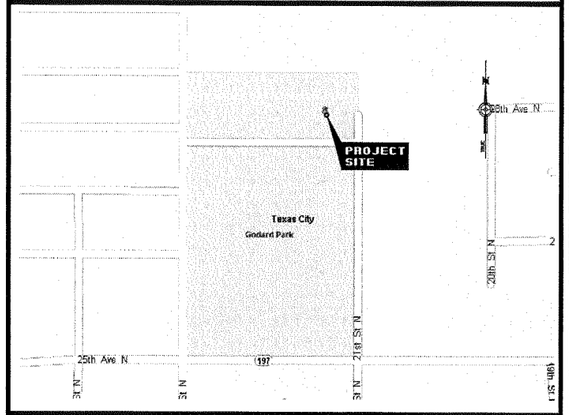
T-Mobile®

SITE NAME
TEXAS CITY WATER TOWER

SITE NUMBER
A3D0099A

CONFIGURATION: 4+7+10
CLUSTER #: 23
CO-LOCATE/WATER TOWER
LATITUDE: N 29.41154°
LONGITUDE: W 94.92553°

VICINITY MAP



DRIVING DIRECTIONS:

TAKE 45 SOUTH PAST DICKINSON TO FM 1764. GO EAST ON FM 1764 1.6 MILES PAST HWY 146. TURN LEFT ON 21 ST AND GO ABOUT 1 MILE. THE SITE IS IN THE NORTHEAST CORNER OF THE WATER FACILITY IN GODARD PARK. MUST CALL WHEN ENTERING SITE

GENERAL NOTES

1. THE CONTRACTOR SHALL SUPERVISE AND DIRECT ALL WORK, USING HIS BEST SKILL AND ATTENTION. HE SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, PROCEDURES AND SEQUENCES FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.
2. THE CONTRACTOR SHALL VISIT THE JOB SITE TO REVIEW THE SCOPE OF WORK AND EXISTING JOB SITE CONDITIONS INCLUDING, BUT NOT LIMITED TO MECHANICAL, ELECTRICAL SERVICE, AND OVERALL COORDINATION.
3. THE CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS PRIOR TO SUBMITTING HIS BID. ANY DISCREPANCIES CONFLICTS OR OMISSIONS, ETC. SHALL BE REPORTED TO T-MOBILE BEFORE PROCEEDING WITH THE WORK.
4. THE CONTRACTOR SHALL PROTECT ALL AREAS FROM DAMAGE WHICH MAY OCCUR DURING CONSTRUCTION. ANY DAMAGE TO NEW AND EXISTING CONSTRUCTION, STRUCTURE, OR EQUIPMENT, SHALL BE IMMEDIATELY REPAIRED OR REPLACED TO THE SATISFACTION OF THE TENANT OR BUILDING OWNER, OR OWNER'S REPRESENTATIVE, AT THE EXPENSE OF THE CONTRACTOR.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR, AND SHALL REPLACE OR REMEDY, ANY FAULTY, IMPROPER, OR INFERIOR MATERIALS OR WORKMANSHIP OR ANY DAMAGE WHICH SHALL APPEAR WITHIN ONE YEAR AFTER THE COMPLETION AND ACCEPTANCE OF THE WORK UNDER THIS CONTRACT.
6. THE CONTRACTOR SHALL REMOVE ALL RUBBISH AND WASTE MATERIALS ON A REGULAR BASIS, AND SHALL EXERCISE STRICT CONTROL OVER JOB CLEANING THROUGHOUT CONSTRUCTION, INCLUDING FINAL CLEAN-UP UPON COMPLETION OF WORK. ALL AREAS ARE TO BE LEFT IN A BROOM CLEAN CONDITION AT THE END OF EACH DAY.
7. THE CONTRACTOR SHALL SAFEGUARD THE OWNER'S PROPERTY DURING CONSTRUCTION AND SHALL REPLACE ANY DAMAGED PROPERTY OF THE OWNER TO ORIGINAL CONDITION OR BETTER.
8. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE ALL EXISTING UTILITIES, WHETHER SHOWN HEREON OR NOT, AND TO PROTECT THEM FROM DAMAGE. THE CONTRACTOR SHALL BEAR ALL EXPENSES FOR REPAIR OR REPLACEMENT OF UTILITIES OR OTHER PROPERTY DAMAGED IN CONJUNCTION WITH THE EXECUTION OF WORK.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COMPLETE SECURITY OF THE SITE WHILE THE JOB IS IN PROGRESS AND UNTIL THE JOB IS COMPLETED PER CHAPTER 33 OF THE I.B.C.
10. THE CONTRACTOR DURING CONSTRUCTION SHALL PROVIDE TEMPORARY WATER, POWER, AND TOILET FACILITIES AS REQUIRED BY THE CITY OR GOVERNING AGENCY.
11. ALL CONSTRUCTION WORK SHALL CONFORM TO THE I.B.C. AND ALL OTHER GOVERNING CODES, ALONG WITH THE GOVERNING RESTRICTIVE CODES.
12. THE CONTRACTOR AND ALL SUBCONTRACTORS SHALL COMPLY WITH ALL LOCAL CODE REGULATIONS AND STATE DEPARTMENT OF INDUSTRIAL REGULATIONS AND DIVISION OF INDUSTRIAL SAFETY (OSHA) REQUIREMENTS. REFER TO THE CODES SECTION OF THIS SHEET.
13. THE CONTRACTOR SHALL OBTAIN AND PAY FOR PERMITS, LICENSES AND INSPECTIONS NECESSARY FOR PERFORMANCE OF THE WORK AND INCLUDE THOSE IN THE COST OF THE WORK TO THE OWNER.
14. FIGURED DIMENSIONS HAVE PRECEDENCE OVER DRAWING SCALE, AND DETAIL DRAWINGS HAVE PRECEDENCE OVER SMALL SCALE DRAWINGS. CHECK ACCURACY OF ALL DIMENSIONS IN THE FIELD. UNLESS SPECIFICALLY NOTED, DO NOT FABRICATE ANY MATERIALS OFF-SITE, OR DO ANY CONSTRUCTION UNTIL THE ACCURACY OF DRAWING DIMENSIONS HAS BEEN VERIFIED AGAINST ACTUAL FIELD DIMENSIONS.
15. CONTRACTOR SHALL NOTIFY THE ARCHITECT/ENGINEER OF ANY CONFLICTS OR DISCREPANCIES WITHIN THE CONTRACT DOCUMENTS WITH THE CONTRACT DOCUMENTS AND THE FIELD CONDITIONS PRIOR TO EXECUTING THE WORK IN QUESTION.
16. CONTRACTOR SHALL NOTIFY THE ARCHITECT/ENGINEER IF DETAILS ARE CONSIDERED UNSOUND, UNSAFE, NOT WATERPROOF, OR NOT WITHIN CUSTOMARY TRADE PRACTICE. IF WORK IS PERFORMED, IT WILL BE ASSUMED THAT THERE IS NO OBJECTION TO THE DETAIL. DETAILS ARE INTENDED TO SHOW THE END RESULT OF THE DESIGN. MINOR MODIFICATIONS MAY BE REQUIRED TO SUIT JOB CONDITIONS, AND SHALL BE INCLUDED AS PART OF THE WORK.
17. EXISTING ELEVATIONS AND LOCATIONS TO BE JOINED SHALL BE VERIFIED BY THE CONTRACTOR BEFORE CONSTRUCTION. IF THEY DIFFER FROM THOSE SHOWN ON THE PLANS, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT SO THAT MODIFICATIONS CAN BE MADE BEFORE PROCEEDING WITH THE WORK.
18. ALL SYMBOLS AND ABBREVIATIONS USED ON THE DRAWINGS ARE CONSIDERED CONSTRUCTION STANDARDS. IF THE CONTRACTOR HAS QUESTIONS REGARDING THEIR EXACT MEANING, THE ARCHITECT SHALL BE NOTIFIED FOR CLARIFICATION BEFORE PROCEEDING WITH THE WORK.
19. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY BLOCKING, BACKING, FRAMING, HANGERS OR OTHER SUPPORT FOR ALL OTHER ITEMS REQUIRING THE SAME.
20. CITY APPROVED PLANS SHALL BE KEPT IN A PLAN BOX AND SHALL NOT BE USED BY WORKMEN. ALL CONSTRUCTION SETS SHALL REFLECT SAME INFORMATION. THE CONTRACTOR SHALL ALSO MAINTAIN IN GOOD CONDITION, ONE COMPLETE SET OF PLANS WITH ALL REVISIONS, ADDENDA AND CHANGE ORDERS ON THE PREMISE AT ALL TIMES. THESE ARE TO BE UNDER THE CARE OF THE JOB SUPERINTENDENT.
21. ALL CONDUIT AND CABLE RUNS ARE DRAWN DIAGRAMATICALLY. CONTRACTOR SHALL RUN CONDUITS AND CABLES IN THE BEST POSSIBLE ROUTE, FOLLOWING THE DRAWINGS AS TO SUPPORT AND EQUIPMENT.

EQUIPMENT NOTES

1. ALL RADIO EQUIPMENT PLACEMENT AND INSTALLATION IS BY EQUIPMENT SUPPLIER WHO IS RESPONSIBLE FOR COORDINATING HIS WORK WITH THE WORK OF OTHERS AS IT RELATES TO THE RADIO EQUIPMENT.
2. ALL GROUNDING CONNECTIONS SHALL BE BURNDY HYGROUND SYSTEM.

PROJECT DATA

SCOPE OF WORK FOR B.T.S. INSTALLATION:

THE B.T.S. SITE SHALL BE CONSTRUCTED UNDER THE FOLLOWING STANDARDS WITH SITE SPECIFIC MODIFICATIONS.

1. THE ENTIRE WORK AREA SHALL BE IDENTIFIED AND EXISTING CONDITION DOCUMENTED BY CONTRACTOR PRIOR TO CONSTRUCTION COMMENCEMENT, DOCUMENTATION SHALL CONSIST OF A WRITTEN AND PHOTOGRAPHIC REPORT.

CODES

ALL CONSTRUCTION SHALL COMPLY WITH THE LATEST ADOPTED EDITION OF THE:

1.1 INDUSTRIAL CODE (ANSI)

1.2 OCCUPATIONAL SAFETY AND HEALTH STANDARDS (OSHA)

1.3 NATIONAL ELECTRICAL CODE

1.4 INTERNATIONAL BUILDING CODE 2003

PROJECT INFORMATION

SITE TYPE:

EXISTING WATER TOWER WITH NEW RELATED UNMANNED COMMUNICATION EQUIPMENT UNDERNEATH.

SITE INFORMATION:

JURISDICTION: CITY OF TEXAS CITY

OCCUPANCY: COLO UNMANNED

ZONING: N/A

CONSTRUCTION TYPE: WATER TOWER /COLO

RF ENGINEER

ZONING/LEASING

CONSTRUCTION ENGINEER

OPERATIONS

FIXED NET

UNDERGROUND SERVICE ALERT

CALL TOLL FREE 1-800-245-4545

TWO WORKING DAYS BEFORE YOU DIG

PROJECT TEAM

LANDLORD
CITY OF TEXAS CITY

APPLICANT
NOKIA SIEMENS NETWORKS
6000 CONNECTION DR.
IRVING, TX 75039
PHONE: (972) 894-5000

ENGINEERING CONSULTING
JRH CONSULTING GROUP INC.
TOWNE CROSSING I
3819 TOWNE CROSSING, SUITE 203
MESQUITE, TX 75150
PHONE: 972-385-8292
FAX: 972-385-3451

TOWER ENGINEER
BY OTHERS

SHEET INDEX

NOTES

STRUCTURAL CALCULATION (BY OTHERS) SHALL BE [illegible] USING 110 MPH WIND SPEED WITH 3 SECOND GUST PER [illegible].

