

# Antenna System Upgrade Project

**APPROVED**

By Keith Edwards at 2:10 pm, Feb 09, 2015



**at&t**  
MOBILITY

**APPROVED**

By Steve McCormick at 1:37 pm, Feb 02, 2015

- LTE AC/3C
- CONSOLIDATE GSM/UMTS ANTENNAS
- INSTALL LTE 1900 ANTENNAS
- INSTALL LTE 1900 RRHs
- IMPROVE QUALITY OF SERVICE

**AT&T MOBILITY**  
**SITE NUMBER: CV305**

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

SHEET	DRAWING INDEX	REV	DATE	DIRECTIONS:	SITE INFORMATION																
T1	TITLE SHEET	0	2/2/15	<p>FROM AT&amp;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/CHARLOTTESVILLE. 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 E HIGH ST/US-250 BUS W/VA-2. TURN RIGHT ONTO E HIGH ST. TAKE THE 3RD LEFT ONTO PARK ST. TURN RIGHT ONTO E JEFFERSON ST. BUILDING WILL BE ON THE LEFT.</p>	<p>SCOPE OF WORK: REMOVE (3) EXISTING GSM ANTENNAS AND (3) EXISTING UMTS ANTENNAS. INSTALL (3) NEW LTE 1900 ANTENNAS AND (3) NEW GSM/UMTS ANTENNAS. INSTALL (3) NEW RRUs TO EXISTING SLED MOUNTS. INSTALL (1) FC12 FIBER/POWER DIST. BOX, (3) DC2 SURGE SUPPRESSORS, (1) FIBER TRUNK AND (2) DC TRUNKS. INSTALL (1) RBS 6601 IN EXISTING EQUIPMENT RACK.</p>																
C1	GENERAL NOTES	0	2/2/15																		
C2.1	SITE PLAN	0	2/2/15																		
C2.2	ENLARGED PLATFORM LAYOUT	0	2/2/15																		
C3	ELEVATION VIEW & RF DETAILS	0	2/2/15																		
C4	ANTENNAS/COAX CABLE SCHEMATIC	0	2/2/15																		
E1	GROUNDING & RF NOTES	0	2/2/15																		
E2	GROUNDING DETAILS & COLOR CODE CHART	0	2/2/15																		
				VICINITY MAP	<p>SITE ADDRESS: 500 COURT SQUARE CHARLOTTESVILLE, VA 22902</p> <p>OWNER: 500 COURT SQUARE ASSOCIATION</p> <p>CONTACT PERSON: PETER MILLER/SIDNEY SUTTON, BROADCAST SERVICES (317) 895-9050</p> <p>APPLICANT: AT&amp;T MOBILITY 4801 COX ROAD, SUITE 300 GLEN ALLEN, VA 23060</p> <p>LATITUDE (NAD 83): 38° 01' 54.98" (38.031939)</p> <p>LONGITUDE (NAD 83): -78° 28' 41.02" (-78.478061)</p> <p>CURRENT USE: TELECOMMUNICATIONS FACILITY</p> <p>PROPOSED USE: TELECOMMUNICATIONS FACILITY</p> <p>JURISDICTION: CITY OF CHARLOTTESVILLE</p>																
<p>REVIEWED BY:</p> <p>AT&amp;T _____ DATE _____</p> <p>VELOCITEL _____ DATE _____</p> <p>APPROVED BY:</p> <p>OWNER _____ DATE _____</p> <p>MUNICIPAL _____ DATE _____</p>				<p>NOT TO SCALE</p>	<p>SITE QUALIFICATION PARTICIPANTS</p> <table border="1"> <thead> <tr> <th></th> <th>NAME</th> <th>COMPANY</th> <th>NUMBER</th> </tr> </thead> <tbody> <tr> <td>A/E</td> <td>DAN COSTELLO</td> <td>VELOCITEL</td> <td>(315) 717-6547</td> </tr> <tr> <td>SAC</td> <td>JOAN STEWART</td> <td>VELOCITEL</td> <td>(503) 539-4449</td> </tr> <tr> <td>CM</td> <td>STEVEN MCCORMICK</td> <td>VELOCITEL</td> <td>(757) 508-2154</td> </tr> </tbody> </table>		NAME	COMPANY	NUMBER	A/E	DAN COSTELLO	VELOCITEL	(315) 717-6547	SAC	JOAN STEWART	VELOCITEL	(503) 539-4449	CM	STEVEN MCCORMICK	VELOCITEL	(757) 508-2154
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COMMONWEALTH OF VIRGINIA

