verizon wireless

FPL COCONUT CREEK
61005
4001 LYONS ROAD
POMPANO BEACH, FL 33073

SITE MODIFICATION WITH AWS

811 72 HOURS PRIOR TO DIGGING, CONTRACTOR TO NOTIFY ALL UTILITY COMPANIES TO LOCATE ALL UNDERGROUND UTILITIES.

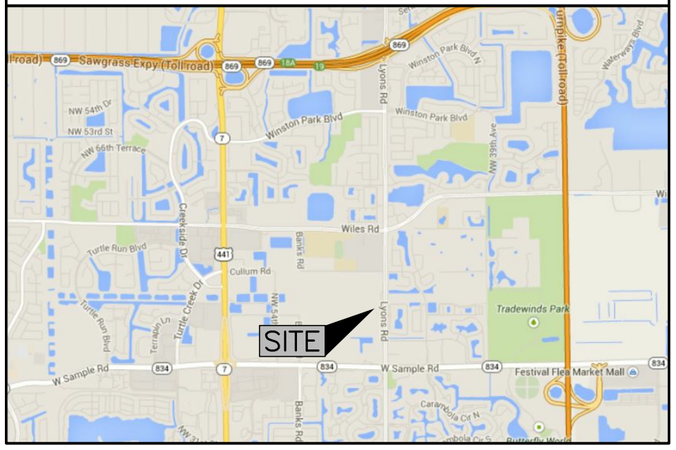
Know what's **below.**
Call before you dig.

CODE COMPLIANCE

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

1. 2010 FLORIDA BUILDING CODE W/ 2012 SUPPLEMENT
   WIND DESIGN CRITERIA:
   A. ASCE 7-10
      BASIC WIND SPEED = 175 MPH
      RISK CATEGORY = II
      EXPOSURE = C
   B. ANSI/TIA-222-G
      (ALLOWED PER EXEMPTION #5 OF 1609.1, FBC2010)
      BASIC WIND SPEED = 136 MPH
      OCCUPANCY CATEGORY = II
      EXPOSURE = C
      IMPORTANCE FACTOR = 1.0
2. FLORIDA FIRE PREVENTION CODE – 2010
3. NATIONAL ELECTRICAL CODE (NFPA 70-2008)
4. CITY AND/OR COUNTY ORDINANCES

VICINITY MAP



SHEET INDEX

SHEET	DESCRIPTION
T-1	TITLE SHEET
C-1	EQUIPMENT PLATFORM PLAN
C-2	TOWER ELEVATION AND ANTENNA ORIENTATIONS
C-3	RF DATA AND CABLE SCHEDULE
C-4	GENERAL NOTES AND DETAILS
E-1	ELECTRICAL NOTES
E-2	GROUNDING DETAILS AND NOTES

PROJECT INFORMATION

SITE NAME:	FPL COCONUT CREEK
SITE NUMBER:	61005
SITE ADDRESS:	4001 LYONS ROAD POMPANO BEACH, FL 33073
JURISDICTION:	BROWARD COUNTY
COORDINATES:	LATITUDE: 26° 16' 48.38" N (NAD 83) LONGITUDE: 80° 11' 12.29" W (NAD 83)

SCOPE OF WORK

VERIZON WIRELESS PROPOSES TO MODIFY AN EXISTING UNMANNED TELECOMMUNICATIONS FACILITY.

1. INSTALL (1) RBS 6601 EQUIPMENT INSIDE OF EXISTING 6101 LTE CABINET.
2. REPLACE EXISTING (9) ANTENNAS WITH (3) NEW PCS ANTENNAS, (3) NEW AWS ANTENNAS & (3) NEW LTE ANTENNAS.
3. INSTALL (3) RRU'S FOR AWS ON EXISTING EQUIPMENT PLATFORM SAFETY RAILING (1 PER SECTOR).
4. INSTALL (24) 7/8" COAX CABLES.
5. INSTALL (1) 6-CIRCUIT BASE OVP BOX MOUNTED ON EXISTING PLATFORM SAFETY RAILING.
6. INSTALL (1) 6x12 HYBRID CABLE FOR AWS TO RRU'S AT PLATFORM.
7. INSTALL (6) DIPLEXERS ON EXISTING ICE BRIDGE.

PROJECT TEAM

APPLICANT:	VERIZON WIRELESS 777 YAMATO ROAD SUITE 600 BOCA RATON, FL 33431
ARCHITECT & ENGINEER:	EBI CONSULTING 21 B STREET BURLINGTON, MA 01803 (781) 273-2500
SITE ACQUISITION:	EBI CONSU 21 B S BURLING (781) 27

ADMINISTRATIVE APPROVAL 06-23-15
APPROVED

APPLICANT:
verizon wireless
777 YAMATO ROAD
SUITE 600
BOCA RATON, FL 33431

PREPARED BY:
EBI Consulting
environmental | engineering | due diligence
21 B Street | Burlington, MA 01803
Tel: (781) 273-2500 | Fax: (781) 273-3311
www.ebiconsulting.com

MARIBEL DENTINGER
LICENSE No 57890
STATE OF FLORIDA
PROFESSIONAL ENGINEER

MARIBEL DENTINGER
LICENSE NO. 57890

ENGINEER STAMP/SIGNATURE

SUBMITTALS

NO.	DATE	DESCRIPTION	BY
A	11/13/14	90% CONSTRUCTION	AMF
B	01/05/15	REVISED PER NEW RFDS	KO
C	01/20/15	REVISED PER COMMENTS	LF
D	01/28/15	REVISED PER COMMENTS	LF

