

June 30, 2014

**BY EMAIL & FEDEX**

Chairman Robert Stein  
and Members of the Connecticut Siting Council  
Connecticut Siting Council  
10 Franklin Square  
New Britain, Connecticut 06051

**RECEIVED**  
JUL - 1 2014

**CONNECTICUT  
SITING COUNCIL**

Re: Docket 420 - D&M Plan Amendment  
SBA Towers III and New Cingular Wireless PCS, LLC ("AT&T")  
350B Cossaduck Hill Road, North Stonington, Connecticut

Dear Chairman Robert Stein and Members of the Connecticut Siting Council:

On behalf of SBA Towers III and New Cingular Wireless PCS, LLC ("AT&T"), please accept for review and Council approval this amendment to the Development Management Plan ("D&M Plan") for the captioned Facility as approved in Docket 420.

Tower, Compound & Other Equipment

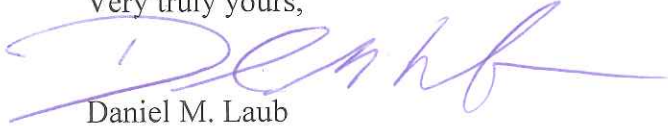
Enclosed are fifteen (15) sets of 11" x 17" updated construction drawings being filed in accordance with the Council's Decision and Order dated February 2, 2012 ("Decision and Order"). Two full-sized sets of the construction drawings will follow under separate cover. A revised structural analyses of the tower (Attachment 2) is also enclosed demonstrating that these changes can be accommodated structurally.

These changes relate only to the installation of AT&T's antennas on the tower where Verizon is already installed and on-air. No change to the details regarding the access drive or compound previously submitted are proposed and only changes to the antenna/equipment configuration on the tower are planned. AT&T has updated its antennas and equipment and proposes to install 12 antennas on a platform mount, with 27 remote radio heads and 4 surge arrestors, see details provided in Attachment 3. A cumulative RF Power Density Analysis prepared by SAI Communications, dated June 24, 2014 is provided as Attachment 4.

We respectfully request that this matter be included on the Council's next available agenda for review and approval. Should the Council or Staff have any questions please do not hesitate to contact me.

Thank you for your consideration of the enclosed.

Very truly yours,



Daniel M. Laub

Enclosures

CERTIFICATE OF SERVICE

I hereby certify that on this day, a copy of the foregoing was sent electronically and by overnight delivery to the Connecticut Siting Council with copy to:

Peter & Gisele Buehler  
16247 Fringe Tree Drive  
Spring Hill, FL 34610  
(727) 856-1963

with electronic copy to:

buehlerga@comcast.net

Dated: June 30, 2014



Daniel M. Laub

cc: Hon. Nicholas H. Mullane, II, First Selectman, Town of North Stonington  
Sean Gormley, SBA  
Michele Briggs, AT&T  
David Vivian, SAI  
Bryon Morawski, SAI  
Christopher B. Fisher, Esq.





# WIRELESS COMMUNICATIONS FACILITY CT2279 NORTH STONINGTON - RT. 201 350B COSSADUCK HILL ROAD NORTH STONINGTON, CT 06359

### GENERAL NOTES

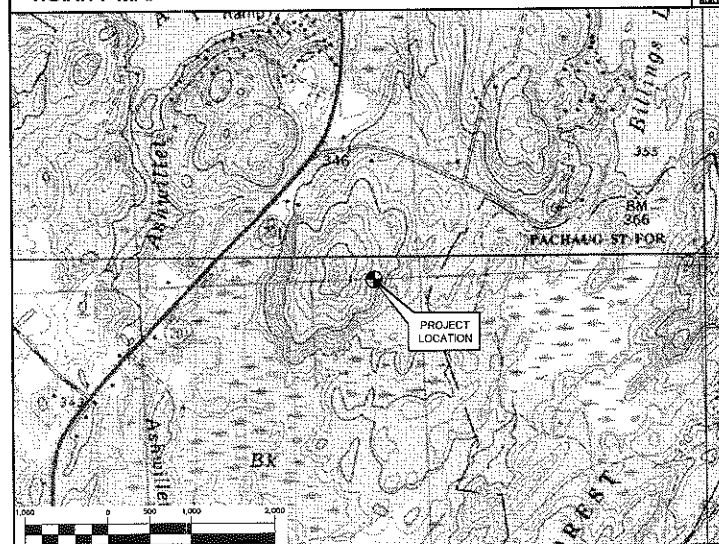
1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2003 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2005 CONNECTICUT SUPPLEMENT AND 2009 AMENDMENTS, INCLUDING THE TA/EA-222 REVISION "F" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES," 2005 CONNECTICUT FIRE SAFETY CODE AND 2009 AMENDMENTS, NATIONAL ELECTRICAL CODE AND LOCAL CODES.
2. THE COMPOUND, TOWER, PRIMARY GROUND RING, ELECTRICAL SERVICE TO THE METER BANK AND TELEPHONE SERVICE TO THE DEMARCATION POINT ARE PROVIDED BY SITE OWNER AS BUILT FIELD CONDITIONS REGARDING THESE ITEMS SHALL BE CONFIRMED BY THE CONTRACTOR. SHOULD ANY FIELD CONDITIONS PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL NOT PROCEED WITH ANY AFFECTED WORK.
3. CONTRACTOR SHALL REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUBCONTRACTORS AND ALL RELATED PARTIES. THE SUBCONTRACTORS SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT AFFECTS THEIR WORK.
4. CONTRACTOR SHALL PROVIDE A COMPLETE BUILD-OUT WITH ALL FINISHES, STRUCTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS AND PROVIDE ALL ITEMS AS SHOWN OR INDICATED ON THE DRAWINGS OR IN THE WRITTEN SPECIFICATIONS.
5. CONTRACTOR SHALL FURNISH ALL MATERIAL LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.
6. CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND ALL INSPECTIONS REQUIRED AND SHALL ALSO PAY FEES REQUIRED FOR THE GENERAL CONSTRUCTION, PLUMBING, ELECTRICAL AND HVAC. PERMITS SHALL BE PAID FOR BY THE RESPECTIVE SUBCONTRACTORS.
7. CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION OF NEW DRAWINGS TO SUBCONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. THE CONTRACTOR SHALL FURNISH AN "AS-BUILT" SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.
8. LOCATION OF EQUIPMENT, AND WORK SUPPLIED BY OTHERS THAT IS DIAGRAMMATICALLY INDICATED ON THE DRAWINGS SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL DETERMINE LOCATIONS AND DIMENSIONS SUBJECT TO STRUCTURAL CONDITIONS AND WORK OF THE SUBCONTRACTORS.
9. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY. MAINTAIN EXISTING BUILDING'S/PROPERTY'S OPERATIONS, COORDINATE WORK WITH BUILDING/PROPERTY OWNER.
10. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
11. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
12. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUBCONTRACTORS FOR ANY CONDITION PER MFR.'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
13. ANY AND ALL ERRORS, DISCREPANCIES, AND "MISSED" ITEMS ARE TO BE BROUGHT TO THE ATTENTION OF THE AT&T CONSTRUCTION MANAGER DURING THE BIDDING PROCESS BY THE CONTRACTOR. ALL THESE ITEMS ARE TO BE INCLUDED IN THE BID. NO "EXTRA" WILL BE ALLOWED FOR MISSED ITEMS.
14. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
15. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE CONSTRUCTION MANAGER FOR REVIEW.
16. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA.
17. COORDINATION, LAYOUT, FURNISHING AND INSTALLATION OF CONDUIT AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
18. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUBCONTRACTORS FOR ANY CONDITION PER THE MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
19. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
20. THE CONTRACTOR SHALL CONTACT "CALL BEFORE YOU DIG" AT LEAST 48 HOURS PRIOR TO ANY EXCAVATIONS AT 1-800-922-4455. ALL UTILITIES SHALL BE IDENTIFIED AND CLEARLY MARKED PRIOR TO ANY EXCAVATION WORK. CONTRACTOR SHALL MAINTAIN AND PROTECT MARKED UTILITIES THROUGHOUT PROJECT COMPLETION.
21. CONTRACTOR SHALL COMPLY WITH OWNERS ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.

### SITE DIRECTIONS

FROM:	TO:
500 ENTERPRISE DRIVE ROCKY HILL, CONNECTICUT	350B COSSADUCK HILL ROAD NORTH STONINGTON, CT 06359
1. HEAD NORTHEAST ON ENTERPRISE DRIVE TOWARD CAPITAL BLVD	0.3 MI
2. TURN LEFT ONTO CAPITAL BLVD	0.3 MI
3. TURN LEFT ONTO WEST ST	0.2 MI
4. TURN LEFT TO MERGE ONTO I-91 N	0.4 MI
5. MERGE ONTO I-91 N	2.3 MI
6. TAKE EXIT 24 TO MERGE ONTO CT-99 N TOWARD WETHERSFIELD	1.5 MI
7. TURN RIGHT ONTO CT-3 N/MAPLE ST	3.1 MI
8. KEEP RIGHT AT THE FORK, FOLLOW SIGNS FOR CT-2 E/NORWICH AND MERGE ONTO CT-2 E	33.8 MI
9. TURN RIGHT ONTO WASHINGTON ST	0.5 MI
10. SLIGHT LEFT ONTO BROADWAY	0.6 MI
11. CONTINUE ONTO UNION ST	0.4 MI
12. CONTINUE ONTO BROADWAY	449 FT
13. TURN LEFT ONTO MAIN ST	1.0 MI
14. SLIGHT LEFT ONTO CT-2 E/STONINGTON RD	9.4 MI
15. TURN LEFT ONTO CT-201 N, AND DESTINATION WILL BE ON THE RIGHT	3.2 MI

### VICINITY MAP

SCALE: 1" = 1000'



### PROJECT SUMMARY

1. THE SCOPE OF WORK GENERALLY INCLUDES THE INSTALLATION OF A 11'-5"x16'-0" PREFABRICATED WIRELESS EQUIPMENT SHELTER AND A DIESEL FUELED BACKUP POWER GENERATOR ON CONCRETE FOUNDATIONS WITHIN THE WIRELESS COMMUNICATIONS LEASE AREA.
2. A TOTAL OF TWELVE (12) DIRECTIONAL PANEL ANTENNAS ARE TO BE MOUNTED ON A 190' TALL MONOPOLE TOWER AT A CENTERLINE ELEVATION OF 186' ABOVE THE EXISTING TOWER BASE PLATE.
3. ELECTRIC UTILITY SHALL BE ROUTED UNDERGROUND TO THE AT&T EQUIPMENT SHELTER FROM AN EXISTING UTILITY BACKBOARD LOCATED ADJACENT TO THE FENCED COMPOUND. TELCO UTILITY TO BE ROUTED TO THE AT&T EQUIPMENT SHELTER FROM AN EXISTING TELCO CABINET LOCATED ADJACENT TO THE EXISTING FENCED COMPOUND.

### PROJECT INFORMATION

AT&T SITE NUMBER: CT2279  
 AT&T SITE NAME: NORTH STONINGTON - RT. 201  
 SITE ADDRESS: 350B COSSADUCK HILL ROAD  
 NORTH STONINGTON, CT 06359  
 LESSEE/APPLICANT: AT&T MOBILITY  
 500 ENTERPRISE DRIVE, SUITE 3A  
 ROCKY HILL, CT 06067  
 ENGINEER: CENTEK ENGINEERING, INC.  
 63-2 NORTH BRANFORD ROAD  
 BRANFORD, CT 06405  
 PROJECT COORDINATES: LATITUDE: 41°-29'-57"N  
 LONGITUDE: 71°-53'-23"W  
 GROUND ELEVATION: ±444'AMSL  
 (REFERENCED FROM CSC DATABASE)

### SHEET INDEX

SHT. NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	0
C-1	SITE LOCATION PLAN	0
C-2	COMPOUND PLAN, ELEVATION AND ANTENNA MOUNTING DETAILS	0
C-3	RF EQUIPMENT TOWER, SITE DETAILS AND NOTES	0
S-1	FOUNDATION PLAN AND DETAILS	0
S-2	STRUCTURAL SPECIFICATIONS	0
E-1	COMPOUND PLAN AND NOTES	0
E-2	SCHEMATIC RISER AND NOTES	0
E-3	SCHEMATIC GROUNDING PLAN AND NOTES	0
E-4	GROUNDING PLAN	0
E-5	DETAILS	0
E-6	DETAILS	0
E-7	DETAILS	0
E-8	SPECIFICATIONS	0

REV.	DATE	BY	CHK'D BY	DESCRIPTION
0	08/21/14	HAR	CFC	CONSTRUCTION - CLIENT REVIEW

PROFESSIONAL ENGINEER SEAL

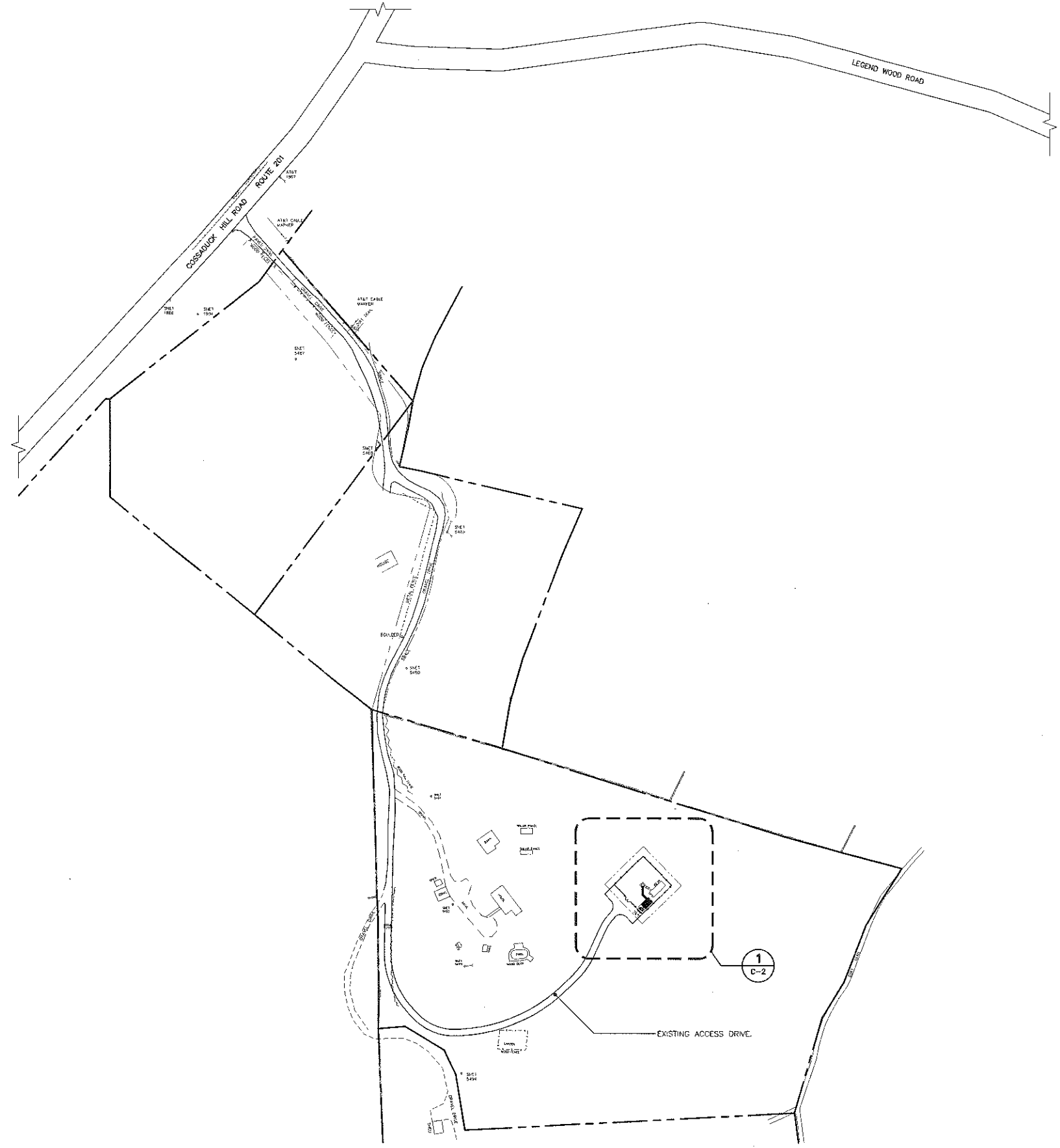


CENTEK ENGINEERING  
 6301 JARVIS RD  
 1201 WALKER FOX  
 652 North Branford Road  
 Branford, CT 06405  
 www.centekeng.com

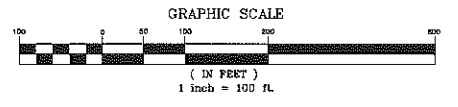
AT&T MOBILITY  
 WIRELESS COMMUNICATIONS FACILITY  
 SITE NUMBER: CT2279  
 SITE NAME: NORTH STONINGTON - RT 201  
 350B COSSADUCK HILL ROAD  
 NORTH STONINGTON, CT 06359

DATE: 05/23/14  
 SCALE: AS NOTED  
 JOB NO. 14034.000

TITLE SHEET  
 T-1  
 Sheet No. 1 of 14



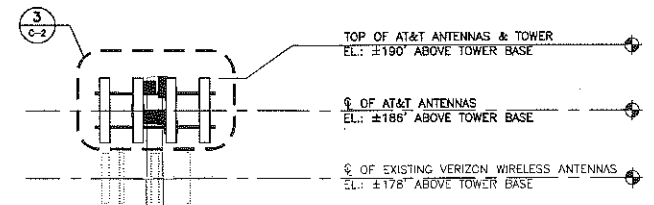
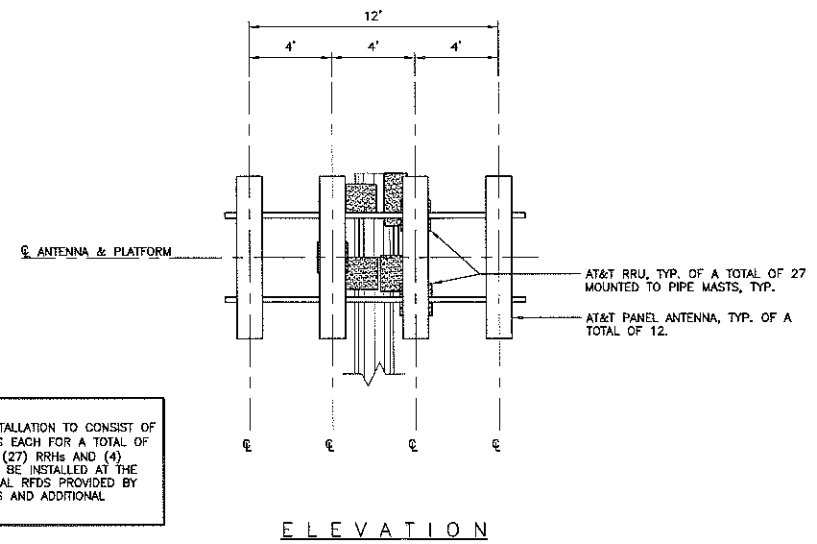
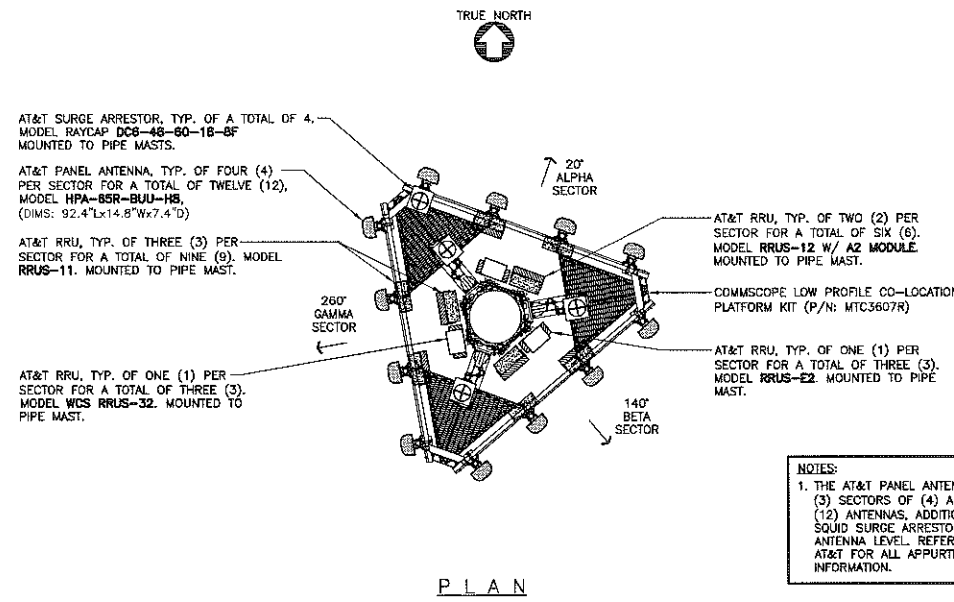
1 SITE LOCATION PLAN  
 C-1 SCALE: 1" = 100'