DRAWING SCALE IS BASED ON A FULL SIZE, 24"x36" SHEET.

STATE OF TEXAS
BRIAN A. McCALLISTER
92643
LICENSED
PROFESSIONAL ENGINEER
1/10/08

Nokia Siemens Networks

REVISIONS	DATE
A PRELIMINARY REVIEW	07/25/07
0 ISSUED FOR CONSTRUCTION	08/31/07
1 REVISED FOR CONSTRUCTION	01/16/08

JRH consulting group
Towne Crossing I
3819 Towne Crossing, Suite 203
Mesquite, TX 75150
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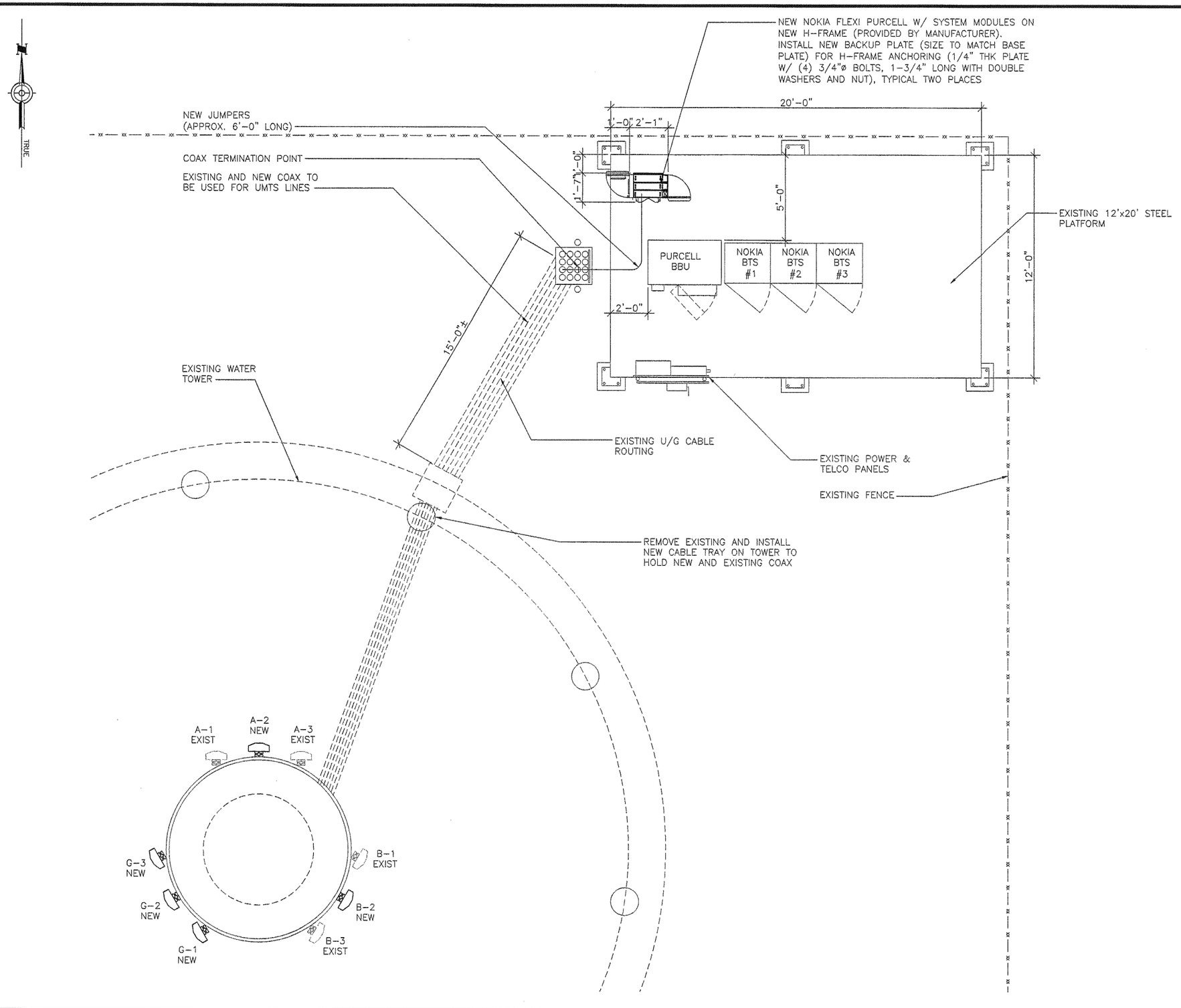
2 GREENWAY PLAZA
11TH FLOOR
HOUSTON, TX 77046

TITLE SHEET

TEXAS CITY
WATER TOWER
A3D0099A
2801 21ST. NORTH
TEXAS CITY, TX 77590

JRH PROJECT NO.: 07-2102

DRAWN BY:	GRC
CHECKED BY:	JWR
DATE	16 JANUARY 2008
PLOT SCALE	1:1
DRAWING NAME	A3D0099A-T1.dwg
SHEET No.	T-1



ENLARGED SITE PLAN

SCALE: 3/8"=1'-0"

1

File Info: M:\T-Mobile Cell\1-Houston UMTS Phase II\07-2102 A3D0099A\CDs\A3D0099A CDs.dwg Jan 16, 2008 - 5:16pm jrushing

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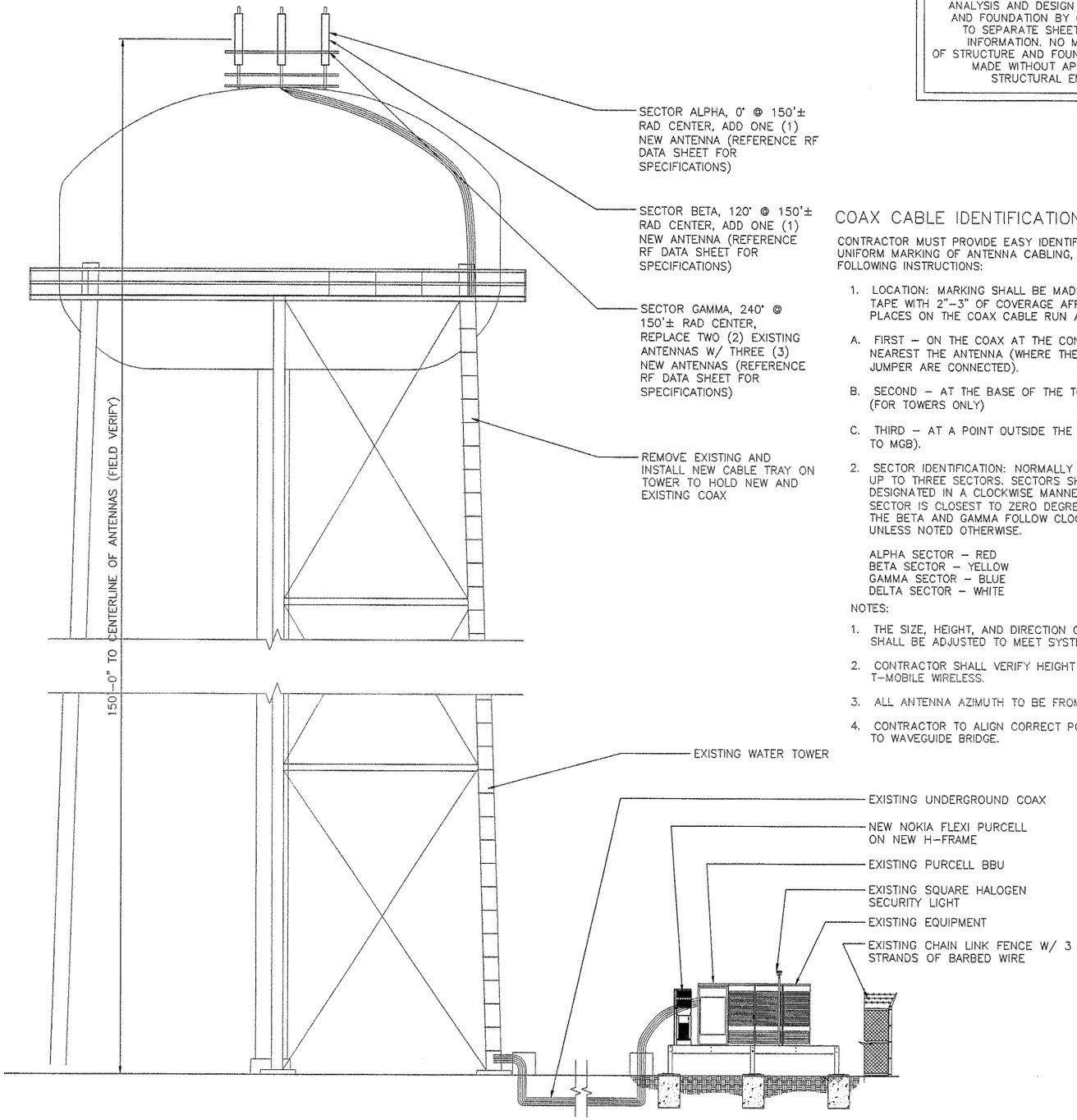
ENLARGED SITE PLAN

TEXAS CITY
WATER TOWER
A3D0099A
2801 21ST. NORTH
TEXAS CITY, TX 77590

JRH PROJECT NO.: 07-2102

DRAWN BY:	GRC
CHECKED BY:	JWR
DATE	16 JANUARY 2008
PLOT SCALE	1:1
DRAWING NAME	A3D0099A-C1.dwg
SHEET No.	C-1

STATE OF TEXAS
BRIAN A. McCALLISTER
92643
LICENSED
PROFESSIONAL ENGINEER
1/16/08



ANALYSIS AND DESIGN OF STRUCTURE AND FOUNDATION BY OTHERS. REFER TO SEPARATE SHEETS FOR MORE INFORMATION. NO MODIFICATION OF STRUCTURE AND FOUNDATION SHALL BE MADE WITHOUT APPROVAL OF STRUCTURAL ENGINEER

COAX CABLE IDENTIFICATION

CONTRACTOR MUST PROVIDE EASY IDENTIFICATION AND UNIFORM MARKING OF ANTENNA CABLING, PER THE FOLLOWING INSTRUCTIONS:

1. LOCATION: MARKING SHALL BE MADE USING COLOR TAPE WITH 2"-3" OF COVERAGE AFFIXED AT THREE PLACES ON THE COAX CABLE RUN AS FOLLOWS:

A. FIRST – ON THE COAX AT THE CONNECTOR NEAREST THE ANTENNA (WHERE THE COAX AND JUMPER ARE CONNECTED).

B. SECOND – AT THE BASE OF THE TOWER STRUCTURE. (FOR TOWERS ONLY)

C. THIRD – AT A POINT OUTSIDE THE BTS. (JUST PRIOR TO MGB).

2. SECTOR IDENTIFICATION: NORMALLY A SITE WILL HAVE UP TO THREE SECTORS. SECTORS SHALL BE DESIGNATED IN A CLOCKWISE MANNER. THE ALPHA SECTOR IS CLOSEST TO ZERO DEGREES (NORTH) THE BETA AND GAMMA FOLLOW CLOCKWISE IN SEQUENCE UNLESS NOTED OTHERWISE.

