



Memorandum

Planning & Development Services Division

To: Planning and Public Works Committee

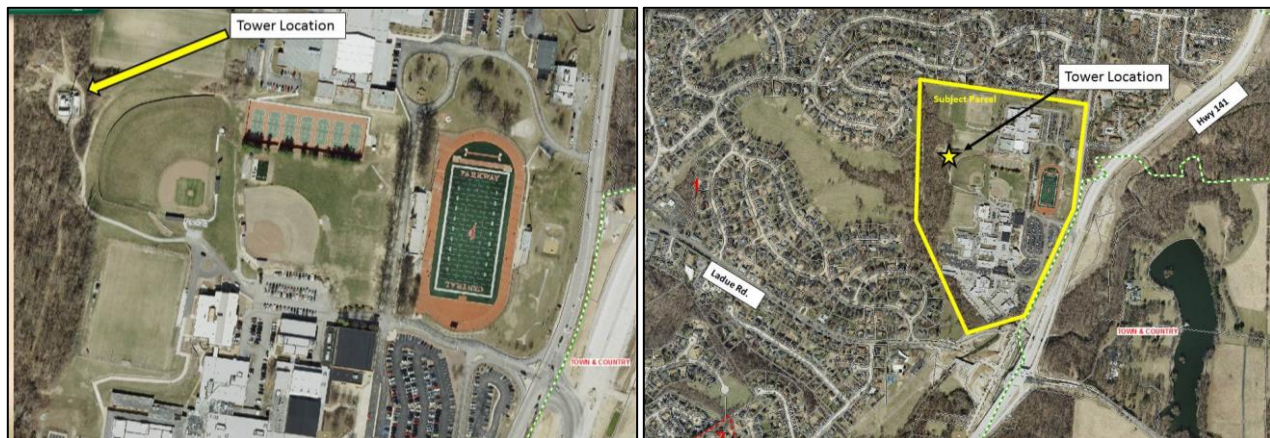
From: John Boyer, Senior Planner

Date: March 21, 2013

RE: **T.S.P. 42-2013 T-Mobile (471 N. Woods Mill Road):** A request to obtain approval to amend a Telecommunications Siting Permit to accommodate nine (9) additional antennas as well as associated new ground equipment on an existing monopole tower within the "NU" Non-Urban District of land located interior to the Parkway Central School District lot west of N. Woods Mill Rd. north of the intersection of Ladue Rd.

Summary

Aaron Adelman (applicant) has submitted a request for a Telecommunications Siting Permit (TSP) for the above referenced property. The proposed TSP is to accommodate nine (9) new antennas as well as associated ground equipment on an existing 115 foot tall monopole tower. The antennas are planned to be located on an existing antenna platform of the tower located 90 feet above the surrounding grade. No antennas are planned for removal with this application (only additions). The additional ground equipment will be installed within the existing fenced enclosure around the tower (see below aerial photos for location maps).



History

The tower was originally approved by the City of Chesterfield in August of 1997 as a 115 foot tall monopole tower. Subsequent amendments to this tower occurred with the following applications (along with description of work);

- T.S.P. 01-2008
 - Three (3) antennas added with new mount/antenna support and ground equipment.
- T.S.P. 10-2009
 - Remove and replace three (3) antennas to existing mount/antenna support.
- T.S.P. 14-2009
 - Three (3) antennas added to existing mount/antenna support and ground equipment.
- T.S.P. 22-2010

- Add three (3) new antennas as well as ground equipment.
- T.S.P. 28-2011
 - Add three (3) new antennas to an existing mount/antenna support.



Discussion

City Code requires that ground equipment be fenced to mitigate unauthorized access. The existing ground equipment is fenced and additionally screened from adjacent properties by existing heavy vegetation/landscaping surrounding the site (see existing site photo and aerial photo above).

City of Chesterfield Ordinance #2391, which governs telecommunications and facilities siting, permits applications for equipment upgrades to be submitted for sites that currently hold a Telecommunications Siting Permit (TSP) without the need for a public hearing. Staff has reviewed the

request by T-Mobile and has determined that the proposed co-location and addition of nine (9) antennas as well as new ground equipment to an existing and permitted site may amend the existing permit without the need for a public hearing.

Attached please find a copy of the statement of intent, construction plans, and site plan.

Respectfully submitted,

John Boyer
Senior Planner

cc. Aimee Nassif, Planning & Development Services Director



City of Chesterfield
Planning & Development Division
690 Chesterfield Parkway West
Chesterfield, MO 63017-0760

March 13, 2013

STATEMENT OF INTENT

RE: T-Mobile's Proposed Antenna Upgrades at 471 North Woods Mill Road, Chesterfield, MO, 63017-3238

RE: T-Mobile's Proposed Antenna Upgrades at 731 Spirit 40 Park-A, Chesterfield, MO, 63005-1142

Dear Madam or Sir,

T-Mobile has leased space at the wireless communication site located at 471 North Woods Mill Road and 731 Spirit 40 Park-A. T-Mobile is in the process of upgrading their existing equipment with new technology to replace their existing obsolete technology. This is being done to support their 4G Network.

For 731 Spirit 40 Park Drive, T-Mobile currently has 3 antennas on their array at 100'. They propose to add 6 more antennas at the same height. No antennas are being removed.

For 471 North Woods Mill Road, T-Mobile currently has 3 antennas on their array at 90'. They propose to add 6 more antennas at the same height. No antennas are being removed.

Per the structural analysis conducted at each site, both structures are designed to accommodate the proposed load.

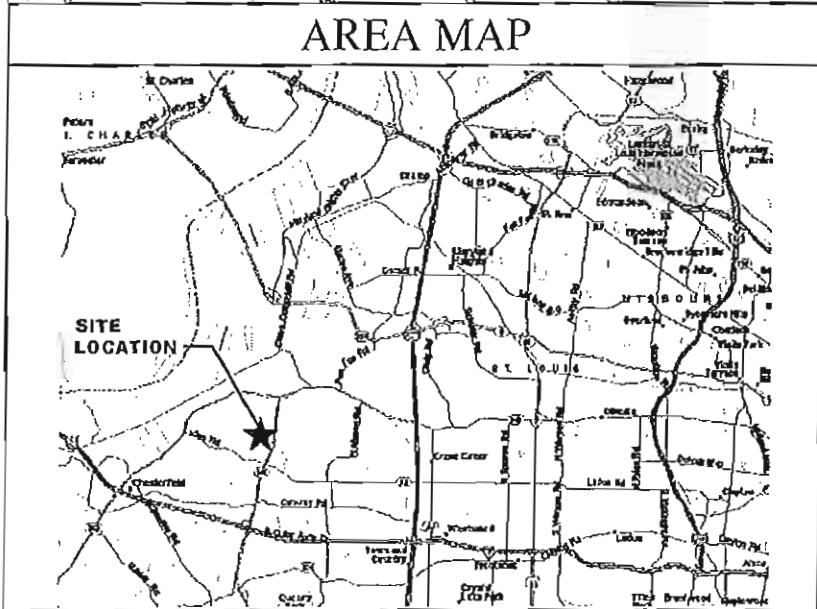
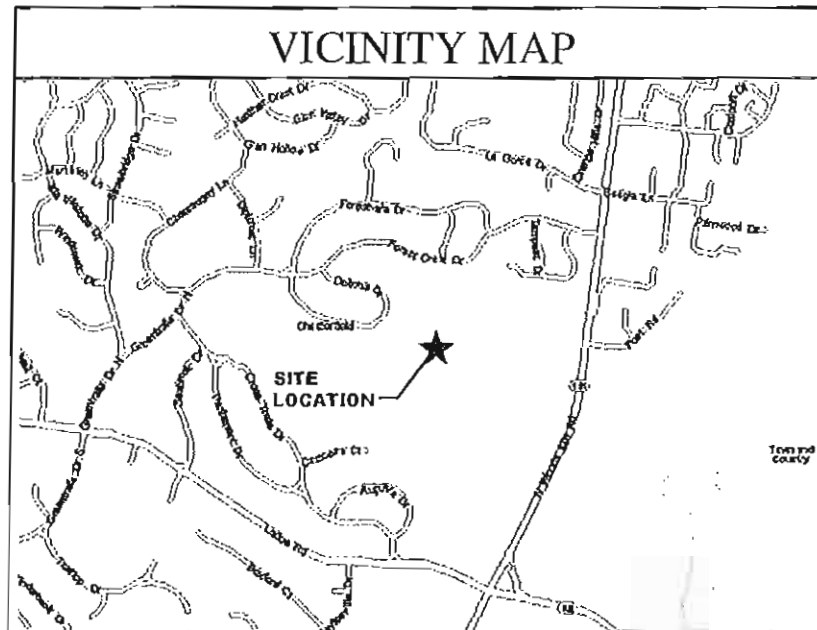
No additional cabinets or structures will be erected at the site. Any new equipment will be mounted to the pedestal next to the existing equipment cabinet.

T-Mobile's installation is a collocation upgrade and will not extend the height of the structure. T-Mobile will not be expanding the existing fenced compound. T-Mobile will not be adding any lighting to the tower.

This installation will not change the existing use of the Wireless Communication Tower.

Respectfully,

Aaron Adelman
SMJ International, LLC



DRIVING DIRECTIONS

DRIVE TO DIRECTIONS AS FOLLOWS:
 FROM T-MOBILE OFFICE AT PAGE AVENUE AND WESTPORT CENTER DRIVE.
 TAKE PAGE AVENUE WEST (0.4 MI) TO BENNINGTON PLACE.
 TAKE BENNINGTON PLACE NORTH (1.1 MI) TO FEE FEE ROAD.
 TAKE FEE FEE ROAD SOUTH (1.1 MI) TO OLIVE BLVD.
 TAKE OLIVE BLVD. WEST (1.3 MI) TO WOODS MILL ROAD.
 TURN LEFT (SOUTH) ONTO SR-141 N WOOD MILL ROAD (0.6 MI).
 TURN RIGHT (NORTH-WEST) ONTO FOREST CREST DRIVE (0.6 MI).
 TURN LEFT (SOUTH-EAST) ONTO DELTONA DRIVE (0.2 MI).
 TURN LEFT (EAST) ONTO LOCAL ROADS.
 ARRIVE AT SITE.

CODE COMPLIANCE

ALL WORK SHALL BE PERFORMED AND MATERIALS INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES.

- INTERNATIONAL BUILDING CODE
- INTERNATIONAL MECHANICAL CODE
- ANSI/TIA-222 STRUCTURAL STANDARD
- NFPA 780 - LIGHTNING PROTECTION CODE
- UNIFORM PLUMBING CODE
- NATIONAL ELECTRICAL CODE

PROJECT INFORMATION

PROJECT ADDRESS: 477 NORTH WOODS MILL ROAD
CHESTERFIELD, MISSOURI 63017

STRUCTURAL INFORMATION: LATITUDE: 38.66742245 N
LONGITUDE: -90.506751 W
TOWER HT: 115'-0" AGL
ANTENNA CL: 90'-0" AGL

APPLICANT: T-MOBILE
2004 WESTPORT CENTER DRIVE
ST. LOUIS, MISSOURI 63146

CONSULTING TEAM

ENGINEER: SSC, INC.
721 EMERSON ROAD, SUITE 475
ST. LOUIS, MISSOURI 63141
PHONE: (314) 993-1010
FAX: (314) 993-1036

M.L. OWENS - LEAD ENGINEER
S.D. KEISLING - LEAD ELECTRICAL
F. GUY - LEAD DESIGNER

PROJECT MANAGER: CHUCK HALL
AMERICAN TOWER CORPORATION
PHONE: (314) 575-0000

APPROVALS

SSC	DATE
RF	DATE
CONSTRUCTION	DATE
T-MOBILE	DATE
OPERATIONS	DATE
REAL ESTATE	DATE

EQUIPMENT

EQUIPMENT FURNISHED AND/OR INSTALLED BY:

DESCRIPTION	FURNISHED	INSTALLED
ANTENNAS	T-MOBILE	CONTRACTOR
FLEXI STACK EQUIPMENT	T-MOBILE	T-MOBILE
COAX HANGERS	CONTRACTOR	CONTRACTOR
CONNECTORS	T-MOBILE	CONTRACTOR
LDF4 ANTENNA JUMPERS	T-MOBILE	CONTRACTOR
HYBRID CABLE	T-MOBILE	CONTRACTOR
UPPER & LOWER COVP'S	T-MOBILE	CONTRACTOR
RRU'S	T-MOBILE	CONTRACTOR

DRAWING INDEX

SHEET NUMBER	TITLE DESCRIPTION	REVISION	RESPONSIBLE DISCIPLINE
T-1	TITLE SHEET	0	SC/E
A-1	SITE PLAN	0	SC
A-2	CONDUIT LAYOUT AND DETAILS	0	SC
A-3	EQUIPMENT ELEVATION	0	SC
A-4	TOWER ELEVATION AND ANTENNA PLAN	0	SC
A-5	ANTENNA, RRU & TMA CONFIGURATION KEYS	0	SC
A-6	NSN CONFIGURATION	0	SC
A-7	RRU CONNECTION DIAGRAM	0	SC
A-8	RET ACTUATOR NAMING AND DETAILS	0	SC
A-9	RFDS CONFIGURATION DATA SHEET	0	SC
G-1	GROUNDING PLAN & ELEVATION	0	E
G-1	GROUNDING DETAILS	0	E
SP-1	SPECIFICATIONS (1 OF 3)	0	SC
SP-2	SPECIFICATIONS (2 OF 3)	0	E
SP-3	SPECIFICATIONS (3 OF 3)	0	E

T-Mobile USA, INC.

LTE UPGRADE FOR EXISTING CELL SITE

SITE NAME:
PARKWAY CENTRAL HS SWB MP

SITE NUMBER:
MO-06-263-A

ATC SITE NUMBER: 305930

RECEIVED
 City of Chesterfield
 FEB 22 2013
 Department of Public Services

AMERICAN TOWER
 3200 COBB GALLERIA PARKWAY, SUITE 205
 ATLANTA, GEORGIA 30339
 PHONE: (770) 308-1973

T-Mobile
 2004 WESTPORT CENTER DRIVE
 ST. LOUIS, MO 63146
 PHONE: (314) 812-3600
 FAX: (314) 812-3692

SSC
 9900 West 109th Street, Suite 300
 Overland Park, Kansas 66210
 Phone: 913-438-7700 Fax: 913-438-7777

STATE OF MISSOURI
 CERTIFICATE OF AUTHORIZATION #091640
 RESPONSIBLE ENGINEERS RESPONSIBLE DISCIPLINE:
 M.V. KEVIN VAHLE E-21561 STRUCTURAL/CIVIL EC
 M.L. MICHAEL OWENS E-29058 STRUCTURAL/CIVIL EC
 R.E. ROBERT E. JENSEN E-22874 STRUCTURAL/CIVIL EC
 S.D. SHELTON E-27379 ELECTRICAL E
 T.M. TERRANCE M. BLUPER E-18521 ELECTRICAL E

DESIGNER: F. GUY
LEAD EE: S.D. KEISLING
LEAD CESE: M.L. OWENS

SUBMITTALS

NO.	DATE	DESCRIPTION	BY
A	01/14/13	ISSUED FOR REVIEW	FG
B	01/15/13	REVISED PER CLIENT COMMENTS	DSH
C	01/18/13	REVISED PER CLIENT COMMENTS	DSH
D	01/21/13	REVISED PER CLIENT COMMENTS	DSH
E	01/24/13	ISSUED FOR CONSTRUCTION	DSH

SITE NAME:
PARKWAY CENTRAL HS SWB MP

SITE NUMBER:
MO-06-263-A

SITE ADDRESS:
 1101 KISKER ROAD
 SAINT CHARLES, MISSOURI
 63304

SHEET TITLE:
TITLE SHEET

SHEET NUMBER:
T-1



AMERICAN TOWER
 3200 COBB GALLERIA PARKWAY, SUITE 205
 ATLANTA, GEORGIA 30339
 PHONE: (770) 308-1973



2004 WESTPORT CENTER DRIVE
 ST. LOUIS, MO 63148
 PHONE: (314) 812-3600
 FAX: (314) 812-3692



9900 West 109th Street, Suite 300
 Overland Park, Kansas 66210
 Phone: 913-438-7700 Fax: 913-438-7777

STATE OF MISSOURI
 CERTIFICATE OF AUTHORIZATION #011643
 RESPONSIBLE ENGINEERS RESPONSIBLE DISCIPLINE
 M.V. ZEYIN M.A.S. E-21561 STRUCTURAL/CIVIL EC
 M.L. OWENS E-20058 STRUCTURAL/CIVIL EC
 R.E. ROBERTS E-20274 STRUCTURAL/CIVIL SC
 E.O.K. ENELTODI E-27222 ELECTRICAL E
 T.M.S. TERRANCE M. GUYER E-16521 ELECTRICAL E

DESIGNER: F. GUY
 LEAD EE: S.D. KEISLING
 LEAD CE/SE: M.L. OWENS

SUBMITTALS		
NO.	DATE	DESCRIPTION
A	01/14/13	ISSUED FOR REVIEW
B	01/15/13	REVISED PER CLIENT COMMENTS
C	01/16/13	REVISED PER CLIENT COMMENTS
D	01/21/13	REVISED PER CLIENT COMMENTS
E	01/24/13	ISSUED FOR CONSTRUCTION

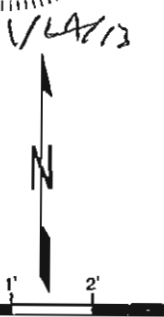
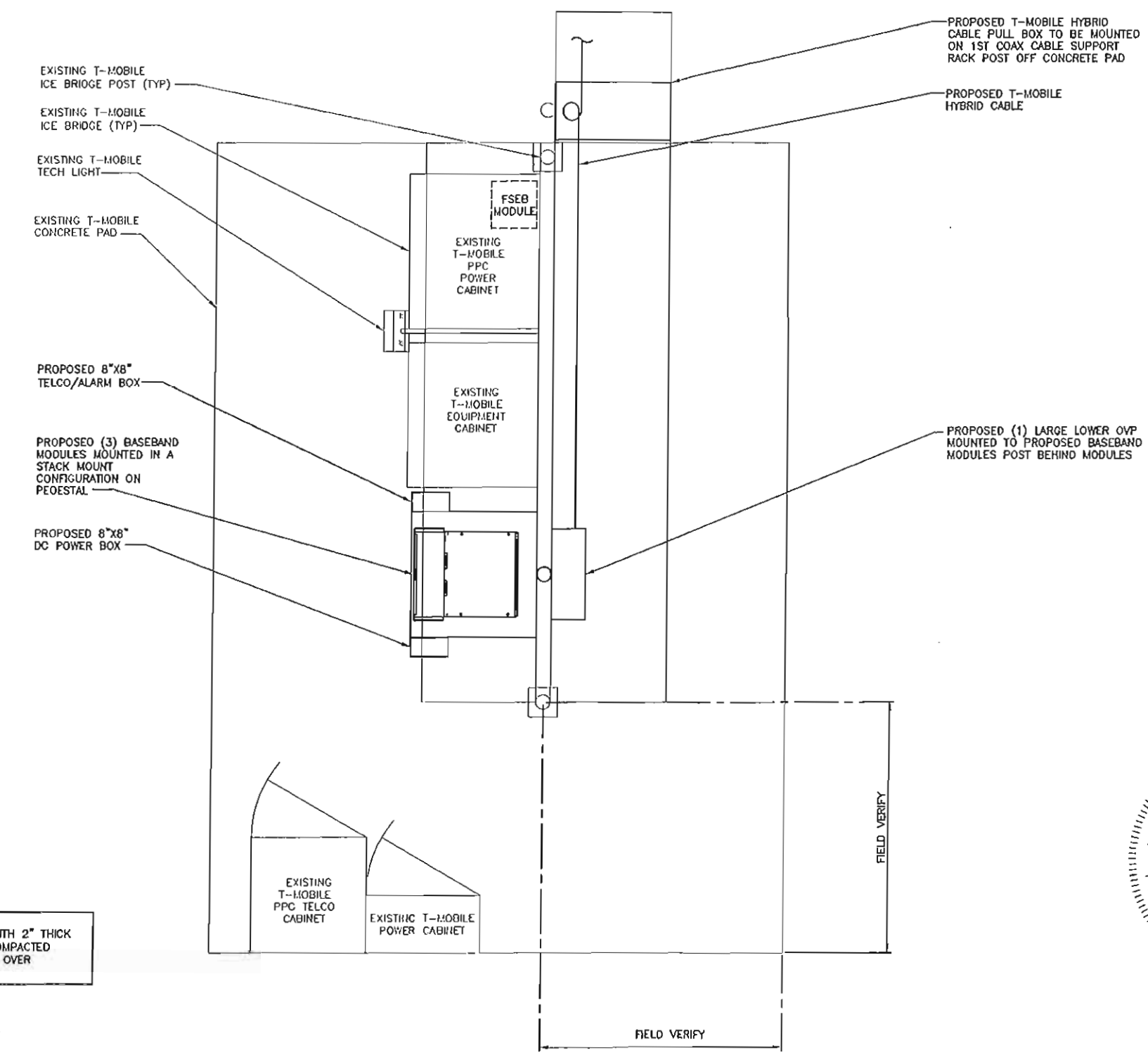
SITE NAME
**PARKWAY CENTRAL
 HS SWB MP**

SITE NUMBER
MO-06-263-A

SITE ADDRESS
**1101 KISKER ROAD
 SAINT CHARLES, MISSOURI
 63304**

SHEET TITLE
SITE PLAN

SHEET NUMBER
A-1



NOTE:
 REPAIR DISTURBED GRAVEL DURING CONSTRUCTION WITH 2" THICK CLEAN GRADE B CRUSHED STONE OVER 4" THICK COMPACTED MODOT TYPE 2A AGGREGATE BASE COURSE MATERIAL OVER GEO-TEXTILE FABRIC.

CALL BEFORE YOU DIG - DRILL - BLAST
 1-800-344-7483 (TOLL FREE)
 MISSOURI ONE CALL SYSTEM, INC.