<b>CENTEK engineering</b> <small>Centek is a subsidiary of</small> 0203 488-2500 0203 488-8387 Fax 65-2 North Branford Road Branford, CT 06405 www.CentekEng.com	
<b>AT&amp;T MOBILITY</b> WIRELESS COMMUNICATIONS FACILITY <b>SITE NUMBER: CT2279</b> <b>SITE NAME: NORTH STONINGTON - RT 201</b> 350B COSSADUCK HILL ROAD NORTH STONINGTON, CT 06359	
DATE:	05/23/14
SCALE:	AS NOTED
JOB NO.	14034.000
SITE LOCATION PLAN	
<b>C-1</b>	
Sheet No. 2 of 14	

REV.	DATE	BY	CHK'D BY	DESCRIPTION
0	05/23/14	HAIR	C/S	CONSTRUCTION - CLIENT REVIEW

PROFESSIONAL ENGINEER SEAL



**NOTES:**

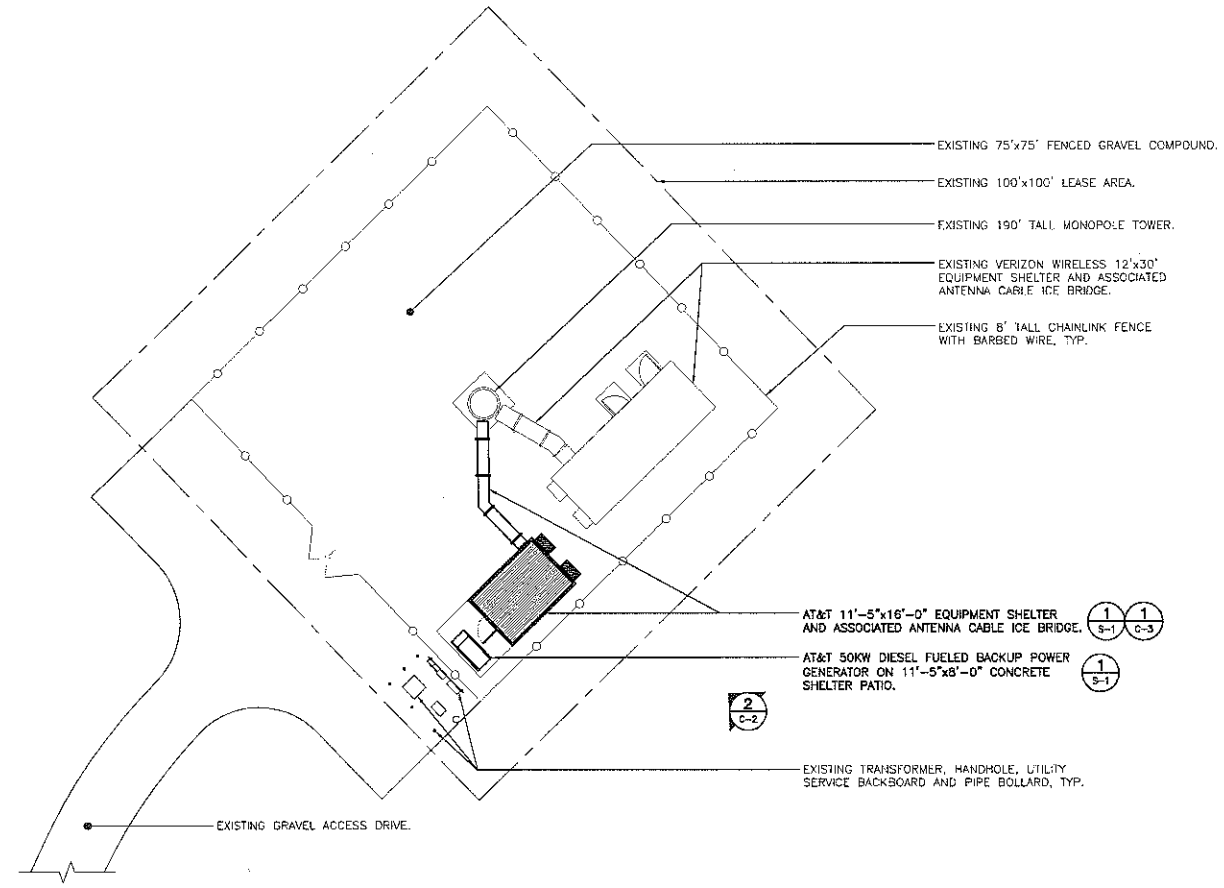
1. THE AT&T PANEL ANTENNA INSTALLATION TO CONSIST OF (3) SECTORS OF (4) ANTENNAS EACH FOR A TOTAL OF (12) ANTENNAS, ADDITIONALLY, (27) RRUs AND (4) SURGE ARRESTORS WILL BE INSTALLED AT THE ANTENNA LEVEL. REFER TO FINAL RFDS PROVIDED BY AT&T FOR ALL APPURTENANCES AND ADDITIONAL INFORMATION.

**3 ANTENNA MOUNTING CONFIGURATION DETAILS**  
C-2 NOT TO SCALE

**TOWER STRUCTURAL NOTES:**

1. REFER TO STRUCTURAL ANALYSIS REPORT PREPARED BY FDM ENGINEERING, INC., DATED: JUNE 4, 2014 P/N: 1486LL1400

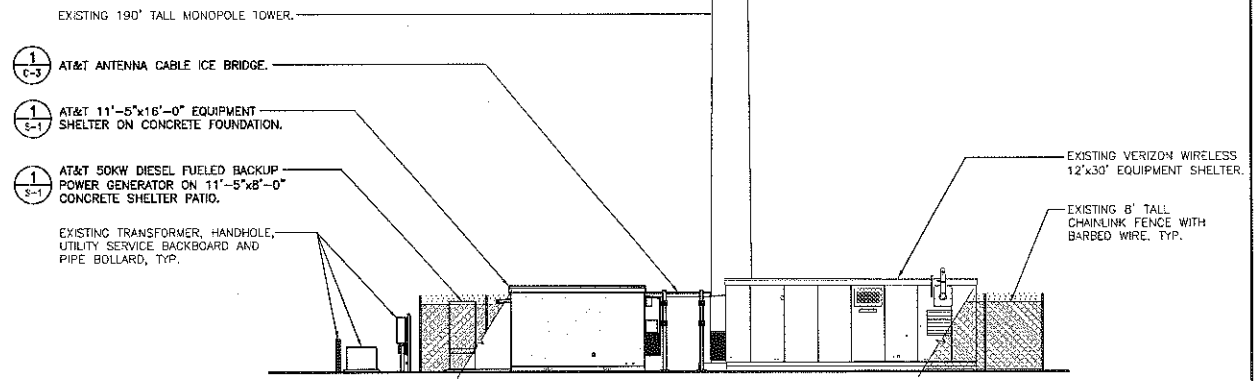
2. ALL ANTENNAS AND COAX TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS AND FINAL AT&T RF DATA SHEET.



**1 COMPOUND PLAN**  
C-2 SCALE: 1" = 15'

GRAPHIC SCALE  
( IN FEET )  
1 inch = 15 ft.

APPROXIMATE NORTH



**2 SOUTHEAST ELEVATION**  
C-2 SCALE: 1" = 10'

GRAPHIC SCALE  
( IN FEET )  
1 inch = 10 ft.

DATE	05/23/14
SCALE	AS NOTED
JOB NO.	14034.000
COMPOUND PLAN, ELEVATION AND ANTENNA MOUNTING DETAILS	
<b>C-2</b>	
Sheet No. 3 of 14	

AT&T MOBILITY  
WIRELESS COMMUNICATIONS FACILITY  
**SITE NUMBER: CT2279**  
**SITE NAME: NORTH STONINGTON - RT 201**  
180B COSSADUCK HILL ROAD  
NORTH STONINGTON, CT 06359

at&t

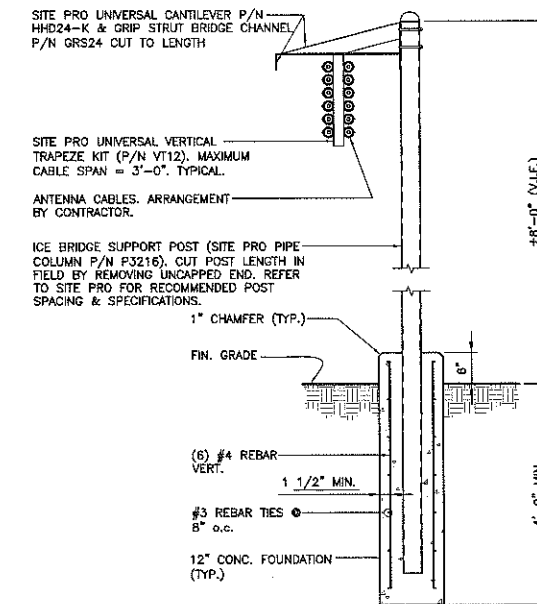
SAI  
COMMUNICATIONS

CEN  
ENGINEERING  
Communications  
1201 W. 30th St.  
2001 408-9397 Fax  
63-2 North Stonington Road  
Branford, CT 06405  
www.ceneng.com

RF EQUIPMENT TABLE																				
SECTOR	PANEL ANTENNAS				FILTER	FROM REMOTE RADIO UNIT				REMOTE RADIO UNIT		FROM SURGE SUPPRESSOR				SURGE SUPPRESSOR	FROM SHELTER			
	AZIMUTH	QTY.	MAKE & MODEL	RAD CENTER (AGL)		DOWNTILT	QTY.	COAX QTY.	COAX SIZE	COAX LENGTH	RET QTY.	QTY.	MAKE & MODEL	DC QTY.	DC SIZE	FIBER QTY.	DC & FIBER LENGTH	QUANTITY	DC BUNDLE QTY.	FIBER TRUNK QTY.
ALPHA	30°	4	CCI HPA-65R-BUU-HB	186.0'	0°M Z/Z'E	0	20	1/2" Ø	15' ±	1	3 2 2 1 1	ERICSSON RRUS-11 ERICSSON RRUS-12 ERICSSON RRUS-A2 ERICSSON RRUS-E2 ERICSSON RRUS-32	7	6MM² PAIR	7	15' ±				210'±
BETA	150°	4	CCI HPA-65R-BUU-HB	186.0'	0°M Z/Z'E	0	20	1/2" Ø	15' ±	1	3 2 2 1 1	ERICSSON RRUS-11 ERICSSON RRUS-12 ERICSSON RRUS-A2 ERICSSON RRUS-E2 ERICSSON RRUS-32	7	6MM² PAIR	7	15' ±	4	8	2	210'±
GAMMA	270°	4	CCI HPA-65R-BUU-HB	186.0'	0°M Z/Z'E	0	20	1/2" Ø	15' ±	1	3 2 2 1 1	ERICSSON RRUS-11 ERICSSON RRUS-12 ERICSSON RRUS-A2 ERICSSON RRUS-E2 ERICSSON RRUS-32	7	6MM² PAIR	7	15' ±				210'±

**SITE NOTES:**

1. THE CONTRACTOR SHALL CALL UTILITIES PRIOR TO THE START OF CONSTRUCTION.
2. ACTIVE EXISTING UTILITIES, WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES. THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY, PRIOR TO PROCEEDING, SHOULD ANY UNCOVERED EXISTING UTILITY PRECLUDE COMPLETION OF THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
3. ALL RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED OFF SITE AND BE LEGALLY DISPOSED, AT NO ADDITIONAL COST.
4. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE EQUIPMENT AND TOWER AREAS.
5. 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.
6. THE SUBGRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
7. THE AREAS OF THE COMPOUND DISTURBED BY THE WORK SHALL BE RETURNED TO THEIR ORIGINAL CONDITION.
8. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
9. IF ANY FIELD CONDITIONS EXIST WHICH PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL PROCEED WITH AFFECTED WORK AFTER CONFLICT IS SATISFACTORILY RESOLVED.
10. DIMENSIONS AND DETAILS SHALL BE CHECKED AGAINST THE PRE MANUFACTURED EQUIPMENT BUILDING SHOP DRAWINGS.
11. THE CONTRACTOR SHALL VERIFY AND COORDINATE THE SIZE AND LOCATION OF ALL OPENINGS, SLEEVES AND ANCHOR BOLTS AS REQUIRED BY ALL TRADES.



**1 ICE BRIDGE DETAIL**  
C-3 NOT TO SCALE

DATE	08/23/14	DATE	08/23/14	DATE	08/23/14
SCALE	AS NOTED	SCALE	AS NOTED	SCALE	AS NOTED
JOB NO.	14034.000	JOB NO.	14034.000	JOB NO.	14034.000
DESCRIPTION	CONSTRUCTION - CLIENT REVIEW	DESCRIPTION	CONSTRUCTION - CLIENT REVIEW	DESCRIPTION	CONSTRUCTION - CLIENT REVIEW

PROFESSIONAL ENGINEER SEAL

**CENITEK** engineering  
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2001 488-6189 Fax  
33-2 North Branford Road  
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WIRELESS COMMUNICATIONS FACILITY  
**SITE NUMBER: CT2279**  
**SITE NAME: NORTH STONINGTON - FT 201**  
8508 COSSADUCK HILL ROAD  
NORTH STONINGTON, CT 06359

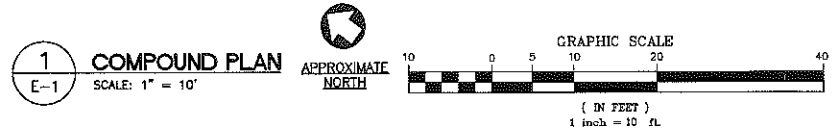
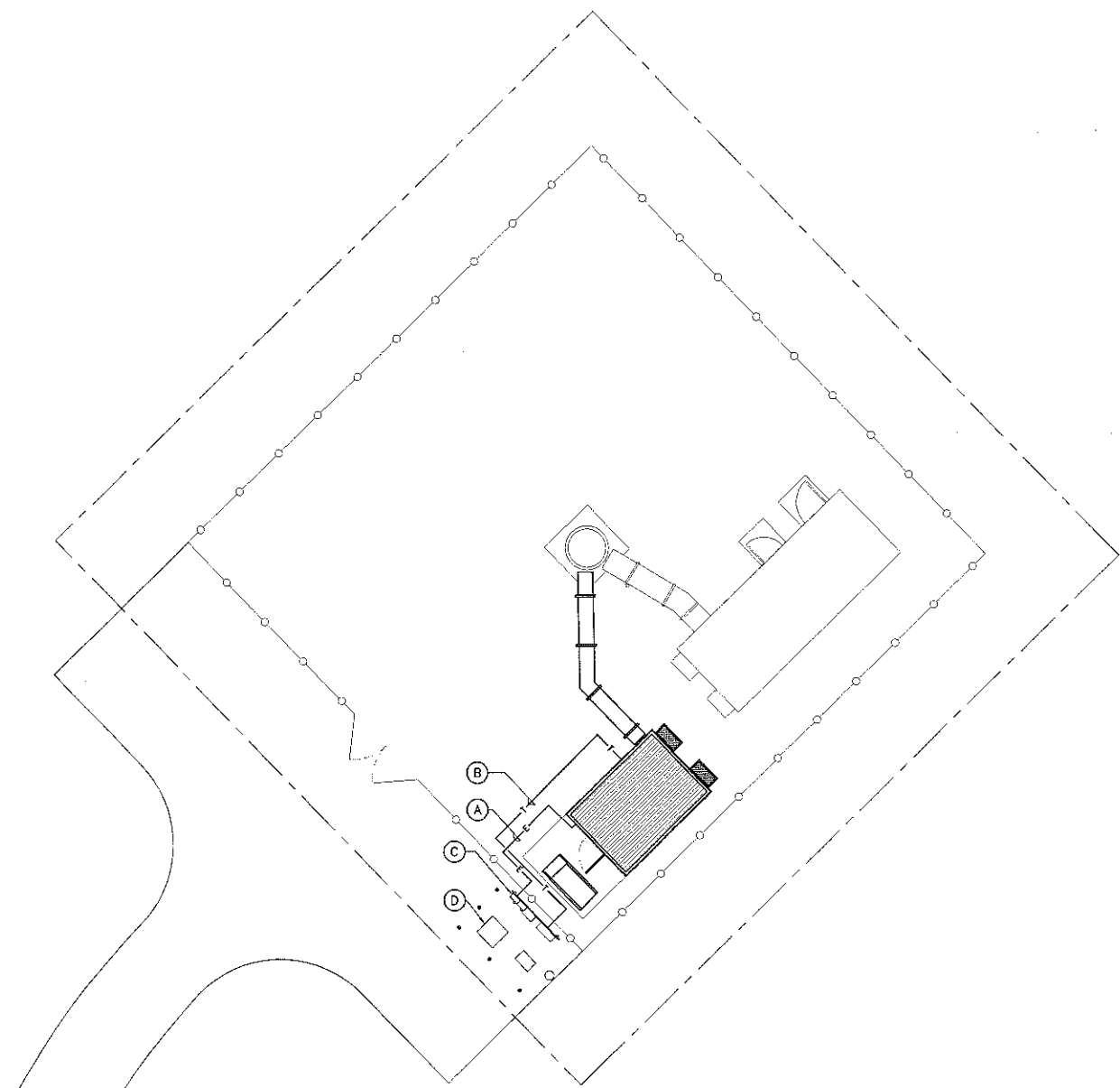
DATE: 08/23/14  
SCALE: AS NOTED  
JOB NO. 14034.000

RF EQUIP. TABLE,  
SITE DETAILS  
AND NOTES









**GENERAL NOTES**

- REFER TO CIVIL DRAWINGS FOR ACTUAL LOCATIONS OF STRUCTURES ON SITE.
- COORDINATION, LAYOUT AND FURNISHING OF CONDUIT, CABLE AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL / TELECOMMUNICATIONS SERVICES SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
- THE EXACT BUILDING FOUNDATION SIZE AND BUILDING WALL PENETRATIONS FOR UTILITIES SHALL BE CONFIRMED WITH THE BUILDING SPECIFICATIONS AND PLANS PRIOR TO LAYOUT.
- ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
- PROVIDE CADWELD CONNECTION STYLES: THROUGH (CABLE TO CABLE) TYPE "TA"  
(CABLE TO SURFACE) TYPE "LA" OR "VS" (PIPE)  
(CABLE TO ROD) TYPE "GT" OR "NC"  
(CABLE TO CABLE) TYPE "SS"
- EXTEND UTILITY SERVICES TO UTILITY BACKBOARD IN OWNER'S EQUIPMENT SHELTER. COORDINATE WITH SHELTER SHOP DRAWINGS FOR LOCATION. CONTRACTOR TO COORDINATE ALL UTILITY SERVICES TO NEW EQUIPMENT SHELTER.