ALPHA SECTOR – RED
BETA SECTOR – YELLOW
GAMMA SECTOR – BLUE
DELTA SECTOR – WHITE

NOTES:

1. THE SIZE, HEIGHT, AND DIRECTION OF THE ANTENNA SHALL BE ADJUSTED TO MEET SYSTEM REQUIREMENTS.
2. CONTRACTOR SHALL VERIFY HEIGHT OF ANTENNA WITH T-MOBILE WIRELESS.
3. ALL ANTENNA AZIMUTH TO BE FROM TRUE NORTH.
4. CONTRACTOR TO ALIGN CORRECT PORT HOLE TO TOWER TO WAVEGUIDE BRIDGE.

RF NOTES:

1. ACTUAL LENGTHS SHALL BE DETERMINED PER SITE CONDITION BY SUBCONTRACTOR.

2. THE DESIGN IS BASED ON RF DATA SHEETS, SIGNED AND APPROVED.

3. RADIO SIGNAL CABLE AND RACEWAY SHALL COMPLY WITH THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC, NFPA 70), CHAPTER 8.

4. ALL SPECIFIED MATERIAL FOR EACH LOCATION (E.G., OUTDOORS, INDOORS–OCCUPIED, INDOORS–UNOCCUPIED, PLENUMS, RISER SHAFTS, ETC.) SHALL BE APPROVED, LISTED, OR LABELED AS REQUIRED BY THE NEC.

5. RADIO SIGNAL CABLE SHALL BE SUPPORTED AT MINIMUM OF EVERY THREE (3) FEET EXCEPT INSIDE WATER TOWERS OR LATTICE TOWERS WHERE CABLE AND CONNECTOR MANUFACTURERS SUPPORT RECOMMENDATIONS SHALL BE FOLLOWED. MANUFACTURER RECOMMENDED CABLE SUPPORT ACCESSORIES SHALL BE USED.

6. THE OUTDOOR CABLE SUPPORT SYSTEM SHALL BE PROVIDED TO MATCH EXISTING TO SUPPORT AND PROTECT ANTENNA CABLE RUNS.

7. DRIP LOOPS SHALL BE REQUIRED ON ALL OUTSIDE CABLES. CABLES SHALL BE SLOPED AWAY FROM THE BUILDING OR OUTDOOR BTS CABINETS TO PREVENT WATER FROM ENTERING THROUGH THE COAXIAL CABLE PORT.

8. SEE SEPARATE EUPEN DOCUMENTATION FOR SPECIFICATION, CONNECTION AND WEATHERPROOFING.

9. IF OTHER THAN EUPEN, 7/16 DIN CONNECTORS REQUIRE NO ADDITIONAL WEATHERPROOFING IN INDOOR APPLICATIONS IF INSTALLED AND TORQUED PROPERLY. IN OUTDOOR APPLICATIONS WEATHERPROOFING IS REQUIRED AND THE FOLLOWING PROCEDURE SHOULD BE FOLLOWED:
APPLY A "COURTESY" WRAP OF ONE LAYER OF 7MIL THICK VINYL ELECTRICAL TAPE EXTENDING APPROXIMATELY ONE (1) INCH ON EACH SIDE OF THE COAX CABLE/ CONNECTOR JUNCTURE.

USING WEATHERPROOFING KIT APPROVED BY CABLE MANUFACTURER AND CONTRACTOR. START TAPE APPROXIMATELY 5 INCHES FROM THE CONNECTOR AND WRAP 2 INCHES TOWARD THE CONNECTOR, THEN REVERSE THE TAPE SO THAT THE STICKY SIDE IS UP. TAPE OVER THE CONNECTOR OR SURGE ARRESTOR UNTIL THREE (3) TO FOUR (4) INCHES BEYOND THE CONNECTOR AND REVERSE AGAIN WITH THE STICKY SIDE DOWN FOR ANOTHER INCH OR TWO. ADD THE BUTYL RUBBER AND FINISH WITH A FINAL LAYER OF TAPE.

10. ANTENNAS SHALL BE PAINTED, WHEN REQUIRED, BY THE LANDLORD OR AUTHORITY HAVING JURISDICTION IN ACCORDANCE WITH ANTENNA MANUFACTURERS' SURFACE PREPARATION AND PAINTING REQUIREMENTS.

11. CABLE SHIELDS, AND TOWER CONDUITS SHALL BE GROUNDED AT THE TRIPOD ABOUT 6 INCHES BEFORE THE TURN TOWARD THE FACILITY.

12. APPROVED GROUNDING KITS, WHICH INCLUDE GROUNDING STRAPS, SHALL BE USED TO GROUND THE COAXIAL CABLE SHIELDS, AND CONDUITS. THE GROUND CONDUCTORS FOR THE KITS AT THE TOP OF THE TOWER, AND IN THE MIDDLE SECTION OF THE TOWER, ARE BONDED DIRECTLY TO TOWER STEEL USING EXOTHERMIC, BOLTED, OR APPROVED CLAMP CONNECTIONS.

13. ALL RADIO SIGNAL CABLE SHALL BE LABELED PER MARKET REQUIREMENTS.

14. MHA/TMA'S TO BE INSTALLED AT TRIPOD, SHALL BE SUPPLIED TO THE SUBCONTRACTOR (WHERE REQUIRED) AND INSTALLED BY SUBCONTRACTOR.

15. ANTENNA FEED LINE SYSTEM SWEEP TESTING SHALL BE PERFORMED AND REPORTED IN ACCORDANCE WITH NOKIA–T–MOBILE REQUIREMENTS. A RADIO SIGNAL CABLE INSTALLATION WITH UNSATISFACTORY SWEEP TEST RESULT WILL NOT BE ACCEPTED.

STATE OF TEXAS
BRIAN A. McCALLISTER
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LICENSED
PROFESSIONAL ENGINEER
1/16/08

ELEVATION SCALE: N.T.S. 1

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ELEVATION & RF NOTES

TEXAS CITY
WATER TOWER
A3D0099A
2801 21ST. NORTH
TEXAS CITY, TX 77590

JRH PROJECT NO.: 07-2102

DRAWN BY:	GRC
CHECKED BY:	JWR
DATE	16 JANUARY 2008
PLOT SCALE	1:1
DRAWING NAME	A3D0099A-C2.dwg
SHEET No.	C-2

T-Mobile RF Configuration Data Sheet Option - 1:
3 X 1 Dual port antenna

UMTS Phase:2	Site ID	A3D0099A	
Date: 5/31/07	Site Type	Collocation	
Address: 2801 21st. N Texas City Tx. 77590			
Longitude:	-94.92553	Latitude:	29.41154

Existing Equipment	Alpha	Beta	Gamma
Existing Antenna Type	Unknown	Unknown	Unknown
Number of existing Antennas	2	2	2
Existing Antenna Center line (ft.)	150	150	150
Existing Antenna Azimuth (true)	0	120	240
Existing Mechanical Tilt (1900)	1	1	1
Existing Electrical Tilt (1900)	0	0	0
Existing Number of Feeders attached to ant	6	6	6
Existing Feeder Diameter	1 5/8"	1 5/8"	1 5/8"
Existing Feeder Length (ft.)	240	240	240
Radio forecast for June 2008	4	7	10
Current Radio Count from Survey	3	7	8
Number of existing TMA (GSM)	2	2	2

Changes to Current Antenna to accommodate UMTS			
Replacement Antenna Type			RFS-APX17DWV-quad 1.8
Replacement Antenna Dimensions (L,W,D)			73 x 13 x 3.15
New Antenna Vendor			RFS
Number of Antennas to be replaced			2
Replacement Antenna Mechanical Tilt 17/21			NA
Replacement Antenna Electrical Tilt 17/21			NA
Replacement Antenna Mechanical Tilt 1900			1
Replacement Antenna Electrical Tilt 1900			0
New Antenna Center line (ft.) -17/21			150
New Azimuth 17/21			240

Additional UMTS Antenna			
New Antenna Type	RFS-APXV18-dual 1.8	RFS-APXV18-dual 1.8	RFS-APXV18-dual 1.8
New Antenna Dimensions (inches) (L,W,D)	72 x 6.8 x 3.15	72 x 6.8 x 3.15	72 x 6.8 x 3.15
New Antenna Vendor	RFS	RFS	RFS
Number of New Antennas	1	1	1
New Mechanical Tilt	0	0	0
New Electrical Tilt 17/21	TBD	TBD	TBD
New Electrical Tilt 1900	NA	NA	NA
New Antenna Center line (ft.) 17/21	150	150	150
New Azimuth 17/21	0	120	240

New Antenna Hardware Configuration for GSM & UMTS			
Total Number of Feeders	6	6	8
# Spare Feeders to be used for UMTS	2	2	0
Number of new Feeders	0	0	2
New Feeder Diameter	NA	NA	1 5/8"
New Feeder Length (ft.)	NA	NA	240
Jumper Vendor/Type	TBD	TBD	TBD
Number of new Jumpers Top (antenna)	8	8	8
Number of new Jumpers Bottom (BS)	2	2	2
TMA Vendor/Type	RFS Style 2 GSM/ AWS	RFS Style 2 GSM/ AWS	RFS Style 2 GSM/ AWS
Number of New TMA	2	2	2
New Diplexer Vendor/Type	NA	NA	NA
Number of New Diplexer	NA	NA	NA
Total Number of RET	1	1	5
Combiner/Splitter Vendor	NA	NA	NA
Combiner/Splitter Type	NA	NA	NA

Alpha:
- Add one (1) AWS dual port antenna.
- Use existing two (2) 1-5/8" andrew spare feeder lines
- Replace TMAs with two (2) RFS Style 2 GSM/AWS TMAs

Beta:
- Add one (1) AWS dual port antenna.
- Use existing two (2) 1-5/8" andrew spare feeder lines
- Replace TMAs with two (2) RFS Style 2 GSM/AWS TMAs

Gamma:
- Replace all existing antennas with one (1) AWS dual port antenna and two (2) AWS quad port antenna.
- Replace one (1) existing 1-5/8" Andrew feeder with one (1) 1-5/8" Eupen feeder and add one (1) new 1-5/8 Eupen feeder.
- Replace TMAs with two (2) RFS Style 2 GSM/AWS TMAs

Axxius location: Existing Purcell
ACU Location: New Flexi Purcell
System Modules: New Flexi Purcell

File Info: M:\T-Mobile Cell\1-Houston UMTS Phase II\07-2102 A3D0099A\CDs\A3D0099A CDs.dwg Jan 16, 2008 - 5:17pm jrushing

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Technical Data Sheet APXV18-206517S-C-ACU (Cont.)