WILLIAM PANEK  
Lic. No. 034732

*William Panek*  
PROFESSIONAL ENGINEER

2/2/15

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**LTE AC/3C**  
**SITE NO. CV305**  
**COURT SQUARE**  
**FA# 10068631**  
500 COURT SQUARE  
CHARLOTTESVILLE, VA 22902

NO	DATE	REVISIONS	BY	CHK	APP'D
0	2/2/15	ISSUED FOR CONSTRUCTION	SRN	SRN	-
A	1/16/15	ISSUED FOR REVIEW	SRN	LAM	-

SCALE: \_\_\_\_\_ DESIGNED: SRN CHECKED: LAM

JOB #	DRAWING NUMBER	REV
10068631	T1	0

**TITLE SHEET**

**GENERAL NOTES:**

1. 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).
2. OCCUPANCY IS LIMITED TO PERIODIC MAINTENANCE AND INSPECTION, APPROXIMATELY 2 TIMES PER MONTH, BY AT&T TECHNICIANS.
3. NO NOISE, SMOKE, DUST, ODOR OR VIBRATIONS WILL RESULT FROM THIS PROPOSAL.
4. OUTDOOR STORAGE AND SOLID WASTE CONTAINERS ARE NOT PROPOSED.
5. 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.
6. SUBCONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING ANY DAMAGE CAUSED BY THE CONSTRUCTION OPERATION.
7. SUBCONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS REQUIRED FOR CONSTRUCTION.
8. SUBCONTRACTOR SHALL REMOVE ALL TRASH AND DEBRIS FROM THE SITE ON A DAILY BASIS.
9. 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.
10. NO WHITE STROBIC LIGHTS ARE PERMITTED. LIGHTING, IF REQUIRED, WILL MEET FAA STANDARDS AND REQUIREMENTS.
11. 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.
12. NO ADDITIONAL PARKING TO BE PROPOSED. EXISTING ACCESS AND PARKING TO BE USED.
13. NO LANDSCAPING IS PROPOSED AT THIS SITE.

14. 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"

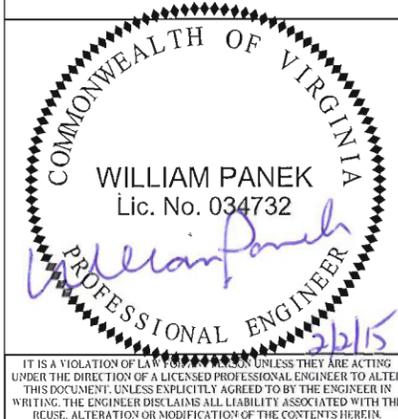
15. ALL COAXIAL CABLE INSTALLATIONS TO FOLLOW MANUFACTURER'S INSTRUCTIONS.

**GENERAL NOTES:**

1. FOR THE PURPOSE OF CONSTRUCTION DRAWINGS, THE FOLLOWING DEFINITIONS SHALL APPLY:  
CONTRACTOR – CONTRACTOR  
SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)  
OWNER – AT&T WIRELESS
2. ALL SITE WORK SHALL BE COMPLETED AS INDICATED ON THE DRAWINGS AND PROJECT SPECIFICATIONS.
3. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.
4. 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.
5. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
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 SUBCONTRACTOR 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 SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR AND SITE OWNER.
9. 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.
10. THE SUBCONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
11. 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.
12. 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.
13. 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.
14. 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.
15. 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.
16. THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
17. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE BTS EQUIPMENT.
18. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
19. THE SUBCONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH OSHA REGULATIONS.
20. SUBCONTRACTOR SHALL LEAVE PREMISES IN A CLEAN CONDITION.