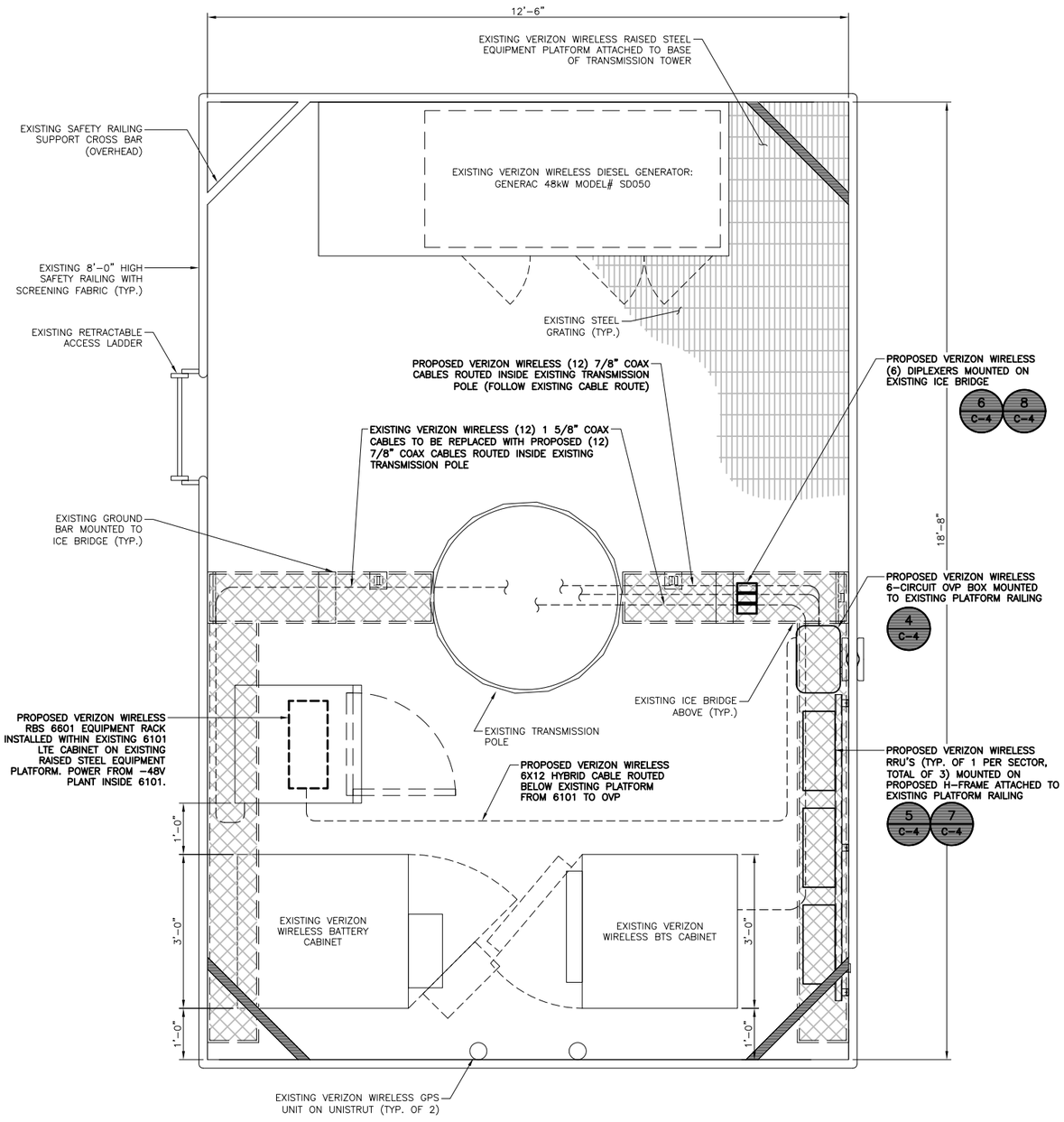
EBI JOB NO: 81140922

SITE INFO:
FPL COCONUT CREEK
61005
4001 LYONS ROAD
POMPANO BEACH, FL 33073

SHEET TITLE:
TITLE SHEET

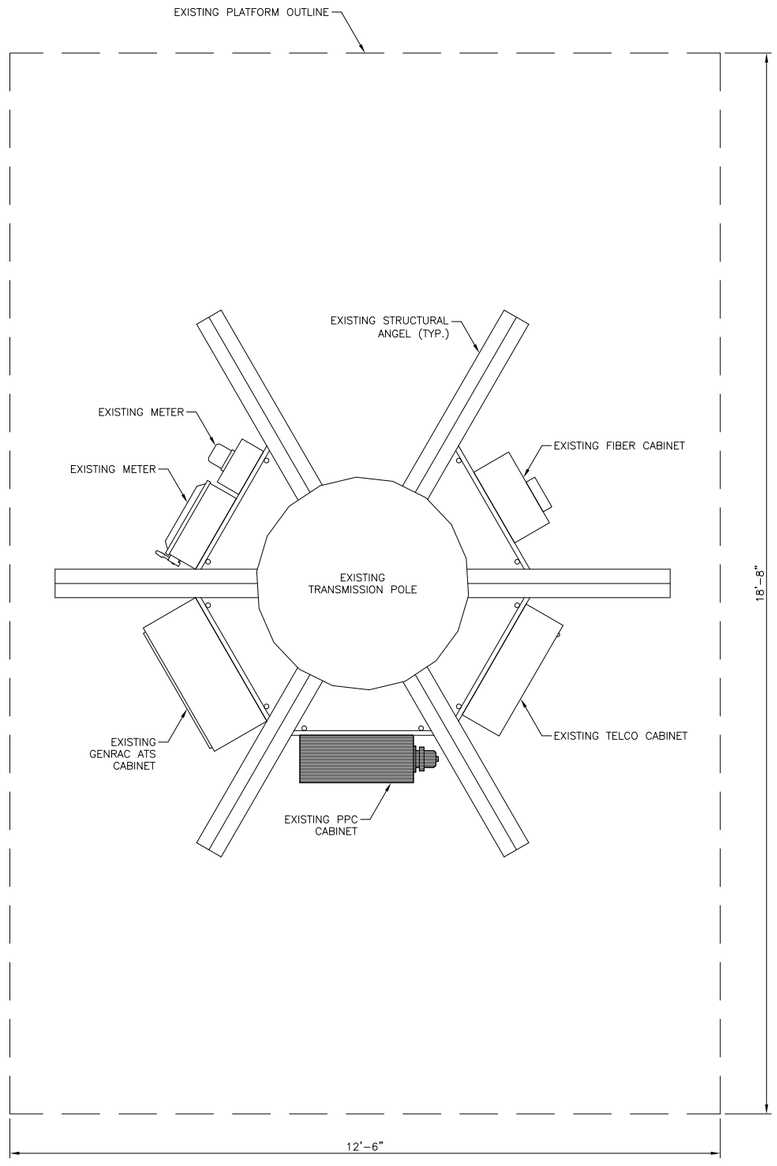
DRAWN BY: AMF
CHECKED BY: EG
DATE: 11/13/14

SHEET NO: T-1



APPROX. NORTH

1 | EQUIPMENT PLATFORM PLAN | 11x17 SCALE: 3/8" = 1'-0" 22x34 SCALE: 3/4" = 1'-0"



APPROX. NORTH

2 | EQUIPMENT BELOW PLATFORM PLAN | 11x17 SCALE: 3/8" = 1'-0" 22x34 SCALE: 3/4" = 1'-0"

APPLICANT:
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Maribel Dentinger

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D	01/28/15	REVISED PER COMMENTS	LF

EBI JOB NO:
81140922

SITE INFO:
FPL COCONUT CREEK
61005
4001 LYONS ROAD
POMPANO BEACH, FL 33073

SHEET TITLE:
EQUIPMENT PLATFORM PLAN

DRAWN BY: AMF
CHECKED BY: EG
DATE: 11/13/14

SHEET NO:
C-1

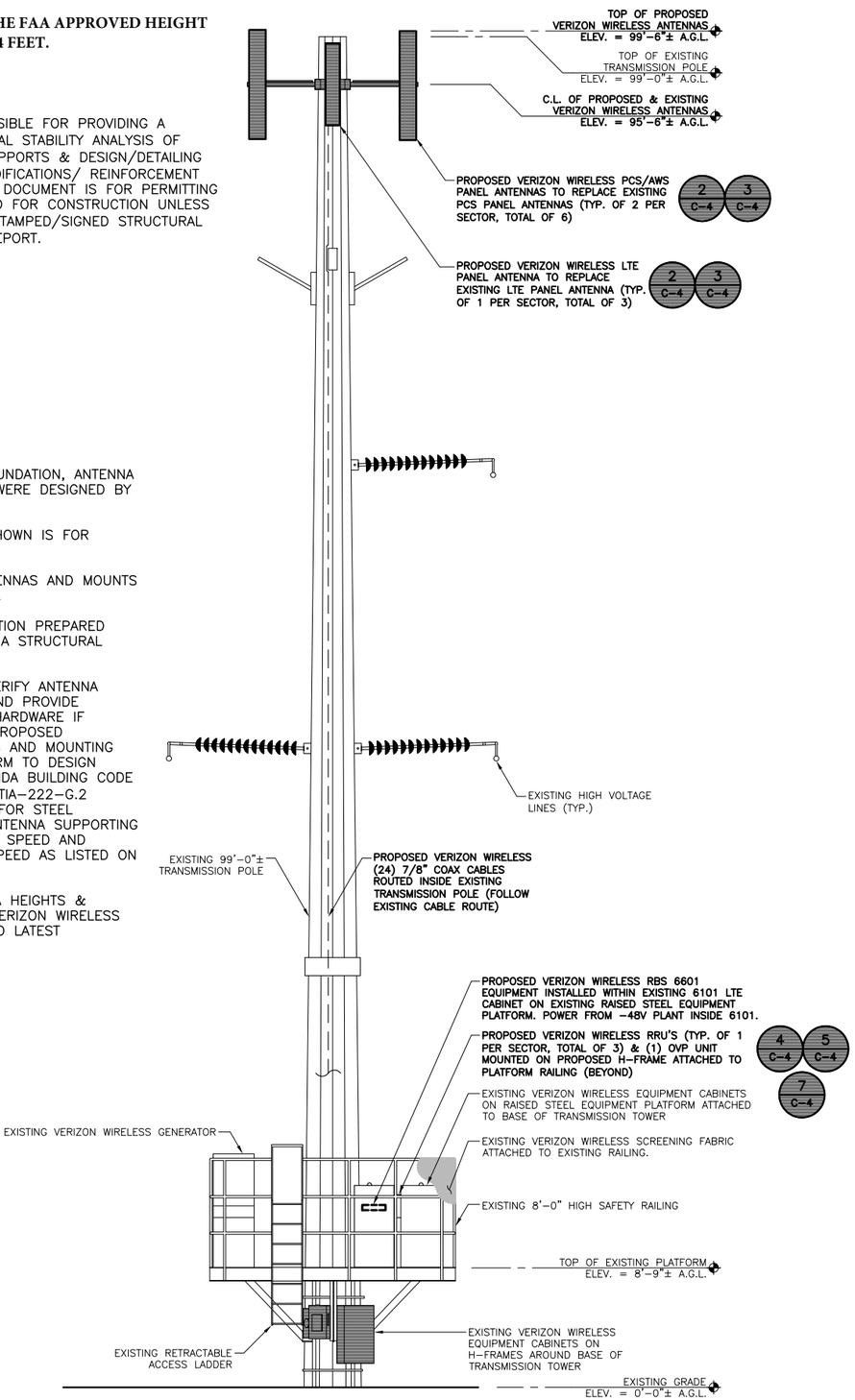
REGULATORY NOTE: THE FAA APPROVED HEIGHT FOR THIS TOWER IS 104 FEET.