**ELECTRICAL LEGEND**

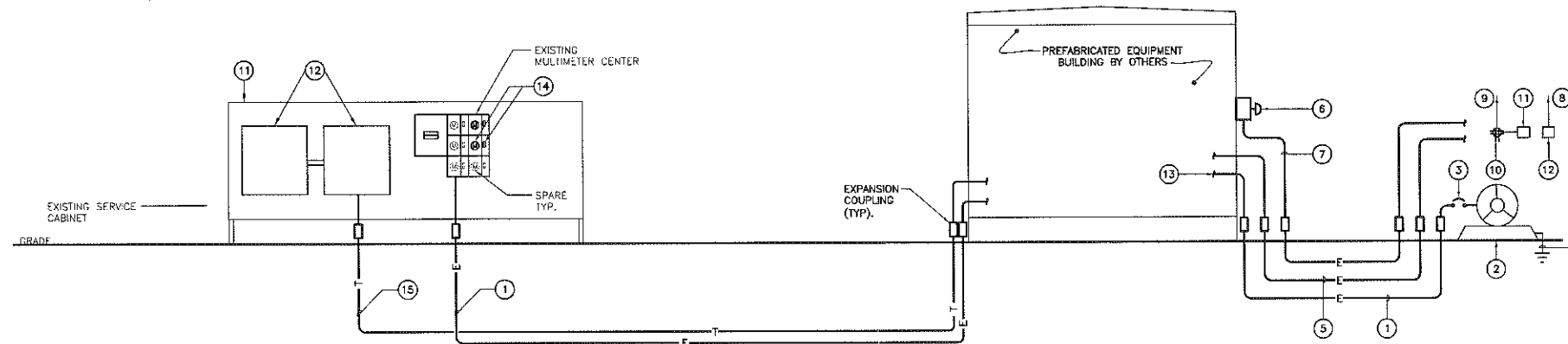
SYMBOL	DESCRIPTION
— — — — —	GROUND RING
-T-----T-	UNDERGROUND COMMUNICATION CONDUIT
-E-----E-	UNDERGROUND ELECTRICAL CONDUIT AS INDICATED
⊕	GROUND BAR
-X-----X-	PERIMETER CHAIN LINK FENCE
⊗	5/8" DIAMETER x 10'-0" COPPER GROUND ROD OR 24"x24" GROUND PLATE ABOVE MATT FOUNDATION.
⊗	5/8" DIAMETER x 10'-0" COPPER GROUND ROD WITH ACCESS.
■	EXOTHERMIC WELD TYPE "TA"
●	MECHANICAL CONNECTION

**COMPOUND UTILITY PLAN NOTES**

- CONDUIT AND CONDUCTORS FOR NEW ELECTRICAL SERVICE TO AT&T EQUIPMENT SHELTER, UNDER FINISHED GRADE. EXTEND CONDUIT AND CONDUCTORS THROUGH EQUIPMENT SHELTER TO MDP/MTS LOCATED WITHIN EQUIPMENT SHELTER. COORDINATE LOCATION WITH SHELTER MANUFACTURER.
- CONDUIT AND CONDUCTORS FOR NEW TELEPHONE SERVICE TO AT&T EQUIPMENT SHELTER, UNDER FINISHED GRADE. EXTEND CONDUIT AND CONDUCTORS THROUGH EQUIPMENT SHELTER TO TELEPHONE EQUIPMENT LOCATED WITHIN EQUIPMENT SHELTER. COORDINATE LOCATION WITH SHELTER MANUFACTURER.
- EXISTING COMPOUND FACILITY ELECTRICAL METER BANK AND TELCO HOFFMAN BOX.
- EXISTING TRANSFORMER.

**EQUIPMENT SHELTER BY OTHERS. VERIFY ALL SHELTER DIMENSIONS, EQUIPMENT DIMENSIONS, EQUIPMENT LOCATIONS AND UTILITY OPENINGS WITH BUILDING SHOP DRAWINGS PRIOR TO COMMENCEMENT OF WORK.**

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CENTER engineering 1231 86-805 1201 86-805 552 North Branford Road Branford, CT 06405 www.CenterEng.com	COMPOUND PLAN, AND NOTES
AT&T MOBILITY WIRELESS COMMUNICATIONS FACILITY SITE NUMBER: CT2279 SITE NAME: NORTH STONINGTON - FT 201 800B CUSHING HILL ROAD NORTH STONINGTON, CT 06386	<b>E-1</b>
	Sheet No. 7 of 14



**2 ELECTRICAL POWER RISER DIAGRAM**  
E-2 NOT TO SCALE

EQUIPMENT SHELTER BY OWNER. VERIFY ALL SHELTER DIMENSIONS, EQUIPMENT DIMENSIONS, EQUIPMENT LOCATIONS AND UTILITY OPENINGS WITH BUILDING SHOP DRAWINGS PRIOR TO COMMENCEMENT OF WORK.

- ELECTRICAL RISER NOTES:**
- ① (3) # 3/0 AWG, (1) # 6 AWG GND, MIN 2-1/2" CONDUIT.
  - ② 50KW DIESEL FUELED GENERATOR.
  - ③ 200A, 240V, MAIN CIRCUIT BREAKER AT GENERATOR OUTPUT.
  - ④ GROUND GENERATOR PER NEC AND MANUFACTURER'S SPECIFICATIONS.
  - ⑤ 1" CONDUIT WITH CONTROL AND ALARM CONDUCTORS FROM GENERATOR TO TRANSFER SWITCH AND ALARM PANEL IN SHELTER. INSTALL CONDUCTORS AS REQUIRED BY MANUFACTURER.
  - ⑥ REMOTE GENERATOR SHUT OFF SWITCH IN BREAK GLASS ENCLOSURE MOUNTED TO THE EXTERIOR OF THE SHELTER IN LOCATION APPROVED BY LOCAL FIRE MARSHAL. INSTALL ALL REQUIRED SIGNAGE.
  - ⑦ 3/4" CONDUIT AND CONDUCTORS REQUIRED FOR PROPER OPERATION OF EMERGENCY GENERATOR SHUT OFF SWITCH.
  - ⑧ DEDICATED 20A, 120V, CIRCUIT IN 3/4" CONDUIT FROM OWNER'S ELECTRIC PANEL TO GENERATOR BLOCK HEATER.
  - ⑨ DEDICATED 20A, 120V, CIRCUIT IN 3/4" CONDUIT FROM OWNER'S ELECTRIC PANEL TO GENERATOR BATTERY CHARGER AND DUPLEX RECEPTACLE.
  - ⑩ DUPLEX GFCI RECEPTACLE IN WEATHERPROOF ENCLOSURE. MOUNT IN CONVENIENT LOCATION AT GENERATOR.
  - ⑪ GENERATOR BATTERY CHARGER.
  - ⑫ GENERATOR BLOCK HEATER.
  - ⑬ EXTEND GENERATOR POWER OUTPUT CONDUCTORS TO EMERGENCY LUGS IN TRANSFER SWITCH.
  - ⑭ PROVIDE 120/240 AC, 200 AMP., 1φ, 3 WIRE REVENUE METER W/200, 1φ BREAKER IN SPARE METER AND BREAKER LOCATION. (ALL SERVICE EQUIPMENT MUST BE UTILITY CO. APPROVED).
  - ⑮ 4" CONDUIT WITH CONDUCTORS REQUIRED FOR TELEPHONE SERVICE. COORDINATE REQUIREMENTS WITH OWNER AND TELEPHONE COMPANY.

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SCHEMATIC RISER AND NOTES

**E-2**  
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**GROUNDING SCHEMATIC NOTES**

- ① #2 AWG GREEN INSULATED
- ② SHELTER GROUND RING, #2 AWG BCW
- ③ #2/0 GREEN INSULATED
- ④ #6 AWG
- ⑤ BOND ALL HALO GROUND RING TAILS TO GROUND RING. COORDINATE LOCATION AND QUANTITY WITH EQUIPMENT ROOM/SHELTER DRAWINGS
- ⑥ HALO GROUND RING, #2 AWG BCW.

**GENERAL NOTES:**

- 1. ALL SURGE SUPPRESSION EQUIPMENT SHALL BE BONDED TO GROUND PER MANUFACTURER'S SPECIFICATIONS
- 2. GROUND CONDUCTORS SHOWN SHALL BE #2 AWG SOLID TINNED BCW UNLESS OTHERWISE NOTED OR REQUIRED BY CODE.
- 3. BOND CABLE TRAY AND ICE BRIDGE SECTIONS TOGETHER WITH #6 AWG STRANDED GREEN INSULATED JUMPERS.
- 4. ALL SECTOR GROUND BARS SHALL BE BONDED TOGETHER WITH #2 AWG SOLID TINNED BCW.
- 5. BOND ALL EQUIPMENT CABINETS AND BATTERY CABINETS TO GROUND PER MANUFACTURER'S SPECIFICATIONS.
- 6. REFER TO GROUNDING PLAN FOR LOCATION OF GROUNDING DEVICES.
- 7. REFER TO ALL ELECTRICAL AND GROUNDING DETAILS.
- 8. COORDINATE ALL TOWER MOUNTED EQUIPMENT WITH OWNER.
- 9. ALL TOWER MOUNTED AMPLIFIERS AND ASSOCIATED EQUIPMENT SHALL BE BONDED TO THE SECTOR GROUND BAR PER MANUFACTURER'S SPECIFICATIONS.
- 10. ALL FENCE POSTS WITHIN 6' OF EQUIPMENT SHELTER SHALL BE BONDED TO GROUND RING.
- 11. ALL GROUNDING METAL BE IN ACCORDANCE WITH NEC AND OWNER'S REQUIREMENTS.
- 12. ALL EXPOSED METAL OBJECTS IN SHELTER SHALL BE BONDED TO THE HALO GROUND WITHIN THAT ROOM.
- 13. BOND GENERATOR TO GROUND PER NEC AND MANUFACTURER'S SPECIFICATIONS

**CELLULAR GROUNDING NOTES**

**OBJECTIVE**

PROVIDE A CELLULAR GROUNDING SYSTEM WITH MAXIMUM ALTERNATING CURRENT RESISTANCE OF 5 OHMS BETWEEN ANY POINT ON THE GROUNDING SYSTEM AND REFERENCE GROUND. PROVIDE EXTERIOR GROUNDING SCHEME WITH OWNER'S ENGINEER APPROVAL AS REQUIRED TO ACHIEVE DESIRED MAXIMUM AC RESISTANCE TO GROUND.

**TESTING**

CONTRACTOR TO PROVIDE AN INDEPENDENT TESTING CONTRACTOR TO DETERMINE THE GROUNDING SYSTEM RESISTANCE BY USE OF THE THREE POINT TEST AND AN AEMC MODEL 4500, OR APPROVED EQUAL TEST TO BE PERFORMED PRIOR TO CONNECTION OF POWER SUPPLY TO THE CELL SITE AND CONNECTION OF THE GROUNDING SYSTEM TO THE WATER MAIN OR AC SUPPLY AS APPLICABLE.

**CONDUCTOR USED FOR CELLULAR GROUNDING SYSTEM**

IGR - #2 AWG ANNEALED SOLID TINNED BARE COPPER  
 IGR - #2 AWG ANNEALED STRANDED (7 STRAND) THW GREEN COLORED INSULATION  
 INTER-BUS EXTENSION (FROM IGR TO EGR) - SEE DETAILS  
 EXTERNAL BOND CONNECTIONS TO EGR - #2 AWG ANNEALED SOLID TINNED BARE COPPER  
 INTERIOR BOND CONNECTIONS TO IGR - #6 AWG ANNEALED STRANDED (7 STRAND) THW GREEN COLORED INSULATION

**MINIMUM BENDING RADIUS**

IGR #2 : 1'-0" NOMINAL AND 8" MINIMUM  
 EGR #2 : 2'-0" NOMINAL AND 8" MINIMUM  
 CELLULAR GROUNDING CONDUCTOR SHALL BE AS STRAIGHT AS POSSIBLE WITH MINIMUM 6" BENDING RADIUS.

**FASTENER FOR CELLULAR GROUNDING CONDUCTOR**

USE NON-METALLIC FASTENER AND STANDOFF 'CLIC' (AVAIL. FROM NEFCO 203-289-0285) TO SURFACE SUPPORT CONDUCTOR 3" AWAY FROM SURFACES.

SPACING OF FASTENERS: 2'-0" O.C. OUTSIDE BUILDING  
 3'-0" O.C. INSIDE BUILDING

**GROUNDING ELECTRODE**

GROUNDING ELECTRODE SHALL BE 5/8" DIA. x 10'-0" L. COPPER CLAD STEEL ROD. ADJUST LOCATION OF GROUNDING ELECTRODE IF SOIL CONDITION IS NOT CONDUCTIVE (GRAVEL, SANDY SOIL, ROCKS). SPACE GROUNDING ELECTRODES 20'-0" APART (SPACING MAY BE REDUCED WHERE REQUIRED TO ACCOMMODATE FIELD CONDITIONS BUT SHALL NOT BE LESS THAN 10'-0"). ELECTRODES SHALL BE DRIVEN ONLY WITH PROPER DRIVER SLEEVE TO PREVENT MUSHROOMING TOP OF ROD. WHEN ROCK BOTTOM IS ENCOUNTERED, THE ELECTRODE SHALL BE DRIVEN AT AN OBLIQUE ANGLE NOT TO EXCEED 45° FROM THE VERTICAL AWAY FROM STRUCTURES. TOP OF GROUNDING ELECTRODE SHALL BE MIN. 3'-6" BELOW FINISH GRADE.

**CONNECTIONS ABOVE GRADE (MECHANICAL)**

COMPRESSION LUG CONNECTOR - 15 TON COMPRESSION, 2 HOLE, LONG BARREL, ELECTRO TINNED PLATED, HIGH CONDUCTIVITY, COPPER BODY RATED. USE 1/4" Ø BOLT, 3/4" SPACING LUGS TO BOND OBJECTS FROM THE IGR. (CONNECTOR SHALL BE BURNDY HYLUG SERIES OR EQUAL.)

EXOTHERMIC WELD LUG CONNECTOR - 2 HOLE, OFFSET, ELECTRO TINNED PLATED, HIGH CONDUCTIVITY, COPPER 600V. USE 1/2" Ø BOLT, 1-3/4" SPACING LUGS. CONNECTOR SHALL BE CADWELD CONNECTION STYLE (CABLE TO SURFACE) TYPE LA, LUG SIZE 1/8 x 1. EXOTHERMIC WELD TO LUG AS REQUIRED.

C-TAP COMPRESSION CONNECTOR - HIGH CONDUCTIVITY COPPER FOR MAIN TO BRANCH LINE TAPPING. (CONNECTOR SHALL BE BURNDY HYTAP SERIES OR EQUAL.)

**MECHANICAL CONNECTIONS**

USE MATCHING MANUFACTURER TOOL AND DIE FOR COMPRESSION CONNECTION.

APPLY ANTI-OXIDANT CONDUCTIVITY ENHANCER COMPOUND ON SURFACES THAT ARE COMPRESSED.

SURFACES INTENDED TO BE CONNECTED WITH MECHANICAL CONNECTORS SHALL BE BARE METAL TO BARE METAL. PRIME AND PAINT OVER BONDED AREA TO PREVENT CORROSION.

**WHEN BONDING #2 TO #2**

EXTERIOR OF BUILDING - USE EXOTHERMIC WELD CONNECTION

INTERIOR OF BUILDING - USE COMPRESSION CONNECTION ON STRANDED CONDUCTORS ONLY.

- USE EXOTHERMIC WELD CONNECTION ON SOLID CONDUCTOR.

**WHEN BONDING #2 TO FENCE POST**

USE EXOTHERMIC WELD 'CADWELD TYPE VS' CONNECTION TO FENCE POST STEEL SURFACE. TEST WELD FOR POSSIBLE BURN THRU. PATCH WELDED AREA WITH GALVANIZED COATING AS REQUIRED FOR PROPER WELDED PERMANENT BOND. REFER TO MANUFACTURER'S REQUIREMENTS FOR DETAILS

**GROUNDING SYSTEM INTERCONNECTION**

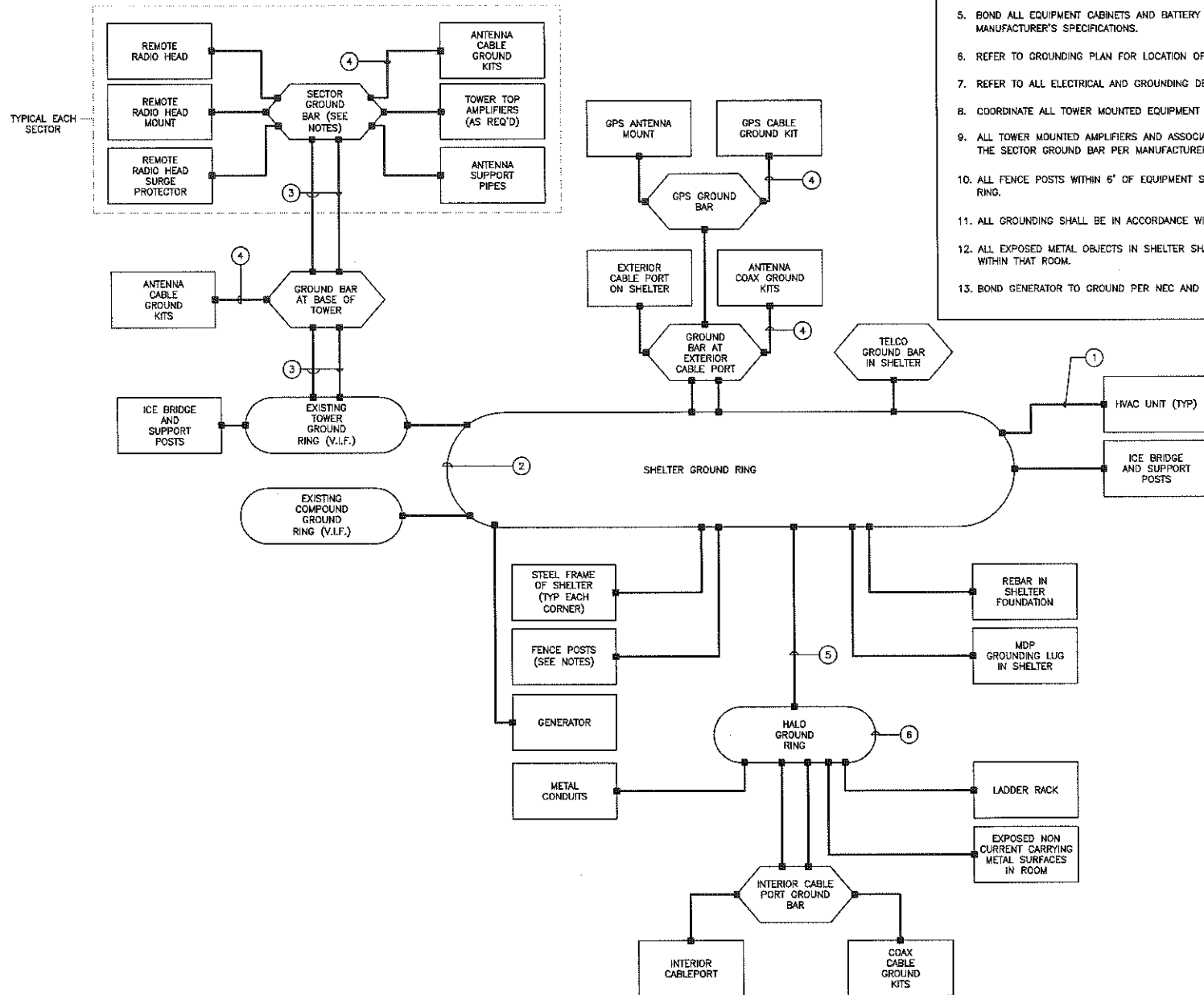
BOND THE EGR DOWN CONDUCTORS, AND/OR BURIED GROUND RING TO ANY METALLIC OBJECT OR EXISTING GROUNDING SYSTEM WITHIN 6'.

**WHEN BONDING #2 TO TOWER GROUND PLATE**

TOWER GROUND PLATE SHALL BE 6" x 8" x 1/4" COPPER AND BE MADE AVAILABLE TO TOWER CONTRACTOR TO BE INSTALLED DURING TOWER CONSTRUCTION. USE EXOTHERMIC WELD 'CADWELD TYPE HS' TO TOWER GROUND PLATE TEST WELD FOR POSSIBLE BURN THRU. COORDINATE THE SIZE OF THE MOUNTING HOLE WITH TOWER CONTRACTOR.

**METALLIC CONDUITS**

BOND ALL STEEL CONDUITS TO PANELS AT POINT OF CONTACT WITH APPROVED GROUNDING BUSHING.