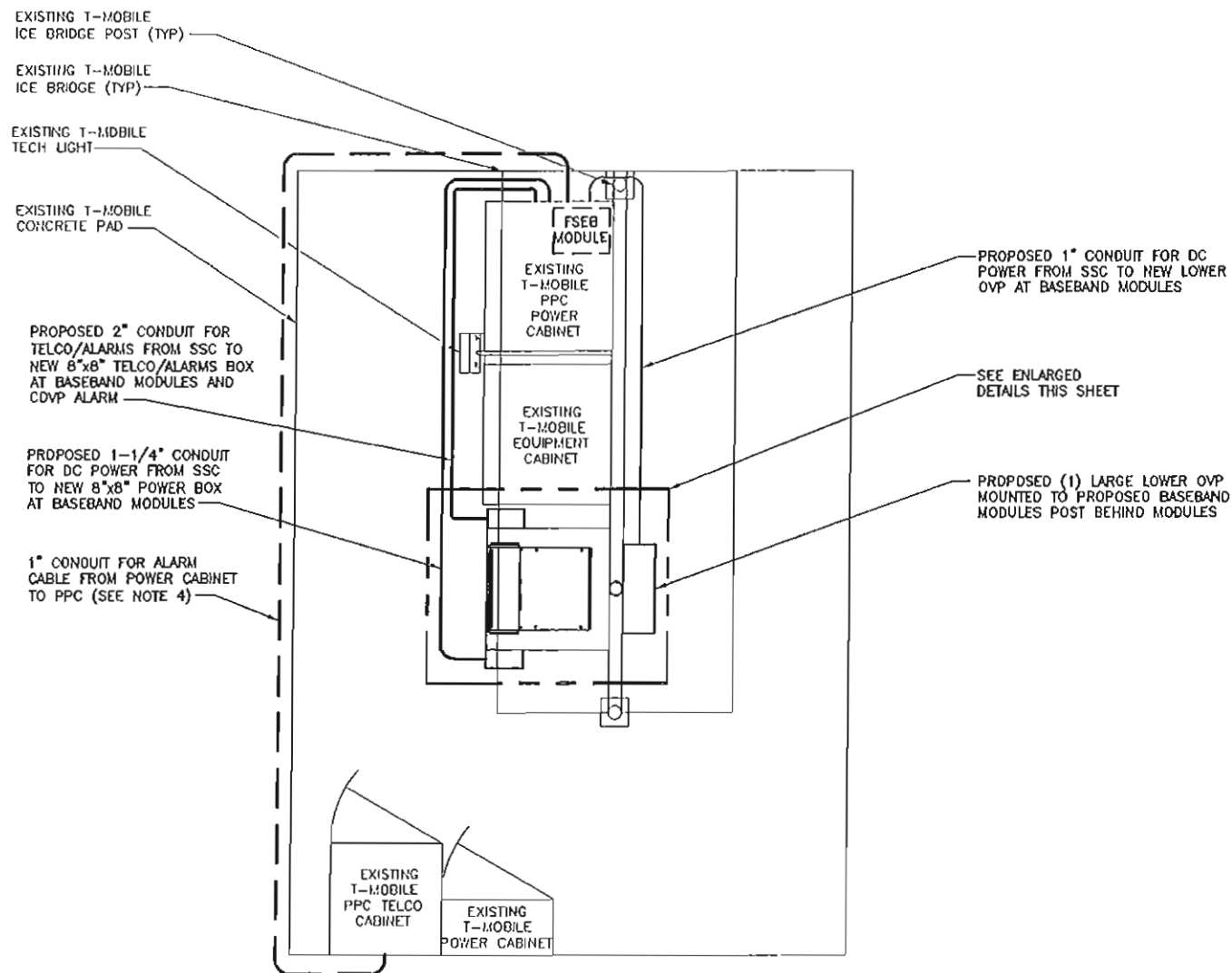
THE UTILITIES AS SHOWN ON THIS SET OF DRAWINGS WERE DEVELOPED FROM THE INFORMATION AVAILABLE. THE INFORMATION PROVIDED IS NOT IMPLIED NOR INTENDED TO BE THE COMPLETE INVENTORY OF UTILITIES IN THIS AREA. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE LOCATION OF ALL UTILITIES (WHETHER SHOWN OR NOT) AND PROTECT SAID UTILITIES FROM ANY DAMAGE CAUSED BY CONTRACTOR'S ACTIVITIES.

NOTE:
 SEE SHEET A-2 CONDUIT LAYOUT FOR CONDUIT ROUTING DETAIL

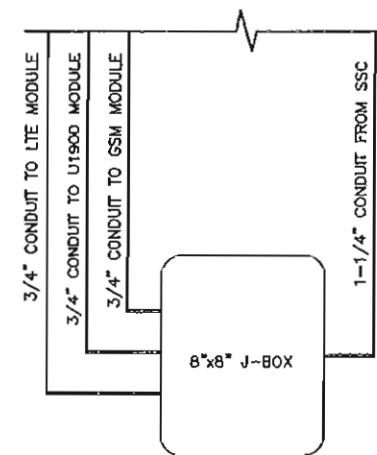
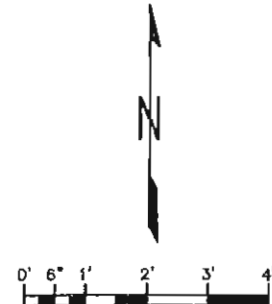
SITE PLAN

NOTES:

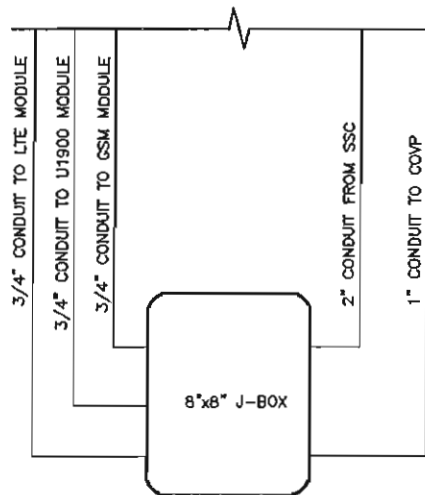
1. CONTRACTOR TO ROUTE ALL NEW CONDUIT ON ICE BRIDGE. ALL NEW CONDUIT TO BE ROUTED OFF OF PAD TO AVOID TRIP HAZARD.
2. ALL NEW & PROPOSED EQUIPMENT NOT TO EXCEED 7'-0".
3. VERIFY WITH T-MOBILE PRIOR TO CONSTRUCTION ON THE REMOVAL OF ANY CABINETS.
4. INSTALL CONDUIT ONLY IF AN EXISTING SPARE ALARM CONDUIT IS NOT AVAILABLE (FIELD VERIFY).



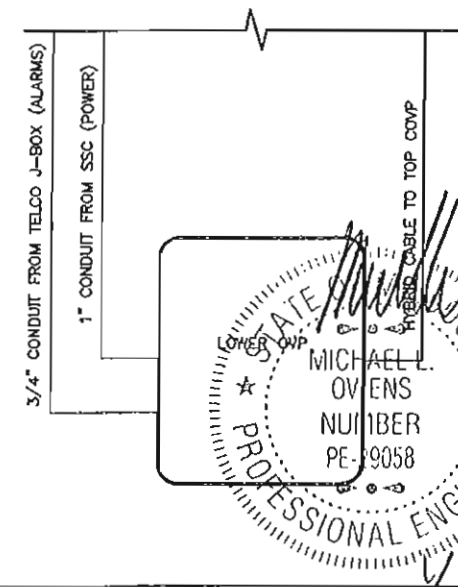
CONDUIT PLAN



POWER J-BOX CONNECTIONS



TELCO/ALARMS J-BOX CONNECTIONS



LOWER OVP CONNECTIONS

AMERICAN TOWER
 3200 COBB GALLERIA PARKWAY, SUITE 205
 ATLANTA, GEORGIA 30339
 PHONE: (770) 308-1973

T-Mobile
 2001 WESTPORT CENTER DRIVE
 ST. LOUIS, MO 63148
 PHONE: (314) 812-3600
 FAX: (314) 812-3692

SSC
 9900 West 109th Street, Suite 300
 Overland Park, Kansas 66210
 Phone: 913-438-7700 Fax: 913-438-7777

STATE OF MISSOURI
 CERTIFICATE OF AUTHORIZATION #001649
 RESPONSIBLE DESIGNERS:
 KY KEVIN VAZMALE E-21351 STRUCTURAL/CIVIL SC
 KEO MICHAEL L. OWENS E-26563 STRUCTURAL/CIVIL SC
 REJ ROBERT E. JENSEN PE-026974 STRUCTURAL/CIVIL SC
 SOK SHELTON D. KEISLING E-7333 ELECTRICAL E
 TMS TERRANCE M. SUPER E-16221 ELECTRICAL E

DESIGNER: F. GUY
 LEAD EE: S.D. KEISLING
 LEAD CESE: M.L. OWENS

SUBMITTALS

NO.	DATE	DESCRIPTION	BY
A	01/14/13	ISSUED FOR REVIEW	FG
B	01/15/13	REVISED PER CLIENT COMMENTS	DSH
C	01/18/13	REVISED PER CLIENT COMMENTS	DSH
D	01/21/13	REVISED PER CLIENT COMMENTS	DSH
E	01/24/13	ISSUED FOR CONSTRUCTION	DSH

SITE NAME
**PARKWAY CENTRAL
 HS SWB MP**

SITE NUMBER
MO-06-263-A

SITE ADDRESS
**1101 KISKER ROAD
 SAINT CHARLES, MISSOURI
 63304**

SHEET TITLE
**CONDUIT LAYOUT
 AND DETAILS**

SHEET NUMBER
A-2



AMERICAN TOWER
 3200 COBB GALLERIA PARKWAY, SUITE 205
 ATLANTA, GEORGIA 30339
 PHONE: (770) 308-1973



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 ST. LOUIS, MO 63146
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STATE OF MISSOURI
 CERTIFICATE OF AUTHORIZATION #001649
 RESPONSIBLE ENGINEER RESPONSIBLE DISCIPLINE:
 BY KEVIN WADSWALE E-21561 STRUCTURAL/CIVIL GC
 MLO MICHAEL L. OWENS E-26588 STRUCTURAL/CIVIL SC
 REJ ROBERT E. JENSEN PE-076974 STRUCTURAL/CIVIL SC
 ROK SHELTON D. KESLUNG E-27323 ELECTRICAL E
 TWS TERRANCE M. SUPER E-16321 ELECTRICAL E

DESIGNER: F. GUY
 LEAD EE: S.D. KESLUNG
 LEAD CESE: M.L. OWENS

SUBMITTALS			
NO.	DATE	DESCRIPTION	BY
A	01/14/13	ISSUED FOR REVIEW	FG
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C	01/18/13	REVISED PER CLIENT COMMENTS	DGH
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D	01/24/13	ISSUED FOR CONSTRUCTION	DGH

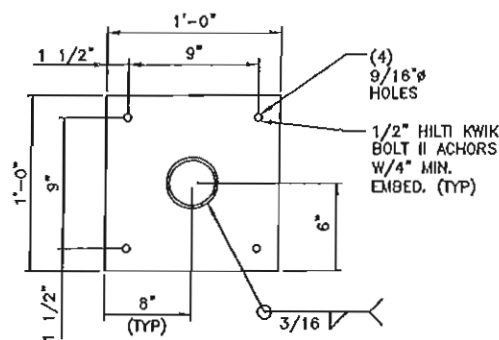
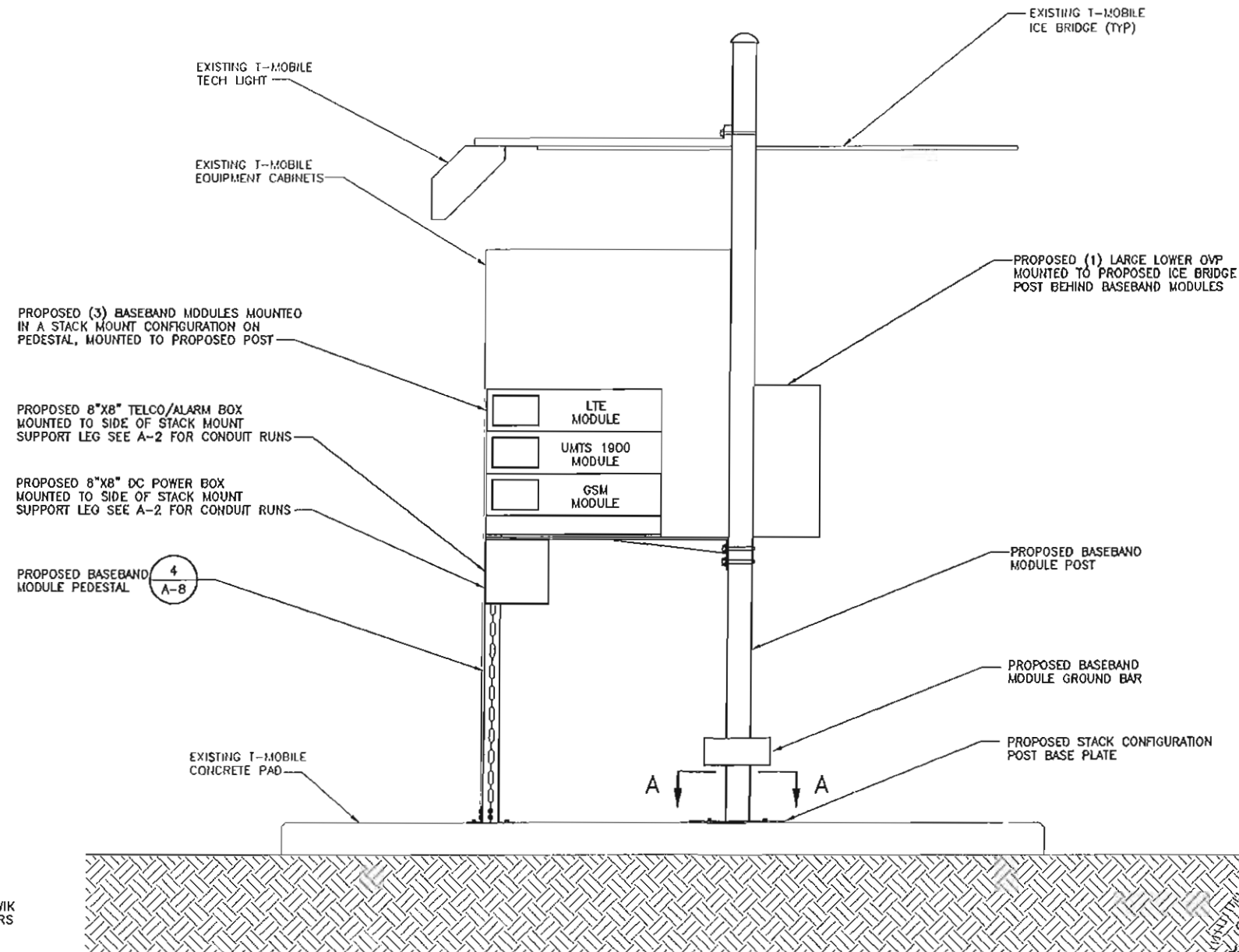
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**PARKWAY CENTRAL
 HS SWB MP**

SITE NUMBER
MO-06-263-A

SITE ADDRESS
 1101 KISKER ROAD
 SAINT CHARLES, MISSOURI
 63304

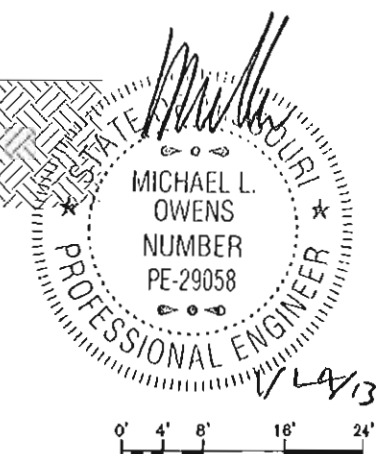
SHEET TITLE
**EQUIPMENT
 ELEVATION**

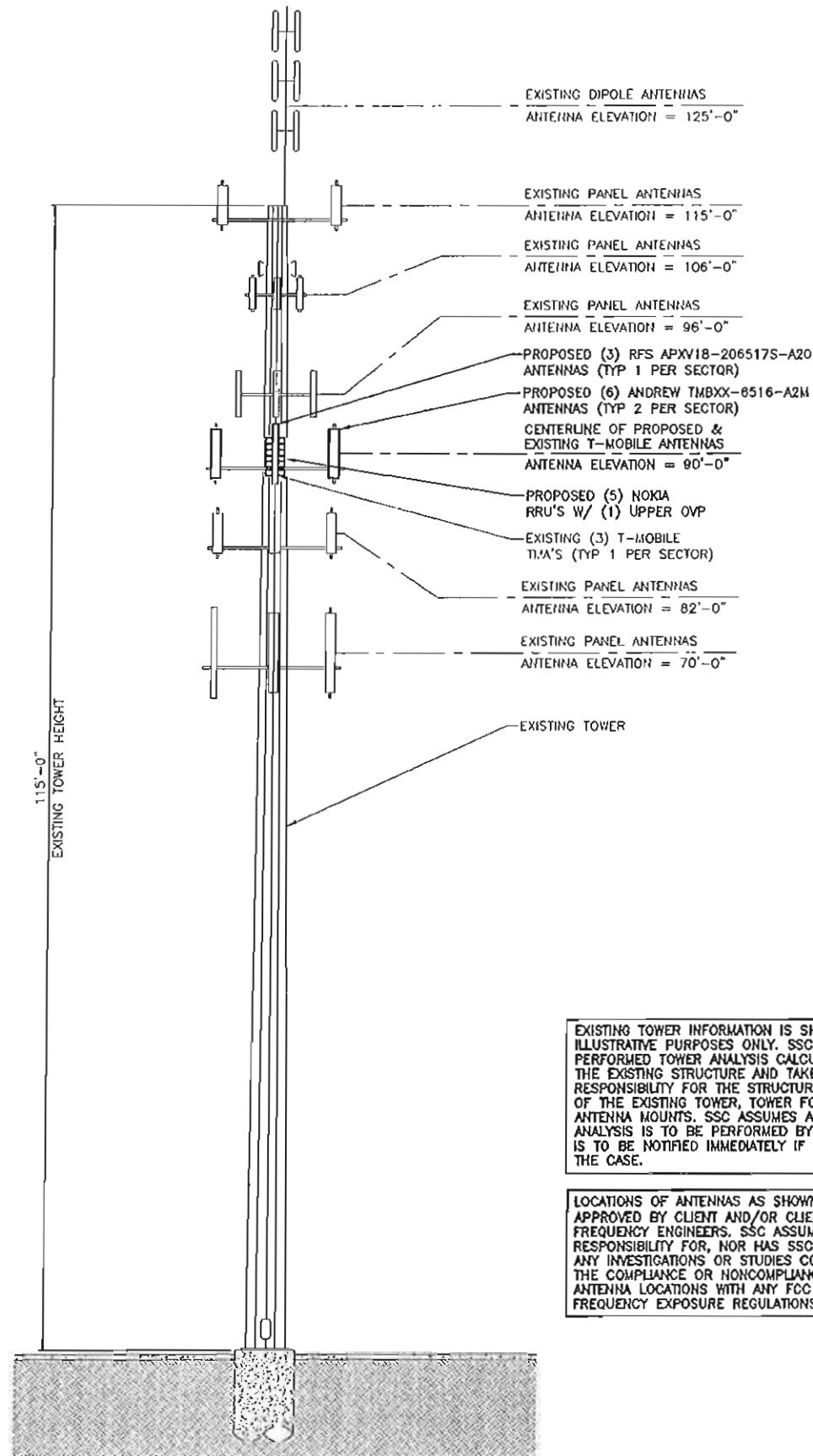
SHEET NUMBER
A-3



NOTES:

- SEE SHEET G-2 DETAIL 2 FOR EQUIPMENT GROUNDING
- PPG CABINETS AND AAV CIENA EQUIPMENT NOT SHOWN FOR CLARITY





EXISTING DIPOLE ANTENNAS
ANTENNA ELEVATION = 125'-0"

EXISTING PANEL ANTENNAS
ANTENNA ELEVATION = 115'-0"

EXISTING PANEL ANTENNAS
ANTENNA ELEVATION = 106'-0"

EXISTING PANEL ANTENNAS
ANTENNA ELEVATION = 96'-0"

PROPOSED (3) RFS APXV18-2065175-A20
ANTENNAS (TYP 1 PER SECTOR)

PROPOSED (6) ANDREW TMBXX-6516-A2M
ANTENNAS (TYP 2 PER SECTOR)

CENTERLINE OF PROPOSED &
EXISTING T-MOBILE ANTENNAS
ANTENNA ELEVATION = 90'-0"

PROPOSED (5) NOKIA
RRU'S W/ (1) UPPER OVP

EXISTING (3) T-MOBILE
TMA'S (TYP 1 PER SECTOR)

EXISTING PANEL ANTENNAS
ANTENNA ELEVATION = 82'-0"

EXISTING PANEL ANTENNAS
ANTENNA ELEVATION = 70'-0"

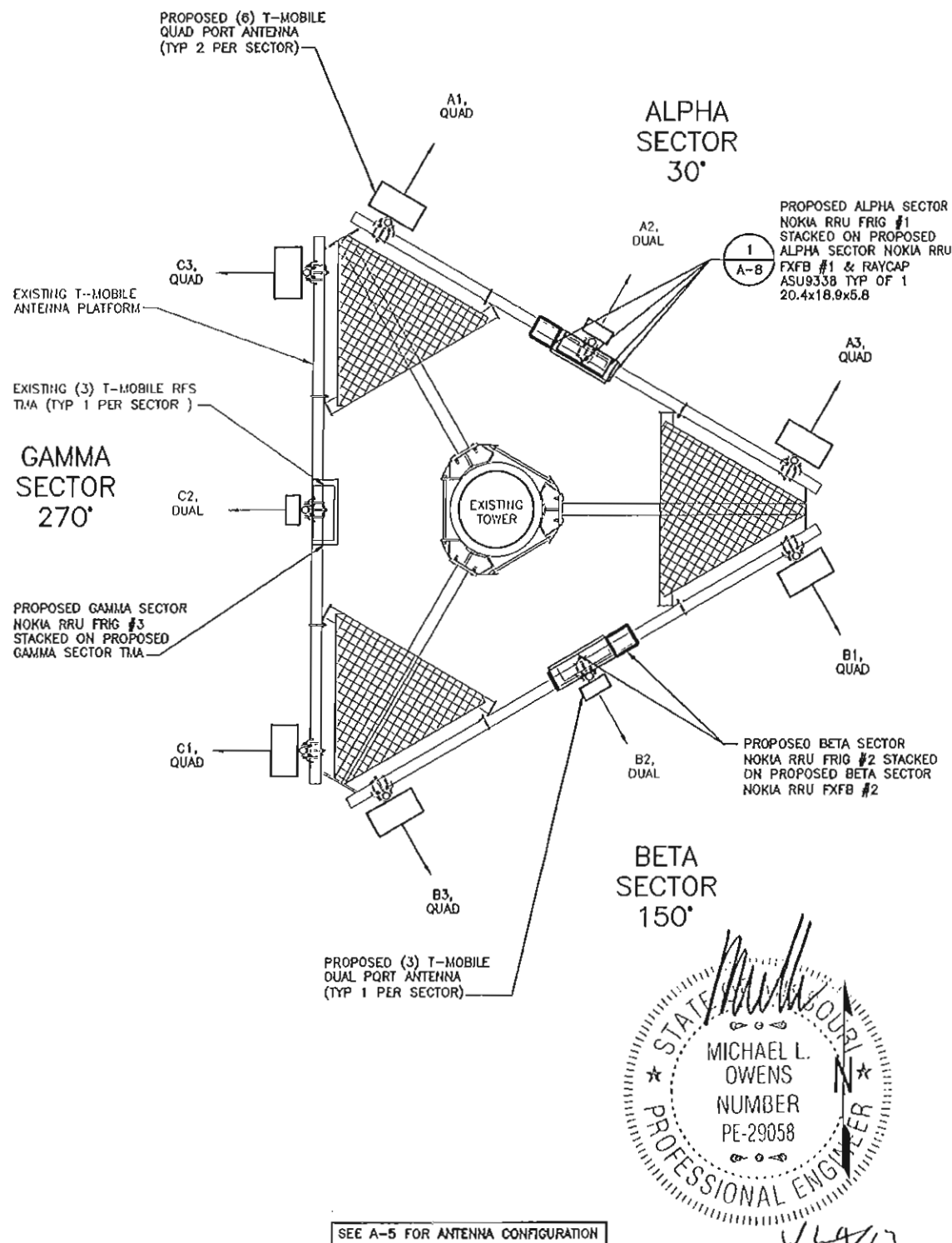
EXISTING TOWER

115'-0"
EXISTING TOWER HEIGHT

EXISTING TOWER INFORMATION IS SHOWN FOR ILLUSTRATIVE PURPOSES ONLY. SSC HAS NOT PERFORMED TOWER ANALYSIS CALCULATIONS FOR THE EXISTING STRUCTURE AND TAKES NO RESPONSIBILITY FOR THE STRUCTURAL INTEGRITY OF THE EXISTING TOWER, TOWER FOUNDATION, OR ANTENNA MOUNTS. SSC ASSUMES A STRUCTURAL ANALYSIS IS TO BE PERFORMED BY OTHERS AND IS TO BE NOTIFIED IMMEDIATELY IF THIS IS NOT THE CASE.

