35532.20	52.1	Pass
						Summary		
						Leg (T8)	67.5	Pass
						Diagonal (T7)	82.2	Pass
						Top Girt (T1)	2.6	Pass
						Bolt Checks	56.0	Pass
						RATING =	**82.2**	**Pass**

FCC License

Federal Communications Commission

Wireless Telecommunications Bureau

RADIO STATION AUTHORIZATION

LICENSEE: AT&T MOBILITY SPECTRUM LLC

ATTN: FCC GROUP
AT&T MOBILITY SPECTRUM LLC
5601 LEGACY DRIVE, MS: A-3
PLANO, TX 75024

Call Sign	File Number
WQGA763	
Radio Service AW - AWS, 1710-1755/2110-2155 MHz bands	

FCC Registration Number (FRN): 0014980726

Grant Date	Effective Date	Expiration Date	Print Date
11-29-2006	03-16-2010	11-29-2021	

Market Number	Channel Block	Sub-Market Designator
BEA003	C	0

Market Name
Boston-Worcester-Lawrence-Lowe

1st Build-out Date	2nd Build-out Date	3rd Build-out Date	4th Build-out Date

Waivers/Conditions:

This authorization is conditioned upon the licensee, prior to initiating operations from any base or fixed station, making reasonable efforts to coordinate frequency usage with known co-channel and adjacent channel incumbent federal users operating in the 1710-1755 MHz band whose facilities could be affected by the proposed operations. See, e.g., FCC and NTIA Coordination Procedures in the 1710-1755 MHz Band, Public Notice, FCC 06-50, WTB Docket No. 02-353, rel. April 20, 2006.

Grant of the request to update licensee name is conditioned on it not reflecting an assignment or transfer of control (see Rule 1.948); if an assignment or transfer occurred without proper notification or FCC approval, the grant is void and the station is licensed under the prior name.

Conditions:
Pursuant to §309(h) of the Communications Act of 1934, as amended, 47 U.S.C. §309(h), this license is subject to the following conditions: This license shall not vest in the licensee any right to operate the station nor any right in the use of the frequencies designated in the license beyond the term thereof nor in any other manner than authorized herein. Neither the license nor the right granted thereunder shall be assigned or otherwise transferred in violation of the Communications Act of 1934, as amended. See 47 U.S.C. § 310(d). This license is subject in terms to the right of use or control conferred by §706 of the Communications Act of 1934, as amended. See 47 U.S.C. §606.

This license may not authorize operation throughout the entire geographic area or spectrum identified on the hardcopy version. To view the specific geographic area and spectrum authorized by this license, refer to the Spectrum and Market Area information under the Market Tab of the license record in the Universal Licensing System (ULS). To view the license record, go to the ULS homepage at http://wireless.fcc.gov/uls/index.htm?job=home and select "License Search". Follow the instructions on how to search for license information.

AWS operations must not cause harmful interference across the Canadian or Mexican Border. The authority granted herein is subject to future international agreements with Canada or Mexico, as applicable.

Commission approval of this application and the licenses contained therein are subject to the conditions set forth in the Memorandum Opinion and Order, adopted on December 29, 2006 and released on March 26, 2007, and revised in the Order on Reconsideration, adopted and released on March 26, 2007. See AT&T Inc. and BellSouth Corporation Application for Transfer of Control, WC Docket No. 06-74, Memorandum Opinion and Order, FCC 06-189 (rel. Mar. 26, 2007); AT&T Inc. and BellSouth Corporation, WC Docket No. 06-74, Order on Reconsideration, FCC 07-44 (rel. Mar. 26, 2007).

Federal Communications Commission

Wireless Telecommunications Bureau

RADIO STATION AUTHORIZATION

LICENSEE: AT&T MOBILITY SPECTRUM LLC

ATTN: FCC GROUP
AT&T MOBILITY SPECTRUM LLC
5601 LEGACY DRIVE, MS: A-3
PLANO, TX 75024

Call Sign	File Number
WQJU455	
Radio Service	
WY - 700 MHz Lower Band (Blocks A, B, E)	

FCC Registration Number (FRN): 0014980726

Grant Date	Effective Date	Expiration Date	Print Date
01-06-2009	03-16-2010	06-13-2019	

Market Number	Channel Block	Sub-Market Designator
CMA038	B	0

Market Name
Providence-Warwick-Pawtucket,

1st Build-out Date	2nd Build-out Date	3rd Build-out Date	4th Build-out Date
06-13-2013	06-13-2019		

Waivers/Conditions:

If the facilities authorized herein are used to provide broadcast operations, whether exclusively or in combination with other services, the licensee must seek renewal of the license either within eight years from the commencement of the broadcast service or within the term of the license had the broadcast service not been provided, whichever period is shorter in length. See 47 CFR §27.13(b).

Conditions:

Pursuant to §309(h) of the Communications Act of 1934, as amended, 47 U.S.C. §309(h), this license is subject to the following conditions: This license shall not vest in the licensee any right to operate the station nor any right in the use of the frequencies designated in the license beyond the term thereof nor in any other manner than authorized herein. Neither the license nor the right granted thereunder shall be assigned or otherwise transferred in violation of the Communications Act of 1934, as amended. See 47 U.S.C. § 310(d). This license is subject in terms to the right of use or control conferred by §706 of the Communications Act of 1934, as amended. See 47 U.S.C. §606.

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Federal Communications Commission

Wireless Telecommunications Bureau

RADIO STATION AUTHORIZATION

LICENSEE: AT&T MOBILITY II LLC

ATTN: FCC GROUP
AT&T MOBILITY II LLC
5601 LEGACY DRIVE, MS: A-3
PLANO, TX 75024

Call Sign	File Number
WPWV380	
Radio Service	
WZ - 700 MHz Lower Band (Blocks C, D)	

FCC Registration Number (FRN): 0016982233

Grant Date	Effective Date	Expiration Date	Print Date
01-24-2003	03-16-2010	06-13-2019	

Market Number	Channel Block	Sub-Market Designator
CMA624	C	0

Market Name
Rhode Island 1 - Newport

1st Build-out Date	2nd Build-out Date	3rd Build-out Date	4th Build-out Date
06-13-2019			

Waivers/Conditions:

Operation of the facilities authorized herein, are subject to the condition that harmful interference may not be caused to, but must be accepted from UHF TV transmitters in Canada and Mexico as identified in existing and any future agreements with those countries.

Conditions:

Pursuant to §309(h) of the Communications Act of 1934, as amended, 47 U.S.C. §309(h), this license is subject to the following conditions: This license shall not vest in the licensee any right to operate the station nor any right in the use of the frequencies designated in the license beyond the term thereof nor in any other manner than authorized herein. Neither the license nor the right granted thereunder shall be assigned or otherwise transferred in violation of the Communications Act of 1934, as amended. See 47 U.S.C. § 310(d). This license is subject in terms to the right of use or control conferred by §706 of the Communications Act of 1934, as amended. See 47 U.S.C. §606.

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Federal Communications Commission

Wireless Telecommunications Bureau

RADIO STATION AUTHORIZATION

LICENSEE: AT&T MOBILITY II LLC

ATTN: FCC GROUP
AT&T MOBILITY II LLC
5601 LEGACY DRIVE, MS: A-3
PLANO, TX 75024

Call Sign	File Number
WPWV367	
Radio Service	
WZ - 700 MHz Lower Band (Blocks C, D)	

FCC Registration Number (FRN): 0016982233

Grant Date	Effective Date	Expiration Date	Print Date
01-24-2003	03-16-2010	06-13-2019	

Market Number	Channel Block	Sub-Market Designator
CMA038	C	0

Market Name
Providence-Warwick-Pawtucket,

1st Build-out Date	2nd Build-out Date	3rd Build-out Date	4th Build-out Date
06-13-2019			

Waivers/Conditions:

Operation of the facilities authorized herein, are subject to the condition that harmful interference may not be caused to, but must be accepted from UHF TV transmitters in Canada and Mexico as identified in existing and any future agreements with those countries.

Conditions:

Pursuant to §309(h) of the Communications Act of 1934, as amended, 47 U.S.C. §309(h), this license is subject to the following conditions: This license shall not vest in the licensee any right to operate the station nor any right in the use of the frequencies designated in the license beyond the term thereof nor in any other manner than authorized herein. Neither the license nor the right granted thereunder shall be assigned or otherwise transferred in violation of the Communications Act of 1934, as amended. See 47 U.S.C. § 310(d). This license is subject in terms to the right of use or control conferred by §706 of the Communications Act of 1934, as amended. See 47 U.S.C. §606.

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Federal Communications Commission

Wireless Telecommunications Bureau

RADIO STATION AUTHORIZATION

LICENSEE: AT&T MOBILITY II LLC

ATTN: FCC GROUP
AT&T MOBILITY II LLC
5601 LEGACY DRIVE, MS: A-3
PLANO, TX 75024

Call Sign	File Number
WPWU950	
Radio Service	
WZ - 700 MHz Lower Band (Blocks C, D)	

FCC Registration Number (FRN): 0016982233

Grant Date	Effective Date	Expiration Date	Print Date
01-24-2003	03-16-2010	06-13-2019	

Market Number	Channel Block	Sub-Market Designator
CMA006	C	0

Market Name
Boston-Lowell-Brockton-Lawrenc

1st Build-out Date	2nd Build-out Date	3rd Build-out Date	4th Build-out Date
06-13-2019			

Waivers/Conditions:

If the facilities authorized herein are used to provide broadcast operations, whether exclusively or in combination with other services, the licensee must seek renewal of the license either within eight years from the commencement of the broadcast service or within the term of the license had the broadcast service not been provided, whichever period is shorter in length. See 47 CFR §27.13(b).