**STRUCTURAL STEEL NOTES:**

1. ALL STEEL WORK SHALL BE PAINTED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS AND IN ACCORDANCE WITH ASTM A36 UNLESS OTHERWISE NOTED.
2. 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.
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 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.
6. 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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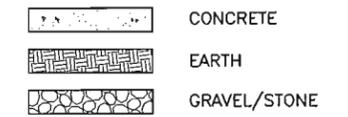
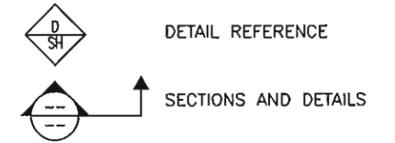
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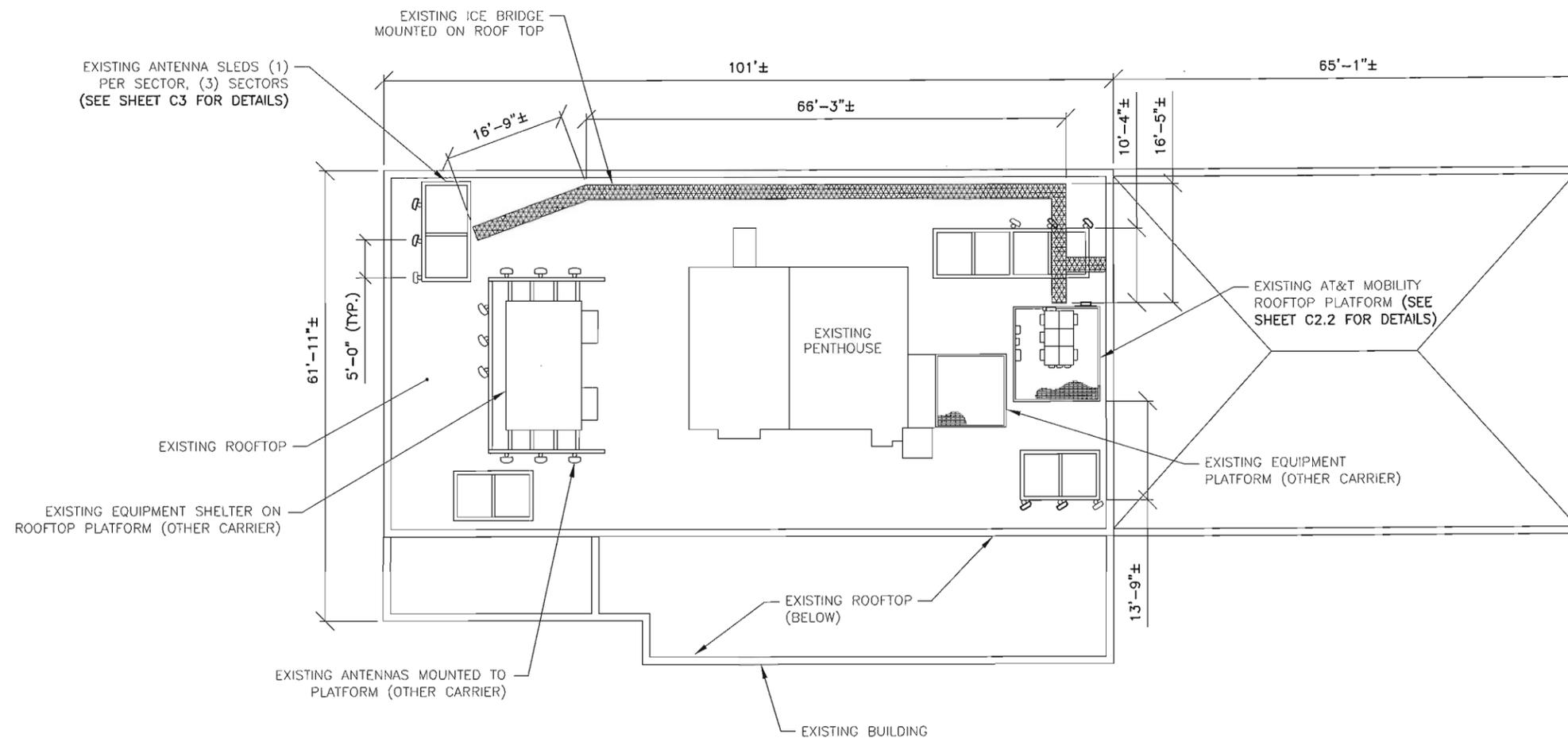
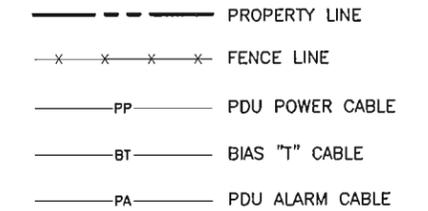
**GENERAL NOTES**