① **GROUNDING PLAN**  
 E-3 SCALE: 1/4" = 1'-0"

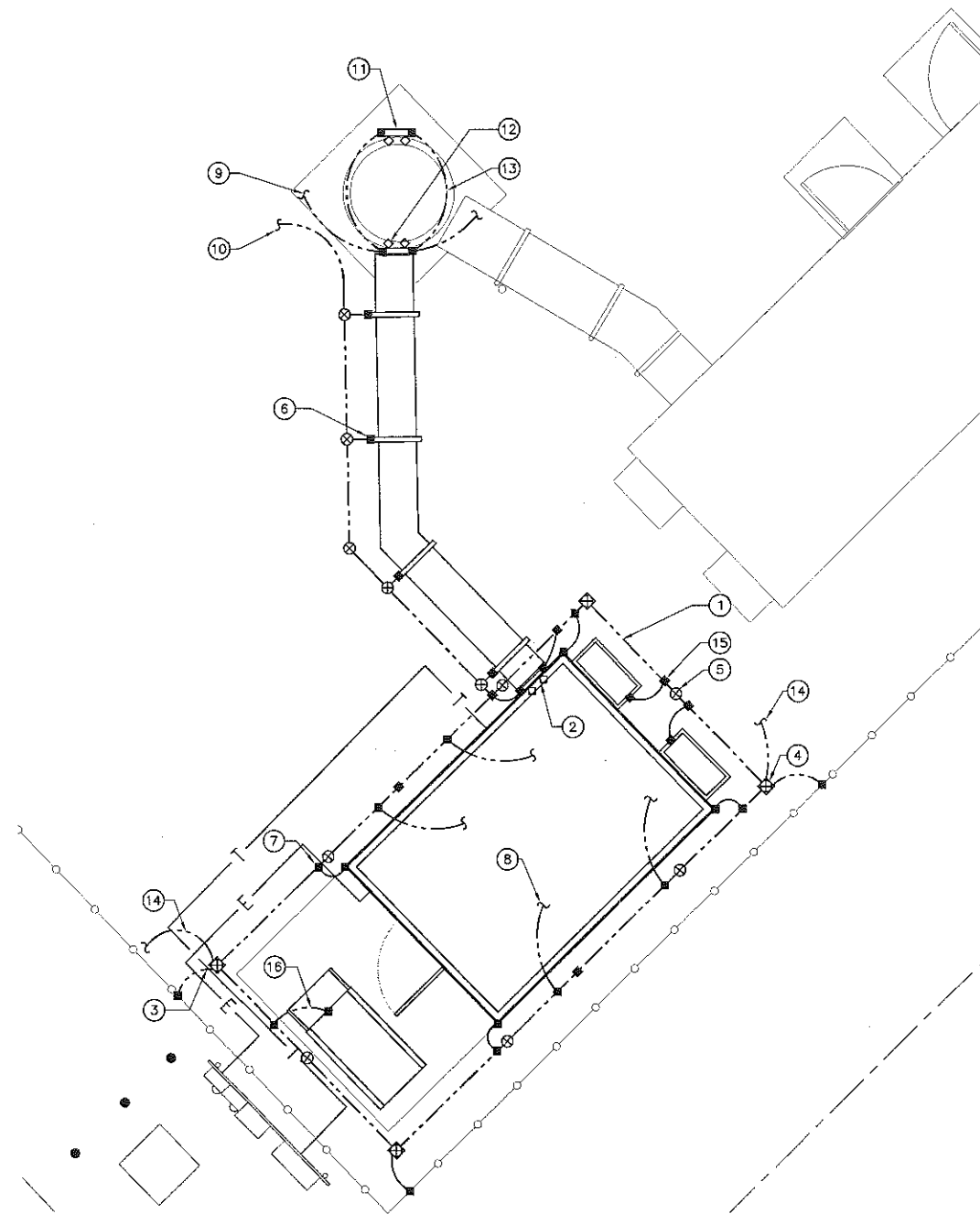
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SCHEMATIC GROUNDING PLAN AND NOTES	
<b>E-3</b>	
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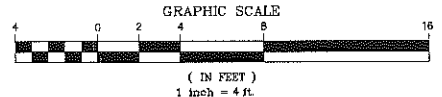
  

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- GROUNDING PLAN NOTES**
- ① #2 SOLID TINNED BOW GROUND RING (2'-0" FROM OUTSIDE EDGE OF EQUIPMENT SHELTER FOUNDATION) (TYP.).
  - ② WAVEPORT GROUND BAR PER DETAILS.
  - ③ CONNECT FENCE TO GROUNDING RING (TYP. 3 PLACES).
  - ④ GROUNDING ROD WITH ACCESS (TYP.) PER DETAILS.
  - ⑤ GROUNDING ROD (TYP.) PER DETAILS.
  - ⑥ ICE BRIDGE POST AND COVER. BOND EACH SECTION AND SUPPORT TO GROUND RING PER DETAILS.
  - ⑦ CADWELD EQUIPMENT BUILDING TO GROUND RING (TYP. EACH CORNER).
  - ⑧ EXTEND GROUND RING PIGTAIL THROUGH SHELTER AND BOND TO HALO GROUND DOWNLEAD. (TYP. 6 PLACES)
  - ⑨ BOND GROUND BAR TO EXISTING TOWER GROUND RING (TYP OF 2). CONTRACTOR TO VERIFY LOCATION IN FIELD.
  - ⑩ BOND SHELTER GND RING TO EXISTING TOWER GROUND RING WITH #2 AWG BCW.
  - ⑪ UPPER TOWER MOUNTED GROUND BAR PER DETAILS.
  - ⑫ LOWER TOWER MOUNTED GROUND BAR PER DETAILS.
  - ⑬ BOND UPPER TOWER MOUNTED GROUND BAR TO LOWER TOWER MOUNTED GROUND BAR (2 GROUND LEADS) PER DETAILS.
  - ⑭ BOND SHELTER GROUND RING TO EXISTING COMPOUND GROUND RING. (MINIMUM TWO PLACES.)
  - ⑮ BOND HVAC UNIT TO GROUND RING (TYPICAL).
  - ⑯ BOND GENERATOR TO GROUND PER NEC AND MANUFACTURER SPECIFICATIONS.

**1**  
E-4  
**COMPOUND GROUNDING PLAN**  
SCALE: 1/4" = 1'-0"



EQUIPMENT SHELTER BY OTHERS. VERIFY ALL SHELTER DIMENSIONS, EQUIPMENT DIMENSIONS, EQUIPMENT LOCATIONS AND UTILITY OPENINGS WITH BUILDING SHOP DRAWINGS PRIOR TO COMMENCEMENT OF WORK.

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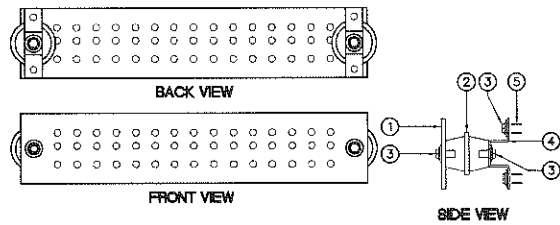
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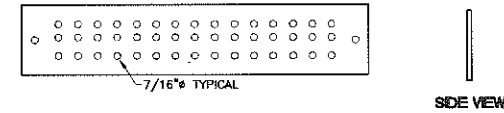
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GROUNDING PLAN

**E-4**  
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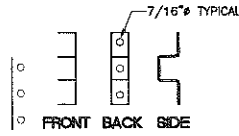


**TYPICAL GROUND BAR ASSEMBLY**  
N.T.S.



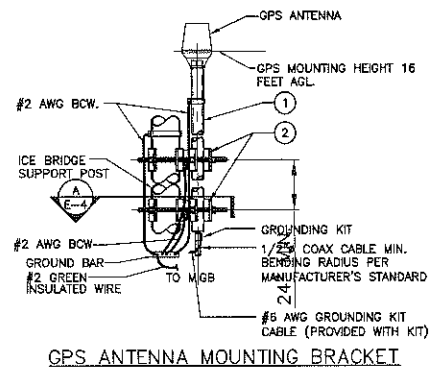
**TYPICAL GROUND BAR - DIMENSIONS**  
N.T.S.

- NOTES**
- HIGH CONDUCTIVITY TINNED COPPER BAR 1"-8" L x 4" W x 1/4" D.
  - RED COLORED STANDOFF INSULATOR PLASTIC #1872-1A.
  - STAINLESS STEEL TRUSS SPANNER MACHINE SCREWS, SPLIT LOCKWASHER AND FLAT WASHER.
  - 1" W x 1/8" T STAINLESS STEEL TYPE 304 BRACKET.
  - STAINLESS STEEL TYPE 304 HARDWARE - 3/8" EXPANSION BOLT FOR CONCRETE.



**BRACKET FOR GROUND BAR - DIMENSIONS**  
N.T.S.

**1 MASTER/EQUIPMENT GROUND BAR DETAILS**  
E-5 N.T.S.



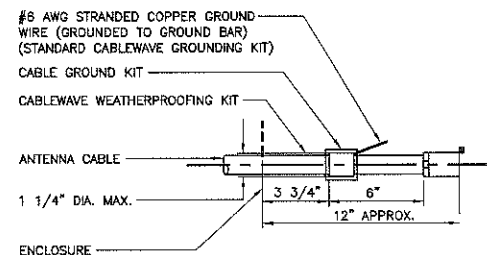
**GPS ANTENNA MOUNTING BRACKET**

**BILL OF MATERIALS**

ITEM	DESCRIPTION	QUANTITY
1	2-1/2" SCH. 40 x 8'-0" LG. MAX SS OR GALV. PIPE	1
2	UNIVERSAL CLAMP SET.	2

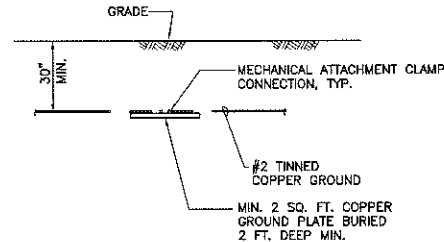
- NOTES**
- THE ELEVATION AND LOCATION OF THE GPS ANTENNA SHALL BE IN ACCORDANCE WITH THE FINAL RF REPORT.
  - THE GPS ANTENNA MOUNT IS DESIGNED TO FASTEN TO A STANDARD 2-1/2" DIAMETER, SCHEDULE 40, GALVANIZED STEEL OR STAINLESS STEEL PIPE. THE PIPE MUST NOT BE THREADED AT THE ANTENNA MOUNT END. THE PIPE SHALL BE CUT TO THE REQUIRED LENGTH (MINIMUM OF 24 INCHES) USING A HAND OR ROTARY PIPE CUTTER TO ASSURE A SMOOTH AND PERPENDICULAR CUT. A HACK SAW SHALL NOT BE USED. THE CUT PIPE END SHALL BE DEBURRED AND SMOOTH IN ORDER TO SEAL AGAINST THE NEOPRENE GASKET ATTACHED TO THE ANTENNA MOUNT.

**4 GPS GROUNDING/MOUNTING BRACKET DETAIL**  
E-5 NOT TO SCALE



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

**7 ANTENNA CABLE GROUNDING DETAIL**  
E-5 NOT TO SCALE

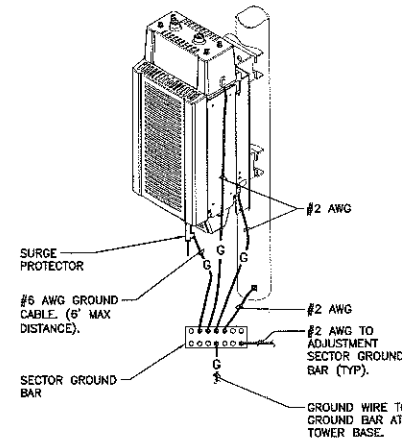


- NOTE**
- GROUND PLATE DETAIL TO BE USED ONLY IF 10 FT. GROUND ROD DEPTH CANNOT BE ACHIEVED DUE TO LEDGE CONDITION OR IF EXISTING TOWER FOUNDATION IS ENCOUNTERED.

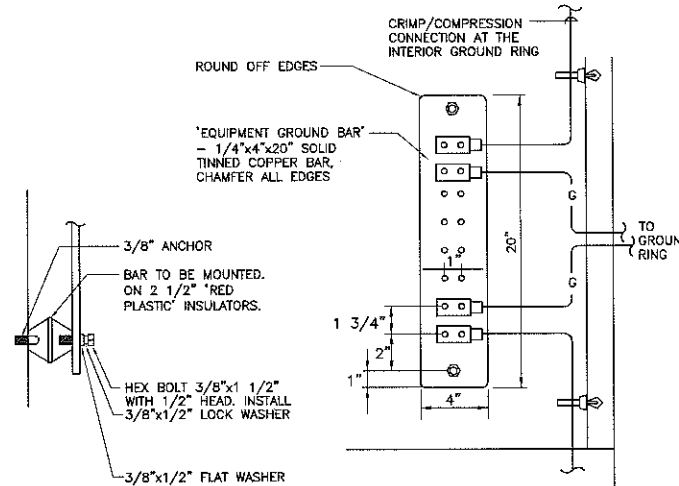
**8A GROUND PLATE DETAIL**  
E-5 NOT TO SCALE

EACH RRH CABINET SHALL BE GROUNDED IN THE FOLLOWING MANNER:

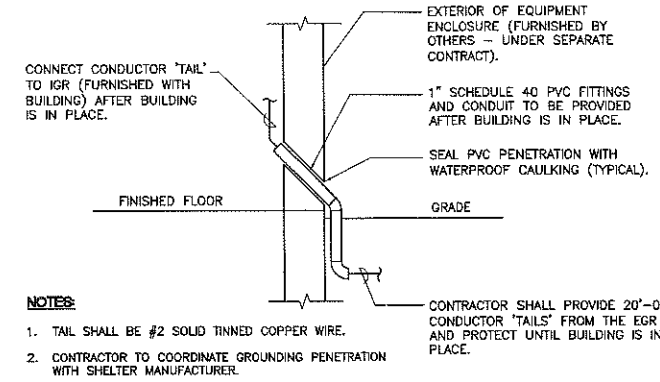
- AT TOP OF THE CABINET.
- AT RIGHT SIDE OF THE CABINET.



**2 RRH POLE MOUNT GROUNING**  
E-5 NOT TO SCALE

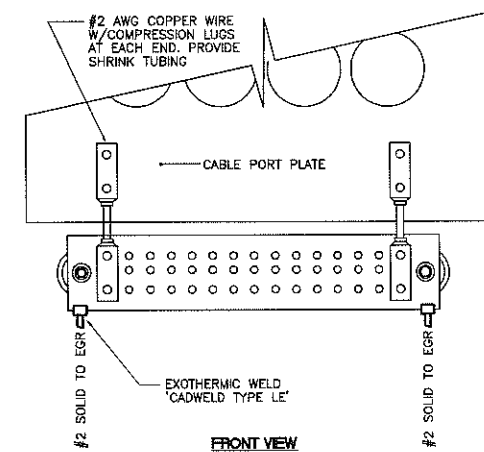


**5 EQUIPMENT GROUND BAR DETAIL**  
E-5 NOT TO SCALE

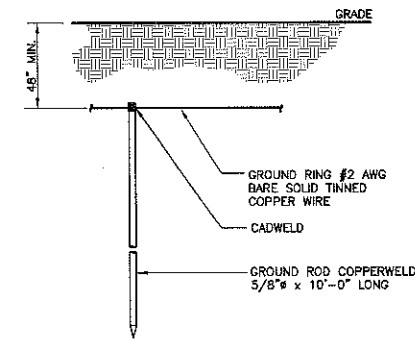


- NOTES**
- TAIL SHALL BE #2 SOLID TINNED COPPER WIRE.
  - CONTRACTOR TO COORDINATE GROUNING PENETRATION WITH SHELTER MANUFACTURER.

**3 TYPICAL EXTERIOR/INTERIOR GROUNING CONNECTION**  
E-5 NOT TO SCALE

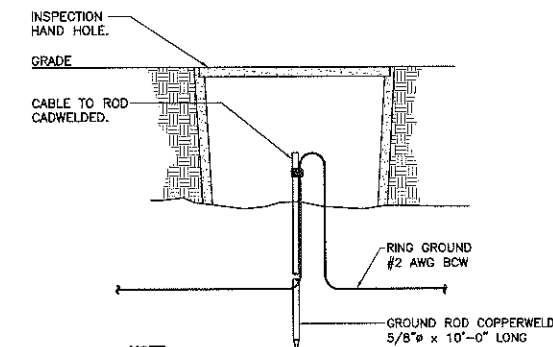


**6 CABLEPORT GROUND BAR LUG CONNECTION**  
E-5 NOT TO SCALE



- NOTE**
- USE GROUND PLATE DETAIL IF 10 FT. GROUND ROD DEPTH CANNOT BE ACHIEVED DUE TO LEDGE CONDITION OR IF EXISTING TOWER FOUNDATION IS ENCOUNTERED.

**8 GROUND ROD DETAIL**  
E-5 NOT TO SCALE



- NOTE**
- INSPECTION HAND HOLE MAY BE CONCRETE OR PVC AND SHALL BE A MINIMUM OF 12" DIA x 18" DEEP.

**9 GROUND ROD WITH ACCESS DETAIL**  
E-5 NOT TO SCALE

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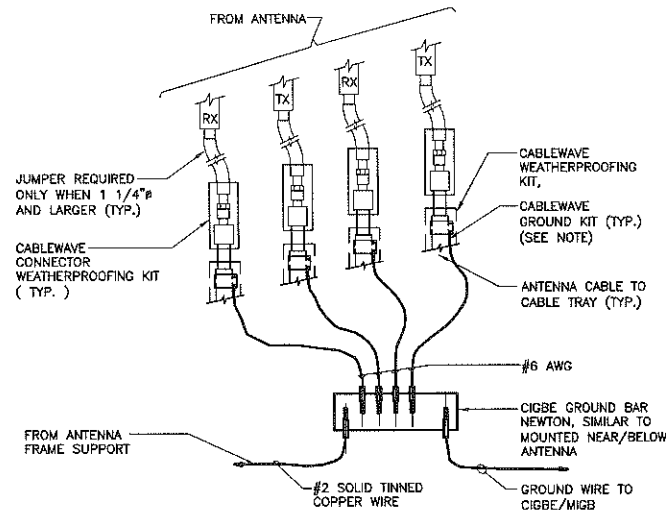
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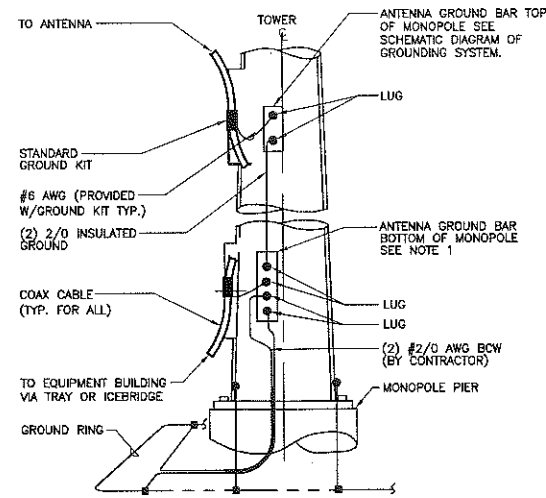
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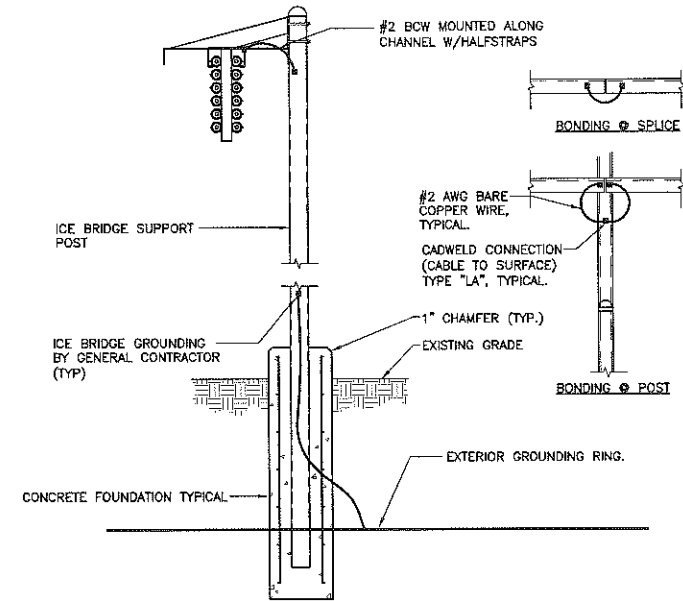
**NOTE**  
1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE

**1 CONNECTION OF GROUND WIRES TO GROUND BAR**  
E-6 NOT TO SCALE

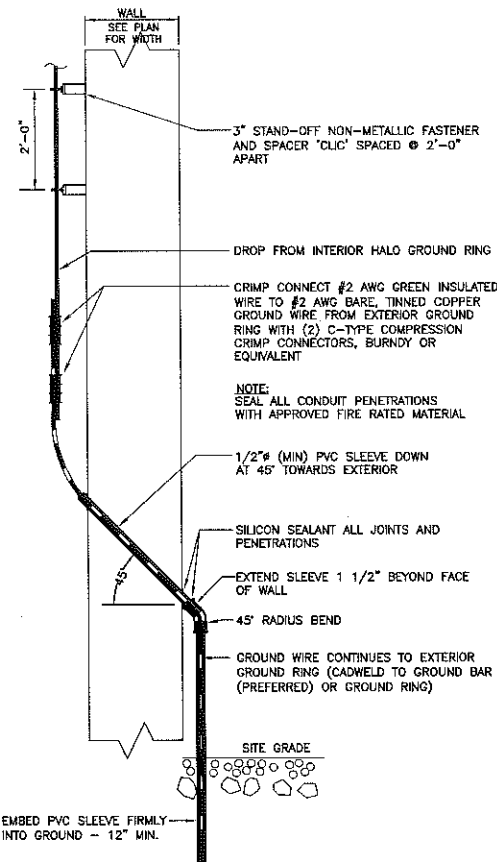


**NOTES**  
1. NUMBER OF GROUND BARS MAY VARY DEPENDING ON THE TYPE OF TOWER, LOCATION AND CONNECTION ORIENTATION. PROVIDE AS REQUIRED.  
2. A SEPARATE GROUND BAR TO BE USED FOR GPS ANTENNA IF REQUIRED.