Optimizer® Panel Dual Polarized Antenna equipped with ACU motor

RFS

Features/Benefits

- **Variable electrical downtilt - provides enhanced precision in controlling intercell interference. The tilt is infield adjustable 0-10 deg.**
- **High Suppression of all Upper Sidelobes (Typically <-20dB).**
- **Gain difference between UL and DL <1dB.**
- **Azimuth horizontal beamwidth difference <10deg between UL and DL (1710-1755 & 2110-2155).**
- **Dual polarization; Broadband design.**
- **Low profile for low visual impact.**

Technical Features

Frequency Band	3G/UMTS
Horizontal Pattern	Directional
Antenna Type	Panel Dual Polarized
Electrical Down Tilt Option	Variable
Gain, dBi (dBd)	18.8 (16.7) Avg. across band
Frequency Range, MHz	1710-2170
Connector Type	(2) 7-16 DIN Female
Connector Location	Bottom
Mount Type	Downtilt
Electrical Downtilt, deg	0-10
Horizontal Beamwidth, deg	65 ±5 (65.1 average across band)
Mounting Hardware	APM40-2
Rated Wind Speed, km/h (mph)	160 (100)
VSWR	< 1.5:1
Vertical Beamwidth, deg	4.5 to 5.5
Upper Sidelobe Suppression, dB	>18 (Typically >20)
Polarization	Dual pol +/-45°
Front-To-Back Ratio, dB	> 30
Maximum Power Input, W	300
Isolation between Ports, dB	> 30
Lightning protection	Direct Ground
3rd Order IMP @ 2 x 43 dBm, dBc	> 150 (155 Typical)
7th Order IMP @ 2x46 dBm, dBc	> 170
Overall Length, m (ft)	1.85 (6.06)
Dimensions - HxWxD, mm (in)	1850 x 175 x 80 (72.0 x 6.8 x 3.15)

Technical Data Sheet APX17DWV-17DWV-S-E-ACU (Cont.)

Optimizer® Panel Dual Polarized Antenna equipped with (2) ACU motors

RFS

Frequency Range, MHz	1710-2170
Connector Type	(4) 7-16 DIN Female
Connector Location	Bottom
Mount Type	Downtilt
Electrical Downtilt, deg	0-10 , 0-10
Horizontal Beamwidth, deg	65 ±5 (64.8 average across band)
Mounting Hardware	APM40-2
Rated Wind Speed, km/h (mph)	160 (100)
VSWR	< 1.5:1
Vertical Beamwidth, deg	4.4 to 5.6
Upper Sidelobe Suppression, dB	>18 (Typically >20)
Polarization	Dual pol +/-45°
Front-To-Back Ratio, dB	> 30
Maximum Power Input, W	300
Isolation between Ports, dB	> 30
Lightning protection	Direct Ground
3rd Order IMP @ 2 x 43 dBm, dBc	> 150 (155 Typical)
7th Order IMP @ 2x38 dBm, dBc	> 170
Overall Length, m (ft)	1.85 (6.0)
Dimensions - HxWxD, mm (in)	1850 x 330 x 80 (73 x 13 x 3.15)
Radiating Element Material	Brass
Radome Material	Fiberglass
Reflector Material	Aluminum
Max Wind Loading Area, m² (ft²)	0.64 (6.6)
Survival Wind Speed, km/h (mph)	200 (125)
Maximum Thrust @ Rated Wind, N (lbf)	787 (177)
Front Thrust @ Rated Wind, N (lbf)	787 (177)
Shipping Weight, kg (lb)	23.8 (52)
Packing Dimensions, HxWxD, mm (in)	2021 x 420 x 210 (61 x 16.5 x 8.3)
Packing Dimensions - HxWxD, m (ft)	2.0 x .42 x .21 (5.08 x 1.37 x 0.69)
Isolation Between Bands, dB	> 30
Weight w/o Mtg Hardware, kg (lb)	18.0 (39.6)
Weight w/ Mtg Hardware, kg (lb)	20.8 (45.7)

Note

This data is provisional and subject to change.

Nokia Siemens Networks

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RF DATA SHEET & ANTENNA DETAILS

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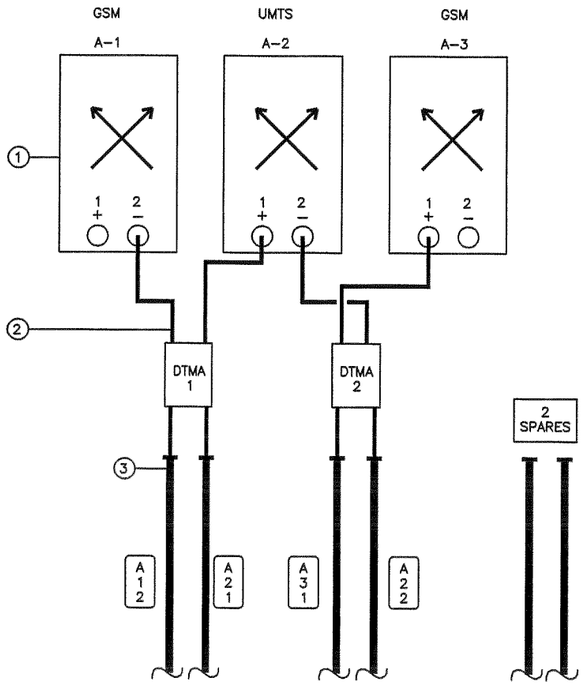
WATER TOWER
A3D0099A
2801 21ST. NORTH
TEXAS CITY, TX 77590

JRH PROJECT NO.: 07-2102

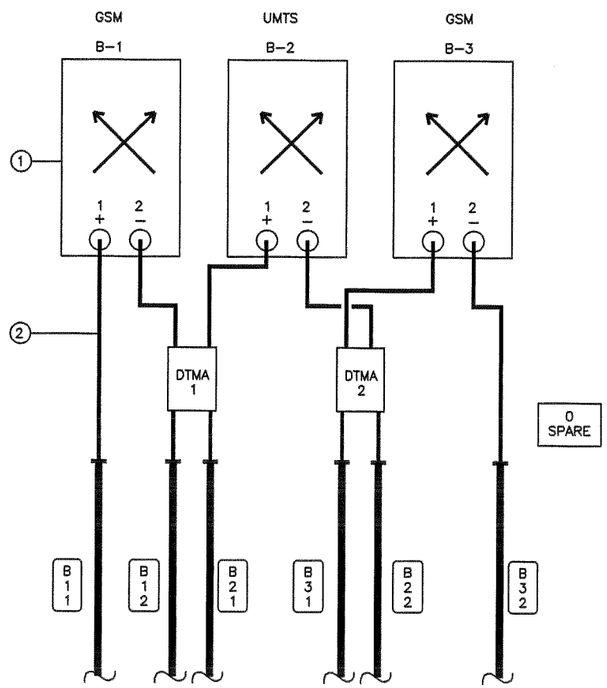
DRAWN BY:	GRC
CHECKED BY:	JWR
DATE	16 JANUARY 2008
PLOT SCALE	1:1
DRAWING NAME	A3D0099A-C3.dwg
SHEET No.	C-3

LOCATION OF UMTS ANTENNAS IS SCHEMATIC ONLY
SEE SHEET C-1 FOR SITE SPECIFIC LOCATION
ANTENNAS ARE BEING VIEWED FROM THE BACK

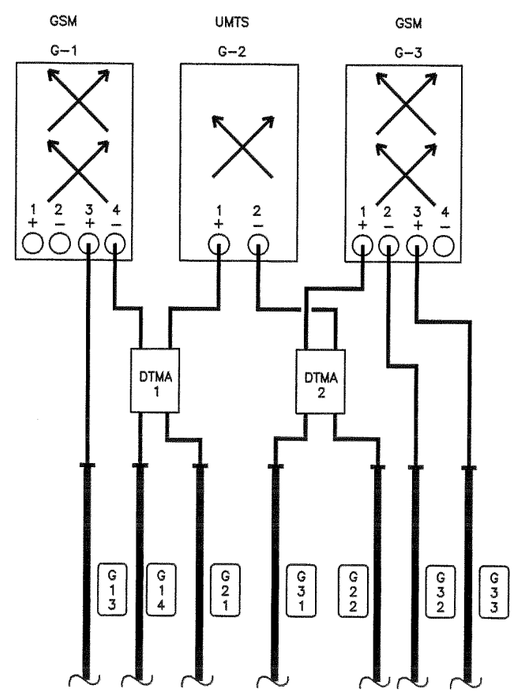
SECTOR ALPHA



SECTOR BETA



SECTOR GAMMA

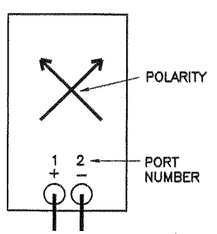


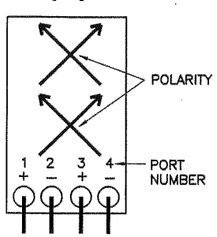
LEGEND

1. ANTENNA
2. TOP JUMPER
3. COAX
4. BOTTOM JUMPER

A — SECTOR
1 — ANTENNA NUMBER
2 — PORT

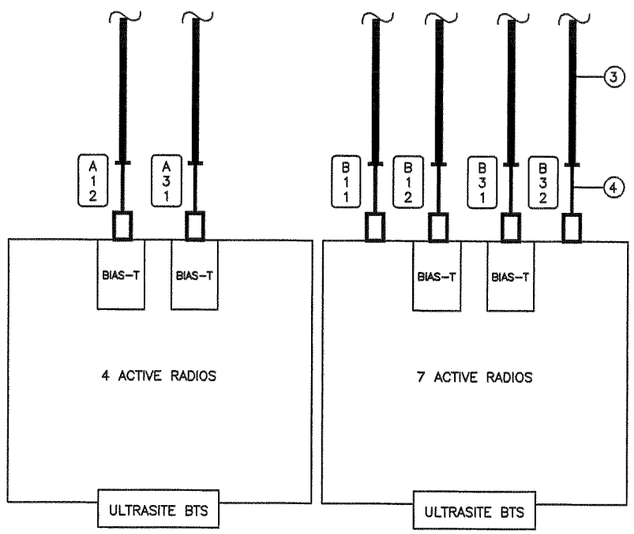
GSM — ANTENNA BAND TYPE
A-1 — ANTENNA NUMBERING





EUPEN RF CONNECTIONS DO NOT REQUIRE
WEATHERPROOFING IF USED AND INSTALLED PER
EUPEN INSTALLATION REQUIREMENTS.

