

RECEIVED

OCT 24 2014

NEIGHBORHOOD DEVELOPMENT SERVICES

FA#10068631 CV305

LTE 2C



**Board of Architectural Review (BAR)
Certificate of Appropriateness**

Please Return To: City of Charlottesville
Department of Neighborhood Development Services
P.O. Box 911, City Hall
Charlottesville, Virginia 22902
Telephone (434) 970-3130 Fax (434) 970-3359

Please submit ten (10) copies of application form and all attachments.
For a new construction project, please include \$375 application fee. For all other projects requiring BAR approval, please include \$125 application fee. For projects that require only administrative approval, please include \$100 administrative fee. Make checks payable to the City of Charlottesville.
The BAR meets the third Tuesday of the month.
Deadline for submittals is Tuesday 3 weeks prior to next BAR meeting by 4 p.m.

Owner Name AT&T MOBILITY Applicant Name Joan Stewart (Velocitel)
Project Name/Description CV305 LTE/2C Antenna Upgrade Parcel Number 530096000
Property Address 500 Court Square

Applicant Information

Address: 4144 Innslake Dr.
Glen Allen, VA 23060
Email: j.stewart@velocitel.com
Phone: (W) 757-573-3129 (H) _____
FAX: 804-217-8665

Property Owner Information (if not applicant)

Address: 500 Court Square Associates
500 Court Sq., Cville, VA 22902
Email: dwarner@broadcastservicesinc.com
Phone: (W) 0: 317-895-9050 x 204
FAX: _____

Do you intend to apply for Federal or State Tax Credits for this project? n/a

Signature of Applicant

I hereby attest that the information I have provided is, to the best of my knowledge, correct. (Signature also denotes commitment to pay invoice for required mail notices.)

Joan Stewart 10/9/14
Signature Date

Joan Stewart 10/9/14
Print Name Date

Property Owner Permission (if not applicant)

I have read this application and hereby give my consent to its submission.

D.G. Brooks 10-6-14
Signature Date

500 Court Square Assoc., Inc. by Douglas G. Brooks, Sr., its
Managing Agent 10/6/2014
Print Name Date

Description of Proposed Work (attach separate narrative if necessary):
remove existing antennas and replace with new antennas

List All Attachments (see reverse side for submittal requirements):
site plan drawings and structural analysis provided

For Office Use Only
Received by: S. Barnow
Fee paid: \$100.00 Cash/Ck. # 5030
Date Received: 10/24/2014
P14-07169
Approved/Disapproved by: M. Seal
Date: Oct. 27, 2014
Conditions of approval: _____



4144 Innslake Drive
Glen Allen, VA 23060

October 23, 2014

Ms. Mary Joy Scala
Preservation and Design Planner
City of Charlottesville, Dept of NDS
City Hall – 610 East Market Street
PO Box 911
Charlottesville, VA 22902

RE: AT&T Site No. CV305 – 500 Court Square Building

Dear Ms. Scala:

AT&T is Federally Licensed and currently operating its equipment on the aforementioned rooftop facility in Charlottesville. In an effort to advance technology and provide its customers with the best wireless coverage in the area, AT&T is tasked with upgrading and improving its services in this vital business area of the City.

The proposed modification project will consist of removing three (3) SBNH-1D6565B (one per sector) and adding three (3) SBNHH-1D65B antennas (one per sector) to the currently located rooftop sled mounts. The visual impact will be negligible as there are currently 3 existing antennas located on each sled.

(Proposed) antenna:

SBNHH-1D65B
Dimensions
Depth 181.0 mm | 7.1 in
Length 1847.00 mm | 72.72 in
Width 301.00 mm | 11.85 in
Net Weight 23.00 kg | 50.71 lb.

(Current) Antenna:

SBNH-1D6565B
Dimensions
Depth 181.0 mm | 7.1 in
Length 1847.0 mm | 72.7 in
Width 301.0 mm | 11.9 in
Net Weight 21.5 kg | 47.4 lb.

As you can see there is very little difference between current and proposed antenna. The new antenna is 3.31 lbs. heavier. Additionally, the antenna cut sheets, revised construction drawings dated 09/10/14 and the PE Structural Letter" dated 09/10/14 have been provided to more specifically describe the projects objectives.

Please do not hesitate to contact me with any questions and/or concerns.

Thank you,

Joan Stewart

Joan Stewart
Sr. Site Acquisition Specialist
(503) 539-4449
j.stewart@velocitel.com



CommScope—Private and Confidential. Preliminary specifications are for internal use only.

Andrew Solutions
SBNHH-1D65B

DualPol® Tri-band Teletilt® Smartbeam Antenna, 1 x 698-896 and 2 x 1710-2360 MHz, 65° horizontal beamwidth, RET compatible

- Three DualPol® antennas under one radome
- Interleaved dipole technology providing for attractive, low wind load mechanical package

Electrical Specifications

Frequency Band, MHz	698-806	806-896	1710-1880	1850-1990	1920-2180	2300-2360
Gain, dBi	14.9	15.2	17.4	17.7	17.9	18.0
Beamwidth, Horizontal, degrees	68	68	66	65	65	63
Beamwidth, Vertical, degrees	11.7	11.1	5.4	5.1	4.8	4.5
Beam Tilt, degrees	0-14	0-14	0-7	0-7	0-7	0-7
USLS, typical, dB	15	15	14	14	14	14
Front-to-Back Ratio at 180°, dB	30	30	30	30	30	30
CPR at Boresight, dB	20	20	20	20	18	18
CPR at Sector, dB	10	10	10	10	10	8
Isolation, dB	28	28	29	29	29	29
Isolation, Intersystem, dB	30	30	30	30	30	30
VSWR Return Loss, dB	1.5:1 14.0	1.5:1 14.0	1.5:1 14.0	1.5:1 14.0	1.5:1 14.0	1.5:1 14.0
PIM, 3rd Order, 2 x 20 W, dBc	-150	-150	-150	-150	-150	-150
Input Power per Port, maximum, watts	400	400	350	350	350	250
Polarization	±45°	±45°	±45°	±45°	±45°	±45°
Impedance	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm
Lightning Protection	dc Ground	dc Ground	dc Ground	dc Ground	dc Ground	dc Ground

Mechanical Specifications

Color Radome Material	Light gray Fiberglass, UV resistant
Connector Interface Location Quantity	7-16 DIN Female Bottom 6
Wind Loading, maximum	617.7 N @ 150 km/h 138.9 lbf @ 150 km/h
Wind Speed, maximum	241.0 km/h 149.8 mph

Dimensions

Depth	181.0 mm 7.1 in
Length	1847.00 mm 72.72 in
Width	301.00 mm 11.85 in
Net Weight	23.00 kg 50.71 lb

Regulatory Compliance/Certifications

Agency	Classification
RoHS 2002/95/EC	Compliant by Exemption
China RoHS SJ/T 11364-2006	Above Maximum Concentration Value (MCV)
ISO 9001:2008	Designed, manufactured and/or distributed under this quality management system



Product Specifications

COMMSCOPE®

SBNHH-1D65B



Included Products

DB380-5083 — Standard two point mounting system to secure BSA panels to pipes with an OD measuring 2.4-4.5" (60-115mm). Includes locking downtilt brackets and heavy guage pipe brackets to provide superior windload performance.

Product Specifications



SBNH-1D6565B

DualPol® Dual Band Antenna, 698–896 MHz and 1710–2180 MHz, 65° horizontal beamwidth, RET compatible variable electrical tilt



- Two DualPol® antennas under one radome
- Interleaved dipole technology providing for attractive, low wind load mechanical package
- Each antenna is independently capable of field adjustable electrical tilt
- Internal next generation actuator eliminates field installation and defines new standards for reliability
- Fully compatible with Andrew Teletilt® remote control system

CHARACTERISTICS

General Specifications

Antenna Type	SmartBeam®
Brand	DualPol® SmartBeam® Teletilt®
Operating Frequency Band	1710 – 2180 MHz 698 – 896 MHz

Electrical Specifications

Frequency Band, MHz	698–806	806–896	1710–1880	1850–1990	1920–2180
Beamwidth, Horizontal, degrees	70	67	59	57	65
Beamwidth, Horizontal Tolerance, degrees	±3	±8	±2	±4	±6
Gain, dBd	12.9	13.1	16.3	16.1	15.7
Gain, dBi	15.0	15.2	18.4	18.2	17.8
Beamwidth, Vertical, degrees	12.3	10.8	5.5	5.1	4.8
Beam Tilt, degrees	0–10	0–10	0–6	0–6	0–6
Upper Sidelobe Suppression (USLS), typical, dB	15	15	15	15	15
Front-to-Back Ratio at 180°, dB	25	27	34	35	32
Front-to-Back Total Power at 180° ± 20°, dB	20	20	28	28	25
Cross Polarization Ratio (CPR) at Boresight, dB	24	18	25	25	22
Cross Polarization Ratio (CPR) at Sector, dB	10	8	10	10	8
Isolation, dB	30	30	30	30	30
Isolation, Intersystem, dB	30	30	30	30	30
VSWR Return Loss, db	1.5:1 14.0	1.5:1 14.0	1.5:1 14.0	1.5:1 14.0	1.5:1 14.0
Intermodulation Products, 3rd Order, 2 x 20 W, dBc	-150	-150	-150	-150	-150
Input Power, maximum, watts	400	400	300	300	300
Polarization	±45°	±45°	±45°	±45°	±45°
Impedance, ohms	50	50	50	50	50
Lightning Protection	dc Ground	dc Ground	dc Ground	dc Ground	dc Ground

