

## Memorandum Planning & Development Services Division



**To:** Planning and Public Works Committee

**From:** John Boyer, Senior Planner

**Date:** July 15, 2015

**RE:** **T.S.P. 51-2015 Verizon (724 Straub Rd):** A request to obtain approval for a Telecommunications Siting Permit to accommodate three (3) new antennas and additional related equipment for an existing monopole telecommunication site within the “NU” Non-Urban District located at the terminus of a Private Drive, approximately 600 feet west of Straub Road.

### Summary

Michael Daubenmire of Fortune Wireless Inc. on behalf of Verizon Wireless has submitted a request for a Telecommunications Siting Permit (TSP) for the above referenced property. The proposed TSP is to accommodate three (3) new antennas and associated equipment on an existing 140 feet tall monopole tower. The antennas are planned to be placed on a replacement antenna array which will be smaller than the existing array. Currently, nine (9) antennas are located on the existing array. If approved, twelve (12) antennas will be located on the smaller array. All associated ground equipment will be placed within existing equipment shelters.



Figure 1: Aerial Photo



Figure 2: Photo of Tower

## History

The Tower was originally approved administratively by the City of Chesterfield on November 15, 2000 under the conditions of City of Chesterfield Ordinance 1214. Subsequent amendments to this tower occurred with the following applications (along with description of work);

- **TSP 21-2010**
  - Add new antennas to the existing tower and ground equipment within the fenced compound to facilitate a new user.
- **TSP 23-2010**
  - Add additional antennas to the existing tower and ground equipment within the fenced area.

## Discussion

The Unified Development Code (UDC) states that any new equipment or updates to a telecommunication facility exceeding the current TSP approval requires an amendment to the TSP. The UDC permits applications for equipment upgrades to be submitted without the need for a public hearing if the update does not reflect a Material Modification. A Material Modification is defined by the UDC as an important, essential or significant change to an existing wireless telecommunication facility. Material modifications do not include collocations which do not increase the height or increase the existing antenna array. In this application, three (3) additional antennas are requested which will collocate on the facility and will not increase the height nor increase the array size since the existing array will be getting smaller, see figure 3 below. The intent of the definition of Material Modification is to ensure a facility which exceeds the previous City approval by a substantial height increase would require the re-review of the site.

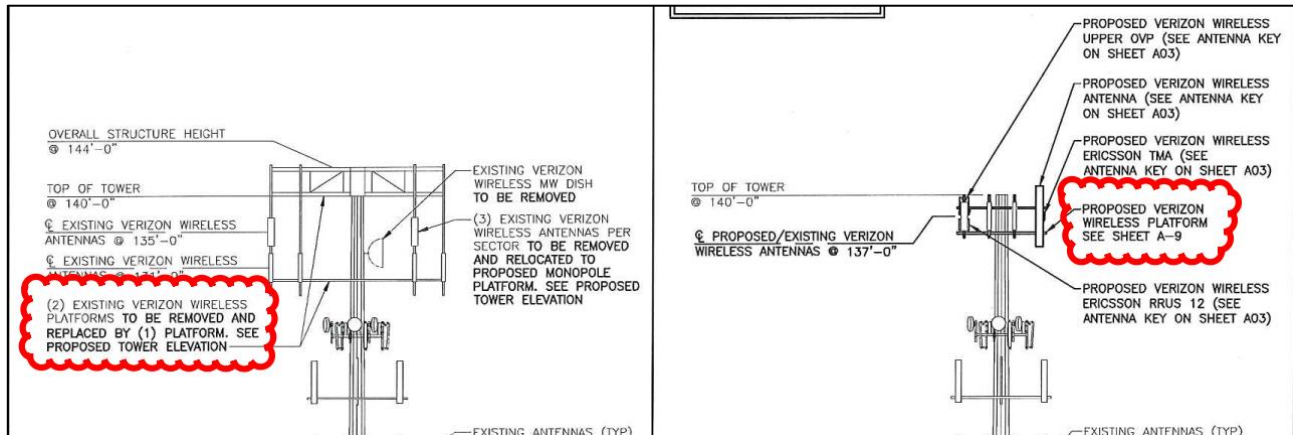


Figure 3: Portion of Construction Drawings Showing Smaller Array

Staff has reviewed the request by Verizon against the UDC and has determined that the proposal is not a material modification and therefore may receive a TSP without a public hearing. Staff recommends approval of a TSP for Verizon as proposed. The site is currently compliant with the previous approval and the City has not received any complaints on the facility. After receiving a recommendation from the Planning and Public Works Committee, this request may be forwarded to the City Council for review. Attached please find a copy of the construction plans.

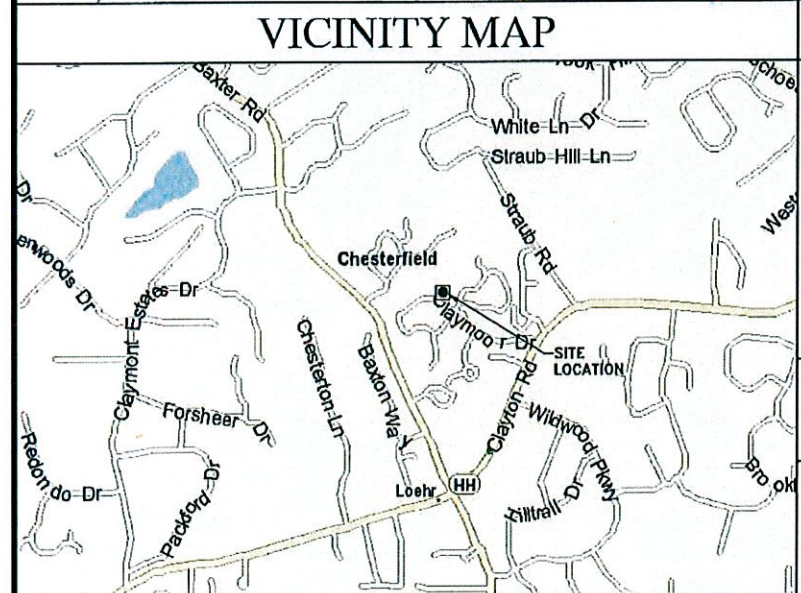
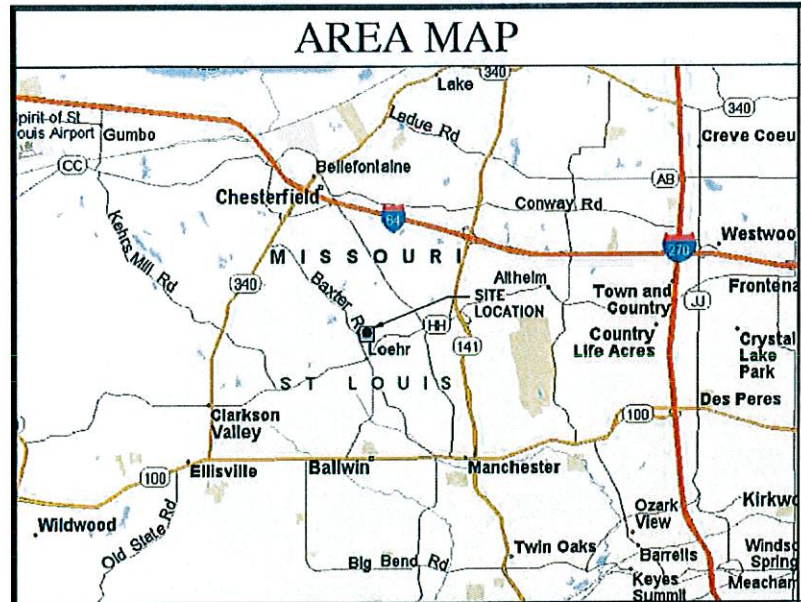
Respectfully submitted,

A handwritten signature in black ink, appearing to be 'J. Boyer', written over a horizontal line.

John Boyer  
Senior Planner

cc. Aimee Nassif, Planning and Development Services Director





**CONTRACTOR INFORMATION**

**PROJECT INFORMATION**

CELL SITE NAME: STLC WEST COUNTY AWS

CELL SITE ADDRESS: 724 STRAUB ROAD  
BALLWIN, MISSOURI 63011

LESSOR NAME /TOWER OWNER NAME & ADDRESS: CROWN CASTLE  
ONE CITY PLACE DRIVE, SUITE 490  
ST. LOUIS, MISSOURI 63141  
CROWN CASTLE # 817348  
PETE FAULHABER  
(314)-432-3158

LESSOR/TOWER OWNER CONTACT:

TOWER INFORMATION:  
LATITUDE: 38° 37' 23.1" N  
LONGITUDE: 90° 32' 25.0" W  
GROUND ELEV: 637'-0" AMSL  
OVERALL STRUCTURE HT: 144'-0" AGL  
TOWER HT: 140'-0" AGL  
ANTENNA CL: 136'-0" AGL

APPLICANT NAME & ADDRESS: VERIZON WIRELESS  
10740 NALL AVENUE  
OVERLAND PARK, KANSAS 66211

APPLICANT CONTACT: MANAGER - NETWORK REAL ESTATE  
(913) 344-2800

**CONSULTING TEAM**

ENGINEER: SSC, INC.  
721 EMERSON ROAD, SUITE 475  
SAINT LOUIS, MISSOURI 63141  
PHONE: (314) 993-1010  
FAX: (913) 438-7777

M.L. OWENS - LEAD ENGINEER

T.M. SUPER - LEAD ELECTRICAL

T. WEISHAAR - PROJECT MANAGER

D.S. HOLLINGSHEAD - LEAD DESIGNER

**VERIZON WIRELESS DEPARTMENTAL APPROVALS**

	INITIALS	DATE
STEVE FALLON	SF	09/04/13
JEREMY WALL	JW	09/04/13
RF ENGINEER		
SCOTT YOUNG	SY	09/04/13
OPERATIONS MANAGER		
TIM MAULDIN	TM	09/11/13
CONSTRUCTION ENGINEER		
CONSTRUCTION MANAGER		
MARION S. CRABLE	MSC	09/11/13
BRENDA CLEMONS	BC	09/03/13
REAL ESTATE MANAGER		

**LESSOR/LICENSOR APPROVAL**

	INITIALS	DATE
LESSOR/LICENSOR		

LESSOR/LICENSOR: PLEASE CHECK THE APPROPRIATE BOX BELOW

NO CHANGES  CHANGES NEEDED. SEE COMMENTS ON PLANS

**DRAWING INDEX**

SHEET NUMBER	SHEET DESCRIPTION	REVISION	RESPONSIBLE ENGINEER
T01	TITLE SHEET	1	SC/E
A01	SITE PLAN	1	SC
A02	TOWER ELEVATIONS	1	SC
A03	ANTENNA KEYS	1	SC
A04	PROPOSED RRU DIAGRAM & PARTS LIST	1	SC
A05	ANTENNA LAYOUT & ENTRY PORT DETAILS	1	SC
A06	DETAILS	1	SC
A07	DETAILS	1	SC
A08	DETAILS	1	SC
A09	DETAILS	1	SC
A10	DETAILS	1	SC
GN01	GENERAL NOTES	1	SC/E

VERIZON WIRELESS PROJECT #: 20130886180

PROJECT DESCRIPTION:  
TO MODIFY ANTENNA CONFIGURATION ON TOWER.

**SITE NAME:**  
**STLC WEST COUNTY**

**LOCATION NUMBER:**  
**127205**

**RECEIVED**  
City of Chesterfield  
JUL 15 2015  
Department of Public Services

ROBERT E. JENSEN  
NUMBER PE-028974

STATE OF MISSOURI  
PROFESSIONAL ENGINEER

SHELTON KEISLING  
NUMBER E-27323

STATE OF MISSOURI  
PROFESSIONAL ENGINEER

PLANS PREPARED FOR:  
**verizon wireless**

PLANS PREPARED BY:

424 S. Woods Mill Road, Suite 220  
Chesterfield, Missouri 63017  
Phone: 314-993-1010  
Fax: 913-438-7777

**SSC**

ENGINEERING LICENSE:

STATE OF MISSOURI  
PE CERTIFICATE OF AUTHORIZATION #001640

ENGINEER	PE #	DISCIPLINE
MLO MICHAEL L. OWENS	E-29058	STRUCTURAL/CIVIL SC
KV KEVIN VAJMALE	E-21561	STRUCTURAL/CIVIL SC
REJ ROBERT E. JENSEN	E-28974	STRUCTURAL/CIVIL SC
TMS TERRANCE M. SUPER	E-18521	ELECTRICAL E
SOK SHELTON D. KEISLING	E-27323	ELECTRICAL E
DEK DAVE E. KASPER	E-18063	ELECTRICAL E

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SUBMITTALS

DESCRIPTION	DATE	BY	REV
REVISED PER CLIENT COMMENTS	02/10/14	DSH	E
REVISED PER NEW RF	02/26/15	DSH	F
REVISED PER CLIENT COMMENTS	03/10/15	DSH	G
REVISED PER EQUIPMENT APPLICATION	03/30/15	DWG	H
ISSUED FOR CONSTRUCTION	03/31/15	DSH	O
REVISED PER CITY COMMENTS	04/29/15	DWG	I

SITE NAME:  
**STLC WEST COUNTY**

LOCATION NUMBER:  
**127205**

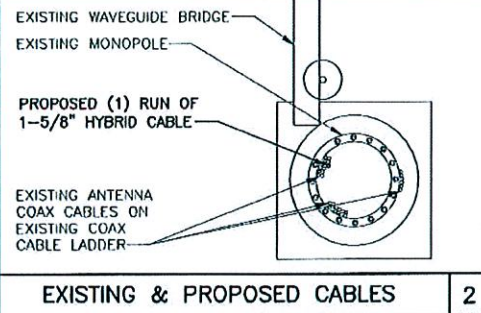
SITE ADDRESS:  
724 STRAUB ROAD  
BALLWIN, MISSOURI  
63011

SHEET DESCRIPTION:  
**TITLE SHEET**

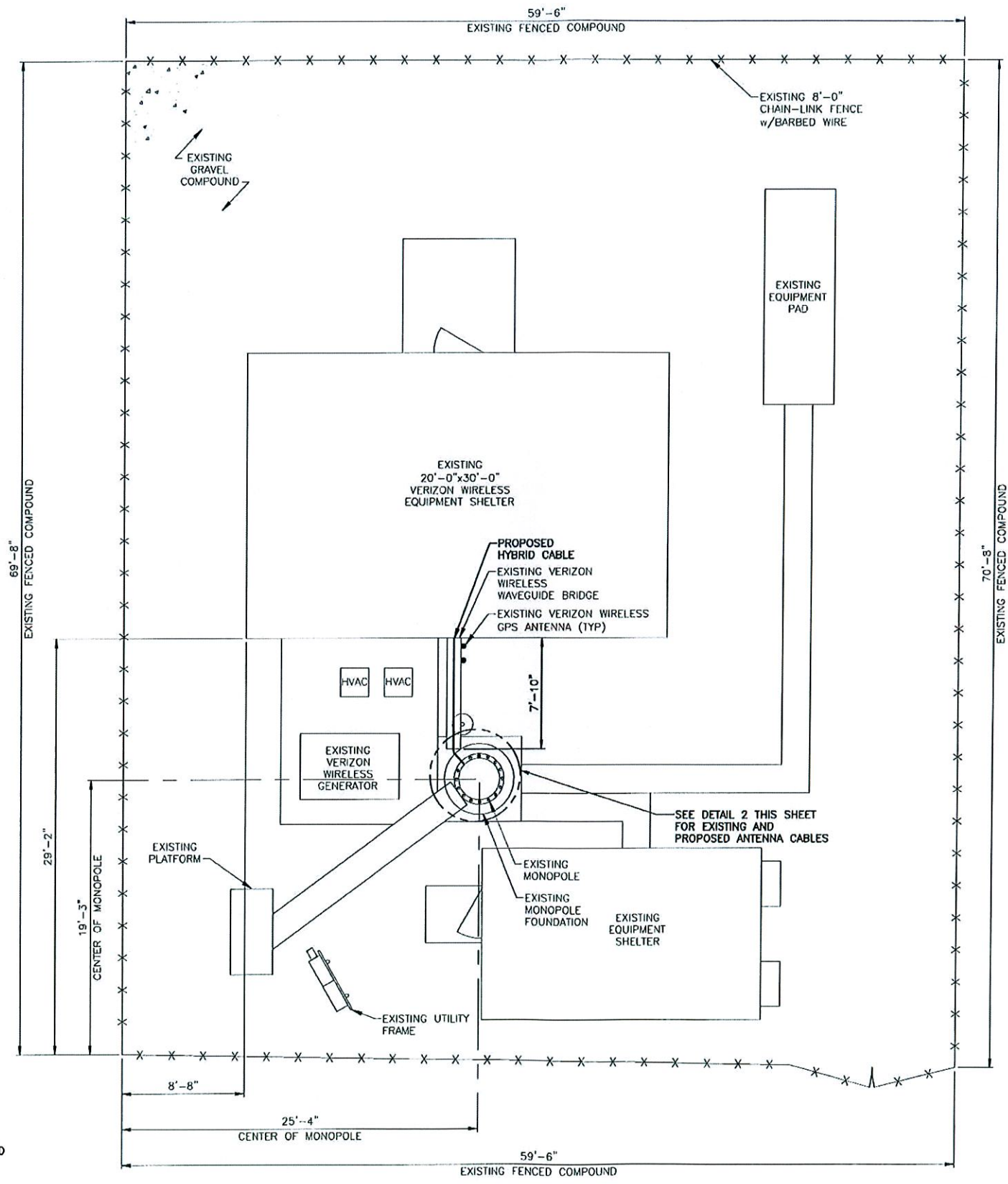
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**T01**