REPLACE (1) ANDREW FEEDER W/ (1) EUPEN FEEDER
AND ADD (1) NEW EUPEN FEEDER



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REVISIONS	DATE
A PRELIMINARY REVIEW	07/25/07
0 ISSUED FOR CONSTRUCTION	08/31/07
1 REVISED FOR CONSTRUCTION	01/18/08

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RF PLUMBING DIAGRAM

TEXAS CITY
WATER TOWER
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2801 21ST. NORTH
TEXAS CITY, TX 77590

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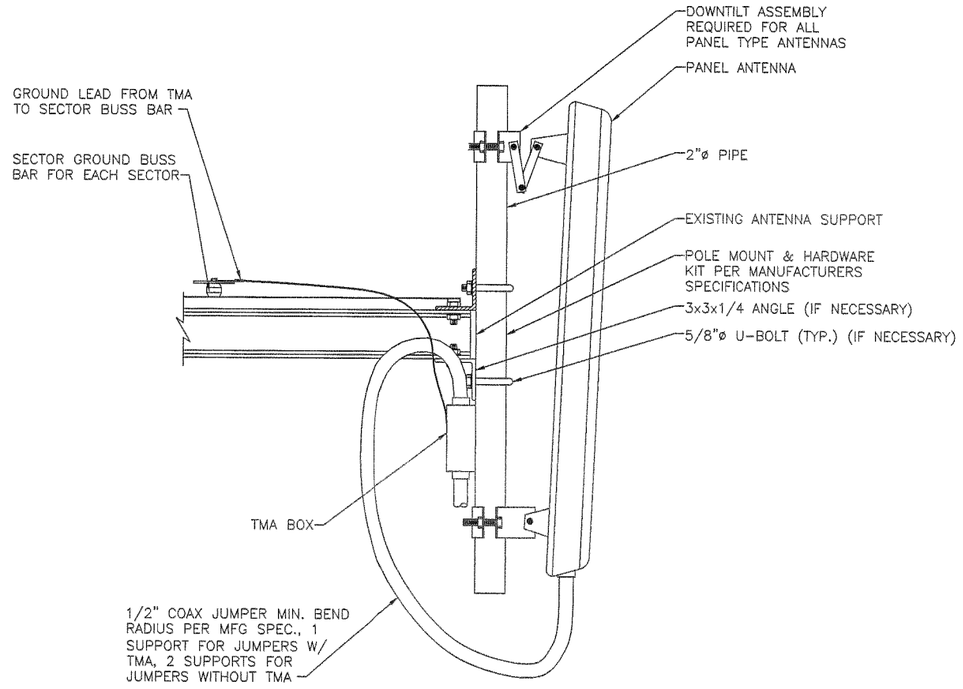
SHEET No.	C-4



NOT USED SCALE: N.T.S. | 2

TYPICAL ANTENNA DETAIL SCALE: N.T.S. | 1

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DETAILS

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TEXAS CITY, TX 77590

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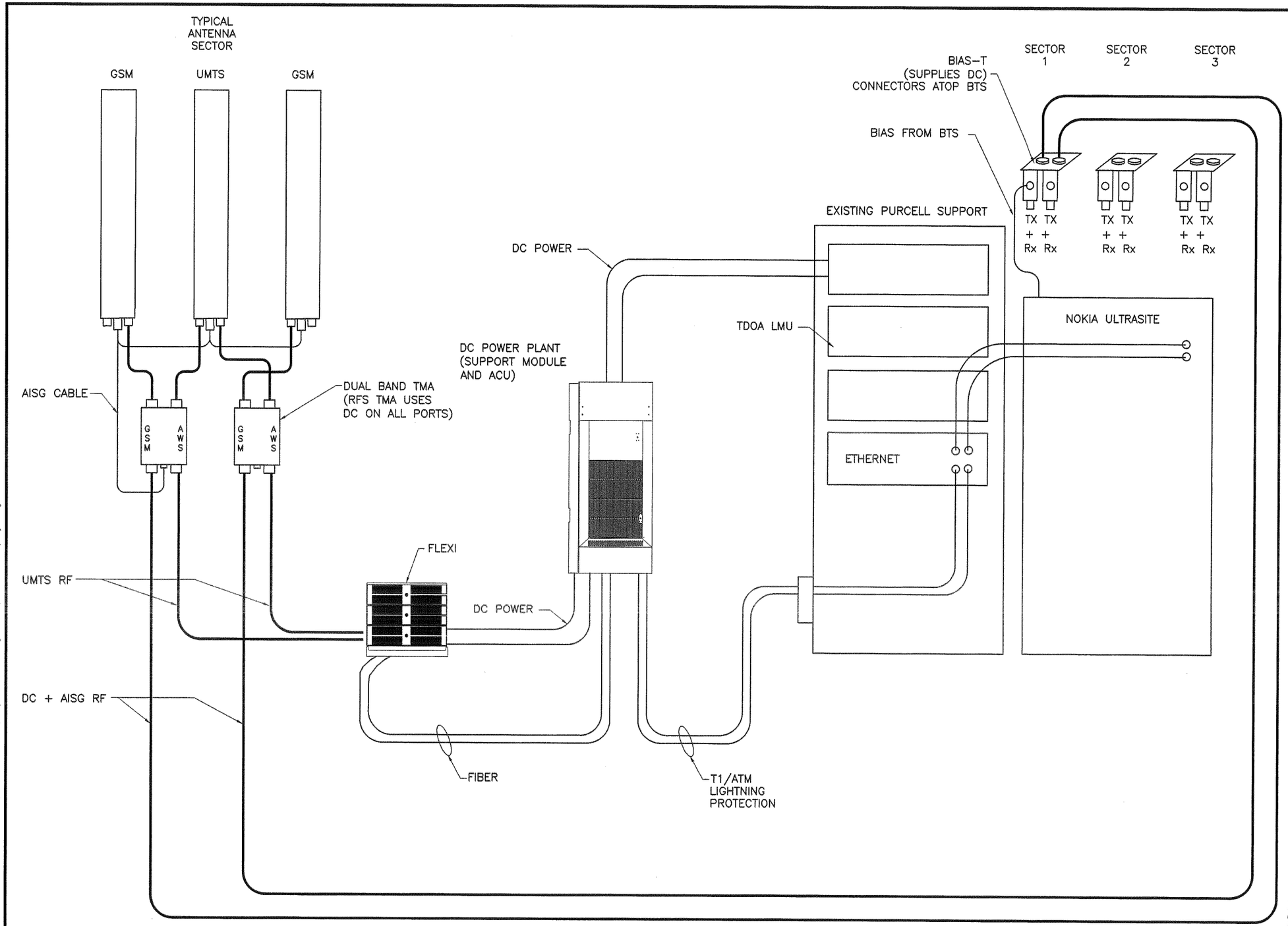
PLOT SCALE	1:1
DRAWING NAME	A3D0099A-C5.dwg
SHEET No.	C-5

STATE OF TEXAS
BRIAN A. McCALLISTER
92643
LICENSED
PROFESSIONAL ENGINEER



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STATE OF TEXAS
BRIAN A. McCALLISTER
92643
LICENSED
PROFESSIONAL ENGINEER
1/16/09

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GENERAL EQUIPMENT CONFIGURATION

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WATER TOWER
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2801 21ST. NORTH
TEXAS CITY, TX 77590

JRH PROJECT NO.: 07-2102

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CHECKED BY:	JWR
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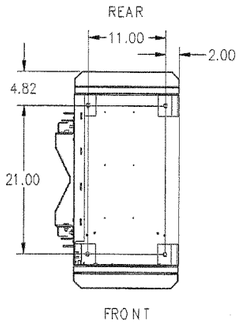
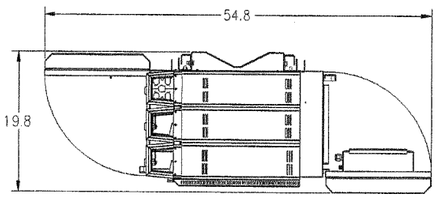
PLOT SCALE	1:1
DRAWING NAME	A3D0099A-C6.dwg
SHEET No.	C-6

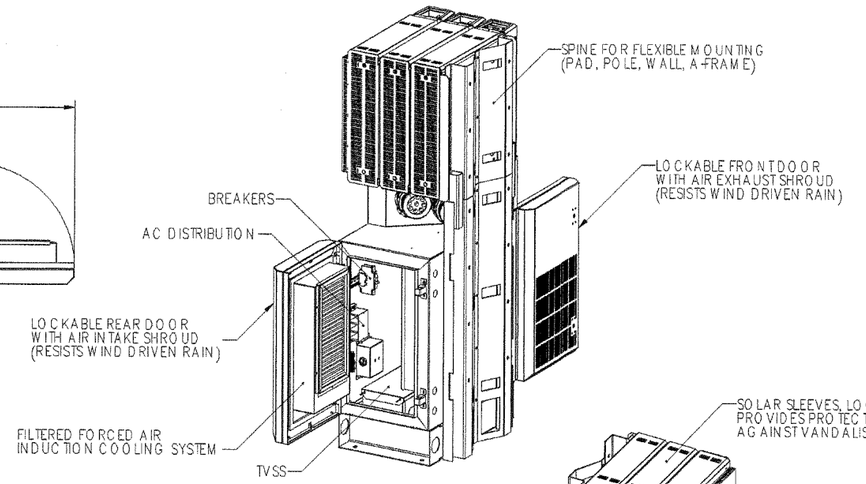
NOTES: OPTIONAL CONFIGURATION

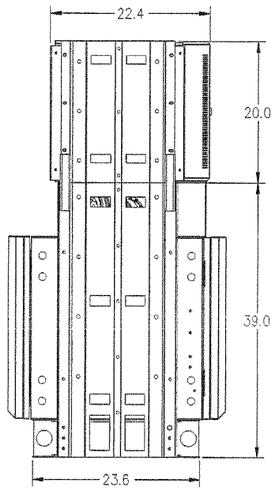


PAD LAYOUT VIEW

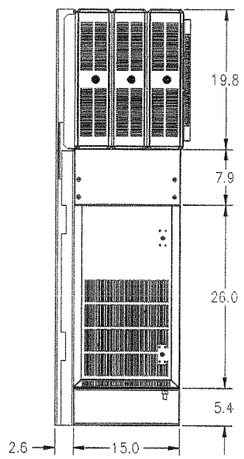


TOP VIEW
DOORS OPEN

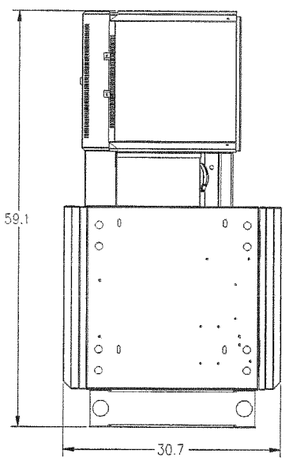




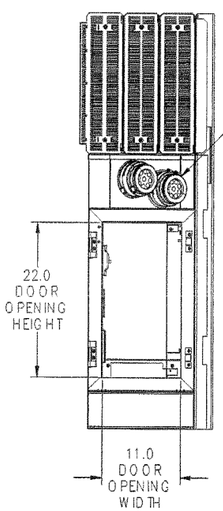
LEFT VIEW



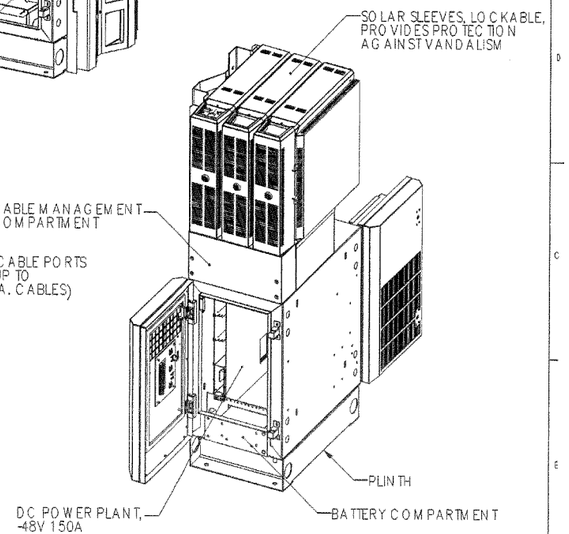
FRONT VIEW



RIGHT VIEW



REAR VIEW
DOORS REMOVED



PROPRIETARY
INFORMATION

DO NOT SCALE DRAWING	DRAWN BY: DWW	DATE: 2-21-07	Purcell SYSTEMS, Spokane Valley, WA 99216		
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES. TOLERANCES AS NOTED.	ENGINEER: —	DATE: —	16125 E. Euclid Ph: 509-755-0341 Fax: 509-755-0345		
DECIMAL TOLERANCES .X ± .XX ± .XXX ± ANGLE TOLERANCE X ±1°	CHECKED BY: —	DATE: —	DESCRIPTION: CUST.DWG,FLEXI,NOKIA,UM,TS		
THIRD ANGLE PROJECTION	THE DRAWING AND INFORMATION CONTAINED HEREIN IS THE CONFIDENTIAL PROPRIETARY PROPERTY OF PURCELL SYSTEMS AND MAY BE DISCLOSED BY PATENT APPLICATION PENDING WITH THE UNITED STATES PATENT AND TRADEMARK OFFICE. ANY REPRODUCTION IS PROHIBITED WITHOUT WRITTEN CONSENT FROM PURCELL SYSTEMS. OPERATION OF THIS SYSTEM IS STRICTLY PROHIBITED.		SIZE: D	PART NUMBER: 1000008831	REV: 00
			PROJECT: —	SCALE: 1:8	SHEET 1 OF 1