Operation of the facilities authorized herein, are subject to the condition that harmful interference may not be caused to, but must be accepted from UHF TV transmitters in Canada and Mexico as identified in existing and any future agreements with those countries.

Conditions:

Pursuant to §309(h) of the Communications Act of 1934, as amended, 47 U.S.C. §309(h), this license is subject to the following conditions: This license shall not vest in the licensee any right to operate the station nor any right in the use of the frequencies designated in the license beyond the term thereof nor in any other manner than authorized herein. Neither the license nor the right granted thereunder shall be assigned or otherwise transferred in violation of the Communications Act of 1934, as amended. See 47 U.S.C. § 310(d). This license is subject in terms to the right of use or control conferred by §706 of the Communications Act of 1934, as amended. See 47 U.S.C. §606.

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Federal Communications Commission

Wireless Telecommunications Bureau

RADIO STATION AUTHORIZATION

LICENSEE: AT&T MOBILITY SPECTRUM LLC

ATTN: FCC GROUP
AT&T MOBILITY SPECTRUM LLC
5601 LEGACY DRIVE, MS: A-3
PLANO, TX 75024

Call Sign	File Number
WQJU427	
Radio Service	
WY - 700 MHz Lower Band (Blocks A, B, E)	

FCC Registration Number (FRN): 0014980726

Grant Date	Effective Date	Expiration Date	Print Date
01-06-2009	03-16-2010	06-13-2019	

Market Number	Channel Block	Sub-Market Designator
CMA006	B	0

Market Name
Boston-Lowell-Brockton-Lawrenc

1st Build-out Date	2nd Build-out Date	3rd Build-out Date	4th Build-out Date
06-13-2013	06-13-2019		

Waivers/Conditions:

If the facilities authorized herein are used to provide broadcast operations, whether exclusively or in combination with other services, the licensee must seek renewal of the license either within eight years from the commencement of the broadcast service or within the term of the license had the broadcast service not been provided, whichever period is shorter in length. See 47 CFR §27.13(b).

Conditions:

Pursuant to §309(h) of the Communications Act of 1934, as amended, 47 U.S.C. §309(h), this license is subject to the following conditions: This license shall not vest in the licensee any right to operate the station nor any right in the use of the frequencies designated in the license beyond the term thereof nor in any other manner than authorized herein. Neither the license nor the right granted thereunder shall be assigned or otherwise transferred in violation of the Communications Act of 1934, as amended. See 47 U.S.C. § 310(d). This license is subject in terms to the right of use or control conferred by §706 of the Communications Act of 1934, as amended. See 47 U.S.C. §606.

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Corporate Authorization

STATE OF DELAWARE

CERTIFICATE OF CONVERSION OF

AT&T WIRELESS PCS INC. INTO

AT&T WIRELESS PCS, LLC

Pursuant to Section 266 of the Delaware General Corporation Law, the following Certificate of Conversion is executed in accordance with Section 103 of the Delaware General Corporation Law:

1. The name of the corporation immediately prior to filing this Certificate of Conversion is AT&T Wireless PCS Inc.

2. The date the Certificate of Incorporation of AT&T Wireless PCS Inc. was filed on is October 20, 1994.

3. The original name of the corporation as set forth in the Certificate of Incorporation is AT&T Wireless PCS Inc.

4. The name of the limited liability company into which the corporation shall be converted is AT&T Wireless PCS, LLC.

5. The conversion has been approved in accordance with the provisions of Section 266 of the Delaware General Corporation Law.

AT&T WIRELESS PCS INC.

By: _____
Authorized Officer

Name: Daniel R. Hesse
(Print or Type Signature)

Title: President

STATE OF DELAWARE

CERTIFICATE OF FORMATION OF

AT&T WIRELESS PCS, LLC

The undersigned authorized person hereby executes the following Certificate of Formation for the purpose of forming a limited liability company under the Delaware Limited Liability Company Act.

FIRST: The name of the limited liability company is AT&T Wireless PCS, LLC.

SECOND: The address of its registered office in the State of Delaware is Corporation Trust Center, 1209 Orange Street, Wilmington, Delaware 19801. The name of its registered agent at such address is The Corporation Trust Company.

DATED this 7 day of September, 1999.

AT&T WIRELESS SERVICES, INC.,
As Authorized Person

Mark U. Thomas, Vice President

State of Delaware
Secretary of State
Division of Corporations
Delivered 11:20 AM 10/26/2004
FILED 11:07 AM 10/26/2004
SRV 040770586 - 2445544 FILE

CERTIFICATE OF AMENDMENT TO THE CERTIFICATE OF FORMATION OF AT&T WIRELESS PCS, LLC

1. The name of the limited liability company is AT&T Wireless PCS, LLC (the "Company").

2. The Certificate of Formation of the Company is amended by deleting the first paragraph in its entirety and replacing it with a new first paragraph to read as follows:

   "**FIRST:** The name of the limited liability company is New Cingular Wireless PCS, LLC."

3. The Certificate of Amendment shall be effective at 7:30 p.m. EDT on October 26, 2004.

[Signature on following page]

IN WITNESS WHEREOF, AT&T Wireless PCS, LLC has caused this Certificate of Amendment to be executed by its duly authorized Manager this 26th day of October, 2004.

AT&T WIRELESS PCS, LLC

By: Cingular Wireless LLC, its Manager

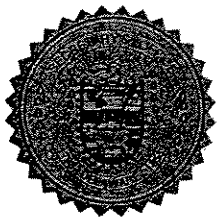
By: Joanne Todaro
Name: Joanne Todaro
Title: Assistant Secretary

Delaware

The First State

I, HARRIET SMITH WINDSOR, SECRETARY OF STATE OF THE STATE OF DELAWARE, DO HEREBY CERTIFY THE ATTACHED IS A TRUE AND CORRECT COPY OF THE CERTIFICATE OF AMENDMENT OF "AT&T WIRELESS PCS, LLC", CHANGING ITS NAME FROM "AT&T WIRELESS PCS, LLC" TO "NEW CINGULAR WIRELESS PCS, LLC", FILED IN THIS OFFICE ON THE TWENTY-SIXTH DAY OF OCTOBER, A.D. 2004, AT 11:07 O'CLOCK A.M.

AND I DO HEREBY FURTHER CERTIFY THAT THE EFFECTIVE DATE OF THE AFORESAID CERTIFICATE OF AMENDMENT IS THE TWENTY-SIXTH DAY OF OCTOBER, A.D. 2004, AT 7:30 O'CLOCK P.M.



Harriet Smith Windsor

Harriet Smith Windsor, Secretary of State

2445544 8100

040770586

AUTHENTICATION: 3434823

DATE: 10-26-04

Plans

PROJECT INFORMATION

SCOPE OF WORK:	ADD (3) NEW ANTENNAS TO AN EXISTING LATTICE TOWER. INSTALL FIBER AND POWER CONDUITS, AND INSTALL ADDITIONAL EQUIPMENT INSIDE AN EXISTING SHELTER.
SITE ADDRESS:	293 BOSTON STREET TOPSFIELD, MA 01983
LATITUDE:	42° 38' 22.56" (NAD 83)*
LONGITUDE:	70° 56' 20.76" (NAD 83)* * PER RFDS
JURISDICTION:	TOWN OF TOPSFIELD
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY
NAME OF APPLICANT:	AT&T MOBILITY 550 COCHITUATE ROAD SUITES 13&14 FRAMINGHAM, MA 01701
TOWER OWNER:	N/A
TOWER NUMBER:	N/A

DRAWING INDEX

		REV
T01	TITLE SHEET	2
G01	GENERAL NOTES	2
A01	SITE PLAN & SHELTER LAYOUT	2
A02	ELEVATION & CONSTRUCTION DETAILS	2
E01	GROUNDING DETAILS	2

THIS DOCUMENT WAS DEVELOPED TO REFLECT A SPECIFIC SITE AND ITS SITE CONDITIONS AND IS NOT TO BE USED FOR ANOTHER SITE OR WHEN OTHER CONDITIONS PERTAIN. REUSE OF THIS DOCUMENT IS AT THE SOLE RISK OF THE USER.

STRUCTURAL NOTE:

1. AS REQUIRED UNDER TIA/EIA 222G – STANDARD, SAI COMMUNICATIONS SHALL PROVIDE A STRUCTURAL ANALYSIS OF THE TOWER PREPARED BY A LICENSED MASSACHUSETTS STRUCTURAL ENGINEER CERTIFYING THAT, THE EXISTING TOWER AND ANY REQUIRED IMPROVEMENTS AND REINFORCEMENTS HAVE SUFFICIENT CAPACITY TO SUPPORT ALL EXISTING AND PROPOSED ANTENNAS, SUPPORTS AND APPURTENANCES AND COMPLIES WITH THE CURRENT MASSACHUSETTS STATE BUILDING CODE AND EIA/TIA CRITERIA. THE CONTRACTOR IS RESPONSIBLE TO CONFIRM THAT ANY IMPROVEMENTS AND REINFORCEMENTS REQUIRED BY THE STRUCTURAL ANALYSIS CERTIFICATION ARE PROPERLY INSTALLED PRIOR TO THE ADDITION OF ANTENNAS, SUPPORTS AND APPURTENANCES PROPOSED ON THESE DRAWINGS OR OTHERWISE NOTED IN THE STRUCTURAL ANALYSIS.