JOB #	DRAWING NUMBER	REV
10068631	C1	0

**SYMBOLS AND MATERIALS**



**SITE LEGEND**



CALLED NORTH

**SITE PLAN**

SCALE: 1"=20'



COMMONWEALTH OF VIRGINIA  
**WILLIAM PANEK**  
 Lic. No. 034732  
 PROFESSIONAL ENGINEER  
 2/2/15

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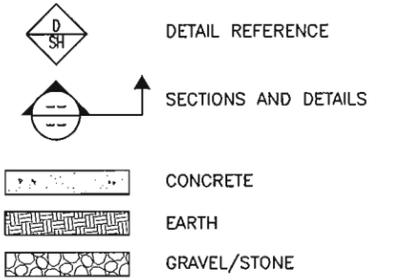
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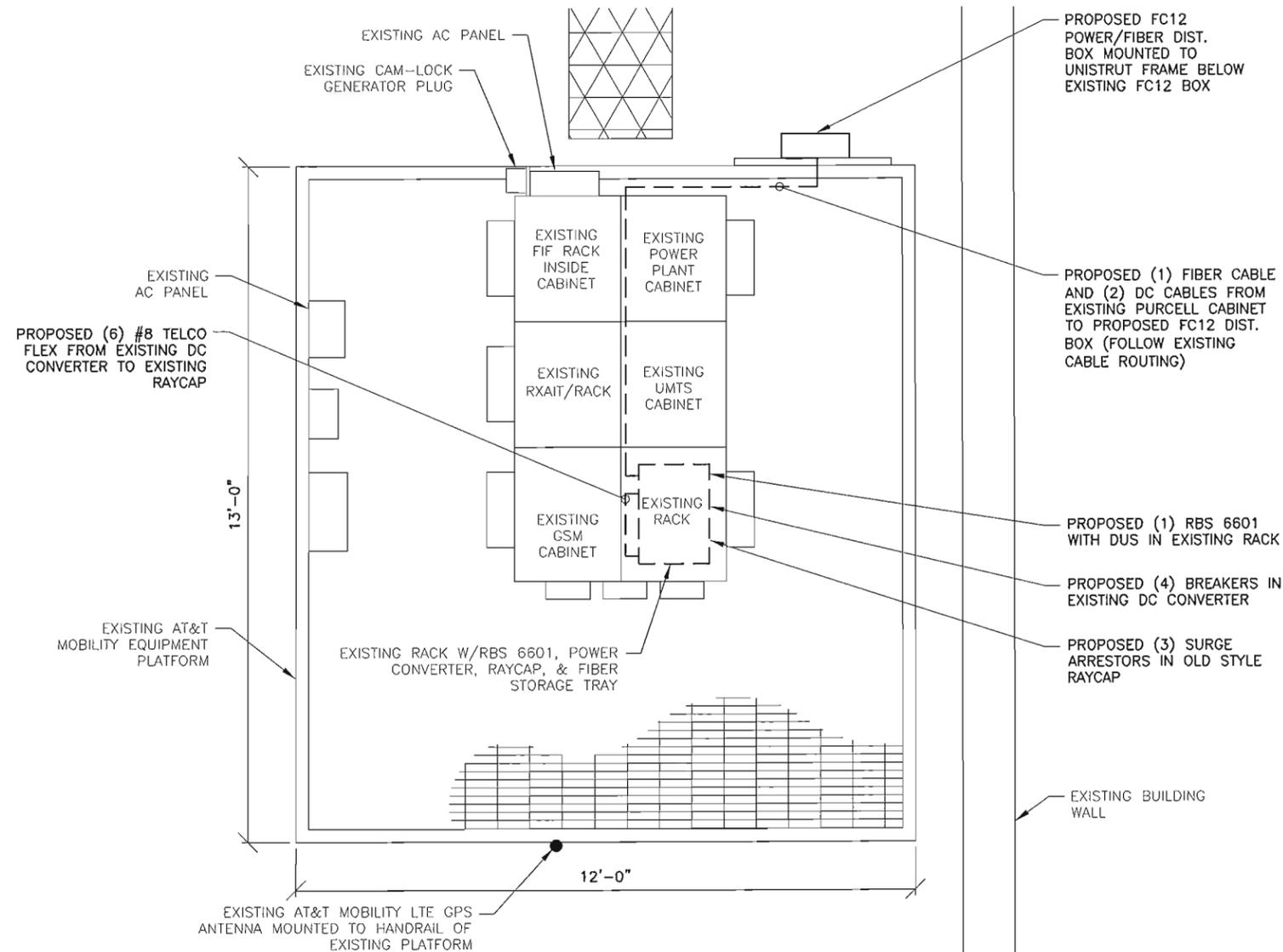
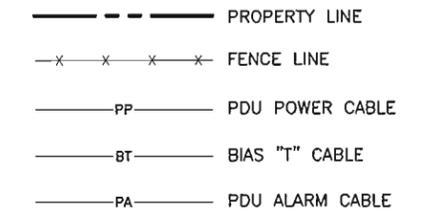
**SITE PLAN**