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page 1 of 5
4/30/2011

Product Specifications

SBNH-1D6565B



Mechanical Specifications

Color	Light gray
Connector Interface	7-16 DIN Female
Connector Location	Bottom
Connector Quantity	4
Radome Material	Fiberglass, UV resistant
Wind Loading, maximum	617.7 N @ 150 km/h 138.9 lbf @ 150 km/h
Wind Speed, maximum	241.0 km/h 149.8 mph

Dimensions

Depth	181.0 mm 7.1 in
Length	1847.0 mm 72.7 in
Width	301.0 mm 11.9 in
Net Weight	21.5 kg 47.4 lb

Remote Electrical Tilt (RET) Information

Adjustment Time, full range, maximum	30 s
Annual Failure Rate, maximum	0.01%
Power Consumption, during motor movements, maximum	11.0 W
Power Consumption, idle state, maximum	2.0 W
Power Input	10–30 V
Protocol	3GPP/AISG 2.0 Multi-RET
RET Interface	RS-485 Male (input port, 1) RS-485 Female (daisy chain port ,1)
RET System	Teletilt®

Regulatory Compliance/Certifications

Agency	Classification
RoHS 2002/95/EC	Compliant by Exemption
China RoHS SJ/T 11364-2006	Above Maximum Concentration Value (MCV)
ISO 9001:2008	Designed, manufactured and/or distributed under this quality management system



INCLUDED PRODUCTS

www.commscope.com/andrew

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page 2 of 5
4/30/2011

Product Specifications

SBNH-1D6565B



DB380

Pipe Mounting Kit for 2.4 - 4.5 in (60 - 115 mm) OD round members



DB5083

Downtilt Mounting Kit for 2.4 - 4.5 in (60 - 115 mm) OD round members

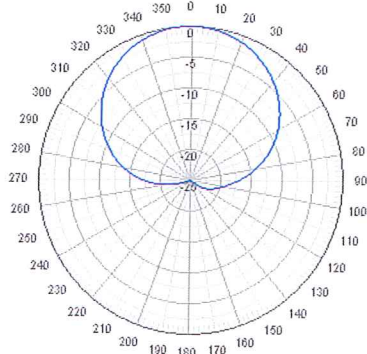
Product Specifications

SBNH-1D6565B

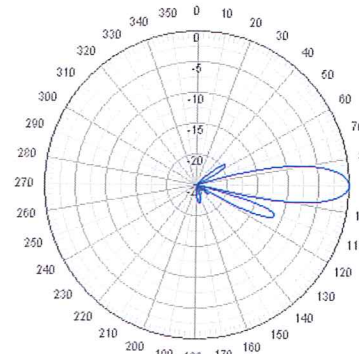


Horizontal Pattern

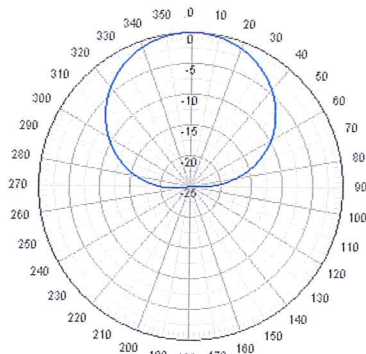
Vertical Pattern



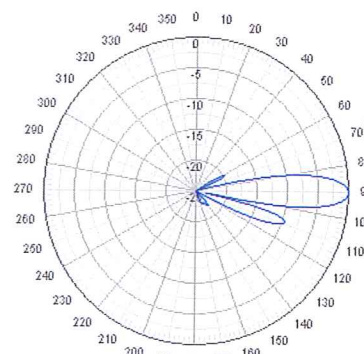
Freq: 725 MHz, Tilt: 0°



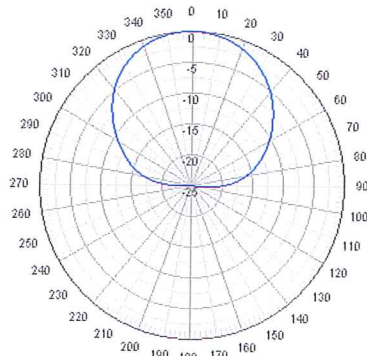
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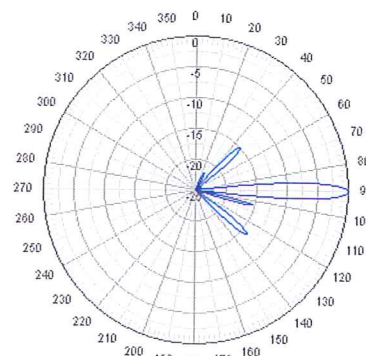
Freq: 850 MHz, Tilt: 0°



Freq: 850 MHz, Tilt: 0°



Freq: 1730 MHz, Tilt: 0°



Freq: 1730 MHz, Tilt: 0°

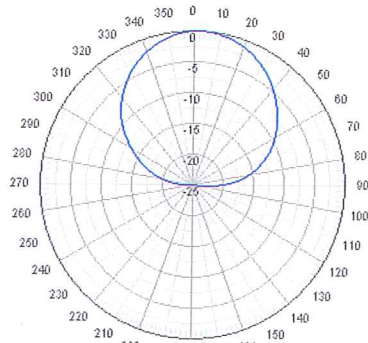
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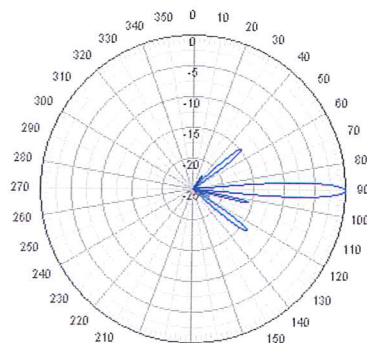
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Product Specifications

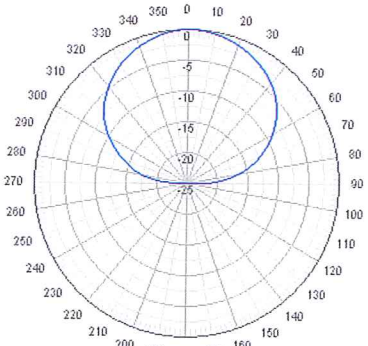
SBNH-1D6565B



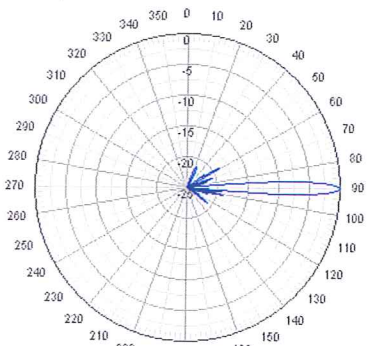
Freq: 1920 MHz, Tilt: 0°



Freq: 1920 MHz, Tilt: 0°



Freq: 2130 MHz, Tilt: 0°



Freq: 2130 MHz, Tilt: 0°

September 10, 2014

Mr. Xiao He
Velocitel, Inc.
8000 Regency Parkway, Suite 430
Cary, NC 27518
(919) 380-0062



B+T Group
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630
btwo@btgrp.com

Subject: Structural Letter

Carrier Designation: **Site Number:** 10068631
Site Name: Court Square

Engineering Firm Designation: **B+T Group Project Number:** 92167.001.02a

Site Data: 500 Court Square, Charlottesville, VA, Charlottesville City County
Latitude 38.03194°, Longitude -78.47806°
Rooftop

Dear Mr. He,

B+T Group is pleased to submit this "Structural Letter" to determine the structural integrity of the above mentioned roof top supported telecommunications site.

The purpose of the analysis is to determine acceptability of the building to sufficiently support the telecommunications equipment presented in this report. Based on our analysis we have determined the suitability for the structure, under the following load case, to be:

Existing + Proposed Equipment

Sufficient Capacity

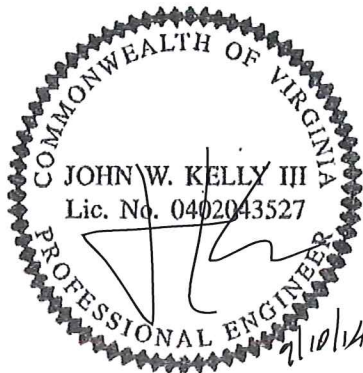
Note: See Table 1 and Table 2 for the proposed and existing loading, respectively.

The analysis has been performed in accordance with the ASCE 7 standard and the 2009 VA Uniform Statewide Building Code (2009 IBC) based upon a wind speed of 90 mph 3-second gust.

All equipment proposed in this report shall be installed in accordance with the drawings for the determined available structural capacity to be effective.

We at B+T Group appreciate the opportunity of providing our continuing professional services to you and Velocitel, Inc. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully submitted by:
B+T Engineering, Inc.



Karishma Caiado, E.I.
Project Engineer

John W. Kelly, P.E.
Vice President
COA# 0407 005047 Expires: 12/31/2014

TABLE OF CONTENTS

1) INTRODUCTION

2) ANALYSIS CRITERIA

Table 1 - Proposed Antenna and Cable Information

Table 2 - Existing and Reserved Antenna and Cable Information

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

3.1) Analysis Method

3.2) Assumptions

4) ANALYSIS RESULTS

4.1) Recommendations

1) INTRODUCTION

The proposed telecommunications equipment will be located on the rooftop of the building located at 500 Court Square, Charlottesville, VA, Charlottesville City County. There are existing telecommunications antennas mounted on existing rooftop sled at three different sectors. An antenna per sector is to be replaced.