LOCATIONS OF ANTENNAS AS SHOWN HAVE BEEN APPROVED BY CLIENT AND/OR CLIENT'S RADIO FREQUENCY ENGINEERS. SSC ASSUMES NO RESPONSIBILITY FOR, NOR HAS SSC PERFORMED ANY INVESTIGATIONS OR STUDIES CONCERNING, THE COMPLIANCE OR NONCOMPLIANCE OF SAID ANTENNA LOCATIONS WITH ANY FCC RADIO FREQUENCY EXPOSURE REGULATIONS.

TOWER ELEVATION



PROPOSED (6) T-MOBILE
QUAD PORT ANTENNA
(TYP 2 PER SECTOR)

ALPHA
SECTOR
30°

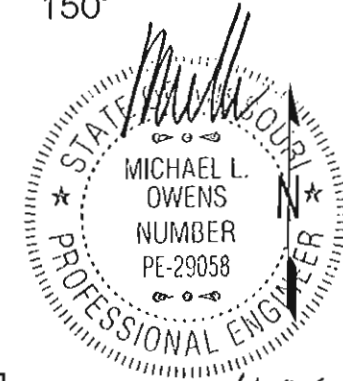
PROPOSED ALPHA SECTOR
NOKIA RRU FRIG #1
STACKED ON PROPOSED
ALPHA SECTOR NOKIA RRU
FXFB #1 & RAYCAP
ASU9338 TYP OF 1
20.4x18.9x5.8

GAMMA
SECTOR
270°

PROPOSED GAMMA SECTOR
NOKIA RRU FRIG #3
STACKED ON PROPOSED
GAMMA SECTOR TMA


BETA
SECTOR
150°

PROPOSED (3) T-MOBILE
QUAD PORT ANTENNA
(TYP 1 PER SECTOR)




SEE A-5 FOR ANTENNA CONFIGURATION


ANTENNA PLAN



AMERICAN TOWER
3200 COBB GALLERIA PARKWAY, SUITE 205
ATLANTA, GEORGIA 30339
PHONE: (770) 308-1973



2004 WESTPORT CENTER DRIVE
ST. LOUIS, MO 63146
PHONE: (314) 812-3600
FAX: (314) 812-3092



9900 West 109th Street, Suite 300
Overland Park, Kansas 66210
Phone: 913-438-7700 Fax: 913-438-7777

STATE OF MISSOURI
CERTIFICATE OF AUTHORIZATION: 001640
RESPONSIBLE ENGINEER: RESPONSIBLE DISCIPLINE:
KY KEVIN VANVAELE E-21561 STRUCTURAL/CIVIL EC
MO MICHAEL L. OWENS E-29058 STRUCTURAL/CIVIL SC
NEJ ROBERT E. JOHNSON PE-02694 STRUCTURAL/CIVIL SC
SDK SHELTON KESLUNG E-27222 ELECTRICAL E
TNS TERRANCE A. SUPER E-16821 ELECTRICAL E

DESIGNER: F. GUY
LEAD EE: S.D. KEISLING
LEAD GE/SE: M.L. OWENS

SUBMITTALS

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SITE NAME

**PARKWAY CENTRAL
HS SWB MP**

SITE NUMBER

MO-06-263-A

SITE ADDRESS

1101 KISKER ROAD
SAINT CHARLES, MISSOURI
63304

SHEET TITLE


**TOWER ELEVATIONS
AND ANTENNA PLAN**

SHEET NUMBER


A-4

ANTENNA KEY AND COAXIAL CABLE SCHEDULE																			
ANTENNA MARK	MARK	STATUS	TECH	ANTENNA MODEL	ANTENNA VENDOR	EXISTING AZIMUTH TN	PROPOSED AZIMUTH TN	MECHANICAL DOWNTILT	ELECTRICAL DOWNTILT	RADIATION CENTER	SECTOR	CONNECTOR	ANTENNA DIMENSIONS	TOTAL WEIGHT	HYBRID MODEL	HYBRID SIZE	HYBRID LENGTH	EXISTING COAX CABLE COUNT	FINAL HYBRID CABLE COUNT
A1	A	PROPOSED	LTE	TMBXX-6516-A2M	ANDREW	30'	30'	0	TBD	90'-0"	Tx1/Rx	7/16 DIN	59.6"Hx12"Wx6.5"D	34.6 LBS.	LOW CAPACITY HCS	1.24"	125'	2	1
A2	A	PROPOSED	UMTS AWS	APXV18-206517S-A20	RFS	30'	30'	0	2	90'-0"	Tx2/Rx	7/16 DIN	72"Hx8.8"Wx3.2"D	26.4 LBS.	-	-	-	2	
A3	A	PROPOSED	UMTS/GSM PCS	TMBXX-6516-A2M	ANDREW	30'	30'	0	2	90'-0"	Tx3/Rx	7/16 DIN	59.6"Hx12"Wx6.5"D	34.6 LBS.	SHARED	SHARED	SHARED	2 L.M.U	SHARED
B1	B	PROPOSED	LTE	TMBXX-6516-A2M	ANDREW	150'	150'	0	TBD	90'-0"	Tx1/Rx	7/16 DIN	59.6"Hx12"Wx6.5"D	34.6 LBS.	SHARED	SHARED	SHARED		SHARED
B2	B	PROPOSED	UMTS AWS	APXV18-206517S-A20	RFS	150'	150'	0	2	90'-0"	Tx2/Rx	7/16 DIN	72"Hx8.8"Wx3.2"D	26.4 LBS.	-	-	-	2	
B3	B	PROPOSED	UMTS/GSM PCS	TMBXX-6516-A2M	ANDREW	150'	150'	0	2	90'-0"	Tx3/Rx	7/16 DIN	59.6"Hx12"Wx6.5"D	34.6 LBS.	SHARED	SHARED	SHARED	2 L.M.U	SHARED
C1	C	PROPOSED	LTE	TMBXX-6516-A2M	ANDREW	270'	270'	0	TBD	90'-0"	Tx1/Rx	7/16 DIN	59.6"Hx12"Wx6.5"D	34.6 LBS.	SHARED	SHARED	SHARED		SHARED
C2	C	PROPOSED	UMTS AWS	APXV18-206517S-A20	RFS	270'	270'	0	2	90'-0"	Tx2/Rx	7/16 DIN	72"Hx8.8"Wx3.2"D	26.4 LBS.	-	-	-	2	
C3	C	PROPOSED	UMTS/GSM PCS	TMBXX-6516-A2M	ANDREW	270'	270'	0	2	90'-0"	Tx3/Rx	7/16 DIN	59.6"Hx12"Wx6.5"D	34.6 LBS.	SHARED	SHARED	SHARED	2 L.M.U	SHARED


TMA AND OVP SCHEDULE								ANTENNA/FEEDER CABLE COLOR CODING CONVENTION				COAX CABLE IDENTIFICATION					
EQUIPMENT	STATUS	PART NUMBER	VENDOR	QTY PER SECTOR	DIMENSIONS	WEIGHT	TOTAL	SECTOR	COLOR	ANTENNA	REFERENCE	FUNCTION	CONTRACTOR MUST PROVIDE EASY IDENTIFICATION AND UNIFORM MARKING OF ANTENNA CABLES, PER THE FOLLOWING INSTRUCTIONS:				
TMA	EXISTING	ATMAA1412D-1A20	RFS	1	12"Hx10"Wx4"D	13 LBS.	3 AT ANTENNA LEVEL		1 RED	A1	MAIN LTE	Tx1/Rx LTE MAIN	1. LOCATION: MARKINGS SHALL BE MADE USING COLOR TAPE W/2" - 3 LAYERS THICK CUT NOT TORN STRANDS OF COVERAGE AFFIXED AT THREE PLACES ON THE COAX CABLE RUN AND NOT BE CONCEALED IN TOWER NOR BE INSTALLED ON WEATHERPROOFING AS FOLLOWS:				
RAYCAP/OVP	PROPOSED	ASU9338 (TYP OF 1)	-	-	-	-	1 UPPER & 1 LOWER		2 RED	A1	SECONDARY LTE	Tx3/Rx LTE DIVERSITY	ALL COLOR CODING AT THE BASE OF THE TOWER AND AT GROUND LEVEL SHALL ONLY BE 3/4" WIDE. USE 2" WIDE TAPE ONLY ON LINES UP HIGH ON THE TOWER.				
FRIO	PROPOSED	-	NOKIA	1	6.0"Hx16.4"Wx20"D	58 LBS.	3 AT ANTENNA LEVEL	A	3 RED	A1	MAIN LTE	Tx1/Rx LTE MAIN	FIRST - ON THE COAX AT THE CONNECTOR NEAREST THE ANTENNA (WHERE THE COAX AND JUMPER ARE CONNECTED).				
FYB GSM-UMTS PCS	PROPOSED	-	NOKIA	-	5.25"Hx17.5"Wx22"D	55 LBS.	2 AT ANTENNA LEVEL		4 RED	A1	SECONDARY LTE	Tx3/Rx LTE DIVERSITY	SECOND - AT THE BASE OF THE TOWER STRUCTURE. (FOR TOWERS ONLY).				
FRIA AWS UMTS	EXISTING	-	NOKIA	1	5.25"Hx17.5"Wx22"D	55 LBS.	3 AT EQUIPMENT LEVEL		5 RED	A2	MAIN AWS/PCS	Tx1/Rx AWS/PCS MAIN	THIRD - AT A POINT OUTSIDE THE BTS. (JUST PRIOR TO MGB)				
ESMB GSM	PROPOSED	-	NOKIA	-	5.25"Hx17.5"Wx22"D	33 LBS.	1 AT EQUIPMENT LEVEL		6 RED	A2	SECONDARY AWS/PCS	Tx3/Rx AWS/PCS DIVERSITY	2. SECTOR IDENTIFICATION: NORMALLY A SITE WILL HAVE UP TO THREE SECTORS. SECTORS SHALL BE DESIGNATED IN A CLOCKWISE MANNER; THE SECTOR IS CLOSEST TO ZERO DEGREES (NORTH), THE BAND C FOLLOW CLOCKWISE IN SEQUENCE.				
FSME UMTS	PROPOSED	-	NOKIA	-	5.25"Hx17.5"Wx22"D	50 LBS.	2 AT EQUIPMENT LEVEL		7 RED	A3	MAIN GSM/UMTS	Tx1/Rx GSM MAIN	A SECTOR COAX WILL BE MARKED MAIN 1 AND DIVERSITY 1. NORMALLY SITES WILL INITIALLY GO ON THE AIR WITH AS FEW AS TWO ANTENNAS PER SECTOR AND AS THE SYSTEM GROWS, ADDITIONAL ANTENNAS WILL BE ADDED.				
FSMF LTE	PROPOSED	-	NOKIA	-	5.25"Hx17.5"Wx22"D	33 LBS.	1 AT EQUIPMENT LEVEL		8 RED	A3	SECONDARY GSM/UMTS	Tx3/Rx GSM DIVERSITY	B SECTOR COAX WILL BE MARKED MAIN 2 AND DIVERSITY 2.				
COAX BEND TABLE									9 RED	A3	MAIN GSM/UMTS	Tx1/Rx GSM MAIN	C SECTOR COAX WILL BE MARKED MAIN 3 AND DIVERSITY 3.				
TYPICAL CABLE SIZES	ANDREW CABLE TYPE NUMBER	MANUFACTURER'S MINIMUM BEND RADIUS	HANGER ANDREW CATALOG NUMBER	CABLE TO CABLE CLEAR SPACING	MAXIMUM VERTICAL HANGER SPACING	MAXIMUM HORIZONTAL HANGER SPACING			10 RED	A3	SECONDARY GSM/UMTS	Tx3/Rx GSM DIVERSITY	D SECTOR COAX WILL BE MARKED MAIN 4 AND DIVERSITY 4.				
1/2"	LDF4-50A	5"	206706-1	1/2"	4'-0"	4'-0"			1 BLUE	B1	MAIN LTE	Tx1/Rx LTE MAIN	COLOR CODE AS FOLLOWS: A SECTOR - RED B SECTOR - BLUE C SECTOR - WHITE D SECTOR - YELLOW UMTS LINES - BAND OF GREEN AFTER ORIGINAL COLOR CODING				
7/8"	LDF5-50A	10"	206706-2	1/2"	4'-0"	4'-0"			2 BLUE	B1	SECONDARY LTE	Tx3/Rx LTE DIVERSITY	MAIN WILL BE MARKED WITH ONE BAND OF TAPE. DIVERSITY WILL BE MARKED WITH TWO BANDS OF TAPE. EXTRA WILL BE MARKED WITH THREE BANDS OF TAPE.				
7/8"	AVA5-50	10"	206706-2	1/2"	4'-0"	4'-0"			3 BLUE	B1	MAIN LTE	Tx1/Rx LTE MAIN	3. OMNI IDENTIFICATION: FOR OMNI SITES, WHICH NORMALLY CONSIST OF THREE ANTENNA, IT IS SUGGESTED THAT THE ORIENTATION OF THE OBSERVER ALSO BE THAT OF LOOKING IN A NORTHERLY DIRECTION.				
1-1/4"	LDF6-50A	15"	206706-3	1/2"	4'-0"	4'-0"			4 BLUE	B1	SECONDARY LTE	Tx3/Rx LTE DIVERSITY					
1-5/8"	LDF7-50A	20"	206706-4	1/2"	4'-0"	4'-0"			5 BLUE	B2	MAIN AWS/PCS	Tx1/Rx AWS/PCS MAIN					
1-5/8"	AVA7-50A	20"	206706-4	1/2"	4'-0"	4'-0"			6 BLUE	B2	SECONDARY AWS/PCS	Tx3/Rx AWS/PCS DIVERSITY					
1/2"	FSJ4-50B	1-1/4"	206706-1	1/2"	4'-0"	4'-0"			7 BLUE	B3	MAIN GSM/UMTS	Tx1/Rx GSM MAIN					
ANTENNA NOTES									8 BLUE	B3	SECONDARY GSM/UMTS	Tx3/Rx GSM DIVERSITY					
1. ANTENNA CONTRACTOR SHALL INSURE THAT ALL ANTENNA MOUNTING PIPES ARE PLUMB.									9 BLUE	B3	MAIN GSM/UMTS	Tx1/Rx GSM MAIN					
2. COAXIAL FEEDER & FIBER LENGTHS INDICATED ARE APPROXIMATE.									10 BLUE	B3	SECONDARY GSM/UMTS	Tx3/Rx GSM DIVERSITY					
3. ANTENNA COAXIAL FEEDERS & ANTENNA JUMPERS SHALL BE COLOR CODED PER T-MOBILE REQUIREMENTS.									1 WHITE	C1	MAIN LTE	Tx1/Rx LTE MAIN					
4. LINES 5 & 6 TO HAVE TMA, MOUNTED ON PIPE BEHIND ANTENNA.									2 WHITE	C1	SECONDARY LTE	Tx3/Rx LTE DIVERSITY					
5. MULTI PORT ANTENNAS: TERMINATE UNUSED ANTENNA PORTS WITH CONNECTOR CAP & WEATHERPROOF THOROUGHLY. JUMPERS FROM TMA'S MUST TERMINATE TO OPPOSITE POLARIZATIONS IN EACH SECTOR.									3 WHITE	C1	MAIN LTE	Tx1/Rx LTE MAIN					
6. CONTRACTOR MUST FOLLOW ALL MANUFACTURER'S RECOMMENDATIONS REGARDING THE INSTALLATION OF COAXIAL CABLES, CONNECTORS, AND ANTENNAS.									4 WHITE	C1	SECONDARY LTE	Tx3/Rx LTE DIVERSITY					
7. MINIMUM BEND RADIUS: LDF4-50A (1/2" HARD LINE) = 5" FSJ4-50B (1/2" SUPER FLEX) = 1-1/4" AVA5-50A (7/8" HARD LINE) = 10" AVA7-50A (1-5/8" HARD LINE) = 15" LDF7-50A (1-5/8" HARD LINE) = 20"									5 WHITE	C2	MAIN AWS/PCS	Tx1/Rx AWS/PCS MAIN					
8. CONTRACTOR SHALL RECORD THE SERIAL #, SECTOR, AND POSITION OF EACH ACTUATOR INSTALLED AT THE ANTENNAS AND FURNISH THE INFORMATION TO T-MOBILE.									6 WHITE	C2	SECONDARY AWS/PCS	Tx3/Rx AWS/PCS DIVERSITY					
9. WEATHERPROOF ALL ANTENNA CONNECTORS WITH SELF AMALGAMATING TAPE.									7 WHITE	C3	MAIN GSM/UMTS	Tx1/Rx GSM MAIN					
10. ANTENNA CONTRACTOR SHALL PERFORM A "TAPE DROP" MEASUREMENT TO CONFIRM/VALIDATE ANTENNA CENTER LINE (ACL) HEIGHT. CONTRACTOR SHALL SUBMIT A COMPLETED HEIGHT VERIFICATION FORM TO THE CONSTRUCTION MANAGER.									8 WHITE	C3	SECONDARY GSM/UMTS	Tx3/Rx GSM DIVERSITY					
11. ALL FIBER RUNS TO BE CONTAINED IN TWO COMMSCOPE HYBRID OC-FIBER CABLES FROM LOWER OVP'S TO UPPER OVP'S MODEL #RFF-12MM-606-218-SPE (COLOR CODE COAX JUMPERS ONLY)									9 WHITE	C3	MAIN GSM/UMTS	Tx1/Rx GSM MAIN					
									10 WHITE	C3	SECONDARY GSM/UMTS	Tx3/Rx GSM DIVERSITY					



AMERICAN TOWER
3200 COBB GALLERIA PARKWAY, SUITE 205
ATLANTA, GEORGIA 30339
PHONE: (770) 308-1973



2004 WESTPORT CENTER DRIVE
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FAX: (314) 812-3692



9900 West 109th Street, Suite 300
Overland Park, Kansas 66210
Phone: 913-438-7700 Fax: 913-438-7777

STATE OF MISSOURI CERTIFICATE OF AUTHORIZATION #031640	
RESPONSIBLE ENGINEER KV KEVIN VARMALE E-21551 STRUCTURAL/CIVIL SC	RESPONSIBLE OSC/PUNE MLO MICHAEL L OWENS E-26058 STRUCTURAL/CIVIL SC
REJ ROBERT E. FEISEN PE-029274 STRUCTURAL/CIVIL SC	SOX SHELDON D. KIDRUMG E-27322 ELECTRICAL E
TWS TERRANCE M. SUPER E-16321 ELECTRICAL E	

DESIGNER: F. GUY

LEAD EE: S.O. KEISLING

LEAD C/SE: M.L. OWENS

SUBMITTALS			
NO.	DATE	DESCRIPTION	BY
A	01/14/13	ISSUED FOR REVIEW	FG
B	01/15/13	REVISED PER CLIENT COMMENTS	DSH
C	01/18/13	REVISED PER CLIENT COMMENTS	DSH
D	01/21/13	REVISED PER CLIENT COMMENTS	DSH
E	01/24/13	ISSUED FOR CONSTRUCTION	DSH

SITE NAME

**PARKWAY CENTRAL
HS SWB MP**

SITE NUMBER

MO-06-263-A

SITE ADDRESS

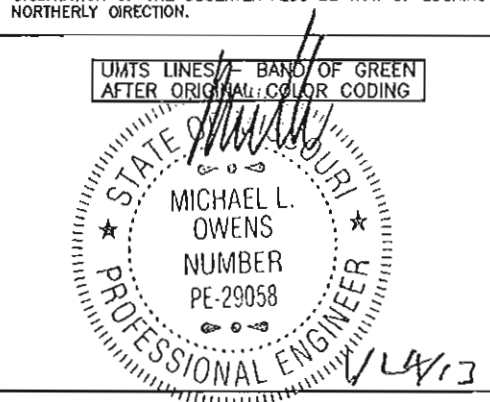
1101 KISKER ROAD
SAINT CHARLES, MISSOURI
63304

SHEET TITLE

**ANTENNA, RRU & TMA
CONFIGURATION KEYS**

SHEET NUMBER

A-5



STATE OF MISSOURI
 CERTIFICATE OF AUTHORIZATION #001240
 RESPONSIBLE ENGINEERS: RESPONSIBLE ENGINEER:

RY MEVIN VAHVALE	E-21361 STRUCTURAL/CIVIL	SC
MLO MICHAEL L OWENS	E-20558 STRUCTURAL/CIVIL	SC
REJ ROBERT E JEDISSEY	E-028274 STRUCTURAL/CIVIL	SC
SKM SHELTON D KEISLING	E-27223 ELECTRICAL	E
TUS TERRANCE M SUPER	E-18521 ELECTRICAL	E

DESIGNER: F. GUY
 LEAD EE: S. D. KEISLING
 LEAD CE/SE: M. L. OWENS

SUBMITTALS

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D	01/24/13	ISSUED FOR CONSTRUCTION	DSH