JOB #	DRAWING NUMBER	REV
10068631	C2.1	0

**SYMBOLS AND MATERIALS**



**SITE LEGEND**



**ENLARGED PLATFORM LAYOUT**

SCALE: 1"=3'



CALLED NORTH

COMMONWEALTH OF VIRGINIA  
**WILLIAM PANEK**  
 Lic. No. 034732  
 PROFESSIONAL ENGINEER  
 2/2/15

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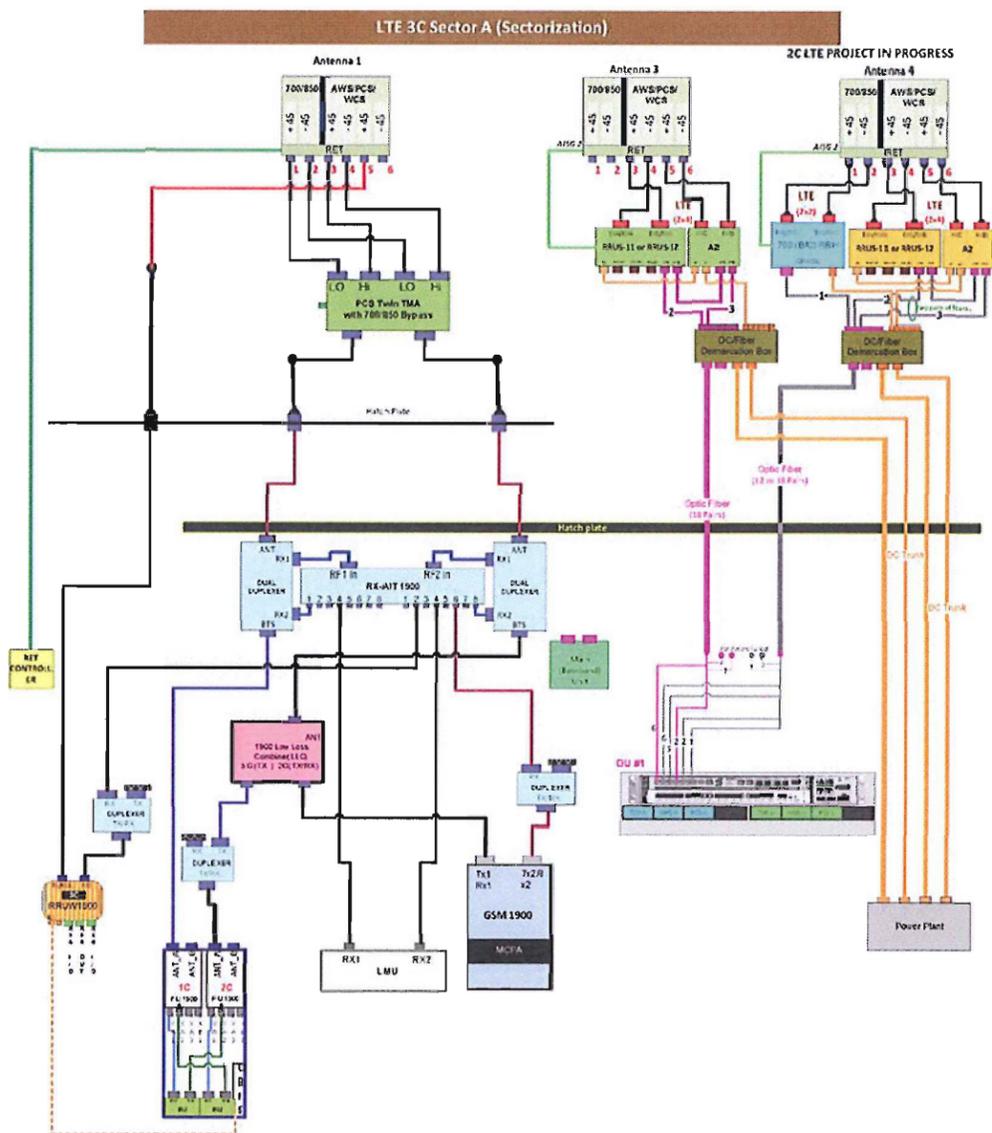
**ENLARGED PLATFORM LAYOUT**