2) ANALYSIS CRITERIA

The structural analysis was performed for this structure in accordance with the 2009 VA Uniform Statewide Building Code (2009 IBC) and the ASCE 7 Design Standard. The TIA-222-G applies to telecommunications towers. Although telecommunications equipment is present, this structure is a building and is more appropriately assessed with the ASCE 7 Standard. The design wind speed for this location is a 90 mph 3-second gust.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size	Note
130	3	Andrew	SBNHH-1D65B	--	--	--
	3	Ericsson	RRUS-12 w/A2 Module			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size	Note	
130	3	Andrew	SBNH-1D6565B	9 2 1	1 5/8" DC Cable Fiber	2	
	6	Andrew	SBNH-1D6565B			1	1
	6	--	Amplink 1900e-F				
	3	Ericsson	RRUS-11				
	3	Raycap	DC2-48-60-0-9E				
	1	Raycap	FC12-PC6-10E				

Note:

1. Existing to remain
2. Existing to be removed

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
Construction Documents	AT&T	Date: 04/07/2014	Velocitel
Existing Loading	RFDS	Date: 02/28/2014	Velocitel
Proposed Loading			

3.1) Analysis Method

This building is a substantial structure and currently supports rooftop telecommunications equipment. A total of (3) existing antennas and associated equipment will be removed and (3) new antennas and associated equipment will be installed. The proposed antennas and feed lines weigh approximately 400 lbs. total and have a total area exposed to wind of approximately 10 square ft. per sector. This amount of additional weight and area is insignificant compared to the overall structural demand of the

building design. It is our assessment that the building structure will safely support the proposed equipment.

3.2) Assumptions

- 1) The structure was built in accordance with the designer's specifications.
- 2) The structure has been maintained and is free of damage.
- 3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
- 4) Existing loading was assumed based on final proposed loading.
- 5) Mount areas and weights are assumed based on photographs, drawings or mapping data provided.

This analysis may be affected if any assumptions are not valid or have been made in error. B+T Group should be notified to determine the effect on the structural integrity of the structure.

4) ANALYSIS RESULTS

4.1) Recommendations

- 1) The antennas shall be installed on the existing top mount of the building in accordance with the installation drawings.
- 2) Minimum Ballast required per sled shall not be less than 1300 lbs.

Antenna System Upgrade Project



AT&T MOBILITY
SITE NUMBER: CV305

SITE NAME: COURT SQUARE - FA# 10068631
TOWER OWNER: 500 COURT SQUARE ASSOCIATION

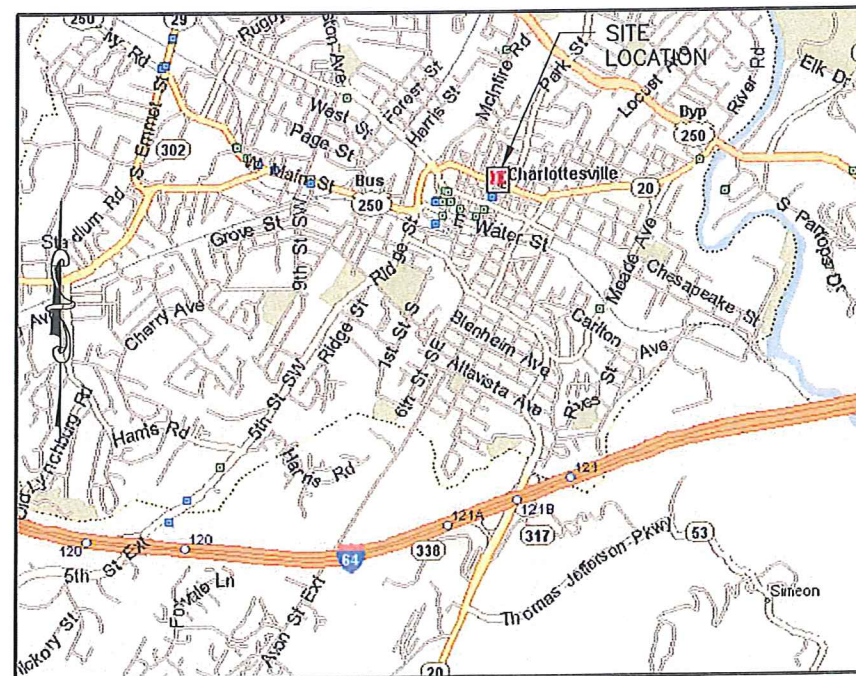
- LTE/2C
- REPLACEMENT OF LTE ANTENNAS
- IMPROVE QUALITY OF SERVICE

SHEET	DRAWING INDEX	REV	DATE
T1	TITLE SHEET	2	09/10/14
C1	GENERAL NOTES	2	09/10/14
C2.1	SITE PLAN	2	09/10/14
C2.2	ENLARGED PLATFORM LAYOUT	2	09/10/14
C3	ELEVATION VIEW & RF DETAILS	2	09/10/14
C4	ANTENNAS/COAX CABLE SCHEMATIC	2	09/10/14
E1	GROUNDING & RF NOTES	2	09/10/14
E2	GROUNDING DETAILS & COLOR CODE CHART	2	09/10/14

DIRECTIONS:
FROM AT&T OFFICE, START OUT GOING SOUTHWEST ON COX RD TOWARD N PARK DR. TAKE THE 1ST RIGHT ONTO NUCKOLS RD. MERGE ONTO I-295 S TOWARD I-64 W. MERGE ONTO I-64 W VIA EXIT 53A TOWARD CHARLOTTESVILLE. TAKE THE US-250 EXIT, EXIT 124, TOWARD CHARLOTTESVILLE/SHADWELL. TURN RIGHT ONTO RICHMOND RD/US-250 W. TURN LEFT ONTO RICHMOND RD/US-240 W. TURN LEFT ONTO E HIGH ST/US-250 BUS W/VA-20. TURN RIGHT ONTO E HIGH STREET. TAKE THE 3RD LEFT ONTO PARK ST. SITE IS ON LEFT.

SITE INFORMATION	
SCOPE OF WORK:	REMOVE LTE ANTENNAS AND REPLACE WITH NEW LTE ANTENNAS. INSTALL RRUS-12+A2 MODULES.
SITE ADDRESS:	500 COURT SQUARE CHARLOTTESVILLE, VA 22902
OWNER:	500 COURT SQUARE ASSOCIATION
CONTACT PERSON:	LEASING
APPLICANT:	AT&T MOBILITY 4801 COX ROAD, SUITE 300 GLEN ALLEN, VA 23060
LATITUDE (NAD 83):	38° 01' 54.98" (38.0319)
LONGITUDE (NAD 83):	-78° 28' 41.02" (-78.4781)
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY
JURISDICTION:	CITY OF CHARLOTTESVILLE

VICINITY MAP



NOT TO SCALE

REVIEWED BY:

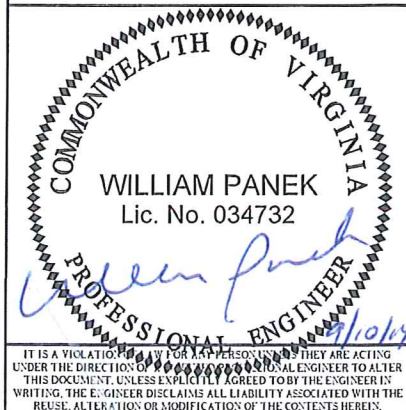
AT&T DATE

VELOCITEL DATE

APPROVED BY:

OWNER DATE

MUNICIPAL DATE



4164 INNSLAKE DRIVE, SUITE B
GLEN ALLEN, VA 23060
(804) 217-7088 (MAIN)
(757) 401-6453 (FAX)



LIBERTY PLAZA 1
4801 COX ROAD, SUITE 300
GLEN ALLEN, VA 23060

SITE NO. CV305
COURT SQUARE
FA# 10068631
500 COURT SQUARE
CHARLOTTESVILLE, VA 22902

NO	DATE	REVISIONS	BY	CHK	APP'D
2	09/10/14	RE-ISSUED FOR CONSTRUCTION	MM	HJ	-
C	09/05/14	RE-ISSUED FOR REVIEW	MM	HJ	-
1	05/20/14	REVISED PER COMMENTS	MM	HJ	-
D	05/09/14	ISSUED FOR CONSTRUCTION	MM	HJ	-
B	04/29/14	REVISED PER COMMENTS	MM	HJ	-

TITLE SHEET

SCALE:	DESIGNED:	JOB #	DRAWING NUMBER	REV
		10068631	T1	2

GENERAL NOTES:

- THE PROPOSED FACILITY WILL BE UNMANNED AND DOES NOT REQUIRE POTABLE WATER OR SEWER SERVICE AND IS NOT FOR HUMAN HABITAT. (NO HANDICAP ACCESS IS REQUIRED).
- OCCUPANCY IS LIMITED TO PERIODIC MAINTENANCE AND INSPECTION, APPROXIMATELY 2 TIMES PER MONTH, BY AT&T TECHNICIANS.
- NO NOISE, SMOKE, DUST, ODOR OR VIBRATIONS WILL RESULT FROM THIS PROPOSAL.
- OUTDOOR STORAGE AND SOLID WASTE CONTAINERS ARE NOT PROPOSED.
- ALL MATERIAL SHALL BE FURNISHED AND WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE AT&T SYSTEM GROUNDING STANDARD DATED JUNE 2011. "TECHNICAL SPECIFICATION FOR CONSTRUCTION OF GSM/GPRS WIRELESS SITES, "TECHNICAL SPECIFICATION FOR FACILITY GROUNDING". IN CASE OF A CONFLICT BETWEEN THE CONSTRUCTION SPECIFICATION AND THE DRAWINGS, THE DRAWINGS SHALL GOVERN.
- SUBCONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING ANY DAMAGE CAUSED BY THE CONSTRUCTION OPERATION.
- SUBCONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS REQUIRED FOR CONSTRUCTION.
- SUBCONTRACTOR SHALL REMOVE ALL TRASH AND DEBRIS FROM THE SITE ON A DAILY BASIS.
- INFORMATION SHOWN ON THESE DRAWINGS WAS OBTAINED FROM SITE VISITS AND DRAWINGS PROVIDED BY THE SITE OWNER. SUBCONTRACTOR SHALL NOTIFY AT&T OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
- NO WHITE STROBIC LIGHTS ARE PERMITTED. LIGHTING, IF REQUIRED, WILL MEET FAA STANDARDS AND REQUIREMENTS.
- ALL SIGNS SHALL BE FURNISHED AND INSTALLED AT ALL AT&T WIRELESS SERVICES SITES IN ACCORDANCE WITH SPECIFICATION AT&T SYSTEM GROUNDING DATED JUNE 2011.
- NO ADDITIONAL PARKING TO BE PROPOSED. EXISTING ACCESS AND PARKING TO BE USED.
- NO LANDSCAPING IS PROPOSED AT THIS SITE.