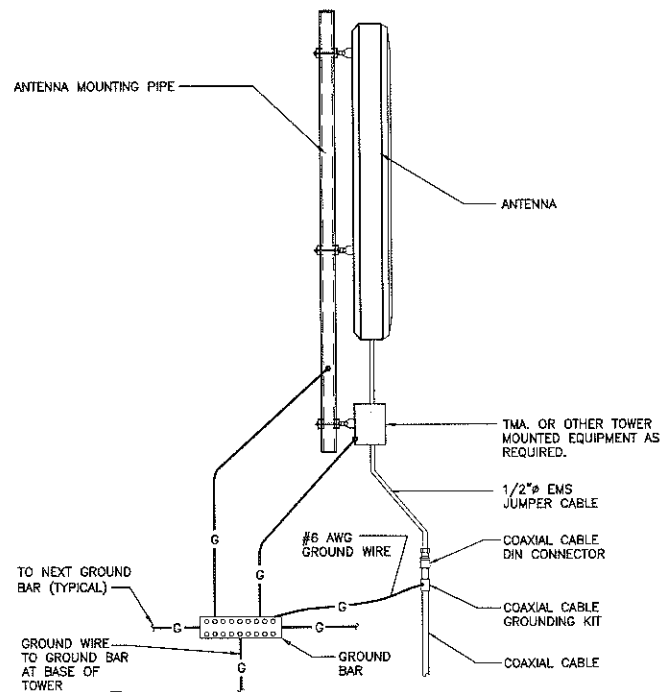
**2 ANTENNA CABLE GROUNDING**  
E-6 NOT TO SCALE



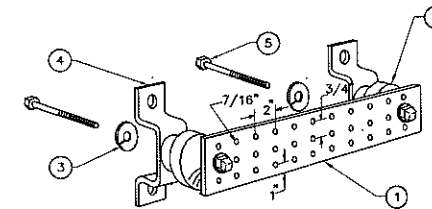
**3 ICE BRIDGE BONDING DETAIL**  
E-6 NOT TO SCALE



**4 CELLULAR GROUNDING CONDUCTOR SECURED ON WALL**  
E-6 N.T.S.



**5 TYPICAL ANTENNA GROUNDING DETAIL**  
E-6 NOT TO SCALE



**NOTES**  
① TINNED COPPER GROUND BAR, 1/4" x 4" x 20", NEWTON INSTRUMENT CO. HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION.  
② INSULATORS, NEWTON INSTRUMENT CAT. NO. 3061-4.  
③ 5/8" LOCK WASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015-8.  
④ WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT. NO. A-8056.  
⑤ 5/8-11 x 1" STAINLESS STEEL TRUSS SPANNER MACHINE SCREWS.

**6 GROUND BAR DETAIL**  
E-6 NOT TO SCALE

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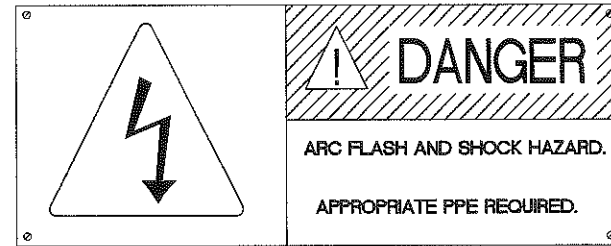
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(203) 468-0058 Fax  
65-2 North Branford Road  
Branford, CT 06405  
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**AT&T MOBILITY**  
WIRELESS COMMUNICATIONS FACILITY  
**SITE NUMBER: CT2279**  
**SITE NAME: NORTH STONINGTON - FT 201**  
9506 COSSADUCK HILL ROAD  
NORTH STONINGTON, CT 06859

DATE: 05/23/14  
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JOB NO. 14034.000

DETAILS  
**E-6**  
Sheet No. 12 of 14

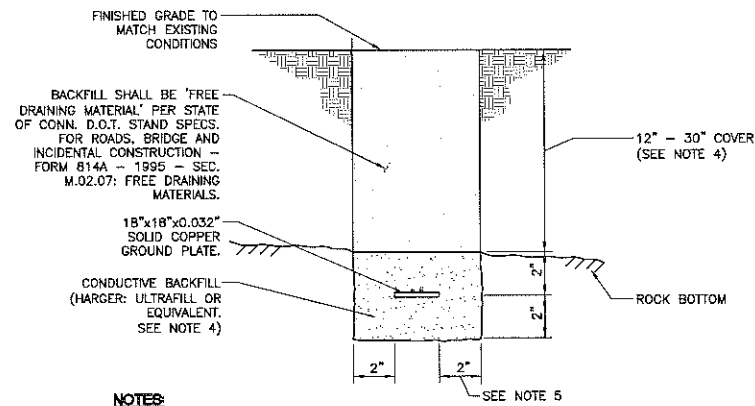




**NOTES:**

1. REFER TO SPECIFICATIONS FOR FOR ADDITIONAL NAMEPLATE REQUIREMENTS.
2. PROVIDE WARNING LABEL ON ALL SWITCHBOARDS, DISTRIBUTION PANELS, PANELBOARDS IN ACCORDANCE WITH 2005 NEC 110.16.

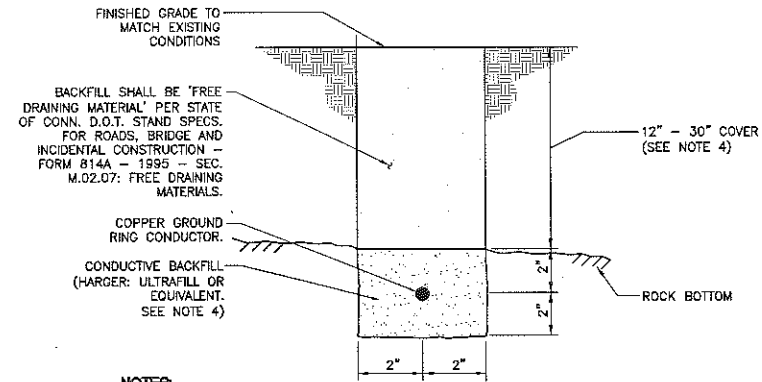
**1** DETAIL OF TYPICAL FLASH PROTECTION WARNING SIGN  
E-7 NOT TO SCALE



**NOTES:**

1. ENGINEER SHALL INSPECT PLACEMENT OF EGR CONDUCTOR PRIOR TO BACKFILLING.
2. MAINTAIN MIN. 2'-0" LINEAR CLEARANCE BETWEEN BACKFILL AND THE FOLLOWING: FOUNDATION, UNDERGROUND PIPING/CONDUIT, UNDERGROUND SERVICES. IN THE CLEARANCE AREAS, USE EARTH BACKFILL INSTEAD.
3. EXERCISE HANDLING AND USE PRECAUTION OF BACKFILL MATERIAL PER MFR'S REQUIREMENTS.
4. FOR LOCATIONS WHERE ROCK BOTTOM DEPTH IS LESS THAN 12" CONDUCTIVE CONCRETE SHALL BE USED INSTEAD OF CONDUCTIVE BACKFILL.
5. PROVIDE MIN 2" CLEARANCE ON ALL SIDES OF GROUND PLATE.

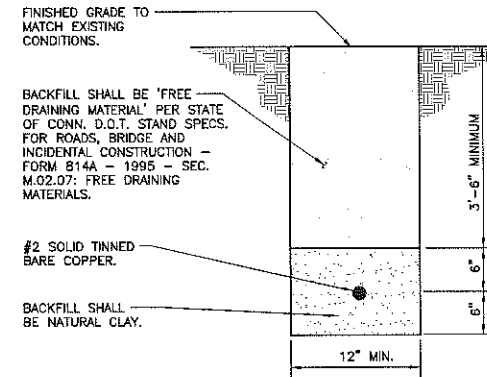
**3** GROUND PLATE TRENCH/BACKFILL DETAIL (SHALLOW TOPSOIL)  
E-7 NOT TO SCALE



**NOTES:**

1. ENGINEER SHALL INSPECT PLACEMENT OF EGR CONDUCTOR PRIOR TO BACKFILLING.
2. MAINTAIN MIN. 2'-0" LINEAR CLEARANCE BETWEEN BACKFILL AND THE FOLLOWING: FOUNDATION, UNDERGROUND PIPING/CONDUIT, UNDERGROUND SERVICES. IN THE CLEARANCE AREAS, USE EARTH BACKFILL INSTEAD.
3. EXERCISE HANDLING AND USE PRECAUTION OF BACKFILL MATERIAL PER MFR'S REQUIREMENTS.
4. FOR LOCATIONS WHERE ROCK BOTTOM DEPTH IS LESS THAN 12" CONDUCTIVE CONCRETE SHALL BE USED INSTEAD OF CONDUCTIVE BACKFILL.

**2** EGR TRENCH/BACKFILL DETAIL (SHALLOW TOPSOIL)  
E-7 NOT TO SCALE



**NOTES:**

1. ENGINEER SHALL INSPECT PLACEMENT OF EGR CONDUCTOR PRIOR TO BACKFILLING.
2. MAINTAIN MIN. 2'-0" LINEAR CLEARANCE BETWEEN NATURAL CLAY BACKFILL AND THE FOLLOWING: FOUNDATION, UNDERGROUND PIPING/CONDUIT, UNDERGROUND SERVICES. IN THE CLEARANCE AREAS, USE EARTH BACKFILL INSTEAD.
3. EXERCISE HANDLING AND USE PRECAUTION OF BACKFILL MATERIAL PER MFR'S REQUIREMENTS.

**4** EGR TRENCH/BACKFILL DETAIL  
E-7 NOT TO SCALE

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AT&T MOBILITY  
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SITE NUMBER: CT2279  
SITE NAME: NORTH STONINGTON - FT 201  
4508 COSAUBUCK HILL ROAD  
NORTH STONINGTON, CT 06399

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DETAILS  
E-7  
Sheet No. 13 of 14

**ELECTRICAL SPECIFICATIONS**

**SECTION 16010**

**1.01. SCOPE OF WORK**

- A. WORK SHALL INCLUDE ALL LABOR, EQUIPMENT AND SERVICES REQUIRED TO COMPLETE (MAKE READY FOR OPERATION) ALL THE ELECTRICAL WORK INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING:
  - 1. INSTALL 200A, 240/120V, 1F, 3 WIRE ELECTRIC SERVICE WITH REVENUE METER AND 200A MAIN CIRCUIT BREAKER FOR OWNER AND ASSOCIATED DISTRIBUTION EQUIPMENT. (AS REQUIRED BY UTILITY CO.)
  - 2. NEW SITE TELEPHONE SERVICE AS SPECIFIED BY TELEPHONE COMPANY.
  - 3. GENERATOR/TRANSFER SWITCH.
  - 4. FEEDERS AND BRANCH CIRCUIT WIRING TO PANELS, RECEPTACLES, EQUIPMENT, LIGHTING FIXTURES, ETC. AS INDICATED OR NOTED ON PLANS.
  - 5. POWER AND TEMPERATURE CONTROL WIRING FOR HVAC EQUIPMENT.
    - a. FURNISH AND INSTALL ALL POWER WIRING FOR ALL HEATING, VENTILATING, AIR CONDITIONING, MOTORS AND DEVICES, AND FIRE PROTECTION EQUIPMENT INDICATED ON THE PLANS OR CALLED FOR IN THIS SPECIFICATION, EITHER ELECTRICAL OR MECHANICAL INCLUDING ALL CONTROL WIRING. ALL MAGNETIC STARTERS SHALL BE FURNISHED UNDER DIVISION 15 AND HAVE INSTALLED THEREIN A PROPER OVERLOAD HEATER FOR EACH MOTOR.
    - b. ALL WIRING, BOTH POWER AND CONTROL, FOR SUCH ITEMS AS UNIT HEATERS, EXHAUST FANS, ETC., NOT SPECIFICALLY CALLED FOR IN THE TEMPERATURE CONTROL SPECIFICATIONS, SHALL BE WIRED UNDER DIVISION 16.
    - c. ALL CONTROLS WHICH ARE TO BE WIRED BY THIS CONTRACTOR SHALL BE DELIVERED TO HIM BY THE CONTRACTOR/VENDOR FURNISHING THEM.
  - 6. CELLULAR SITE ALARMS, ASSOCIATED WIRING AND DEVICES.
  - 7. CELLULAR GROUNDING SYSTEMS, CONSISTING OF ANTENNA GROUNDING, INTERIOR GROUNDING RING, GROUND BARS, ETC.
  - 8. FURNISH AND INSTALL 3/4" PLYWOOD BACKBOARD OF SIZE INDICATED ON DRAWINGS FOR MOUNTING OF POWER/SERVICE EQUIPMENT AND TELEPHONE/ALARM EQUIPMENT. BACKBOARDS SHALL BE PAINTED WITH TWO (2) COATS OF SEMI-GLOSS GRAY FIRE RETARDANT PAINT.
  - 9. FIELD MEASURE EXISTING ELECTRICAL SERVICES TO CONFIRM AVAILABLE EXISTING POWER.
  - 10. COORDINATE ALL WORK SHOWN, ON THESE PLANS WITH LOCAL UTILITY COMPANIES.
- B. LOCAL UTILITY COMPANIES SHALL PROVIDE THE FOLLOWING:
  - 1. TELEPHONE CABLES.
  - 2. SHUTDOWN OF SERVICE (COORDINATE WITH OWNER).
- C. CONTRACTOR SHALL CONFER WITH LOCAL UTILITY COMPANIES TO ASCERTAIN THE LIMITS OF THEIR WORK AND SHALL INCLUDE IN BID ANY CHARGES OR FEES MADE BY THE UTILITY COMPANIES FOR THEIR PORTION OF THE WORK AND SHALL PROVIDE AND INSTALL ALL ITEMS REQUIRED, BUT NOT PROVIDED BY UTILITY COMPANY.
- D. ELECTRICAL CONTRACTOR SHALL COORDINATE ELECTRICAL INSTALLATION WITH ELECTRIC UTILITY CO. PRIOR TO INSTALLATION.
- E. CONTRACTOR SHALL COORDINATE WITH TELEPHONE UTILITY COMPANY FOR LOCATION OF TELEPHONE SERVICE AND TO DETERMINE ANY REQUIRED EQUIPMENT TO BE INSTALLED BY CONTRACTOR.

**1.02. GENERAL REQUIREMENTS**

- A. THE ENTIRE ELECTRICAL INSTALLATION SHALL BE MADE IN STRICT ACCORDANCE WITH ALL LOCAL, STATE AND NATIONAL CODES AND REGULATIONS WHICH MAY APPLY AND NOTHING IN THE DRAWINGS OR SPECIFICATIONS SHALL BE INTERPRETED AS AN INFRINGEMENT OF SUCH CODES OR REGULATIONS.
- B. THE ELECTRICAL CONTRACTOR IS TO BE RESPONSIBLE FOR THE COMPLETE INSTALLATION AND COORDINATION OF THE ENTIRE ELECTRICAL SERVICE. ALL ACTIVITIES TO BE COORDINATED THROUGH OWNERS REPRESENTATIVE, DESIGN ENGINEER AND OTHER AUTHORITIES HAVING JURISDICTION OF TRADES.
- C. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND PAY ALL FEES THAT MAY BE REQUIRED FOR THE ELECTRICAL WORK AND FOR SCHEDULING OF ALL INSPECTIONS THAT MAY BE REQUIRED BY THE LOCAL AUTHORITY.
- D. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH THE BUILDING OWNER FOR NEW AND/OR DEMOLITION WORK INVOLVED.
- E. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH LOCAL TELEPHONE COMPANY THAT MAY BE REQUIRED FOR THE INSTALLATION OF TELEPHONE SERVICE TO THE PROPOSED CELLULAR SITE.
- F. NO MATERIAL OTHER THAN THAT CONTAINED IN THE "LATEST LIST OF ELECTRICAL FITTINGS" APPROVED BY THE UNDERWRITERS' LABORATORIES, SHALL BE USED IN ANY PART OF THE WORK. ALL MATERIAL FOR WHICH LABEL SERVICE HAS BEEN ESTABLISHED SHALL BEAR THE U.L. LABEL.
- G. THE CONTRACTOR SHALL GUARANTEE ALL NEW WORK FOR A PERIOD OF ONE YEAR FROM THE ACCEPTANCE DATE BY THE OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING WARRANTIES FROM ALL EQUIPMENT MANUFACTURERS FOR SUBMISSION TO THE OWNER.
- H. DRAWINGS INDICATE GENERAL ARRANGEMENT OF WORK INCLUDED IN CONTRACT. CONTRACTOR SHALL, WITHOUT EXTRA CHARGE, MAKE MODIFICATIONS TO THE LAYOUT OF THE WORK TO PREVENT CONFLICT WITH WORK OF OTHER TRADES AND FOR THE PROPER INSTALLATION OF WORK. CHECK ALL DRAWINGS AND VISIT JOB SITE TO VERIFY SPACE AND TYPE OF EXISTING CONDITIONS IN WHICH WORK WILL BE DONE, PRIOR TO SUBMITTAL OF BID.
- I. THE ELECTRICAL CONTRACTOR SHALL SUPPLY THREE (3) COMPLETE SETS OF APPROVED DRAWINGS, ENGINEERING DATA SHEETS, MAINTENANCE AND OPERATING INSTRUCTION MANUALS FOR ALL SYSTEMS AND THEIR RESPECTIVE EQUIPMENT. THESE MANUALS SHALL BE INSERTED IN VINYL COVERED 3-RING BINDERS AND TURNED OVER TO OWNER'S REPRESENTATIVE ONE (1) WEEK PRIOR TO FINAL PUNCH LIST.
- J. ALL WORK SHALL BE INSTALLED IN A NEAT AND WORKMAN LIKE MANNER AND WILL BE SUBJECT TO THE APPROVAL OF THE OWNER'S REPRESENTATIVE.
- K. ALL EQUIPMENT AND MATERIALS TO BE INSTALLED SHALL BE NEW, UNLESS OTHERWISE NOTED.
- L. BEFORE FINAL PAYMENT, THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF PRINTS (AS-BUILTS), LEGIBLY MARKED IN RED PENCIL TO SHOW ALL CHANGES FROM THE ORIGINAL PLANS.
- M. PROVIDE TEMPORARY POWER AND LIGHTING IN WORK AREAS AS REQUIRED.
- N. SHOP DRAWINGS:
  - 1. CONTRACTOR SHALL SUBMIT SIX (6) COPIES OF SHOP DRAWINGS ON ALL EQUIPMENT AND MATERIALS PROPOSED FOR USE ON THIS PROJECT, GIVING ALL DETAILS, WHICH INCLUDE DIMENSIONS, CAPACITIES, ETC.
  - 2. CONTRACTOR SHALL SUBMIT SIX (6) COPIES OF ALL TEST REPORTS CALLED FOR IN THE SPECIFICATIONS AND DRAWINGS.