SITE NAME
**PARKWAY CENTRAL
 HS SWB MP**

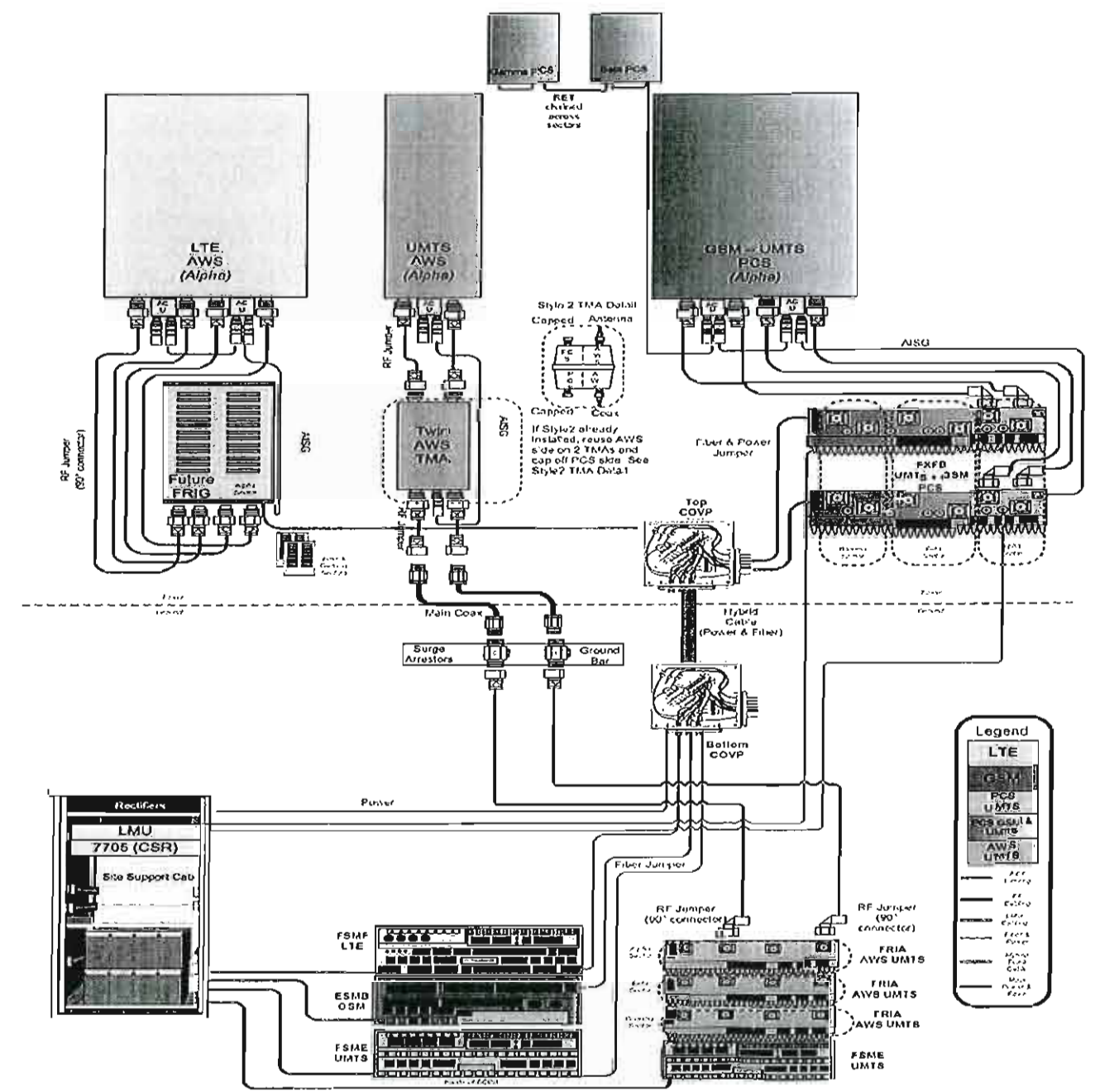
SITE NUMBER
MO-06-263-A

SITE ADDRESS
**1101 KISKER ROAD
 SAINT CHARLES, MISSOURI
 63304**

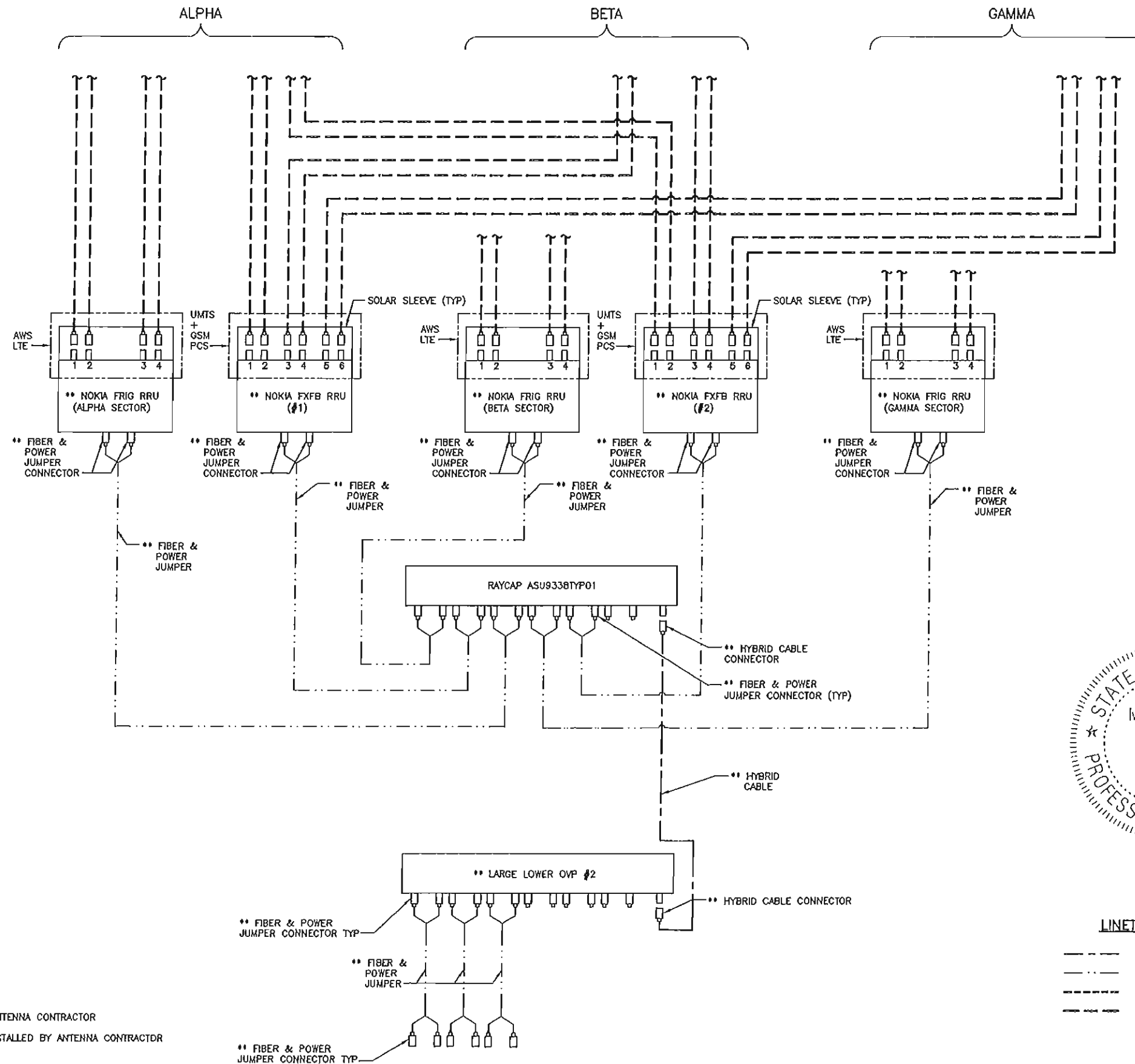
SHEET TITLE
**NSN
 CONFIGURATION**

SHEET NUMBER
A-6

Drawing (1) Comments:
NSN Configuration 1A
 Tower-Top RRU for Contiguous Spectrum Markets
 (Antenna and cabling for only one sector shown)



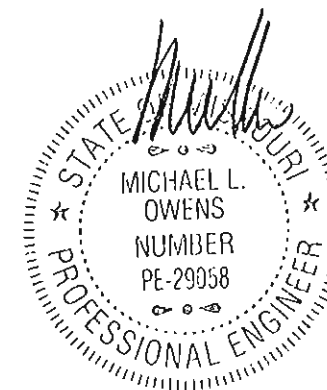
STATE OF MISSOURI
 MICHAEL L. OWENS
 NUMBER
 PE-29058
 PROFESSIONAL ENGINEER
 1/24/13



NOTES:

1. SUPERFLEX JUMPERS CAN BE SUBSTITUTED ONLY WITH THE PERMISSION OF THE T-MOBILE CONSTRUCTION MANAGER.
 2. CONTRACTOR SHALL WEATHERPROOF CONNECTIONS AT THE ANTENNAS WITH SELF AMALGAMATING TAPE.
- * FURNISHED AND INSTALLED BY ANTENNA CONTRACTOR
 - ** FURNISHED BY T-MOBILE AND INSTALLED BY ANTENNA CONTRACTOR

RRU CONNECTION DIAGRAM



LINETYPE LEGEND

- HYBRID CABLE
- .-.- FIBER & POWER JUMPER
- ANTENNA JUMPER
- DM-DMR ANTENNA JUMPER

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SSC
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 Overland Park, Kansas 66210
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STATE OF MISSOURI
 CERTIFICATE OF AUTHORIZATION #001640
 RESPONSIBLE ENGINEERS RESPONSIBLE DISCIPLINE
 KY KEVIN VAHVALE E-21561 STRUCTURAL/CVL SC
 MO MICHAEL L. OWENS E-26548 STRUCTURAL/CVL SC
 NE ROBERT E. JENSEN PE-026974 STRUCTURAL/CVL SC
 SD K. SHELTON D. KESUNIG E-27323 ELECTRICAL E
 TN TERRANCE H. SUPER E-18511 ELECTRICAL E

DESIGNER: F. GUY
 LEAD EE: S.O. KEISLING
 LEAD CESE: M.L. OWENS

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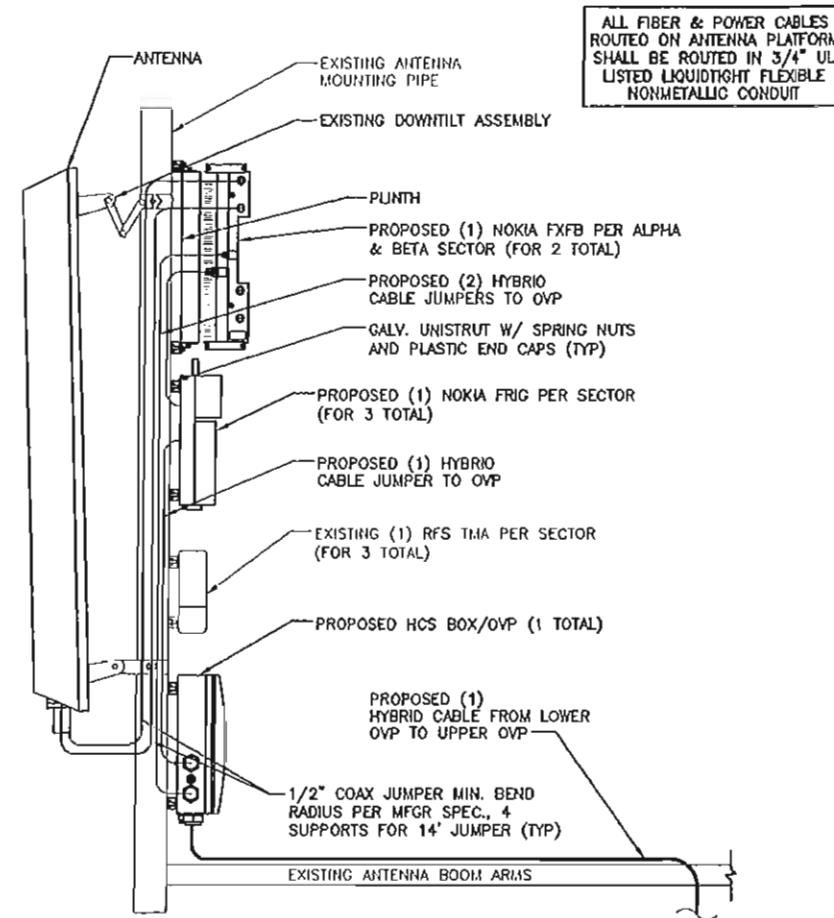
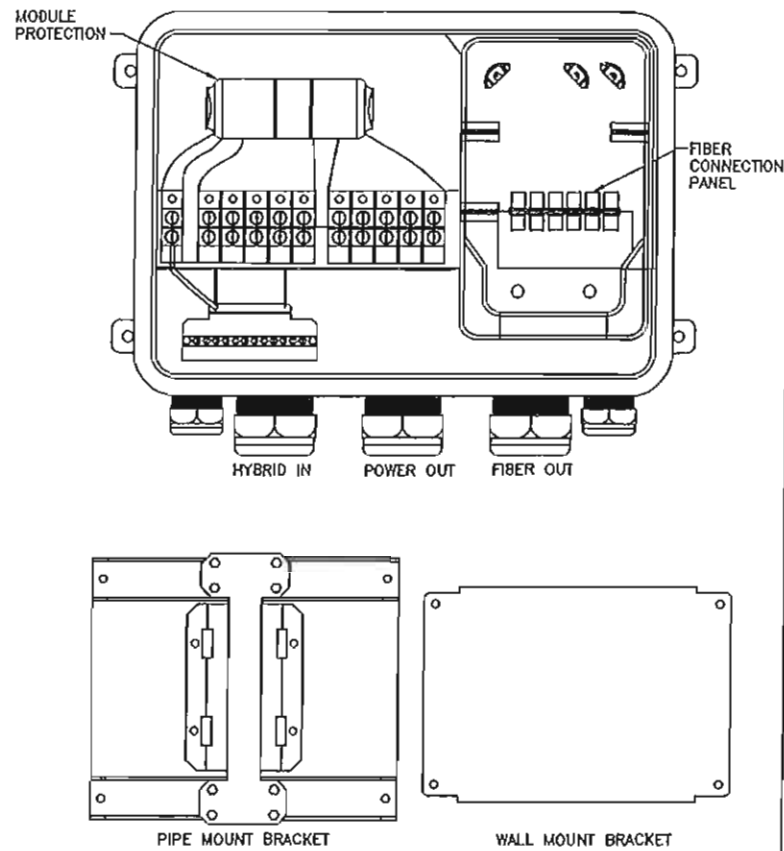
SITE NAME
**PARKWAY CENTRAL
 HS SWB MP**

SITE NUMBER
MO-06-263-A

SITE ADDRESS
**1101 KISKER ROAD
 SAINT CHARLES, MISSOURI
 63304**

SHEET TITLE
**RRU CONNECTION
 DIAGRAM**

SHEET NUMBER
A-7



ALL FIBER & POWER CABLES ROUTED ON ANTENNA PLATFORM SHALL BE ROUTED IN 3/4" UL LISTED LIQUIDTIGHT FLEXIBLE NONMETALLIC CONDUIT

AMERICAN TOWER
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STATE OF MISSOURI
 CERTIFICATE OF AUTHORIZATION #001640
 RESPONSIBLE ENGINEER RESPONSIBLE DISCIPLINE
 M.V. KEVIN VAHVALE E-21561 STRUCTURAL/CIVIL EC
 R.D. MICHAEL L. OWENS E-29058 STRUCTURAL/CIVIL EC
 R.E.J. ROBERT E. JENSEN E-025874 STRUCTURAL/CIVIL EC
 SOK SHELTON D. KESKINEN E-27373 ELECTRICAL E
 T.M.S. TERRANCE M. SUPER E-18221 ELECTRICAL E

DESIGNER: F. GUY
 LEAD EE: S.D. KEISLING
 LEAD CE/SE: M.L. OWENS

SUBMITTALS		
NO.	DATE	DESCRIPTION
A	01/11/13	ISSUED FOR REVIEW
B	01/15/13	REVISED PER CLIENT COMMENTS
C	01/18/13	REVISED PER CLIENT COMMENTS
D	01/21/13	REVISED PER CLIENT COMMENTS
O	01/24/13	ISSUED FOR CONSTRUCTION

SITE NAME
PARKWAY CENTRAL HS SWB MP

SITE NUMBER
MO-06-263-A

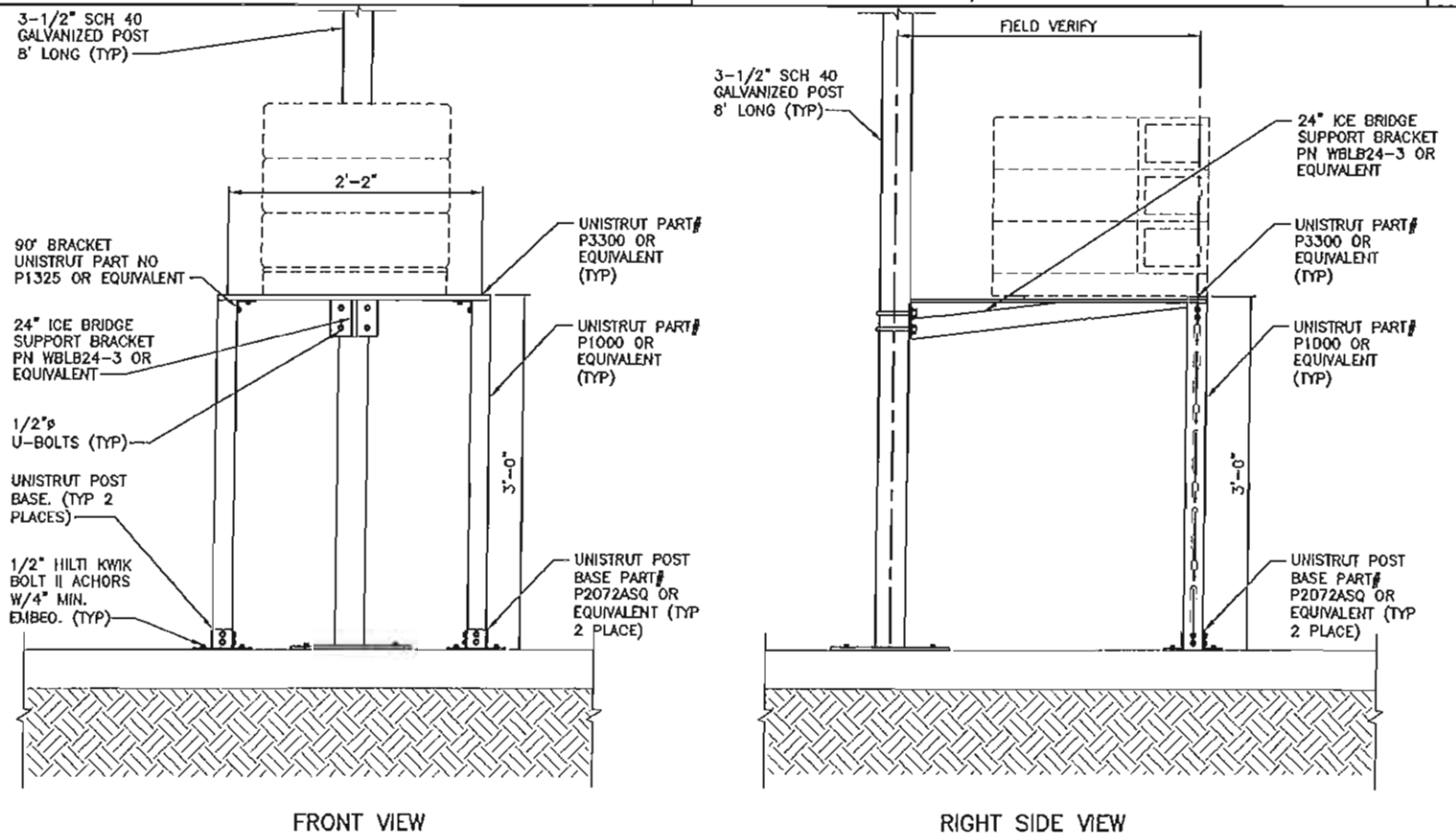
SITE ADDRESS
 1101 KISKER ROAD
 SAINT CHARLES, MISSOURI
 63304

SHEET TITLE
RET ACTUATOR NAMING AND DETAILS

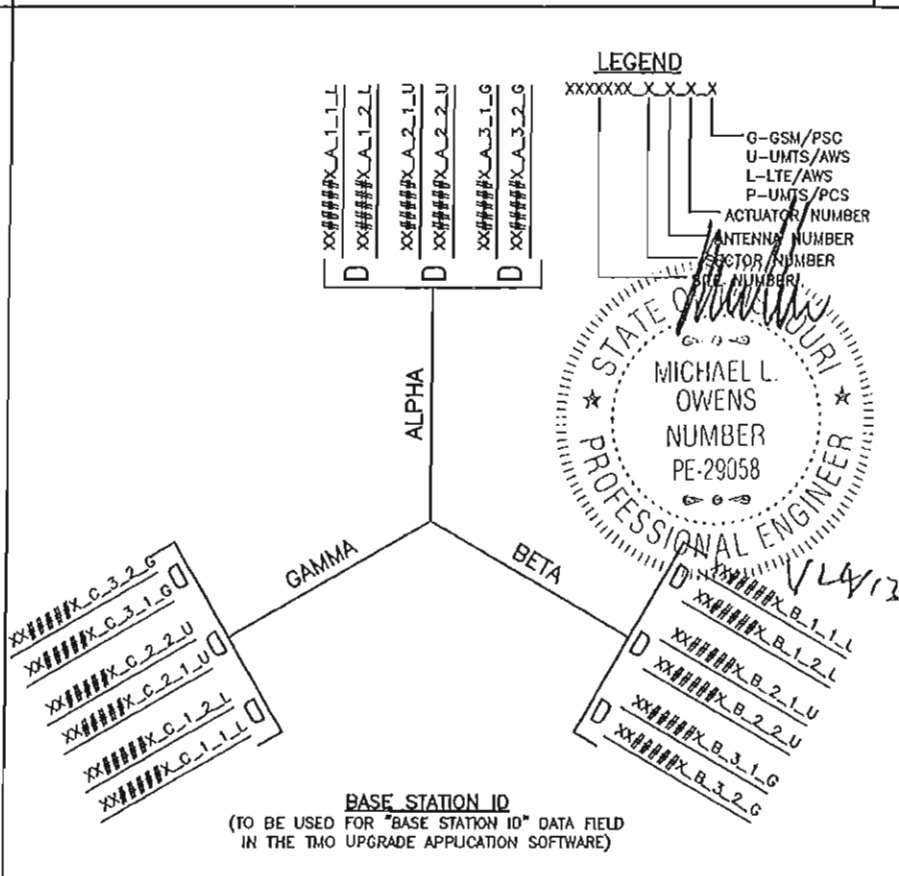
SHEET NUMBER
A-8

5 OVP W/MOUNTING BRACKETS 3

TYPICAL RRU MOUNTING DETAIL 1



BASEBAND MODULES PEDESTAL 4



RET ACTUATOR NAMING CONVENTION 2

User: WTRALTO
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T-Mobile
 RFDS Data Configuration Sheet