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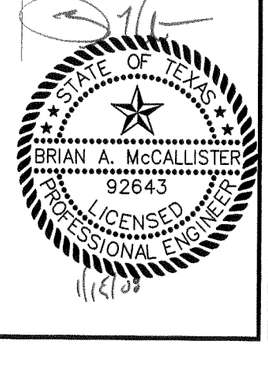

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FLEXI DETAILS

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2801 21ST. NORTH
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JRH PROJECT NO.: 07-2102

DRAWN BY: GRC
CHECKED BY: JWR
DATE: 16 JANUARY 2008
PLOT SCALE: 1:1
DRAWING NAME: A3D0099A-C7.dwg
SHEET No.: C-7

File Info: M:\T-Mobile Cell\1-Houston UMTS Phase II\07-2102 A3D0099A\CDs\A3D0099A CDs.dwg Jan 16, 2008 - 5:18pm jrushing

ELECTRICAL NOTES

1. ALL WORK IS TO COMPLY WITH THE LATEST EDITION OF THE INTERNATIONAL BUILDING CODE (IBC), NATIONAL ELECTRIC CODE (N.E.C.) AND ANY LOCAL ORDINANCES, CODES, AND ALL OTHER ADMINISTRATIVE AUTHORITIES HAVING JURISDICTION. THE CONTRACTOR SHALL FURNISH AND PAY FOR ALL PERMITS AND RELATED FEES.

2. ALL EQUIPMENT AND MATERIAL FURNISHED AND INSTALLED UNDER THIS CONTRACT SHALL BE UNDERWRITERS LABORATORIES (U.L.) LISTED, NEW, FREE FROM DEFECTS, AND SHALL BE GUARANTEED FOR A PERIOD OF ONE YEAR FROM DATE OF FINAL ACCEPTANCE BY OWNER OR HIS REPRESENTATIVE. SHOULD ANY TROUBLE DEVELOP DURING THIS PERIOD DUE TO FAULTY WORKMANSHIP, MATERIAL OR EQUIPMENT, THE CONTRACTOR SHALL FURNISH ALL NECESSARY MATERIALS AND LABOR TO CORRECT THE TROUBLE WITHOUT COST TO THE OWNER.

3. ALL WORK SHALL BE EXECUTED IN A WORKMAN-LIKE MANNER AND SHALL PRESENT A NEAT MECHANICAL APPEARANCE WHEN COMPLETED. CONTRACTOR SHOULD AVOID DAMAGE TO EXISTING UTILITIES WHEREVER POSSIBLE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CUTTING AND PATCHING RELATED TO ELECTRICAL WORK, AND SHALL RESTORE ALL EXISTING LANDSCAPING, SPRINKLER SYSTEMS, CONDUITS, WIRING, PIPING, ETC. DAMAGED BY THE ELECTRICAL WORK TO MATCH EXISTING CONDITIONS.

4. ELECTRICAL WORK SHALL INCLUDE, BUT NOT BE LIMITED TO, ALL LABOR, MATERIALS AND EQUIPMENT REQUIRED TO COMPLETE ELECTRICAL POWER AND LIGHTING SYSTEMS, TELEPHONE AND COMMUNICATION SYSTEMS, PANEL BOARDS, CONDUIT, CONTROL WIRING, GROUNDING, ETC. AS INDICATED ON ELECTRICAL DRAWINGS AND/OR AS REQUIRED BY GOVERNING CODES.

5. PRIOR TO INSTALLING ANY ELECTRICAL WORK, THE CONTRACTOR SHALL VISIT THE JOB SITE AND VERIFY EXISTING SITE LOCATIONS AND CONDITIONS AND UTILITY SERVICE REQUIREMENTS OF THE JOB, AND BY REFERENCE TO ENGINEERING AND EQUIPMENT SUPPLIERS DRAWINGS. SHOULD THERE BE ANY QUESTION OR PROBLEM CONCERNING THE NECESSARY PROVISIONS TO BE MADE, PROPER DIRECTIONS SHALL BE OBTAINED BEFORE PROCEEDING WITH ANY WORK.

6. PROVIDE POWER AND TELEPHONE TO SERVICE POINTS PER UTILITY COMPANY REQUIREMENTS. CONTRACTOR SHALL CONTACT UTILITY SERVICE PLANNERS AND OBTAIN ALL SERVICE REQUIREMENTS AND INCLUDE COSTS FOR SUCH IN THEIR BID.

7. SERVICE EQUIPMENT SHALL HAVE A SHORT CIRCUIT WITHSTAND RATING EQUAL TO OR EXCEEDING THE MAXIMUM AVAILABLE FAULT CURRENT AT THE SUPPLY TERMINAL ON THE UTILITY TRANSFORMER SECONDARY, THE INSULATION SHALL BE FREE FROM ANY SHORT CIRCUITS AND GROUNDS.

8. ALL WIRES SHALL BE STRANDED COPPER WITH THHN/THWN AND 600 VOLTS INSULATION. ALL GROUND CONDUCTORS TO BE PROPERLY SIZED COPPER. (STRANDED OR SOLID).

9. IN THE EVENT OF ANY CONFLICT OR INCONSISTENCY BETWEEN ITEMS SHOWN ON THE PLANS AND/OR SPECIFICATIONS, THE NOTE, SPECIFICATION OR CODE WHICH PRESCRIBES AND ESTABLISHES THE HIGHEST STANDARD OF PERFORMANCE SHALL PREVAIL.

10. SERVICE CONDUITS SHALL HAVE NO MORE THAN (2) -90° BENDS IN ANY SINGLE RUN. THE CONTRACTOR SHALL PROVIDE PULL BOXES AS NEEDED WHERE CONDUIT REQUIREMENTS EXCEED THESE CONDITIONS. PULL WIRES AND CAPS SHALL BE PROVIDED AT ALL SPARE CONDUITS FOR FUTURE USE.

11. ALL ELECTRICAL EQUIPMENT SHALL BE ANCHORED TO WITHSTAND 100 M.P.H. WIND SPEED AND DESIGNED FOR OUTDOOR EXPOSURE.

12. ALL COAX, POWER AND TELEPHONE SYSTEM CONDUITS SHALL HAVE A MINIMUM 24" SCH. 80 PVC RADIUS SWEEPS TO EQUIPMENT, PULLBOXES, WATER TOWER, ETC., UNLESS OTHERWISE NOTED, OR AS REQUIRED BY UTILITY COMPANIES.

13. FUSE TYPE SHALL BE BUSSMAN RKI LOW PEAK FUSE (LPU-RK-100).

14. UPON COMPLETION OF THE JOB, THE CONTRACTOR SHALL FURNISH AS-BUILT DRAWINGS TO THE OWNER.

15. CONTRACTOR TO COLOR PHASE CONDUCTORS BLACK (B PHASE), RED (A PHASE), WHITE (NEUTRAL), AND GREEN (GROUND).

16. CONTRACTOR TO PROVIDE GUTTER TAP.

17. GENERAL GROUNDING CRITERIA - ROOFTOP INSTALLATIONS:

    1ST STEP: GROUND TO EXISTING BUILDING STRUCTURAL STEEL AND TO THE EXISTING COLD WATER LINE. (WHERE APPLICABLE) THEN TEST GROUNDING RESISTANCE TO WITHIN 1 TO 5 OHMS OVERALL GROUND RESISTANCE. WHERE THE EFFECTIVE RESISTANCE DOES NOT MEET THIS CRITERIA, PROVIDE SUPPLEMENTAL GROUNDING AND RE-TEST UNTIL GROUND RESISTANCE FALLS BELOW THIS LEVEL.
    SUPPLEMENTAL GROUND MAY CONSIST OF ONE OR MORE OF THE FOLLOWING:
    1) COUNTERPOISE
    2) UFER GROUND
    3) GROUND ROD AND/OR GROUND WELL IN EXTREMELY ADVERSE SOIL CONDITIONS.
    WHERE THE EXISTING BUILDING STEEL DOES NOT PROVIDE AN EFFECTIVE GROUND RESISTANCE, THEN THE CONTRACTOR SHALL PROVIDE A SEPARATE GROUND CONDUCTOR FROM ROOF MOUNTED BTS EQUIPMENT LOCATIONS EITHER DOWN THROUGH THE INSIDE OF THE BUILDING OR DOWN THE OUTSIDE OF THE BUILDING, DEPENDING UPON OWNER PREFERENCE. WHERE THE GROUND CONDUCTOR FROM THE ROOF MOUNTED EQUIPMENT IS ROUTED IN CONDUIT, THE CONDUIT SHALL BE EFFECTIVELY GROUNDED TO THE GROUND CONDUCTOR AT BOTH ENDS OF THE CONDUIT.

18. GENERAL GROUNDING CRITERIA - WATER TOWER INSTALLATIONS:

    FOR INSTALLATIONS WHERE WOODEN STRUCTURES, TOWERS, CONCRETE SILOS, ETC. ARE ENCOUNTERED A SEPARATE DOWNLEAD SHALL BE PROVIDED FROM THE 3 ANTENNAS SEPARATED BY A MINIMUM OF 12 INCHES FROM THE COAXIAL CABLES. THE GROUND CONDUCTOR SHALL BE SECURELY FASTENED TO THE EXTERIOR OF OUTSIDE STRUCTURES WITH NONMETALLIC GROUND STRAPS EVERY 10 FEET. AGAIN, AS FOR TENANT IMPROVEMENT PROJECTS, TEST THE GROUND RESISTANCE FOR WATER TOWER INSTALLATIONS AND PROCEED PER THE ABOVE STEPS.