JOB #	DRAWING NUMBER	REV
10068631	C2.2	0



**NOTE:**

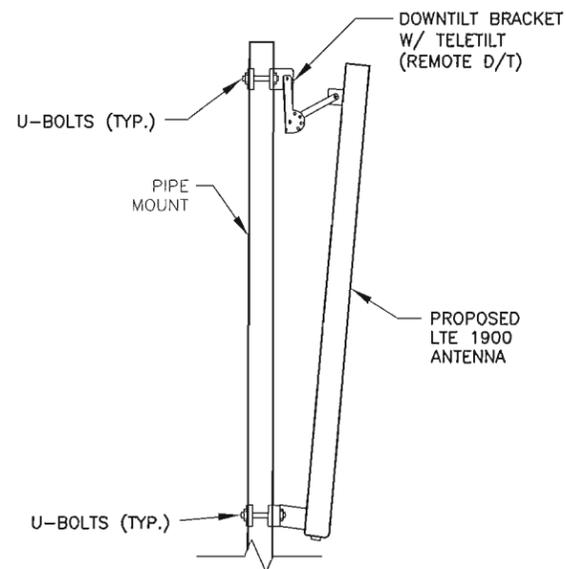
CAP UNUSED PORTS WITH 50 ohm LOADS



**INSTALLATION SCHEMATIC**

NOT TO SCALE

1

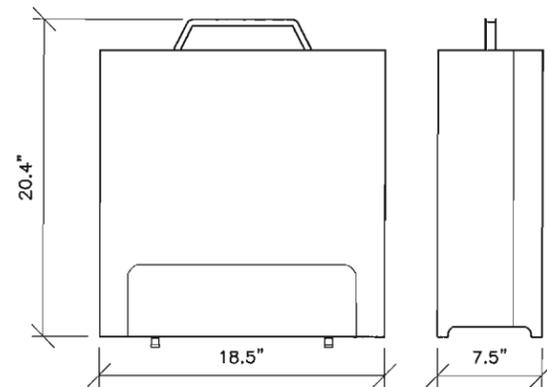


**LTE 1900 ANTENNA PIPE MOUNT**

NOT TO SCALE

2

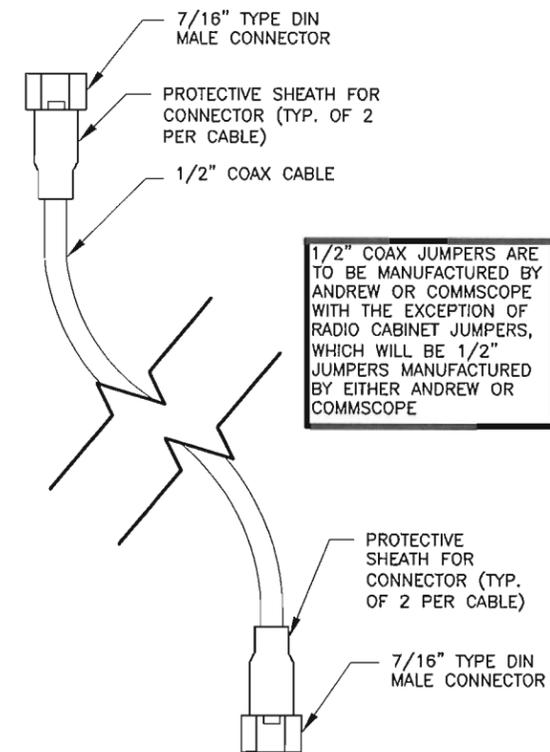
**NOTE:** CONTRACTOR TO VERIFY FINAL MOUNTING LOCATION AND METHODS W/ SITE CM PRIOR TO INSTALLATION.