Date: 11/8/2012
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Site Information:

Market:	61	Radio Vendor:	NSH	Plan Year:	2012	RF Plan:	N.P.S.
Site ID:	MO01263A	Site Name:	Parkway Central HS SWB MP	Structural Owner:	American Tower		
Type/Class:	Structure (Non-Su-High) (Monopole)	Created At:		State:	MO	Zip:	63013
Address:	477 North Woods Hill Rd	City:		Created Date:	May 21 2012		
Latitude:	38.68742145	Longitude:	-90.506751	Last Save Date:	Oct 10 2012 2:58 PM	Last Modified By:	APLHALL
ID Manager:	Za Zakaria	RF Engineer:	Eyed Abbas				

Cell Site Configuration

Configuration Type:	Configuration 1A	Final Configuration (Antenna/Line/TMA/RFU):	01/2013	Sub/Elec Type:	Tower Top	TV DS Sub:	Preliminary
Final Sector Count:	2						

Sector Information

PCS GSM Design	A	B	C	D	E	F
Antenna RAD Center:	85	85	85	0	0	0
Antenna Azimuth:	30	150	270	0	0	0
Mechanical Tilt:	0	0	0	0	0	0
Electrical Tilt:	2	2	2	0	0	0

PCS UMTS Design

PCS UMTS Design	A	B	C	D	E	F
Antenna RAD Center:	85	85	85	0	0	0
Antenna Azimuth:	30	150	270	0	0	0
Mechanical Tilt:	0	0	0	0	0	0
Electrical Tilt:	2	2	2	0	0	0

AW5 UMTS Design

AW5 UMTS Design	A	B	C	D	E	F
Antenna RAD Center:	85	85	85	0	0	0
Antenna Azimuth:	30	150	270	0	0	0
Mechanical Tilt:	0	0	0	0	0	0
Electrical Tilt:	2	2	2	0	0	0

AW5 LTE Design

AW5 LTE Design	A	B	C	D	E	F
Antenna RAD Center:	85	85	85	0	0	0
Antenna Azimuth:	30	150	270	0	0	0
Mechanical Tilt:	180	180	180	0	0	0
Electrical Tilt:	180	180	180	0	0	0

Antenna Configuration (Site Level)

Antenna Use Existing	PCS GSM	PCS UMTS	AW5 UMTS	AW5 LTE
Antenna Use Existing Qty:				
Antenna Model:	Andrew - H1100-0512-020	Andrew - H1100-0512-020	H1100-0512-020	Andrew - TMAA1112U-1A20
Antenna Qty:	2	2	2	2
Antenna and (or) Port Shared:	Antenna & Port Shared with PCS UMTS	Antenna & Port Shared with PCS GSM	No	No

TMA Configuration (Site Level)

TMA Use Existing	PCS GSM	PCS UMTS	AW5 UMTS	AW5 LTE
TMA Use Existing TMA New/Not Needed:	Not Needed	Not Needed	Not Needed	Not Needed
TMA Model:			H1100-0512-020	ATMAA1112U-1A20
TMA Qty:	0	0	2	0

Dispenser/Combiner Configuration

Dispenser/Combiner Model (1)	A	B	C	D	EF
Dispenser Qty (1):					
Dispenser Model (2):					
Dispenser Qty (2):					
Combiner/Dispenser Model:					
Combiner/Dispenser Qty:					
Antenna Fiber Coax Solution (Site Level)					
Use HCS (Yes/No)?	Yes				

Use NSH Filter & OVP for Roof Top (Yes/No)?	No					
Use Coax Cable (Yes/No)?	Yes					
Hybrid Cable Configuration (Site Level)						
Hybrid Cable Type:	Low Capacity HCS - 104'					
Hybrid Cable Length:	174					
Hybrid Cable Qty:	1					
Hybrid Cable Config (Sector Level)	A	B	C	D	EF	
HCS run between sectors (e.g. Roof Top/Water Tank etc.)						
Hybrid Cable Length (ft):	0	0	0	0	0	0
COVP Configuration (Site Level)						
COVP Type (1):	Large COVP					
COVP Type (2):						
COVP Qty (1):						2
COVP Qty (2):						EF
Coax Configuration	A	B	C	D	EF	
Existing Coax Qty:						
Existing Coax Desc:						
Reason existing coax for TDOA (Yes/No)?	Yes	Yes	Yes			
Qty. of excess coax lines to remove?						
New Coax Type:						
New Coax Length (ft):						
New Coax Qty:						
HET Home-Run Cable:						
HET Home-Run Cable Length (ft):						
System Module (Site Level)	PCS GSM	PCS UMTS	AW5 UMTS	AW5 LTE		
System Module Type (1):	L200	L200	L200	L200		
System Module Qty (1):	1	1	1	1		
System Module Type (2):						
System Module Qty (2):						
RF Module (Site Level)	PCS GSM	PCS UMTS	AW5 UMTS	AW5 LTE		
RF Module Type (1):	L200	L200	L200	L200		
RF Module Qty (1):	2	2	2	2		
RF Module Type (2):						
RF Module Qty (2):						
Sector/BTS/Node-B (Site Level)	PCS GSM	PCS UMTS	AW5 UMTS	AW5 LTE		
Sector Count:						
BTS/Node-B Count:						
Comments/Notes:	4/20/12 Rev 0. He use 2 existing feeder lines per sector for UMTS and 2 per sector for AW5 UMTS. He use AW5 TMAA1112U-1A20 Low Cap HCS type with 105' length. The Quad antennas were changed to Andrew H1100-0512-020. 4/20/12 due to ATC install preference. Replace existing UMTS AW5 Antenna from Cellular Unit to H1100 Unit.					

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 CERTIFICATE OF AUTHORIZATION #001620
 RESPONSIBLE ENGINEER: RESPONSIBLE DISCIPLINE:
 KY MICHAEL L. OWENS E-21561 STRUCTURAL/CIVIL SC
 MO MICHAEL L. OWENS E-20658 STRUCTURAL/CIVIL SC
 REJ ROBERT E. JENSEN PE-02874 STRUCTURAL/CIVIL SC
 ROK SHELTON B. KESKING E-22333 ELECTRICAL E
 TMS TERRANCE M. SUPER E-15621 ELECTRICAL E

DESIGNER: F. GUY
 LEAD EE: S.D. KEISLING
 LEAD CESE: M.L. OWENS

SUBMITTALS

NO.	DATE	DESCRIPTION	BY
A	01/11/13	ISSUED FOR REVIEW	FG
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C	01/18/13	REVISED PER CLIENT COMMENTS	DSH
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E	01/21/13	ISSUED FOR CONSTRUCTION	DSH

SITE NAME
 PARKWAY CENTRAL
 HS SWB MP

SITE NUMBER
 MO-06-263-A

SITE ADDRESS
 1101 KISKER ROAD
 SAINT CHARLES, MISSOURI
 63304

SHEET TITLE
 RFDS CONFIGURATION
 DATA SHEET

SHEET NUMBER
 A-9





AMERICAN TOWER
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 RESPONSIBLE DESIGNER: S.D. KEISUNG
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 REJ ROBERT E. JENSEN FE-026374 STRUCTURAL/CIVIL SC
 SDK SHELTON O. KEISUNG E-27323 ELECTRICAL E
 TWS TERRANCE M. SUPER E-18621 ELECTRICAL E

DESIGNER: F. GUY
 LEAD EE: S.D. KEISUNG
 LEAD CE/SE: M.L. OWENS

SUBMITTALS		
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E	01/24/13	ISSUED FOR CONSTRUCTION

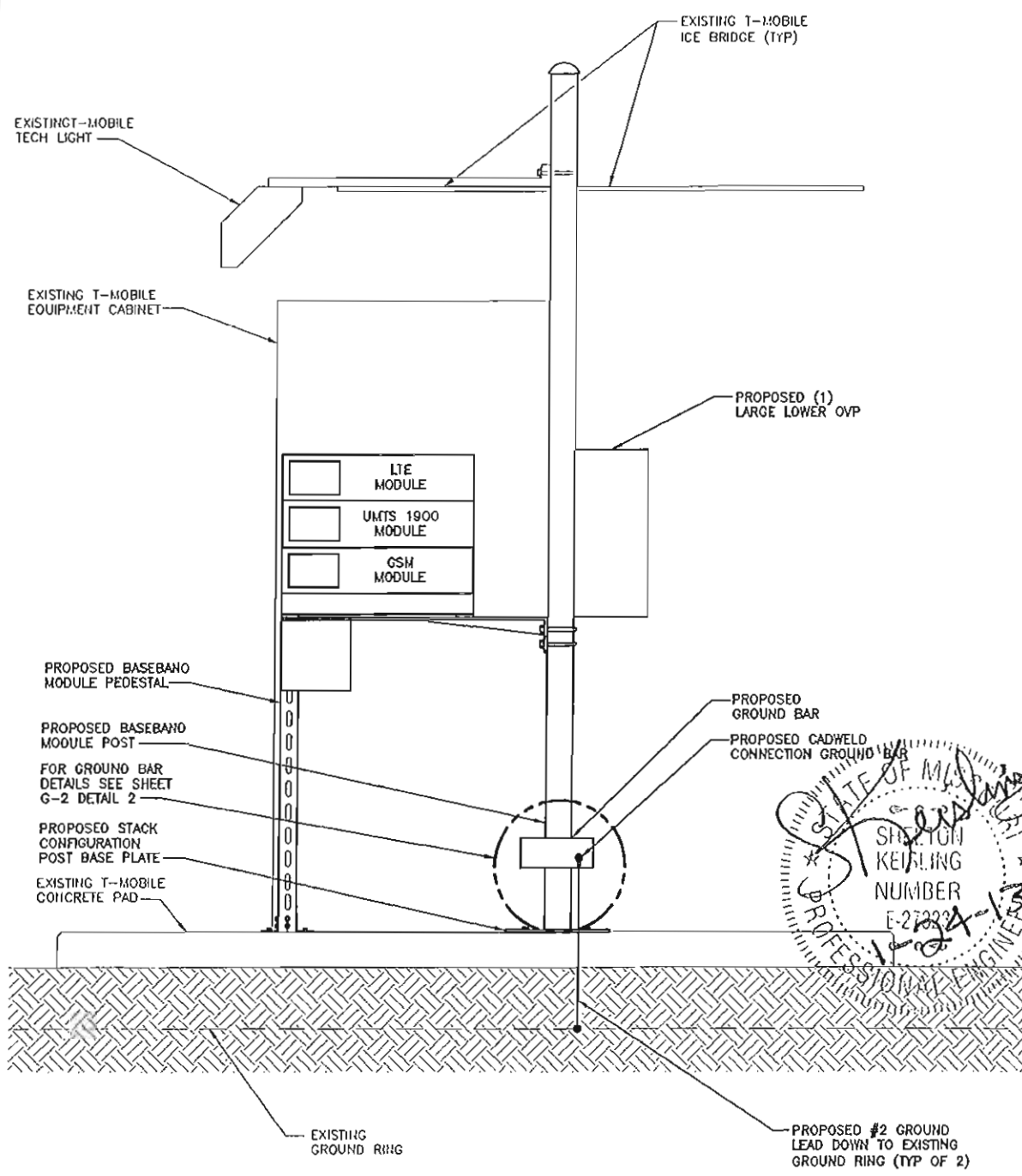
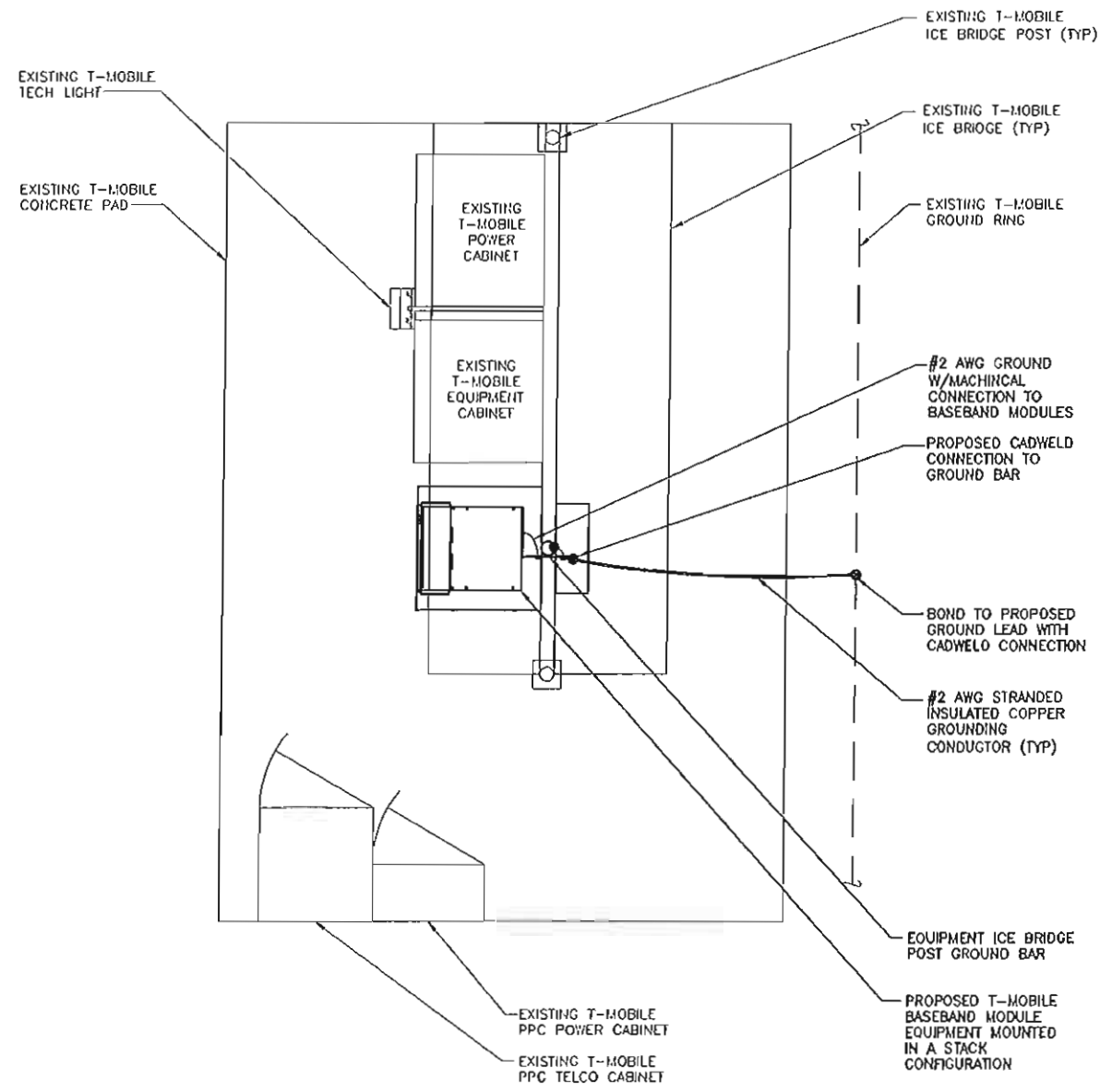
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**PARKWAY CENTRAL
 HS SWB MP**

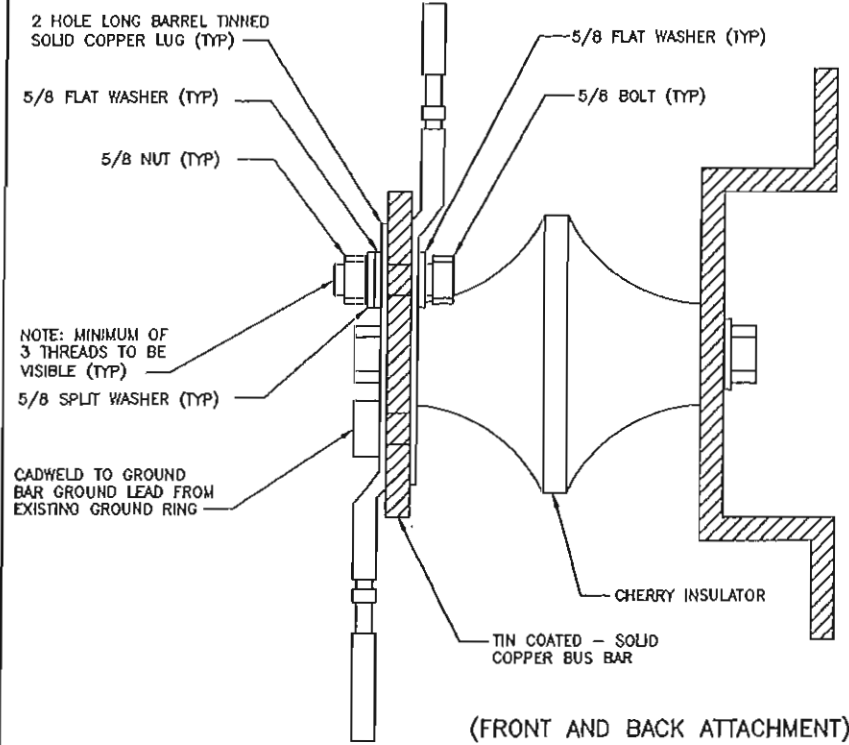
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 SAINT CHARLES, MISSOURI
 63304**

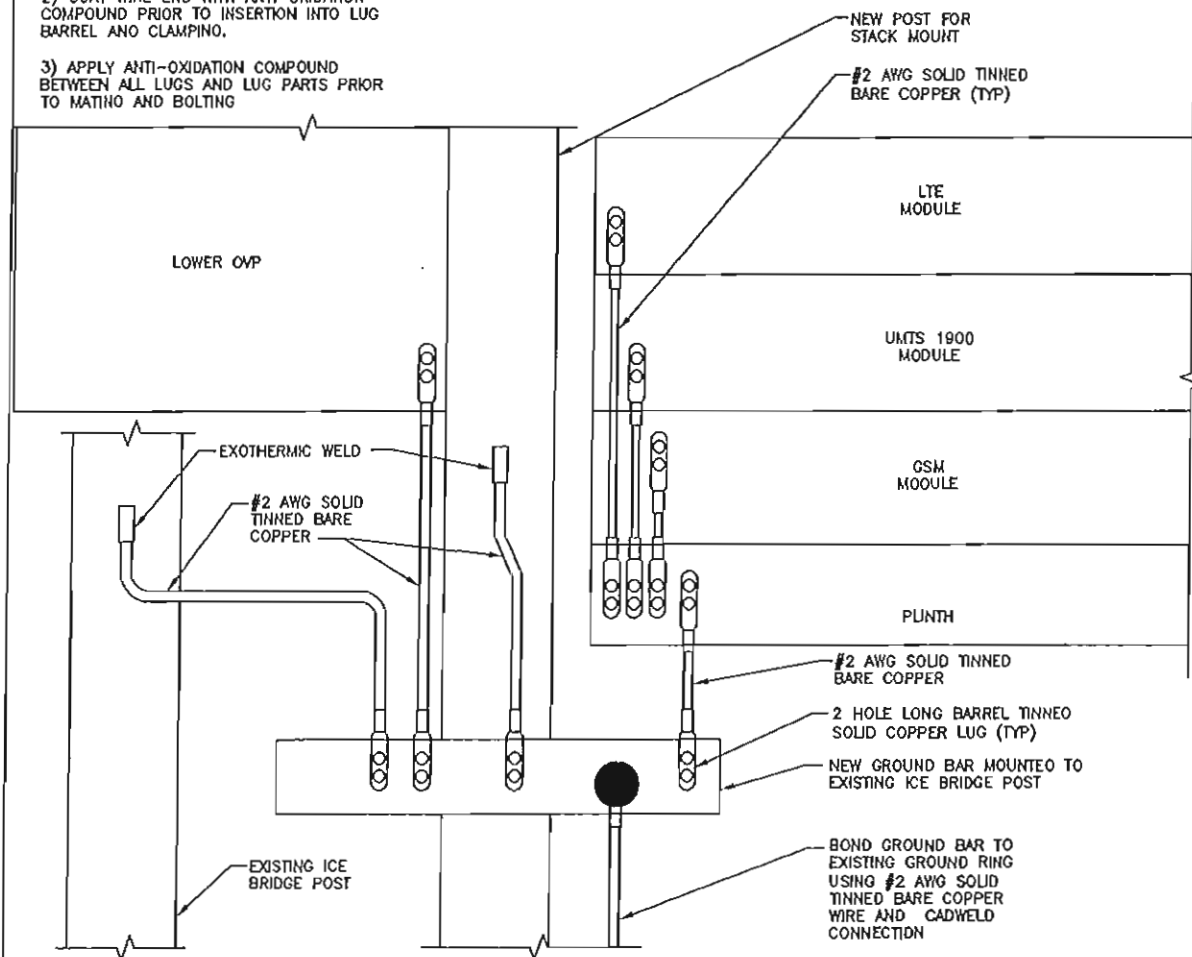
SHEET TITLE
**GROUNDING
 PLAN & ELEVATION**

SHEET NUMBER
G-1

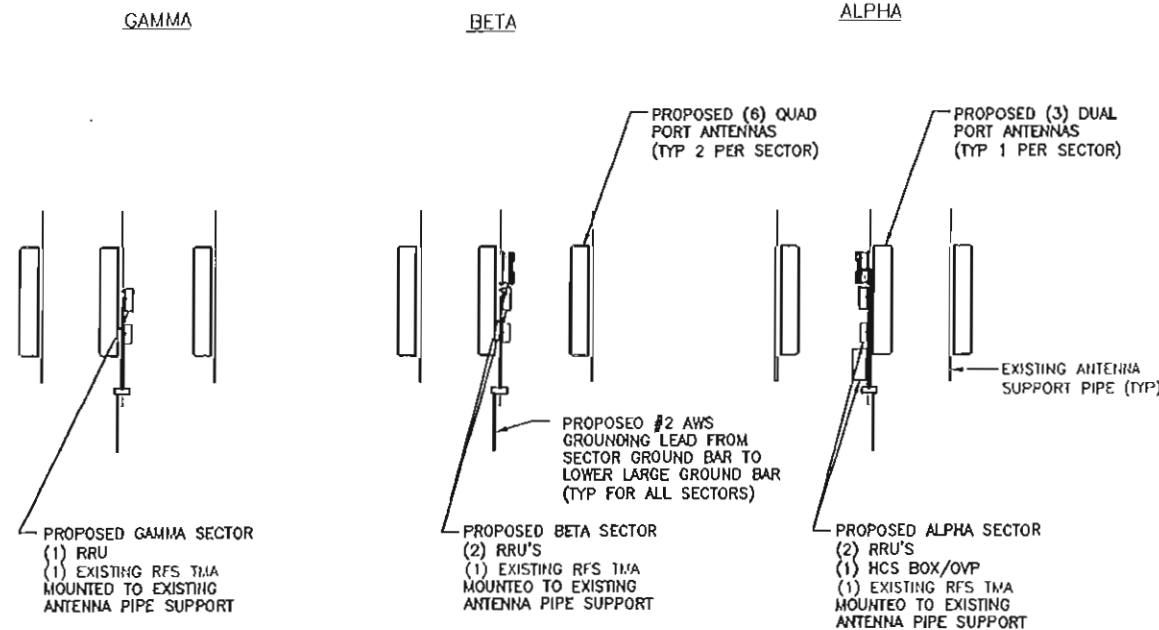




- NOTES:**
- 1) ALL HARDWARE 18-8 STAINLESS STEEL INCLUDING SPLIT WASHERS.
 - 2) COAT WIRE END WITH ANTI-OXIDATION COMPOUND PRIOR TO INSERTION INTO LUG BARREL AND CLAMPING.
 - 3) APPLY ANTI-OXIDATION COMPOUND BETWEEN ALL LUGS AND LUG PARTS PRIOR TO MATHING AND BOLTING

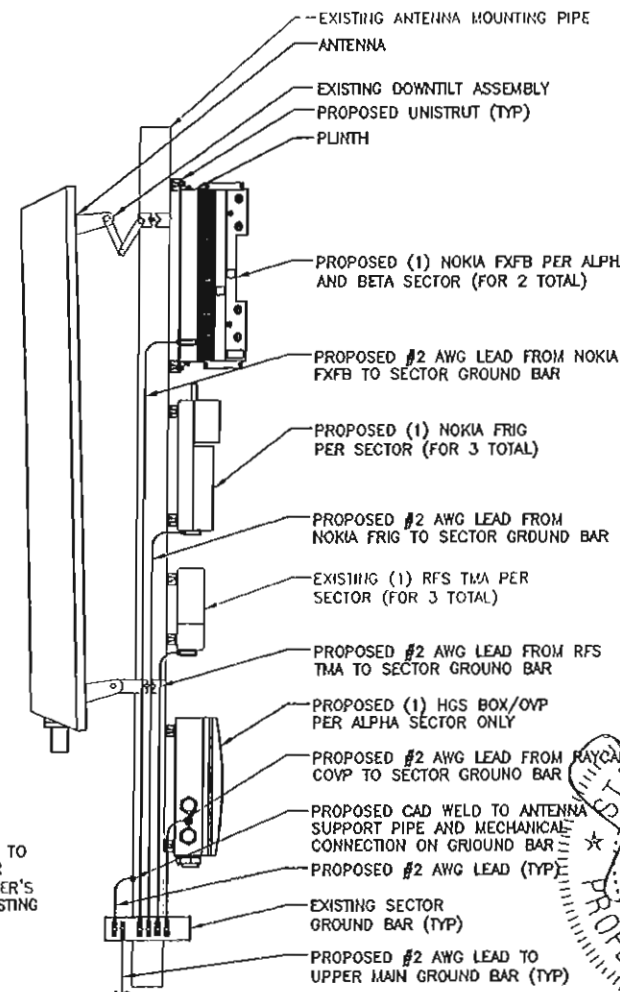


BOTTOM EQUIPMENT GROUNDING DETAIL



NOTE:

PROPOSED NEW RRU EQUIPMENT TO BE BONDED TO EXISTING SECTOR GROUND BARS PER MANUFACTURER'S RECOMMENDATIONS. IF NONE EXISTING ONE MUST BE INSTALLED PER RECOMMENDATIONS.