TYPICAL MINIMUM BEND RADII		
COAX DIAMETER	ANDREW	COMMSCOPE
1/2" SUPERFLEX	1.25"	1.25"
1/2"	5"	2"
7/8"	10"	5"
1 1/4"	15"	8"
1 5/8"	20"	15"

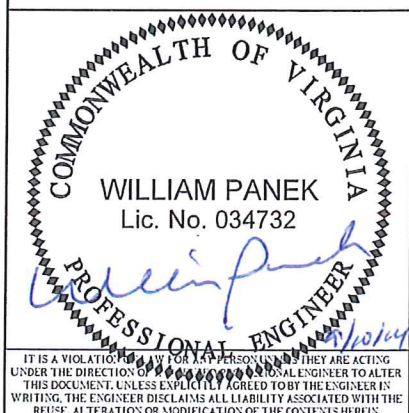
- ALL COAXIAL CABLE INSTALLATIONS TO FOLLOW MANUFACTURER'S INSTRUCTIONS.

GENERAL NOTES:

- FOR THE PURPOSE OF CONSTRUCTION DRAWINGS, THE FOLLOWING DEFINITIONS SHALL APPLY:
CONTRACTOR - CONTRACTOR
SUBCONTRACTOR - GENERAL CONTRACTOR (CONSTRUCTION)
OWNER - AT&T WIRELESS
- ALL SITE WORK SHALL BE COMPLETED AS INDICATED ON THE DRAWINGS AND PROJECT SPECIFICATIONS.
- DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.
- ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR 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.
- ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
- UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
- THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
- IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR AND SITE OWNER.
- THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.
- THE SUBCONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
- 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 ENGINEERS. EXTREME CAUTION SHOULD BE USED BY THE SUBCONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. SUBCONTRACTOR 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.
- 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, AS DIRECTED BY THE RESPONSIBLE ENGINEER, AND SUBJECT TO THE APPROVAL OF THE OWNER AND/OR LOCAL UTILITIES.
- 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.
- SUBCONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
- 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.
- THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
- THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE BTS EQUIPMENT.
- IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
- THE SUBCONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH OSHA REGULATIONS.
- SUBCONTRACTOR SHALL LEAVE PREMISES IN A CLEAN CONDITION.

STRUCTURAL STEEL NOTES:

- ALL STEEL WORK SHALL BE PAINTED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS AND IN ACCORDANCE WITH ASTM A36 UNLESS OTHERWISE NOTED.
- ALL WELDING SHALL BE PERFORMED USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC AND AWS D1.1. 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.
- BOLTED CONNECTIONS SHALL BE ASTM A325 BEARING TYPE (3/4"φ) CONNECTIONS AND SHALL HAVE MINIMUM OF TWO BOLTS UNLESS NOTED OTHERWISE.
- NON-STRUCTURAL CONNECTIONS FOR STEEL GRATING MAY USE 5/8" DIA. ASTM A 307 BOLTS UNLESS NOTED OTHERWISE.
- 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 ENGINEERING 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 METAL WORK SHALL BE GALVANIZED IN ACCORDANCE WITH SPECIFICATION ASTM A123. ALL SHOP WELDED MEMBERS SHALL BE GALVANIZED AFTER WELDING.



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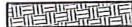

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FA# 10068631
500 COURT SQUARE
CHARLOTTESVILLE, VA 22902

2	09/10/14	RE-ISSUED FOR CONSTRUCTION	MM	HJ	-
C	09/05/14	RE-ISSUED FOR REVIEW	MM	HJ	-
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B	04/29/14	REVISED PER COMMENTS	MM	HJ	-
NO	DATE	REVISIONS	BY	CHK	APP'D
SCALE:		DESIGNED:	-		



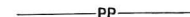
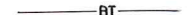

GENERAL NOTES

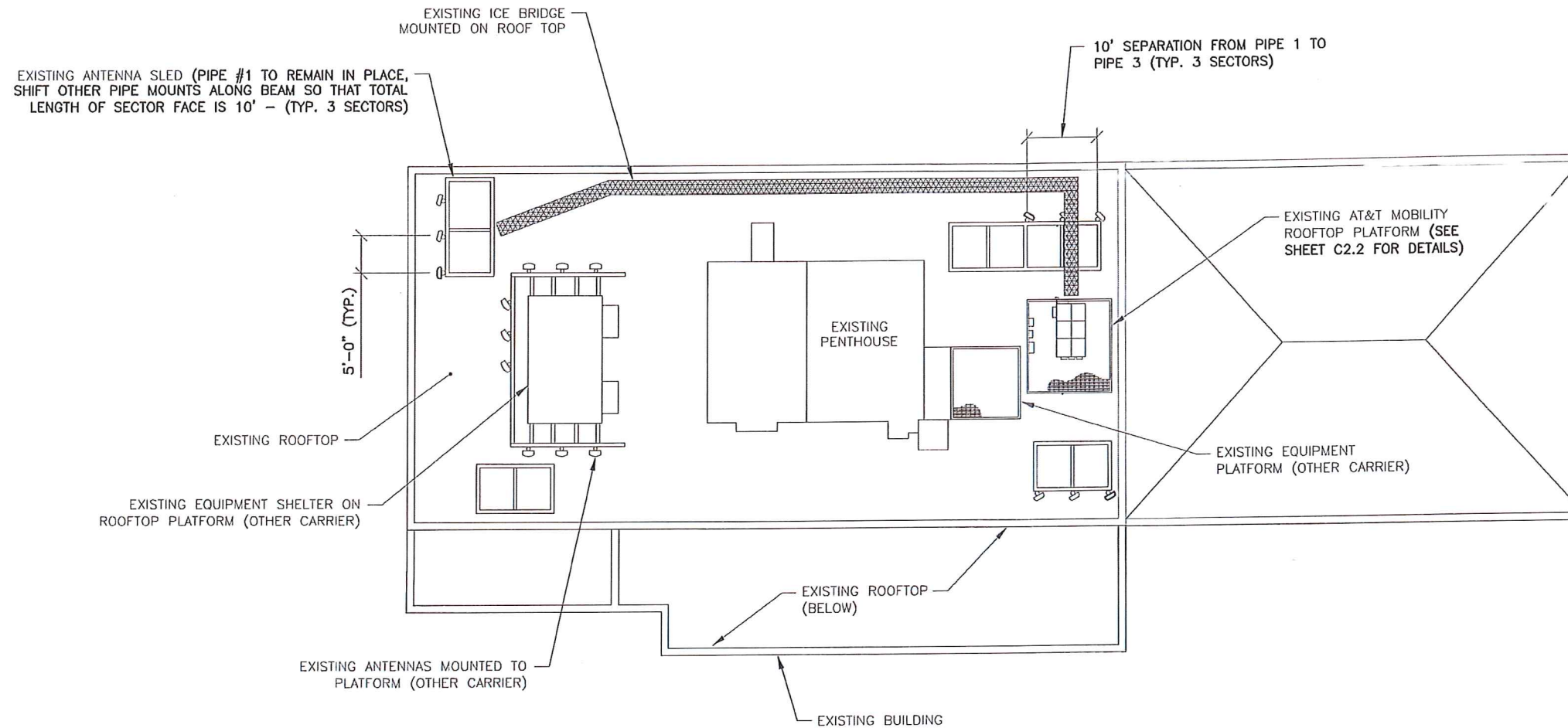
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SYMBOLS AND MATERIALS

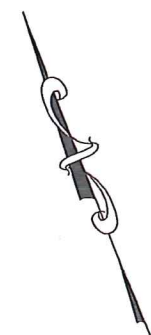
-  DETAIL REFERENCE
-  SECTIONS AND DETAILS
-  CONCRETE
-  EARTH
-  GRAVEL/STONE

SITE LEGEND

-  PROPERTY LINE
-  FENCE LINE
-  PDU POWER CABLE
-  BMS "T" CABLE
-  PDU ALARM CABLE



SITE PLAN
SCALE: 1"=20'



CALLED NORTH

COMMONWEALTH OF VIRGINIA
WILLIAM PANEK
Lic. No. 034732
PROFESSIONAL ENGINEER



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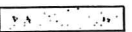


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SCALE:			DESIGNED:		