SHEET NUMBER:  
**T01**



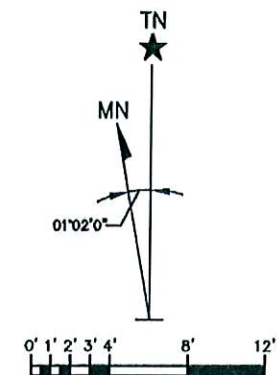


EXISTING & PROPOSED CABLES 2

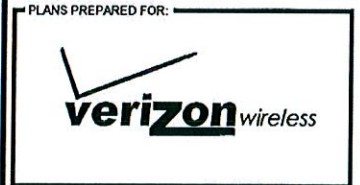
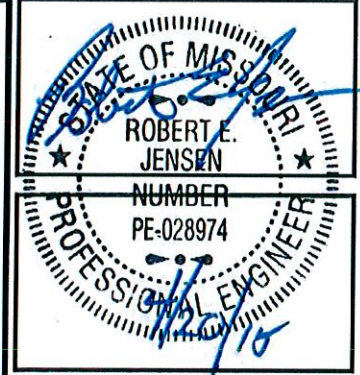


**CALL BEFORE YOU DIG - DRILL - BLAST**  
 1-800-344-7483  
 (TOLL FREE)  
 MISSOURI ONE CALL SYSTEM, INC.

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.



SITE PLAN



PLANS PREPARED BY:  
 424 S. Woods Mill Road, Suite 220  
 Chesterfield, Missouri 63017  
 Phone: 314-993-1010  
 Fax: 913-438-7777  
**SSC**

ENGINEERING LICENSE:  
 STATE OF MISSOURI  
 PE CERTIFICATE OF AUTHORIZATION #001640  
 ENGINEER: PE #: DISCIPLINE:  
 MLO MICHAEL L. OWENS E-29058 STRUCTURAL/CIVIL SC  
 KY KEVIN VANMAELE E-21561 STRUCTURAL/CIVIL SC  
 REJ ROBERT E. JENSEN E-28974 STRUCTURAL/CIVIL SC  
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ISSUED FOR CONSTRUCTION		03/31/15	DSH	0
REVISED PER CITY COMMENTS		04/29/15	DWG	1

SITE NAME:  
**STLC WEST COUNTY**

LOCATION NUMBER:  
 127205

SITE ADDRESS:  
 724 STRAUB ROAD  
 BALLWIN, MISSOURI  
 63011

SHEET DESCRIPTION:  
**SITE PLAN**

SSC #: SHEET NUMBER:  
**A01**





PHOTO OF EXISTING TOWER ELEVATION

3



PHOTO OF EXISTING ANTENNAS

4

**NOTE:**  
EXISTING AND PROPOSED  
VERIZON WIRELESS  
ANTENNA COAX CABLES  
ARE ROUTED ON THE  
INSIDE OF MONOPOLE

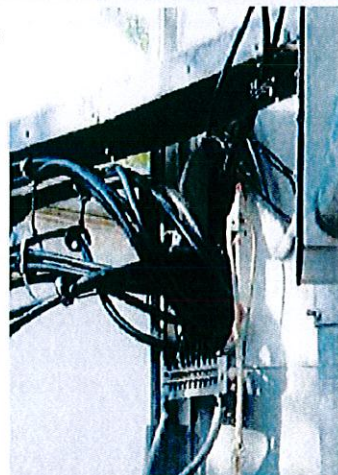
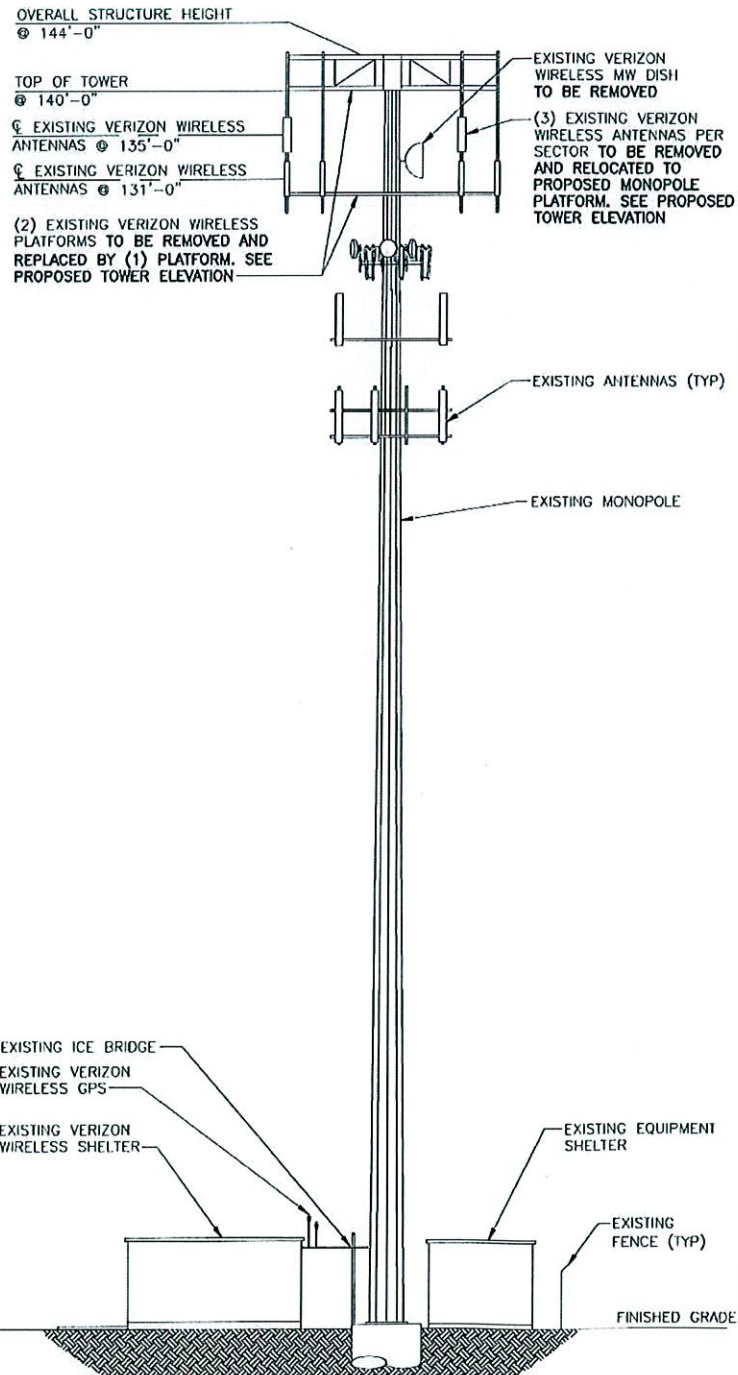


PHOTO OF EXISTING COAX PORT

5



EXISTING TOWER ELEVATION

2

ALL ANTENNAS AND CABLES TO BE TAGGED WITH CARRIER ID.

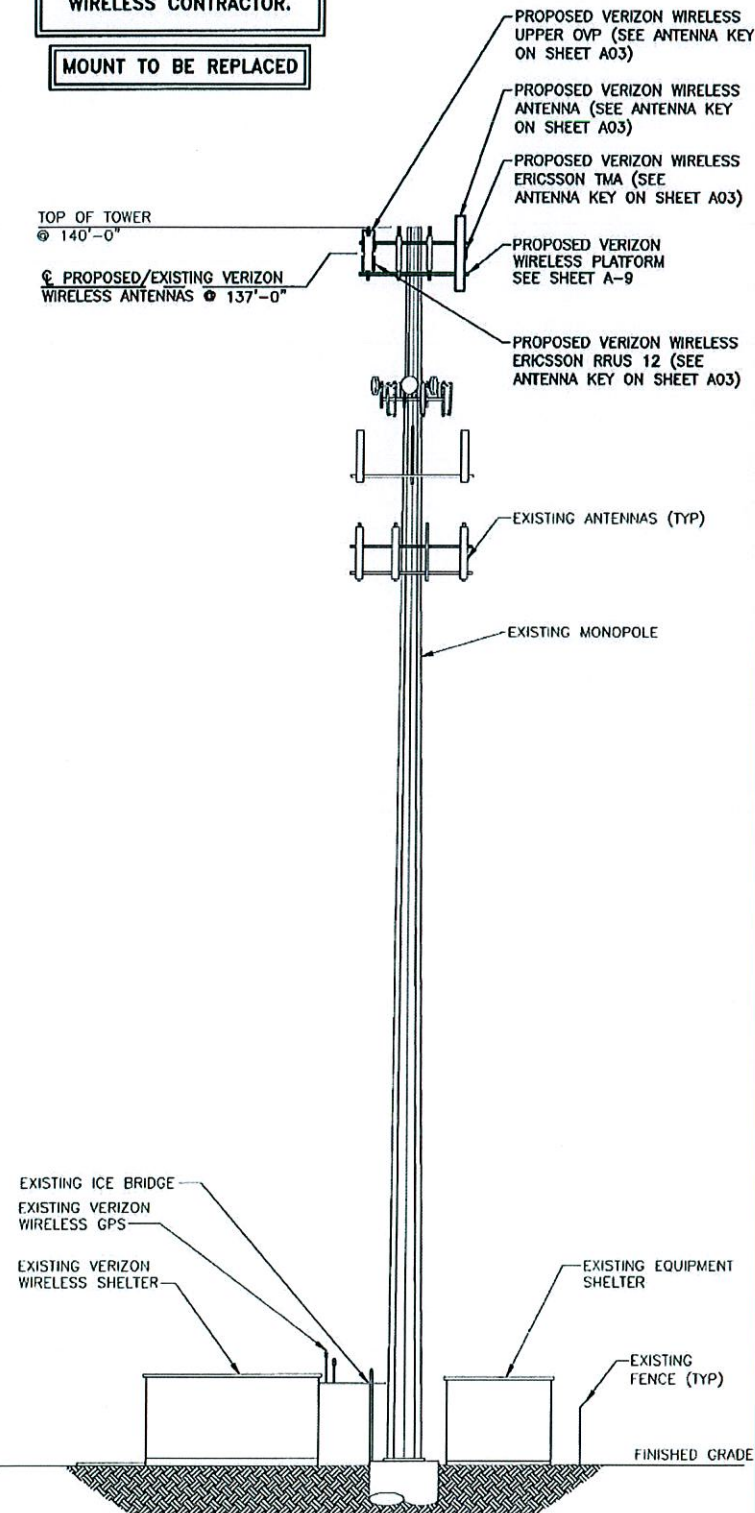
STRUCTURAL TOWER ANALYSIS HAS BEEN PERFORMED BY PAUL J. FORD AND COMPANY. CONTRACTOR SHALL OBTAIN A COPY OF THE LATEST TOWER ANALYSIS.

NO TOWER MODIFICATIONS REQUIRED BY VERIZON WIRELESS CONTRACTOR.

MOUNT TO BE REPLACED

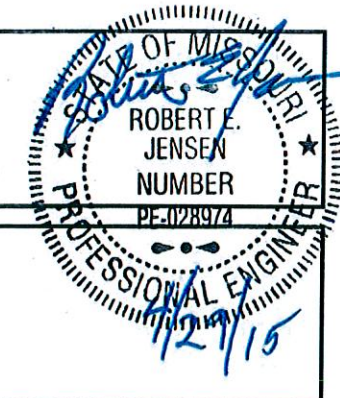
TOP OF TOWER @ 140'-0"

PROPOSED/EXISTING VERIZON WIRELESS ANTENNAS @ 137'-0"



PROPOSED TOWER ELEVATION

1



PLANS PREPARED FOR:



PLANS PREPARED BY:

424 S. Woods Mill Road, Suite 220  
Chesterfield, Missouri 63017  
Phone: 314-993-1010  
Fax: 913-438-7777



ENGINEERING LICENSE:

STATE OF	MISSOURI
PE CERTIFICATE OF AUTHORIZATION #	0001640
ENGINEER:	PE #:
MLO MICHAEL L. OWENS	E-29058 STRUCTURAL/CIVIL SC
KV KEVIN VANMAELE	E-21561 STRUCTURAL/CIVIL SC
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ISSUED FOR CONSTRUCTION	03/31/15	DSH	O
REVISED PER CITY COMMENTS	04/29/15	DWG	I

SITE NAME:

STLC WEST COUNTY

LOCATION NUMBER:

127205

SITE ADDRESS:

724 STRAUB ROAD  
BALLWIN, MISSOURI  
63011

SHEET DESCRIPTION:

TOWER ELEVATIONS

SSC #:

SHEET NUMBER:

A02



EXISTING ANTENNA KEY

	Position	Status	Antenna Centerline (ft AGL)	Antenna Make / Model	Antenna Count	Height (in)	Width (in)	Depth (in)	Weight (lbs)	Azimuth (true north)	Azimuth (magnetic north)	Mech DownTilt	Electrical DownTilt	Coax Make/Model	Coax Count	Coax Size	Coax Length	
Alpha Sector	A	relocate	131'	DECIBEL/DB844H80-XY	1	48	6	8.5	15	0	-	0	0	ANDREW/AVAS-50	1	7/8"	185'	
	B	removing	135'	ANTEL/BXA-70063-8CF-EDIN	1	47.4	11.2	5	9.9	0	-	2	0	ANDREW/AVAS-50	2	7/8"	185'	
	C	empty	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	D	relocate	131'	DECIBEL/DB844H80-XY	1	48	6	8.5	15	0	-	0	0	ANDREW/AVAS-50	1	7/8"	185'	
Beta Sector	E	relocate	131'	ANTEL/LPD-7907/4	1	47.2	5.1	14.8	26.5	120	-	8	0	ANDREW/AVAS-50	1	7/8"	185'	
	F	removing	135'	ANTEL/BXA-70063-4CF-EDIN	1	47.4	11.2	5	9.9	120	-	0	0	ANDREW/AVAS-50	2	7/8"	185'	
	G	empty	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	H	relocate	131'	ANTEL/LPD-7907/4	1	47.2	5.1	14.8	26.5	120	-	8	0	ANDREW/AVAS-50	1	7/8"	185'	
Gamma Sector	I	relocate	131'	ANTEL/LPD-7905/4	1	47.2	5.1	9.6	22.1	240	-	0	0	ANDREW/AVAS-50	1	7/8"	185'	
	J	removing	135'	ANTEL/BXA-70063-4CF-EDIN	1	47.4	11.2	5	9.9	240	-	0	0	ANDREW/AVAS-50	2	7/8"	185'	
	K	empty	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	L	relocate	131'	ANTEL/LPD-7905/4	1	47.2	5.1	9.6	22.1	240	-	0	0	ANDREW/AVAS-50	1	7/8"	185'	
					Antenna Total				9				Coax Total					12