RRU EQUIPMENT GROUNDING DETAIL

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CERTIFICATE OF AUTHORIZATION #031643

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MO AL CHAEL L OWENS	E-25068 STRUCTURAL/CIVIL
REJ ROBERT E. JENSDI	PE-028974 STRUCTURAL/CIVIL
SDK SHELTON G. KEISLING	E-27223 ELECTRICAL
TWS TERRANCE M. SUPER	E-16671 ELECTRICAL

DESIGNER: F. GUY
LEAD EE: S.D. KEISLING
LEAD CESE: M.L. OWENS

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SITE NAME
**PARKWAY CENTRAL
HS SWB MP**

SITE NUMBER
MO-06-263-A

SITE ADDRESS
1101 KISKER ROAD
SAINT CHARLES, MISSOURI
63304

SHEET TITLE
**GROUNDING
DETAILS**

SHEET NUMBER
G-2



GENERAL REQUIREMENTS SECTION 01 10 00

PART 1 GENERAL

1.1 INTENT

- A. THESE SPECIFICATIONS AND CONSTRUCTION DRAWINGS DESCRIBE THE WORK TO BE DONE AND THE MATERIALS TO BE FURNISHED FOR CONSTRUCTION. PLANS ARE NOT TO BE SCALED.
- B. THE DRAWINGS AND SPECIFICATIONS ARE INTENDED TO BE FULLY EXPLANATORY AND SUPPLEMENTARY, HOWEVER, SHOULD ANYTHING BE SHOWN, INDICATED OR SPECIFIED ON ONE AND NOT THE OTHER, IT SHALL BE DONE THE SAME AS IF SHOWN, INDICATED OR SPECIFIED IN BOTH.
- C. THE INTENTION OF DOCUMENTS IS TO INCLUDE ALL LABOR AND MATERIALS REASONABLY NECESSARY FOR THE PROPER EXECUTION AND COMPLETION OF THE WORK AS STIPULATED IN THE CONTRACT.
- D. CONFLICTS: THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATION OF ALL MEASUREMENTS AT THE SITE BEFORE ORDERING MATERIALS OR DOING ANY WORK. NO COMPENSATION SHALL BE ALLOWED DUE TO DIFFERENCE BETWEEN ACTUAL DIMENSIONS AND THOSE ON THE DOCUMENTS. ANY DISCREPANCY SHALL BE REPORTED TO THE OWNER OR HIS AGENT FOR CONSIDERATION.

1.2 LICENSING REQUIREMENTS: THE CONTRACTOR IS RESPONSIBLE FOR PROCUREMENT AND MAINTAINING ALL APPLICABLE LICENSES AND BONDS.

1.3 STORAGE: ALL MATERIALS MUST BE STORED IN A LEVEL AND DRY FASHION THAT DOES NOT OBSTRUCT THE FLOW OF OTHER WORK. ANY STORAGE METHOD MUST MEET ALL RECOMMENDATIONS OF THE ASSOCIATED MANUFACTURER.

1.4 CLEAN UP: THE CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATION OF WASTE MATERIALS OR RUBBISH AT ALL TIMES.

1.5 QUALITY ASSURANCE: ALL WORK SHALL BE IN ACCORDANCE WITH APPLICABLE LOCAL, STATE, AND FEDERAL REGULATIONS.

PART 2 PRODUCTS - Not Applicable To This Section

PART 3 EXECUTION - Not Applicable To This Section

END OF SECTION

CAST-IN-PLACE-CONCRETE SECTION 03 30 00

PART 1 GENERAL

1.1 SUMMARY

FURNISH AND INSTALL ALL CAST-IN-PLACE CONCRETE, REINFORCING AND ACCESSORIES, AS SPECIFIED HEREIN AND AS SHOWN ON THE DRAWINGS.

1.2 SUBMITTALS

A. PRODUCT DATA: SUBMIT MANUFACTURER'S PRODUCT DATA AND INSTALLATION INSTRUCTIONS FOR EACH MATERIAL AND PRODUCT USED.

B. SHOP DRAWINGS: SUBMIT SHOP DRAWINGS INDICATING MATERIAL CHARACTERISTICS, DETAILS OF CONSTRUCTION, CONNECTIONS, AND RELATIONSHIP WITH ADJACENT CONSTRUCTION.

SHOP DRAWINGS SHALL BE PREPARED AND STAMPED BY A QUALIFIED ENGINEER LICENSED IN THE JURISDICTION OF THE PROJECT.

C. MIX DESIGN: SUBMIT FOR APPROVAL MIX DESIGN PROPOSED FOR USE.

1.3 QUALITY ASSURANCE

A. COMPLY WITH GOVERNING CODES AND REGULATIONS. PROVIDE PRODUCTS OF ACCEPTABLE MANUFACTURERS, WHICH HAVE BEEN IN SATISFACTORY USE IN SIMILAR SERVICE FOR A MINIMUM OF THREE YEARS. USE EXPERIENCED INSTALLERS. DELIVER, HANDLE, STORE MATERIALS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

B. TESTING: EMPLOY AN INDEPENDENT TESTING AGENCY ACCEPTABLE TO OWNER TO DESIGN CONCRETE MIXES AND TO PERFORM MATERIAL EVALUATION TESTS. PROVIDE 4 AND 28 DAY CYLINDER TESTS. COMPLY WITH ASTM C 143, C 173, C 31 AND C 39.

C. STANDARDS

- 1. ACI 301, SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS.
- 2. ACI 318, BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE, AND CRSI MANUAL OF STANDARD PRACTICE.

PART 2 PRODUCTS

2.1 MATERIALS

A. MATERIALS SHALL CONFORM TO THE RESPECTIVE PUBLICATIONS AND OTHER REQUIREMENTS SPECIFIED HEREIN.

B. CEMENT: CEMENT SHALL CONFORM TO ASTM C150, TYPE 1. CEMENT MAY BE BAGGED OR BULK. CEMENT SHALL BE USED FORM ONLY ONE MILL THROUGHOUT PROJECT.

C. FINE AGGREGATE: FINE AGGREGATE SHALL CONFORM TO ASTM C33-08 AND SHALL BE UNIFORMLY GRADED, CLEAN, SHARP, WASHED MATERIAL OR CRUSHED SAND, FREE FROM ORGANIC IMPURITIES.

D. COURSE AGGREGATE: COURSE AGGREGATE SHALL CONFORM TO ASTM C33-08 AND SHALL BE NATURAL WASHED GRAVEL OR WASHED CRUSHED ROCK HAVING HARD, STRONG, DURABLE PIECES, FREE FROM ADHERENT COATINGS, THE MAXIMUM SIZE OF COURSE AGGREGATE SHALL BE 3/4" IN ACCORDANCE WITH THE REQUIREMENTS OF ASTM C33-08; GRADATION SIZE NO. 67.

E. WATER: WATER USED IN THE CONCRETE MIX SHALL BE POTABLE, CLEAN, AND FREE FROM OILS, ACIDS, SALTS, CHLORIDES, ALKALI, SUGAR, VEGETABLE, OR OTHER INJURIOUS SUBSTANCES.

F. REINFORCING STEEL: ALL BARS ARE TO BE NEW BILLET STEEL CONFORMING TO ASTM A615, GRADE 60. BENDING DETAILS RE TO CONFORM TO THE STANDARDS OF ACI 318.

G. FORMS: THE FORMS SHALL BE TRUE AND RIGID AND CONFORM TO SHAPE, LINE AND DIMENSIONS AS SHOWN ON THE DRAWINGS. ALL FORMS SHALL BE RIGIDLY CONSTRUCTED, BRACED AND TIED TO PREVENT ANY DEFLECTION OR DISPLACEMENT DURING PLACING OF CONCRETE. ALL EXPOSED CORNERS AND EDGES SHALL HAVE 3/4" FILLETS. ALL JOINTS SHALL BE MORTAR TIGHT; OPEN JOINTS SHALL BE SEALED AS REQUIRED.

H. CONCRETE:

1. PROPORTIONING: CONCRETE SHALL CONFORM TO THE FOLLOWING:

- a. CEMENT-6 SACKS PER CUBIC YARD, MINIMUM
- b. WATER SHALL BE KEPT TO AN ABSOLUTE MINIMUM TO MAINTAIN SLUMP AS SPECIFIED
- c. AGGREGATE; SAND FACTOR SHALL BE AS REQUIRED TO GIVE THE BEST WORKABLE MIX WITHIN THE RANGE OF 46 TO 52 PERCENT OF TOTAL AGGREGATE.
- d. STRENGTH-4,000 PSI AT 28 DAYS, UNLESS NOTED OTHERWISE
- e. ALL CONCRETE SHALL CONTAIN A WATER-REDUCING AGENT AND SHALL HAVE THREE (3) TO FIVE (5) PERCENT ENTRAINED AIR.

2.2 SLUMP:

A. THE MAXIMUM SLUMP SHALL NOT EXCEED 3" EXCEPT FOR CONCRETE TO BE PLACED IN FORMS 8" WIDE OR LESS, WHERE THE MAXIMUM SLUMP SHALL BE 4".

B. THE DETERMINATION OF SLUMP SHALL CONFORM TO ASTM C143.

2.3 MIXING:

THE CONTRACTOR SHALL USE READY-MIXED CONCRETE, MIXED AND DELIVERED IN CONFORMANCE WITH ASTM C94.

2.4 MIXTURES:

A. THE CONCRETE SHALL CONTAIN AIR-ENTRAINING ADMIXTURE COMPLYING WITH THE REQUIREMENTS OF ASTM C-260 AND ACI 212.1R AND A WATER-REDUCING ADMIXTURE COMPLYING WITH THE REQUIREMENTS OF ASTM C-494 AND ACI 212.1R. ADMIXTURES SHALL BE PURCHASE AND BATCHED IN LIQUID SOLUTION. THE USE OF CALCIUM CHLORIDE OR AN ADMIXTURE CONTAINING CALCIUM CHLORIDE IS PROHIBITED.

B. ADMIXTURES SHALL BE OF THE SAME MANUFACTURER TO ASSURE COMPATIBILITY.

C. ACCEPTABLE MANUFACTURERS ARE:

- 1. W.R. GRACE
- 2. SIKKA GROUP
- 3. MASTER BUILDERS
- 4. EUCLID CHEMICAL CO

2.5 CURING COMPOUNDS

CURING COMPOUNDS SHALL CONFORM TO ASTM C309, TYPE 1, ID, CLASS A AND B AND ASTM C171 AS APPLICABLE

PART 3 EXECUTION

3.1 GENERAL

A. CONSTRUCT AND ERECT FORMWORK IN ACCORDANCE WITH ACI 301 ACI 347.

B. COLD-WEATHER CONCRETING SHALL BE IN ACCORDANCE WITH ACI 308.

C. HOT-WEATHER CONCRETING SHALL BE IN ACCORDANCE WITH ACI 305.

3.2 INSERTS, EMBEDDED COMPONENTS AND OPENINGS

A. CONTRACTOR SHALL CHECK ALL CML, ARCHITECTURAL, STRUCTURAL, AND ELECTRICAL DRAWINGS FOR OPENINGS, SLEEVES, ANCHOR BOLTS, INSERTS AND OTHER ITEMS TO BE BUILT INTO THE CONCRETE WORK.

B. COORDINATE THE WORK OF OTHER SECTIONS IN FORMING AND SETTING OPENINGS, RECESSES, SLOTS, CHASES, ANCHORS, INSERTS AND OTHER ITEMS TO BE EMBEDDED.

C. EMBEDDED ITEMS SHALL BE SET ACCURATELY IN LOCATION, ALIGNMENT, ELEVATION, AND PLUMBNESS. LOCATE AND MEASURE FROM ESTABLISHED SURVEYED REFERENCE BENCHMARKS.

D. EMBEDDED ITEMS SHALL BE ANCHORED INTO PLACE AS REQUIRED TO PREVENT MOVEMENT DURING CONCRETE PLACEMENT AND CONSOLIDATION. COMPONENTS FORMING A PART OF A COMPLETE ASSEMBLY SHALL BE ALIGNED BEFORE ANCHORING. PROVIDE TEMPORARY BRACING, ANCHORAGE, AND TEMPLATES AS REQUIRED TO MAINTAIN THE SETTING AND ALIGNMENT.

3.3 REINFORCEMENT PLACEMENT:

A. REINFORCEMENT SHALL BE PLACED IN ACCORDANCE WITH CHECKED AND RELEASED DRAWINGS AND ACI 301 AND ACI 315; SECURELY WIRE-TIE REINFORCEMENT AT ALL INTERSECTIONS.

B. ACCURATELY POSITION, SUPPORT AND SECURE REINFORCEMENT AGAINST DISPLACEMENT FROM FORMWORK CONSTRUCTION OR CONCRETE PLACEMENT AND CONSOLIDATION. REINFORCING SHALL BE SUPPORTED ON METAL CHAIRS, RUNNERS, BOLSTERS, SPACERS, AND HANGERS.

C. SPLICES OF REINFORCING BARS SHALL BE CLASS D UNLESS SHOWN OTHERWISE. SPLICES SHALL BE STAGGERED. FULL DEVELOPMENT LENGTH SHALL BE PROVIDED ACROSS JOINTS.

D. LOCATE REINFORCING TO PROVIDE CONCRETE COVER AND SPACING SHOWN ON THE DRAWINGS. MINIMUM COVER SHALL BE AS REQUIRED BY ACI 318.

E. WELDING OF AND TO ANY REINFORCING MATERIALS INCLUDING TACK WELDING OF CROSSING BARS IS STRICTLY PROHIBITED. BARS SHALL BE FREE OF FLAKY OR SCALY RUST AT THE TIME THE CONCRETE IS PLACED.

3.4 CONCRETE PLACEMENT:

A. PRIOR TO PLACING CONCRETE, FORMS AND REINFORCEMENT SHALL BE THOROUGHLY INSPECTED. ALL WOOD CHIPS, DIRT, ETC., AS WELL AS ALL TEMPORARY BRACING, TIES, AND CLEATS REMOVED, AND ALL OPENINGS FOR UTILITIES PROPERLY BOXED, ALL FORMS SHALL BE PROPERLY SECURED IN THEIR CORRECT POSITION AND MADE TIGHT. ALL REINFORCING AND EMBEDDED ITEMS SHALL BE SECURED IN THEIR PROPER LOCATIONS. ALL OLD AND DRY CONCRETE AND DIRT SHALL BE CLEANED AND ALL STANDING WATER AND OTHER FOREIGN MATTER REMOVED.

B. PLACING CONCRETE SHALL BE IN ACCORDANCE WITH ACI 301 AND ACI 304 AND SHALL BE CARRIED OUT AT SUCH A RATE THAT THE CONCRETE PREVIOUSLY PLACED IS STILL PLASTIC AND INTEGRATED WITH THE FRESHLY PLACED CONCRETE. CONCRETING, ONCE STARTED, SHALL BE CARRIED ON AS A CONTINUOUS OPERATION UNTIL THE SECTION IS COMPLETED. NO COLD JOINTS SHALL BE ALLOWED.

C. CONSTRUCTION JOINTS: USE KEYWAYS, CONTINUE REINFORCEMENT THROUGH JOINT.

D. EXPANSION JOINTS: FOR EXTERIOR WORK, LOCATE AT 30' O.C. MAXIMUM, AT APPROVED LOCATIONS. PROVIDE SMOOTH DOWELS ACROSS JOINT WHICH PERMIT 1" HORIZONTAL MOVEMENT AND NO VERTICAL SHEAR MOVEMENT.

E. ISOLATION JOINTS: PROVIDE BETWEEN SLABS AND VERTICAL ELEMENTS SUCH AS COLUMNS AND STRUCTURAL WALLS.

F. CONTROL JOINTS: PROVIDE SAWN OR TOOLED JOINTS OR REMOVABLE INSERT STRIPS; DEPTH EQUAL TO 1/4" SLAB THICKNESS. SPACING SHALL BE AS REQUIRED AND APPROVED.

G. ALL CONCRETE SHALL BE THOROUGHLY CONSOLIDATED AND COMPACTED BY VIBRATION, SPADING, RODDING, OR FORKING DURING THE OPERATION OF PLACING AND DEPOSITING IN ACCORDANCE WITH ACI 309. THE CONCRETE SHALL BE WORKED AROUND REINFORCEMENT, EMBEDDED ITEMS, AND INTO THE CORNERS OF THE FORMS SO AS TO ELIMINATE ALL AIR AND STONE POCKETS.

3.5 FINISHING:

A. FINISHING OF ALL SLABS SHALL BE IN ACCORDANCE WITH ACI 302.1; SECTION 7.2 WITH A MINIMUM OF THREE TROWELINGS.

1. INTERIOR SLAB FINISH TOLERANCE AS MEASURED IN ACCORDANCE WITH ASTM E 1155 SHALL HAVE AN OVERALL TEST F NUMBER FOR FLATNESS, FF=20 AND FOR LEVEL, FL=15. THE MINIMUM LOCAL NUMBER FOR FLATNESS, FF=15 AND FOR LEVEL, FL=10.

2. EXTERIOR SLAB FINISH SHALL BE FLAT (FF=20) AND SHALL BE SLOPED A MINIMUM OF 1/8" PER FOOT TO A MAXIMUM OF 1/4" PER FOOT TO PREVENT PONDING WATER.

B. SURFACES OF SLABS SHALL RECEIVE TWO COATS OF CLEAR SEALER/HARDNER.

C. ABOVE GRADE WALL SURFACES SHALL HAVE A SMOOTH FORM FINISH AS DEFINED IN CHAPTER 10 OF ACI 301.

3.6 CURING:

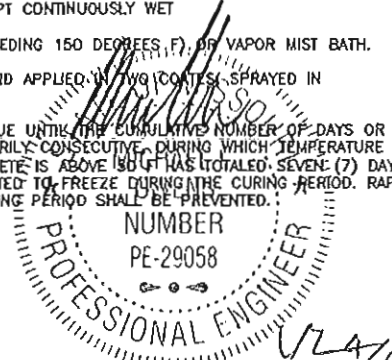
A. FRESHLY DEPOSITED CONCRETE SHALL BE PROTECTED FROM PREMATURE DRYING AND EXCESSIVELY HOT OR COLD TEMPERATURES AND SHALL BE MAINTAINED WITH MINIMAL MOISTURE LOSS AT A RELATIVELY CONSTANT TEMPERATURE FOR A PERIOD OF TIME NECESSARY FOR THE HYDRATION OF THE CEMENT AND PROPER HARDENING OF THE CONCRETE.

B. CURING SHALL IMMEDIATELY FOLLOW THE FINISH OPERATION. CONCRETE SHALL BE KEPT CONTINUOUSLY MOIST AT LEAST OVERNIGHT, IMMEDIATELY FOLLOWING THE INITIAL CURING. BEFORE THE CONCRETE HAS DRIED, ADDITIONAL CURING SHALL BE ACCOMPLISHED BY ONE OF THE FOLLOWING MATERIALS OR METHODS:

- 1. PONDING OR CONTINUOUS SPRINKLING
- 2. ABSORPTIVE MAT OR FABRIC KEPT CONTINUOUSLY WET
- 3. NON-ABSORPTIVE FILM (POLYETHYLENE) OVER A PREVIOUSLY SPRINKLED SURFACE
- 4. SAND OR OTHER COVERING KEPT CONTINUOUSLY WET
- 5. CONTINUOUS STEAM (NOT EXCEEDING 150 DEGREES F), OR VAPOR MIST BATH.
- 6. SPRAYED-ON CURING COMPOUND APPLIED IN TWO COATS, SPRAYED IN PERPENDICULAR DIRECTIONS.

