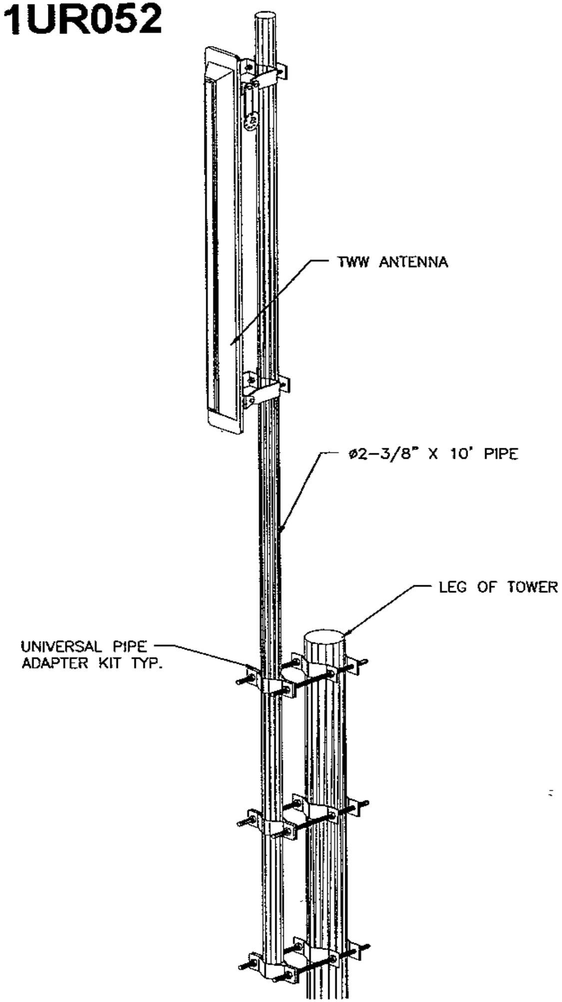
01UR052

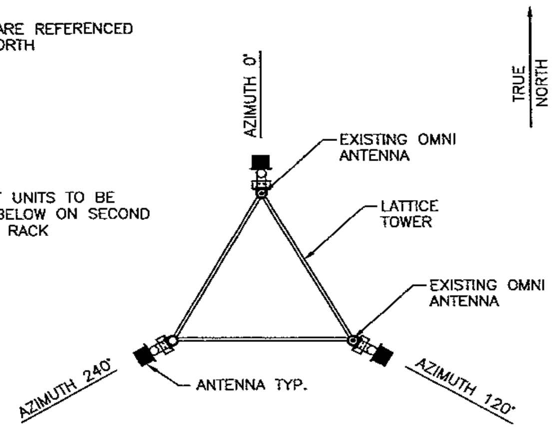


ANTENNA MOUNT DETAIL

SCALE:NTS

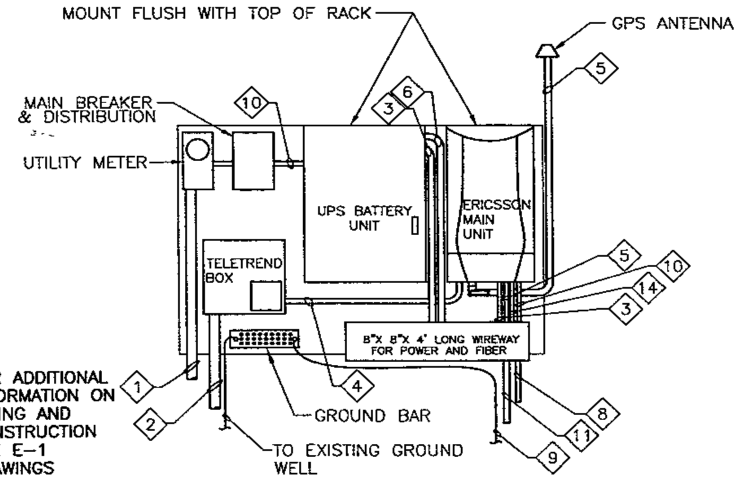
AZIMUTH'S ARE REFERENCED TO TRUE NORTH

NOTE:
REMOTE RF UNITS TO BE MOUNTED BELOW ON SECOND EQUIPMENT RACK



ANTENNA PLAN

NOT TO SCALE



FOR ADDITIONAL INFORMATION ON WIRING AND CONSTRUCTION SEE E-1 DRAWINGS

EQUIPMENT RACK

SCALE: NTS

No.	DATE	REVISIONS	BY	CHKD	APVLS
3	09/04/01	CONSTRUCTION SUBMIT (REV1)	DLL		
2	08/22/01	CONSTRUCTION SUBMIT	DLL		
1	08/10/01	CONSTRUCTION REVIEW	DLL		

Tetragenics

TW WIRELESS, LLC.