CONTACT & UTILITY INFORMATION

CONTACT	CONTACT	COMPANY	PHONE NO.
ENGINEERING:	GREG H. NAWROTZKI	DEWBERRY	(617) 695-3400
SAC:	DAVE COOPER	SAI COMMUNICATIONS	(603) 305-5641
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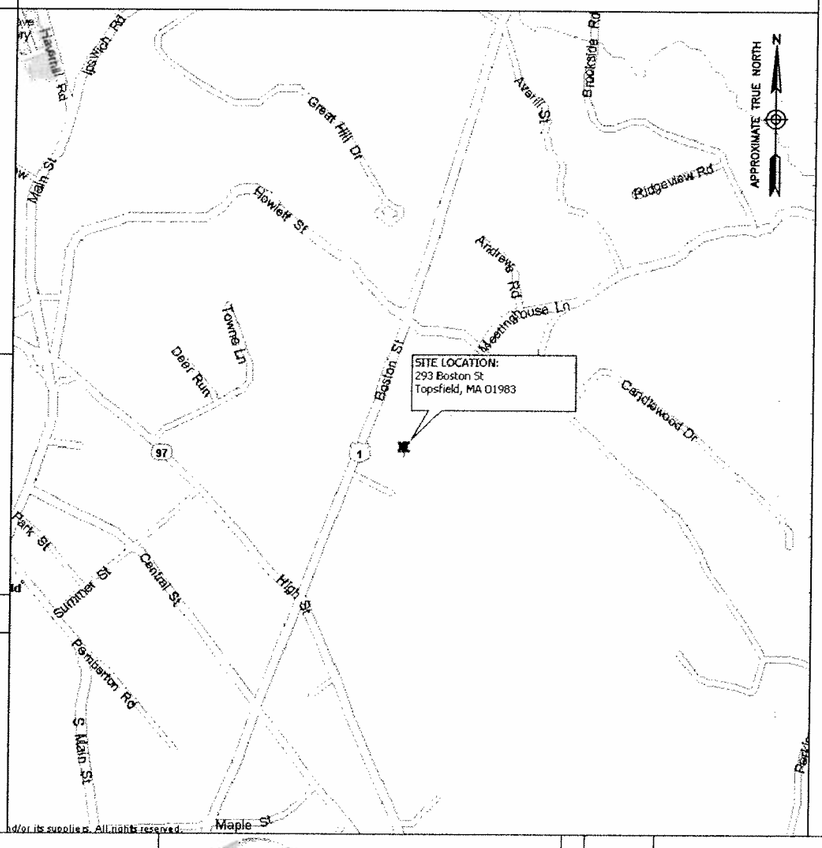
UTILITIES			
POWER:		NSTAR	(800) 592-2000
TELCO:		VERIZON	(800) 941-9900

SITE NAME: TOPSFIELD
SITE NUMBER: MA-3052

VICINITY MAP

DIRECTIONS: TAKE I-90 E. TAKE EXIT 14 FOR I-95 N TOWARD N.H – MAINE AND MERGE ONTO I-95 N. TAKE EXIT 50 TO MERGE ONTO US-1 N/NEWBURY ST/NEWBURYPORT TURNPIKE TOWARD TOPSFIELD CONTINUE TO FOLLOW US-1 N/NEWBURYPORT TURNPIKE. THE SITE WILL BE ON THE RIGHT.



APPLICABLE BUILDING CODES AND STANDARDS

CONTRACTOR'S WORK SHALL COMPLY WITH PROJECT STANDARD NOTES, SYMBOLS AND DETAILS (SEE DRAWING INDEX FOR STANDARD NOTES AND DETAILS INCLUDED WITH TYPICAL DRAWING PACKAGE). CONTRACTOR WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.

BUILDING CODE:
MASSACHUSETTS STATE BUILDING CODE (780 CMR)

ELECTRICAL CODE:
NATIONAL ELECTRICAL CODE (NEC 2011)
MASSACHUSETTS ELECTRICAL CODE (527 CMR 12.00)

CONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS.
AMERICAN CONCRETE INSTITUTE (ACI) 318, BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE
AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC), MANUAL OF STEEL CONSTRUCTION, ASD, NINTH EDITION
TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) 222-G, STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES:
TIA 607, COMMERCIAL BUILDING GROUNDING AND BONDING REQUIREMENTS FOR TELECOMMUNICATIONS

INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE) 81, GUIDE FOR MEASURING EARTH RESISTIVITY, GROUND IMPEDANCE, AND EARTH SURFACE POTENTIALS OF A GROUND SYSTEM
IEEE 1100 (1999) RECOMMENDED PRACTICE FOR POWERING AND GROUNDING OF ELECTRONIC EQUIPMENT

IEEE C62.41, RECOMMENDED PRACTICES ON SURGE VOLTAGES IN LOW VOLTAGE AC POWER CIRCUITS (FOR LOCATION CATEGORY "C3" AND "HIGH SYSTEM EXPOSURE")

TELCORDIA GR-1503, COAXIAL CABLE CONNECTIONS

ANSI T1.311, FOR TELECOM – DC POWER SYSTEMS – TELECOM, ENVIRONMENTAL PROTECTION

FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS REGARDING MATERIAL, METHODS OF CONSTRUCTION, OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN. WHERE THERE IS CONFLICT BETWEEN A GENERAL REQUIREMENT AND A SPECIFIC REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL GOVERN.

COMMONWEALTH OF MASSACHUSETTS
BRADFORD A. MILLS
CIVIL
No 33965
REGISTERED PROFESSIONAL ENGINEER
6/21/11

Dewberry
Dewberry-Goodkind, Inc.
280 SUMMER ST.
10TH FLOOR
BOSTON, MA 02210
PHONE: 617.695.3400
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SAI communications
22 KEEWAYDIN DRIVE
SALEM, NH 03079

TOPSFIELD
SITE NO. MA-3052
293 BOSTON STREET
TOPSFIELD, MA 01983

at&t Mobility
550 COCHITUATE ROAD
SUITES 13 & 14
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
2	06/21/11	ISSUED FOR ZONING	SK	GHN	PPB
1	05/31/11	ISSUED FOR ZONING	SK	GHN	PPB
0	04/25/11	ISSUED FOR REVIEW	SK	GHN	PPB
A	04/04/11	ISSUED FOR SCOPING	SK	GHN	PPB

SCALE: AS SHOWN | DESIGNED BY: GHN | DRAWN BY: SK

AT&T MOBILITY
FRAMINGHAM, MA 01701

TITLE SHEET

DEWBERRY NO.	DRAWING NUMBER	REV
50019239/50044311	T01	2

GENERAL NOTES:

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
   PROJECT MANAGEMENT – SAI
   CONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
   OWNER – AT&T MOBILITY
   OEM – ORIGINAL EQUIPMENT MANUFACTURER
2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING CONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF PROJECT MANAGEMENT.
3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK.
4. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
5. DRAWINGS PROVIDED HERE ARE NOT TO SCALE UNLESS OTHERWISE NOTED AND ARE INTENDED TO SHOW OUTLINE ONLY.
6. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
7. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
8. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY PROJECT MANAGEMENT.
9. CONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. CONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. CONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH PROJECT MANAGEMENT.
10. THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE OWNER.
11. CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
12. CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.
13. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.
14. CONTRACTOR SHALL NOTIFY DEWBERRY 48 HOURS IN ADVANCE OF POURING CONCRETE, OR BACKFILLING TRENCHES, SEALING ROOF AND WALL PENETRATIONS & POST DOWNS, FINISHING NEW WALLS OR FINAL ELECTRICAL CONNECTIONS FOR ENGINEER REVIEW.
15. CONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. CONTRACTOR SHALL NOTIFY PROJECT MANAGEMENT OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
16. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY CONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.
17. SINCE THE CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE ADVISED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.

SITE WORK GENERAL NOTES:

1. THE CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
2. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY CONTRACTOR. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT BE LIMITED TO:
   A) FALL PROTECTION
   B) CONFINED SPACE
   C) ELECTRICAL SAFETY
   D) TRENCHING & EXCAVATION.
3. ALL SITE WORK SHALL BE AS INDICATED ON THE DRAWINGS AND PROJECT SPECIFICATIONS.
4. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES, TOP SOIL AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
5. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF CONTRACTOR, OWNER AND/OR LOCAL UTILITIES.
6. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION.
7. THE CONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE AT&T SPECIFICATION FOR SITE SIGNAGE.
8. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE TRANSMISSION EQUIPMENT AND TOWER AREAS.
9. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.
10. THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION, SEE SOIL COMPACTION NOTES.
11. THE AREAS OF THE OWNER'S PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE, AND STABILIZED TO PREVENT EROSION.
12. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL JURISDICTION'S GUIDELINES FOR EROSION AND SEDIMENT CONTROL.