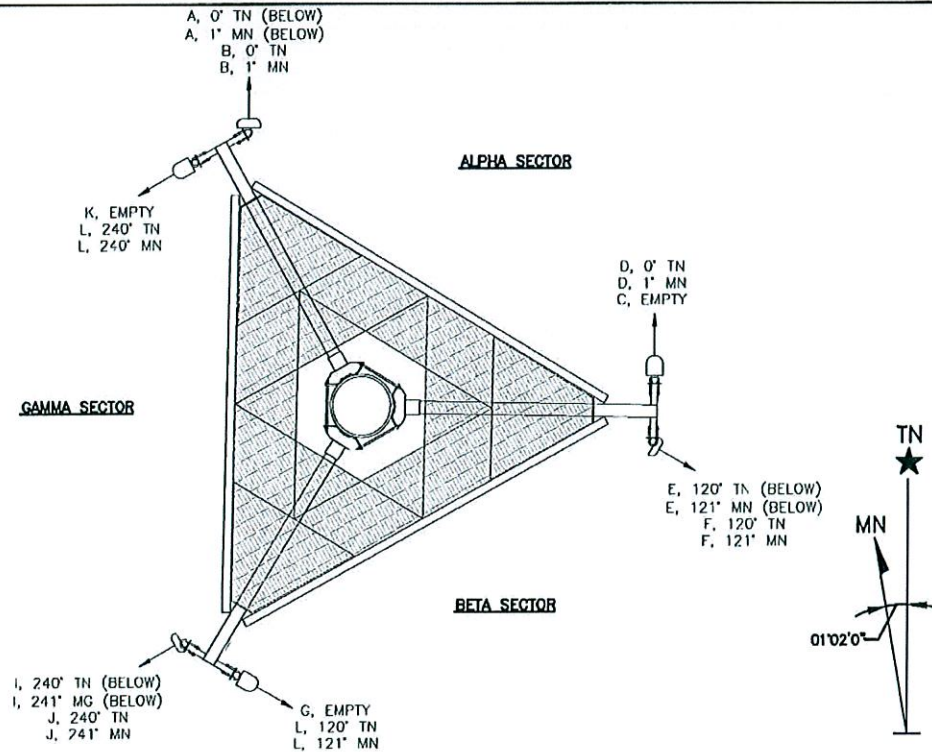
PROPOSED ANTENNA KEY

	Position	Status	Antenna Centerline (ft AGL)	Antenna Make / Model	Antenna Count	Height (in)	Width (in)	Depth (in)	Weight (lbs)	Azimuth (true north)	Azimuth (magnetic north)	Mech DownTilt	Electrical DownTilt	TMA Make/Model	TMA Count	Coax Make/Model	Coax Count	Coax Size	Coax Length	RRU Make/Model	RRU Count	Distribution Box Make/Model	Raycap Count	Hybrid Cable Make/Model	Hybrid Cable Count	Hybrid Cable Size	Hybrid Cable Length	Hybrid Jumper Count	RF Jumper Count																	
Alpha Sector	A	relocated	137'	DECIBEL/DB844H80-XY	1	48	6	8.5	15	0	1	0	0			ANDREW/AVAS-50	1	7/8"	185'																											
	B	proposed	137'	ANTEL/HTXC6318R000G	1	102	12	7.6	39.7	0	1	2	0	E15R0SP19	1	ANDREW/AVAS-50	2	7/8"	185'																											
	C	proposed	137'	ANTEL/BXA-171063-12CF-EDIN	1	72.4	6.1	4.1	15	0	1	0	0								ERICSSON LTE AWS RRU12	1			HBF058-08U151-10F		5/8"	10'	1	2																
	D	relocated	137'	DECIBEL/DB844H80-XY	1	48	6	8.5	15	0	1	0	0			ANDREW/AVAS-50	1	7/8"	185'																											
Beta Sector	E	proposed	137'	ANTEL/HTXC6318R000G	1	102	12	7.6	39.7	120	121	0	0	E15R0SP19	1	ANDREW/AVAS-50	1	7/8"	185'																											
	F	relocated	137'	ANTEL/LPD-7907/4	1	47.2	5.1	14.8	26.5	120	121	8	0			ANDREW/AVAS-50	2	7/8"	185'																											
	G	relocated	137'	ANTEL/LPD-7907/4	1	47.2	5.1	14.8	26.5	120	121	8	0			ANDREW/AVAS-50	1	7/8"	185'																											
	H	proposed	137'	ANTEL/BXA-171063-12CF-EDIN	1	72.4	6.1	4.1	15	120	121	0	0								ERICSSON LTE AWS RRU12	1			HBF058-08U151-10F		5/8"	10'	1	2																
Gamma Sector	I	proposed	137'	ANTEL/HTXC6318R000G	1	102	12	7.6	39.7	240	241	0	0	E15R0SP19	1	ANDREW/AVAS-50	1	7/8"	185'																											
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					Antenna Total				12				TMA Total				3				Coax Total					12	RRU Total			3	Distro Box Total			1	Hybrid Cable Total			1	Jumper Total			3	RF Jumper Total			2

ONLY EQUIPMENT LOCATED AT ANTENNA SECTORS IS LISTED ABOVE. MAIN HYBRID CABLE LENGTH(S) ARE MEASURED FROM THE EXTERIOR SIDE OF THE EXISTING VERIZON WIRELESS EQUIPMENT SHELTER, ROUTED AS SHOWN IN THE DRAWINGS, TO TERMINATION AT ANTENNA SECTOR MAIN UPPER OVP BOX.

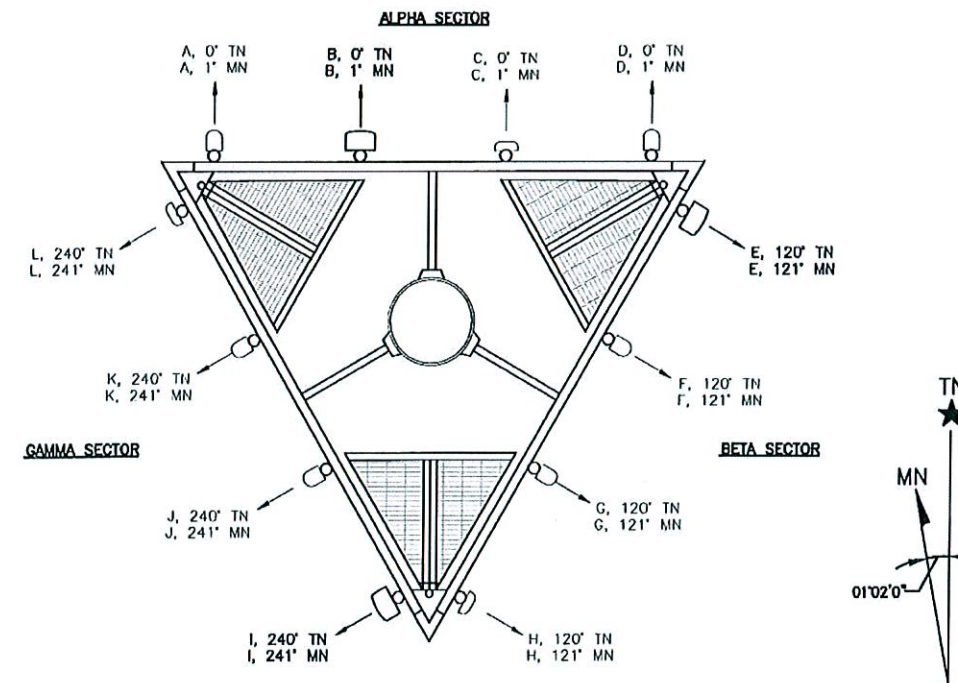
CONTRACTOR SHALL OBTAIN A COPY OF VERIZON WIRELESS ENGINEERING SITE DATA FORM FOR ANTENNA INFORMATION.

ANTENNA KEYS



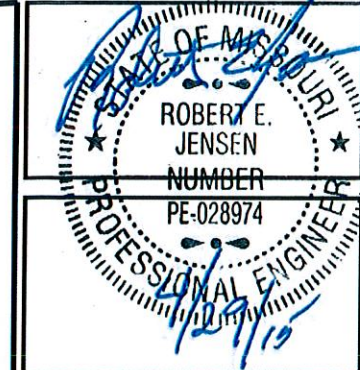
EXISTING ANTENNA PLAN

3



PROPOSED ANTENNA PLAN

2



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 PE CERTIFICATE OF AUTHORIZATION #001640  
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 KV KEVIN VANHALE E-21561 STRUCTURAL/CIVIL SC  
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SITE NAME:  
**STLC WEST COUNTY**

LOCATION NUMBER:  
 127205

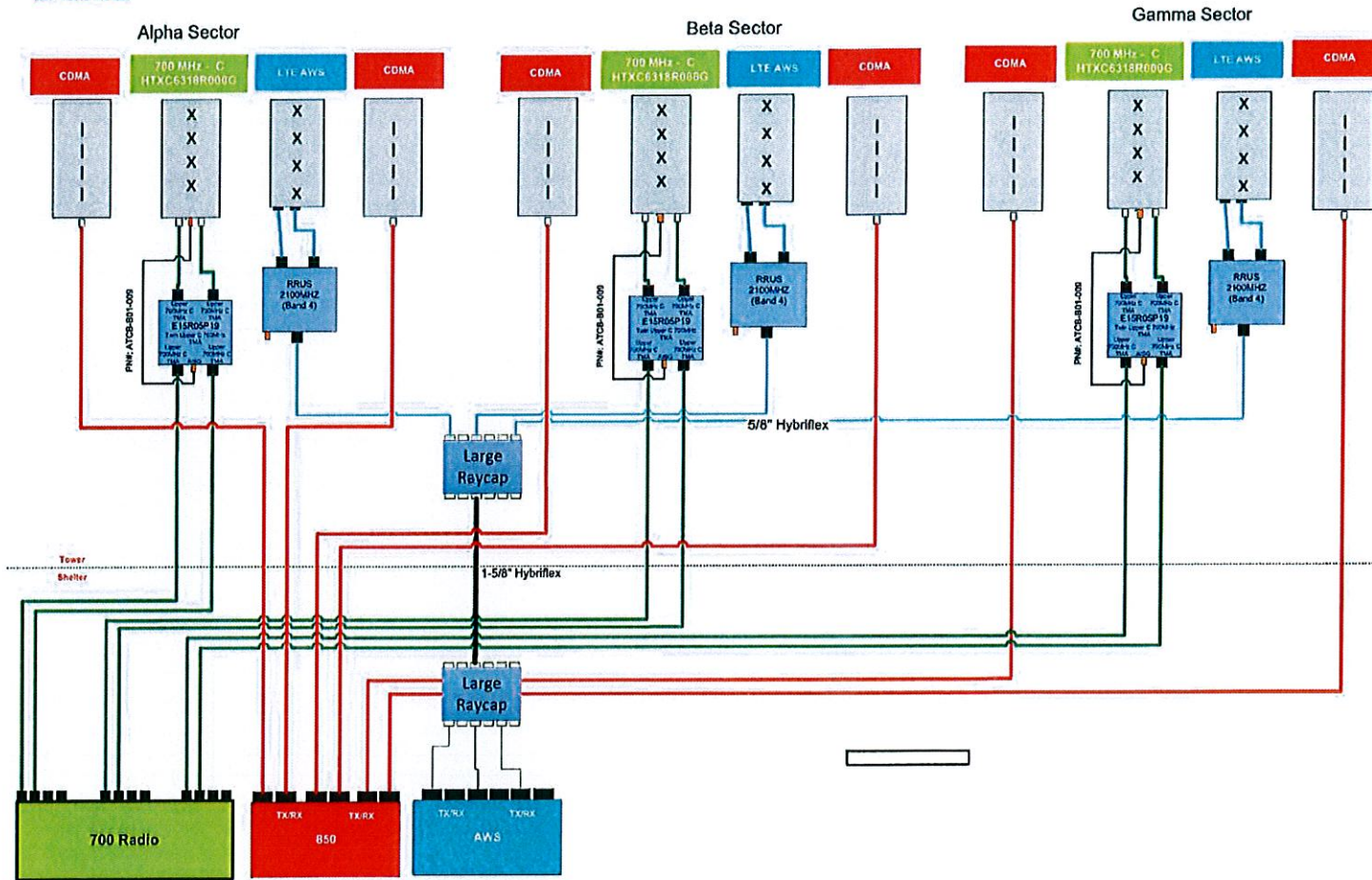
SITE ADDRESS:  
 724 STRAUB ROAD  
 BALLWIN, MISSOURI  
 63011

SHEET DESCRIPTION:  
**ANTENNA KEYS**

SSC #: SHEET NUMBER:  
**A03**



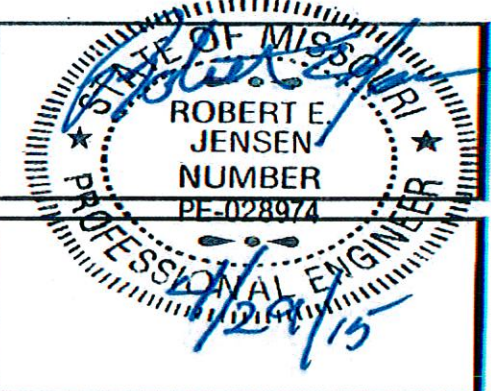
Verizon Guidelines  
 Note: Not a standard configuration  
 Lower 700MHz - Upper 700MHz  
 Cell A - AWS (D-E-F Bands)  
 AWS + PCS1  
 Cell A - Lower 700 MHz



RF PARTS LIST

MARKET: STLC  
 CELL#: 212  
 CELL NAME: WEST COUNTY

- (3) COMMSCOPE TMAS AND CABLING KITS, PN#E15R05P19
- (3) ANTEL 700 ANTENNAS, PN# HTXC6318R000G
- (3) COMMSCOPE AISG CONTROL CABLES PN#: ATCB-B01-009
- ANCILLARY CABLING KITS AND SITE ACCESSORIES TO BE SPECIFIED BY IMPLEMENTATION ENG.
- (1) LTE AWS DUS41
- (3) E// LTE AWS RRUS 12 (BAND 4)
- (1) RFS 1-5/8" HYBRIFLEX CABLE HBF158-13U6S6-210F (LENGTH 210')
- (3) RFS 5/8" HYBRIFLEX CABLE HBF058-08U1S1-10F (LENGTH = 10 FT), 3 ON THE TOWER
- EQUIPMENT ENGINEERING TO DETERMINE LENGTH OF HYBRID CABLE FROM RAYCAP IN SHELTER TO THE DUS41
- (2) RAYCAP DISTRIBUTION UNIT/BASE DB-B1-8C-12AB-OZ, 1 IN THE SHELTER, 1 ON TOWER
- (6) 10 FT 1/2" RF JUMPERS FROM RRH TO ANTENNAS FOR AWS
- (3) AWS ANTENNAS ANTEL BXA-171063-12CF-EDIN-0
- POWER SUPPLY AND FIBER TRAY TO BE SPECIFIED BY EQUIPMENT ENGINEERING



PLANS PREPARED FOR:

PLANS PREPARED BY:  
  
 424 S. Woods Mill Road, Suite 220  
 Chesterfield, Missouri 63017  
 Phone: 314-993-1010  
 Fax: 913-438-7777

ENGINEERING LICENSE:  
 STATE OF MISSOURI  
 PE CERTIFICATE OF AUTHORIZATION #001640  
 ENGINEER: ROBERT E. JENSEN PE # 028974 DISCIPLINE: STRUCTURAL/CIVIL SC