STRUCTURAL NOTE:

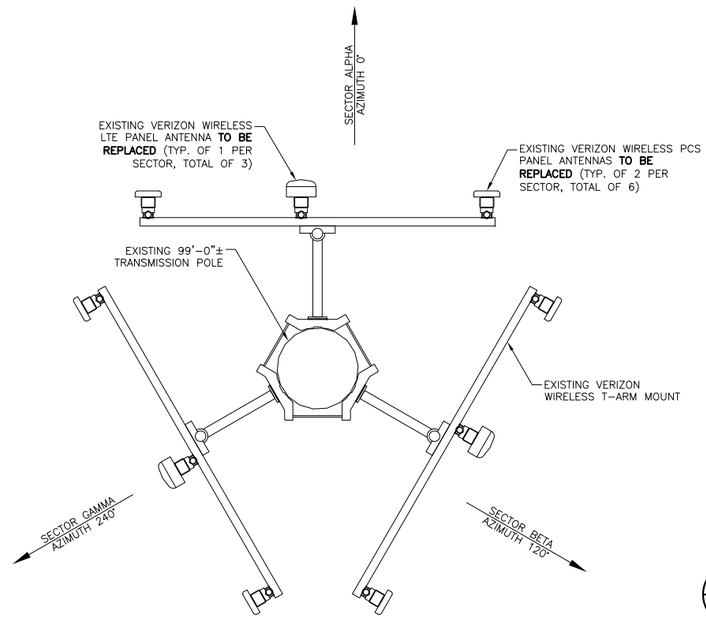
1. PROJECT OWNER RESPONSIBLE FOR PROVIDING A GLOBAL/LOCAL STRUCTURAL STABILITY ANALYSIS OF EQUIPMENT ANCHORS, SUPPORTS & DESIGN/DETAILING OF ANY STRUCTURAL MODIFICATIONS/ REINFORCEMENT REQUIRED THERETO. THIS DOCUMENT IS FOR PERMITTING ONLY & IS NOT INTENDED FOR CONSTRUCTION UNLESS ACCOMPANIED BY A PE STAMPED/SIGNED STRUCTURAL ASSESSMENT/ANALYSIS REPORT.

TOWER NOTES:

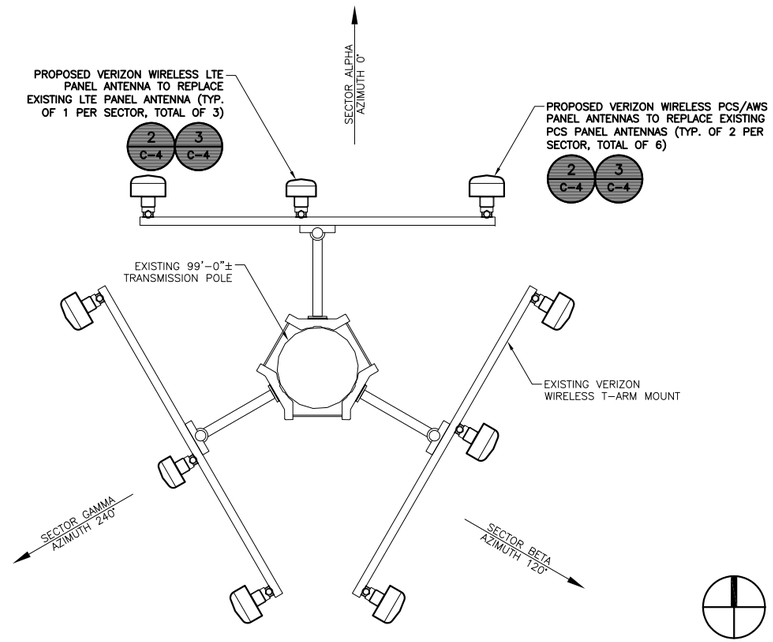
1. THE EXISTING TOWER, FOUNDATION, ANTENNA MOUNTS AND ANTENNAS WERE DESIGNED BY OTHERS.
2. THE TOWER ELEVATION SHOWN IS FOR REFERENCE ONLY.
3. ADDITIONAL EXISTING ANTENNAS AND MOUNTS NOT SHOWN FOR CLARITY.
4. EXISTING TOWER INFORMATION PREPARED WITHOUT THE REVIEW OF A STRUCTURAL ANALYSIS.
5. CONTRACTOR TO FIELD VERIFY ANTENNA MOUNT CONFIGURATION AND PROVIDE MOUNTS OR ADDITIONAL HARDWARE IF REQUIRED TO SUPPORT PROPOSED ANTENNAS. ALL ANTENNAS AND MOUNTING HARDWARE SHALL CONFORM TO DESIGN REQUIREMENTS PER FLORIDA BUILDING CODE (2010 EDITION) AND EIA/TIA-222-G.2 STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES, BASIC WIND SPEED AND ULTIMATE DESIGN WIND SPEED AS LISTED ON SHEET T-1.
6. TOWER HEIGHTS, ANTENNA HEIGHTS & AZIMUTHS TAKEN FROM VERIZON WIRELESS RF SITE DESIGN DATA AND LATEST CONSTRUCTION DRAWINGS.



1	TOWER ELEVATION	11x17 SCALE: 3/32" = 1'-0" 22x34 SCALE: 3/16" = 1'-0"



2	EXISTING ANTENNA ORIENTATION	11x17 SCALE: 3/16" = 1'-0" 22x34 SCALE: 3/8" = 1'-0"



3	PROPOSED ANTENNA ORIENTATION	11x17 SCALE: 3/16" = 1'-0" 22x34 SCALE: 1/2" = 1'-0"

APPLICANT:

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D	01/28/15	REVISED PER COMMENTS	LF

EBI JOB NO:

81140922

SITE INFO:

FPL COCONUT CREEK
61005
4001 LYONS ROAD
POMPANO BEACH, FL 33073

SHEET TITLE:

TOWER ELEVATION AND ANTENNA ORIENTATIONS

DRAWN BY: AMF
CHECKED BY: EG
DATE: 11/13/14

SHEET NO:

C-2

CURRENT CONFIGURATION	FPL Coconut Creek 148031

RF ENGINEERING ANTENNA SPECIFICATION SHEET

CELLULAR 800 MHz ANTENNA CONFIGURATIONS				
No CDMA Service		ALPHA	BETA	GAMMA
Antenna Quantity				
Antenna Model				
Antenna Orientation				
Antenna Centerline (feet AGL)				
Mechanical Down-Tilt (Deg.)				
Diplexed Antenna				
Diplexer Model	Qty:			
TMA Model	Qty:			
Coaxial Type				
Coaxial Quantity				
Cell Site Number & PNs				

PCS 1900MHz ANTENNA CONFIGURATIONS				
SCOPE OF WORK- 1900 Mhz		ALPHA	BETA	GAMMA
Antenna Quantity		2	2	2
Antenna Model		LPA-180080-12CF 2°	LPA-180080-12CF 2°	LPA-180080-12CF 2°
Antenna Orientation		0	120	240
Antenna Centerline (feet AGL)		95.5	95.5	95.5
Mechanical Down-Tilt (Deg.)		0	0	0
Diplexed Antenna				
Diplexer Model	Qty:			
TMA Model	Qty:			
Coaxial Type		1 5/8 "	1 5/8 "	1 5/8 "
Coaxial Quantity		2	2	2
PCS Site Number & PNs	31			

LTE 700MHz ANTENNA CONFIGURATIONS				
SCOPE OF WORK-700 Mhz		ALPHA	BETA	GAMMA
Antenna Quantity		1	1	1
Antenna Model		X7-665-2	X7-665-2	X7-665-2
Antenna Orientation		0	120	240
Antenna Centerline (feet AGL)		95.5	95.5	95.5
Mechanical Down-Tilt (Deg.)		0	0	0
Diplexed Antenna				
Diplexer Model	Qty:			
TMA Model	Qty:			
Coaxial Type		1 5/8 "	1 5/8 "	1 5/8 "
Coaxial Quantity		2	2	2
DUL Quantity	Qty:			
LTE Site Number & PNs	148031			

LTE 2100MHz (AWS) ANTENNA CONFIGURATIONS				
No AWS Service		ALPHA	BETA	GAMMA
Antenna Quantity				
Antenna Model				
Antenna Orientation				
Antenna Centerline (feet AGL)				
Mechanical Down-Tilt (Deg.)				
Diplexed Antenna				
Diplexer Model	Qty:			
TMA Model	Qty:			
Coaxial Type				
Coaxial Quantity				
DUL Quantity	Qty:			
AWS Site Number & PNs				

TECH TYPE: 700/1900
ANTENNA:
COAX:
DIPLEXER:
COMMENTS:

EQUIPMENT SUMMARY				
Total Number of Antennas:	0	CELLULAR (850MHz)	Total Number of Coaxial:	0
Total Number of Antennas:	6	PCS (1900MHz)	Total Number of Coaxial:	6
Total Number of Antennas:	3	LTE (700MHz)	Total Number of Coaxial:	6
Total Number of Antennas:	0	AWS (2100MHz)	Total Number of Coaxial:	0
TOTAL ANTENNA COUNT:	9	TOTAL	TOTAL COAXIAL COUNT:	12
Cellular Diplexed:	0	CELLULAR (850MHz)	Cellular Coaxial Size:	0
PCS Diplexed:	0	PCS (1900MHz)	PCS Coaxial Size:	1 5/8 "
LTE Diplexed:	0	LTE (700MHz)	LTE Coaxial Size:	1 5/8 "
AWS Diplexed:	0	AWS (2100MHz)	AWS Coaxial Size:	0
TOTAL DIPLEXER COUNT:	0	*COMBINER SET NEEDED AT BTS:*		N/A
TOTAL DUL COUNT	0			
TOTAL TMA COUNT	0			

1 **EXISTING ANTENNA RF DATA**

PROPOSED CONFIGURATION	148031

RF ENGINEERING ANTENNA SPECIFICATION SHEET

CELLULAR 800 MHz ANTENNA CONFIGURATIONS				
No CDMA Service		ALPHA	BETA	GAMMA
Antenna Quantity				
Antenna Model				
Antenna Orientation				
Antenna Centerline (feet AGL)				
Mechanical Down-Tilt (Deg.)				
Diplexed Antenna				
Diplexer Model	Qty:			
TMA Model	Qty:			
Coaxial Type				
Coaxial Quantity				
Cell Site Number & PNs				

PCS 1900MHz ANTENNA CONFIGURATIONS				
No PCS Service		ALPHA	BETA	GAMMA
Antenna Quantity		1	1	1
Antenna Model		CSS X7CQAP-665-VR0	CSS X7CQAP-665-VR0	CSS X7CQAP-665-VR0
Antenna Orientation		0	120	240
Antenna Centerline (feet AGL)		95.5	95.5	95.5
Starting Electrical Down-Tilt (Deg.)		2	2	2
Diplexed Antenna		YES, 6 DBC-Aps	YES, 6 DBC-Aps	YES, 6 DBC-Aps
Diplexer Model	Qty:	YES, 6 DBC-Aps	YES, 6 DBC-Aps	YES, 6 DBC-Aps
TMA Model	Qty:			
Coaxial Type		7/8 "	7/8 "	7/8 "
Coaxial Quantity		2	2	2
PCS Site Number & PNs	31			

LTE 700MHz ANTENNA CONFIGURATIONS				
New Service - New Antennas (Like-for-Like)		ALPHA	BETA	GAMMA
Antenna Quantity		1	1	1
Antenna Model		CSS X7C-665-4	CSS X7C-665-4	CSS X7C-665-4
Antenna Orientation		0	120	240
Antenna Centerline (feet AGL)		95.5	95.5	95.5
Starting Electrical Down-Tilt (Deg.)		4	4	4
Diplexed Antenna		NO	NO	NO
Diplexer Model	Qty:	NO	NO	NO
TMA Model	Qty:			
Coaxial Type		7/8 "	7/8 "	7/8 "
Coaxial Quantity		4	4	4
DUL Quantity	Qty:			
LTE Site Number & PNs	148031			

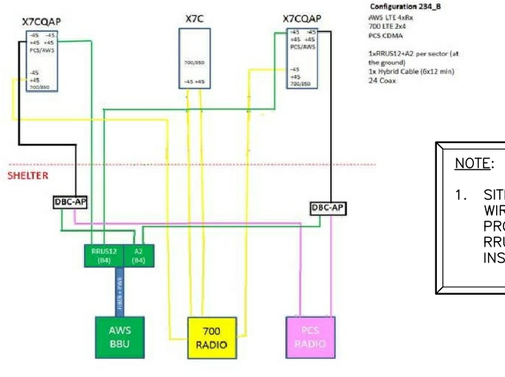
LTE 2100MHz (AWS) ANTENNA CONFIGURATIONS				
New Service - New Antennas (Like-for-Like)		ALPHA	BETA	GAMMA
Antenna Quantity		1	1	1
Antenna Model		CSS X7CQAP-665-VR0	CSS X7CQAP-665-VR0	CSS X7CQAP-665-VR0
Antenna Orientation		0	120	240
Antenna Centerline (feet AGL)		95.5	95.5	95.5
Starting Electrical Down-Tilt (Deg.)		4	4	4
Diplexed Antenna		YES, 6 DBC-Aps	YES, 6 DBC-Aps	YES, 6 DBC-Aps
Diplexer Model	Qty:	YES, 6 DBC-Aps	YES, 6 DBC-Aps	YES, 6 DBC-Aps
TMA Model	Qty:			
Coaxial Type		7/8" and Hybrid Cable & Jumpers	7/8" and Hybrid Cable & Jumpers	7/8" and Hybrid Cable & Jumpers
Coaxial Quantity		2	2	2
DUL Quantity	Qty:			
AWS Site Number & PNs	148031			

TECH TYPE: 700/2100
ANTENNA: Add X7CQAP Model RET Antennas for LTE/AWS. X7C Model RET Antennas for LTE.
COAX: 24 Coax Lines total
DIPLEXER: No, Smart Bias-T's needed for LTE(refer to Maintenance Eng Guide for details).
COMMENTS: Note starting electrical downtilt values for RET antennas (instead of the mechanical downtilt). BBU (ground) and RRUW2 (ground mounted) for AWS.

EQUIPMENT SUMMARY				
Total Number of Antennas:	0	CELLULAR (850MHz)	Total Number of Coaxial:	0
Total Number of Antennas:	3	PCS (1900MHz)	Total Number of Coaxial:	6
Total Number of Antennas:	3	LTE (700MHz)	Total Number of Coaxial:	12
Total Number of Antennas:	3	AWS (2100MHz)	Total Number of Coaxial:	6
TOTAL ANTENNA COUNT:	9	TOTAL	TOTAL COAXIAL COUNT:	24
Cellular Diplexed:	0	CELLULAR (850MHz)	Cellular Coaxial Size:	0
PCS Diplexed:	YES, 6 DBC-Aps	PCS (1900MHz)	PCS Coaxial Size:	7/8 "
LTE Diplexed:	0	LTE (700MHz)	LTE Coaxial Size:	7/8 "
AWS Diplexed:	YES, 6 DBC-Aps	AWS (2100MHz)	AWS Coaxial Size:	7/8" and Hybrid Cable & Jumpers
TOTAL DIPLEXER COUNT:	0	*COMBINER SET NEEDED AT BTS:*		N/A

2 **PROPOSED ANTENNA RF DATA**

ANTENNA LAYOUT	FPL Coconut Creek 148031
	Option 2348



NOTE:

1. SITE WAS VISITED WITH VERIZON WIRELESS CE TO CONFIRM PROPOSED EQUIPMENT LOCATION. RRU AND OVP EQUIPMENT TO BE INSTALLED AS SHOW ON PLAN.

3 **ANTENNA LAYOUT DIAGRAM**

PROPOSED CABLE SCHEDULE				
SECTOR	COLOR	SIZE/TYPE		LENGTH
		COAX	HYBRID	
ALPHA	RED	(8) 7/8"	(1) SHARED 6X12 CABLE	120'
BETA	BLUE	(8) 7/8"		120'
GAMMA	GREEN	(8) 7/8"		120'

4 **CABLE SCHEDULE**

APPLICANT:

verizon wireless
777 YAMATO ROAD
SUITE 600
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EBI JOB NO: 81140922

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SHEET TITLE:

RF DATA AND CABLE SCHEDULE

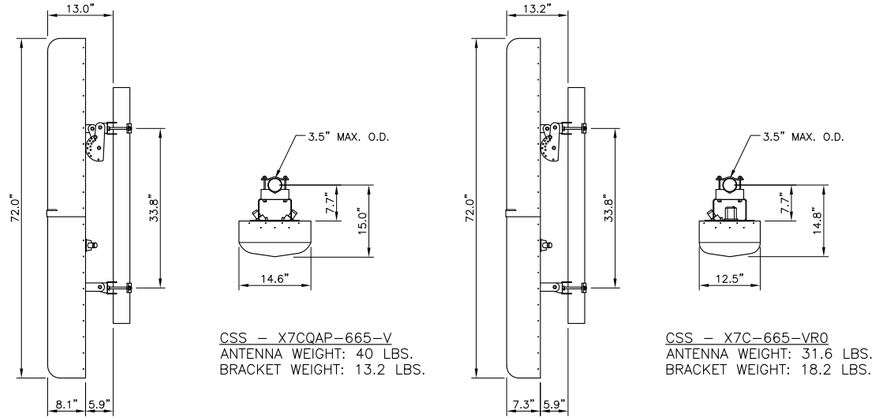
DRAWN BY: AMF
CHECKED BY: EG
DATE: 11/13/14