C. THE FINAL CURING SHALL CONTINUE UNTIL THE CUMULATIVE NUMBER OF DAYS OR FRACTION THEREOF, NOT NECESSARILY CONSECUTIVE, DURING WHICH TEMPERATURE OF THE AIR IN CONTACT WITH CONCRETE IS ABOVE 50°F HAS TOTALLED SEVEN (7) DAYS. CONCRETE SHALL NOT BE PERMITTED TO FREEZE DURING THE CURING PERIOD. RAPID DRYING AT THE END OF THE CURING PERIOD SHALL BE PREVENTED.

END OF SECTION



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Overland Park, Kansas 66210
Phone: 913-438-7700 Fax: 913-438-7777

STATE OF MISSOURI	
CERTIFICATE OF AUTHORIZATION #001640	
RESPONSIBLE ENGINEERS:	RESPONSIBLE DISCIPLINE:
MY KENNY VANVAELE E-21561 STRUCTURAL/CVIL SC	SC
MLO MICHAEL L OZENS E-20508 STRUCTURAL/CVIL SC	SC
RE J ROBERT E REISDI E-078074 STRUCTURAL/CVIL SC	SC
SOK SHELTON D KEISUNG E-77329 ELECTRICAL E	E
TUS TERRANCE M SUPER E-13571 ELECTRICAL E	E

DESIGNER:	F. GUY
LEAD EE:	S. D. KEISLING
LEAD CESE:	M.L. OWENS

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SITE NAME	PARKWAY CENTRAL HS SWB MP
SITE NUMBER	MO-06-263-A
SITE ADDRESS	1101 KISKER ROAD SAINT CHARLES, MISSOURI 63304
SHEET TITLE	SPECIFICATIONS (1 OF 3)
SHEET NUMBER	SP-1

SECTION 16000 ELECTRICAL

PART 1 GENERAL

1.1 GENERAL CONDITIONS:

- A. THE CONTRACTOR SHALL INSPECT THE SITE WHERE THIS WORK IS TO BE PERFORMED AND FULLY FAMILIARIZE HIMSELF WITH ALL CONDITIONS RELATED TO THIS PROJECT.
- B. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS AND LICENSES AND SHALL MAKE ALL DEPOSITS AND PAY ALL FEES REQUIRED FOR THE PERFORMANCE OF WORK UNDER THIS SECTION.
- C. DRAWINGS SHOW THE GENERAL ARRANGEMENT OF ALL SYSTEMS AND COMPONENTS COVERED UNDER THIS SECTION. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS. DRAWINGS SHALL NOT BE SCALED TO DETERMINE DIMENSIONS.

1.2 LAWS, REGULATIONS, ORDINANCES, STATUTES AND CODES.

- A. ALL WORK SHALL BE INSTALLED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE, AND ALL APPLICABLE LOCAL LAWS, REGULATIONS, ORDINANCES, STATUTES AND CODES.

1.3 REFERENCES:

- A. THE PUBLICATIONS LISTED BELOW FORM PART OF THIS SPECIFICATION. EACH PUBLICATION SHALL BE THE LATEST REVISION AND ADDENDUM IN EFFECT ON THE DATE THIS SPECIFICATION IS ISSUED FOR CONSTRUCTION UNLESS OTHERWISE NOTED. EXCEPT AS MODIFIED BY THE REQUIREMENTS SPECIFIED HEREIN OR THE DETAILS OF THE DRAWINGS, WORK INCLUDED IN THIS SPECIFICATION SHALL CONFORM TO THE APPLICABLE PROVISIONS OF THESE PUBLICATIONS.

- 1. ANSI/IEEE (AMERICAN NATIONAL STANDARDS INSTITUTE)
- 2. IEEE (INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS)
- 3. ASTM (AMERICAN SOCIETY FOR TESTING AND MATERIALS)
- 4. ICEA (INSULATED CABLE ENGINEERS ASSOCIATION)
- 5. NEMA (NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION)
- 6. NFPA (NATIONAL FIRE PROTECTION ASSOCIATION)
- 7. OSHA (OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION)
- 8. UL (UNDERWRITERS LABORATORIES, INC.)

1.4 SCOPE OF WORK:

- A. WORK UNDER THIS SECTION SHALL CONSIST OF FURNISHING ALL LABOR, MATERIAL AND ASSOCIATED SERVICES REQUIRED TO COMPLETELY CONSTRUCT AND LEAVE READY FOR OPERATION SYSTEMS AS SHOWN ON THE DRAWINGS AND HEREIN DESCRIBED.
- B. ALL ELECTRICAL EQUIPMENT UNDER THIS CONTRACT SHALL BE PROPERLY TESTED, ADJUSTED, AND ALIGNED BY THE CONTRACTOR.
- C. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL EXCAVATING, DRAINING, TRENCHES, BACKFILLING, AND REMOVAL OF EXCESS DIRT.
- D. THE CONTRACTOR SHALL FURNISH TO THE OWNER, CERTIFICATES OF FINAL INSPECTION AND APPROVAL FROM THE INSPECTION AUTHORITIES HAVING JURISDICTION.

PART 2 PRODUCTS

2.1 GENERAL:

- A. ALL ITEMS OF MATERIALS AND EQUIPMENT SHALL BE NEW, FREE FROM DEFECTS AND OF THE BEST QUALITY NORMALLY USED FOR THE PURPOSE IN GOOD COMMERCIAL PRACTICE.
- B. ALL MATERIALS AND EQUIPMENT SHALL BE ACCEPTABLE TO THE AUTHORITY HAVING JURISDICTION AS SUITABLE FOR THE USE INTENDED.
- C. ALL EQUIPMENT SHALL BEAR THE UNDERWRITERS LABORATORIES LABEL OF APPROVAL, AND SHALL CONFORM TO REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE.
- D. ALL OVERCURRENT DEVICES SHALL HAVE AN INTERRUPTING RATING EQUAL TO OR GREATER THAN THE SHORT CIRCUIT CURRENT TO WHICH THEY ARE SUBJECTED, 10,000 AC MINIMUM. VERIFY AVAILABLE SHORT CIRCUIT CURRENT DOES NOT EXCEED THE RATING OF ELECTRICAL EQUIPMENT.

2.2 MATERIALS AND EQUIPMENT:

A. CONDUIT:

- 1. RIGID GALVANIZED STEEL CONDUIT (RGS) SHALL BE HOT-DIP GALVANIZED INSIDE AND OUTSIDE INCLUDING ENDS AND THREADS AND ENAMELED OR LACQUERED INSIDE IN ADDITION TO GALVANIZING.
- 2. FLEXIBLE METAL CONDUIT SHALL BE GALVANIZED, ZINC-COATED STEEL, PVC COATED FOR OUTDOOR APPLICATIONS.
- 3. CONDUIT CLAMPS, STRAPS AND SUPPORTS SHALL BE STEEL OR MALLEABLE IRON. ALL FITTINGS SHALL BE COMPRESSION TYPE AND WATERTIGHT.
- 4. NON-METALLIC CONDUIT AND FITTINGS SHALL BE SCHEDULE 40 PVC, HEAVY-WALL RIGID WITH SOLVENT-CEMENT-TYPE JOINTS AS RECOMMENDED BY THE MANUFACTURER.
- 5. -48 DC POWER COLOR CODE SHALL BE BLUE AND BLACK.

B. WIRE AND CABLE:

- 1. WIRE AND CABLE SHALL BE FLAME-RETARDANT, MOISTURE AND HEAT RESISTANT THERMOPLASTIC, SINGLE CONDUCTOR, COPPER, TYPE THHN/THWN, 600 VOLT, SIZES AS INDICATED, #12 AWG MINIMUM.
- 2. #10 AWG AND SMALLER CONDUCTORS SHALL BE SOLID AND #8 AWG AND LARGER CONDUCTORS SHALL BE STRANDED.
- 3. SOLDERLESS, PRESSURE-TYPE CONNECTORS CONSTRUCTED OF HIGH-STRENGTH, NON-CORRODIBLE, TIN-PLATED COPPER DESIGNED TO FURNISH HIGH-PULLOUT STRENGTH AND HIGH CONDUCTIVITY JOINTS SHALL BE USED.
- 4. SUPPORT GRIPS SHALL BE SINGLE WEAVE, CLOSED MESH, HIGH-GRADE, NON-MAGNETIC, TIN-COATED BRONZE CAPABLE OF SUPPORTING TEN TIMES THE CABLE DEAD WEIGHT, HUBBELL KELLEMS OR APPROVED EQUAL.

C. DISCONNECT SWITCHES:

- 1. DISCONNECT SWITCHES SHALL BE HEAVY DUTY, DEAD-FRONT, QUICK-MAKE, QUICK-BREAK, EXTERNALLY OPERABLE, HANDLE LOCKABLE AND INTERLOCKED WITH COVER IN CLOSED POSITION, RATING AS INDICATED, UL LABELED FURNISHED IN NEMA 3R ENCLOSURE, SQUARE D CLASS 3110 OR APPROVED EQUAL.

D. SYSTEM GROUNDING:

- 1. GROUNDING CONDUCTOR SHALL BE BARE, STRANDED, COPPER, SIZE AS INDICATED, EXCEPT ABOVE GROUND GROUNDING CONDUCTORS SHALL BE INSULATED.
- 2. GROUND BUSES SHALL BE BARE ANNEALED COPPER BARS OF RECTANGULAR CROSS SECTION. BUSS BARS SHALL BE TIN PLATED OR PAINTED GRAY AFTER CONNECTIONS HAVE BEEN COMPLETED.
- 3. CONNECTORS SHALL BE HIGH-CONDUCTIVITY, HEAVY DUTY, LISTED AND LABELED AS GROUNDING CONNECTORS FOR THE MATERIALS USED. USE TWO-HOLE COMPRESSION LUGS WITH HEAT SHRINK FOR MECHANICAL CONNECTIONS.
- 4. EXOTHERMIC WELDED CONNECTIONS SHALL BE PROVIDED IN KIT FORM AND SELECTED FOR THE SPECIFIC TYPES, SIZES, AND COMBINATIONS OF CONDUCTORS AND OTHER ITEMS TO BE CONNECTED.
- 5. GROUND RODS SHALL BE COPPER-CLAD STEEL WITH HIGH-STRENGTH STEEL CORE AND ELECTROLYTIC-GRADE COPPER OUTER SHEATH, MOLTEN WELDED TO CORE, 3/4" x 10'-0".

E. OTHER MATERIALS:

- 1. THE CONTRACTOR SHALL PROVIDE OTHER MATERIALS, THOUGH NOT SPECIFICALLY DESCRIBED, WHICH ARE REQUIRED FOR A COMPLETELY OPERATIONAL SYSTEM AND PROPER INSTALLATION OF THE WORK.



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Overland Park, Kansas 66210
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STATE OF MISSOURI	
CERTIFICATE OF AUTHORIZATION: 0001663	
RESPONSIBLE ENGINEERS	RESPONSIBLE DESIGNER
KY KEVIN VANVAELE E-21561 STRUCTURAL/CIVIL SC	
MO MICHAEL OWENS E-29058 STRUCTURAL/CIVIL SC	
NE ROBERT E. JENSEN PE-09974 STRUCTURAL/CIVIL SC	
SDS SHELTON D. KEISLING E-27323 ELECTRICAL E	
TX TERRAYNE M. SUPER E-16521 ELECTRICAL E	

DESIGNER: F. GUY
LEAD EE: S.D. KEISLING
LEAD CESE: M.L. OWENS

SUBMITTALS			
NO.	DATE	DESCRIPTION	BY
A	01/14/13	ISSUED FOR REVIEW	FG
B	01/15/13	REVISED PER CLIENT COMMENTS	DSH
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D	01/21/13	REVISED PER CLIENT COMMENTS	DSH
E	01/24/13	ISSUED FOR CONSTRUCTION	DSH

SITE NAME
**PARKWAY CENTRAL
HS SWB MP**

SITE NUMBER
MO-06-263-A

SITE ADDRESS
**1101 KISKER ROAD
SAINT CHARLES, MISSOURI
63304**

SHEET TITLE
SPECIFICATIONS (2 OF 3)

SHEET NUMBER
SP-2



PART 3 EXECUTION

3.1 GENERAL:

- A. ALL MATERIALS AND EQUIPMENT SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
- B. EQUIPMENT SHALL BE TIGHTLY COVERED AND PROTECTED AGAINST DIRT OR WATER, AND AGAINST CHEMICAL OR MECHANICAL INJURY DURING INSTALLATION AND CONSTRUCTION PERIODS.

3.2 LABOR AND WORKMANSHIP:

- A. ALL LABOR FOR THE INSTALLATION OF MATERIALS AND EQUIPMENT FURNISHED FOR THE ELECTRICAL SYSTEM SHALL BE DONE BY EXPERIENCED MECHANICS OF THE PROPER TRADES.
- B. ALL ELECTRICAL EQUIPMENT FURNISHED SHALL BE ADJUSTED, ALIGNED AND TESTED BY THE CONTRACTOR AS REQUIRED TO PRODUCE THE INTENDED PERFORMANCE.
- C. UPON COMPLETION OF THE WORK, THE CONTRACTOR SHALL THOROUGHLY CLEAN ALL EXPOSED EQUIPMENT, REMOVE ALL LABELS AND ANY DEBRIS, CRATING OR CARTONS AND LEAVE THE INSTALLATION FINISHED AND READY FOR OPERATION.

3.3 COORDINATION:

- A. THE CONTRACTOR SHALL COORDINATE THE INSTALLATION OF ELECTRICAL ITEMS WITH THE OWNER-FURNISHED EQUIPMENT DELIVERY SCHEDULE TO PREVENT UNNECESSARY DELAYS IN THE TOTAL WORK.

3.4 INSTALLATION:

A. CONDUIT:

1. ALL ELECTRICAL WIRING SHALL BE INSTALLED IN CONDUIT AS HEREIN SPECIFIED. NO CONDUIT OR TUBING OF LESS THAN 3/4 INCH NOMINAL SIZE SHALL BE USED.
2. PROVIDE RGS CONDUIT FOR ALL EXPOSED, EXTERIOR CONDUIT.
3. PROVIDE SCHEDULE 40 PVC OR RGS CONDUIT BELOW GRADE, 1" MINIMUM, UNLESS NOTED OTHERWISE. ALL 90 DEGREE BENDS TO ABOVE GRADE SHALL BE RGS. MINIMUM BURIAL DEPTH SHALL BE 24" CLEAR TO TOP OF CONDUIT, UNLESS NOTED OTHERWISE.
4. USE GALVANIZED FLEXIBLE STEEL CONDUIT WHERE DIRECT CONNECTION IS NOT DESIRABLE FOR REASONS OF EQUIPMENT MOVEMENT, VIBRATION, OR FOR EASE OF MAINTENANCE. USE LIQUIDTIGHT, PVC COATED FLEXIBLE METAL CONDUIT FOR OUTDOOR APPLICATIONS.
5. INSTALL GALVANIZED FLEXIBLE STEEL CONDUIT AT ALL POINTS OF CONNECTION TO EQUIPMENT MOUNTED ON SUPPORTS TO ALLOW FOR EXPANSION AND CONTRACTION. NO MORE THAN 3' SEALTIGHT FROM RGS.
6. A RUN OF CONDUIT BETWEEN BOXES OR FITTINGS SHALL NOT CONTAIN MORE THAN THE EQUIVALENT OF FOUR QUARTER-BENDS INCLUDING THOSE BENDS LOCATED IMMEDIATELY AT THE BOX OR FITTING. THE RADIUS OF BENDS SHALL NEVER BE SHORTER THAN THAT OF THE CORRESPONDING TRADE ELBOW.
7. WHERE CONDUIT HAS TO BE CUT IN THE FIELD, IT SHALL BE CUT SQUARE WITH A PIPE CUTTER USING CUTTING KNIVES.
8. ALL CONDUITS SHALL BE SWABBED CLEAN BY PULLING AN APPROPRIATE SIZE MANDREL THROUGH THE CONDUIT BEFORE INSTALLATION OF WIRE OR CABLE. CLEAR ALL BLOCKAGES AND REMOVE BURRS, DIRT, AND DEBRIS.
9. INSTALL PULL STRINGS IN ALL EMPTY CONDUITS. IDENTIFY PULL STRINGS AT EACH END WITH ITS DESTINATION.
10. PROVIDE INSULATED GROUNDING BUSHINGS FOR ALL CONDUITS STUBBED INTO EQUIPMENT ENCLOSURES OR STUBBED OUT FOR FUTURE USE BY OTHERS.
11. CONTRACTOR IS RESPONSIBLE FOR PROTECTING ALL CONDUITS DURING CONSTRUCTION. TEMPORARY OPENINGS IN THE CONDUIT SYSTEM SHALL BE PLUGGED OR CAPPED TO PREVENT ENTRANCE OF MOISTURE OR FOREIGN MATTER. CONTRACTOR SHALL REPLACE ANY CONDUITS CONTAINING FOREIGN MATERIALS THAT CANNOT BE REMOVED.
12. INSTALL 2" ORANGE DETECTABLE TAPE 12" ABOVE ALL UNDERGROUND CONDUIT AND WIRE.
13. CONDUITS SHALL BE INSTALLED IN SUCH A MANNER AS TO INSURE AGAINST COLLECTION OF TRAPPED CONDENSATION.

B. WIRE AND CABLE:

- 1. ALL POWER WIRING SHALL BE COLOR CODED AS FOLLOWS:

DESCRIPTION	120/240V	208Y/120V	480Y/277V
PHASE A	BLACK	BLACK	BROWN
PHASE B	RED	RED	ORANGE
PHASE C		BLUE	YELLOW
NEUTRAL	WHITE	WHITE	GRAY
GROUND	GREEN	GREEN	GREEN

- 1-A. DC -48 POWER COLOR CODE: BLUE & BLACK
- 2. SPLICES SHALL BE MADE ONLY AT OUTLETS, JUNCTION BOXES, OR ACCESSIBLE RACEWAYS WITH PRESSURE-TYPE CONNECTORS.
- 3. PULLING LUBRICANTS SHALL BE SOAPSTONE POWDER, POWDERED TALC, OR A COMMERCIAL PULLING COMPOUND. NO SOAP SUDS, SOAP FLAKES, OIL, OR GREASE SHALL BE USED, AS THESE MAY BE HARMFUL TO CABLE INSULATION. CONTRACTOR SHALL USE NYLON OR HEMP ROPE FOR PULLING CABLE TO

AVOID SCORING THE CONDUIT.

- 4. CABLES SHALL BE NEATLY TRAINED, WITHOUT INTERLACING, AND BE OF SUFFICIENT LENGTH IN ALL BOXES, EQUIPMENT, ETC. TO PERMIT MAKING A NEAT ARRANGEMENT. CABLES SHALL BE SECURED IN A MANNER TO AVOID TENSION ON CONDUCTORS OR TERMINALS, AND SHALL BE PROTECTED FROM MECHANICAL INJURY AND FROM MOISTURE. SHARP BENDS OVER CONDUIT BUSHINGS ARE PROHIBITED. DAMAGED CABLES SHALL BE REMOVED AND REPLACED AT THE CONTRACTOR'S EXPENSE.

C. DISCONNECT SWITCHES:

- 1. INSTALL DISCONNECT SWITCHES LEVEL AND PLUMB. CONNECT TO WIRING SYSTEM AND GROUND AS INDICATED.

D. GROUNDING:

1. ALL METALLIC PARTS OF ELECTRICAL EQUIPMENT WHICH DO NOT CARRY CURRENT SHALL BE GROUNDED IN ACCORDANCE WITH THE REQUIREMENTS OF ARTICLE 250 OF THE NATIONAL ELECTRICAL CODE.
2. PROVIDE ELECTRICAL GROUNDING AND BONDING SYSTEMS INDICATED WITH ASSEMBLY OF MATERIALS, INCLUDING GROUNDING ELECTRODES, BONDING JUMPERS AND ADDITIONAL ACCESSORIES AS REQUIRED FOR A COMPLETE INSTALLATION.
3. ROUTE GROUNDING CONNECTIONS AND CONDUCTORS TO GROUND IN THE SHORTEST AND STRAIGHTEST PATHS POSSIBLE TO MINIMIZE TRANSIENT VOLTAGE RISES.
4. TIGHTEN GROUNDING AND BONDING CONNECTORS, INCLUDING SCREWS AND BOLTS, IN ACCORDANCE WITH MANUFACTURER'S PUBLISHED TORQUE TIGHTENING VALUES FOR CONNECTORS AND BOLTS. WHERE MANUFACTURER'S TORQUING REQUIREMENTS ARE NOT AVAILABLE, TIGHTEN CONNECTIONS TO COMPLY WITH TIGHTENING TORQUE VALUES SPECIFIED IN UL 486A TO ASSURE PERMANENT AND EFFECTIVE GROUNDING.
5. ALL UNDERGROUND GROUNDING CONNECTIONS SHALL BE MADE BY THE EXOTHERMIC WELD PROCESS AND INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
6. ALL GROUND CONNECTIONS SHALL BE INSPECTED FOR TIGHTNESS. EXOTHERMIC-WELDED CONNECTIONS SHALL BE APPROVED BY THE CONSTRUCTION INSPECTOR BEFORE BEING PERMANENTLY CONCEALED.
7. APPLY CORROSION-RESISTANT FINISH TO FIELD CONNECTIONS, AND PLACES WHERE FACTORY APPLIED PROTECTIVE COATINGS HAVE BEEN DESTROYED. USE COPPER-BASED "NO-OX" OR APPROVED EQUAL.
8. A SEPARATE, CONTINUOUS, INSULATED EQUIPMENT GROUNDING CONDUCTOR SHALL BE INSTALLED IN ALL FEEDER AND BRANCH CIRCUITS.
9. BOND ALL INSULATED GROUNDING BUSHINGS WITH A BARE #6 AWO GROUNDING CONDUCTOR TO A GROUND BUS OR GROUNDING LUG IN ENCLOSURE.
10. DIRECT BURIED GROUND CONDUCTORS SHALL BE INSTALLED AT A NOMINAL DEPTH OF 30" BELOW GRADE, UNLESS NOTED OTHERWISE.
11. ALL GROUNDING CONDUCTORS EMBEDDED IN OR PENETRATING CONCRETE SHALL BE INSULATED OR INSTALLED IN PVC CONDUIT.
12. INSTALL ELECTROLYTIC GROUNDING SYSTEM IN STRICT ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. REMOVE SEALING TAPE FROM LEACHING AND BREATHER HOLES. INSTALL PROTECTIVE BOX FLUSH WITH GRADE.
13. DRIVE GROUND RODS UNTIL TOPS ARE 30 INCHES BELOW FINAL GRADE.
14. GROUNDING CONDUCTOR TO EQUIPMENT GROUND LUGS:
 - 1) BOLTED TO EQUIPMENT HOUSING WITH STAINLESS STEEL BOLTS AND LOCK WASHERS.
 - 2) ALL EQUIPMENT TO BE GROUNDED SHALL BE FREE OF PAINT OR ANY OTHER MATERIAL COVERING BARE METAL AT THE POINT OF CONNECTION.