MLO	MICHAEL L. OWENS	E-29058	STRUCTURAL/CIVIL SC
KV	KEVIN VANMAELE	E-21581	STRUCTURAL/CIVIL SC
REJ	ROBERT E. JENSEN	E-28974	STRUCTURAL/CIVIL SC
TMS	TERRANCE M. SUPER	E-18521	ELECTRICAL E
SDK	SHELTON D. KEISLING	E-27323	ELECTRICAL E
DEK	DAVE E. KASPER	E-18063	ELECTRICAL E

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SUBMITTALS	DESCRIPTION	DATE	BY	REV
REVISED	PER CLIENT COMMENTS	02/10/14	DSH	E
REVISED	PER NEW RF	02/26/15	DSH	F
REVISED	PER CLIENT COMMENTS	03/10/15	DSH	G
REVISED	PER EQUIPMENT APPLICATION	03/30/15	DMG	H
ISSUED	FOR CONSTRUCTION	03/31/15	DSH	O
REVISED	PER CITY COMMENTS	04/29/15	DMG	I

SITE NAME:  
**STLC WEST COUNTY**

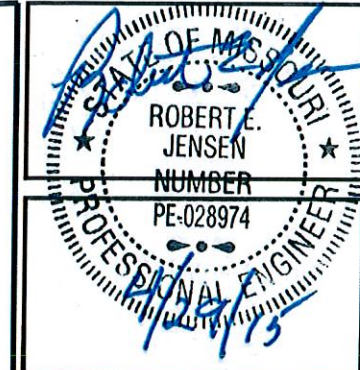
LOCATION NUMBER:  
 127205

SITE ADDRESS:  
 724 STRAUB ROAD  
 BALLWIN, MISSOURI  
 63011

SHEET DESCRIPTION:  
**PROPOSED RRU DIAGRAM & PARTS LIST**

SSC #: - SHEET NUMBER:  
**A04**





PLANS PREPARED BY:

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**SSC**

ENGINEERING LICENSE:

STATE OF MISSOURI  
 PE CERTIFICATE OF AUTHORIZATION #001640  
 ENGINEER: PE #: DISCIPLINE:

MLO	MICHAEL L. OWENS	E-29058	STRUCTURAL/CIVIL	SC
KV	KEVIN VANMAELE	E-21561	STRUCTURAL/CIVIL	SC
REJ	ROBERT E. JENSEN	E-28974	STRUCTURAL/CIVIL	SC
TMS	TERRANCE M. SUPER	E-18521	ELECTRICAL	E
SOK	SHELTON D. KEISLING	E-27323	ELECTRICAL	E
DEK	DAVE E. KASPER	E-18063	ELECTRICAL	E

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SUBMITTALS

DESCRIPTION	DATE	BY	REV
REVISED PER CLIENT COMMENTS	02/10/14	DSH	E
REVISED PER NEW RF	02/28/15	DSH	F
REVISED PER CLIENT COMMENTS	03/10/15	DSH	G
REVISED PER EQUIPMENT APPLICATION	03/30/15	DWG	H
ISSUED FOR CONSTRUCTION	03/31/15	DSH	I
REVISED PER CITY COMMENTS	04/29/15	DWG	J

SITE NAME:

**STLC WEST COUNTY**

LOCATION NUMBER:

127205

SITE ADDRESS:

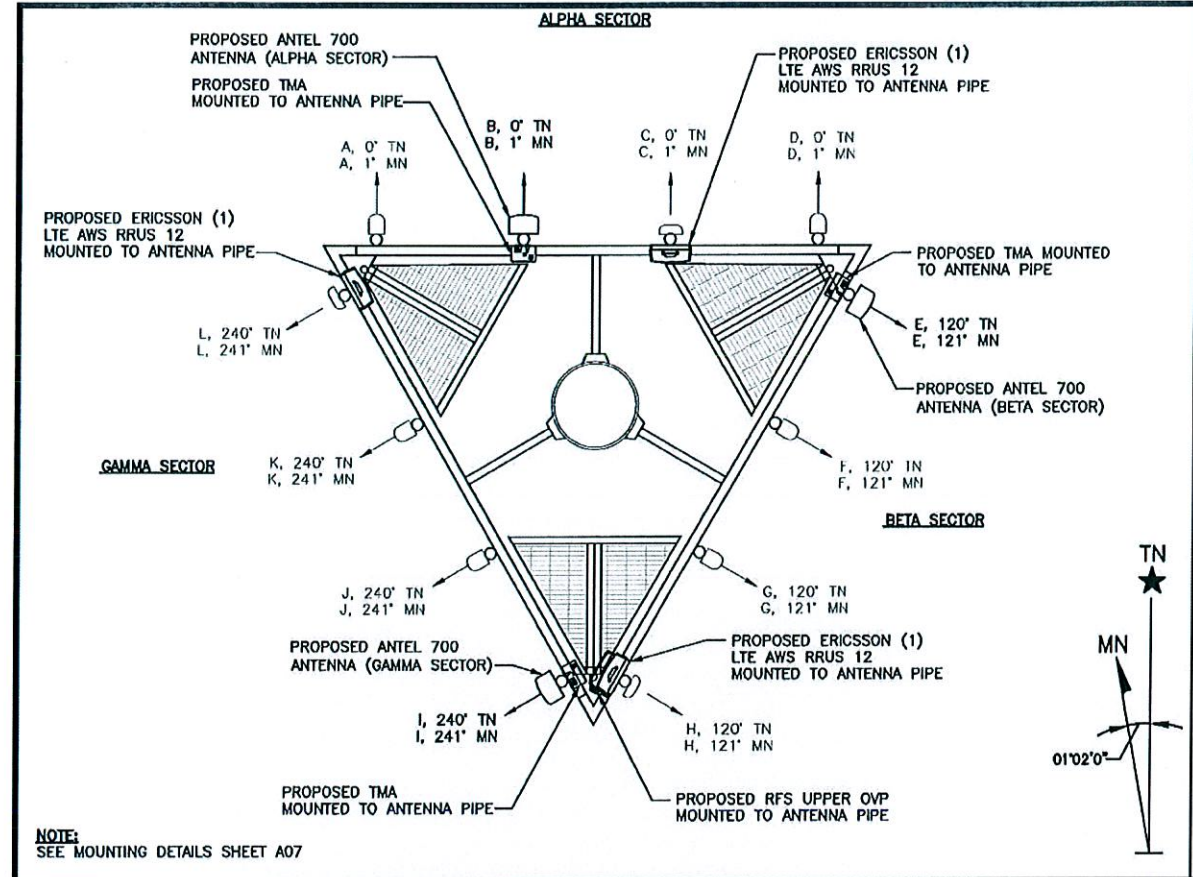
724 STRAUB ROAD  
 BALLWIN, MISSOURI  
 63011

SHEET DESCRIPTION:

**ANTENNA LAYOUT & ENTRY PORT DETAILS**

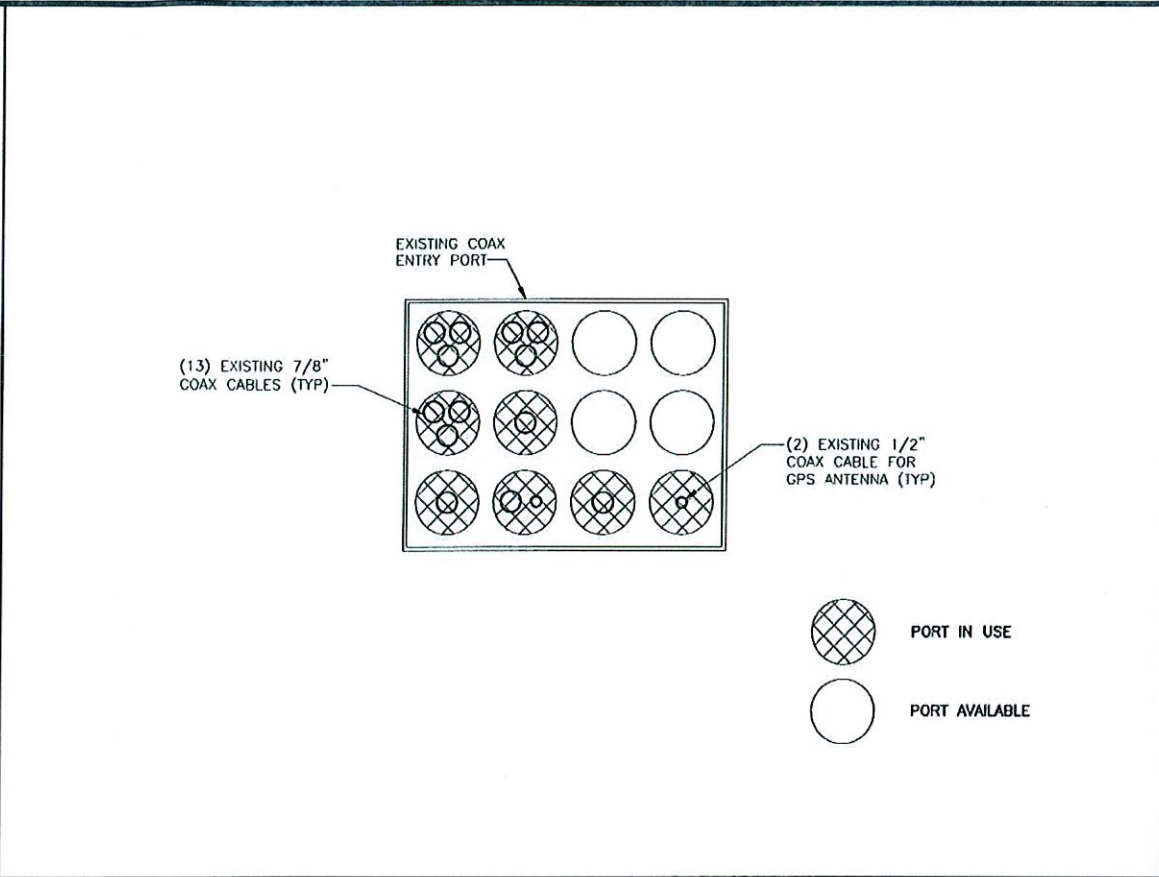
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**A05**