CONCRETE AND REINFORCING STEEL NOTES:

1. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301, ACI 318, ACI 336, ASTM A184, ASTM A185 AND THE DESIGN AND CONSTRUCTION SPECIFICATION FOR CAST-IN-PLACE CONCRETE.
2. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS, UNLESS NOTED OTHERWISE. A HIGHER STRENGTH (4000 PSI) MAY BE USED. ALL CONCRETING WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.
3. REINFORCING STEEL SHALL CONFORM TO ASTM A 615, GRADE 60, DEFORMED UNLESS NOTED OTHERWISE. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A 185 WELDED STEEL WIRE FABRIC UNLESS NOTED OTHERWISE (UNO). SPLICES SHALL BE CLASS "B" AND ALL HOOKS SHALL BE STANDARD, UNO.
4. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:
   CONCRETE CAST AGAINST EARTH.....3 IN.
   CONCRETE EXPOSED TO EARTH OR WEATHER:
   #6 AND LARGER .....2 IN.
   #5 AND SMALLER & WWF.....1 1/2 IN.
   CONCRETE NOT EXPOSED TO EARTH OR WEATHER OR NOT CAST AGAINST THE GROUND:
   SLAB AND WALL .....3/4 IN.
   BEAMS AND COLUMNS.....1 1/2 IN.
5. A CHAMFER 3/4" SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNO, IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.
6. INSTALLATION OF CONCRETE EXPANSION/WEDGE ANCHOR, SHALL BE PER MANUFACTURER'S WRITTEN RECOMMENDED PROCEDURE. THE ANCHOR BOLT, DOWEL OR ROD SHALL CONFORM TO MANUFACTURER'S RECOMMENDATION FOR EMBEDMENT DEPTH OR AS SHOWN ON THE DRAWINGS. NO REBAR SHALL BE CUT WITHOUT PRIOR CONTRACTOR APPROVAL WHEN DRILLING HOLES IN CONCRETE. SPECIAL INSPECTIONS, REQUIRED BY GOVERNING CODES, SHALL BE PERFORMED IN ORDER TO MAINTAIN MANUFACTURER'S MAXIMUM ALLOWABLE LOADS. ALL EXPANSION/WEDGE ANCHORS SHALL BE STAINLESS STEEL OR HOT DIPPED GALVANIZED. EXPANSION BOLTS SHALL BE PROVIDED BY RAMSET/REDHEAD OR APPROVED EQUAL.
7. CONCRETE CYLINDER TEST IS NOT REQUIRED FOR SLAB ON GRADE WHEN CONCRETE IS LESS THAN 50 CUBIC YARDS (IBC 1905.6.2.3) IN THAT EVENT THE FOLLOWING RECORDS SHALL BE PROVIDED BY THE CONCRETE SUPPLIER;
   (A) RESULTS OF CONCRETE CYLINDER TESTS PERFORMED AT THE SUPPLIER'S PLANT,
   (B) CERTIFICATION OF MINIMUM COMPRESSIVE STRENGTH FOR THE CONCRETE GRADE SUPPLIED.
   FOR GREATER THAN 50 CUBIC YARDS THE GC SHALL PERFORM THE CONCRETE CYLINDER TEST.
8. AS AN ALTERNATIVE TO ITEM 7, TEST CYLINDERS SHALL BE TAKEN INITIALLY AND THEREAFTER FOR EVERY 50 YARDS OF CONCRETE FROM EACH DIFFERENT BATCH PLANT.
9. EQUIPMENT SHALL NOT BE PLACED ON NEW PADS FOR SEVEN DAYS AFTER PAD IS POURED, UNLESS IT IS VERIFIED BY CYLINDER TESTS THAT COMPRESSIVE STRENGTH HAS BEEN ATTAINED.

STRUCTURAL STEEL NOTES:

1. ALL STEEL WORK SHALL BE PAINTED OR GALVANIZED IN ACCORDANCE WITH THE DRAWINGS UNLESS NOTED OTHERWISE. STRUCTURAL STEEL SHALL BE ASTM-A-36 UNLESS OTHERWISE NOTED ON THE SITE SPECIFIC DRAWINGS. STEEL DESIGN, INSTALLATION AND BOLTING SHALL BE PERFORMED IN ACCORDANCE WITH THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) "MANUAL OF STEEL CONSTRUCTION".
2. ALL WELDING SHALL BE PERFORMED USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC. WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLE J2.4 IN THE AISC "MANUAL OF STEEL CONSTRUCTION". PAINTED SURFACES SHALL BE TOUCHED UP.
3. BOLTED CONNECTIONS SHALL BE ASTM A325 BEARING TYPE (3/4"Ø) CONNECTIONS AND SHALL HAVE MINIMUM OF TWO BOLTS UNLESS NOTED OTHERWISE.
4. NON-STRUCTURAL CONNECTIONS FOR STEEL GRATING MAY USE 5/8" DIA. ASTM A 307 BOLTS UNLESS NOTED OTHERWISE.
5. INSTALLATION OF CONCRETE EXPANSION/WEDGE ANCHOR, SHALL BE PER MANUFACTURER'S WRITTEN RECOMMENDED PROCEDURE. THE ANCHOR BOLT, DOWEL OR ROD SHALL CONFORM TO MANUFACTURER'S RECOMMENDATION FOR EMBEDMENT DEPTH OR AS SHOWN ON THE DRAWINGS. NO REBAR SHALL BE CUT WITHOUT PRIOR CONTRACTOR APPROVAL WHEN DRILLING HOLES IN CONCRETE. SPECIAL INSPECTIONS, REQUIRED BY GOVERNING CODES, SHALL BE PERFORMED IN ORDER TO MAINTAIN MANUFACTURER'S MAXIMUM ALLOWABLE LOADS. ALL EXPANSION/WEDGE ANCHORS SHALL BE STAINLESS STEEL OR HOT DIPPED GALVANIZED. EXPANSION BOLTS SHALL BE PROVIDED BY RAMSET/REDHEAD OR APPROVED EQUAL.
6. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR ENGINEER REVIEW & APPROVAL ON PROJECTS REQUIRING STRUCTURAL STEEL.
7. ALL STRUCTURAL STEEL WORK SHALL BE DONE IN ACCORDANCE WITH AISC SPECIFICATIONS.

SOIL COMPACTION NOTES FOR SLAB ON GRADE:

1. EXCAVATE AS REQUIRED TO REMOVE VEGETATION & TOPSOIL EXPOSE UNDISTURBED NATURAL SUBGRADE AND PLACE CRUSHED STONE AS REQUIRED.
2. COMPACTION CERTIFICATION: AN INSPECTION AND WRITTEN CERTIFICATION BY A QUALIFIED GEOTECHNICAL TECHNICIAN OR ENGINEER IS ACCEPTABLE.
3. AS AN ALTERNATIVE TO INSPECTION AND WRITTEN CERTIFICATION, THE "UNDISTURBED SOIL" BASE SHALL BE COMPACTED WITH "COMPACTION EQUIPMENT", LISTED BELOW, TO AT LEAST 90% MODIFIED PROCTOR MAXIMUM DENSITY PER ASTM D 1557 METHOD C.
4. COMPACTED SUBBASE SHALL BE UNIFORM & LEVELED. PROVIDE 6" MINIMUM CRUSHED STONE OR GRAVEL COMPACTED IN 3" LIFTS ABOVE COMPACTED SOIL. GRAVEL SHALL BE NATURAL OR CRUSHED WITH 100% PASSING 1" SIEVE.
5. AS AN ALTERNATIVE TO ITEMS 2 AND 3 PROOFROLL THE SUBGRADE SOILS WITH 5 PASSES OF A MEDIUM SIZED VIBRATORY PLATE COMPACTOR (SUCH AS BOMAG BPR 30/38) OR HAND-OPERATED SINGLE DRUM VIBRATORY ROLLER (SUCH AS BOMAG BW 55E). ANY SOFT AREAS THAT ARE ENCOUNTERED SHOULD BE REMOVED AND REPLACED WITH A WELL-GRADED GRANULAR FILL, AND COMPACTED AS STATED ABOVE.

COMPACTION EQUIPMENT:

1. HAND OPERATED DOUBLE DRUM, VIBRATORY ROLLER, VIBRATORY PLATE COMPACTOR OR JUMPING JACK COMPACTOR.

CONSTRUCTION NOTES:

1. FIELD VERIFICATION:
   CONTRACTOR SHALL FIELD VERIFY SCOPE OF WORK, AT&T ANTENNA PLATFORM LOCATION AND ANTENNAS TO BE REPLACED.
2. COORDINATION OF WORK:
   CONTRACTOR SHALL COORDINATE RF WORK AND PROCEDURES WITH PROJECT MANAGEMENT.
3. CABLE LADDER RACK:
   CONTRACTOR SHALL FURNISH AND INSTALL CABLE LADDER RACK, CABLE TRAY, AND CONDUIT AS REQUIRED TO SUPPORT CABLES TO THE NEW BTS LOCATION.