19. ADDITIONAL GROUNDING CRITERIA:

    A. ALL FASTENERS STAINLESS STEEL, FOR INDOOR ONLY USE ZINC FASTENERS.
    B. LOCATE MAINLINE GROUNDS 12-18 INCHES BEHIND CONNECTORS.
    C. USE GROUND JUMPERS BETWEEN GRIPSTRUT SPLICES AND (1) JUMPER FROM GRIP STRUT TO ICE BRIDGE BRIDGE POST NEAREST BTS CABINET.
    D. APPLY A THIN COATING OF ANTI-OXIDANT COMPOUND TO THE INSIDE OF THE BARREL AND TO THE STRIPPED CONDUCTOR PRIOR TO PLACEMENT IN THE BARREL OF THE COMPRESSION LUG.
    E. INSTALL, CLEAR HEAT SHRINKABLE INSULATOR SO IT COVERS APPROX. 2 INCHES OF THE CABLE INSULATOR AND APPROX. 1/4 INCH OF THE LUG'S BARREL.
    F. LUGS MAY BE INSTALLED ON BOTH SIDES OF THE BUS BAR AT THE SAME POSITION WHERE NECESSARY BUT MAY NOT BE INSTALLED ON THE SAME SIDE OF THE BUS BAR AND IN THE SAME POSITION.
    G. SLACK FOR STRESS RELIEF OF APPROXIMATELY 3 INCHES SHALL BE PROVIDED ON ALL GROUNDING CABLES. MAXIMUM BEND RADIUS OF 12 INCHES FOR ALL CABLES.
    H. SURGE ARRESTORS INSTALLED SEE DETAIL 4/E-4.
    I. USE PVC SCH. 80 UNDER ROADWAYS AND ACCESS, ALSO UP SERVICE POLE RISERS.

TRANSIENT VOLTAGE SURGE SUPPRESSION (TVSS)

1. RF TVSS DEVICES SHALL BE INSTALLED IN ALL NEW ANTENNA & NEW COAXIAL INSTALLATION OR REPLACEMENTS.

2. AC TVSS DEVICES FOR AC POWER SHALL BE INSTALLED FOR ALL NEW AC PANEL INSTALLATION OR REPLACEMENTS

3. THE AC TVSS SHALL BE COMMON MODE TYPE, MINIMUM RATED 120kA SURGE CURRENT, AND HAVE MONITORING LIGHTS WITH FORM C ALARM CONTACTS. THE AC TVSS SHALL BE INNOVATIVE TECHNOLOGIES PTX120 OR OWNER APPROVED EQUAL. THE TVSS SHALL BE CONNECTED TO THE AC SYSTEM THROUGH A CIRCUIT BREAKER IN THE AC PANELBOARD AND SHALL BE MOUNTED INTEGRAL WITH THE PANELBOARD OR DIRECTLY ADJACENT

4. T1 TVSS DEVICES SHALL BE INSTALLED IN ALL NEW T1 INSTALLATIONS (AC DATA MODEL # TJ1010B) (OR APPROVED EQUAL

5. THE SUBCONTRACTOR SHALL INSPECT THE EXISTING TELCO SYSTEM FOR TVSS PRESENCE AND REPORT FINDINGS TO CONTRACTOR

6. SURGE SUPPRESSION AND PROTECTION DEVICES SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC) ARTICLE 250, 280, 285, AND CHAPTER 8, AS APPLICABLE

STATE OF TEXAS
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1/16/08

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ELECTRICAL NOTES & SPECIFICATIONS

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WATER TOWER
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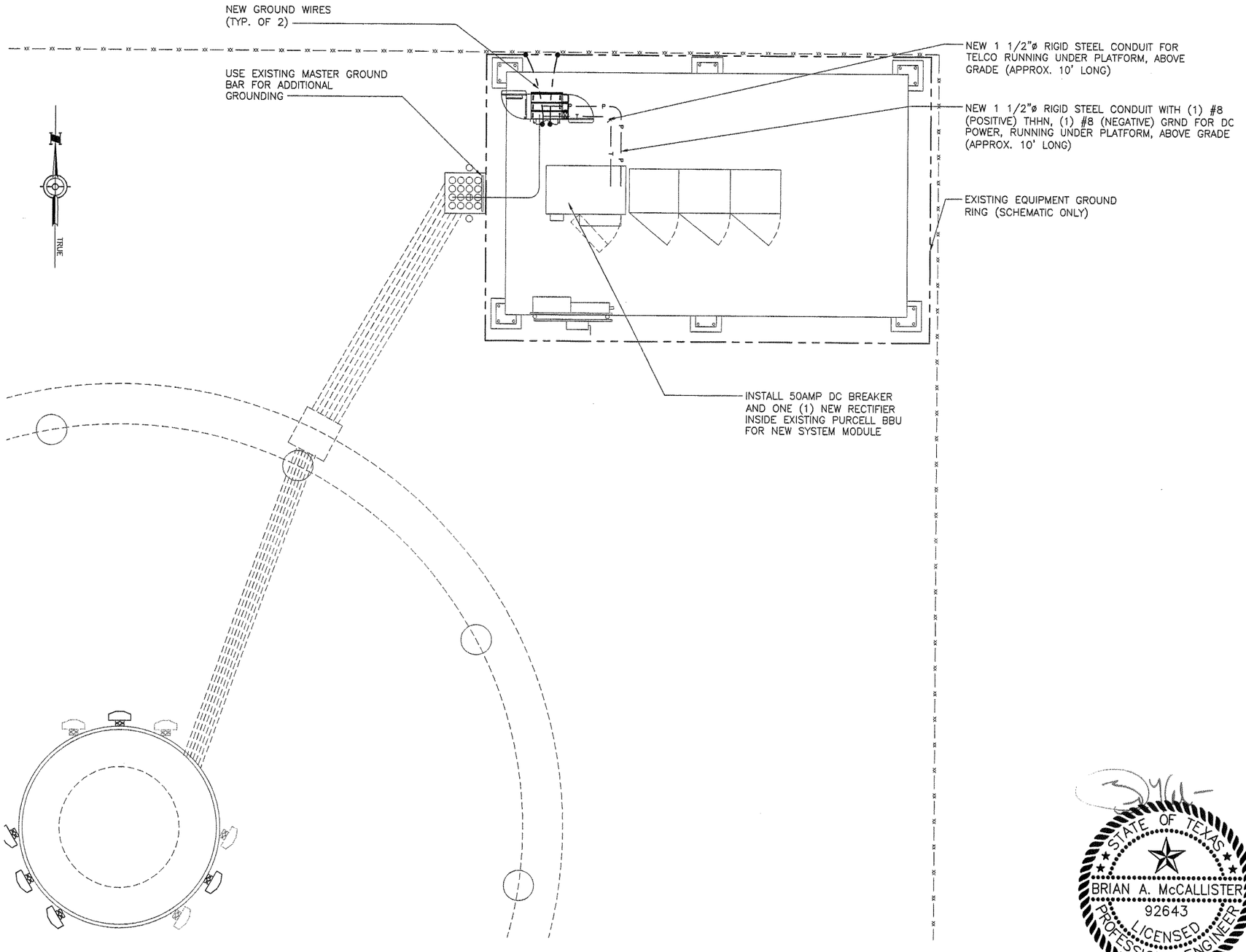
SHEET No.	E-1

GROUNDING NOTES:

1. GROUNDING SHALL COMPLY WITH NEC ART. 250.
2. EQUIPMENT CONTRACTOR SHALL GROUND COAXIAL CABLE SHIELDS MINIMUM AT BOTH ENDS USING MANUFACTURER'S COAX CABLE GROUNDING KITS.
3. BURIED GROUND RING SHALL BE #2 TINNED COPPER BARE WIRE. ALL OTHER GROUNDING TO BE #2 BARE WIRE OR AS SHOWN IN DWG.
4. ROUTE GROUNDING CONDUCTORS ALONG THE SHORTEST AND STRAIGHTEST PATH POSSIBLE. EXCEPT AS OTHERWISE INDICATED. GROUNDING LEADS SHOULD NEVER BE BENT AT A RIGHT ANGLE. ALWAYS MAKE AT LEAST 12" RADIUS BENDS.
5. ALL GROUND CONNECTIONS SHALL BE CADWELD. INSTALLATION SHALL CONFORM TO MANUFACTURERS REQUIREMENTS. DO NOT ALLOW BARE COPPER WIRE TO BE IN CONTACT WITH GALVANIZED STEEL.
6. BOND ANY METAL OBJECTS WITHIN 7 FEET OF BTS EQUIPMENT TO GROUND RING, INCLUDING FENCE POST.
7. CONNECTIONS TO MGB SHALL BE ARRANGED IN THREE MAIN GROUPS:
   SURGE PRODUCERS (COAXIAL CABLE GROUND KITS, TELCO AND POWER GROUND OR SURGE PROTECTOR)
   SURGE ABSORBERS (GROUNDING, ELECTRICAL RING OR BUILDING STEEL)
   NON-SURGE OBJECTS (EGB GROUND IN BTS)
8. CONNECTIONS TO GROUND BARS SHALL BE MADE WITH TWO-HOLE COPPER LUGS WITH LOCK OR STAR WASHERS AND NO-OX OR EQUIVALENT PLACED BETWEEN CONNECTOR AND GROUND BAR.
9. THE GROUND ELECTRODE SYSTEM, SHALL CONSIST OF DRIVEN GROUND RODS UNIFORMLY SPACED AT 8'-0" MINIMUM AROUND CELL SITE. THE GROUND RODS SHALL BE 5/8" X 10'-0" COPPER CLAD STEEL. THE RODS SHALL BE INTERCONNECTED WITH #2 TINNED COPPER GROUND WIRE BURIED A MINIMUM OF 1 FOOT BELOW THE SURFACE OF THE SOIL.
10. MEASURED GROUND RESISTANCE SHALL BE 5 OR LESS. NOTIFY ENGINEER IMMEDIATELY IF RESISTANCE IS ABOVE 5.
11. LOCATE MAIN LINE GROUND 12"-18" BEHIND CONNECTORS.
12. USE THE GROUND JUMPERS BETWEEN GRIPSTRUT BRIDGE SECTION OF ICE BRIDGE, & 1 JUMPER FROM THE GRIPSTRUT BRIDGE SECTION TO THE ICE BRIDGE POST CLOSEST TO THE BTS.
13. SLACK FOR STRESS RELIEF OF APPROX. 3" SHOULD BE PROVIDED ON ALL GROUNDING CABLES MAX. BEND RADIUS 12" FOR ALL CABLES.
14. NEW 40AMP 2P, 1ø, 120/240V BREAKER AS REQUIRED IN EXISTING A/C EQUIPMENT ELEC PANEL PER T-MOBILE REQUIREMENTS FOR INSTALLATION OF NEW RECTIFIER IN EXISTING BBU.