SITE INFORMATION

RUSHMORE COMMUNICATIONS
1711 CAMBELL STREET
RAPID CITY, SD 57701
RPC-008A

DESIGN TYPE

PANEL ANTENNAS ON EXISTING LATTICE TOWER WITH EQUIPMENT RACK

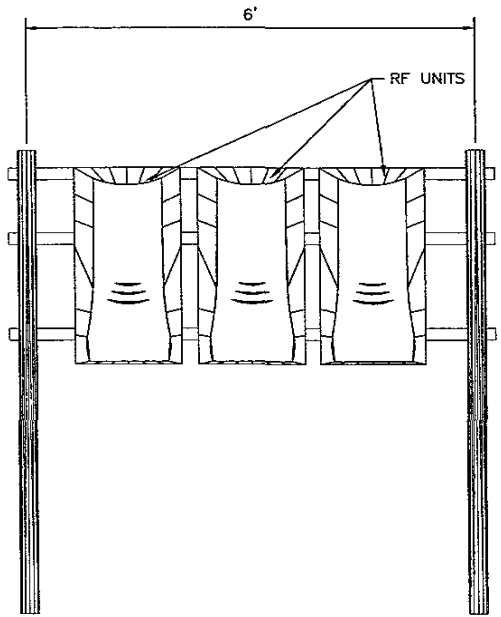
SHEET TITLE

CONSTRUCTION DETAILS

SHEET NUMBER	REV.
D-1	2

PLOT DATE: 09/04/01

01UR052



SECOND EQUIPMENT RACK
SCALE: NOT TO SCALE

ANTENNA SCHEDULE:

ANTENNA SECTOR	ANT./ SEC.	ANTENNA MODEL	AZIMUTH **	ANTENNA C/L	DOWN TILT	ANT. MAKE	# OF COAX	COAX TYPE
X	1	AP18-1850-065/XP	0°	105'	0°	SCALA	2	7/8" DIA. LDF4-50A
Y	1	AP18-1850-065/XP	120°	105'	0°	SCALA	2	7/8" DIA. LDF4-50A
Z	1	AP18-1850-065/XP	240°	105'	0°	SCALA	2	7/8" DIA. LDF4-50A

** AZIMUTH'S ARE REFERENCED TO TRUE NORTH

No.	DATE	REVISIONS	BY	CHKD	APVLS
3	09/04/01	CONSTRUCTION SUBMIT (REV1)	DLL		
2	08/22/01	CONSTRUCTION SUBMIT	DLL		
1	08/19/01	CONSTRUCTION REVIEW	DLL		