ELECTRICAL INSTALLATION NOTES:

1. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE LOCAL CODES.
2. CONTRACTOR SHALL MODIFY EXISTING CABLE TRAY SYSTEM AS REQUIRED TO SUPPORT RF AND TRANSPORT CABLING TO THE NEW BTS EQUIPMENT. CONTRACTOR SHALL SUBMIT MODIFICATIONS TO PROJECT MANAGEMENT FOR APPROVAL.
3. CONDUIT ROUTINGS ARE SCHEMATIC. CONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED.
4. WIRING, RACEWAY AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC AND TELCORDIA.
5. ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC AND TELCORDIA.
6. CABLES SHALL NOT BE ROUTED THROUGH LADDER-STYLE CABLE TRAY RUNGS.
7. EACH END OF EVERY POWER, POWER PHASE CONDUCTOR (I.E., HOTS), GROUNDING, AND T1 CONDUCTOR AND CABLE SHALL BE LABELED WITH COLOR-CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2 INCH PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC & OSHA, AND MATCH EXISTING INSTALLATION REQUIREMENTS.
8. ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH ENGRAVED LAMACOID PLASTIC LABELS. ALL EQUIPMENT SHALL BE LABELED WITH THEIR VOLTAGE RATING, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING, AND BRANCH CIRCUIT ID NUMBERS (I.E., PANELBOARD AND CIRCUIT ID'S).
9. PANELBOARDS (ID NUMBERS) AND INTERNAL CIRCUIT BREAKERS (CIRCUIT ID NUMBERS) SHALL BE CLEARLY LABELED WITH ENGRAVED LAMACOID PLASTIC LABELS.
10. ALL TIE WRAPS SHALL BE CUT FLUSH WITH APPROVED CUTTING TOOL TO REMOVE SHARP EDGES.
11. POWER, CONTROL, AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE CONDUCTOR (SIZE 14 AWG OR LARGER), 600V, OIL RESISTANT THHN OR THWN-2, CLASS B STRANDED COPPER CABLE RATED FOR 90 °C (WET AND DRY) OPERATION; LISTED OR LABELED FOR THE LOCATION AND RACEWAY SYSTEM USED, UNLESS OTHERWISE SPECIFIED.
12. POWER PHASE CONDUCTORS (I.E., HOTS) SHALL BE LABELED WITH COLOR-CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2 INCH PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL.) PHASE CONDUCTOR COLOR CODES SHALL CONFORM WITH THE NEC & OSHA AND MATCH EXISTING INSTALLATION REQUIREMENTS.
13. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE CONDUCTOR (SIZE 6 AWG OR LARGER), 600V, OIL RESISTANT THHN OR THWN-2 GREEN INSULATION, CLASS B STRANDED COPPER CABLE RATED FOR 90°C (WET AND DRY) OPERATION; LISTED OR LABELED FOR THE LOCATION AND RACEWAY SYSTEM USED, UNLESS OTHERWISE SPECIFIED.
14. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED OUTDOORS, OR BELOW GRADE, SHALL BE SINGLE CONDUCTOR #2 AWG SOLID TINNED COPPER CABLE, UNLESS OTHERWISE SPECIFIED.
15. POWER AND CONTROL WIRING, NOT IN TUBING OR CONDUIT, SHALL BE MULTI-CONDUCTOR, TYPE TC CABLE (SIZE 14 AWG OR LARGER), 600V, OIL RESISTANT THHN OR THWN-2, CLASS B STRANDED COPPER CABLE RATED FOR 90°C (WET AND DRY) OPERATION; WITH OUTER JACKET; LISTED OR LABELED FOR THE LOCATION USED, UNLESS OTHERWISE SPECIFIED.
16. ALL POWER AND POWER GROUNDING CONNECTIONS SHALL BE CRIMP-STYLE, COMPRESSION WIRE LUGS AND WIRENUTS BY THOMAS AND BETTS (OR EQUAL). LUGS AND WIRENUTS SHALL BE RATED FOR OPERATION AT NO LESS THAN 75°C (90°C IF AVAILABLE).
17. RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE, AND NEC.
18. NEW RACEWAY OR CABLE TRAY WILL MATCH THE EXISTING INSTALLATION WHERE POSSIBLE.
19. ELECTRICAL METALLIC TUBING (EMT) OR RIGID NONMETALLIC CONDUIT (I.E., RIGID PVC SCHEDULE 40, OR RIGID PVC SCHEDULE 80 FOR LOCATIONS SUBJECT TO PHYSICAL DAMAGE) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.
20. ELECTRICAL METALLIC TUBING (EMT), ELECTRICAL NONMETALLIC TUBING (ENT), OR RIGID NONMETALLIC CONDUIT (RIGID PVC, SCHEDULE 40) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.
21. GALVANIZED STEEL INTERMEDIATE METALLIC CONDUIT (IMC) SHALL BE USED FOR OUTDOOR LOCATIONS ABOVE GRADE.
22. RIGID NONMETALLIC CONDUIT (I.E., RIGID PVC SCHEDULE 40 OR RIGID PVC SCHEDULE 80) SHALL BE USED UNDERGROUND; DIRECT BURIED, IN AREAS OF OCCASIONAL LIGHT VEHICLE TRAFFIC OR ENCASED IN REINFORCED CONCRETE IN AREAS OF HEAVY VEHICLE TRAFFIC.
23. LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID-TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
24. CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION-TYPE AND APPROVED FOR THE LOCATION USED. SETSCREW FITTINGS ARE NOT ACCEPTABLE.
25. CABINETS, BOXES, AND WIREWAYS SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE, AND NEC.
26. CABINETS, BOXES, AND WIREWAYS TO MATCH THE EXISTING INSTALLATION WHERE POSSIBLE.
27. WIREWAYS SHALL BE EPOXY-COATED (GRAY) AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARD; SHALL BE PANDUIT TYPE E (OR EQUAL); AND RATED NEMA 1 (OR BETTER) INDOORS, OR NEMA 3R (OR BETTER) OUTDOORS.
28. EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES, AND PULL BOXES SHALL BE GALVANIZED OR EPOXY-COATED SHEET STEEL, SHALL MEET OR EXCEED UL 50, AND RATED NEMA 1 (OR BETTER) INDOORS, OR NEMA 3R (OR BETTER) OUTDOORS.
29. METAL RECEPTACLE, SWITCH, AND DEVICE BOXES SHALL BE GALVANIZED, EPOXY-COATED, OR NON-CORRODING; SHALL MEET OR EXCEED UL 514A AND NEMA OS 1; AND RATED NEMA 1 (OR BETTER) INDOORS, OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.
30. NONMETALLIC RECEPTACLE, SWITCH, AND DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2; AND RATED NEMA 1 (OR BETTER) INDOORS, OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.
31. THE CONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM PROJECT MANAGEMENT BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.
32. THE CONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD AGAINST LIFE AND PROPERTY.

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CIVIL
No 33966
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6-21-11

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2	06/21/11	ISSUED FOR ZONING	SK	GHN	PPB
1	05/31/11	ISSUED FOR ZONING	SK	GHN	PPB
0	04/25/11	ISSUED FOR REVIEW	SK	GHN	PPB
A	04/04/11	ISSUED FOR SCOPING	SK	GHN	PPB

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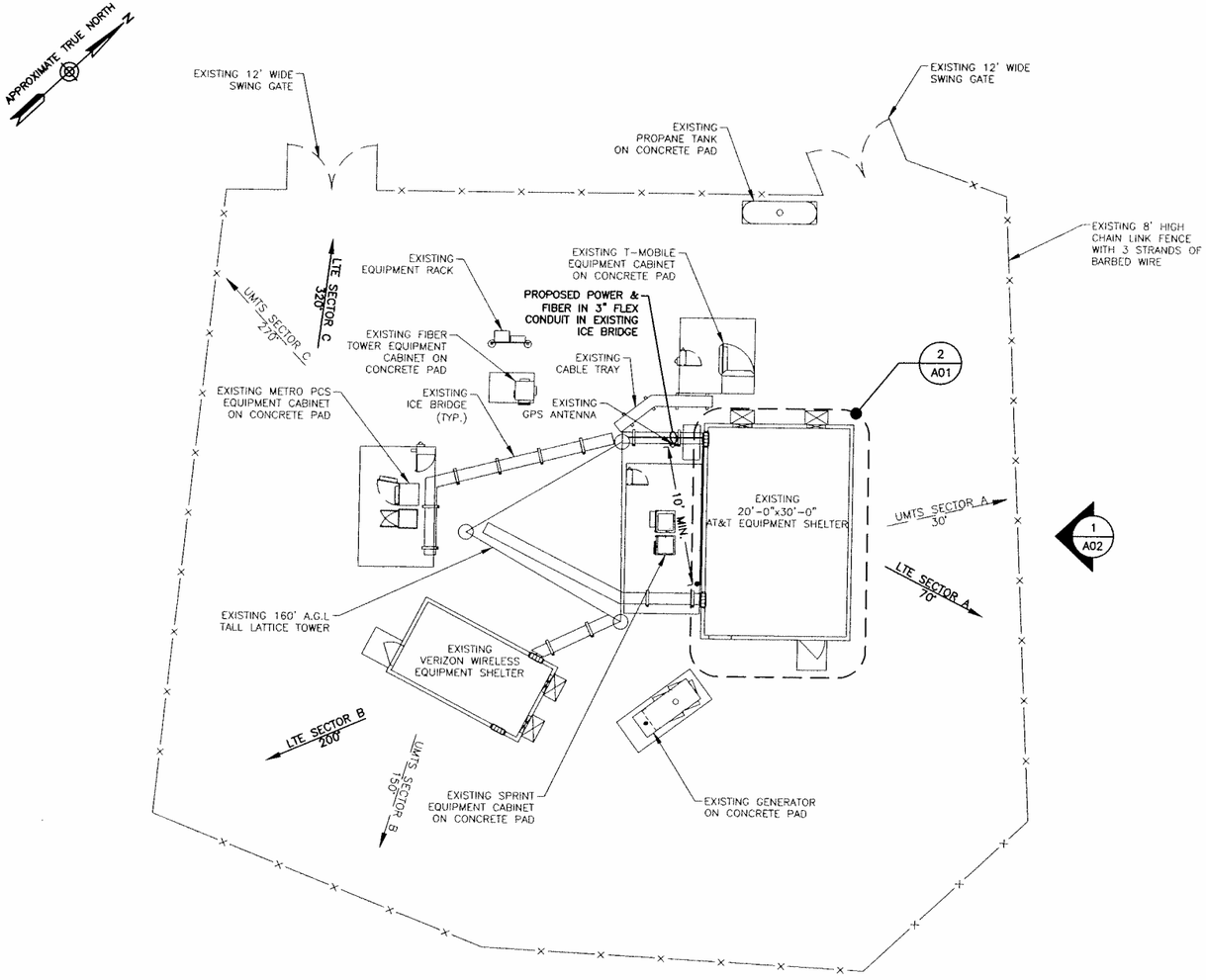
GENERAL NOTES