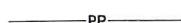


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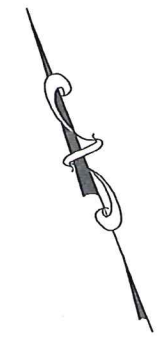
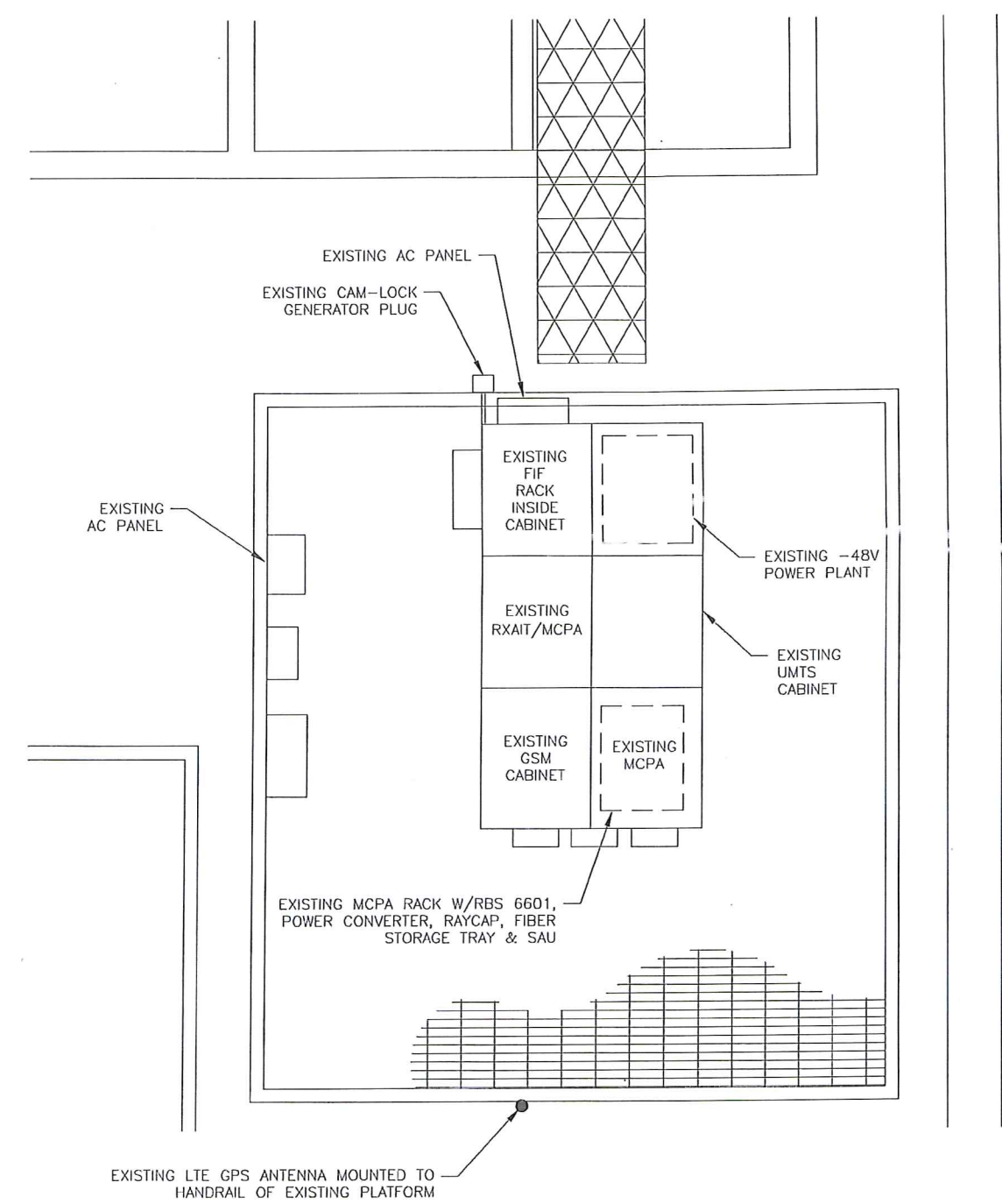
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SYMBOLS AND MATERIALS

-  DETAIL REFERENCE
-  SECTIONS AND DETAILS
-  CONCRETE
-  EARTH
-  GRAVEL/STONE

SITE LEGEND

-  PROPERTY LINE
-  FENCE LINE
-  PDU POWER CABLE
-  BIAS "T" CABLE
-  PDU ALARM CABLE



ENLARGED PLATFORM LAYOUT 1
SCALE: 1"=3'



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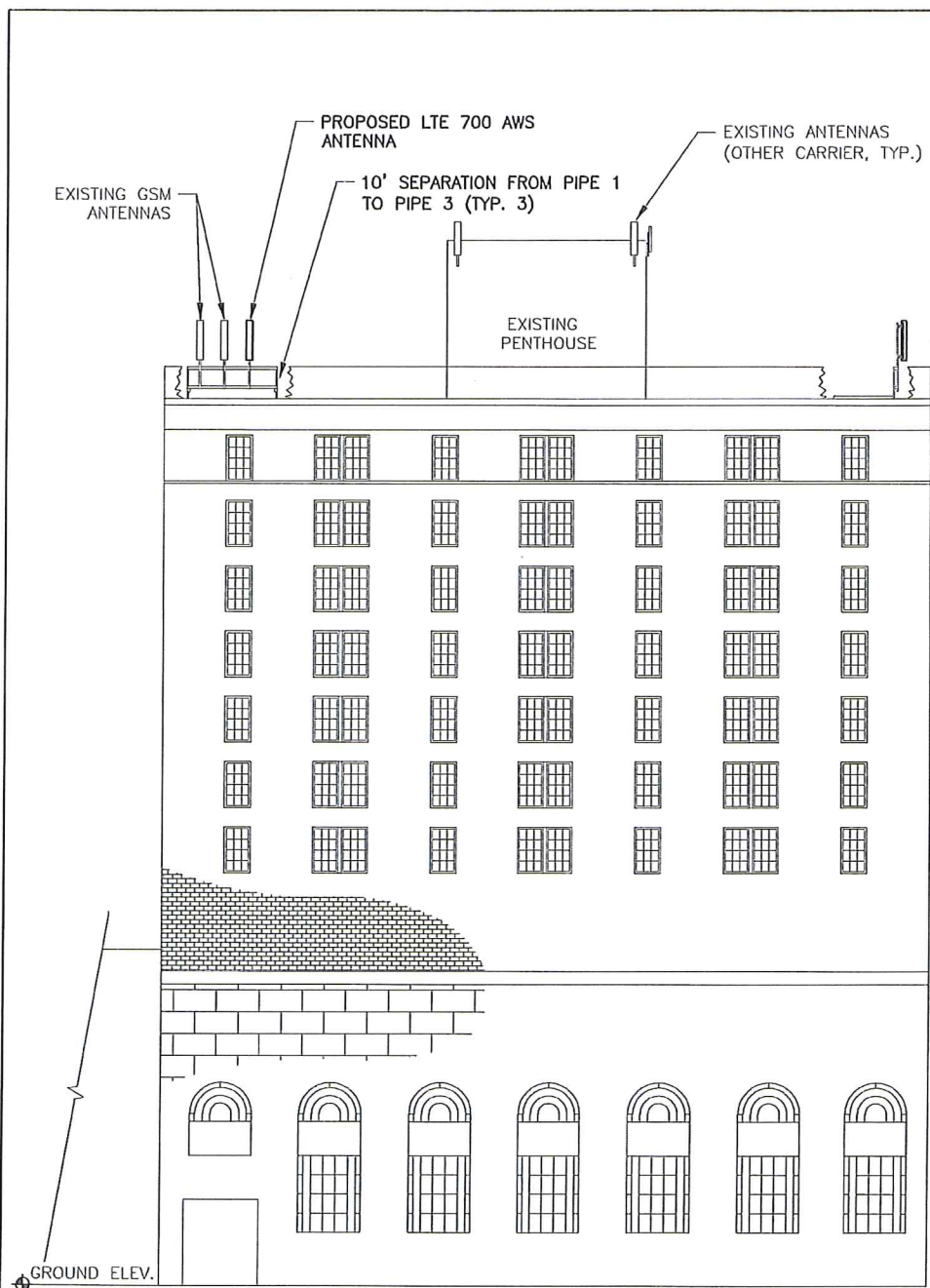
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ENLARGED PLATFORM LAYOUT		JOB #	DRAWING NUMBER	REV
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GROUND ELEV. ELEV. = + 0'-0" ±

A STRUCTURAL ANALYSIS OF THIS BUILDING WAS NOT PERFORMED BY VELOCITEL, INC. CONTRACTOR SHALL REFER TO STRUCTURAL ANALYSIS (IF APPLICABLE) AND COORDINATE INSTALLATION WITH THE SITE CONSTRUCTION MANAGER AND THE BUILDING OWNER.