**RRUS-12 DIMENSIONS**

NOT TO SCALE

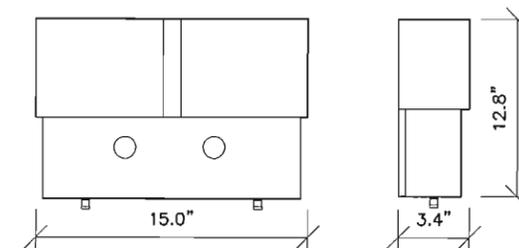
4



**1/2" COAX JUMPER DETAIL**

NOT TO SCALE

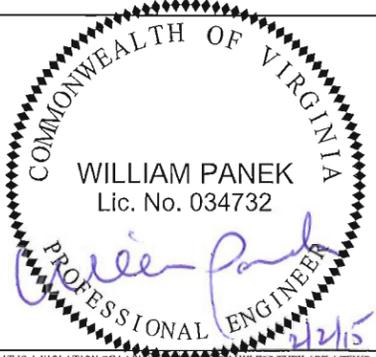
3



**A2 MODULE DIMENSIONS**

NOT TO SCALE

5



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**ANTENNA/COAX**  
**CABLE SCHEMATIC**

DRAWING NUMBER	REV
C4	0

**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

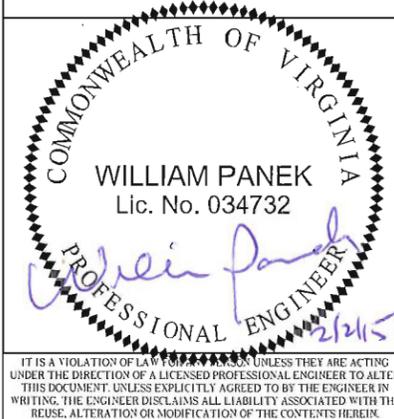
- A. INSTALLATION: INSTALL AS REQUIRED SPECIFICATION. CONTRACTORS REPRESENTATIVE WILL INSPECT EXOTHERMIC WELDS AND CONDUCT MEGGER TEST PRIOR TO BURIAL. MAXIMUM 5 OHMS RESISTANCE IS REQUIRED, WHEN MORE THAN (4) ADDITIONAL GROUNDS ARE REQUIRED, VERIFY OHM LEVEL PRIOR TO CONSTRUCTION. USE CLEAN SAND AND 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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 GLEN ALLEN, VA 23060  
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**at&t**  
**MOBILITY**

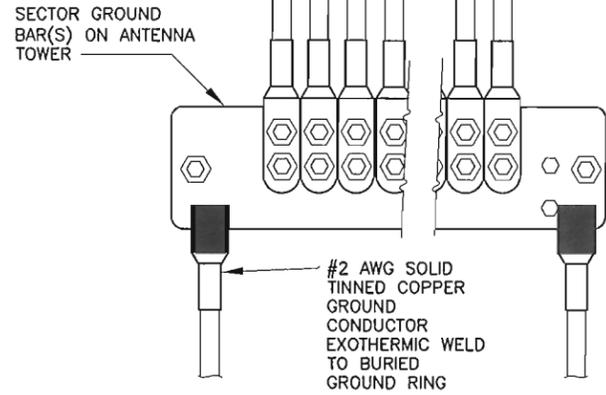
LIBERTY PLAZA 1  
 4801 COX ROAD, SUITE 300  
 GLEN ALLEN, VA 23060

**LTE AC/3C**  
**SITE NO. CV305**  
**COURT SQUARE**  
**FA# 10068631**  
 500 COURT SQUARE  
 CHARLOTTESVILLE, VA 22902

				<b>GROUNDING &amp; RF NOTES</b>		
NO	DATE	REVISIONS	BY	CHK	APP'D	REV
0	2/2/15	ISSUED FOR CONSTRUCTION	SRN	SRN	-	
A	1/16/15	ISSUED FOR REVIEW	SRN	LAM	-	
SCALE:			DESIGNED: SRN	CHECKED: LAM	JOB #	DRAWING NUMBER
					10068631	E1
						0

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

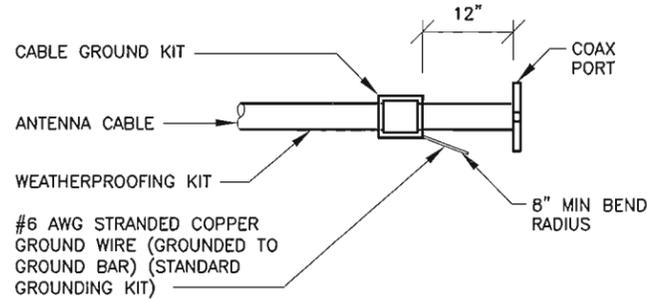


BLACK UV HEAT SHRINK ON ALL GROUNDS OUTSIDE OF SHELTER. CLEAR HEAT SHRINK INSIDE SHELTER.

