

PROJECT SPECIFICATIONS

REFERENCE STANDARDS

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)  
 NFPA 70, NATIONAL ELECTRICAL CODE (NEC).  
 NFPA 79, INDUSTRIAL CONTROL EQUIPMENT.  
 UL 508 – INDUSTRIAL CONTROL EQUIPMENT – FOR CUSTOM FABRICATED EQUIPMENT

GENERAL

ALL INSTRUMENTATION AND ELECTRONIC EQUIPMENT SHALL BE OF THE MANUFACTURER'S LATEST DESIGN, UTILIZING PRINTED CIRCUITRY AND EPOXY OR EQUAL COATING TO PREVENT CONTAMINATION BY DUST, MOISTURE AND FUNGUS. THE FIELD MOUNTED EQUIPMENT AND SYSTEM COMPONENTS SHALL BE DESIGNED FOR INSTALLATION IN DUSTY, HUMID AND SLIGHTLY CORROSIVE SERVICE CONDITIONS.

ALL EQUIPMENT, CABINETS AND DEVICES FURNISHED SHALL BE HEAVY DUTY TYPE, DESIGNED FOR CONTINUOUS INDUSTRIAL SERVICE. THE SYSTEM SHALL CONTAIN SIMILAR PRODUCTS OF A SINGLE MANUFACTURER, AND SHALL CONSIST OF EQUIPMENT MODELS, WHICH ARE CURRENTLY IN PRODUCTION. ALL EQUIPMENT PROVIDED SHALL BE OF MODULAR CONSTRUCTION AND SHALL BE CAPABLE OF FIELD EXPANSION.

ALL SWITCHES SHALL HAVE DOUBLE POLE, DOUBLE THROW CONTACTS RATED AT A MINIMUM OF 600 VA, UNLESS NOTED OTHERWISE.

SWITCHES AND/OR SIGNALS INDICATING AN ALARM, FAILURE OR UPSET CONDITION SHALL BE WIRED IN A FAIL-SAFE MANNER. A FAIL-SAFE CONDITION IS AN OPEN CIRCUIT WHEN IN AN ALARM STATE.

MATERIALS AND EQUIPMENT SHALL BE UL APPROVED WHENEVER SUCH APPROVED EQUIPMENT AND MATERIALS ARE AVAILABLE.

ELECTRICAL SURGE PROTECTION

SURGE PROTECTION SHALL BE PROVIDED TO PROTECT THE ELECTRONIC INSTRUMENTATION SYSTEM FROM INDUCED SURGES PROPAGATING ALONG THE SIGNAL AND POWER SUPPLY LINES FROM LIGHTNING OR THE UTILITY SYSTEM. THE PROTECTION SYSTEMS SHALL BE SUCH THAT THE PROTECTIVE LEVEL SHALL NOT INTERFERE WITH NORMAL OPERATION, BUT SHALL BE LOWER THAN THE INSTRUMENT SURGE WITHSTAND LEVEL. PROTECTION SHALL BE MAINTENANCE FREE AND SELF RESTORING. DEVICES SHALL HAVE A RESPONSE TIME OF LESS THAN 50 NANoseconds AND BE CAPABLE OF HANDLING A DISCHARGE SURGE CURRENT (AT AN 8X20MS IMPULSE WAVEFORM) OF AT LEAST 8 KA.

PROVIDE PROTECTION OF ALL 120 VAC POWER FEEDS INTO CONTROL PANELS AND INSTRUMENTS.

PROVIDE PROTECTION OF ALL ANALOG SIGNAL (4-20 MA) CIRCUITS WHERE ANY PART OF THE CIRCUIT IS OUTSIDE OF THE BUILDING ENVELOPE.

PROVIDE PROTECTION OF ALL COMMUNICATION CABLES BETWEEN RADIOS AND ANTENNAS. MOUNT THIS PROTECTION EITHER INSIDE THE PANEL OR IN THE WALL OF THE ENCLOSURE IN ACCORDANCE WITH NEMA AND UL STANDARDS. INSTALL SURGE PROTECTIVE DEVICES AT EACH END OF ALL ANTENNA CABLE PROVIDED.