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RPC-008A

DESIGN TYPE

PANEL ANTENNAS ON EXISTING LATTICE TOWER WITH EQUIPMENT RACK

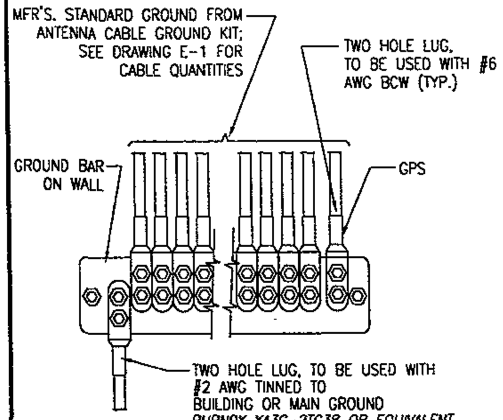
SHEET TITLE

CONSTRUCTION DETAILS CONTINUED

SHEET NUMBER: D-2 REV.: 2

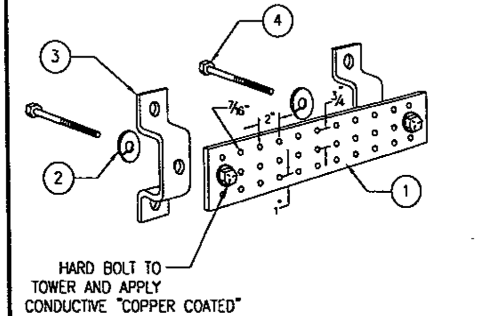
PLOT DATE: 09/04/01

01UR052



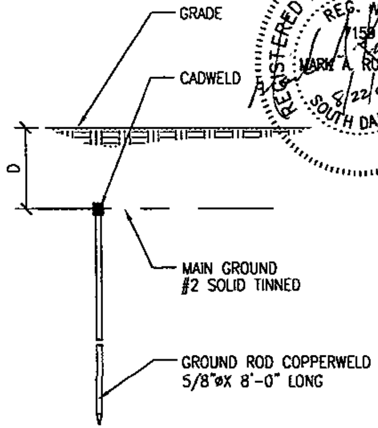
NOTES:
1. ALL GROUNDING CONNECTIONS WILL BE BURNDY COMPRESSION LUGS OR EQUIVALENT.
2. ALL CONNECTIONS MUST BE "COPPER COATED"

GROUND WIRE TO GROUND BAR | NO SCALE | 1



LEGEND
1. COPPER GROUND BAR, 1/4"X 4"X 12". HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION
2. 5/8" LOCKWASHERS
3. WALL MOUNTING BRACKET
4. 5/8-11 X 1" H.H.C.S.BOLTS

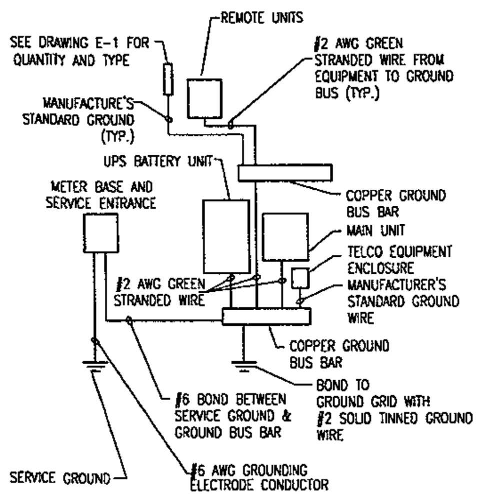
GROUND BAR | NO SCALE | 2



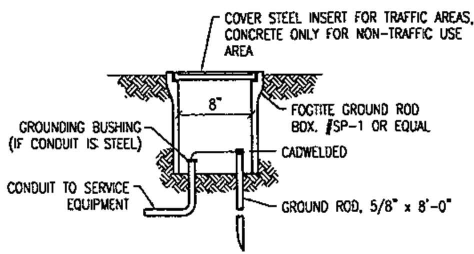
REGISTERED PROFESSIONAL ENGINEER REG. NO. 7158 MARK A. RUSSELL 8/22/01 SOUTH DAKOTA

NOTE:
D = 2'-6" MIN. OR 6" BELOW FROST DEPTH

GROUND ROD | NO SCALE | 3



TYPICAL GROUNDING SCHEMATIC | NO SCALE | 4



GROUND ROD DETAIL | NO SCALE | 5

DESIGN & CONSTRUCTION NOTES:

1. GROUND LOOP SYSTEMS ARE REQUIRED AROUND ANTENNA POLES, TRANSFORMERS, SWITCHGEAR AND BUILDINGS TO PROVIDE EQUIPMENT GROUNDING.

2. GROUND LOOP CABLES SHALL HAVE A CURRENT CAPACITY NOT LESS THAN 25 % OF THE HIGHEST CONTINUOUS CURRENT RATING OF ANY PIECE OF EQUIPMENT, BUT NEVER LESS THAN No. 2. UNDERGROUND GROUND LOOP CABLES ARE TO BE BARE COPPER.

3. SEPARATE GROUND RODS SHALL BE USED FOR GROUNDING EQUIPMENT ENCLOSURES, LIGHTING ARRESTERS AND TELEPHONE PROTECTORS. THE RODS SHOULD BE INTERCONNECTED AND TIED TO THE GROUND LOOP SYSTEM

4. GROUND LOOP SYSTEM SHALL HAVE A MINIMUM OF TWO (2) GROUNDING RODS WITH GROUND WELLS, AND GROUND RODS SHALL BE SPACED A MINIMUM OF 10 FT. APART, PREFERRED SPACING IS 15 TO 20 FT.