LEGEND:

- CADWELD
- 10' x 5/8"ø COPPER CLAD GROUND ROD (8' MAX. SEPARATION EQUALLY SPACED)
- TEST WELL & GROUND ROD



ELECTRICAL & GROUNDING PLAN

SCALE: 3/8"=1'-0"

1

STATE OF TEXAS
BRIAN A. McCALLISTER
92643
LICENSED PROFESSIONAL ENGINEER

Nokia Siemens Networks

REVISIONS	DATE
A PRELIMINARY REVIEW	07/25/07
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1 REVISED FOR CONSTRUCTION	01/16/08

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ELECTRICAL, GROUNDING PLAN & NOTES

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WATER TOWER
A3D0099A
2801 21ST. NORTH
TEXAS CITY, TX 77590

JRH PROJECT NO.: 07-2102

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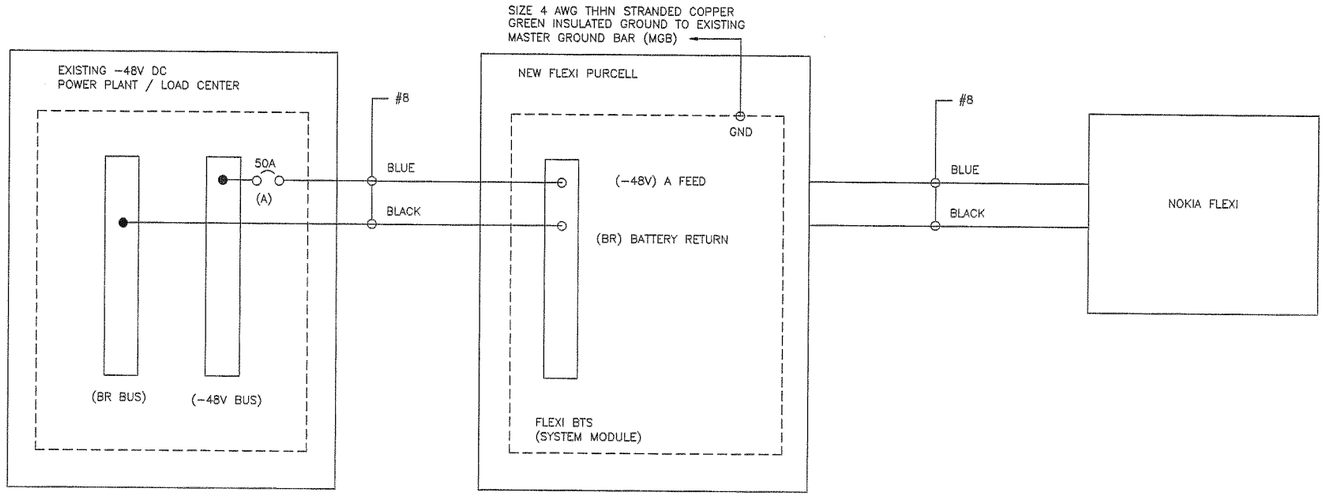
SHEET No.	E-2



DC POWER
ONE - LINE DIAGRAM (1)

SCALE : N.T.S.

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POWER ONE-LINE DIAGRAM

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WATER TOWER
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2801 21ST. NORTH
TEXAS CITY, TX 77590

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PLOT SCALE	1:1
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SHEET No.	E-3

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BRIAN A. McCALLISTER
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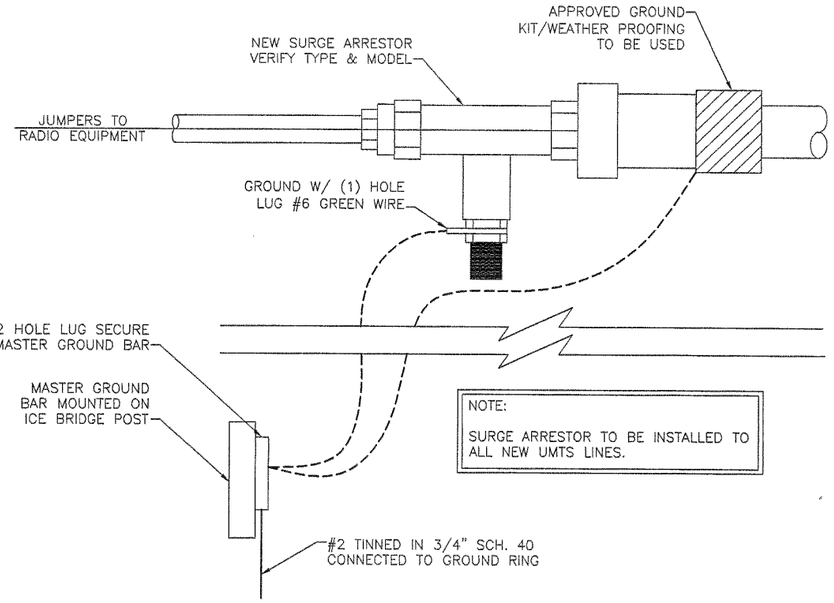
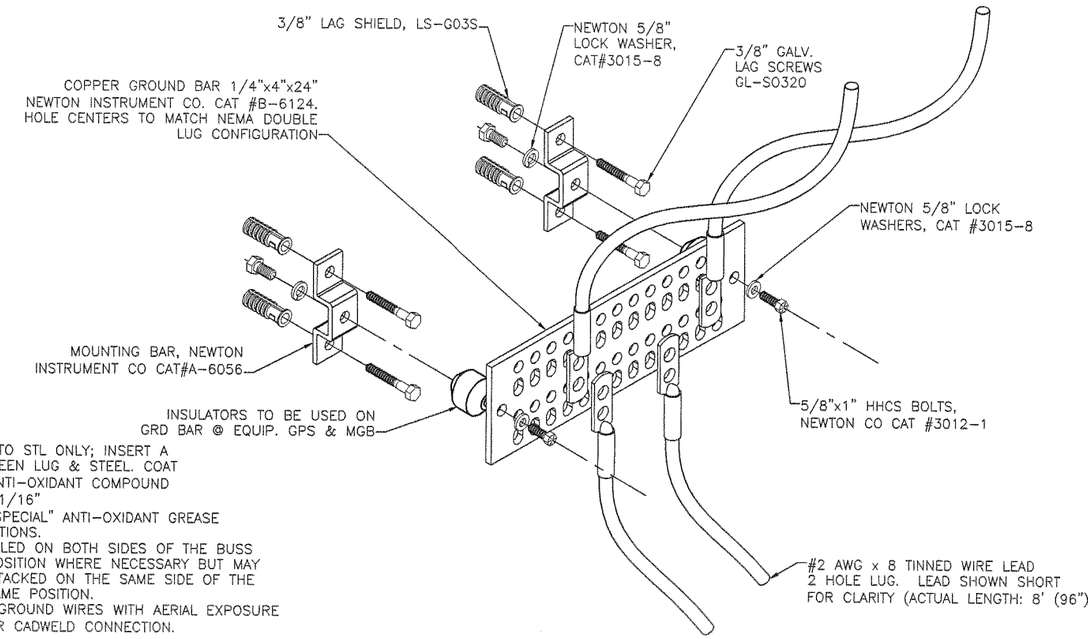
PROFESSIONAL ENGINEER
1/16/08



SURGE ARRESTOR GROUNDING

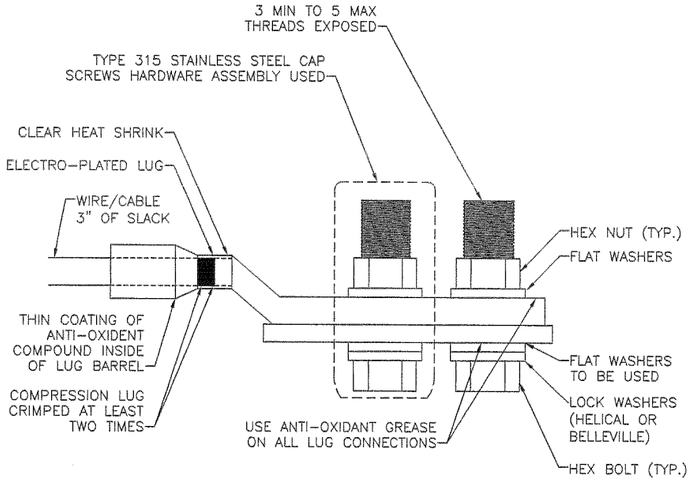
SCALE: N.T.S. | 4



NOTE:
1. FOR GROUND BOND TO STL ONLY; INSERT A TOOTH WASHER BETWEEN LUG & STEEL. COAT ALL SURFACES W/ ANTI-OXIDANT COMPOUND
2. ALL HOSES ARE CS 1/16"
3. USE NO-OX-ID "A-SPECIAL" ANTI-OXIDANT GREASE ON ALL LUG CONNECTIONS.
4. LUGS MAY BE INSTALLED ON BOTH SIDES OF THE BUSS BAR AT THE SAME POSITION WHERE NECESSARY BUT MAY NOT BE INSTALLED STACKED ON THE SAME SIDE OF THE BUSS BAR IN THE SAME POSITION.
5. SEAL-TITE ALL NEW GROUND WIRES WITH AERIAL EXPOSURE WITHIN 1" OF LUG OR CADWELD CONNECTION.

GROUND BAR DETAIL

SCALE: N.T.S. | 5



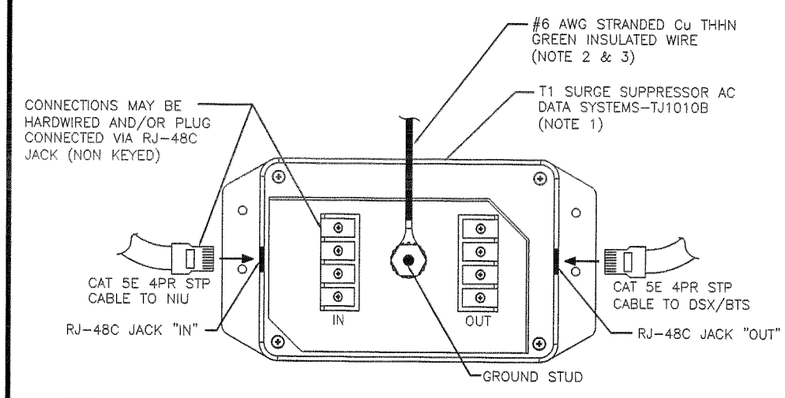
NOTE:
INSTALL TOP QUALITY, CLEAR HEAT SHRINKABLE INSULATOR SO IT COVERS 2" OF THE CABLE INSULATOR.

OUTDOOR GROUNDING CONNECTION DETAIL

SCALE: N.T.S. | 1

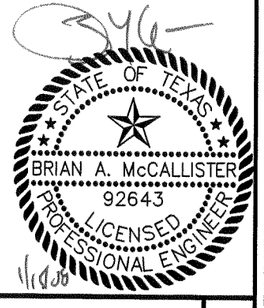
NOT USED

SCALE: N.T.S. | 2



NOTES:

1. MOUNT T1-TVSS UNIT ON EQUIPMENT FRAME HOUSING THE DSX UNIT. USE APPROPRIATE STAINLESS STEEL BOLTS WITH FLAT WASHERS AND A LOCK WASHER ON THE NUT SIDE. THE TVSS MAY BE LOCATED ON THE TELCO BACKBOARD. REFER TO MANUFACTURER'S INSTRUCTIONS.
2. ATTACH RING TERMINAL FROM SUPPLIED GROUND CONDUCTOR TO TVSS GROUND STUD SECURELY FASTEN WITH SUPPLIED WASHER AND NUT. REFER TO MANUFACTURER'S INSTRUCTIONS. FOR PROPER PERFORMANCE, THE GROUND CONDUCTOR LENGTH SHOULD BE LIMITED WITH NO SHARP BENDS ON COILS.
3. WHEN TVSS IS MOUNTED ON EQUIPMENT FRAME, BOND THE GROUND CONDUCTOR TO THE EQUIPMENT FRAME GROUND. ENSURE PROPER GROUNDING SURFACES. WHEN TVSS IS MOUNTED ON THE TELCO BACK BOARD, BOND THE GROUND CONDUCTOR TO THE TELCO (BOARD) GROUND BAR OR NEAREST GROUND BAR.



T1 SURGE SUPRESSOR DETAIL

SCALE: N.T.S. | 3

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GROUNDING DETAILS

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PLOT SCALE	1:1
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SHEET No.	E-4