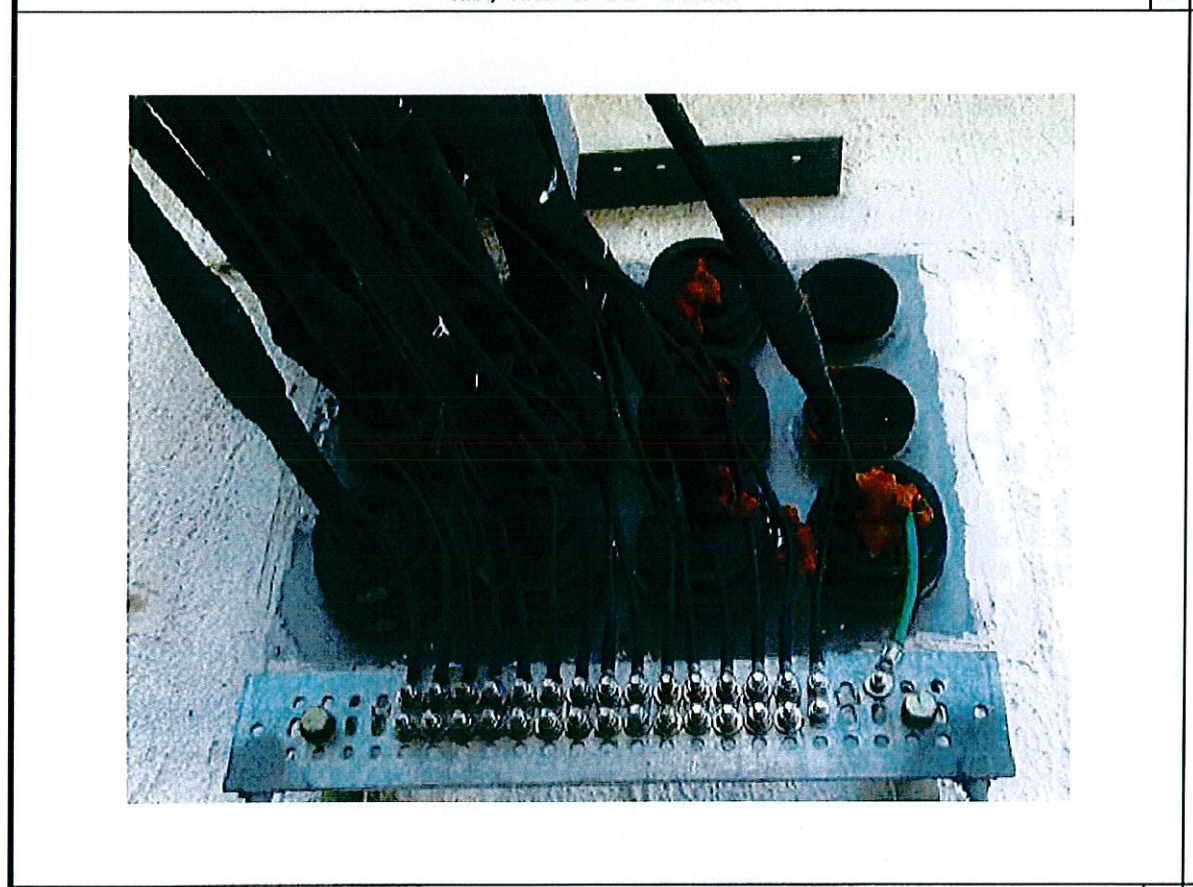
TMA, RRU & OVP LAYOUT

3



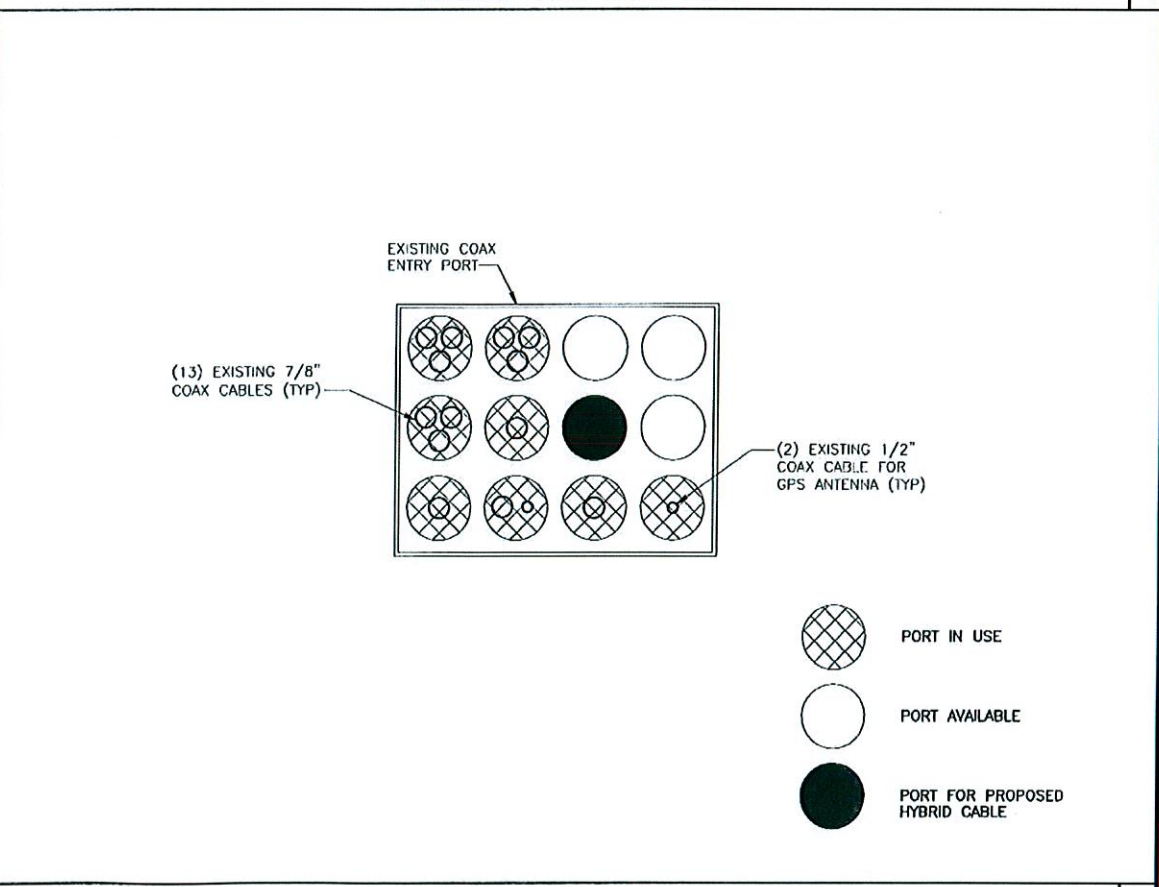
EXISTING COAX ENTRY PORT

1



EXISTING COAX ENTRY PORT

4

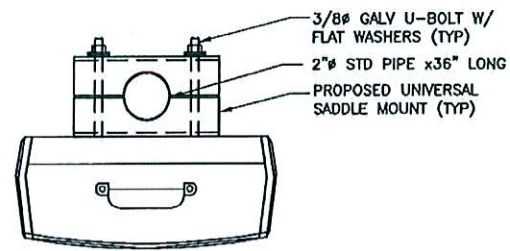


PROPOSED COAX ENTRY PORT

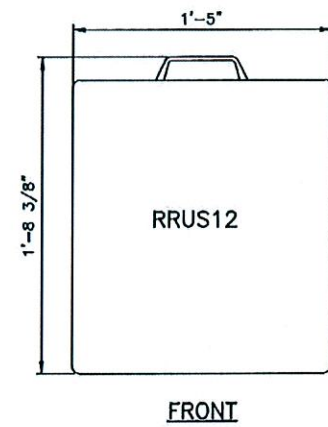
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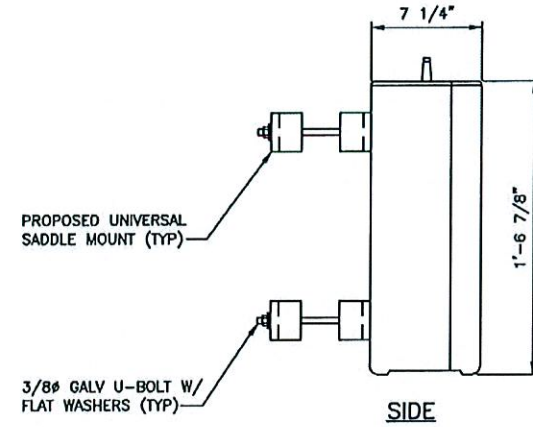
NOTE:  
CONTRACTOR SHALL INSTALL RRUS 12  
WITH MOUNTING INSTRUCTIONS PER  
MANUFACTURER'S SPECIFICATION



TOP



FRONT

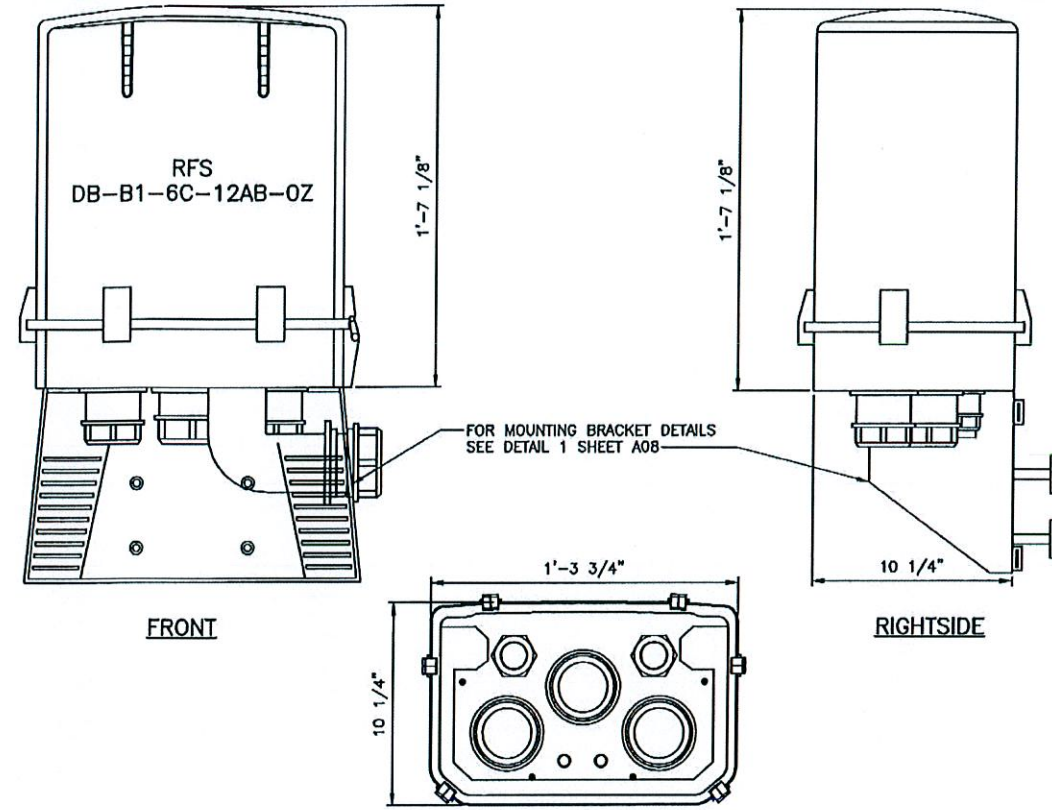


SIDE

RRUS 12

ERICSSON RRUS 12 DETAIL

3



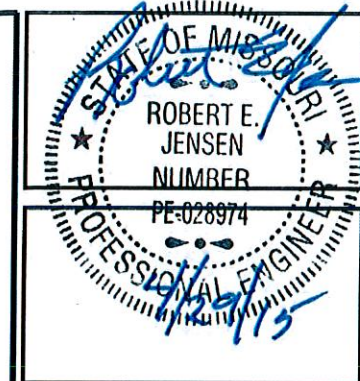
FRONT

RIGHTSIDE

BOTTOM

UPPER OVP DETAIL

1



PLANS PREPARED FOR:  
**verizon** wireless

PLANS PREPARED BY:  
424 S. Woods Mill Road, Suite 220  
Chesterfield, Missouri 63017  
Phone: 314-993-1010  
Fax: 913-438-7777  
**SSC**

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FE CERTIFICATE OF AUTHORIZATION #001640  
ENGINEER: PE # DISCIPLINE:  
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RY KEVIN VAHMALE E-21561 STRUCTURAL/CIVIL SC  
REJ ROBERT E. JENSEN E-28974 STRUCTURAL/CIVIL SC  
TMS TERRANCE M. SUPER E-18521 ELECTRICAL E  
SDK SHELTON D. KEISLING E-27323 ELECTRICAL E  
DEK DAVE E. KASPER E-18063 ELECTRICAL E

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INSTALLING HYBRID CABLE--POWER (IN)

To assist in ease of wiring, proceed by wiring in the following order:  
1st: OVP #1 and OVP #4  
2nd: OVP #2 and OVP #5  
3rd: OVP #3 and OVP #6

Circuit Number	Color	
	-48V	Return
1	Yellow/Black Stripe	Black
2	Red/Black Stripe	Blue
3	Brown/Red Stripe	Red
4	Purple/Red Stripe	Yellow
5	Black/White Stripe	Orange
6	Grey/Red Stripe	Purple

INSTALLING HYBRID CABLE--POWER (OUT) TO OVP

To assist in ease of wiring, proceed by wiring in the following order:  
1st: OVP #1 and OVP #4  
2nd: OVP #2 and OVP #5  
3rd: OVP #3 and OVP #6

Torque: 40 in-lbs (10-6 AWG)

Circuit Number	Color	
	-48V	Return
1	Yellow/Black Stripe	Black
2	Red/Black Stripe	Blue
3	Brown/Red Stripe	Red
4	Purple/Red Stripe	Yellow
5	Black/White Stripe	Orange
6	Grey/Red Stripe	Purple

INSTALLING HYBRID CABLE--POWER (OUT) TO SECTORS

To assist in ease of wiring, proceed by wiring in the following order:  
1st: OVP #1 and OVP #4  
2nd: OVP #2 and OVP #5  
3rd: OVP #3 and OVP #6

Torque: 40 in-lbs (10-6 AWG)

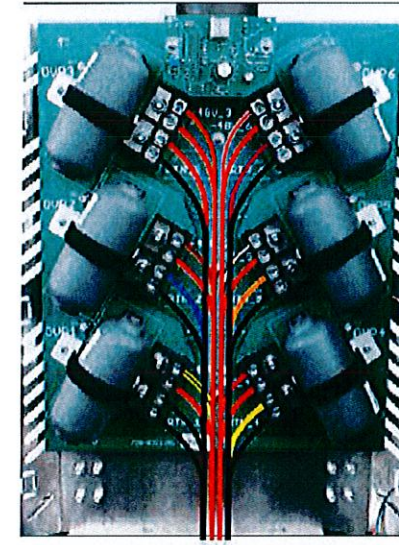
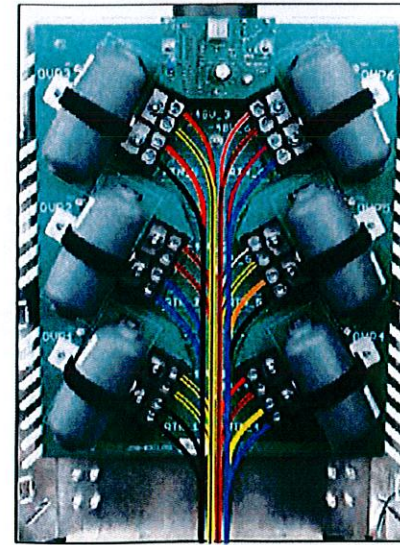
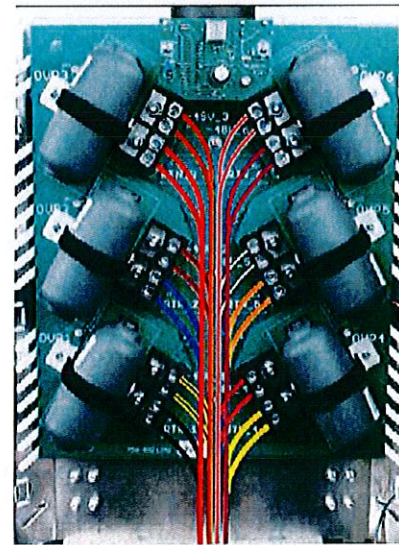
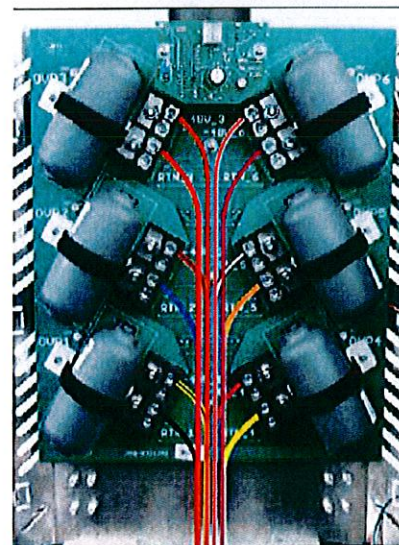
Sector	Circuit Number	Color	
		-48V	Return
Alpha	1	Yellow/Black Stripe	Black
	2	Red/Black Stripe	Blue
Beta	3	Brown/Red Stripe	Red
	4	Purple/Red Stripe	Yellow
Gamma	5	Black/White Stripe	Orange
	6	Grey/Red Stripe	Purple

INSTALLING HYBRID JUMPERR (OUT) TO RRH'S

To assist in ease of wiring, proceed by wiring in the following order:  
1st: OVP #1 and OVP #4  
2nd: OVP #2 and OVP #5  
3rd: OVP #3 and OVP #6

Torque: 40 in-lbs (10-6 AWG)

Sector	Circuit Number	Color	
		-48V	Return
Alpha	1	Red	Black
	2	Red	Black
Beta	3	Red	Black
	4	Red	Black
Gamma	5	Red	Black
	6	Red	Black



WIRING DIAGRAM

2

SUBMITTALS

REVISION	DESCRIPTION	DATE	BY	REV
REVISED PER CLIENT COMMENTS		02/10/14	DSH	E
REVISED PER NEW RF		02/26/15	DSH	F
REVISED PER CLIENT COMMENTS		03/10/15	DSH	G
REVISED PER EQUIPMENT APPLICATION		03/30/15	DWG	H
ISSUED FOR CONSTRUCTION		03/31/15	DSH	O
REVISED PER CITY COMMENTS		04/29/15	DWG	I

SITE NAME:  
**STLC WEST COUNTY**

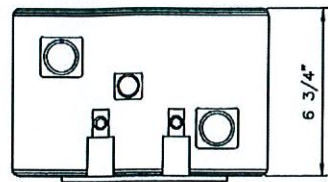
LOCATION NUMBER:  
127205

SITE ADDRESS:  
724 STRAUB ROAD  
BALLWIN, MISSOURI  
63011

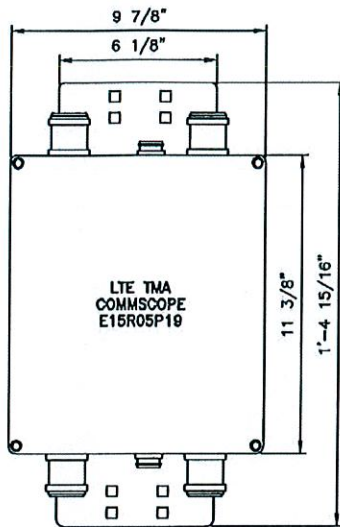
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DETAILS

SSC #:  
SHEET NUMBER:  
**A06**

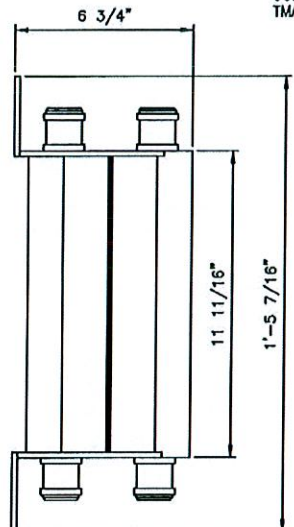




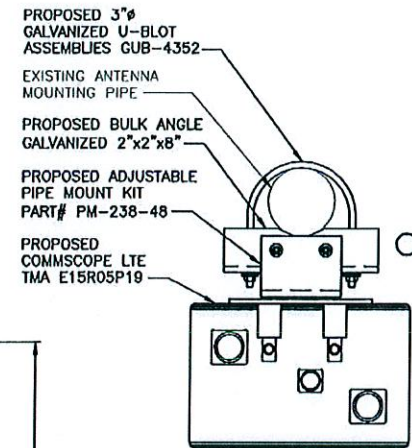
TOP



FRONT



SIDE



MOUNTING

- PROPOSED 3/8" GALVANIZED U-BOLT ASSEMBLIES GUB-4352
- EXISTING ANTENNA MOUNTING PIPE
- PROPOSED BULK ANGLE GALVANIZED 2"x2"x8"
- PROPOSED ADJUSTABLE PIPE MOUNT KIT PART# PM-238-48
- PROPOSED COMMSCOPE LTE TMA E15R05P19

LTE TMA DETAILS

DETAIL NOT USED

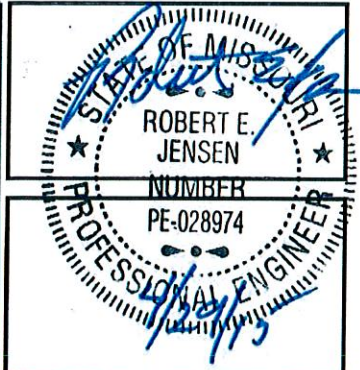
3

DETAIL NOT USED

4

DETAIL NOT USED

2



PLANS PREPARED BY:  
  