GROUND WIRES FOR ALL INSTRUMENTATION DEVICE SURGE PROTECTORS SHALL BE CONNECTED TO A LOW RESISTANCE GROUND.

PROVIDE COAXIAL GROUNDING KIT FOR EACH RADIO.

PROVIDE GROUNDING KITS, TWO FOR EACH ANTENNAE INSTALLATION (TOP AND BOTTOM).

FURNISH AND INSTALL GROUND ROD AND GROUND WIRE AS SHOWN ON DRAWING.

ANTENNAS AND MASTS

ANTENNA AND MAST SHALL BE PROVIDED, INSTALLED, AND CONFIGURED FOR RADIO TELEMETRY. ANTENNA SHALL BE YAGI-DIRECTIONAL. ANTENNA FREQUENCY RANGE SHALL INCLUDE 450-462 MHZ. THE ANTENNAS SHALL BE FABRICATED OF 6061/T6 ALUMINUM ROD AND SEAMLESS DRAWN PIPE, ANODIZED FOR MAXIMUM RELIABILITY AND CORROSION RESISTANCE. THE HARDWARE AND FASTENINGS SHALL BE STAINLESS STEEL. RATED WIND VELOCITY SHALL BE 150 MPH (NOMINAL); 180 MPH (MAX). THE ANTENNA MAST SHALL BE SELF-SUPPORTING.

ANTENNA CABLE ASSEMBLY

ANTENNA CABLE ASSEMBLIES SHALL BE PROVIDED AND INSTALLED BETWEEN THE ANTENNA AND THE RADIO. CABLE LENGTHS WILL BE DETERMINED BY COORDINATING WITH THE OWNER AS TO THE ANTENNA, MAST, AND TOWER LOCATIONS AND THE LOCATION OF THE ENCLOSURES IN WHICH THE RADIO IS INSTALLED.

EACH ANTENNA CABLE ASSEMBLY SHALL CONSIST OF FOAM-INSULATED COAXIAL CABLE, CONNECTORS, GROUNDING KIT, SURGE PROTECTOR, JUMPER CABLES, AND TOWER CLAMPS AS REQUIRED FOR A COMPLETE OPERATIONAL COMMUNICATIONS LINK.

CABLE ASSEMBLIES SHALL BE PROVIDED AND INSTALLED, COMPLETE WITH CABLE CONNECTOR AND FASTENING HARDWARE FOR ALL ANTENNAS.

CABLE SIZE

1. LESS THAN 100 FT. (30M) IN LENGTH: 1/2 INCH (13MM) DIAMETER MINIMUM
2. 100 FT. TO 200 FT. (30M TO 60M) IN LENGTH: 7/8 INCH (22MM) DIAMETER MINIMUM
3. GREATER THAN 200 FT. (60M) IN LENGTH: 1-5/8 INCH (41MM) DIAMETER MINIMUM

CABLE INSTALLATION

THE CABLE SHALL BE GROUNDED AT THREE LOCATIONS;

1. AT THE ANTENNA LOCATION (GROUND TO TOWER).
2. AT THE POINT THE CABLE LEAVES THE TOWER (GROUND TO TOWER).
3. AT THE RADIO EQUIPMENT LOCATION (GROUND TO THE EXISTING SYSTEM GROUND).
4. FURNISH A SINGLE CONTINUOUS PIECE OF COAXIAL CABLE FOR THE MAIN RUNS OF CABLE; SPLICING IS NOT ACCEPTABLE.
5. WEATHERPROOF ALL ANTENNA CABLE CONNECTIONS USING BUTYL RUBBER TAPE.



**CITY OF COCOA**  
 Brevard County, Florida  
 UTILITIES DEPARTMENT  
 ENGINEERING DIVISION

**RTU INSTALLATION  
 SPECIFICATIONS**

DRAWN BY: CDM SMITH	SCALE: NOT TO SCALE
CHECKED BY: P. DAVIS	DATE: JULY 2021
DESIGN BY:	SHEET: 1 OF 1
ACAD NAME: RTU INSTALLATION SPECIFICATIONS 1-14	