PROPOSED BUILDING ELEVATION 1
NOT TO SCALE

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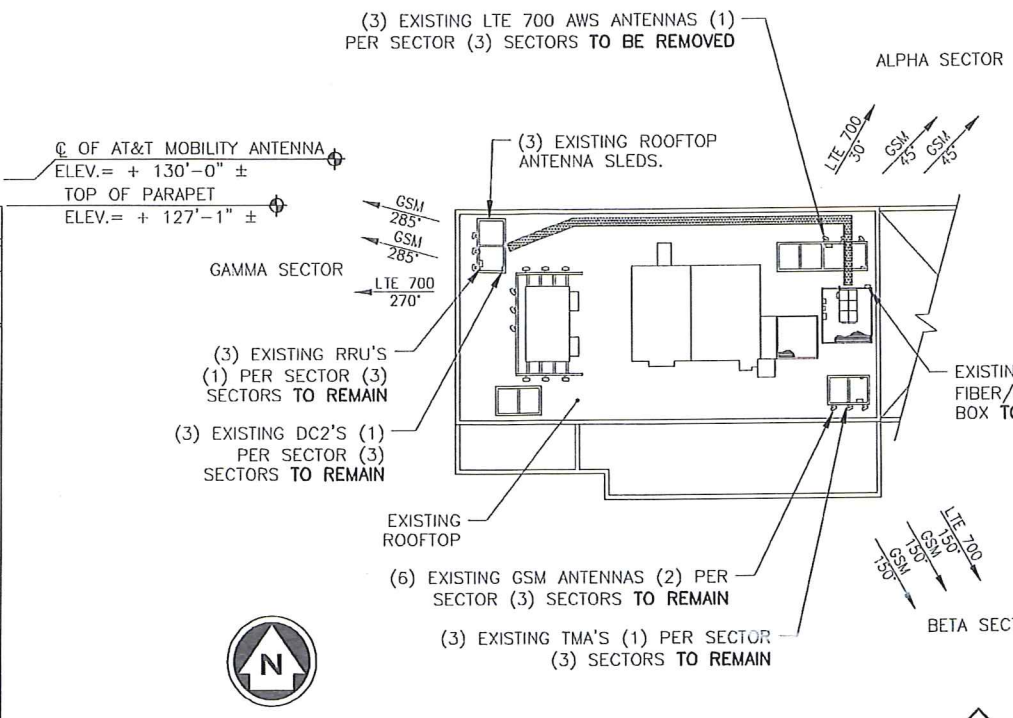
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ELEVATION VIEW & RF DETAILS

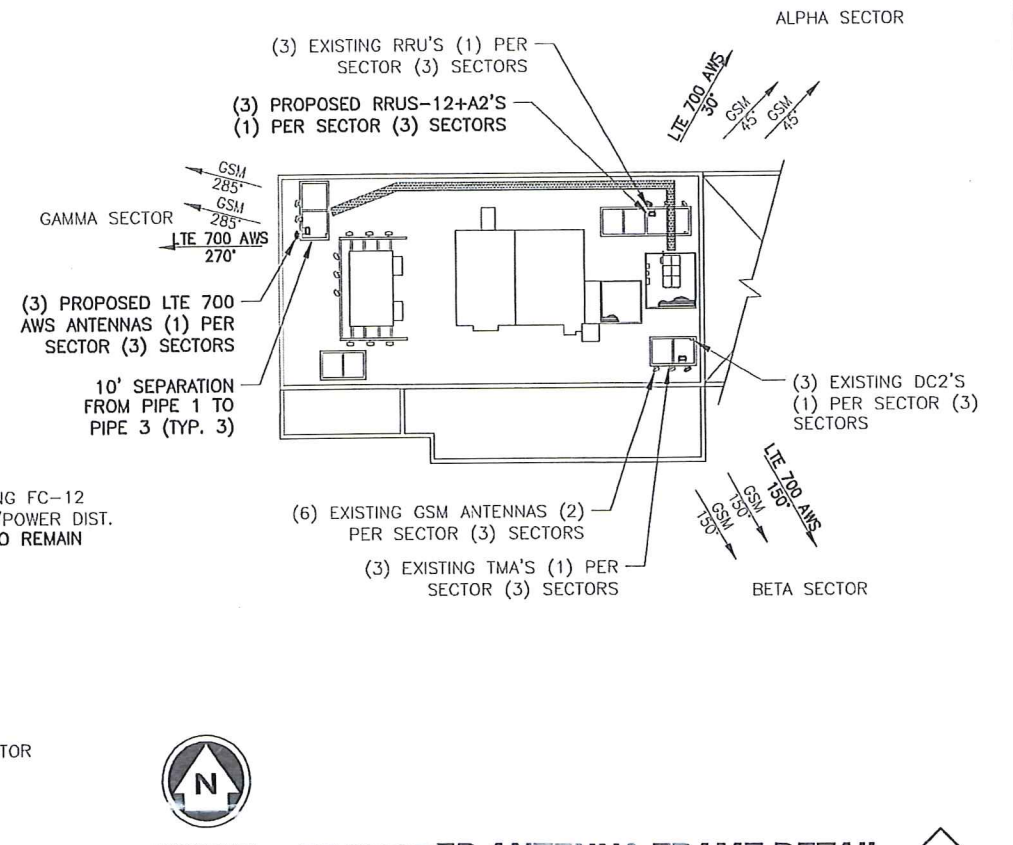
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APPROXIMATE TRUE NORTH

EXISTING ANTENNA FRAME DETAIL 2
NOT TO SCALE

NOTE: CONTRACTOR REQUIRED TO VERIFY AND DOCUMENT EXISTING AZIMUTHS AND DOWNTILTS



APPROXIMATE TRUE NORTH

PROPOSED ANTENNA FRAME DETAIL 3
NOT TO SCALE

NOTE: CONTRACTOR TO REFER TO FINAL RF CONFIGURATION PRIOR TO CONSTRUCTION

PROPOSED ANTENNA CONFIGURATION AND CABLE SCHEDULE
 SUPPLIED BY AT&T WIRELESS, FROM RF CONFIG DATED 7/25/2014, BY SHAUN PAUL

SECTOR	ANTENNA	ANTENNA HEIGHT	AZIMUTH	TMA/RRU	CABLE TYPE	CABLE LENGTH	DOWNTILTS
A	(1) SBNHH-1D65B (N)-LTE 700 AWS	130' ± AGL	30'	(1) RRUS-12+A2 (N) & (1) RRUS-11 (X)	(1) FIBER CABLE (X)	170' (X)	8',4'(E) 1'(M)
	(1) SBNH-1D8585B (X)-GSM		45'	(1) TMA2061F1V1-1 PCS1900 (X)			3'(E) 2'(M)
	(1) SBNH-1D8585B (X)-GSM		45'				3'(E) 2'(M)
B	(1) SBNHH-1D65B (N)-LTE 700 AWS	130' ± AGL	150'	(1) RRUS-12+A2 (N) & (1) RRUS-11 (X)	(2) DC CABLES (X)	170' (X)	8',4'(E) 0'(M)
	(1) SBNH-1D8585B (X)-GSM		150'	(1) TMA2061F1V1-1 PCS1900 (X)			3'(E) 1'(M)
	(1) SBNH-1D8585B (X)-GSM		150'				3'(E) 1'(M)
G	(1) SBNHH-1D65B (N)-LTE 700 AWS	130' ± AGL	270'	(1) RRUS-12+A2 (N) & (1) RRUS-11 (X)	(9) COAX (X)	170' (X)	8',4'(E) 0'(M)
	(1) SBNH-1D8585B (X)-GSM		285'	(1) TMA2061F1V1-1 PCS1900 (X)			3'(E) 2'(M)
	(1) SBNH-1D8585B (X)-GSM		285'				3'(E) 2'(M)

CONTRACTOR TO VERIFY RF DATA WITH AT&T WIRELESS CONSTRUCTION MANAGER AND/OR RF ENGINEER PRIOR TO INSTALLATION.

ANTENNA AND CABLE CONFIGURATION DETAIL 4
NOT TO SCALE

- (N) = NEW
- (X) = EXISTING
- (F) = FUTURE
- (E) = ELECTRICAL
- (M) = MECHANICAL

GENERAL NOTES

1. INSPECTIONS

- A. GENERAL: DURING AND UPON COMPLETION OF THE WORK, ARRANGE AND PAY ALL ASSOCIATED INSPECTIONS OF ALL ELECTRICAL WORK INSTALLED UNDER THIS CONTRACT IN ACCORDANCE WITH THE CONDITIONS OF THE CONTRACT. INSTALLATION SHALL COMPLY WITH APPLICABLE LAWS AND ORDINANCES, UTILITY COMPANY REQUIREMENTS, AND THE LATEST EDITION OF NEC, NFC, NEMA, OSHA, SBC, AND UL.
- B. INSPECTIONS REQUIRED: AS PER THE LAWS AND REGULATIONS OF THE LOCAL AND/OR STATE AGENCIES HAVING JURISDICTION AT THE PROJECT SITE.
- C. INSPECTION AGENCY: APPROVED BY THE LOCAL AND/OR STATE AGENCIES HAVING JURISDICTION AT THE PROJECT SITE.
- D. CERTIFICATES: SUBMIT ALL REQUIRED INSPECTION CERTIFICATES.

2. HANGERS AND SUPPORTS

- A. MATERIALS: ALL HANGERS, SUPPORTS, FASTENERS AND HARDWARE SHALL BE STAINLESS STEEL OR OF EQUIVALENT CORROSION RESISTANCE BY TREATMENT OR INHERENT PROPERTY, AND SHALL BE MANUFACTURED PRODUCTS DESIGNED FOR THE APPLICATION. PRODUCTS FOR OUTDOOR USE SHALL BE HOT DIP GALVANIZED.
- B. TYPES: HANGERS, STRAPS, RISER SUPPORTS, CLAMPS, U-CHANNEL, THREADED RODS, ETC. AS INDICATED OR REQUIRED.
- C. INSTALLATION: RIGIDLY SUPPORT AND SECURE ALL MATERIALS, RACEWAY AND EQUIPMENT TO BUILDING STRUCTURE USING HANGERS, SUPPORTS AND FASTENERS SUITABLE FOR THE USE. MATERIALS AND LOADS ENCOUNTERED. PROVIDE ALL NECESSARY HARDWARE. PROVIDE CONDUIT SUPPORTS AT MAXIMUM 5 FT. O.C.
- D. STRUCTURAL MEMBERS: DO NOT CUT, DRILL, OR WELD ANY STRUCTURAL MEMBER EXCEPT AS SPECIFICALLY APPROVED BY THE ENGINEER.
- E. MISCELLANEOUS SUPPORTS: PROVIDE ANY ADDITIONAL STRUCTURAL SUPPORT STEEL BRACKETS, ANGLES, FASTENERS AND HARDWARE AS REQUIRED TO ADEQUATELY SUPPORT ALL ELECTRICAL MATERIALS AND EQUIPMENT.
- F. ONE HOLE STRAPS SHALL NOT BE USED FOR CONDUITS LARGER THAN 3/4 INCH.