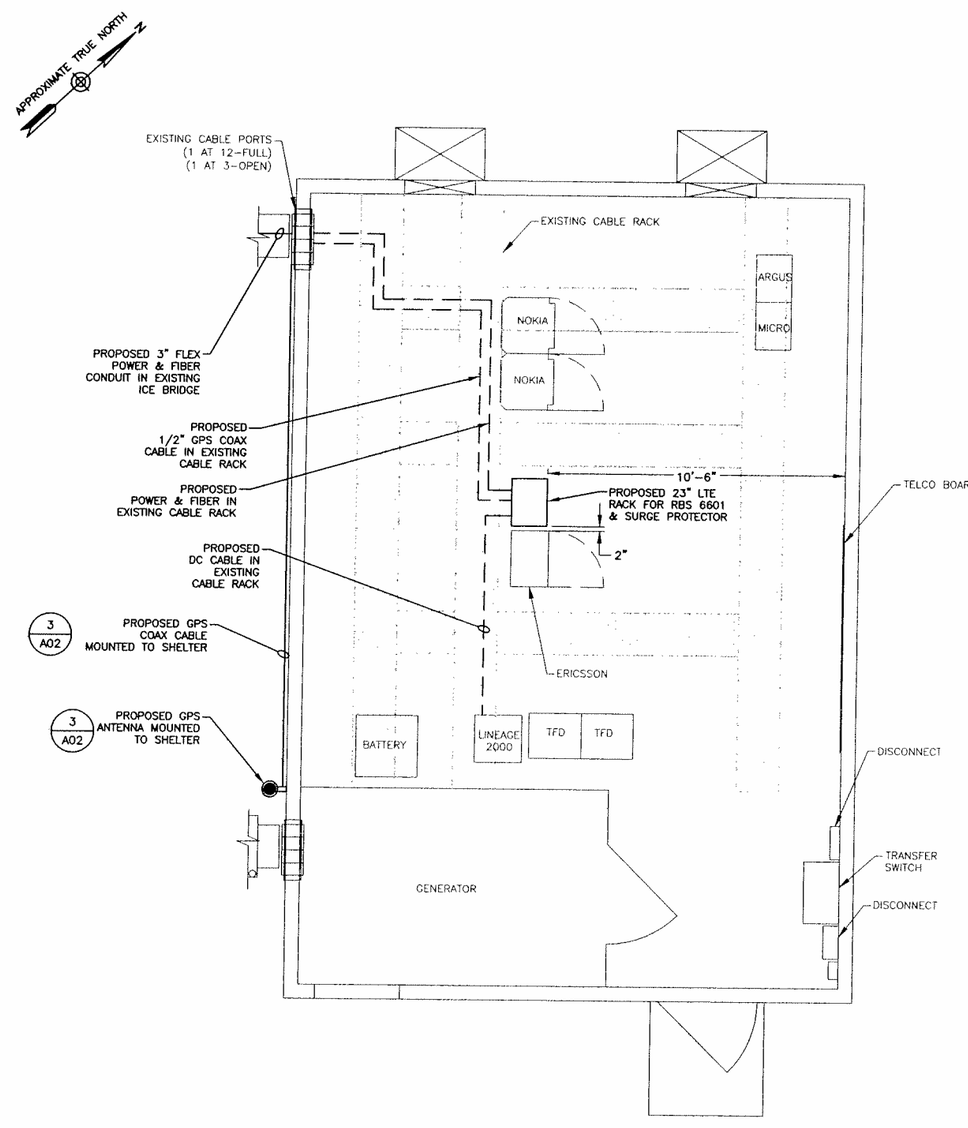
DEWBERRY NO.	DRAWING NUMBER	REV
50019239/50044311	G01	2



SITE PLAN 1

SCALE: 1"=20' FOR 11"x17"
1"=10' FOR 22"x34"

0' 10' 20'



NOTES:

1. NORTH SHOWN AS APPROXIMATE.
2. MOUNT ALL ANTENNAS, COAX, SURGE ARRESTORS, RRU'S, ETC. IN ACCORDANCE WITH STRUCTURAL ANALYSIS.
3. NOT ALL INFORMATION SHOWN FOR CLARITY.

SHELTER LAYOUT 2

SCALE: 3/16"=1' FOR 11"x17"
3/8"=1' FOR 22"x34"

0' 2' 4' 6'

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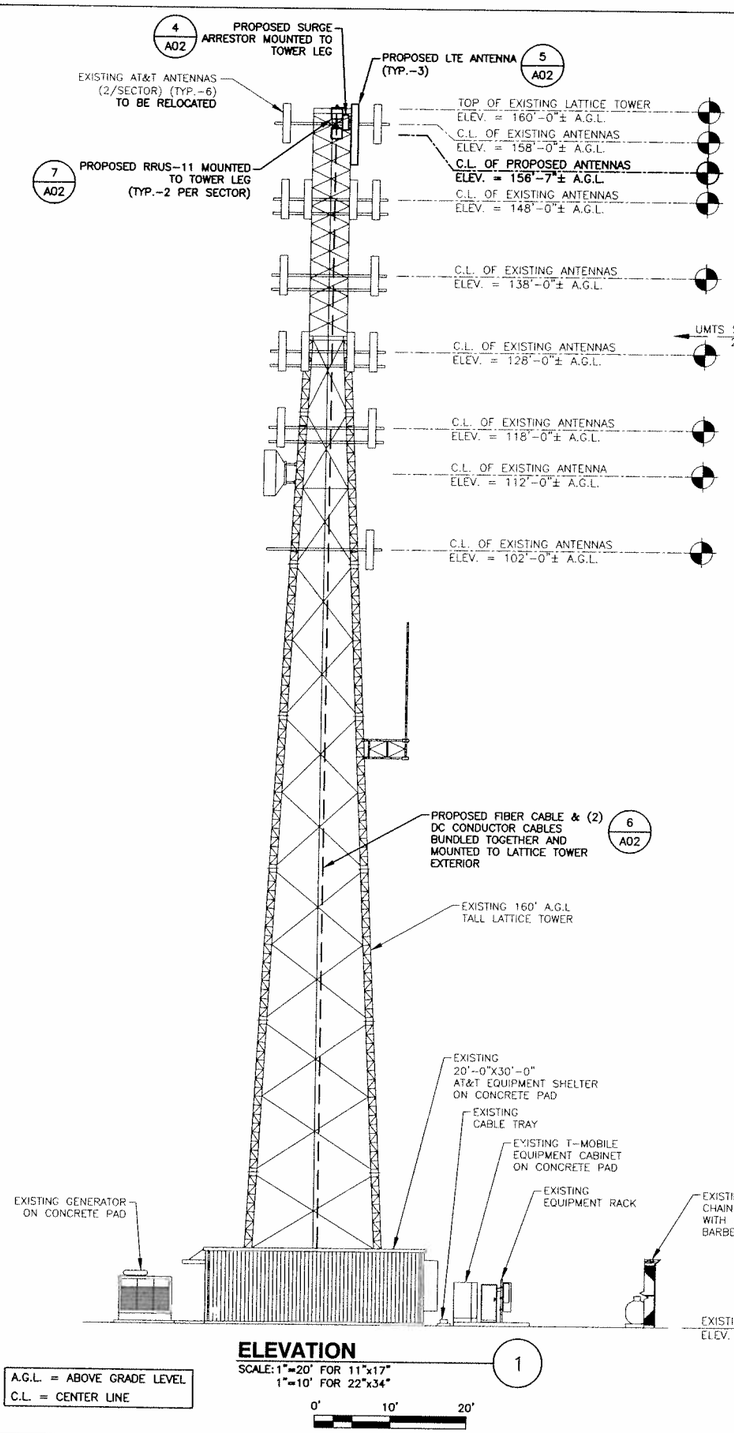
SITE PLAN & SHELTER LAYOUT