5. SEPARATE GROUNDING CONDUCTORS SHALL BE RUN FROM EACH ENCLOSURE TO BE GROUNDED.

6. GROUND LOOP CABLE SHALL BE CONTINUOUS BETWEEN GROUND RODS WHENEVER POSSIBLE IF THE LOOP MUST BE EXTENDED DUE TO DESIGN CHANGES, THE EXTENSION CONNECTION SHALL BE MADE BY MEANS OF THE EXOTHERMIC WELDING PROCESS. ANY UNDERGROUND TAP SHALL BE MADE WITH THE EXOTHERMIC WELDING PROCESS OR BY BRAZING.

7. ALL EQUIPMENT CONNECTIONS ABOVE GROUND SHALL BE MADE WITH BOLTED CONNECTORS USING LOCK WASHERS TO INSURE A PERMANENT LOW RESISTANCE GROUND PATH. GROUND CONNECTIONS SHALL BE INSTALLED IN A PROTECTED LOCATION TO AVOID MECHANICAL DAMAGE.

8 GROUNDING CABLE SHALL BE INSTALLED WITHOUT SHARP BLENDS OR KINKS AND WHERE BENDS OR LOOPS ARE REQUIRED THEY SHALL BE MADE WITH AS LARGE A RADIUS AS POSSIBLE.

9. ALL FENCING AND GATES SHALL BE GROUNDED PER NEC REQUIREMENTS

CONSTRUCTION/DESIGN NOTES | 6

No.	DATE	REVISIONS	BY	CHKD	APVLS
1	08/10/01	CONSTRUCTION REVIEW	DLL		
2	08/22/01	CONSTRUCTION SUBMIT	DLL		

Tetragenics

RUSSELL ELECTRICAL CONSULTING, PLLC
4128 W. NORTHWEST BLVD. Spokane, WA 99205
PHONE. (509) 327-0446 FAX: (509) 327-0450 EMAIL. russengr@cet.com

TW TIRELESS, LLC.

SITE INFORMATION
RUSHMORE COMMUNICATIONS
1711 CAMBELL STREET
RAPID CITY, SD 57701
RPC-008A

DESIGN TYPE
PANEL ANTENNAS ON EXISTING LATTICE TOWER WITH EQUIPMENT RACK

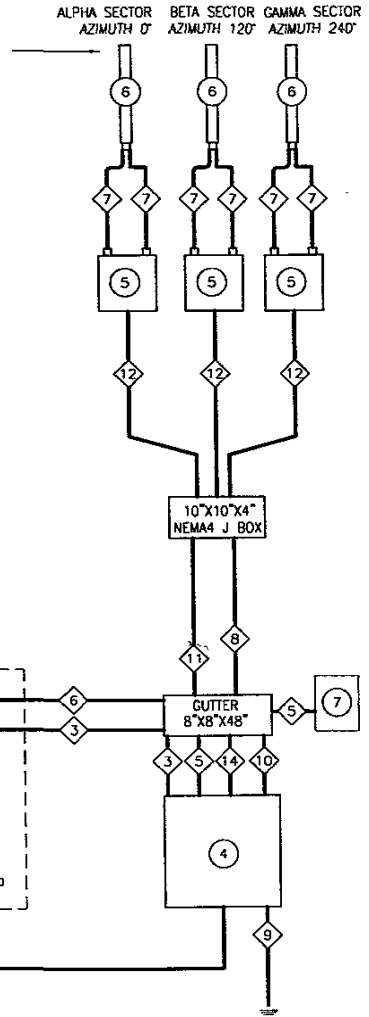
SHEET TITLE
ELECTRICAL GROUNDING DETAILS

SHEET NUMBER: E-2 | REV.: 1

PLOT DATE: 08/22/01

01UR052

1 OR 2 PANEL ANTENNAS PER SECTOR, INCLUDING MOUNTING HARDWARE, GAIN = 16DBI



GENERAL NOTES:

1. POWER AND GROUNDING SCHEMATICS ARE BASED ON CURRENT USWEST EQUIPMENT AND STANDARDS. VERIFY ALL SITE SPECIFIC REQUIREMENTS AND EQUIPMENT BEFORE PROCEEDING WITH INSTALLATION.
2. SEE SHEETS A-1 FOR ANTENNA LOCATIONS.
3. POWER SOURCE SHALL BE 120V AC, 60 Hz, 1P, 3W, 30 A
4. SEE SHEET S-1 PLAN DRAWING FOR INCOMING POWER SOURCE LOCATION.
5. SEE SHEET S-1 PLAN DRAWING FOR INCOMING TELEPHONE SOURCE LOCATION.
6. ALL UNDERGROUND CONDUIT TO BE SCHEDULE 40 PVC.
7. ALL ABOVE GROUND CONDUIT TO BE IMC OR BETTER.
8. ALL ELLS TO BE FACTORY MADE AND BE RGS.
9. ALL WORK SHALL BE PERFORMED IN COMPLIANCE WITH THE NEC AND APPLICABLE LOCAL CODES.

LOAD DATA

CONNECTED LOAD	13 AMPS MAX
RUNNING LOAD	9 AMPS

EQUIPMENT LEGEND:

ITEM	QTY	DESCRIPTION / SPECIFICATION
1	1	METER AND DISCONNECT (PROVIDE 30 A CIRCUIT BREAKER) 100 AMP, 120/240V, 1ø, 60 Hz, 10 KAIC
2	1	TELCO DEMARC – VERIFY WITH SERVING PHONE CO.
3	1	UNINTERRUPTABLE POWER SUPPLY / RATED 20 AMPS, 120/240 VOLT, 1ø, 60Hz
4	1	MAIN UNIT / ERICSSON MICRO RBS 1106 SERIES
5	3	REMOTE UNIT / ERICSSON MICRO RBS 1106 SERIES MALE CONNECTOR WITH 7/16" DIN
6	3	PANEL ANTENNA / MALE CONNECTOR WITH 7/16" DIN
7	1	GPS ANTENNA

CONDUIT AND CONDUCTOR SCHEDULE:

ITEM	CONDUIT QTY	CONDUIT SIZE	CONDUIT TYPE	CONDUCTORS *
1				POWER SOURCE – VERIFY
2				TELEPHONE CABLE – VERIFY No. PAIR
3	1	3/4"	IMC	CAT 5 ALARM WIRE
4	1	1"	IMC	6 PAIR TELEPHONE CABLE
5	1	3/4"	IMC	CAT 5 GPS CABLE
6	1	1"	IMC	(8) #12 THWN (4) #12 GRND. THWN
7	6			7/8" DIA. COAXIAL CABLE LDF4-50A
8	1	1"	IMC	(3) FIBER OPTIC CABLE JUMPER * *
9	1			(1) #2 GND
10	1	3/4"	IMC	(2) #10 THWN (1) GND THWN
11	1	1"	IMC	(6) #12 THWN (3) #12 GND THWN * *
12	1	1"	IMC	(1) FIBER OPTIC CABLE JUMPER AND (2) #12 THWN (1) #12 GND THWN
13	1	–	–	#12-3 S-O CORD (WITH THREE PRONG PLUG)
14	1	3/4"	IMC	(3) FIBER OPTIC CABLE

* 600V – THWN, 75 DEGREE C. COPPER

* * TO BE DETERMINED IN FIELD FOR NON-STANDARD INSTALLATIONS

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 7158
MARK A. RUSSELL
8/22/01
SOUTH DAKOTA

No.	DATE	REVISIONS	BY	CHK'D	APV'D
2	08/22/01	CONSTRUCTION SUBMIT	DLL		
1	08/10/01	CONSTRUCTION REVIEW	DLL		

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PHONE: (509) 327-0446
FAX: (509) 327-0450
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DESIGN TYPE

PANEL ANTENNAS ON EXISTING LATTICE TOWER WITH EQUIPMENT RACK

SHEET TITLE

ELECTRICAL SCHEMATICS NOTES & SCHEDULES

SHEET NUMBER: E-1 REV: 1

PLOT DATE 08/22/01

POWER AND TELCO SCHEMATIC | NO SCALE | 1 | ELECTRICAL NOTES AND LEGENDS | 2