 424 S. Woods Mill Road, Suite 220  
 Chesterfield, Missouri 63017  
 Phone: 314-993-1010  
 Fax: 913-438-7777

ENGINEERING LICENSE:  
 STATE OF MISSOURI  
 FE CERTIFICATE OF AUTHORIZATION #001640  
 ENGINEER: FE # DISCIPLINE:  
 MLO MICHAEL L. OWENS E-29058 STRUCTURAL/CIVIL SC  
 KV KEVIN VAINMALE E-21561 STRUCTURAL/CIVIL SC  
 REJ ROBERT E. JENSEN E-28974 STRUCTURAL/CIVIL SC  
 TMS TERRANCE M. SUPER E-18521 ELECTRICAL E  
 SDK SHELTON D. KEISLING E-27323 ELECTRICAL E  
 DEK DAVE E. KASPER E-16063 ELECTRICAL E

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REVISED PER CLIENT COMMENTS	03/10/15	DSH	G	
REVISED PER EQUIPMENT APPLICATION	03/30/15	DWG	H	
ISSUED FOR CONSTRUCTION	03/31/15	DSH	O	
REVISED PER CITY COMMENTS	04/29/15	DWG	I	

SITE NAME:  
 STLIC WEST COUNTY

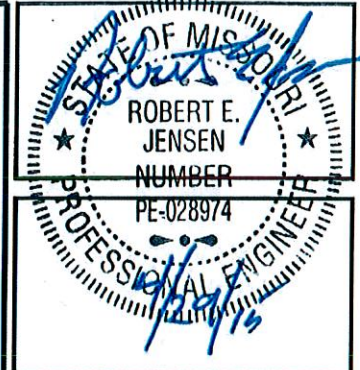
LOCATION NUMBER:  
 127205

SITE ADDRESS:  
 724 STRAUB ROAD  
 BALLWIN, MISSOURI  
 63011

SHEET DESCRIPTION:  
 DETAILS

SSC #:  
 SHEET NUMBER:  
 A07





PLANS PREPARED BY:

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STATE OF MISSOURI  
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 ENGINEER: PE #: DISCIPLINE:  
 MLO MICHAEL L. OWENS E-29058 STRUCTURAL/CIVIL SC  
 KY KEVIN VANIMAELE E-21561 STRUCTURAL/CIVIL SC  
 REJ ROBERT E. JENSEN E-028974 STRUCTURAL/CIVIL SC  
 TMS TERRANCE M. SUPER E-18521 ELECTRICAL E  
 SEK SHELTON D. KEISLING E-27323 ELECTRICAL E  
 DEK DAVE E. KASPER E-10063 ELECTRICAL E

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REVISED PER CLIENT COMMENTS		03/10/15	DSH	C
REVISED PER EQUIPMENT APPLICATION		03/30/15	DWG	H
ISSUED FOR CONSTRUCTION		03/31/15	DSH	O
REVISED PER CITY COMMENTS		04/29/15	DWG	1

SITE NAME:

**STLC WEST COUNTY**

LOCATION NUMBER:

127205

SITE ADDRESS:

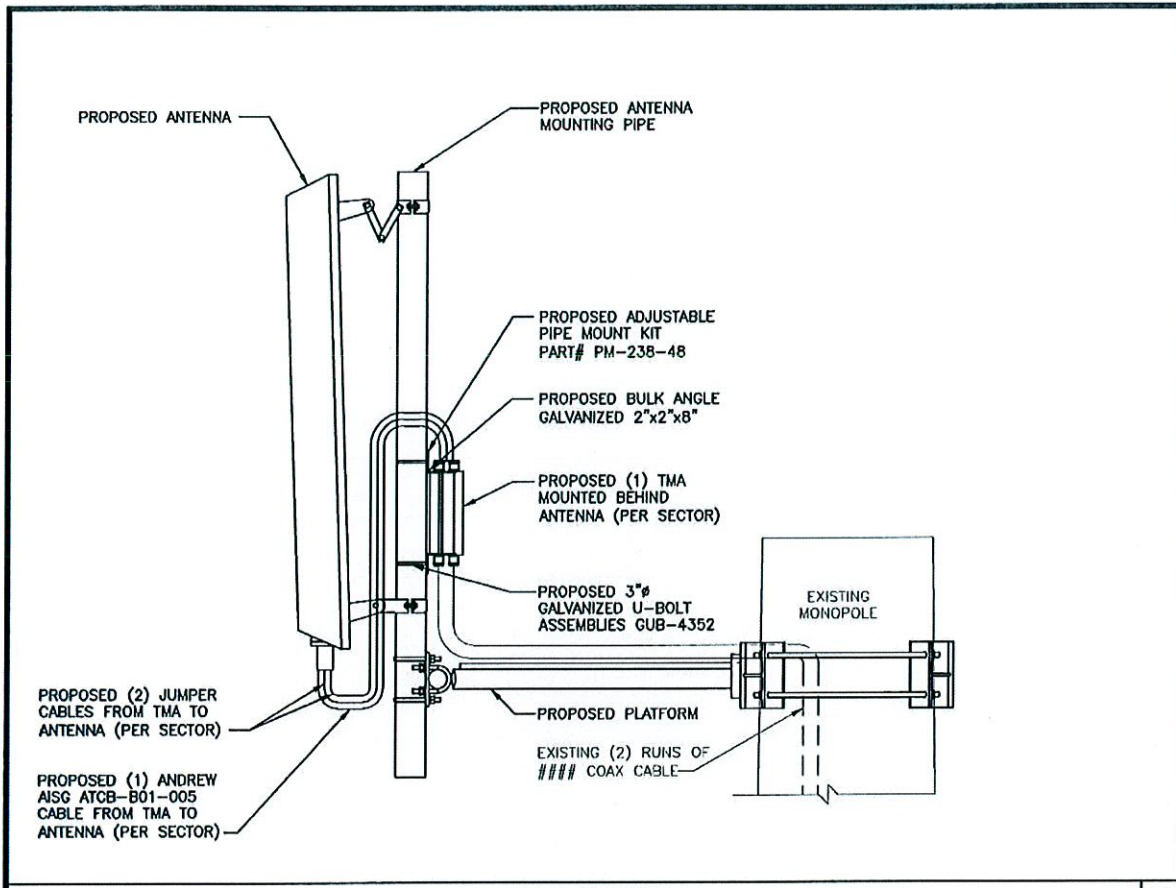
724 STRAUB ROAD  
 BALLWIN, MISSOURI  
 63011

SHEET DESCRIPTION:

**DETAILS**

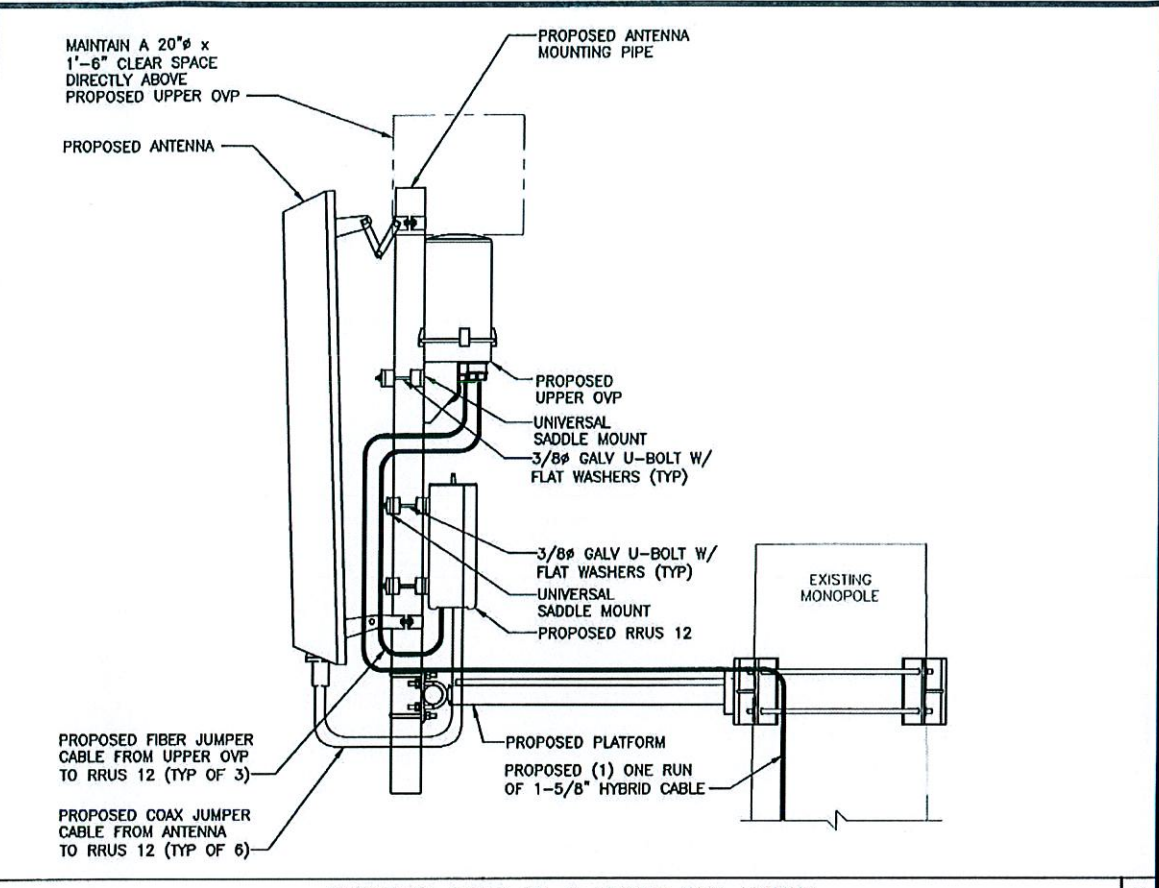
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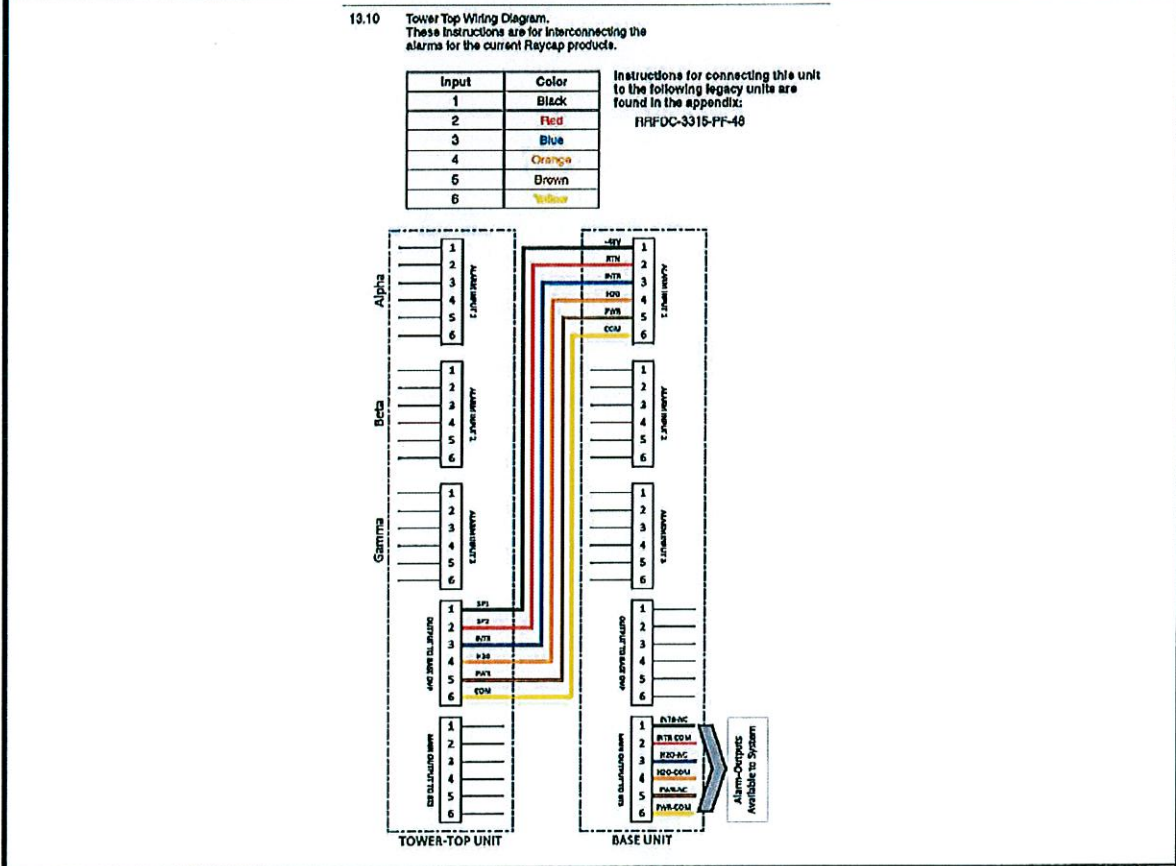
TMA MOUNT

3



ERICSSON RRUS 12 & UPPER OVP MOUNT

1



ALARM WIRING DIAGRAM

4

VOLTAGE MONITOR OPERATION

- ONCE CABLING IS COMPLETE AND POWER IS SUPPLIED TO THE UNIT, THE VOLTAGE CAN BE VERIFIED FOR EACH DC CIRCUIT.
- TO MONITOR EACH INDIVIDUAL CIRCUIT, TURN THE SELECTOR KNOB TO CORRESPONDING CIRCUIT INDICATED NEXT TO THE DIAL.

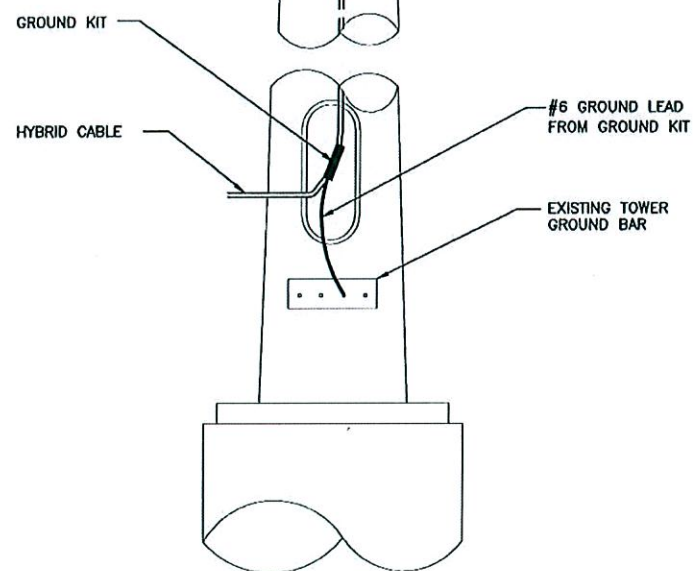
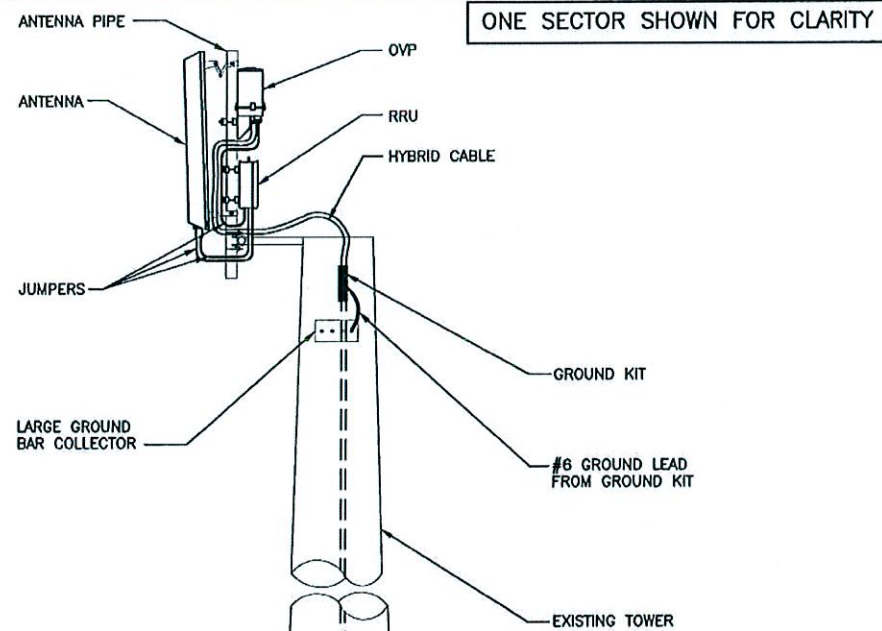
NOTE:  
 THE VOLTAGE MONITOR FUNCTION INCLUDES AN AUTOMATIC SLEEP MODE THE " TURNS-OFF" THE LED DIGITS AFTER 2 MINUTES.