DEWBERRY NO.	DRAWING NUMBER	REV
50019239/50044311	A01	2

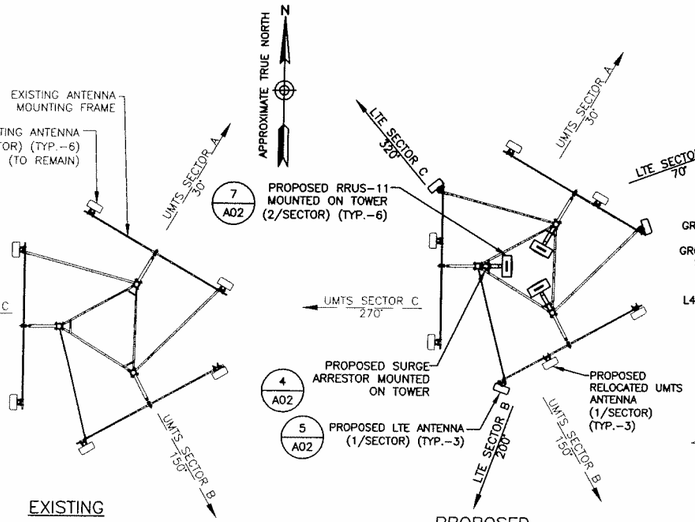


A.G.L. = ABOVE GRADE LEVEL
C.L. = CENTER LINE

ELEVATION 1

SCALE: 1"=20' FOR 11"x17"
1"=10' FOR 22"x34"

0' 10' 20'

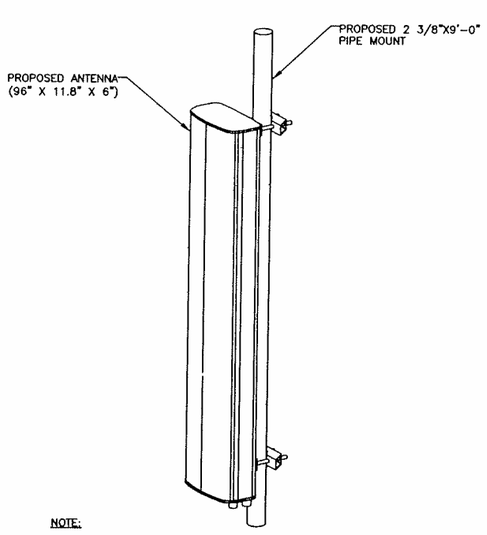


NOTES:

1. ANTENNA MOUNTING FRAME TO BE INSTALLED PER TOWER DESIGN & STRUCTURAL ANALYSIS.
2. AZIMUTHS BASED ON TRUE NORTH.
3. CONTRACTOR TO VERIFY FINAL AZIMUTHS PRIOR TO ANTENNA INSTALLATION.

ANTENNA MOUNTING PLAN 2

SCALE: N.T.S.

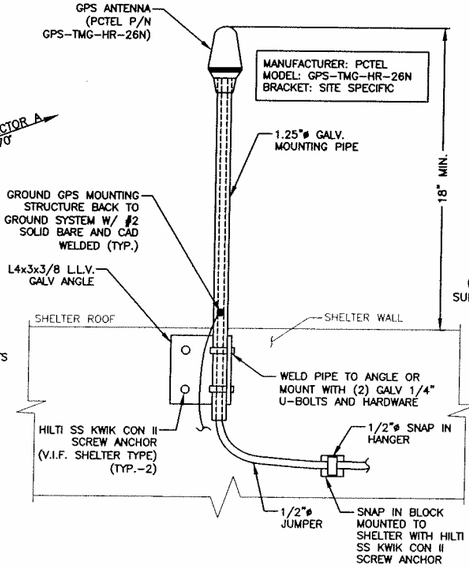


NOTE:

1. PLEASE SEE RFDS FOR SPECIFIC ANTENNA MODEL.

ISOMETRIC ANTENNA DETAIL 5

SCALE: N.T.S.

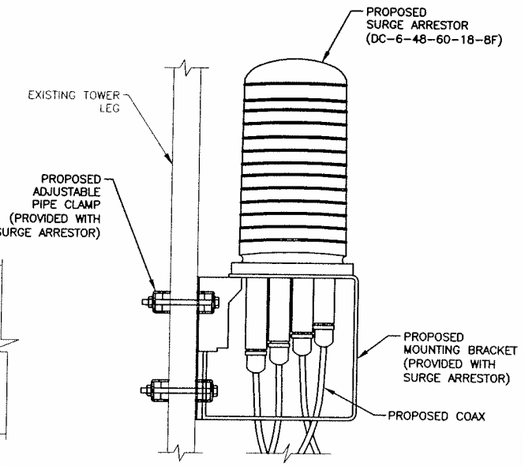


GPS ANTENNA NOTES:

1. GROUND ANTENNAS AND MOUNTS PER MANUFACTURERS RECOMMENDATIONS AND AT&T STANDARDS.
2. FIELD LOCATE GPS ANTENNA A MINIMUM OF 10' HORIZONTALLY FROM EXISTING GPS ANTENNA WITH AT&T CM APPROVAL.
3. SEAL ALL WALL PENETRATIONS WILL SILICONE SEALANT.

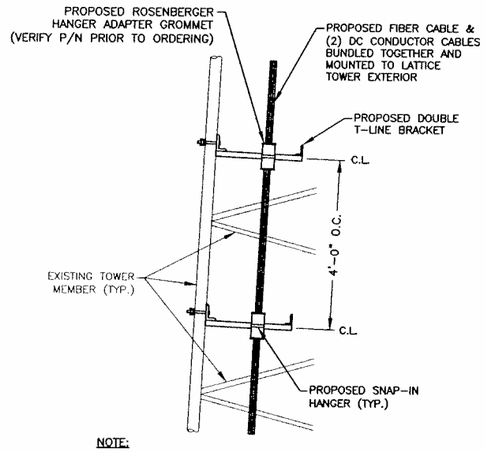
GPS ANTENNA MOUNT TO SHELTER DETAIL 3

SCALE: N.T.S.



SURGE ARRESTOR MOUNTING DETAIL 4

SCALE: N.T.S.

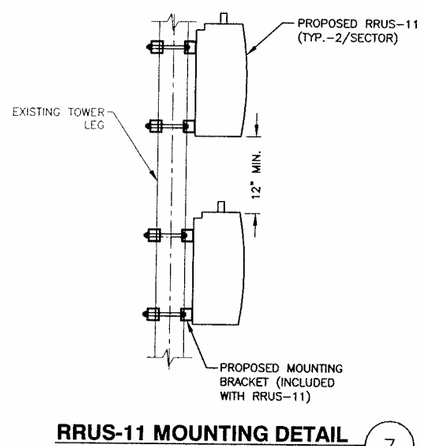


NOTE:

1. MODIFY OR IMPROVE EXISTING CABLE LADDER AS NEEDED.

VERTICAL CONDUCTOR DETAIL 6

SCALE: N.T.S.



RRUS-11 MOUNTING DETAIL 7

SCALE: N.T.S.

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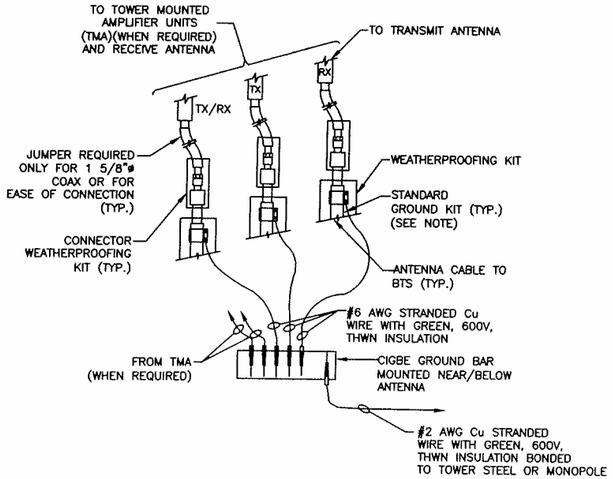
ELEVATION & CONSTRUCTION DETAILS

DEWBERRY NO.	DRAWING NUMBER	REV
50019239/50044311	A02	2

GROUNDING NOTES:

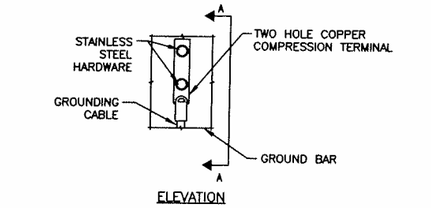
1. THE CONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM AND LIGHTNING PROTECTION SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ). THE SITE-SPECIFIC (UL, LPI, OR NFPA) LIGHTING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE CONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE CONTRACTOR FOR RESOLUTION.
2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS. ALL AVAILABLE GROUNDING ELECTRODES SHALL BE CONNECTED TOGETHER IN ACCORDANCE WITH THE NEC.
3. THE CONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR GROUND ELECTRODE SYSTEMS. USE OF OTHER METHODS MUST BE PRE-APPROVED BY CONTRACTOR IN WRITING.
4. THE CONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS ON TOWER SITES AND 10 OHMS OR LESS ON ROOFTOP SITES. WHEN ADDING ELECTRODES, CONTRACTOR SHALL MAINTAIN A MINIMUM DISTANCE BETWEEN THE ADDED ELECTRODE AND ANY OTHER EXISTING ELECTRODE EQUAL TO THE BURIED LENGTH OF THE ROD. IDEALLY, CONTRACTOR SHALL STRIVE TO KEEP THE SEPARATION DISTANCE EQUAL TO TWICE THE BURIED LENGTH OF THE RODS.
5. THE CONTRACTOR IS RESPONSIBLE FOR PROPERLY SEQUENCING GROUNDING AND UNDERGROUND CONDUIT INSTALLATION AS TO PREVENT ANY LOSS OF CONTINUITY IN THE GROUNDING SYSTEM OR DAMAGE TO THE CONDUIT.
6. METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 AWG COPPER WIRE AND UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
7. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO TRANSMISSION EQUIPMENT.
8. CONNECTIONS TO THE GROUND BUS SHALL NOT BE DOUBLED UP OR STACKED. BACK-TO-BACK CONNECTIONS ON OPPOSITE SIDES OF THE GROUND BUS ARE PERMITTED.
9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
10. USE OF 90° BENDS IN THE PROTECTION GROUNDING CONDUCTORS SHALL BE AVOIDED WHEN 45° BENDS CAN BE ADEQUATELY SUPPORTED. IN ALL CASES, BENDS SHALL BE MADE WITH A MINIMUM BEND RADIUS OF 8 INCHES.
11. EACH INTERIOR TRANSMISSION CABINET FRAME/PLINTH SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH 6 AWG STRANDED, GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRE UNLESS NOTED OTHERWISE IN THE DETAILS. EACH OUTDOOR CABINET FRAME/PLINTH SHALL BE DIRECTLY CONNECTED TO THE BURIED GROUND RING WITH 2 AWG SOLID TIN-PLATED COPPER WIRE UNLESS NOTED OTHERWISE IN THE DETAILS.
12. ALL EXTERIOR GROUND CONDUCTORS BETWEEN EQUIPMENT/GROUND BARS AND THE GROUND RING, SHALL BE 2 AWG SOLID TIN-PLATED COPPER UNLESS OTHERWISE INDICATED.
13. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE. CONNECTIONS TO ABOVE GRADE UNITS SHALL BE MADE WITH EXOTHERMIC WELDS WHERE PRACTICAL OR WITH 2 HOLE MECHANICAL TYPE BRASS CONNECTORS WITH STAINLESS STEEL HARDWARE, INCLUDING SET SCREWS. HIGH PRESSURE CRIMP CONNECTORS MAY ONLY BE USED WITH WRITTEN PERMISSION FROM SAI COMMUNICATIONS MARKET REPRESENTATIVE.
14. EXOTHERMIC WELDS SHALL BE PERMITTED ON TOWERS ONLY WITH THE EXPRESS APPROVAL OF THE TOWER MANUFACTURER OR THE CONTRACTORS STRUCTURAL ENGINEER.
15. ALL WIRE TO WIRE GROUND CONNECTIONS TO THE INTERIOR GROUND RING SHALL BE FORMED USING HIGH PRESS CRIMPS OR SPLIT BOLT CONNECTORS WHERE INDICATED IN THE DETAILS.
16. ON ROOFTOP SITES WHERE EXOTHERMIC WELDS ARE A FIRE HAZARD COPPER COMPRESSION CAP CONNECTORS MAY BE USED FOR WIRE TO WIRE CONNECTORS. 2 HOLE MECHANICAL TYPE BRASS CONNECTORS WITH STAINLESS STEEL HARDWARE, INCLUDING SET SCREWS SHALL BE USED FOR CONNECTION TO ALL ROOFTOP TRANSMISSION EQUIPMENT AND STRUCTURAL STEEL.
17. COAX BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR USING TWO-HOLE MECHANICAL TYPE BRASS CONNECTORS AND STAINLESS STEEL HARDWARE.
18. APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
19. ALL EXTERIOR GROUND CONNECTIONS SHALL BE COATED WITH A CORROSION RESISTANT MATERIAL.
20. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
21. BOND ALL METALLIC OBJECTS WITHIN 6 FT OF THE BURIED GROUND RING WITH 2 AWG SOLID TIN-PLATED COPPER GROUND CONDUCTOR. DURING EXCAVATION FOR NEW GROUND CONDUCTORS, IF EXISTING GROUND CONDUCTORS ARE ENCOUNTERED, BOND EXISTING GROUND CONDUCTORS TO NEW CONDUCTORS.
22. GROUND CONDUCTORS USED IN THE FACILITY GROUND AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS. WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON-METALLIC MATERIAL SUCH AS PVC PLASTIC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (E.G., NON-METALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT WITH LISTED BONDING FITTINGS.



NOTE:

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

CONNECTION OF GROUND WIRES TO GROUNDING BAR (CIGBE) — 1

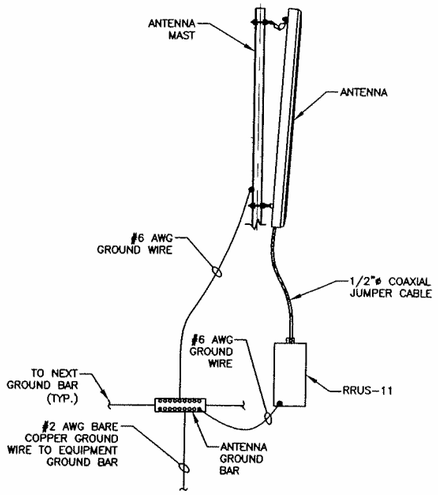


NOTES:

1. DOUBLING UP OR STACKING OF CONNECTIONS IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.

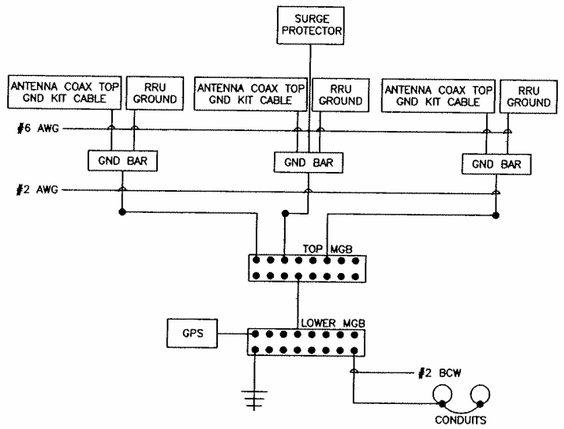
TYPICAL GROUND BAR MECHANICAL CONNECTION DETAIL — 2

SCALE: N.T.S.



TYPICAL ANTENNA GROUNDING DETAIL — 3

SCALE: N.T.S

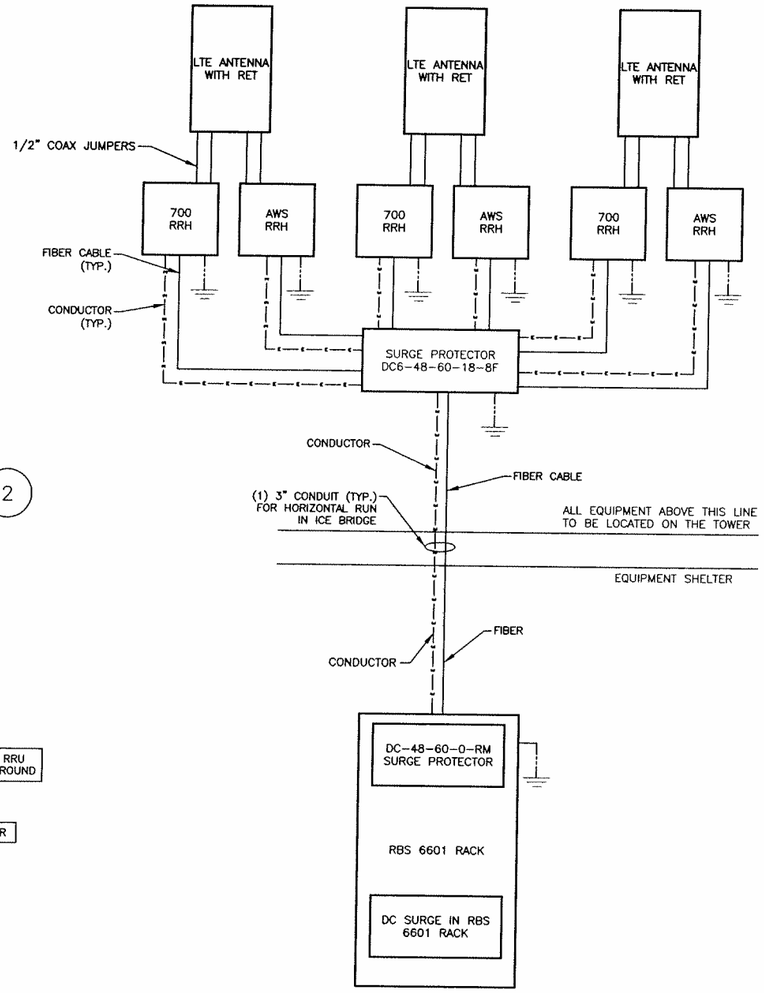


NOTES:

1. BOND ANTENNA GROUNDING KIT CABLE TO TOP CIGBE
2. BOND ANTENNA GROUNDING KIT CABLE TO BOTTOM CIGBE.

SCHEMATIC GROUNDING DIAGRAM — 4

SCALE: N.T.S.



NOTES:

1. CONTRACTOR TO CONFIRM ALL PARTS.
2. INSTALL ALL EQUIPMENT TO MANUFACTURER RECOMMENDATION.

PLUMBING DIAGRAM — 5

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GROUNDING DETAILS

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