SHEET NO: C-3

GENERAL NOTES:

1. ALL WORK PRESENTED ON THESE DRAWINGS MUST BE COMPLETED BY THE CONTRACTOR UNLESS NOTED OTHERWISE. THE CONTRACTOR MUST HAVE CONSIDERABLE EXPERIENCE IN PERFORMANCE OF WORK SIMILAR TO THAT DESCRIBED HEREIN. BY ACCEPTANCE OF THIS ASSIGNMENT, THE CONTRACTOR IS ATTESTING THAT HE DOES HAVE SUFFICIENT EXPERIENCE AND ABILITY, THAT HE IS KNOWLEDGEABLE OF THE WORK TO BE PERFORMED AND THAT HE IS PROPERLY LICENSED, REGISTERED AND INSURED TO DO THIS WORK IN THE STATE AND/OR COUNTY IN WHICH IT IS TO BE PERFORMED.
2. ALL MATERIALS AND EQUIPMENT FURNISHED SHALL BE NEW AND OF GOOD QUALITY, FREE FROM FAULTS AND DEFECTS AND IN CONFORMANCE WITH THE CONTRACT DOCUMENTS. ANY AND ALL SUBSTITUTIONS MUST BE PROPERLY APPROVED AND AUTHORIZED IN WRITING BY VERIZON WIRELESS AND THE ENGINEER PRIOR TO INSTALLATION. THE CONTRACTOR SHALL FURNISH SATISFACTORY EVIDENCE AS TO THE KIND AND QUALITY OF THE MATERIALS AND EQUIPMENT BEING SUBSTITUTED.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK. THE CONTRACTOR IS RESPONSIBLE FOR INSURING THAT THIS PROJECT AND RELATED WORK COMPLIES WITH ALL APPLICABLE LOCAL, STATE AND FEDERAL SAFETY CODES AND REGULATIONS GOVERNING THIS WORK.
4. ALL DIMENSIONS SHALL BE VERIFIED WITH THE PLANS (LATEST REVISION) PRIOR TO COMMENCING CONSTRUCTION. NOTIFY VERIZON WIRELESS IMMEDIATELY IF DISCREPANCIES ARE DISCOVERED.
5. ALL MATERIALS AND WORKMANSHIP SHALL BE WARRANTED FOR ONE (1) YEAR FROM DATE OF ACCEPTANCE.

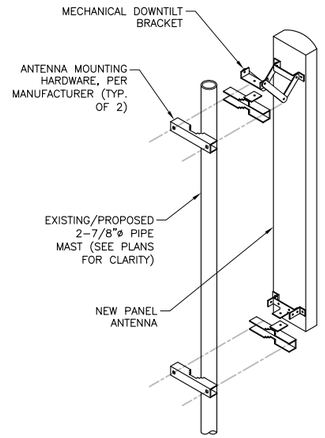
1 GENERAL NOTES



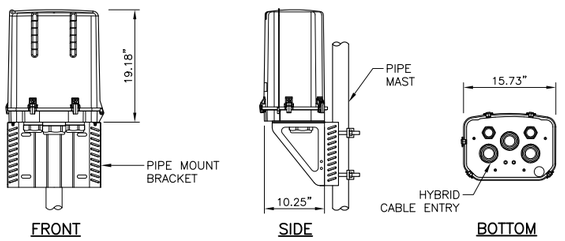
CSS – X7CQAP–665–V
ANTENNA WEIGHT: 40 LBS.
BRACKET WEIGHT: 13.2 LBS.

CSS – X7C–665–VR0
ANTENNA WEIGHT: 31.6 LBS.
BRACKET WEIGHT: 18.2 LBS.

2 ANTENNA SPECIFICATIONS N.T.S.



3 TYPICAL ANTENNA ATTACHMENT DETAIL N.T.S.

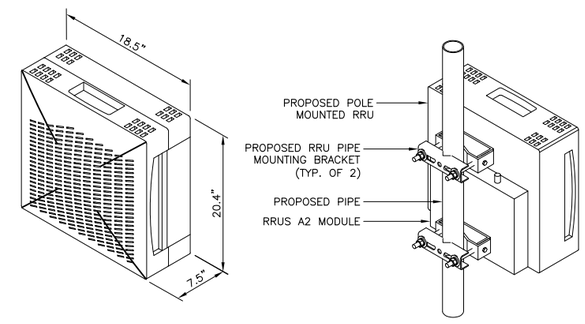


6–CIRCUIT TOWER TOP/BASE/ROOFTOP OVP BOX
MANUFACTURER: RAYCAP
MODEL NO.: RHSDC–3315–PF–48
WEIGHT: 32 LBS.

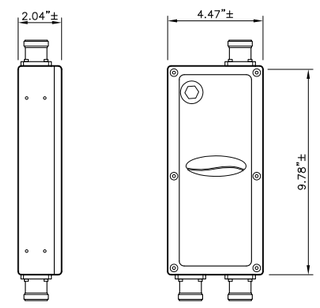
4 OVP BOX SPECIFICATION & DETAIL N.T.S.

ERICSSON RRUS–12 WITH A2 MODULE

RRUS–12:
–RRUS 12 DIMENSIONS (H x W x D): 19.7" x 17.0" x 7.2" (INCLUDES SUNSHIELD)
–WEIGHT: 51 LBS
–CLIMATE: –40°C TO +55°C (SELF CONVECTION SILENT, NO FANS, IP55)
–POWER CONSUMPTION: N/A
RRUS A2 MODULE:
–RRUS A2 MODULE DIMENSIONS (H x W x D): 12.8" x 15" x 3.5" (INCLUDES SUNSHIELD)
–WEIGHT: 15 LBS

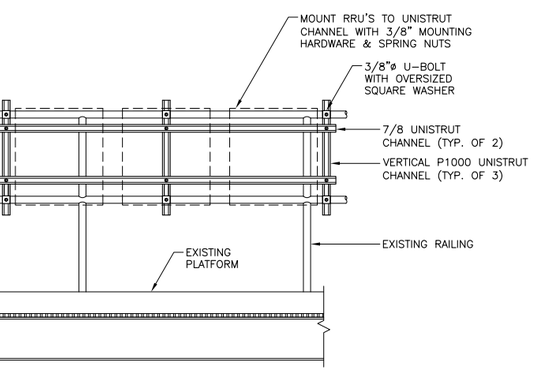


5 RRU SPECIFICATION & DETAIL N.T.S.

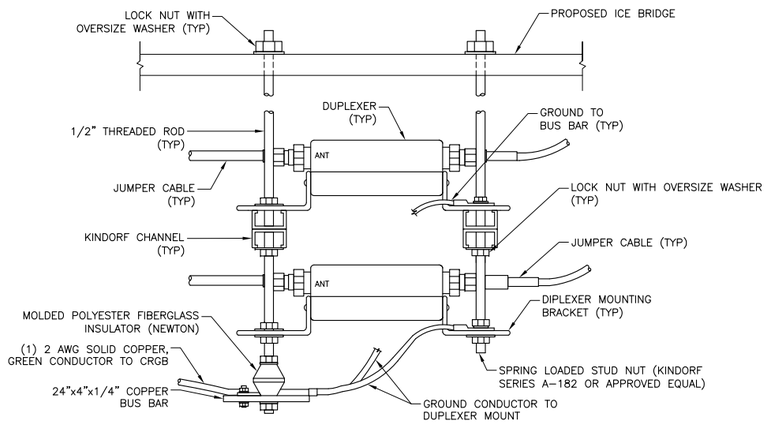


DBC–AP DUPLEXER
UNIT WEIGHT: ≈7 LBS.

6 DIPLEXER SPECIFICATIONS N.T.S.



7 H–FRAME & RRU MOUNTING DETAIL N.T.S.



8 DIPLEXER MOUNTING DETAIL N.T.S.

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PROFESSIONAL ENGINEER

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EBI JOB NO:
81140922

SITE INFO:
FPL COCONUT CREEK
61005
4001 LYONS ROAD
POMPANO BEACH, FL 33073

SHEET TITLE:
GENERAL NOTES AND DETAILS

DRAWN BY:	SHEET NO:
AMF	C-4
CHECKED BY: EG	
DATE: 11/13/14	

NOTES TO CONTRACTOR

1. ALL DRAWINGS SHALL BE READ IN CONJUNCTION WITH ARCHITECTURAL AND ENGINEERING DRAWINGS AND SPECIFICATIONS.

2. ALL ELECTRICAL WORK SHALL COMPLY WITH THE WIRELESS CARRIERS INSTALLATION GUIDE.

3. THE LOCATION OF EQUIPMENT, CONDUIT AND DEVICES SHOWN ON THE PLANS ARE DIAGRAMMATIC. EXACT LOCATION AND ROUTING SHALL BE DETERMINED BY THE CONTRACTOR IN THE FIELD PRIOR TO INSTALLATION WITH THE APPROVAL OF THE WIRELESS CARRIERS CONSTRUCTION MANAGER OR OTHERWISE BE REROUTED AT THE EXPENSES OF THE CONTRACTOR.