3.5 ACCEPTANCE TESTING:

1. PROVIDE PERSONNEL AND EQUIPMENT, MAKE REQUIRED TESTS, AND SUBMIT TEST REPORTS UPON COMPLETION OF TESTS.
2. WHEN MATERIAL AND/OR WORKMANSHIP IS FOUND NOT TO COMPLY WITH THE SPECIFIED REQUIREMENTS, THE NONCOMPLYING ITEMS SHALL BE REMOVED FROM THE JOBSITE AND REPLACED WITH ITEMS COMPLYING WITH THE SPECIFIED REQUIREMENTS PROMPTLY AFTER RECEIPT OF NOTICE OF SUCH NON-COMPLIANCE.

A. TEST PROCEDURES:

1. ALL FEEDERS SHALL HAVE THEIR INSULATION TESTED AFTER INSTALLATION, BUT BEFORE CONNECTION TO DEVICES. THE CONDUCTORS SHALL TEST FREE FROM SHORT CIRCUITS AND GROUNDS. TESTING SHALL BE FOR ONE MINUTE USING 1000V DC. INVESTIGATE ANY VALUES LESS THAN 50 MEGOHMS.
2. PRIOR TO ENERGIZING CIRCUITRY, TEST WIRING DEVICES FOR ELECTRICAL CONTINUITY AND PROPER POLARITY CONNECTIONS.
3. MEASURE AND RECORD VOLTAGES BETWEEN PHASES AND BETWEEN PHASE WIRES AND NEUTRALS. SUBMIT A REPORT OF MAXIMUM AND MINIMUM VOLTAGES.
4. PERFORM GROUND TEST TO MEASURE GROUND RESISTANCE OF GROUNDING SYSTEM USING THE IEEE STANDARD 3-POINT "FALL-OF-POTENTIAL" METHOD. PROVIDE PLOTTED TEST VALUES & LOCATION SKETCH. NOTIFY THE ENGINEER IMMEDIATELY IF MEASURED VALUE IS OVER 5 OHMS.

END OF SECTION

END OF SPECIFICATION



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Phone: 913-438-7700 Fax: 913-438-7777

STATE OF MISSOURI
CERTIFICATE OF AUTHORIZATION #01640
RESPONSIBLE ENGINEERS RESPONSIBLE DISCIPLINE:
BY KEVIN W. VALE E-21561 STRUCTURAL/CIVIL SC
DLO MICHAEL L. OWENS E-29558 STRUCTURAL/CIVIL SC
REJ ROBERT E. OWENS PE-00974 STRUCTURAL/CIVIL SC
60X SHELTON D. KEISLING E-27329 ELECTRICAL E
TWS TERRANCE W. SUTHER E-18521 ELECTRICAL E

DESIGNER: F. GUY

LEAD EE: S.D. KEISLING

LEAD CE/SE: M.L. OWENS

SUBMITTALS			
NO.	DATE	DESCRIPTION	BY
A	01/14/13	ISSUED FOR REVIEW	FG
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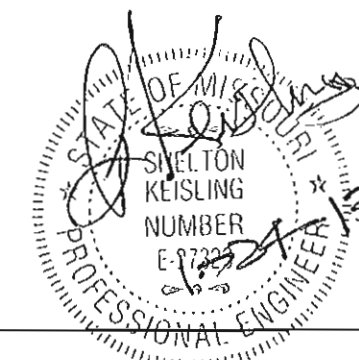
SITE NAME
**PARKWAY CENTRAL
HS SWB MP**

SITE NUMBER
MO-06-263-A

SITE ADDRESS
1101 KISKER ROAD
SAINT CHARLES, MISSOURI
63304

SHEET TITLE
SPECIFICATIONS (3 OF 3)

SHEET NUMBER
SP-3





APPENDIX A

***Optional Checklist for Determination
Of Whether a Facility is Categorically Excluded***

Filled out by Aaron Adelman of SMJ International 3/8

A handwritten signature in black ink, appearing to be 'A. Adelman', written in a cursive style.

of SMJ International o/b/o T-Mobile

**Optional Checklist for Local Government
To Determine Whether a Facility is Categorically Excluded**

Purpose: The FCC has determined that many wireless facilities are unlikely to cause human exposures in excess of RF exposure guidelines. Operators of those facilities are exempt from routinely having to determine their compliance. These facilities are termed "categorically excluded." Section 1.1307(b)(1) of the Commission's rules defines those categorically excluded facilities. This checklist will assist state and local government agencies in identifying those wireless facilities that are categorically excluded, and thus are highly unlikely to cause exposure in excess of the FCC's guidelines. Provision of the information identified on this checklist may also assist FCC staff in evaluating any inquiry regarding a facility's compliance with the RF exposure guidelines.

BACKGROUND INFORMATION

1. Facility Operator's Legal Name: T-Mobile
2. Facility Operator's Mailing Address: 2400 Westport Center Drive
3. Facility Operator's Contact Name/Title: Aaron Adelman, Authorized Agent
4. Facility Operator's Office Telephone: 616-916-3062
5. Facility Operator's Fax: 888-745-4719
6. Facility Name: Parkway Central HS SWB MP
7. Facility Address: 477 North Woods Mill Road
8. Facility City/Community: Chesterfield
9. Facility State and Zip Code: MO
10. Latitude: 38.66742245
11. Longitude: -90.506751

continue
→

Optional Local Government Checklist (page 2)

EVALUATION OF CATEGORICAL EXCLUSION	
12. Licensed Radio Service (see attached Table 1):	<u>Cellular Radiotelephone Service</u>
13. Structure Type (free-standing or building/roof-mounted):	<u>Free-standing</u>
14. Antenna Type [omnidirectional or directional (includes sectored)]:	<u>Directional</u>
15. Height above ground of the lowest point of the antenna (in meters):	<u>98'</u>
16. <input checked="" type="checkbox"/> Check if <u>all</u> of the following are true:	
(a) This facility will be operated in the Multipoint Distribution Service, Paging and Radiotelephone Service, Cellular Radiotelephone Service, Narrowband or Broadband Personal Communications Service, Private Land Mobile Radio Services Paging Operations, Private Land Mobile Radio Service Specialized Mobile Radio, Local Multipoint Distribution Service, or service regulated under Part 74, Subpart I (see question 12).	
(b) This facility will <u>not</u> be mounted on a building (see question 13).	
(c) The lowest point of the antenna will be at least 10 meters above the ground (see question 15).	
If box 16 is checked, this facility is categorically excluded and is unlikely to cause exposure in excess of the FCC's guidelines. The remainder of the checklist need not be completed. If box 16 is not checked, continue to question 17.	
17. Enter the power threshold for categorical exclusion for this service from the attached Table 1 in watts ERP or EIRP* (note: $EIRP = (1.64) \times ERP$):	_____
18. Enter the total number of channels if this will be an omnidirectional antenna, or the maximum number of channels in any sector if this will be a sectored antenna:	_____
19. Enter the ERP or EIRP per channel (using the same units as in question 17):	_____
20. Multiply answer 18 by answer 19:	_____
21. Is the answer to question 20 less than or equal to the value from question 17 (yes or no)?	_____
If the answer to question 21 is YES, this facility is categorically excluded. It is unlikely to cause exposure in excess of the FCC's guidelines.	
If the answer to question 21 is NO, this facility is not categorically excluded. Further investigation may be appropriate to verify whether the facility may cause exposure in excess of the FCC's guidelines.	

*"ERP" means "effective radiated power" and "EIRP" means "effective isotropic radiated power"

TABLE 1: TRANSMITTERS, FACILITIES AND OPERATIONS SUBJECT TO ROUTINE ENVIRONMENTAL EVALUATION

Service	Criteria
<p>Experimental Radio Services (part 5)</p>	<p>power > 100 W ERP (164 W EIRP)</p>
<p>Multipoint Distribution Service (subpart K of part 21)</p>	<p><u>non-building-mounted antennas</u>: height above ground level to lowest point of antenna < 10 m <u>and</u> power > 1640 W EIRP <u>building-mounted antennas</u>: power > 1640 W EIRP</p>
<p>Paging and Radiotelephone Service (subpart E of part 22)</p>	<p><u>non-building-mounted antennas</u>: height above ground level to lowest point of antenna < 10 m <u>and</u> power > 1000 W ERP (1640 W EIRP) <u>building-mounted antennas</u>: power > 1000 W ERP (1640 W EIRP)</p>
<p>Cellular Radiotelephone Service (subpart H of part 22)</p>	<p><u>non-building-mounted antennas</u>: height above ground level to lowest point of antenna < 10 m <u>and</u> total power of all channels > 1000 W ERP (1640 W EIRP) <u>building-mounted antennas</u>: total power of all channels > 1000 W ERP (1640 W EIRP)</p>

TABLE 1 (cont.)

SERVICE NUMBER AND PART	SITUATION REQUIRED BY
<p>Personal Communications Services (part 24)</p>	<p>(1) Narrowband PCS (subpart D): <u>non-building-mounted antennas</u>: height above ground level to lowest point of antenna < 10 m <u>and</u> total power of all channels > 1000 W ERP (1640 W EIRP) <u>building-mounted antennas</u>: total power of all channels > 1000 W ERP (1640 W EIRP)</p> <p>(2) Broadband PCS (subpart E): <u>non-building-mounted antennas</u>: height above ground level to lowest point of antenna < 10 m <u>and</u> total power of all channels > 2000 W ERP (3280 W EIRP) <u>building-mounted antennas</u>: total power of all channels > 2000 W ERP (3280 W EIRP)</p>
<p>Satellite Communications (part 25)</p>	<p>all included</p>
<p>General Wireless Communications Service (part 26)</p>	<p>total power of all channels > 1640 W EIRP</p>
<p>Wireless Communications Service (part 27)</p>	<p>total power of all channels > 1640 W EIRP</p>
<p>Radio Broadcast Services (part 73)</p>	<p>all included</p>

TABLE I (cont.)

FEDERAL REGULATORY CODE PART	LIMITS AND REQUIREMENTS
<p>Experimental, auxiliary, and special broadcast and other program distributional services (part 74)</p>	<p>subparts A, G, L: power > 100 W ERP</p> <p>subpart I: <u>non-building-mounted antennas</u>: height above ground level to lowest point of antenna < 10 m <u>and</u> power > 1640 W ERP <u>building-mounted antennas</u>: power > 1640 W ERP</p>
<p>Stations in the Maritime Services (part 80)</p>	<p>ship earth stations only</p>
<p>Private Land Mobile Radio Services Paging Operations (part 90)</p>	<p><u>non-building-mounted antennas</u>: height above ground level to lowest point of antenna < 10 m <u>and</u> power > 1000 W ERP (1640 W EIRP) <u>building-mounted antennas</u>: power > 1000 W ERP (1640 W EIRP)</p>
<p>Private Land Mobile Radio Services Specialized Mobile Radio (part 90)</p>	<p><u>non-building-mounted antennas</u>: height above ground level to lowest point of antenna < 10 m <u>and</u> total power of all channels > 1000 W ERP (1640 W EIRP) <u>building-mounted antennas</u>: total power of all channels > 1000 W ERP (1640 W EIRP)</p>

TABLE 1 (cont.)

SERVICE (PART OF TITLE 47)	APPLICABLE REQUIREMENTS
<p>Amateur Radio Service (part 97)</p>	<p>transmitter output power > levels specified in § 97.13(c)(1) of this chapter</p>
<p>Local Multipoint Distribution Service (subpart L of part 101)</p>	<p><u>non-building-mounted antennas</u>: height above ground level to lowest point of antenna < 10 m <u>and</u> power > 1640 W EIRP <u>building-mounted antennas</u>: power > 1640 W EIRP</p> <p>LMDS licensees are required to attach a label to subscriber transceiver antennas that: (1) provides adequate notice regarding potential radiofrequency safety hazards, e.g., information regarding the safe minimum separation distance required between users and transceiver antennas; and (2) references the applicable FCC-adopted limits for radiofrequency exposure specified in § 1.1310 of this chapter.</p>

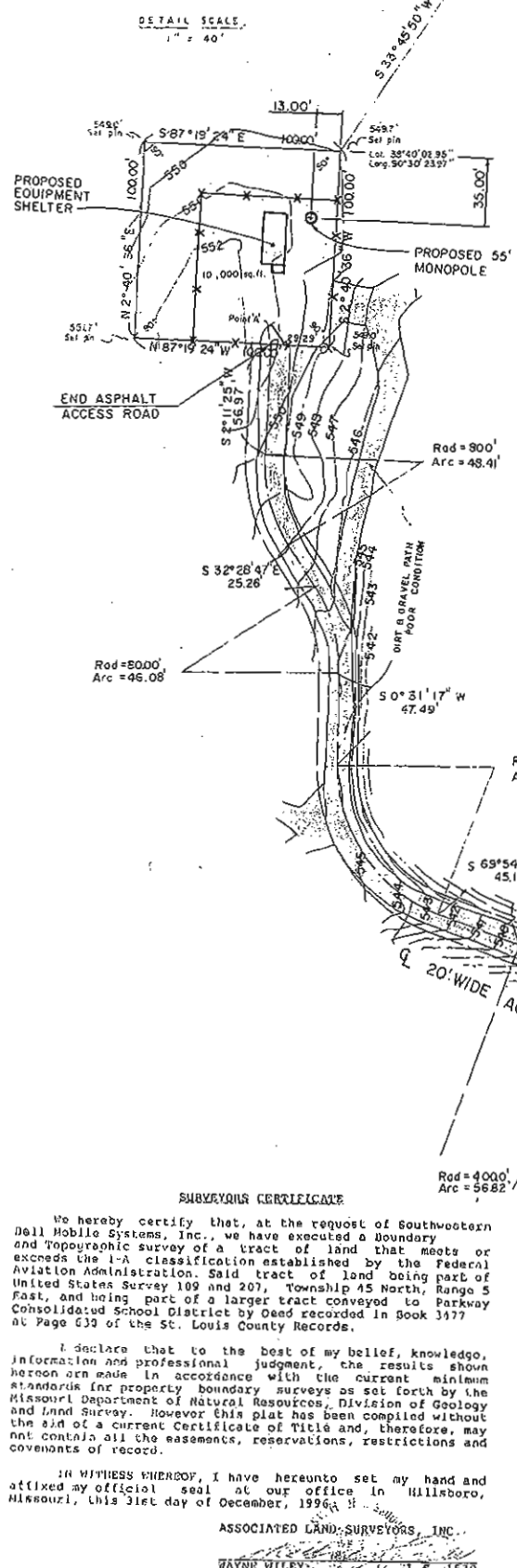
LEGAL DESCRIPTION

A parcel of land being part of U. S. Surveys 109 and 207, Township 45 North, Range 5 East, St. Louis County, Missouri and being part of a larger tract conveyed to Parkway Consolidated School District by deed recorded in Book 3477 at page 639 of the St. Louis County Records and being described as follows:

Beginning at a point located South 33 degrees 45 minutes 50 seconds West 885.25 feet from the southwest corner of Lot 4 of Greymore Court being the southwest corner of said subdivision; said subdivision filed for record in Plat Book 277 at page 54 of said St. Louis County Records, thence South 2 degrees 40 minutes 36 seconds West 100.00 feet to a point, thence North 07 degrees 19 minutes 24 seconds West 29.29 to a point hereinafter designated as point "A", thence continuing North 87 degrees 19 minutes 24 seconds West 70.71 feet to a point, thence North 2 degrees 40 minutes 36 seconds East 100.00 feet to a point, thence South 87 degrees 19 minutes 24 seconds East 100.00 feet to the point of beginning and containing 10,000 square feet more or less.

ROAD EASEMENT

Also an easement 20 feet wide for ingress, egress and public utilities the centerline of which is described as beginning at point "A" as set forth above, thence along said centerline the following courses and distances: South 2 degrees 11 minutes 25 seconds West 56.97 feet to a point of curve, thence along said curve to the left having a radius of 80.00 feet an arc distance of 48.41 feet to the point of tangency, thence South 32 degrees 28 minutes 47 seconds East 25.26 feet to a point of curve, thence along a curve to the right having a radius of 80.00 feet an arc distance of 46.08 feet to the point of tangency, thence South 0 degrees 31 minutes 17 seconds West 47.49 feet to a point of curve, thence along a curve to the left having a radius of 80.00 feet an arc distance of 48.41 feet to the point of tangency, thence South 32 degrees 28 minutes 47 seconds East 25.26 feet to a point of curve, thence along a curve to the right having a radius of 80.00 feet an arc distance of 46.08 feet to the point of tangency, thence South 0 degrees 31 minutes 17 seconds West 47.49 feet to a point of curve, thence along a curve to the left having a radius of 80.00 feet an arc distance of 48.41 feet to the point of tangency, thence South 32 degrees 28 minutes 47 seconds East 25.26 feet to a point of curve, thence along a curve to the right having a radius of 80.00 feet an arc distance of 46.08 feet to the point of tangency, thence South 0 degrees 31 minutes 17 seconds West 47.49 feet to the point of ending of the description contained herein.



SURVEYORS CERTIFICATE

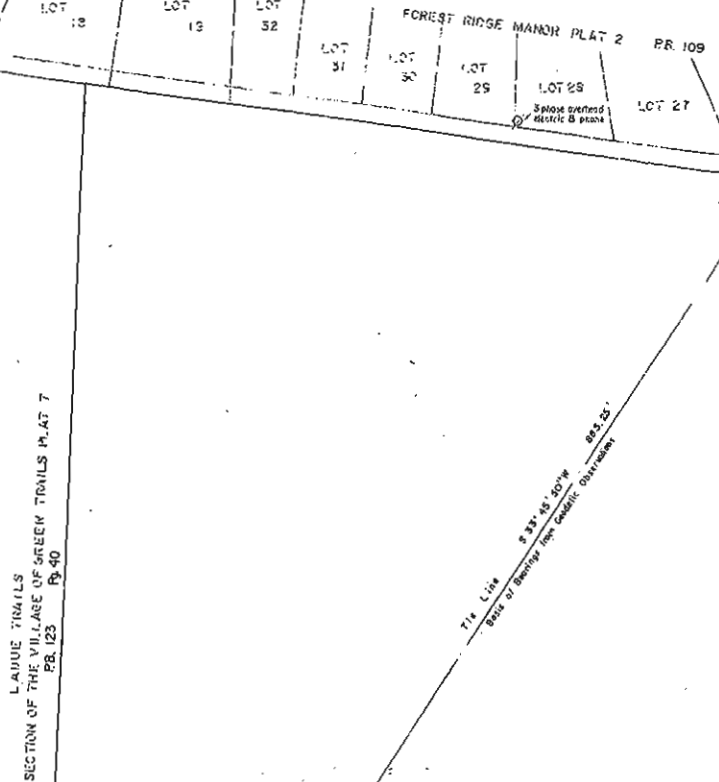
We hereby certify that, at the request of Southwestern Bell Mobile Systems, Inc., we have executed a Boundary and Topographic survey of a tract of land that meets or exceeds the 1-A classification established by the Federal Aviation Administration. Said tract of land being part of United States Survey 109 and 207, Township 45 North, Range 5 East, and being part of a larger tract conveyed to Parkway Consolidated School District by deed recorded in Book 3477 at Page 639 of the St. Louis County Records.

I declare that to the best of my belief, knowledge, information and professional judgment, the results shown hereon were made in accordance with the current minimum standards for properly boundary surveys as set forth by the Missouri Department of Natural Resources, Division of Geology and Land Survey. However this plat has been compiled without the aid of a current Certificate of Title and, therefore, may not contain all the easements, reservations, restrictions and covenants of record.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal at our office in Hillsboro, Missouri, this 31st day of December, 1996.

ASSOCIATED LAND SURVEYORS, INC.
WAYNE WILEY
P. O. Box 137
Hillsboro, MO 63050
(314) 797-2283

THE ENCLAVE AT GREEN TRAILS

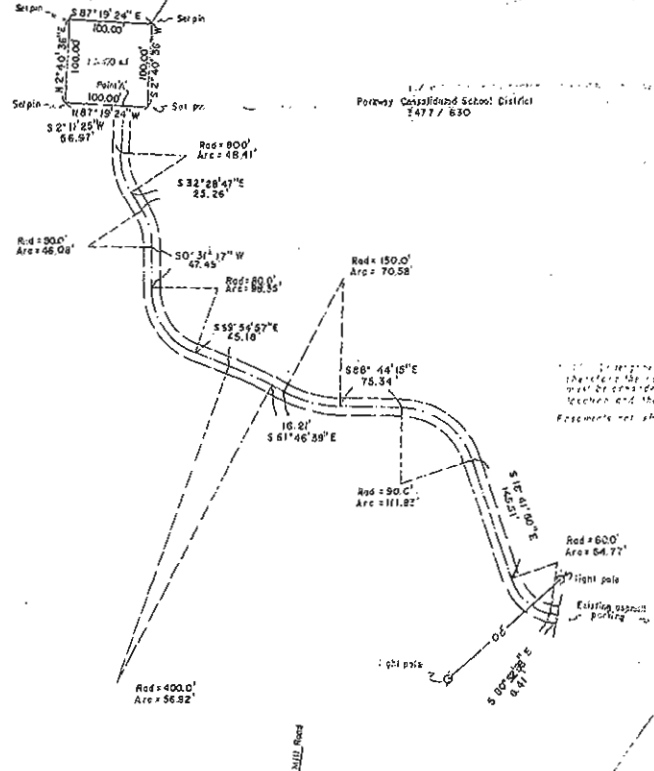


This is to affirm that the drawings and documents contained herein have been prepared and assembled under my immediate, personal supervision. The various portions of the drawing and documents prepared by persons other than myself and for which I take no responsibility for their correctness or reliability are the following: all land and/or boundary surveys; existing conditions surveys; geotechnical investigations; reports and recommendations; cover design and calculations; tower and building foundation design and calculations; the design and calculations for other structural or reinforced concrete items such as retaining walls, platforms, etc.; any and all drawings, calculations, and specifications for the prefabricated equipment shelters; including the construction and construction inspection of any portion of this work.



Daniel J. Reuter, L.L.C.

SOUTHWESTERN BELL MOBILE SYSTEMS INC.	
OLIVE ROAD MICRO SITE SURVEY	
DRAWN: R.L.H.	PROJECT NO. T-4000 (15)
CHKD: D.J.H.	SHEET NO. 1
DATE: FEB. 1997	



TITLE: U.S. SURVEY 109 & 207, TOWNSHIP 45 NORTH, RANGE 5 EAST	
PROJECT: OLIVE ROAD MICRO RF	
STL 3354 St. Louis County, Missouri Southwestern Bell Mobile Systems	
Associated Land Surveyors, Inc. 10000 Olive Road P.O. Box 137, Hillsboro, MO 63050 (314) 940-4001	
SCALE: HORIZONTAL 1" = 100'	SURV. REVISIONS
VERTICAL 1" = 10'	DATE ISSUED: 01/02/97