- 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**

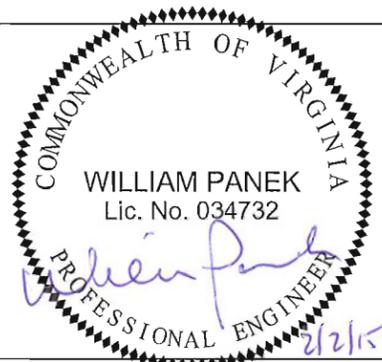
NOT TO SCALE



**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**

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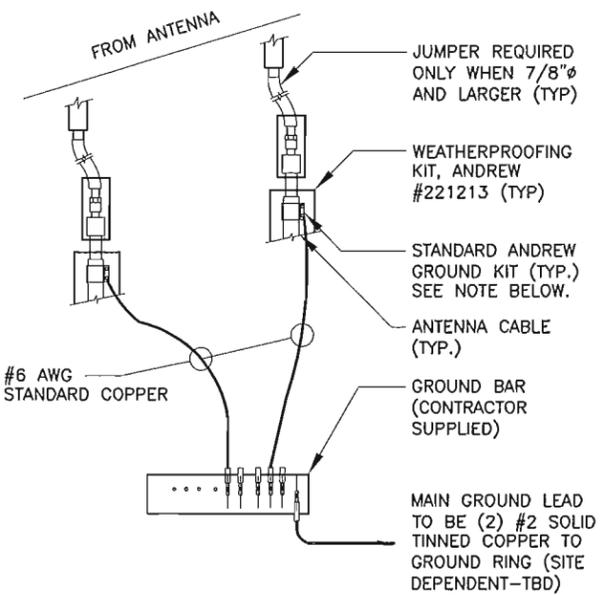
LTE AC/3C  
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500 COURT SQUARE  
CHARLOTTESVILLE, VA 22902

NO	DATE	REVISIONS	BY	CHK	APP'D
0	2/2/15	ISSUED FOR CONSTRUCTION	SRN	SRN	-
A	1/16/15	ISSUED FOR REVIEW	SRN	LAM	-

SCALE: DESIGNED: SRN CHECKED: LAM

**GROUNDING DETAILS & COLOR CODE CHART**

JOB #	DRAWING NUMBER	REV
10068631	E2	0



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

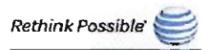
- NOTE:**  
DO NOT INSTALL CABLE GROUND KIT AT A BEND ALWAYS DIRECT GROUND WIRE DOWN TO COAX ISOLATED GROUND BAR EXTERNAL (CIGBE).

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

NOT TO SCALE

**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 TMA's/Diplexers or RRH - 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								
Alpha	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								
* Note: Pipe 1 is to the left if you are standing behind the antennas in this sector.																				
Beta	1st Line	1 Green	2 Green	3 Green	4 Green	B1-1	LTE	700 D/E	TXM / RXM	Blue	Gray	Orange								
Beta	2nd Line	1 Green & 1 Brown	2 Green & 1 Brown	3 Green & 1 Brown	4 Green & 1 Brown	B1-2	LTE	700 D/E	TXD1 / RXD1	Blue	Gray	Orange								
* Note: Pipe 1 is to the left if you are standing behind the antennas in this sector.																				
Gamma	1st Line	1 White	2 White	3 White	4 White	G1-1	LTE	700 D/E	TXM / RXM	White	Gray	Orange								
Gamma	2nd Line	1 White & 1 Brown	2 White & 1 Brown	3 White & 1 Brown	4 White & 1 Brown	G1-2	LTE	700 D/E	TXD1 / RXD1	White	Gray	Orange								
* Note: Pipe 1 is to the left if you are standing behind the antennas in this sector.																				

**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 Saononiga  
Construction Manager WV-VA  
AT&T Mobility  
172 Whiteslick Road  
Beckley, WV 25801  
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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