4. ELECTRICAL CHARACTERISTICS OF ALL EQUIPMENT (NEW AND EXISTING) SHALL BE FIELD VERIFIED WITH THE OWNER'S REPRESENTATIVE AND EQUIPMENT SUPPLIER PRIOR TO ROUGH–IN OF CONDUITS. ALL EQUIPMENT SHALL BE PROPERLY CONNECTED ACCORDING TO THE NAMEPLATE DATA FURNISHED ON THE EQUIPMENT (THE DESIGN OF THESE PLANS ARE BASED UPON BEST AVAILABLE INFORMATION AT THE TIME OF DESIGN DRAWINGS). LOCATION OF OUTLETS, BOXES, ETC. AND THE TYPE OF CONNECTION (PLUG OR DIRECT), SHALL BE CONFIRMED WITH THE OWNER'S REPRESENTATIVE PRIOR TO ROUGH–IN.

5. THE CONTRACTOR SHALL PERFORM IEEE 'THREE POINT FALL OF POTENTIAL' RESISTANCE TO EARTH TEST FOR GROUND ELECTRODE SYSTEM AT EXTERIOR LOCATED SITES. THE CONTRACTOR SHALL INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS. REFER TO THE WIRELESS CARRIERS INSTALLATION GUIDE FOR COMPLETE TESTING AND RECORDING REQUIREMENTS.

6. ELECTRICAL EQUIPMENT SHALL BE FIRMLY SECURED TO THE SURFACE ON WHICH IT IS MOUNTED.

7. COMMUNICATION EQUIPMENT AND RACEWAYS SHALL COMPLY WITH REQUIREMENTS OF NEC CHAPTER 8 AND ARTICLE 480 WHERE APPLICABLE.

ELECTRICAL SPECIFICATIONS

SECTION 16010 – GENERAL PROVISIONS

A. ALL APPLICABLE PROVISIONS OF DIVISION 01 GOVERN WORK UNDER THIS DIVISION. REFER TO THIS ARTICLE ON THE DRAWINGS FOR ADDITIONAL INFORMATION.

B. THIS CONTRACTOR SHALL GUARANTY FULLY ALL WORKMANSHIP, MATERIAL, EQUIPMENT, SYSTEMS, ETC., PROVIDED BY HIM FOR A PERIOD OF ONE YEAR AFTER SUBSTANTIAL COMPLETION OF THE PROJECT.

C. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE LATEST EDITIONS OF THE APPLICABLE STATE, NATIONAL AND LOCAL ORDINANCES, BUILDING CODES AND THE NATIONAL ELECTRIC CODE, AND THE TERMS AND THE CONDITIONS OF THE AUTHORITIES HAVING LAWFUL JURISDICTION PERTAINING TO THE WORK REQUIRED. ALL MODIFICATIONS REQUIRED BY THESE CODES, RULES, REGULATIONS, AND AUTHORITIES SHALL BE MADE BY THE CONTRACTOR WITHOUT ADDITIONAL CHARGE TO THE OWNER.

D. ALL MATERIALS, APPLIANCES, EQUIPMENT, OR DEVICES SHALL BE NEW AND SHALL BE SPECIFICATION GRADE AND LISTED, LABELED AND CERTIFIED BY UNDERWRITER'S LABORATORIES INC. FOR THE USE, ALL OUTDOOR ELECTRICAL ENCLOSURES SHALL BE WEATHERPROOF AND BE NEMA 250, TYPE 3R RATED, OR BETTER.

SECTION 16075 – ELECTRICAL IDENTIFICATION

A. PROVIDE AND INSTALL WARNING, CAUTION AND INSTRUCTION SIGNS WHERE REQUIRED TO COMPLY WITH N.E.C AND OSHA REGULATIONS AND WHERE NEEDED TO ENSURE SAFE OPERATION AND MAINTENANCE OF ELECTRICAL SYSTEMS AND OF ITEMS TO WHICH THEY CONNECT. ALL LABELS SHALL BE SUITABLE FOR EXTERIOR USE WHEN INSTALLED OUTDOORS.

B. ALL ELECTRICAL EQUIPMENT SHALL BE MARKED AND LABELED FOR IDENTIFICATION PURPOSES WITH PHENOLIC NAMEPLATES SIZED IN RELATION TO THE APPARATUS AND ATTACHED ON THE EXTERIOR SURFACES INDICATING THE EQUIPMENT DESIGNATION, OPERATING VOLTAGE AND THE SOURCE SUPPLYING THE EQUIPMENT. ENGRAVED LABEL SHALL BE PROVIDED ON THE WIRELESS CARRIERS METER SOCKET ENCLOSURE.

C. ALL CABLES OR CONDUCTORS SHALL BE IDENTIFIED WITH CIRCUIT IDENTIFICATION MARKERS IN EACH PULL BOX. J–BOXES, EQUIPMENT BOXES AND CABINETS WITH APPROVED PLASTIC TAGS OR APPROVED EQUAL.

D. ALL DIRECT BURIED CONDUITS SHALL BE PROVIDED WITH 6" WIDE 5 MIL THICK ALUMINIZED PLASTIC WARNING TAPE IDENTIFYING CONTENTS. TAPE COLORS SHALL BE ORANGE FOR TELEPHONE AND RED FOR ELECTRIC.

E. ALL LABELS AND PANEL DIRECTORIES SHALL BE TYPEWRITTEN, NOT HAND WRITTEN.

F. INSTALL LABEL ON EACH ACCESSIBLE SIDE OF ENERGIZED EQUIPMENT TO READ: MAINTAIN 30"(MIN)W X 36"D X 78"H CLEAR WORKING SPACE.

SECTION 16110 – RACEWAYS, BOXES AND FITTINGS

A. INSTALL ALL CONDUIT AS REQUIRED FOR THIS CONTRACT PER NEC BY TYPE AND USE, UNLESS NOTED OTHERWISE WITHIN THIS SPECIFICATION.

B. EXERCISE PARTICULAR CARE IN ROUTING AND GROUPING EXPOSED CONDUIT TO PRESENT NEAT AND WORKMANLIKE APPEARANCE WITH ALL LINES RUNNING PARALLEL WITH OR PERPENDICULAR TO SITE LINES AND EQUIPMENT.

C. CUT ALL CONDUITS WITH AN APPROVED CUTTING MACHINE AND REAM AFTER THREADING TO REMOVE ALL BURRS.

D. WHERE SIZE IS NOT SPECIFIED ON DRAWINGS, THE CONTRACTOR SHALL SIZE CONDUIT, JUNCTION BOX AND/OR PULL BOXES PER N.E.C BASED ON WIRING REQUIREMENT. THE CONTRACTOR SHALL PROVIDE PULL BOXES AND JUNCTION BOXES WHERE SHOWN ON THE DRAWINGS OR NOT SHOWN, AND AS REQUIRED BY N.E.C TO LIMITED BENDS IN CONDUITS TO AN EQUIVALENT OF (4) 90–DEGREE BENDS.

E. INSTALL FACTORY ELBOWS ON 2" AND ABOVE CONDUIT. FIELD BENDS AND OFFSETS SHALL BE MADE WITH AN APPROVED BENDING MACHINE. USE CONDUIT BODIES ASSEMBLY TO FACILITATE PULLING OF CONDUCTORS OR TO MAKE CHANGES IN CONDUIT DIRECTION TO AVOID CONFLICT IN CONFINED SPACE.

BURIED ELECTRICAL DUCTS SHALL USE SCHEDULE 80 RIGID PVC PLASTIC CONDUIT WITH WATERTIGHT JOINTS. ALL UNDERGROUND/BURIED 90° ELLS SHALL BE RIGID TYPE FITTINGS. USE RIGID GALVANIZED CONDUIT ELBOWS TO TRANSITION FROM PVC TO RIGID GALVANIZED STEEL CONDUIT INSTALLED FROM 18" BELOW GRADE AND ABOVE GRADE. ALL PVC CONDUITS BURIED LESS THAN 18" BELOW GRADE SHALL BE SCHEDULE 80.