O. ENTIRE ELECTRICAL INSTALLATION SHALL BE IN ACCORDANCE WITH OWNER'S SPECIFICATIONS, AND REQUIREMENTS OF ALL LOCAL AUTHORITIES HAVING JURISDICTION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE WITH APPROPRIATE INDIVIDUALS TO OBTAIN ALL SUCH SPECIFICATIONS AND REQUIREMENTS, NOTHING CONTAINED IN, OR OMITTED FROM, THESE DOCUMENTS SHALL RELIEVE CONTRACTOR FROM THIS OBLIGATION.

**SECTION 16111**

**1.01. CONDUIT**

- A. MINIMUM CONDUIT SIZE FOR BRANCH CIRCUITS, LOW VOLTAGE CONTROL AND ALARM CIRCUITS SHALL BE 3/4"; ALL CONDUIT RUNS LOCATED WITHIN THE OWNER'S EQUIPMENT ROOM SHALL ORIGINATE FROM THE WIREWAY AND RUN VERTICALLY TO ITS DESTINATION. NO BENDS WILL BE ACCEPTED. CONDUITS SHALL BE PROPERLY FASTENED TO THE WALLS AND CEILINGS AS REQUIRED BY THE N.E.C.
- CONDUIT MATERIAL SHALL BE AS FOLLOWS:
- 1. ELECTRIC METALLIC TUBING (EMT) - BRANCH CIRCUITS INSIDE WIRELESS ROOM
  - 2. GALVANIZED RIGID CONDUIT (GRC) - FEEDERS AND CIRCUITS EXPOSED TO EXTERIOR & UNDERGROUND.
  - 3. LIQUID TIGHT FLEXIBLE METAL CONDUIT - FOR SHORT LENGTHS (MAX. 3'-0") WIRING TO VIBRATING EQUIPMENT (HVAC UNITS, MOTORS, ETC.) IN WET LOCATIONS.
  - 4. FLEXIBLE METAL CONDUIT - FOR SHORT LENGTHS (MAX. 3'-0") WIRING TO VIBRATING EQUIPMENT IN DRY LOCATIONS.
  - 5. PVC CONDUIT - WHERE SHOWN ON GROUNDING DETAILS.

**SECTION 16114**

**1.01. CABLE TRAY**

- A. CABLE TRAY SHALL BE SOLID SIDE BAR, 18" WIDE (NEWTON INSTRUMENT COMPANY, INC.). TRAY SHALL BE INSTALLED AS SHOWN ON CONTRACT DOCUMENTS.
- B. CROSSWISE RUNS SHALL BE COORDINATED WITH THE SPECIFIC EQUIPMENT THE TRAY SHALL SERVE.
- C. ALL PROTRUDING CABLE TRAY SUPPORT RODS SHALL BE FILED SMOOTH WITH NO SHARP EDGES. ALL SUPPORT RODS SHALL BE CAD-PLATED FOR RUST RESISTANCE AND A MINIMUM 1/2" DIAMETER.

**SECTION 16123**

**1.01. CONDUCTORS**

- A. ALL CONDUCTORS SHALL BE TYPE THHN (INT. APPLICATION) AND XHHW (EXT. APPLICATION), 75 DEGREE C, 600 VOLT INSULATION, SOFT ANNEALED STRANDED COPPER. #10 AWG AND SMALLER SHALL BE SPICED USING ACCEPTABLE SOLDERLESS PRESSURE CONNECTORS. #8 AWG AND LARGER SHALL BE SPICED USING COMPRESSION SPLIT-BOLT TYPE CONNECTORS. #12 AWG SHALL BE THE MINIMUM SIZE CONDUCTOR FOR LINE VOLTAGE BRANCH CIRCUITS. REFER TO PANEL SCHEDULE FOR BRANCH CIRCUIT CONDUCTOR SIZE(S). CONDUCTORS SHALL BE COLOR CODED FOR CONSISTENT PHASE IDENTIFICATION:
 

LINE	120/208/240V	277/480V
A	BLACK	BROWN
B	RED	ORANGE
C	BLUE	YELLOW
H	CONTINUOUS WHITE	GREY
G	CONTINUOUS GREEN	GREEN WITH YELLOW STRIPE
- B. MINIMUM BENDING RADIUS FOR CONDUCTORS SHALL BE 12 TIMES THE LARGEST DIAMETER OF BRANCH CIRCUIT CONDUCTOR.

**SECTION 16130**

**1.01. BOXES**

- A. FURNISH AND INSTALL OUTLET BOXES FOR ALL DEVICES, SWITCHES, RECEPTACLES, ETC., BOXES TO BE ZINC COATED STEEL.
- B. FURNISH AND INSTALL PULL BOXES IN MAIN FEEDERS RUNS WHERE REQUIRED. PULL BOXES SHALL BE GALVANIZED STEEL WITH SCREW REMOVABLE COVERS, SIZE AND QUANTITY AS REQUIRED. PROVIDE WEATHERPROOF CONSTRUCTION IN WET LOCATIONS.

**SECTION 16140**

**1.01. WIRING DEVICES**

- A. THE FOLLOWING LIST IS PROVIDED TO CONVEY THE QUALITY AND RATING OF WIRING DEVICES WHICH ARE TO BE INSTALLED. A COMPLETE LIST OF ALL DEVICES MUST BE SUBMITTED BEFORE INSTALLATION FOR APPROVAL.
  - 1. 15 MINUTE TIMER SWITCH - INTERMATIC #FF15M (INTERIOR LIGHTS)
  - 2. DUPLEX RECEPTACLE - P&S #2095 (GFC) SPECIFICATION GRADE
  - 3. SINGLE POLE SWITCH - P&S #CSB20AC2 (20A-120V HARD USE) SPECIFICATION GRADE
  - 4. DUPLEX RECEPTACLE - P&S #5362 (20A-120V HARD USE) SPECIFICATION GRADE
- B. PLATES - ALL PLATES USED SHALL BE CORROSION RESISTANT TYPE 304 STAINLESS STEEL. PLATES SHALL BE FROM SAME MANUFACTURER AS SWITCHES AND RECEPTACLES. PROVIDE WEATHERPROOF HOUSING FOR DEVICES LOCATED IN WET LOCATIONS.
- C. OTHER MANUFACTURERS OF THE SWITCHES, RECEPTACLES AND PLATES MAY BE SUBMITTED FOR APPROVAL BY THE ENGINEER.

**SECTION 16170**

**1.01. DISCONNECT SWITCHES**

- A. FUSIBLE AND NON-FUSIBLE, 800V, HEAVY DUTY DISCONNECT SWITCHES SHALL BE AS MANUFACTURED BY SQUARE "D". PROVIDE FUSES AS CALLED FOR ON THE CONTRACT DRAWINGS. AMPERE RATING SHALL BE CONSISTENT WITH LOAD BEING SERVED. DISCONNECT SWITCH COVER SHALL BE MECHANICALLY INTERLOCKED TO PREVENT COVER FROM OPENING WHEN THE SWITCH IS IN THE "ON" POSITION. EXTERIOR APPLICATIONS SHALL BE NEMA 3R CONSTRUCTION WITH PADLOCK FEATURE.

**SECTION 16190**

**1.01. SEISMIC RESTRAINT**

- A. ALL DEVICES SHALL BE INSTALLED IN ACCORDANCE WITH ZONE 2 SEISMIC REQUIREMENTS.

**SECTION 16195**

**1.01. LABELING AND IDENTIFICATION NOMENCLATURE FOR ELECTRICAL EQUIPMENT**

- A. CONTRACTOR SHALL FURNISH AND INSTALL NON-METALLIC ENGRAVED BACK-LIT NAMEPLATES ON ALL PANELS AND MAJOR ITEMS OF ELECTRICAL EQUIPMENT.
- B. LETTERS TO BE WHITE ON BLACK BACKGROUND WITH LETTERS 1-1/2 INCH HIGH WITH 1/4 INCH MARGIN.
- C. IDENTIFICATION NOMENCLATURE SHALL BE IN ACCORDANCE WITH OWNER'S STANDARDS.

- D. PROVIDE NAMEPLATE FOR PORTABLE ENGINE/GENERATOR CONNECTION SHOWING VOLTAGE KVA/KW RATING, # PHASE, AND # OF WIRES. PLATE TO BE PLASTIC ENGRAVED, RED WITH WHITE LETTERS.
- E. ALL RECEPTACLES, SWITCHES, DISCONNECT SWITCHES, ETC. SHALL BE LABELED WITH THE CORRECT BRANCH CIRCUIT NUMBER SERVED BY MEANS OF PERMANENT PRESSED TYPE BLACK 1/4" TRANSFER LETTERING. (FOR EXAMPLE: "MDF-S", ETC.).
- F. PROVIDE A NAMEPLATE AT THE SERVICE EQUIPMENT INDICATING THE TYPE AND LOCATION OF THE ON SITE GENERATOR.

**SECTION 16450**

**1.01. GROUNDING**

- A. ALL NON-CURRENT CARRYING PARTS OF THE ELECTRICAL AND TELEPHONE CONDUIT SYSTEMS SHALL BE MECHANICALLY AND ELECTRICALLY CONNECTED TO PROVIDE AN INDEPENDENT RETURN PATH TO THE EQUIPMENT GROUNDING SOURCES.
- B. GROUNDING SYSTEM WILL BE IN ACCORDANCE WITH THE LATEST ACCEPTABLE EDITION OF THE NATIONAL ELECTRICAL CODE AND REQUIREMENTS PER LOCAL INSPECTOR HAVING JURISDICTION.
- C. GROUNDING OF PANELBOARDS:
  - 1. PANELBOARD SHALL BE GROUNDED BY TERMINATING THE PANELBOARD FEEDER'S EQUIPMENT GROUND CONDUCTOR TO THE EQUIPMENT GROUND BAR KIT(S) LOCATED TO THE CABINET. ENSURE THAT THE SURFACE BETWEEN THE KIT AND CABINET ARE BARE METAL TO BARE METAL. PRIME AND PAINT OVER TO PREVENT CORROSION.
  - 2. CONDUIT(S) TERMINATING INTO THE PANELBOARD SHALL HAVE GROUNDING TYPE BUSHINGS. THE BUSHINGS SHALL BE BONDED TOGETHER WITH BARE #10 AWG COPPER CONDUCTOR WHICH IN TURN IS TERMINATED INTO THE PANELBOARD'S EQUIPMENT GROUND BAR KIT(S).
- D. EQUIPMENT GROUNDING CONDUCTOR:
  - 1. EACH EQUIPMENT GROUND CONDUCTOR SHALL BE SIZED IN ACCORDANCE WITH THE N.E.C. ARTICLE 250-122.
  - 2. THE MINIMUM SIZE OF EQUIPMENT GROUND CONDUCTOR SHALL BE #12 AWG COPPER.
  - 3. REFER TO PANEL SCHEDULE "BRANCH CIRCUIT" DATA FOR EQUIPMENT GROUND CONDUCTOR SIZE FOR EACH BRANCH CIRCUIT.
  - 4. EACH FEEDER OR BRANCH CIRCUIT SHALL HAVE EQUIPMENT GROUND CONDUCTOR(S) INSTALLED IN THE SAME RACEWAY(S).
- E. CELLULAR GROUNDING SYSTEM:
  - CONTRACTOR SHALL PROVIDE A CELLULAR GROUNDING SYSTEM WITH THE MAXIMUM AC RESISTANCE TO GROUND OF 5 OHM BETWEEN ANY POINT ON THE GROUNDING SYSTEM AS MEASURED BY 3-POINT GROUNDING TEST. (REFER TO SECTION 16990).
  - PROVIDE THE CELLULAR GROUNDING SYSTEM AS SPECIFIED ON DRAWINGS, INCLUDING, BUT NOT LIMITED TO:
    - 1. GROUND BARS
    - 2. INTERIOR GROUND RING
    - 3. EXTERIOR GROUNDING (WHERE REQUIRED DUE TO MEASURED AC RESISTANCE GREATER THAN SPECIFIED).
    - 4. ANTENNA GROUND CONNECTIONS AND PLATES.
  - F. CONTRACTOR, AFTER COMPLETION OF THE COMPLETE GROUNDING SYSTEM BUT PRIOR TO CONCEALMENT/BURIAL OF SAME, SHALL NOTIFY OWNER'S WIRELESS PROJECT ENGINEER WHO WILL HAVE A DESIGN ENGINEER VISIT SITE AND MAKE A VISUAL INSPECTION OF THE GROUNDING GRID AND CONNECTIONS OF THE SYSTEM.
  - G. ALL EQUIPMENT SHALL BE BONDED TO GROUND AS REQUIRED BY N.E.C., MFG. SPECIFICATIONS, AND OWNER'S SPECIFICATIONS.

**SECTION 16470**

**1.01. DISTRIBUTION EQUIPMENT**

- A. REFER TO CONTRACT DRAWINGS FOR DETAILS AND SCHEDULES.

**SECTION 16477**

**1.01. FUSES**

- A. FUSES SHALL BE NONRENEWABLE TYPE AS MANUFACTURED BY "BUSSMAN" OR APPROVED EQUAL. FUSES RATED TO 1/10 AMPERE UP TO 600 AMPERES SHALL BE EQUIVALENT TO BUSSMAN TYPE LPN-RK (250V) UL CLASS RK1, LOW PEAK, DUAL ELEMENT, TIME-DELAY FUSES. FUSES SHALL HAVE SEPARATE SHORT CIRCUIT AND OVERLOAD ELEMENTS AND HAVE AN INTERRUPTING RATING OF 200 KAIC. UPON COMPLETION OF WORK, PROVIDE ONE SPARE SET OF FUSES FOR EACH TYPE INSTALLED.

**SECTION 16620**

**(SUPPLIED BY OWNER, INSTALLED BY CONTRACTOR)**

**1.01. GENERATOR SET**

- A. REFER TO CONTRACT DRAWINGS FOR DETAILS AND SCHEDULES.

**SECTION 16960**

**1.01. TESTS BY INDEPENDENT ELECTRICAL TESTING FIRM**

- A. CONTRACTOR SHALL RETAIN THE SERVICES OF A LOCAL INDEPENDENT ELECTRICAL TESTING FIRM (WITH MINIMUM 5 YEARS COMMERCIAL EXPERIENCE IN THE ELECTRICAL TESTING INDUSTRY) AS SPECIFIED BY OWNER TO PERFORM:
  - TEST 1: THERMAL OVERLOAD AND MAGNETIC TRIP TEST, AND CABLE INSULATION TEST FOR ALL CIRCUIT BREAKERS RATED 100 AMPS OR GREATER.
  - TEST 2: RESISTANCE TO GROUND TEST ON THE CELLULAR GROUNDING SYSTEM.
- THE TESTING FIRM SHALL INCLUDE THE FOLLOWING INFORMATION WITH THE REPORT:
  - 1. TESTING PROCEDURE INCLUDING THE MAKE AND MODEL OF TEST EQUIPMENT.
  - 2. CERTIFICATION OF TESTING EQUIPMENT CALIBRATION WITHIN SIX (6) MONTHS OF DATE OF TESTING. INCLUDE CERTIFICATION LAB ADDRESS AND TELEPHONE NUMBER.
  - 3. GRAPHICAL DESCRIPTION OF TESTING METHOD ACTUALLY IMPLEMENTED.
- B. THESE TESTS SHALL BE PERFORMED IN THE PRESENCE AND TO THE SATISFACTION OF OWNER'S CONSTRUCTION REPRESENTATIVE. TESTING DATA SHALL BE INITIALED AND DATED BY THE CONSTRUCTION REPRESENTATIVE AND INCLUDED WITH THE WRITTEN REPORT/ANALYSIS.
- C. THE CONTRACTOR SHALL FORWARD SIX (6) COPIES OF THE INDEPENDENT ELECTRICAL TESTING FIRM'S REPORT/ANALYSIS TO ENGINEER A MINIMUM OF TEN (10) WORKING DAYS PRIOR TO THE JOB TURNOVER.
- D. CONTRACTOR TO PROVIDE A MINIMUM OF ONE (1) WEEK NOTICE TO OWNER AND ENGINEER FOR ALL TESTS REQUIRING WITNESSING.

**SECTION 16961**

**1.01. TESTS BY CONTRACTOR**

- A. ALL TESTS AS REQUIRED UPON COMPLETION OF WORK, SHALL BE MADE BY THIS CONTRACTOR. THESE SHALL BE CONTINUITY AND INSULATION TESTS; TEST TO DETERMINE THE QUALITY OF MATERIALS, ETC. AND SHALL BE MADE IN ACCORDANCE WITH N.E.C. RECOMMENDATIONS. ALL FEEDERS AND BRANCH CIRCUIT WIRING (EXCEPT CLASS 2 SIGNAL CIRCUITS) MUST BE TESTED FREE FROM SHORT CIRCUIT AND GROUND FAULT CONDITIONS AT 500V IN A REASONABLY DRY AMBIENT OF APPROXIMATELY 70 DEGREES F.
- B. CONTRACTOR SHALL PERFORM LOAD PHASE BALANCING TESTS. CIRCUITS SHALL BE SO CONNECTED TO THE PANELBOARDS SUCH THAT THE NEW LOAD IS DISTRIBUTED AS EQUALLY AS POSSIBLE BETWEEN EACH LOAD AND NEUTRAL. 10% SHALL BE CONSIDERED AS A REASONABLE AND ACCEPTABLE ALLOWANCE. BRANCH CIRCUITS SHALL BE BALANCED ON THEIR OWN PANELBOARDS; FEEDER LOADS SHALL, IN TURN, BE BALANCED ON THE SERVICE EQUIPMENT. REASONABLE LOAD TEST SHALL BE ARRANGED TO VERIFY LOAD BALANCE IF REQUESTED BY THE ENGINEER.
- C. ALL TESTS, UPON REQUEST, SHALL BE REPEATED IN THE PRESENCE OF OWNER'S REPRESENTATIVE. ALL TESTS SHALL BE DOCUMENTED AND TURNED OVER TO OWNER. OWNER SHALL HAVE THE AUTHORITY TO STOP ANY OF THE WORK NOT BEING PROPERLY INSTALLED. ALL SUCH DETECTED WORK SHALL BE REPAIRED OR REPLACED AT NO ADDITIONAL EXPENSE TO THE OWNER AND THE TESTS SHALL BE REPEATED.

DATE	REV.	DATE	REV.	DATE	REV.	DATE	REV.	DATE	REV.
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CONSTRUCTION	CLIENT REVIEW	DRAIN BY	CHK'D BY	CDD	CDD	CDD	CDD	CDD	CDD
<b>AT&amp;T MOBILITY</b> WIRELESS COMMUNICATIONS FACILITY <b>SITE NUMBER: CT2279</b> <b>SITE NAME: NORTH STONINGTON - FT 201</b> 5908 COSSAUCK HILL ROAD NORTH STONINGTON, CT 06389									
DATE: 05/23/14 SCALE: AS NOTED JOB NO. 14034.000									
<b>SPECIFICATIONS</b>									
<b>E-8</b>									
Sheet No. 14 of 14									





FDH Engineering, Inc., 6521 Meridien Drive Raleigh, NC 27616, Ph. 919.755.1012

**Structural Analysis for  
SBA Network Services, Inc.**

**190' Monopole Tower**

**SBA Site Name: North Stonington 3  
SBA Site ID: CT11796-S-01  
AT&T Site Name: N. Stonington  
AT&T Site ID: CT2279**

FDH Project Number 1466LL1400

**Analysis Results**

Tower Components	96.9%	Sufficient
Foundation	62.5%	Sufficient

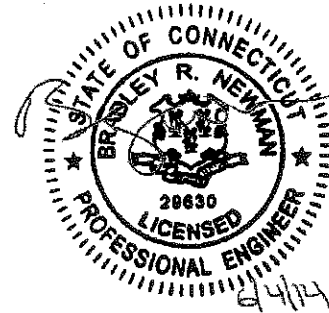
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June 4, 2014

Prepared pursuant to TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures and the 2005 Connecticut Building Code (CBC)

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## EXECUTIVE SUMMARY

At the request of SBA Network Services, Inc., FDH Engineering, Inc. performed a structural analysis of the monopole located in North Stonington, CT to determine whether the tower is structurally adequate to support both the existing and proposed loads pursuant to the *Structural Standards for Steel Antenna Towers and Antenna Supporting Structures, TIA/EIA-222-F* and the *2005 Connecticut Building Code (CBC)*. Information pertaining to the existing/proposed antenna loading, current tower geometry, foundation dimensions, geotechnical data, and member sizes was obtained from:

- Sabre Industries (Job No. 57617) Structural Design Report dated March 26, 2012
- Sabre Industries (Job No. 57617) final erection drawings dated April 9, 2012
- Tower Engineering Professionals (Project No. 121203.10) Subsurface Exploration Report dated March 9, 2012
- SBA Network Services, Inc.