- TO " TURN-ON" THE DIGITS TO THE LED DISPLAY TURN THE SELECTOR KNOB TO ANY POWERED DC CIRCUIT.
- WHEN COMPLETE, PLACE THE VOLTAGE MONITOR DIAL BACK TO THE DC CIRCUIT 1 POSITION.

VOLTAGE MONITOR OPERATION DETAIL AND NOTES

2



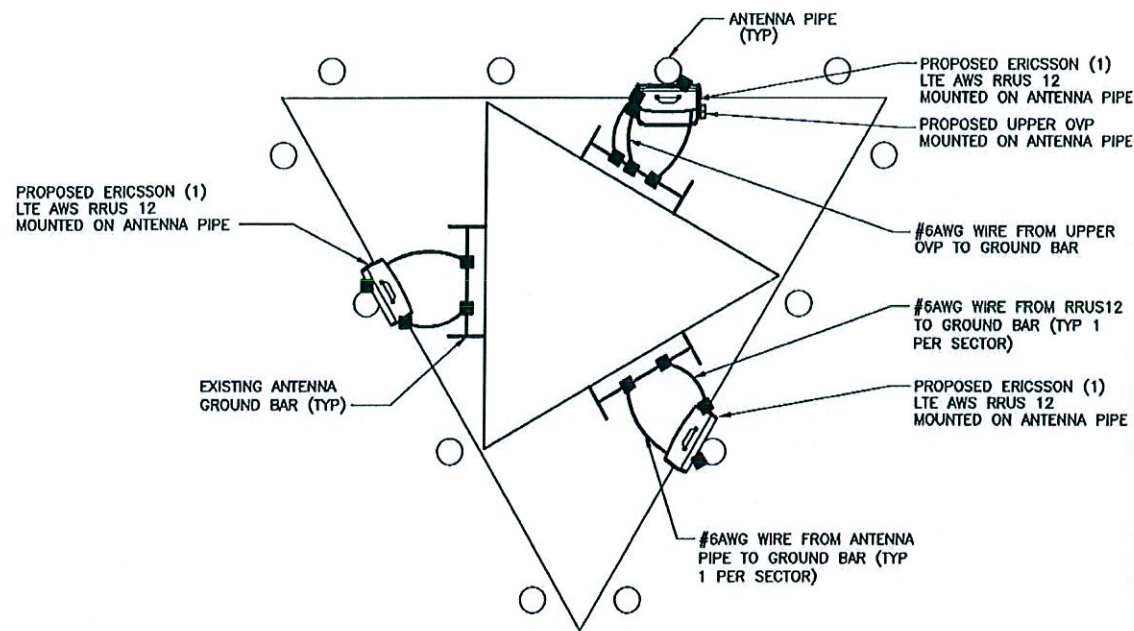


**GROUNDING NOTES:**

1. ALL BASE STATION SPD PROTECTION MUST BE BONDED FROM MAIN SPD GROUND LUG VIA A MINIMUM 6AWG WIRE TO THE CELL SITE MASTER GROUND BAR (MGB) EITHER INTERNAL OR EXTERNAL TO SHELTER CABINET.
2. ALL TOWER SPD PROTECTION MUST BE BONDED FROM THE MAIN SPD GROUND LUG VIA A MINIMUM 6AWG WIRE TO THE TOWER MASTER GROUND BAR (MGB) EITHER INTERNAL OR EXTERNAL TO SHELTER OR CABINET.
3. ALL ROOFTOP BUILDING SPD PROTECTION MUST BE BONDED FROM THE MAIN SPD GROUND LUG VIA A MINIMUM 6 AWG WIRE TO THE CELL SITE MASTER GROUND BAR (MGB) EITHER INTERNAL OR EXTERNAL TO SHELTER OR CABINET.
4. ALL SURGE PROTECTION GROUND CABLES MUST BE GREEN IN COLOR AND A MINIMUM 6 AWG OR GREATER.
5. ALL GROUND CABLES LUGS ATTACHED TO MGB MUST BE CRIMP STYLE DUAL HOLE LUGS FASTENED THROUGH BOTH HOLES.
6. ALL GROUND CABLE CONNECTIONS FROM CAL TO LUG MUST INCLUDE CLEAR HEAT SHRINK OVER THE CRIMP.

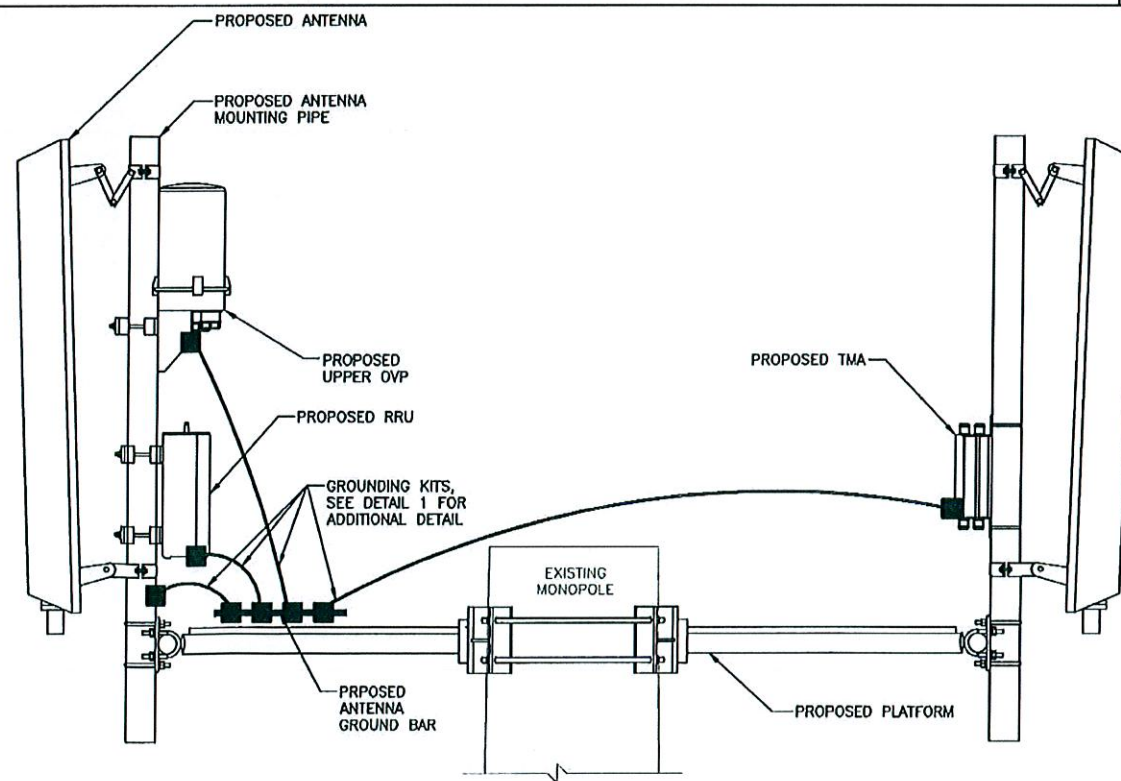
GROUNDING RISER

3



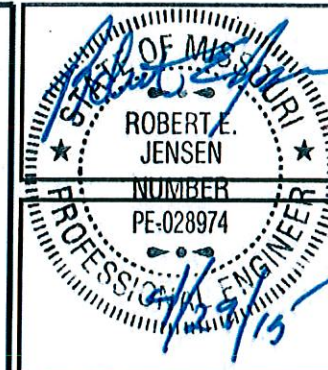
ANTENNA GROUNDING PLAN

1



TMA, RRU & UPPER OVP GROUNDING

2



PLANS PREPARED BY:

424 S. Woods Mill Road, Suite 220  
Chesterfield, Missouri 63017  
Phone: 314-993-1010  
Fax: 913-438-7777

**SSC**

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DEK DAVE E. KASPER	E-16063	ELECTRICAL E

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SUBMITTALS

DESCRIPTION	DATE	BY	REV
REVISED PER CLIENT COMMENTS	02/10/14	DSH	E
REVISED PER NEW RF	02/28/15	DSH	F
REVISED PER CLIENT COMMENTS	03/10/15	DSH	G
REVISED PER EQUIPMENT APPLICATION	03/30/15	DMG	H
ISSUED FOR CONSTRUCTION	03/31/15	DSH	D
REVISED PER CITY COMMENTS	04/29/15	DMG	I

SITE NAME:

**STLC WEST COUNTY**

LOCATION NUMBER:

127205

SITE ADDRESS:

724 STRAUB ROAD  
BALLWIN, MISSOURI  
63011

SHEET DESCRIPTION:

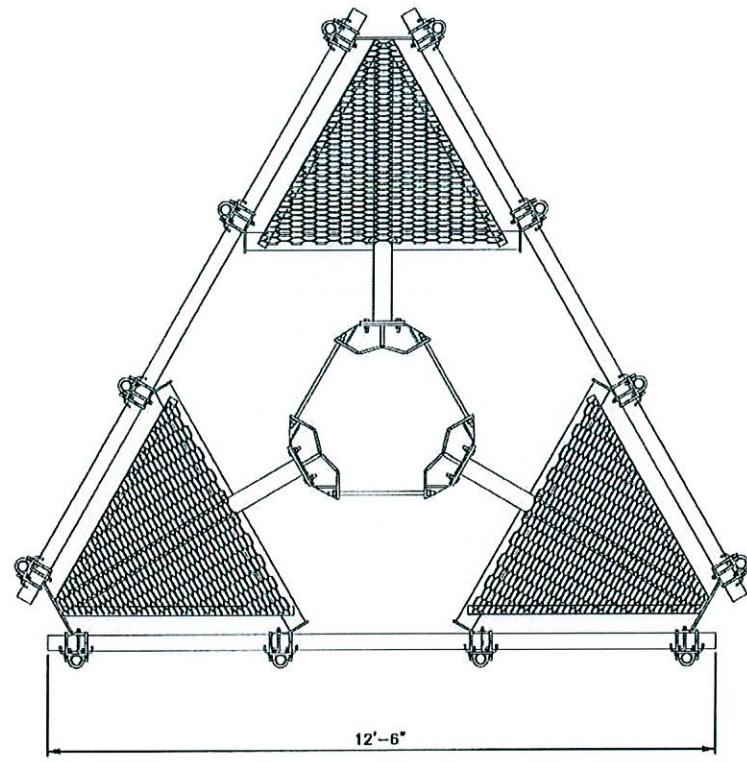
DETAILS

SSC #:

SHEET NUMBER:

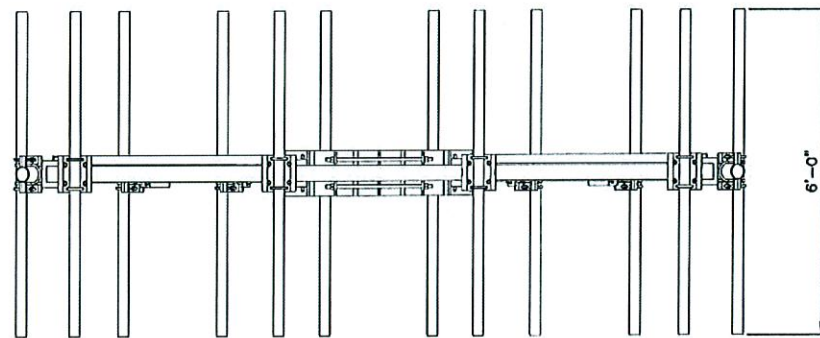
**A09**





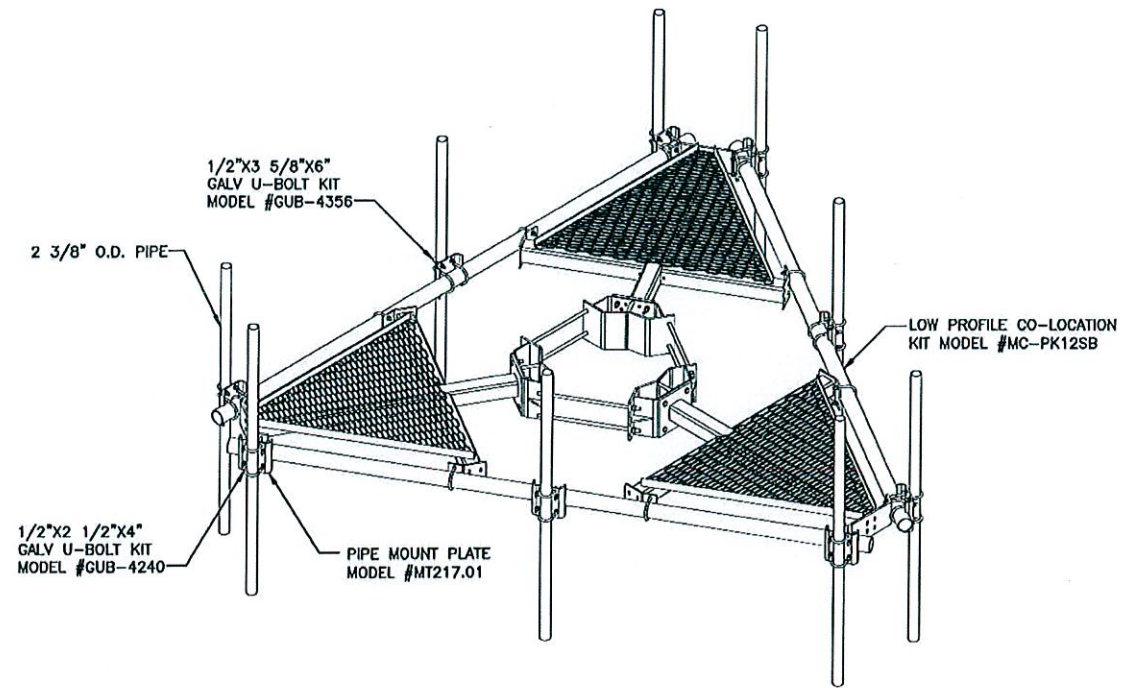
12'-6"

TOP



SIDE

ANDREW  
MC-PK12S-12-72



1/2"x3 5/8"x6"  
GALV U-BOLT KIT  
MODEL #GUB-4356

2 3/8" O.D. PIPE

1/2"x2 1/2"x4"  
GALV U-BOLT KIT  
MODEL #GUB-4240

PIPE MOUNT PLATE  
MODEL #MT217.01

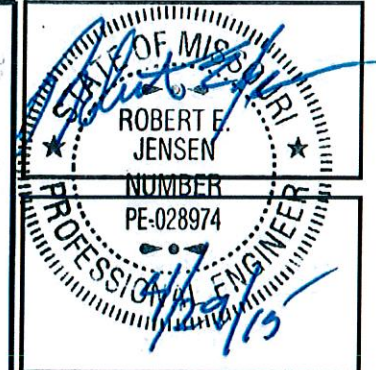
LOW PROFILE CO-LOCATION  
KIT MODEL #MC-PK12SB

ANDREW CORPORATION  
3 WESTBROOK CORPORATE CENTER SUITE 900  
WESTCHESTER, ILLINOIS 60154  
1-800-255-1479  
WWW.ANDREW.COM

PROPOSED ANDREW ANTENNA PLATFORM  
PART NUMBER - MC-PK12S-12-72 OR APPROVED EQUAL.