EXPOSED OUTDOOR LOCATIONS SHALL USE RIGID GALVANIZED STEEL (RGS) CONDUIT, U.O.N, WITH THREADED OR RAIN TIGHT FITTINGS. EXPOSED THREADS SHALL BE PROTECTED WITH ZINC–RICH PAINT. USE SUN RESISTANT LIQUID TIGHT FLEXIBLE METALLIC CONDUIT AND WATERTIGHT CONNECTIONS WHERE REQUIRED TO MAKE FINAL CONNECTIONS TO EQUIPMENT IF IT IS NOT EXPOSED TO PHYSICAL DAMAGE, EXTREME HEAT OR COLD. ENSURE CONTINUITY OF THE BONDING AND GROUNDING SYSTEM WHEN CONDUITS TRANSITION TO NON METALLIC CONDUITS OR WHEN EXPANSION TYPE FITTINGS ARE USED.

DRY INTERIOR LOCATIONS SHALL BE ELECTRICAL METALLIC TUBING (EMT) WITH STEEL COMPRESSION TYPE FITTINGS. THE USE OF SET SCREW FITTING IS NOT PERMITTED – NO EXCEPTION.

PROVIDE INSULATED BUSHINGS TO PREVENT ABRASION OF WIRES AND DOUBLE LOCKNUTS ON CONDUITS ENTERING OR LEAVING JUNCTION BOXES, PULL BOXES, ELECTRICAL DEVICES AND EQUIPMENT CABINETS. EQUIP ALL RGS CONDUIT WITH GROUND BUSHINGS AND GROUND IT TO THE COMMON GROUNDING ELECTRODE SYSTEM.

AVOID CONDENSATION POCKETS IN INSTALLATIONS. KEEP CONDUIT, FITTINGS AND BOXES FREE FROM FOREIGN MATTER BEFORE, DURING AND AFTER INSTALLATION.

ALL CONDUITS, INCLUDING THOSE WITH NEW CABLES INSTALLED, SHALL HAVE A NYLON PULL ROPE INSTALLED TO FACILITATE FUTURE PULL.

F. THE MINIMUM SIZE OF CONDUIT SHALL BE 3/4".

SECTION 16120 – CONDUCTORS

ALL POWER WIRE SHALL BE TYPE THHN/THWN INSULATED SINGLE COPPER CONDUCTOR, RATED AT 600 VOLTS 90°C TO COMPLY WITH UL & NEMA WC 70. MINIMUM WIRE SIZE FOR CURRENTS UP TO 20 AMPERE SHALL BE #12 AWG. USE SOLID COPPER UP TO SIZE #10 AWG AND SMALLER; STRANDED COPPER FOR #8 AWG AND LARGER. USE OF ALUMINUM CONDUCTORS WILL NOT BE PERMITTED.

USE MANUFACTURER–APPROVED PULLING COMPOUND OR LUBRICANT WHERE NECESSARY; COMPOUND USED MUST NOT DETERIORATE CONDUCTOR OR INSULATION. DO NOT EXCEED MANUFACTURER'S RECOMMENDED MAXIMUM PULLING TENSIONS AND SIDEWALL PRESSURE VALUES.

USE PULLING MEANS; INCLUDING FISH TAPE, CABLE, ROPE, AND BASKET–WEAVE WIRE/CABLE GRIPS THAT WILL NOT DAMAGE CABLES OR RACEWAY.

CONDUCTOR LENGTHS SHALL BE CONTINUOUS FROM TERMINATION TO TERMINATION WITHOUT SPLICES AS MUCH AS POSSIBLE. SPLICES, JOINTS AND CONNECTIONS IN CABLE SHALL BE MADE ONLY IN PULL BOXES, JUNCTION BOXES OR MANHOLES. CABLE SHALL BE LOOPED IN ALL JUNCTION BOXES AND PULL BOXES, AND RACKED IN MANHOLES.

TIGHTEN ELECTRICAL CONNECTORS AND TERMINALS ACCORDING TO MANUFACTURER'S PUBLISHED TORQUE–TIGHTENING VALUES. IF MANUFACTURER'S TORQUE VALUES ARE NOT INDICATED, USE THOSE SPECIFIED IN UL 486A AND UL 486B.

CONNECTORS AND LUGS FOR COPPER CONDUCTORS #8 AND SMALLER: 3M SCOTCHLOK SERIES 61 SNAP SPADE, OR ACCEPTABLE EQUAL OR T & B STA–KON COMPRESSION OR INDENT TYPE CONNECTORS WITH INTEGRAL OR SEPARATE INSULATING CAPS. FOR COPPER CONDUCTORS LARGER THAN #8: SOLDERLESS, INDENT, HEX SCREW OR BOLT TYPE PRESSURE CONNECTORS, PROPERLY TAPED OR INSULATED.

PROVIDE ADEQUATE LENGTH OF CONDUCTORS WITHIN ELECTRICAL ENCLOSURES AND TRAIN THE CONDUCTORS TO TERMINATION POINTS WITH NO EXCESS. MAKE TERMINATIONS SO THERE IS NO BARE CONDUCTOR AT THE TERMINAL.

COLOR CODE, PHASE, NEUTRAL, AND GROUND CONDUCTORS COLOR–CODED IN ACCORDANCE WITH NEC. IDENTIFY ALL CONDUCTORS OF THE SAME PHASE CONDUCTOR TO THE SAME COLOR CODE. SUGGESTED COLOR CODING FOR 120/208V, SHOULD BE BLACK, RED, BLUE, WHITE, AND 277/480V, SHOULD BE BROWN, ORANGE, YELLOW, GRAY WITH GREEN FOR ALL EQUIPMENT GROUND CONDUCTORS.

EACH CONDUIT OR RACEWAY THAT HAS A PHASE CONDUCTOR SHALL ALSO CONTAIN A GREEN INSULATED GROUNDING CONDUCTOR SIZED PER N.E.C, UNLESS OTHERWISE INDICATED.

AFTER THE ELECTRICAL EQUIPMENT AND THE WIRING IS INSTALLED, BUT BEFORE ELECTRICAL CONNECTIONS TO EQUIPMENT, TEST PHASE–TO–PHASE AND PHASE–TO–GROUND INSULATION ON SERVICE ENTRANCE AND FEEDERS TO ENSURE THAT THEY HAVE THE PROPER INSULATION AND ARE FREE OF GROUND FAULT. SYSTEMS RATED ABOVE 250 VOLTS SHALL BE TESTED WITH A 1000 VOLT MEGGER. CIRCUITS RATED AT OR BELOW 250 VOLTS SHALL BE TESTED WITH A 500 VOLT MEGGER.

CORRECT MALFUNCTIONING CONDUCTORS AND CABLES, WHERE POSSIBLE, AND RETEST TO DEMONSTRATE COMPLIANCE; OTHERWISE, REMOVE AND REPLACE WITH NEW UNITS AND RETEST AS SPECIFIED. PER NEC770.3(A), THE REQUIREMENTS OF 300.21 FOR ELECTRICAL INSTALLATIONS SHALL ALSO APPLY TO INSTALLATIONS OF OPTICAL FIBER CABLES AND RACEWAYS. THE ACCESSIBLE PORTION OF ABANDONED OPTICAL FIBER CABLES SHALL BE REMOVED.

ELECTRICAL LEGEND

SYMBOLS

	CONDUIT TURNING UP
	CONDUIT TURNING DOWN
	CONDUIT RUN UNDERGROUND
	CONDUIT RUN ABOVE GROUND
	5/8" x 10'–0" COPPER CLAD GROUND ROD
	5/8" x 10'–0" COPPER CLAD GROUND ROD WITH TEST WELL
	EXOTHERMIC TYPE CONNECTION
	COMPRESSION TYPE CONNECTION
G	GROUND RING. #2 AWG SOLID TINNED BARE COPPER GROUND CONDUCTOR 6" BELOW FROST LINE AND 24" OFF CONCRETE PLATFORM
XXX / XXX	REPRESENTS DETAIL NUMBER REF. DRAWINGS NUMBER
XXX	DETAIL NUMBER
G	GROUNDING ELECTRODE

ABBREVIATIONS

AWG	AMERICAN WIRE GAUGE
BTCW	BARE TINNED COPPER WIRE
BTS	BASE TRANSMISSION
CIGBE	COPPER ISOLATED GROUND BAR EXTERNAL
DWG	DRAWINGS
EIGB	EQUIPMENT ISOLATED GROUND BAR
EMT	ELECTRICAL METALLIC TUBING
GEN	GENERATOR
GPS	GLOBAL POSITIONING SYSTEM
IGR	INTERIOR GROUND RING (HALO)
LAGB	LOWER ANTENNA COPPER GROUND BAR
MGB	MASTER ISOLATED GROUND BAR
PPC	POWER PROTECTION CABINET
RGS	RIGID GALVANIZED STEEL
RWY	RACEWAY
TYP	TYPICAL
(E)	EXISTING
(P)	PROPOSED