The *basic design wind speed* per the *TIA/EIA-222-F* standards and the *2005 Connecticut Building Code* is 85 mph without ice and 38 mph with 3/4" radial ice. Ice is considered to increase in thickness with height.

## Conclusions

With the existing and proposed antennas from AT&T in place at 186 ft, the tower meets the requirements of the *TIA/EIA-222-F* standards and *2005 CBC* provided the **Recommendations** listed below are satisfied. Furthermore, provided the foundation was designed and constructed to support the original design reactions (see Sabre Industries Job No. 57617), the foundation should have the necessary capacity to support the existing and proposed loading. For a more detailed description of the analysis of the tower, see the **Results** section of this report.

Our structural analysis has been performed assuming all information provided to FDH Engineering, Inc. is accurate (i.e., the steel data, tower layout, existing antenna loading, and proposed antenna loading) and that the tower has been properly erected and maintained per the original design drawings.

## Recommendations

To ensure the requirements of the *TIA/EIA-222-F* standards and *2005 CBC* are met with the existing and proposed loading in place, we have the following recommendations:

1. The proposed coax should be installed inside the monopole's shaft.
2. RRU/RRH Stipulation: The equipment may be installed in any arrangement as determined by the client.

**APPURTENANCE LISTING**

The proposed and existing antennas with their corresponding cables/coax lines are shown in **Table 1**. *If the actual layout determined in the field deviates from the layout, FDH Engineering, Inc. should be contacted to perform a revised analysis.*

**Table 1 - Appurtenance Loading**

**Existing Loading:**

Antenna Elevation (ft)	Description	Coax and Lines <sup>1</sup>	Carrier	Mount Elevation (ft)	Mount Type
188	(9) Powerwave P90-14-XLH-RR (6) Powerwave TT08-19DB111-001 TMAs (3) Ericsson RRUS-11 RRUs	(12) 1-5/8"	AT&T	188	(1) Platform w/ Handrails (Assumed C <sub>A</sub> A <sub>A</sub> = 32.03 ft <sup>2</sup> )
178	(6) Antel BXA-70063/6CF (6) Antel BXA-171063/12CF (3) Alcatel Lucent RRH 2X40-AWS RRUs (3) Alcatel Lucent RRH 2X40-07-U RRUs (1) RFS DB-T1-6Z-8AB-0Z Junction Box	(2) 1-5/8" Fiber	Verizon	178	(1) Low Profile Platform (Valmont P/N: RMQP-463)

1. Coax installed inside pole's shaft unless otherwise noted.

**Proposed Carrier Final Loading:**

Antenna Elevation (ft)	Description	Coax and Lines	Carrier	Mount Elevation (ft)	Mount Type
186	(12) CCI HPA-65R-BUJ-H8 (9) Ericsson RRUS-11 RRUs (6) Ericsson RRUS-12 RRUs (6) Ericsson RRU A2 Modules (3) Ericsson RRUS-E2 RRUs (3) Ericsson RRUS-32 RRUs (4) Raycap DC6-48-60-18-8F Surge	(8) 5/8" DC (2) 5/8" Fiber (3) RET	AT&T	186	(1) Platform w/ Handrails (MTC3607R)

## RESULTS

The following yield strength of steel for individual members was used for analysis:

**Table 2 - Material Strength**

Member Type	Yield Strength
Tower Shaft Sections	65 ksi
Base Plate	50 ksi
Anchor Bolts	75 ksi

**Table 3** displays the summary of the ratio (as a percentage) of force in the member to their capacities. Values greater than 100% indicate locations where the maximum force in the member exceeds its capacity. *Note: Capacities up to 100% are considered acceptable.* **Table 4** displays the maximum foundation reactions.

If the assumptions outlined in this report differ from actual field conditions, FDH Engineering, Inc. should be contacted to perform a revised analysis. Furthermore, as no information pertaining to the allowable twist and sway requirements for the existing or proposed appurtenances was provided, deflection and rotation were not taken into consideration when performing this analysis.

See the **Appendix** for detailed modeling information.

**Table 3 - Summary of Working Percentage of Structural Components**

Section No.	Elevation ft	Component Type	Size	% Capacity*	Pass Fail
L1	190 - 139	Pole	TP32.7527x21.65x0.25	96.9	Pass
L2	139 - 94.75	Pole	TP41.8859x31.2731x0.375	89.5	Pass
L3	94.75 - 47	Pole	TP51.5311x39.8842x0.4375	86.5	Pass
L4	47 - 1	Pole	TP60.6703x49.0778x0.5	79.7	Pass
-	1	Anchor Bolts	(24) 2.25" Ø w/ BC = 67.5"	72.4	Pass
-	1	Base Plate	69.75" SQ PL x 3" Thk.	56.3	Pass

\*Capacities include 1/3 allowable increase for wind.

**Table 4 - Maximum Base Reactions**

Base Reactions	Current Analysis (TJA/EIA-222-F)	Original Design (ANSI/TIA-222-G)
Axial	45 k	79 k
Shear	34 k	60 k
Moment	4,830 k-ft	7,779 k-ft



## **GENERAL COMMENTS**

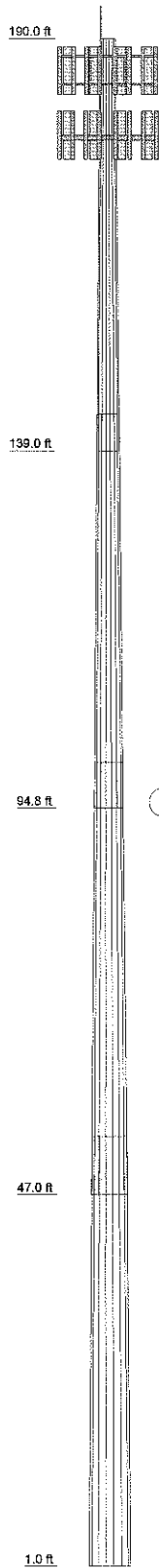
This engineering analysis is based upon the theoretical capacity of the structure. It is not a condition assessment of the tower and its foundation. It is the responsibility of SBA Network Services, Inc. to verify that the tower modeled and analyzed is the correct structure (with accurate antenna loading information) modeled. If there are substantial modifications to be made or the assumptions made in this analysis are not accurate, FDH Engineering, Inc. should be notified immediately to perform a revised analysis.

## **LIMITATIONS**

All opinions and conclusions are considered accurate to a reasonable degree of engineering certainty based upon the evidence available at the time of this report. All opinions and conclusions are subject to revision based upon receipt of new or additional/updated information. All services are provided exercising a level of care and diligence equivalent to the standard and care of our profession. No other warranty or guarantee, expressed or implied, is offered. Our services are confidential in nature and we will not release this report to any other party without the client's consent. The use of this engineering work is limited to the express purpose for which it was commissioned and it may not be reused, copied, or distributed for any other purpose without the written consent of FDH Engineering, Inc.

## APPENDIX

Section	1	2	3	4	
Length (ft)	51.00	48.75	53.50	53.25	
Number of Sides	18	18	18	18	
Thickness (in)	0.2500	0.3750	0.4375	0.5000	
Socket Length (ft)	4.50	5.75	7.25	49.0778	
Top Dia (in)	21.6500	31.2731	39.8841	60.6703	
Bot Dia (in)	32.7527	41.8858	51.5311		
Grade			A572-65		
Weight (K)	3.7	7.4	11.4	15.6	37.6



**DESIGNED APPURTENANCE LOADING**

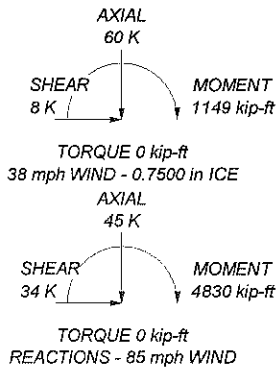
TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod	190	DC6-48-60-18-8F	186
MTC3607R	186	DC6-48-60-18-8F	186
(4) HPA-65R-BUU-H8	186	(2) DC6-48-60-18-8F	186
(4) HPA-65R-BUU-H8	188	Mount Kicker	186
(4) HPA-65R-BUU-H8	186	RRH2X40-07-U	178
(3) RRUS-11	186	RRH2X40-07-U	178
(3) RRUS-11	188	RRH2X40-07-U	178
(3) RRUS-11	186	DB-T1-6Z-8AB-0Z	178
(2) RRUS-12	186	(1) Low Profile Platform (Valmont P/N: RMQP-483)	178
(2) RRUS-12	186	(2) BXA-70063/6CF w/ Mount Pipe	178
(2) RRU-A2 Module	186	(2) BXA-70063/6CF w/ Mount Pipe	178
(2) RRU-A2 Module	186	(2) BXA-70063/6CF w/ Mount Pipe	178
(2) RRU-A2 Module	186	(2) BXA-171063/12CF w/ Mount Pipe	178
RRUS-E2	186	(2) BXA-171063/12CF w/ Mount Pipe	178
RRUS-E2	186	(2) BXA-171063/12CF w/ Mount Pipe	178
RRUS-E2	186	RRH2X40-AWS	178
RRUS-32	186	RRH2X40-AWS	178
RRUS-32	186	RRH2X40-AWS	178
RRUS-32	186		

**MATERIAL STRENGTH**

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

**TOWER DESIGN NOTES**

1. Tower is located in New London County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 96.9%



<p><b>FDH Engineering, Inc.</b> 6521 Meridien Drive, Suite 107 Raleigh, North Carolina 27616 Phone: 9197551012 FAX: 9197551031</p>	<p>Job: <b>North Stonington 3, CT11796-S-01</b></p>		
	<p>Project: <b>1466LL1400</b></p>		
	<p>Client: <b>SBA Network Services, Inc.</b></p>	<p>Drawn by: <b>DFalconi</b></p>	<p>App'd:</p>
	<p>Code: <b>TIA/EIA-222-F</b></p>	<p>Date: <b>06/04/14</b></p>	<p>Scale: <b>NTS</b></p>
	<p>Path:</p>		<p>Dwg No. <b>E-1</b></p>

## Square, Stiffened / Unstiffened Base Plate, Any Rod Material - Rev. F / G

- Assumptions:**
- 1) Rod groups at corners. Total # rods divisible by 4. Maximum total # of rods = 48 (12 per Corner).
  - 2) Rod Spacing = Straight Center-to-Center distance between any (2) adjacent rods (same corner)
  - 3) Clear space between bottom of leveling nut and top of concrete not exceeding  $(1) \times (\text{Rod Diameter})$

### Site Data

Project No. 1466LL1400  
 Site Name: North Stonington 3  
 Site No. CT11796-S-01

Anchor Rod Data		
Qty:	24	
Diam:	2.25	in
Rod Material:	A615-J	
Yield, Fy:	75	ksi
Strength, Fu:	100	ksi
Bolt Circle:	67.5	in
Anchor Spacing:	6	in

Plate Data		
W=Side:	69.75	in
Thick:	3	in
Grade:	50	ksi
Clip Distance:	17	in

Stiffener Data (Welding at both sides)		
Configuration:	Unstiffened	
Weld Type:	**	
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data		
Diam:	60.6703	in
Thick:	0.5	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round

Stress Increase Factor		
ASD ASIF:	1.333	

\*\* Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

### Base Reactions

TIA Revision:	F	
Unfactored Moment, M:	4830	ft-kips
Unfactored Axial, P:	45	kips
Unfactored Shear, V:	34	kips

### Anchor Rod Results

TIA F --> Maximum Rod Tension: 141.2 Kips  
 Allowable Tension: 195.0 Kips  
 Anchor Rod Stress Ratio: 72.4% Pass

### Base Plate Results

Base Plate Stress: 28.1 ksi  
 Allowable PL Bending Stress: 50.0 ksi  
 Base Plate Stress Ratio: 56.3% Pass

### Flexural Check

### PL Ref. Data

Yield Line (in):	37.97
Max PL Length:	37.97

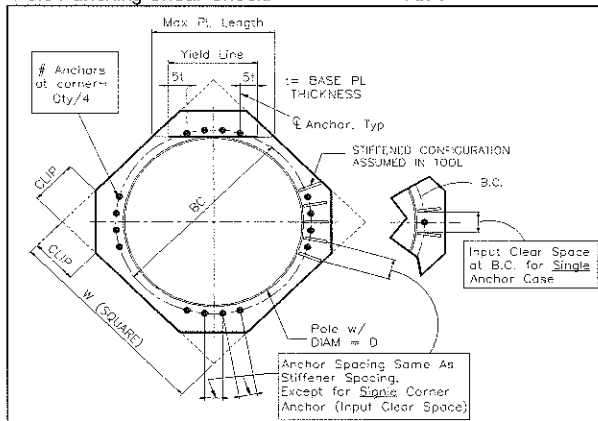
### N/A - Unstiffened

### Stiffener Results

Horizontal Weld: N/A  
 Vertical Weld: N/A  
 Plate Flex+Shear,  $f_b/F_b + (f_v/F_v)^2$ : N/A  
 Plate Tension+Shear,  $f_t/F_t + (f_v/F_v)^2$ : N/A  
 Plate Comp. (AISC Bracket): N/A

### Pole Results

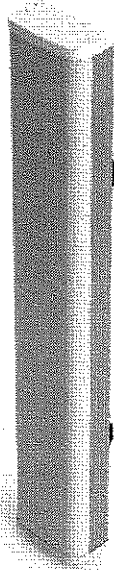
Pole Punching Shear Check: N/A





## HexPORT Multi-Band ANTENNA

### Model HPA-65R-BUU-H8



The CCI Hexport Multi-Band Antenna Array is an industry first 6-port antenna with full WCS Band Coverage. With four high band ports and two low band ports, our hexport antenna is ready for 4X4 high band MIMO.

Modern networks demand high performance, consequently CCI has incorporated several new and innovative design techniques to provide an antenna with excellent side-lobe performance, sharp elevation beams, and high front to back ratio.

Multiple networks can now be connected to a single antenna, reducing tower loading and leasing expense, while decreasing deployment time and installation cost.

Full band capability for 700 MHz , Cellular 850 MHz, PCS 1900 MHz, AWS 1710/2170 MHz and WCS 2300 MHz coverage in a single enclosure.

### Hexport Multi-Band Antenna Array

#### Benefits

- ◆ Includes WCS Band
- ◆ Reduces tower loading
- ◆ Frees up space for tower mounted E-nodes
- ◆ Single radome with six ports
- ◆ All Band design simplifies radio assignments
- ◆ Sharp elevation beam eases network planning

#### Features

- ◆ High Band Ports include WCS Band
- ◆ Four High Band ports with two Low Band ports in one antenna
- ◆ Sharp elevation beam
- ◆ Excellent elevation side-lobe performance
- ◆ Excellent MIMO performance due to array spacing
- ◆ Excellent PIM Performance
- ◆ A multi-network solution in one radome

#### Applications

- ◆ 4x4 MIMO on High Band and 2x2 MIMO on Low Band
- ◆ Adding additional capacity without adding additional antennas
- ◆ Adding WCS Band without increasing antenna count



# HexPORT Multi-Band ANTENNA

## Model HPA-65R-BUU-H8

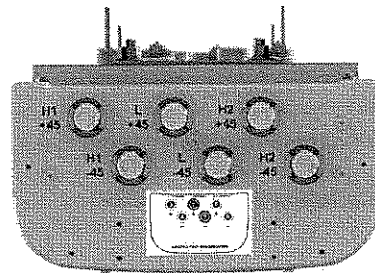
### HPA-65R Multi-Band Antenna

#### Electrical Specifications

Frequency Range	2 X Low Band Ports which cover the full range from 698-894 MHz		4 X High Band Ports which cover the full range from 1710-2360 MHz			
	698-806 MHz	824-894 MHz	1850-1990 MHz	1710-1755/2110-2170 MHz	2305-2360 MHz	
Gain	15.3 dBi	16.2 dBi	17.1 dBi	16.3 dBi	17.4 dBi	17.7 dBi
Azimuth Beamwidth (-3dB)	65°	61°	62°	68°	64°	60°
Elevation Beamwidth (-3dB)	10.1°	8.4°	5.6°	6.2°	5.0°	4.5°
Electrical Downtilt	2° to 10°	2° to 10°	0° to 8°	0° to 8°	0° to 8°	0° to 8°
Elevation Sidelobes (1st Upper)	< -17 dB	< -17 dB	< -19 dB	< -18 dB	< -18 dB	< -17 dB
Front-to-Back Ratio @180°	> 29 dB	> 28 dB	> 35 dB	> 35 dB	> 35 dB	> 35 dB
Front-to-Back Ratio over ± 20°	> 28 dB	> 27 dB	> 28 dB	> 27 dB	> 28 dB	> 28 dB
Cross-Polar Discrimination (at Peak)	> 24 dB	> 20 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB
Cross-Polar Discrimination (at ± 60°)	> 16 dB	> 14 dB	> 18 dB	> 18 dB	> 18 dB	> 18 dB
Cross-Polar Port-to-Port Isolation	> 25 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB
VSWR	< 1.5:1	< 1.5:1	< 1.5:1	< 1.5:1	< 1.5:1	< 1.5:1
Passive Intermodulation (2x20W)	≤ -150dBc	≤ -150dBc	≤ -150dBc	≤ -150dBc	≤ -150dBc	≤ -150dBc
Input Power	500 Watts CW	500 Watts CW	300 Watts CW	300 Watts CW	300 Watts CW	300 Watts CW
Polarization	Dual Pol 45°	Dual Pol 45°	Dual Pol 45°	Dual Pol 45°	Dual Pol 45°	Dual Pol 45°
Input Impedance	50 Ohms	50 Ohms	50 Ohms	50 Ohms	50 Ohms	50 Ohms
Lightning Protection	DC Ground	DC Ground	DC Ground	DC Ground	DC Ground	DC Ground

#### Mechanical Specifications

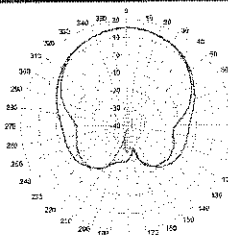
Dimensions (LxWxD)	92.4 x 14.8 x 7.4 inches (2348 x 376 x 189 mm)
Survival Wind Speed	> 150 mph
Front Wind Load	332 lbs (1479 N) @ 100 mph (161 kph)
Side Wind Load	193 lbs (860 N) @ 100 mph (161 kph)
Equivalent Flat Plate Area	13.0 ft <sup>2</sup> (1.2 m <sup>2</sup> )
Weight (without Mounting)	68 lbs (31 kg)
RET System Weight	5.0 lbs (2.25 kg)
Connector	6; 7-16 DIN female long neck
Mounting Pole	2-5 inches (5-12 cm)



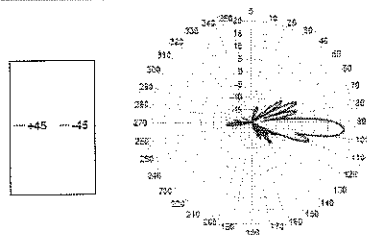
#### Antenna Patterns\*

Bottom View

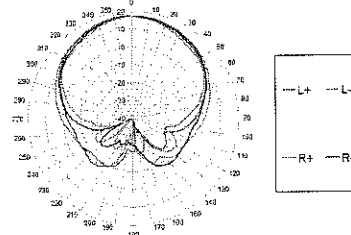
Rear View



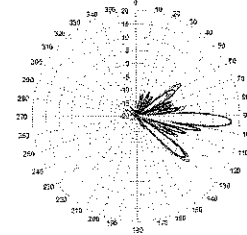
894 MHz Azimuth



Elevation 5°



1920 MHz Azimuth



Elevation 4°

\*Typical antenna patterns. For detail information on antenna pattern, please contact us at [info@cciproducts.com](mailto:info@cciproducts.com). All specifications are subject to change without notice.