3. ENCLOSURES

- A. NEMA 3R

4. HOLES, SLEEVES AND OPENINGS

GENERAL: PROVIDE ALL HOLES, SLEEVES, AND OPENINGS REQUIRED FOR THE COMPLETION OF WORK AND RESTORE ALL SURFACES DAMAGED TO MATCH SURROUNDING SURFACES.

5. CUTTING AND PATCHING

- A. GENERAL: PROVIDE ALL CUTTING, DRILLING, FITTING AND PATCHING NECESSARY FOR ACCOMPLISHING THE WORK. THIS INCLUDES ANY AND ALL WORK NECESSARY TO: UNCOVER WORK TO PROVIDE FOR THE INSTALLATION OF ILL TIMED WORK, REMOVE AND REPLACE DEFECTIVE WORK AND WORK NOT CONFORMING TO THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.
- B. REPAIRS: REPAIR ANY AND ALL DAMAGE TO WORK OF OTHER TRADES CAUSED BY CUTTING AND PATCHING OPERATIONS, USING SKILLED MECHANICS OF THE TRADES INVOLVED.

6. RACEWAY SYSTEMS

- A. ALL ABOVE GRADE CONDUIT AND ALL CONDUIT ELBOWS SHALL BE RIGID GALVANIZED STEEL UNLESS NOTED OTHERWISE.

7. CONDUCTORS

USE 98% CONDUCTIVITY COPPER WITH TYPE XHHW-2 INSULATION, 600 VOLT, COLOR CODED. USE SOLID CONDUCTORS FOR WIRE UP TO AND INCLUDING NO. 8 AWG, STRANDED CONDUCTORS FOR WIRE LARGER THAN NO. 8. USE PRESSURE-TYPE INSULATED TWIST-ON CONNECTORS FOR NO. 10 AWG AND SMALLER, SOLDERLESS MECHANICAL TERMINAL LUGS FOR NO. 8 AWG AND LARGER.

8. GROUNDING SYSTEM

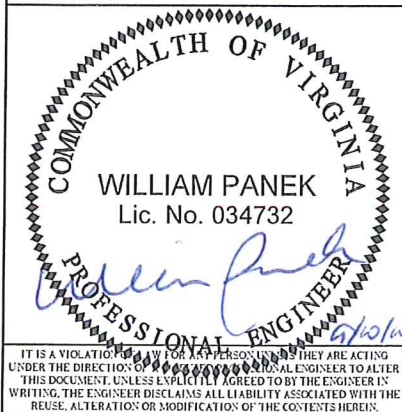
- A. INSTALLATION: INSTALL AS REQUIRED SPECIFICATION. CONTRACTORS REPRESENTATIVE WILL INSPECT EXOTHERMIC WELDS AND CONDUCT MEGGER TEST PRIOR TO BURIAL. MAXIMUM 5 OHMS RESISTANCE IS REQUIRED, WHEN MORE THAN (4) ADDITIONAL GROUNDS ARE REQUIRED, VERIFY OHM LEVEL PRIOR TO CONSTRUCTION. USE CLEAN SAND AND CLAYBACKFILL FOR BURIED GROUND CONDUCTORS

9. CHECKOUT, TESTING AND ADJUSTING

- A. CORRECTION/REPLACEMENT: AFTER TESTING BY CONTRACTOR, OWNER OR ENGINEER, CORRECT ANY DEFICIENCIES AND REPLACE MATERIALS AND EQUIPMENT SHOWN TO BE DEFECTIVE OR UNABLE TO PERFORM AT DESIGN OR RATED CAPACITY.
- B. POWER CONDUCTORS: CONTRACTOR SHALL CONDUCT A CONTINUITY & INSULATION TEST ON CONDUCTORS BETWEEN SERVICE DISCONNECT SWITCH & POWER CABINET.
- C. WHEN SITE POWER IS DERIVED FROM 3 PHASE SOURCE, LOAD READINGS WILL BE TAKEN AND RECORDED TO MAINTAIN A BALANCED LOAD AT THE PRIMARY SOURCE. RECORDS SHALL BE TURNED IN TO THE OWNER'S REPRESENTATIVE.

RF NOTES:

- 1. ACTUAL LENGTHS SHALL BE DETERMINED PER SITE CONDITION BY SUBCONTRACTOR.
- 2. THE DESIGN IS BASED ON RF DATA SHEETS, SIGNED AND APPROVED.
- 3. RADIO SIGNAL CABLE AND RACEWAY SHALL COMPLY WITH THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC, NFPA 70), CHAPTER 8.
- 4. ALL SPECIFIED MATERIAL FOR EACH LOCATION (E.G. OUTDOORS-OCCUPIED, INDOORS-UNOCCUPIED, PLENUMS, RISER SHAFTS, ETC.) SHALL BE APPROVED, LISTED, OR LABELED AS REQUIRED BY THE NEC.
- 5. RADIO SIGNAL CABLE SHALL BE SUPPORTED AT MINIMUM OF EVERY THREE (3) FEET EXCEPT INSIDE MONOPOLES OR LATTICE TOWERS WHERE CABLE AND CONNECTOR MANUFACTURER'S SUPPORT RECOMMENDATIONS SHALL BE FOLLOWED. RF JUMPERS SHALL BE SUPPORTED AT A MAXIMUM OF TWO (2) FEET INTERVALS AND WITHIN 18" OF CONNECTORS. MANUFACTURER RECOMMENDED CABLE SUPPORT ACCESSORIES SHALL BE USED.
- 6. THE OUTDOOR CABLE SUPPORT SYSTEM SHALL BE PROVIDED WITH AN ICE SHIELD TO SUPPORT AND PROTECT ANTENNA CABLE RUNS.
- 7. DRIP LOOPS SHALL BE REQUIRED ON ALL OUTSIDE CABLES. CABLES SHALL BE SLOPED AWAY FROM BUILDING OR OUTDOOR BTS CABINETS TO PREVENT WATER FROM ENTERING THROUGH THE COAXIAL CABLE PORT.
- 8. ALL FEEDER LINE AND JUMPER CONNECTORS SHALL BE 7/16 DIN CABLE CONNECTORS THAT MEET IP68 STANDARDS.
- 9. 7/16 DIN CONNECTORS REQUIRE NO ADDITIONAL WEATHER PROOFING IN INDOOR APPLICATIONS IF INSTALLED AND TORQUED PROPERLY. IN OUTDOOR APPLICATIONS, WEATHER PROOFING IS REQUIRED AND THE FOLLOWING PROCEDURE SHOULD BE FOLLOWED.
- 10. USING WEATHERPROOFING KIT APPROVED BY CABLE MANUFACTURER AND CONTRACTOR, START TAPE APPROXIMATELY 5 INCHES FROM THE CONNECTOR AND WRAP 2 INCHES TOWARD THE CONNECTOR, THEN REVERSE THE TAPE SO THAT THE STICKY SIDE IS UP. TAPE OVER THE CONNECTOR OR SURGE ARRESTOR UNTIL THREE (3) TO FOUR (4) INCHES BEYOND THE CONNECTOR AND REVERSE AGAIN WITH THE STICKY SIDE DOWN FOR ANOTHER INCH OR TWO. ADD THE BUTYL RUBBER AND FINISH WITH A FINAL LAYER OF TAPE.
- 11. ANTENNAS AND COAX SHALL BE PAINTED, WHEN REQUIRED, BY THE LANDLORD OR AUTHORITY HAVING JURISDICTION IN ACCORDANCE WITH ANTENNA MANUFACTURERS' SURFACES' PREPARATION AND PAINTING REQUIREMENTS.
- 12. CABLE SHIELDS, AND TOWER CONDUITS SHALL BE GROUNDED AT THE TOP OF THE TOWER, WITHIN 10 FEET OF THEIR CONNECTORS, AND AT THE BOTTOM OF THE TOWER ABOUT 6 INCHES BEFORE THEY TURN TOWARD THE FACILITY. THEY SHALL BE GROUNDED AT THE MIDPOINT OF THE TOWERS THAT ARE BETWEEN 100 FEET AND 200 FEET HIGH, AND AT INTERVALS OF 100 FEET OR LESS ON TOWERS THAT ARE HIGHER THAN 200 FEET.
- 13. APPROVED GROUNDING KITS, WHICH INCLUDE GROUNDING STRAPS, SHALL BE USED TO GROUND THE COAXIAL CABLE SHIELDS, AND CONDUITS. THE GROUND CONDUCTORS FOR THE KITS AT THE TOP OF THE TOWER, AND IN THE MIDDLE SECTION OF THE TOWER, ARE BONDED DIRECTLY TO GROUND BAR USING EXOTHERMIC OR COMPRESSION CONNECTIONS.
- 14. ALL RADIO SIGNAL CABLE SHALL BE LABELED PER MARKET REQUIREMENTS.
- 15. ANTENNA FEED LINE SYSTEM SWEEP TESTING SHALL BE PERFORMED AND REPORTED IN ACCORDANCE WITH CARRIER REQUIREMENTS. CONTRACTOR WILL NOT ACCEPT A RADIO SIGNAL CABLE INSTALLATION WITH UNSATISFACTORY SWEEP TEST RESULTS. THERE SHALL ALSO BE A HARD COPY OF SWEEPS LEFT AT SITE UPON COMPLETION OF SWEEP TEST.