PLATFORM DETAILS

1



PLANS PREPARED BY:  
424 S. Woods Mill Road, Suite 220  
Chesterfield, Missouri 63017  
Phone: 314-993-1010  
Fax: 913-438-7777  
**SSC**

ENGINEERING LICENSE:

STATE OF MISSOURI  
PE CERTIFICATE OF AUTHORIZATION #001640

ENGINEER	PE #	DISCIPLINE
MLO MICHAEL L. OWENS	E-29068	STRUCTURAL/CIVIL SC
KV KEVIN VAHMALE	E-21561	STRUCTURAL/CIVIL SC
REJ ROBERT E. JENSEN	E-28974	STRUCTURAL/CIVIL SC
TMS TERRANCE M. SUPER	E-18521	ELECTRICAL E
SDK SHELTON D. KEISLING	E-27323	ELECTRICAL E
DEK DAVE E. KASPER	E-18063	ELECTRICAL E

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SHEET DESCRIPTION:  
DETAILS

SSC #: - SHEET NUMBER:  
**A10**



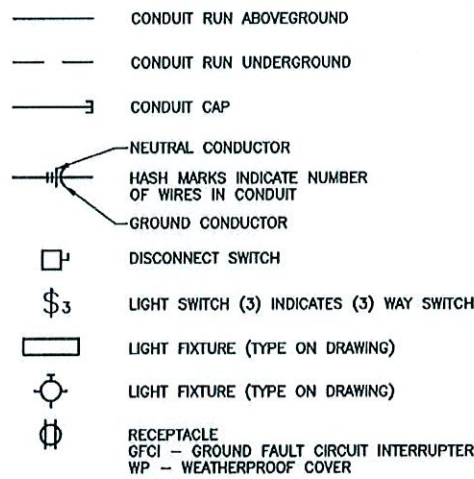
EQUIPMENT FURNISHED AND/OR INSTALLED BY:		
DESCRIPTION	FURNISHED	INSTALLED
ANCHOR BOLTS	VERIZON WIRELESS	CONTRACTOR
ANTENNA MOUNTS	CONTRACTOR	CONTRACTOR
ANTENNAS	VERIZON WIRELESS	CONTRACTOR
CABLE LADDER	CONTRACTOR	CONTRACTOR
COAX	VERIZON WIRELESS	CONTRACTOR
CONNECTORS	CONTRACTOR	CONTRACTOR
ENTRY PORT BOOTS	CONTRACTOR	CONTRACTOR
GPS ANTENNA	VERIZON WIRELESS	CONTRACTOR
GROUND KITS	CONTRACTOR	CONTRACTOR
HANGER KITS	CONTRACTOR	CONTRACTOR
ICE BRIDGE MATERIAL	CONTRACTOR	CONTRACTOR
JUMPERS	CONTRACTOR	CONTRACTOR
SHELTER/EQUIPMENT	VERIZON WIRELESS	CONTRACTOR
TOWER	VERIZON WIRELESS	CONTRACTOR
TOWER BUS BARS	CONTRACTOR	CONTRACTOR
DIPLEXER	VERIZON WIRELESS	CONTRACTOR
TMA	VERIZON WIRELESS	CONTRACTOR
RRUS 12	VERIZON WIRELESS	CONTRACTOR
UPPER OVP	VERIZON WIRELESS	CONTRACTOR
DIPLEXER CONNECTOR	CONTRACTOR	CONTRACTOR
TMA CONNECTOR	CONTRACTOR	CONTRACTOR
RRUS 12 CONNECTOR	CONTRACTOR	CONTRACTOR
UPPER OVP CONNECTOR	CONTRACTOR	CONTRACTOR
TOE TAGS	VERIZON WIRELESS	CONTRACTOR

CONTRACTOR SHALL OBTAIN A COPY OF VERIZON WIRELESS ENGINEERING SITE DATA FORM FOR ANTENNA INFORMATION.

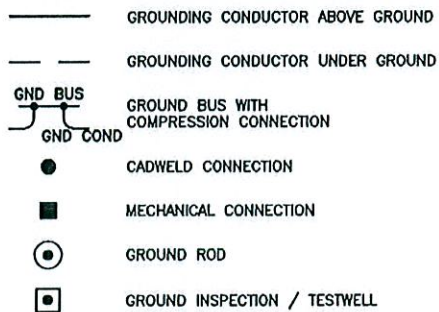
- ANTENNAS SHALL BE DESIGNATED FROM RIGHT TO LEFT, FACING THE ASSEMBLY FROM THE GROUND. LEFT TO RIGHT FACING THE BACK OF THE ANTENNA.
- THE OUTER MOST ANTENNAS ON EACH FACE SHALL BE DESIGNATED AS THE RECEIVE ANTENNAS. THE INNER ANTENNAS SHALL BE DESIGNATED AS THE TRANSMIT ANTENNAS.
- EACH TRANSMISSION LINE SHALL BE LABELED WITH BRASS "TOE TAGS", GRANGER PART NUMBER 1F035-B, STAMPED WITH 1/4" LETTERS/NUMBERS STAMPS, GRANGER PART NUMBER 3W039. THE LABELS SHALL BE ATTACHED WITH A SEMIPERMANENT METHOD (I.E. BLACK UV RESISTANT CABLE TIES). THE TAGS SHALL BE PLACED SO AS NOT TO COME IN CONTACT WITH THE CONNECTOR ON THE LINE AND THE METAL OF THE TOWER. LINES SHALL BE LABELED AT THE TOP, BOTTOM AT ENTRY PORT.
- EACH LINE SHALL ALSO BE LABELED AT THE LIGHTNING/SURGE PROTECTOR MOUNTING PLATE WITH A PRINTABLE LABEL MAKER TO INDICATE LINE NUMBER AND FUNCTION, THE SAME AS THE TOE TAG.
- THE TAG LABELING SHALL BE AS DESIGNATED IN THE ANTENNA KEY. USE A-ALPHA, B-BETA, G-GAMMA, ON SHEET E02.
- IN TWO-ANTENNA CONFIGURATION WHERE ONE ANTENNA WILL BE DUPLEXED, THE DUPLEXED ANTENNA SHALL BE LABELED AS RECEIVE.
- CONTRACTOR SHALL FIELD VERIFY THE EXACT TMA'S (IF THEY ARE REQUIRED) PER THE OPERATIONS MANAGER.
- COAXIAL FEEDER LENGTHS INDICATED ABOVE ARE APPROXIMATE. CONTRACTOR TO VERIFY ACTUAL LENGTH BEFORE ORDERING.
- CONTRACTOR SHALL INSTALL PLATFORM OR MOUNTING BRACKETS AND HARDWARE FOR ALL ANTENNAS AND SHALL BE PER THE TOWER MANUFACTURERS STANDARD DETAILS OR APPROVED EQUAL.
- CONTRACTOR TO FURNISH AND INSTALL AN EXIT PORT (IF ONE IS NOT EXISTING) IN ACCORDANCE WITH THE TOWER MANUFACTURER'S SPECIFICATIONS AND UPON THE TOWER OWNER'S APPROVAL. (TYP. AT PLATFORM AND AT BOTTOM) (FOR MONOPOLE TOWERS ONLY).
- CONTRACTOR SHALL SUPPLY AND INSTALL INTERMITTENT COAX TINNED GALVANIZED GROUND BARS AT 75' INTERVALS STARTING FROM THE ANTENNA CENTERLINE DOWN (ON SELF SUPPORT AND GUYED TOWERS WHERE APPLICABLE).

## SYMBOLS

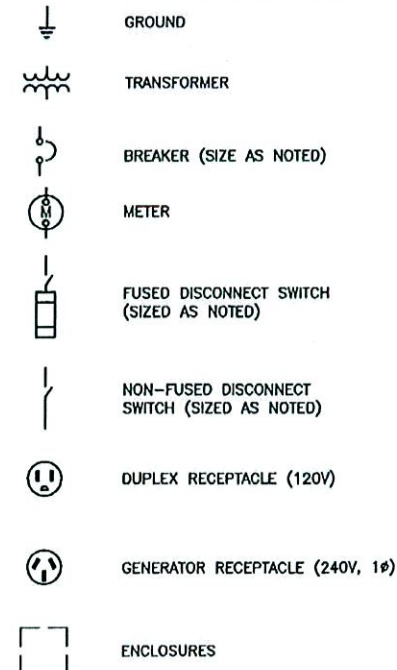
### PLAN SYMBOLS



### GROUNDING PLAN SYMBOLS



### SCHEMATIC SYMBOLS



## GENERAL NOTES

- THE CONTRACTOR SHALL SUPERVISE AND DIRECT ALL WORK USING HIS BEST SKILL AND ATTENTION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, PROCEDURES AND SEQUENCES FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.
  - THE CONTRACTOR SHALL VISIT THE JOB SITE TO REVIEW THE SCOPE OF WORK AND EXISTING CONDITIONS INCLUDING, BUT NOT LIMITED TO ELECTRICAL SERVICE AND OVERALL COORDINATION.
  - THE CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS PRIOR TO SUBMITTING HIS BID. ANY DISCREPANCIES, CONFLICTS OR OMISSIONS, ETC. SHALL BE REPORTED TO VERIZON WIRELESS BEFORE PROCEEDING WITH THE WORK.
  - 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 VERIZON WIRELESS, AT THE EXPENSE OF THE CONTRACTOR.
  - THE CONTRACTOR SHALL SAFEGUARD THE OWNER'S PROPERTY DURING CONSTRUCTION AND SHALL REPLACE ANY DAMAGED PROPERTY OF THE OWNER TO ORIGINAL CONDITION.
  - 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.
  - THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COMPLETE SECURITY OF THE SITE WHILE THE JOB IS IN PROGRESS AND UNTIL THE JOB IS COMPLETE.
  - ALL CONSTRUCTION WORK SHALL CONFORM TO THE U.B.C., I.B.C., OR B.O.C.A. AND ALL APPLICABLE LOCAL REGULATIONS, ORDINANCES, STATUTES & CODES.
  - VERIZON WIRELESS SHALL OBTAIN THE CONSTRUCTION PERMIT. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ADDITIONAL PERMITS, LICENSES AND INSPECTIONS NECESSARY FOR PERFORMANCE OF THE WORK AND INCLUDE THOSE IN THE COST OF THE WORK TO THE OWNER.
  - 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 PREMISES AT ALL TIMES. THESE ARE TO BE UNDER THE CARE OF JOB SUPERINTENDENT.
  - PROVIDE A PORTABLE FIRE EXTINGUISHER WITH A RATING OF NOT LESS THAN 2-A OR 2-A:10-B:C WITHIN 75 FEET OF TRAVEL DISTANCE TO ALL PORTIONS OF THE BUILD OUT AREA DURING CONSTRUCTION.
  - ANY CONNECTION FEES FOR ELECTRICAL SERVICE SHALL BE PAID BY THE CONTRACTOR.
  - BUILDING CODE: (IBC 2012)  
[INTERNATIONAL BUILDING CODE (IBC), 2012 AS PUBLISHED BY THE INTERNATIONAL CODE COUNCIL (ICC) AND AS ADOPTED BY LOCAL BUILDING AUTHORITY]
  - ELECTRICAL CODE: (NEC 2011)  
[NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) 70 - 2011, NATIONAL ELECTRICAL CODE, AS ADOPTED BY LOCAL BUILDING AUTHORITY]
  - CABLING NOTE - FOLLOW HYBRIFLEX MANUFACTURER'S RECOMMENDATIONS FOR HOISTING CABLE. VERIZON HAS REPORTED THAT HOIST GRIPS MUST BE USED EVERY 200' OF CABLE.
  - GROUNDING NOTE - ANY INSTALLED GROUNDING MUST ACHIEVE A RATING OF 5 OHMS OR LESS.
- DESCRIPTION OF PROPOSED SITE USE**  
THE CONSTRUCTION OF THIS COMMUNICATION TOWER SITE IS FOR THE TRANSMISSION AND RECEPTION OF CALLS FOR A NEW WIRELESS TELEPHONE SYSTEM. NO FLAMMABLE PRODUCTS OR CHEMICALS WILL BE USED OR STORED INSIDE THE SHELTER.

## ABBREVIATIONS

AGL	ABOVE GRADE LINE	ELEV	ELEVATOR, ELEVATION	REQ'D	REQUIRED
AMP	AMPERE	EQ	EQUAL	SF	SQUARE FEET
ARCH	ARCHITECT	EQUIP	EQUIPMENT	SHT	SHEET
BLDG	BUILDING	EXIST	EXISTING	SIM	SIMILAR
CL	CENTER LINE	FND	FOUNDATION	SPECS	SPECIFICATIONS
CONC	CONCRETE	FTG	FOOTING	SSC, INC.	SELECTIVE SITE CONSULTANTS, INC.
CONST	CONSTRUCTION	GA	GAUGE	STD	STANDARD
CONTR	CONTRACTOR	GALV	GALVANIZED	STL	STEEL
DET	DETAIL	GND	GROUND	STRUCT	STRUCTURAL
DIA	DIAMETER	HT	HEIGHT	SW	SWITCH
DIAG	DIAGONAL	LF	LINEAL FEET	TOC	TOP OF CONCRETE
DIM	DIMENSION	MIN	MINIMUM	TC	TOP OF CURB
DN	DOWN	MISC	MISCELLANEOUS	TOP	TOP OF PAVING
DWG	DRAWING	NTS	NOT TO SCALE	TOS	TOP OF STEEL
EA	EACH	OC	ON CENTER	TYP	TYPICAL
ELEC	ELECTRICAL	PL	PLATE	UNO	UNLESS NOTED OTHERWISE



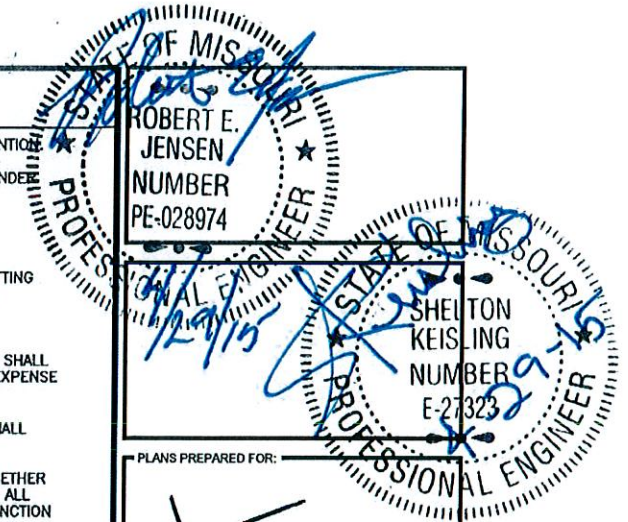
DETAIL NUMBER

DRAWING NUMBER ON WHICH SECTION OR DETAIL APPEARS. (-) INDICATES REFERENCED FROM SAME DRAWING



SECTION NUMBER

DRAWING NUMBER ON WHICH SECTION OR DETAIL APPEARS. (-) INDICATES REFERENCED FROM SAME DRAWING



PLANS PREPARED FOR:



PLANS PREPARED BY:



ENGINEERING LICENSE:

STATE OF	MISSOURI	PE CERTIFICATE OF AUTHORIZATION #	001640
ENGINEER:	KEVIN VANHALE	PE #:	E-21561 STRUCTURAL/CIVIL SC
MLO	MICHAEL L. OWENS	PE #:	E-29058 STRUCTURAL/CIVIL SC
REJ	ROBERT E. JENSEN	PE #:	E-28974 STRUCTURAL/CIVIL SC
TMS	TERRANCE M. SUPER	PE #:	E-18521 ELECTRICAL E
SDK	SHELTON D. KEISLING	PE #:	E-27323 ELECTRICAL E
DEK	DAVE E. KASPER	PE #:	E-18053 ELECTRICAL E

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GN01