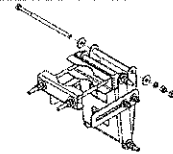
# HexPORT Multi-Band ANTENNA

## Model HPA-65R-BUU-H8

### Ordering Information:

HPA-65R-BUU-H8	8 Foot Hexport Antenna with 65° Azimuth Beamwidth with Factory Installed Actuators (13)
HPA-65R-BUU-H8-K	Complete Kit with Antenna, Factory Installed Actuators (3) and M03 Mounting Bracket
BSA-RET200	RET Actuator
BSA-M03	Mounting Bracket (Top & Bottom) with 0° through 10° Mechanical tilt Adjustment

M03 Top Mounting Bracket



M03 Bottom Mounting Bracket



### RET [Remote Electrical Tilt] System

#### General Specification

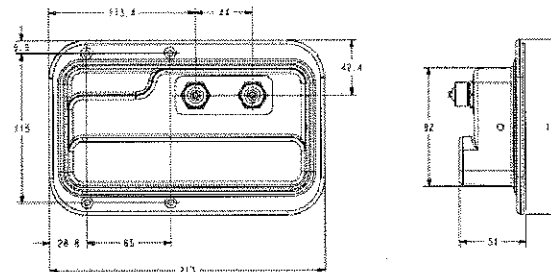
Part Number	BSA-RET200
Protocols	AISG 2.0
Adjustment Cycles	>10,000 cycles
Tilt Accuracy	±0.1°
Temperature Range	-40°C to +70°C

#### Electrical Specification

Interface Signal	Data   dc
Input Voltage Range	10-30 Vdc, Specifications at +24 VDC
Current consumption during tilting	120mA at Vin = 24V
Current consumption idle	55mA at Vin=24V
Hardware Interface	AISG - RS 485 A/B
Input Connector	1x8-pin Daisy Chain In Male
Output Connector	1x8-pin Daisy Chain Out Female

### Mechanical Specification and Dimensions

Housing Material	ASA / ABS / Aluminum
Dimensions (H x W x D)	8 x 5 x 2 inches (213 x 135 x 51 mm)
Weight	1.5 lbs (0.68 kg)



### Standards Compliance

Safety	EN 60950-1, UL 60950-1
Emission	EN 55022
Immunity	EN 55024
Environmental	IEC 60068-2-1, IEC 60068-2-2, IEC 60068-2-5, IEC 60068-2-6, IEC 60068-2-11, IEC 60068-2-14, IEC 60068-2-18, IEC 60068-2-27, IEC 60068-2-29, IEC 60068-2-30, IEC 60068-2-52, IEC 60068-2-64, GR-63-CORE 4.3.1, EN60529 IP24

### Regulatory Certification

AISG, FCC Part 15 Class B, CE, CSA US

[www.cciproducs.com](http://www.cciproducs.com) USA HQ: 89 Leuning Street, South Hackensack, NJ 07606 Telephone: 201-342-3338, Canada: 411 Legget Drive, Suite 104, Ottawa, ON, Canada K2K 3C9 Telephone: 613-591-6696





Description	Value
<b>Dimensions with Solar Shield and Handle</b>	
Height	500 mm
Width	431 mm
Depth	182 mm
<b>Weight</b>	
RRUS 11	23 kg
<b>Color</b>	
Gray	

(1) For RRUS 11 B7, 2x30W is guaranteed for operating ambient temperatures < +50°C. For higher temperatures, 2x20W is guaranteed.

(2) Detailed information about LTE licences can be found in *Licensing*. Detailed information about WCDMA licences can be found in *Licenses and Hardware Activation Codes*.

(3) RRUS 11 for B12 has a bandwidth that is 2 MHz narrower than 3GPP. The supported frequency corresponds to EARFCN (Channel Numbers) of 5010-5169 in downlink and 23010-23169 in uplink.

The RRUS 11 size, height, width, and depth with solar shield, is shown in Figure 2.

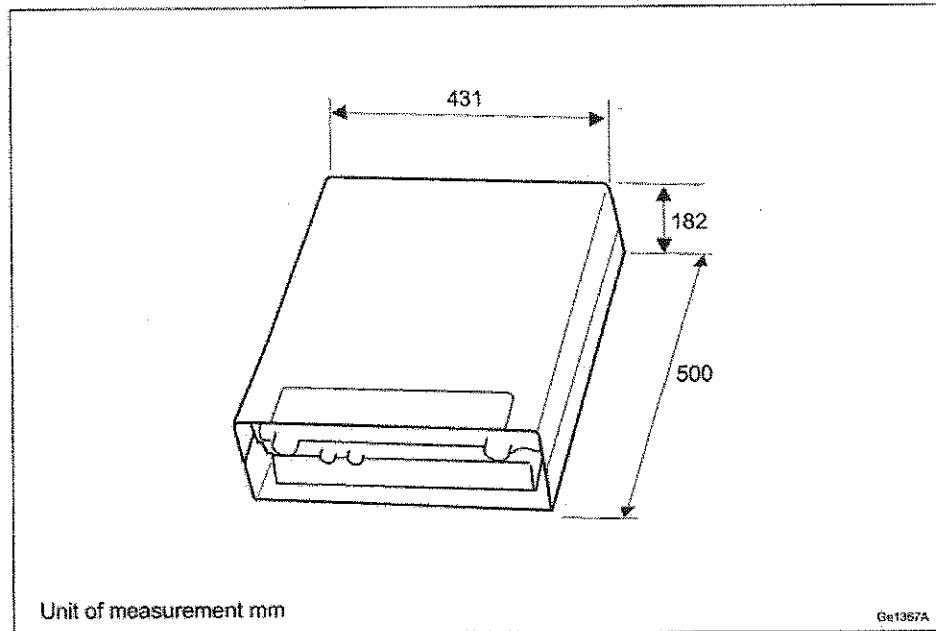


Figure 2 RRUS 11 Height, Width, and Depth with Solar Shield





# RRUS E2 B29

## OVERVIEW

Built on RRUS 12 platform

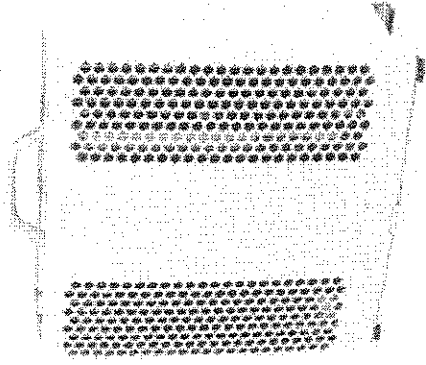
RF Power 2x40 Watts

Improved TX filter, to reduce spurious emissions into B17 (12) uplink

LTE -- DL only. Up to 10 MHz

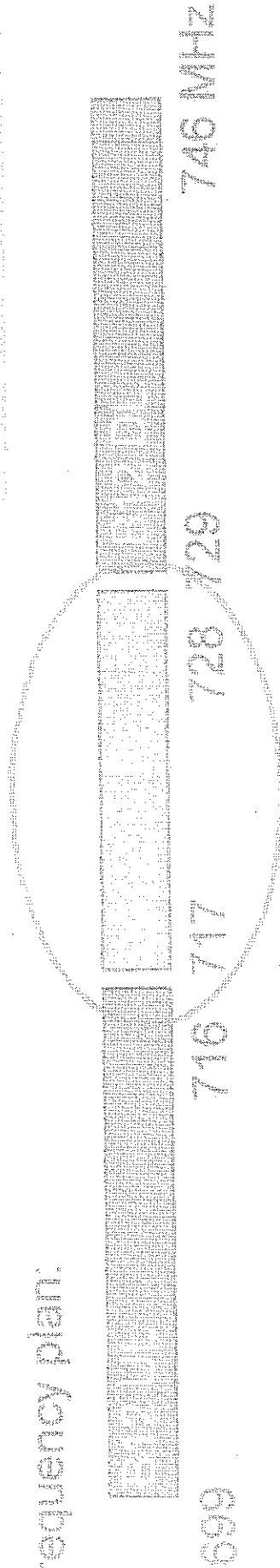
Type B chassis:

- HxWxD = 20.4"x18.5"x7.5" (including air shield and handle)
- Weight: Less than 60 lbs



PRA: February, 2014

Frequency plan:



# POWER

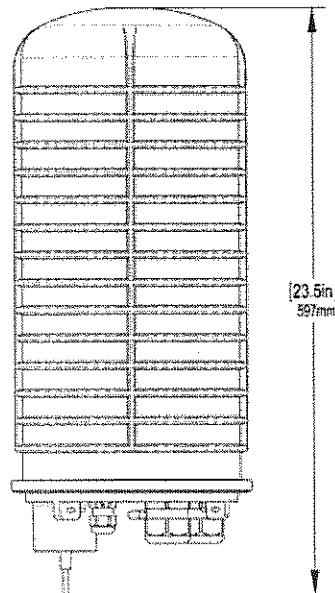
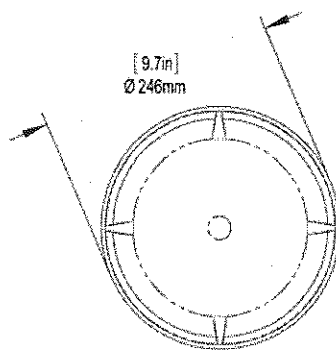
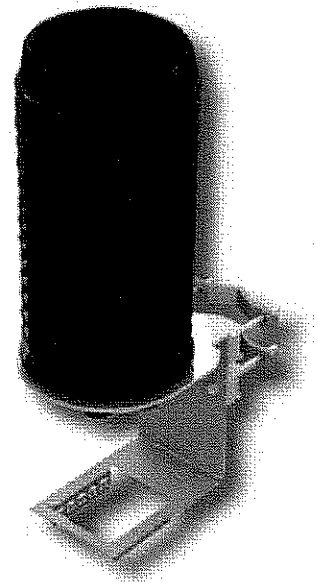
## DC6-48-60-18-8F

### DC Surge Suppression Solution

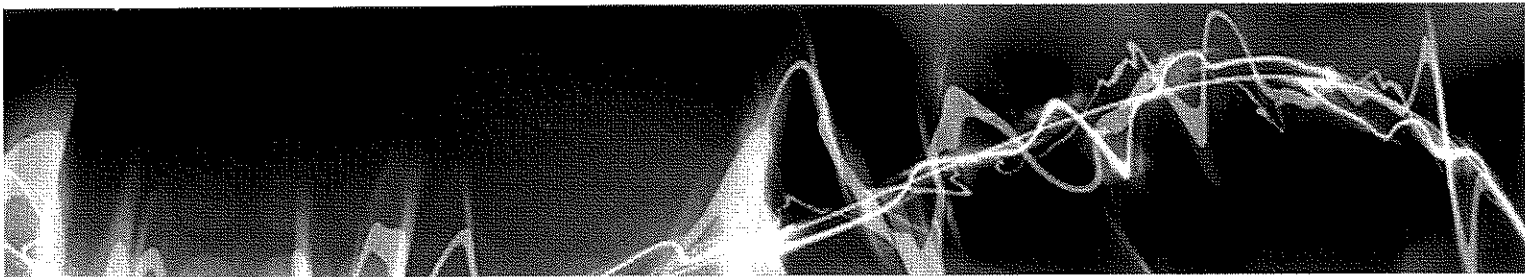
The DC6-48-60-18 is a dual chambered, DC surge suppression system for use in multi-circuit, Distributed Antenna Systems. The system will protect up to 6 Remote Radio Heads from voltage surges and lightning, and connect up to 18 fiber pairs. The system is enclosed in a NEMA 4 rated, waterproof enclosure.

#### FEATURES

- Protects up to 6 Remote Radio Heads, each with its own protection circuit.
- Flexible design allows for installation at the top of a tower for Remote Radio Head protection.
- Includes fiber connections for up to 18 pairs of fiber.
- LED indicators on individual circuits provide visual indication of suppressor status.
- Form 'C' relays allow for remote monitoring of the suppressor status.
- Patented Strikesorb technology provides over 60 kA of surge current capacity per circuit.
- Strikesorb suppression modules are fully recognized to UL 1449-3rd Edition Safety Standard, meeting all intermediate and high current fault requirements to facilitate use in OEM applications.
- Raycap recommends that DC protection system be installed within 2 meters or 6 feet of the radio.
- Dome design is lightweight and aerodynamic providing maximum flexibility for installation on top of towers.



**Raycap**



# DC6-48-60-18-8F

DC Power Surge Protection

Electrical Specifications	
Model Number	DC6-48-60-18-8F
Nominal Operating Voltage	48 VDC
Nominal Discharge Current ( $I_n$ )	20 kA 8/20 $\mu$ s
Maximum Discharge Current ( $I_{max}$ ) per NEMA LS-1	60 kA 8/20 $\mu$ s
Maximum Continuous Operating Voltage ( $U_c$ )	75 VDC
Voltage Protection Rating	400 V

Mechanical Specifications	
Suppression Connection Method	Compression lug, #2-#14 AWG Copper, #2-#12 Aluminum
Fiber Connection Method	LC-LC Single mode duplex
Environmental Rating	IP 68, 7m 72hrs
Operating Temperature	-40° C to +80° C
Storage Temperature	-70° C to +80° C
Cold Temperature Cycling	IEC 61300-2-22e -30° C to +60° C 200 hrs @ 5 psi
Resistance to Aggressive Materials	CEI IEC 61073-2 including acids and bases
UV Protection	ISO 4892-2 Method A Xenon-Arc 2160 hrs
Weight	20 lbs without Mounting Bracket

## STANDARDS

Strikesorb modules are compliant to the following Surge Protection Device (SPD) Standards:

- ANSI/UL 1449 - 3rd Edition
- IEEE C62.41
- NEMA LS-1, IEC 61643-1:2005 2nd Edition:2005
- IEC 61643-12
- EN 61643-11:2002 (including A11:2007)



**Raycap**

G02-00-068 REV 050610



GS-07F-0435V



Certified to  
ISO 9001:2000



TUV Rheinland  
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ERICSSON

# RRUS 32 B30 Data Sheet

# RRUS 32 B30



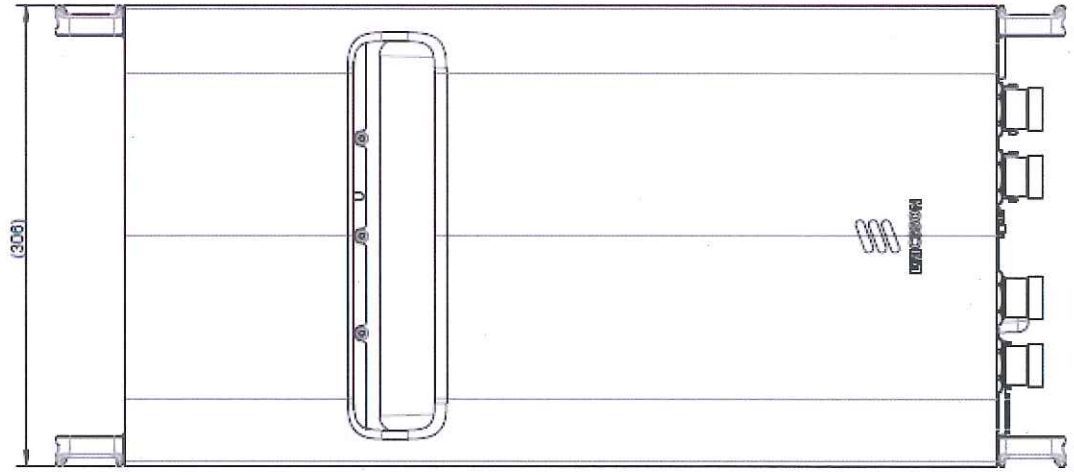
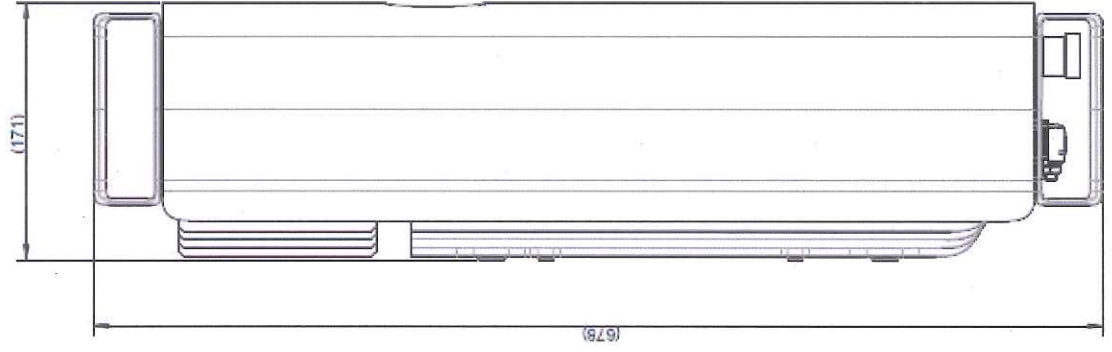
PRELIMINARY

- > WCS A+B blocks
  - TX = 2350 – 2360 MHz
  - RX = 2305 – 2315 MHz
- > RF output 4 x 25 Watts
- > 4T4R FDD
- > 10 MHz IBW for LTE
- > CPRI 2 ports x 10 Gbps
- > Dimensions (incl. feet and sunshield)
  - Height: 26.7” (678 mm)
  - Width: 12.1” (306 mm)
  - Depth: 6.7” (171 mm)
- > Weight, excl. mounting hardware
  - 60 lbs (23 kg)





# Mechanical Outline



(millimeters)

PRELIMINARY





Michael Lawton  
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June 24, 2014

Connecticut Siting Council

Subject: AT&T Wireless, CT2279 – North Stonington

Dear Connecticut Siting Council:

At the request of AT&T Wireless, SAI Communications has performed an assessment of the RF Power Density at the proposed site located at 350B Cossaduck Hill Road, North Stonington, CT. Calculations were done in compliance with FCC OET Bulletin 65. This report provides an FCC compliance assessment based on a "worst-case" analysis that all transmitters are simultaneously operating at full power and pointing directly at the ground.

FCC OET Bulletin 65 formula:

$$S = \frac{2.56 * 1.64 * ERP}{4 * \pi * R^2}$$

Transmission Mode	Antenna Centerline AGL (ft)	Frequency (MHz)	Number of Channels	Effective Radiated Power per Channel (Watts)	Power Density (mW/cm <sup>2</sup> )	Standard Limits (mW/cm <sup>2</sup> )	% MPE (Uncontrolled/General Public)
AT&T UMTS	186	850	2	500.00	0.0104	0.5667	1.83%
AT&T UMTS	186	1900	2	500.00	0.0104	1	1.04%
AT&T LTE 700 BC/DE	186	700	2	500.00	0.0104	0.4667	2.23%
AT&T LTE 850	186	850	1	500.00	0.0052	0.5667	0.92%
AT&T LTE 1900	186	1900	1	500.00	0.0052	1	0.52%
AT&T LTE AWS	186	2100	1	500.00	0.0052	1	0.52%
AT&T LTE WCS	186	2300	1	500.00	0.0052	1	0.52%
Verizon PCS	178	1970	11	223.00	0.0278	1	2.78%
Verizon Cellular	178	869	9	239.00	0.0244	0.579333333	4.21%
Verizon AWS	178	2145	1	1,750.00	0.0199	1	1.99%
Verizon LTE	178	698	1	1,050.00	0.0119	0.465333333	2.56%
<b>Total</b>							<b>19.12%</b>

**Conclusion:** AT&T's proposed antenna installation is calculated to be within 19.12% of FCC Standard for General Public/Uncontrolled Maximum Permissible Exposure (MPE).

Sincerely,

Michael Lawton  
 SAI Communications