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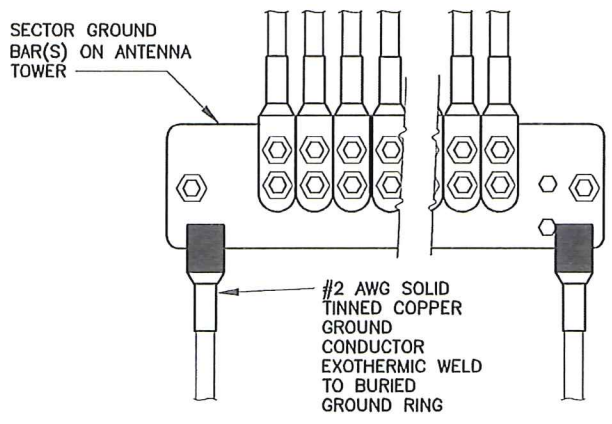
SITE NO. CV305
COURT SQUARE
FA# 10068631
500 COURT SQUARE
CHARLOTTESVILLE, VA 22902

2	09/10/14	RE-ISSUED FOR CONSTRUCTION	MM	HJ	-
C	09/05/14	RE-ISSUED FOR REVIEW	MM	HJ	-
1	05/20/14	REVISED PER COMMENTS	MM	HJ	-
0	05/09/14	ISSUED FOR CONSTRUCTION	MM	HJ	-
B	04/28/14	REVISED PER COMMENTS	MM	HJ	-
NO	DATE	REVISIONS	BY	CHK	APP'D
SCALE:		DESIGNED:	-		

GROUNDING & RF NOTES

JOB #	DRAWING NUMBER	REV
10068631	E1	2

- NOTES:**
1. ALL EXTERIOR GROUNDS USE BLACK HEATSHRINK.
 2. FLAT WASHERS ON ALL LUGS.
 3. NO OVERLAPPING ON GROUNDS.

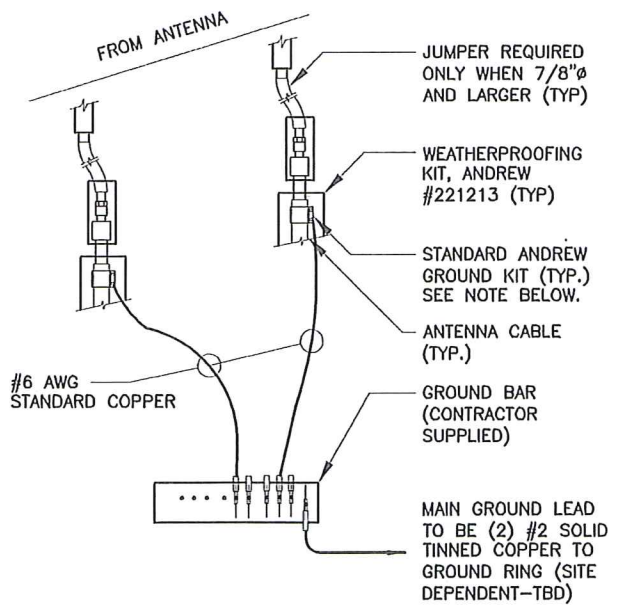


BLACK UV HEAT SHRINK ON ALL GROUNDS OUTSIDE OF SHELTER. CLEAR HEAT SHRINK INSIDE SHELTER.

- NOTES:**
1. COPPER GROUND BAR 1/4"x4"x14" 2-HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION.
 2. SIMILAR INSTALLATION FOR TOP AND BOTTOM TOWER GROUND BARS.

INSTALLATION OF GROUND WIRE TO GROUND BAR

NOT TO SCALE

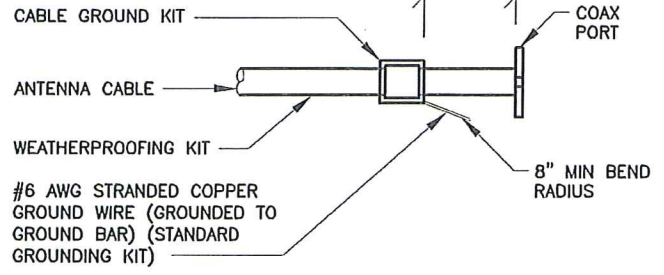


BLACK UV HEAT SHRINK ON ALL GROUNDS OUTSIDE OF SHELTER. CLEAR HEAT SHRINK INSIDE SHELTER.

- NOTE:**
- DO NOT INSTALL CABLE GROUND KIT AT A BEND ALWAYS DIRECT GROUND WIRE DOWN TO COAX ISOLATED GROUND BAR EXTERNAL (CIGBE).

CONNECTION OF GROUND WIRES TO GROUNDING BARS (TOWER/MONOPOLE/ROOFTOP)

NOT TO SCALE



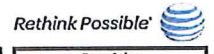
- NOTE:**
- DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.

CABLE GROUND KIT CONNECTION TO ANTENNA CABLE

NOT TO SCALE

AT&T Coax and Jumper Color Code Chart for WV-VA Sites

Updated 3/20/2014



Color Code for Hard-Line Coax to Antennas				Color Code for Jumpers from Antenna to TMAs/Diplexers or RRU - or - from Antenna to Hard-Line Coax																	
Sector	Coax Line	A1	A2	A3	A4	Sector	Technology	Frequency	TX / RX	1st Band	2nd Band	3rd Band	4th Band	5th Band	6th Band	7th Band	8th Band	9th Band	Notes		
Alpha	1st Line	1 Green	2 Green	3 Green	4 Green	A1-1	LTE	700 D/E	TXM / RXM	Green	Gray	Orange	Brown								
	2nd Line	1 Green & 1 Brown	2 Green & 1 Brown	3 Green & 1 Brown	4 Green & 1 Brown	A1-2	LTE	700 D/E	TXD1 / RXD1	Green	Gray	Orange	Brown								
Beta	1st Line	B1	B2	B3	B4	B1-1	LTE	700 D/E	TXM / RXM	Blue	Gray	Orange	Brown								
		B1-2	LTE	700 D/E	TXD1 / RXD1	Blue	Gray	Orange	Brown												
		B1-3	LTE	WCS	TXM / RXM	Blue	Gray	Red	Brown												
		B1-4	LTE	WCS	TXD1 / RXD1	Blue	Gray	Red	Brown	Brown											
		B1-5	LTE	WCS	TXD2 / RXD2	Blue	Gray	Red	Brown	Brown	Brown										
		B1-6	LTE	WCS	TXD3 / RXD3	Blue	Gray	Red	Brown	Brown	Brown										
Gamma	1st Line	G1	G2	G3	G4	G1-1	LTE	700 D/E	TXM / RXM	White	Gray	Orange	Brown								
		G1-2	LTE	700 D/E	TXD1 / RXD1	White	Gray	Orange	Brown												
		G1-3	LTE	WCS	TXM / RXM	White	Gray	Red	Brown												
		G1-4	LTE	WCS	TXD1 / RXD1	White	Gray	Red	Brown	Brown											
		G1-5	LTE	WCS	TXD2 / RXD2	White	Gray	Red	Brown	Brown	Brown										
		G1-6	LTE	WCS	TXD3 / RXD3	White	Gray	Red	Brown	Brown	Brown										

Base Color

Sector A	Green
Sector B	Blue
Sector C	White

Technology Color

LTE	Gray
UMTS	Yellow
GSM	Black

Frequency Color

700/850	Orange
WCS	Red
1900/2100	Violet

Type Color

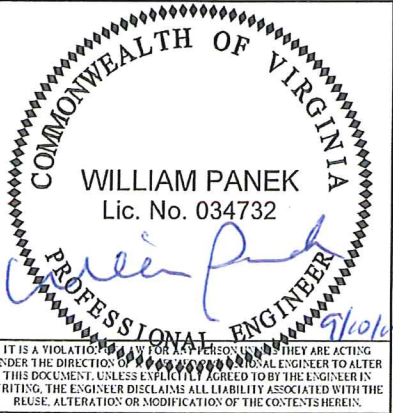
Main (M)	
Diversity (D)	Brown

Info above on 3/20/2014 - from: Tami Semoriga Construction Manager WV-VA AT&T Mobility 122 Whitelick Road Beckley, WV 25801 304-673-2639 tsemor@att.com

Jumpers from TMA to Antenna/Diplexer to Equipment:
 ORANGE band to note Low-Side frequencies
 VIOLET band to note High Side frequencies
 YELLOW band to note UMTS
 GRAY band to note LTE

COAX & JUMPER COLOR CODE CHART

NOT TO SCALE



4164 INNSLAKE DRIVE, SUITE B
 GLEN ALLEN, VA 23060
 (804) 217-7088 (MAIN)
 (757) 401-6453 (FAX)



LIBERTY PLAZA 1
 4801 COX ROAD, SUITE 300
 GLEN ALLEN, VA 23060

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GROUNDING DETAILS & COLOR CODE CHART

JOB #	DRAWING NUMBER	REV
10068631	E2	2