

**SECTION 27-32-16  
WIRELESS TRANSCEIVERS  
(RADIO FREQUENCY (RF) COMMUNICATIONS OR CONTROL)**

**PART 1 – GENERAL**

**1.01 DESCRIPTION**

- A. The work covered by this section of the Specifications shall include all labor necessary to perform and complete such construction/installation, all materials and equipment incorporated or to be incorporated in such construction/installation and all services, facilities, tools and equipment necessary or used to perform and complete such construction/installation. The work of this section shall include, but is not limited to, the following:
  - 1. A complete and operable wireless, RF communications or control system.
- B. All installation locations, products, system configurations, permits, applications and/or licenses must be coordinated with, reviewed and approved by the Cal Poly ITS Telecomm group.

**1.02 QUALITY ASSURANCE**

- A. Refer to Section 27-00-00 for general details.

**1.03 CODES, STANDARDS, AND GUIDELINES**

- A. Except as modified by governing codes and by the Contract Documents, comply with the applicable provisions and recommendations in Section 27-00-00.
- B. Cal Poly University Airwaves Policy -  
[http://www.netadmin.calpoly.edu/documentation/airwave\\_policy.pdf](http://www.netadmin.calpoly.edu/documentation/airwave_policy.pdf)
- C. Cal Poly University Two-Way Radio Frequency Coordination Standard –  
[http://www.netadmin.calpoly.edu/documentation/Two\\_Way\\_Radio\\_Policy.pdf](http://www.netadmin.calpoly.edu/documentation/Two_Way_Radio_Policy.pdf)
- D. Information Technology Resources Responsible Use Policy –  
<http://security.calpoly.edu/policies/rup/>
- E. FCC Regulations – USC - Title 47 - part 90
- F. The Cal Poly ITS Telecomm group, Telecommunications Standards Document and the Labeling, Design and Syntax Standards in Appendix B.

**1.04 SUBMITTALS**

- A. Refer to Section 27-00-00 for general details.
- B. Shop Drawings:
  - 1. All system requirements shall be developed by the user. All system designs and specifications shall be developed by the user in coordination with and with the approval of the Cal Poly ITS Telecomm group. Product specifications shall be provided by the Manufacturer and approved by the Cal Poly ITS Telecomm group it is to be used on the Cal Poly Campus. All system designs and drawings shall be reviewed and approved by the Cal Poly ITS Telecomm group prior to the purchasing of equipment and/or the start of installation and/or demolition.

- C. Submit Manufacturer's Cut Sheets for the following:
  - 1. Submit designs and cut-sheets for all equipment and materials to be used in the system for approval by the Cal Poly ITS Telecomm group.
- D. Provide Manufacturer's Warranty statement.
- E. Provide all user/installation/programming/service manuals for all installed/purchased equipment.
- F. Acquire all necessary Cal Poly building permits, authorizations and approvals for all systems. A partial list of system types would include: Two-Way Radios, Radio Base Stations, RF System Controls, Cell Antenna Units (CAU), Distributed Antenna Systems (DAS), Cell Phone Boosters, and so on.

### **1.05 IDENTIFICATION**

- A. All RF communications infrastructure and two-way radio equipment shall be FCC licensed as required under the guidance of the Cal Poly ITS Telecomm group.

### **1.06 DEFINITIONS**

- A. The Two-Way Radio/Transceiver System shall provide an adequate signal level and connectivity to users and/or equipment in all areas within the specified project area. The number of users and types of equipment supported simultaneously shall be specified by the User.

### **1.07 WARRANTY**

- A. Refer to Section 27-00-00 for general details.

## **PART 2 – PRODUCTS**

### **2.01 PRODUCT CONSISTENCY**

- A. Product Consistency: Any given item of equipment or material shall be the product of one manufacturer throughout the facility/project area. Multiple manufacturers of the same Transceiver/RF system equipment shall not be permitted.

### **2.02 WIRELESS TRANSCEIVER SYSTEM**

- A. GENERAL
  - 1. The Contractor shall work with the User and the Cal Poly ITS Telecomm group. The Contractor shall bring them to the project site for the purposes of evaluating the site and developing a system design that delivers a site-wide signal level that supports the User specified loading, coverage and/or control characteristics.
  - 2. All equipment/materials shall be purchased by and/or delivered to the Contractor or the Cal Poly ITS Telecomm group, whichever group is most appropriate, for installation as specified in the contract documents.
  - 3. Approved Manufacturer: Kenwood (RF transceiver) or Cal Poly ITS group approved equal

## **PART 3 – EXECUTION**

### **3.01 INSTALLATION**

- A. Do not install any transceiver devices until after their installation locations and any pre-installation test results have been reviewed and approved by the Cal Poly ITS Telecomm group.

- B. Contractor shall provide all conduits, cable, boxes and other passive materials to deliver a fully functional system that is constructed within the bounds of all codes, restrictions and specifications.
- C. All wireless transceivers shall be installed per manufacturer's installation instructions.
- D. Post Project Cleanup
  - 1. Remove rubbish, debris, and waste materials and legally dispose of such at an off-campus site.
  - 2. Restore any landscape, concrete, asphalt or aesthetic elements disturbed during installation.

### 3.02 QUANTITIES

- A. Quantities of system elements shown on the drawings shall be illustrative only and are meant to indicate the general configuration of the work. The Contractor shall be responsible for providing the correct quantities of materials to construct a system that meets the intent of these Specifications and the relevant codes.

### 3.03 GROUNDING & BONDING

- A. RF equipment/system installations performed under this section shall use the most appropriate and conservative of the following two Grounding Standards as determined by the Cal Poly ITS Telecomm group:
  - 1. National Electrical Code – 2011 Edition
  - 2. Motorola – R56 Grounding Standard – 2005 Edition

### 3.04 TESTING

- A. Testing shall require that the proposed system shall be deemed fully functioning as described in the scope/contract documents by the Cal Poly ITS Telecomm group.

### 3.06 ACCEPTANCE

- A. Upon receipt of notice of the Contractor's completion of the installation, the Cal Poly ITS Telecomm group representative will review/observe the installation and if desired, randomly request tests of the devices as installed. Once the installation and testing has been completed and the Cal Poly ITS Telecomm group representative is satisfied that all work is in accordance with the Contract Documents, the Cal Poly ITS Telecomm group representative will notify the Contractor and/or the Cal Poly Project Manager in writing or via email of their approval.
- B. ***All installation locations, product configurations, labeling and testing must be approved by the Cal Poly ITS Telecomm group.***

### 3.05 RECORD (AS-BUILT) DRAWINGS

- A. The Project Record Drawings shall show the type and location of each Wireless Transceiver device.

END OF SECTION

**DOCUMENT VERSION CONTROL**

<b>REVISION</b>	<b>DATE</b>	<b>AUTHOR</b>	<b>REASON</b>
1	02/20/2014	R. VOLK	INITIAL DOCUMENT DEVELOPMENT
	02/20/2014	DW & MH	PRIMARY REVIEW COMPLETE