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A	11/13/14	90% CONSTRUCTION	AMF
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EBI JOB NO: 81140922

SITE INFO:

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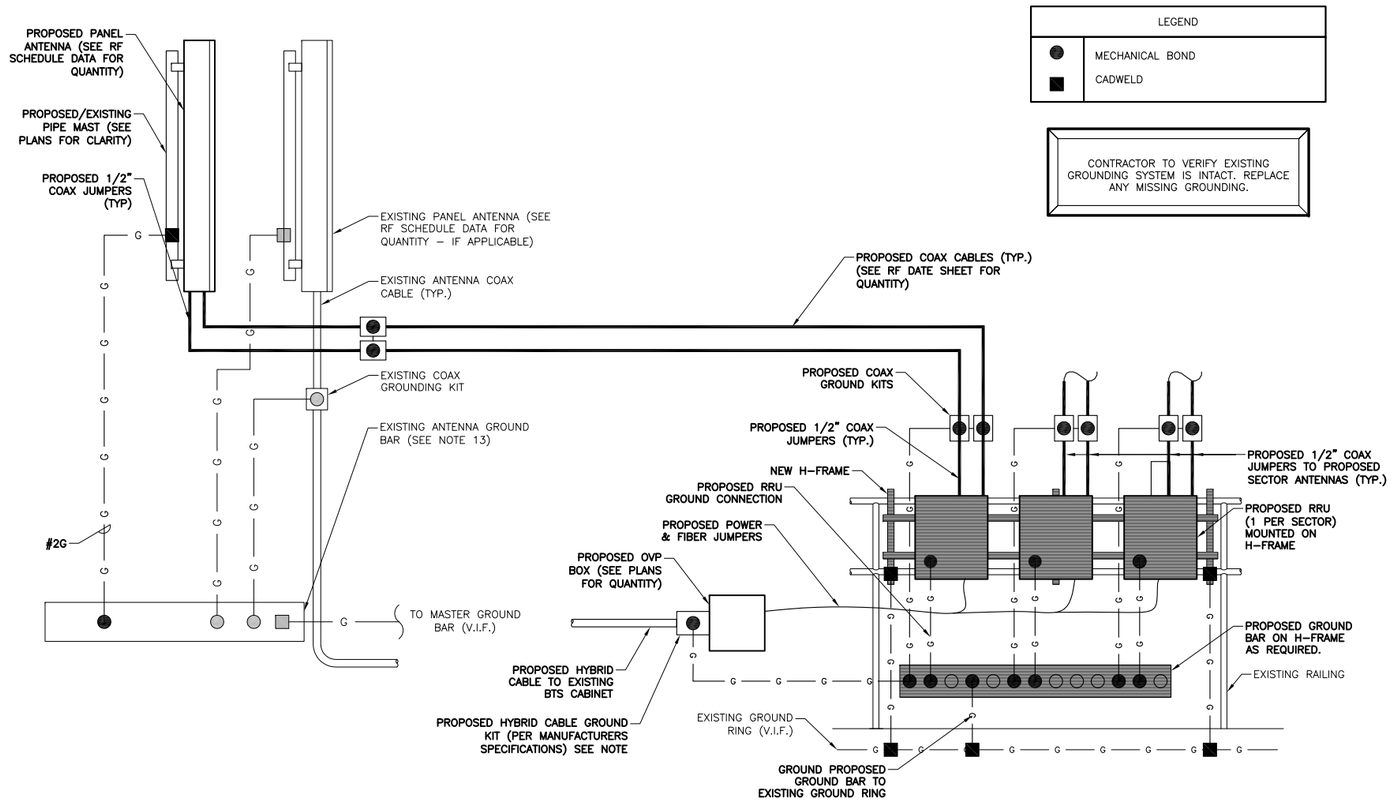
61005
4001 LYONS ROAD
POMPANO BEACH, FL 33073

SHEET TITLE:

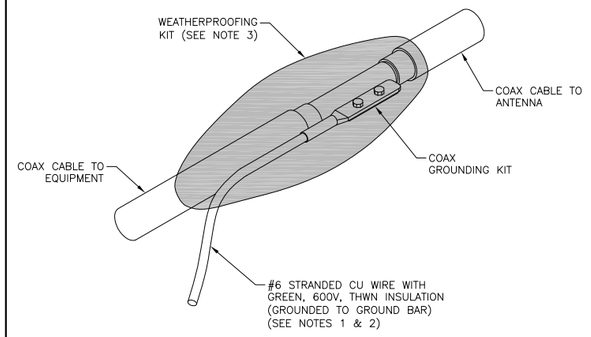
ELECTRICAL NOTES

DRAWN BY: AMF
CHECKED BY: EG
DATE: 11/13/14

SHEET NO: E-1



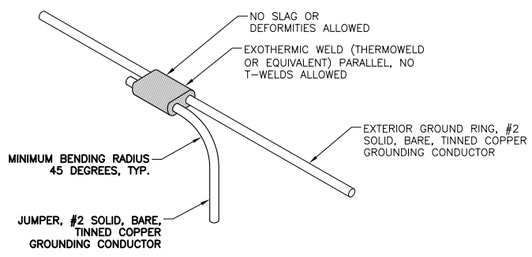
1 **GROUNDING SCHEMATIC** N.T.S.



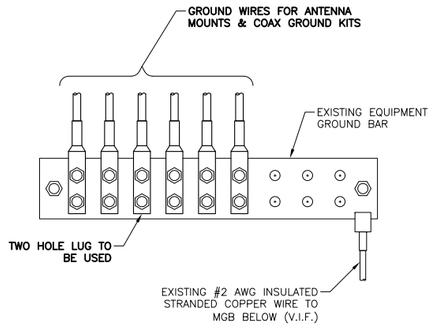
NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND & ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.
2. GROUNDING KIT SHALL BE TYPE & PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.
3. WEATHERPROOFING SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.

2 **COAX CABLE GROUND DETAIL**



3 **EXOTHERMIC WELD DETAIL**



4 **EQUIPMENT GROUND BAR (EGB) DETAIL**

1. ALL GROUND WIRES SHALL BE BARE #2 AWG BCW UNLESS NOTED OTHERWISE.
2. ALL GROUND WIRES SHALL PROVIDE A STRAIGHT, DOWNWARD PATH TO GROUND WITH GRADUAL BENDS AS REQUIRED. GROUND WIRES SHALL NOT BE LOOPED OR SHARPLY BENT.
3. ELECTRICAL CONTRACTOR SHALL COORDINATE INSTALLATION OF GROUND RODS AND GROUND RING WITH FOUNDATION AND UNDERGROUND CONDUIT.
4. EACH EQUIPMENT CABINET SHALL BE CONNECTED TO THE MASTER ISOLATION GROUND BAR (MGB) WITH #2 AWG INSULATED STRANDED COPPER WIRE. EQUIPMENT CABINETS SHALL HAVE (2) CONNECTIONS.
5. PROVIDE DEDICATED #2 AWG COPPER GROUND WIRE FROM EACH ANTENNA MOUNTING PIPE TO ASSOCIATED CIGBE.
6. THE CONTRACTOR SHALL VERIFY THAT THE EXISTING GROUND BARS HAVE ENOUGH SPACE/HOLES FOR ADDITIONAL TWO HOLE LUGS.
7. ALL CONDUITS SHALL BE RIGID GALVANIZED STEEL AND SHALL BE PROVIDED WITH GROUNDING BUSHINGS.
8. PROVIDE GROUND CONNECTIONS FOR ALL METALLIC STRUCTURES, ENCLOSURES, RACEWAYS AND OTHER CONDUCTIVE ITEMS ASSOCIATED WITH THE INSTALLATION OF CARRIER'S EQUIPMENT.
9. WHEN CABLE LENGTH IS OVER 20', THE MANUFACTURERS GROUND KIT MUST BE INSTALLED PER THE MANUFACTURERS SPECIFICATIONS.
10. GROUND SYSTEM SHALL BE TESTED AND SHALL HAVE A RESISTANCE OF 5 OHMS OR LESS.
11. CONTRACTOR SHALL USE THE EXISTING GROUND BARS ALREADY INSTALLED ON SITE UNLESS OTHERWISE NOTED.
12. GROUND NEW EQUIPMENT PER MANUFACTURERS SPECIFICATIONS.
13. THE CONTRACTOR SHALL VERIFY THAT THE EXISTING GROUND BARS HAVE ENOUGH SPACE/HOLES FOR ADDITIONAL TWO HOLE LUGS. INSTALL ADDITIONAL GROUND BARS AS REQUIRED.

5 **GROUNDING NOTES**

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SHEET TITLE:
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DRAWN BY: AMF
CHECKED BY: EG
DATE: 11/13/14

SHEET NO: E-2