SECTION 27 2133 - DATA COMMUNICATIONS WIRELESS ACCESS POINTS

PART 1 – GENERAL

1.01 SECTION INCLUDES:

A. Wiring required to support the “wireless” network.

B. Access Points

C. Testing

1.02 RELATED SECTIONS:

A. Section 27 1500 – Communications Cable Systems

B. Section 27 0502 – Required Submittals for Communications

C. Section 27 0504 – Communications Contractor Qualifications

D. Section 27 0528 – Pathways for Communication Systems

E. Section 27 0553 - Communication Identification and Labeling

**Note: All Cables, Jacks, and Wireless Access points/components shall be labeled with TR identifier, circuit number, and UT abbreviated building identifier using UT labeling standards and approved label maker. Note Jacks and cables do not need to have Building Identifier, but other removable components do.**

**Example**: Cable and Jack Labeling

WAP- Wireless Access Point

WAP 1-2 1025

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Port # |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |
|  | Floor jack located | |  |  |  |  |  |  |  |  |  |  |  |  | |  |
|  | Closet Number | |  |  |  |  |  |  |  |  |  |  |  |  | |  |
|  | Floor closet on | |  |  |  |  |  |  |  |  |  |  |  |  | |  |
|  | Port Used for | |  |  |  |  |  |  |  |  |  |  |  |  | |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |
|  |  |  | WAP | | 1 | | 2 | | 1 | | 025 | | |  | |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |
|  |  | | | | | | | | | | | | | | | |
|  | This is how the cable, Jack at TR, and FP or biscuit jack shall be labeled at both ends using UT labeling standards.   |  |  | | --- | --- | |  |  |   **Example of Labeling WAP**: Component  Building: RH (Rocket Hall) See University of Toledo Building Abbreviations.  RH- 1-2 1025 which means as follows:  Rocket Hall, 1st floor closet #2, Floor 1 circuit 025. | | | | | | | | |  |  |  |  | |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |
|  |  | | | | | | | | | | | | | | | |

1.03 REFERENCES:

A. The wireless network installation shall conform to the latest edition of the N.E.C., national, state and local code which apply.

B. The wireless network installation shall comply with all NFPA, NEMA, TIA, IEEE, ANSI, ISO and U.L. standards as applicable. All components and materials shall be U.L. listed.

1.04 SYSTEM DESCRIPTION:

A. Furnish, install and test as required all conduit, conduit boxes, pull boxes, conduit bushings, sleeves, cabling, cable supports, firestopping, patch cords, connectors, patch panels, organizers, component and cable labels, designation strips, equipment racks, equipment cabinets, equipment shelves, etc. as required for a complete and functioning system.

B. The University of Toledo IT department will specify locations of access points.

C. The wireless network being provided for is a Wireless Local Area Network (WLAN) serving a group of users and their computing devices in a common space, office area or building, as per IEEE 802.11.

D. Wireless network wiring shall be a structured wire infrastructure based upon Section 271500, except for the specialized wiring and dedicated outlets for the wireless access points as described herein.

1.05 SUBMITTMALS:

A. Submittals under provisions of Section 01 3300 and 27 0502.

B. Product data: Provide catalog cut sheets for all materials, equipment, components and software.

C. Test Reports

D. Project Record Drawings

1.06 QUALITY ASSURANCE:

A. Firm regularly engaged in wireless networks with minimum of (5) years’ experience.

1.07 WARRANTY:

A. Warranty material and labor for (2) years.

PART 2 – PRODUCTS

2.01 GENERAL:

A. Active wireless network components such as access points, power supplies, antenna, etc. shall be furnished by the Owner and installed by the Contractor.

2.02 ACCESS POINT (AP):

A. The access point shall be plenum rated or housed in a plenum rated enclosure.

2.03 COMPONENTS:

A. Outlet box shall be a standard 2-gang deep box with ~~a~~ single-gang plaster ring and 3/4" non-metallic conduit nipple (Arlington #NM502) installed or 1"C stubbed up and out per Section 270528.

B. Faceplate shall be a single-gang, one (1) port stainless steel faceplate (Hubbell #SSF11) with one (1) Cat-6A data jack (blue) installed as per the project standard.

C. Plenum Rated Biscuits: In lieu of the outlet box contractor may utilize a plenum rated biscuit, (Hubbell ISB1 Series).

D. Data Jacks one (1) Category-6A data jack (blue) installed as per Section 271500.

E. Cabling shall be one (1) plenum rated, Category-6A, unshielded twisted pair (blue) as per Section 271500.

F. Patch Panel shall be a dedicated Category-6A data patch panel as per Section 271500

G. See Appendix A for manufacturers and part numbers.

PART 3 – EXECUTION

3.01 GENERAL:

A. Workmanship and design shall be in accordance with the requirements of the wireless network vendor and manufacturer.

B. All active equipment and components shall be provided and installed by the Owner unless otherwise noted.

3.02 INSTALLATION:

A. Install wireless data cabling from the wireless access point outlet location to the nearest telecommunications room, or as specified on the Drawings.

B. When the Owner shall provide a “site survey” identifying the required final locations for wireless access points.

1. The "Wireless AP" outlet shall be provided with a 25' service loop at or above the outlet. The additional length shall be coiled at 200% of the recommended minimum bend radius or 24" diameter coil, whichever is larger. The coil shall be loosely cable tied and attached to a nearby support. The coil shall be located, if possible, above the outlet, individually bundled and tagged with the cable identifiers.

C. Above ceiling outlet boxes or biscuit shall be anchored to above ceiling wall, or building structure utilizing a beam clamp, or dedicated drop wire and drop wire clip, or "T-Bar" and "T" bar clip, etc. as required.

D. Provide grommet and strain relief for the cables at the outlet box, as required.

E. Provide outlet and cable identification per Section 270553.

**Note: All Cables, Jacks, and Wireless Access points/components shall be labeled with TR identifier, circuit number, and UT abbreviated building identifier using UT labeling standards and approved label maker. Note Jacks and cables do not need to have Building Identifier, but other removable components do.**

3.03 SITE SURVEY:

1. The Owner shall provide construction documents to a Third Party Associate for the purpose of providing a computer generated site survey indicating the locations for the installation of Access Points (AP).

2. Wireless Survey: Submit supporting documentation indicating AP layout, signal strengths, throughput, channel interference and system performance and full catalog cuts as part of shop drawing submittal and at project conclusion as part of the close out O&M material.

3. The Owner shall provide third party developed site survey information to the Associate for locating APs in the facility.

a. The 25’ of service slack in cable at the AP outlet location is intended for “fine tuning” the location per the site survey.

B. WIRELESS TESTING

1. A site survey shall be performed via a site walk performed prior to AP installation to verify layout and also perform a walk test after installation to verify performance. Determine optimum location of all devices in the wireless LAN coverage and consider the AP density and location. Site walk survey path shall be indicated on report. Software for site survey shall be by Fluke Airmagnet, Ekahau, or Motorola.

2. Perform a post-installation site survey and test per parameters listed as follows:

a. Performance parameters shall be a minimum of -65dB at all locations requiring service and a minimum of 45mbps throughput per user.

3. Site survey shall show equipment placement on a floor plan, coverage areas, channel configurations, signal strength readings, data rates, and interference sources, and co-channel interference. Survey shall include “heat maps” of coverage areas which indicate signal levels (dBm) and items listed in previous sentence. See submittals for additional requirements.

4. Independent testing may be required at the Contractor’s expense in the event of non-compliance with the Contract Documents or non-performance of contested procedures or practices. Independent testing will be at the sole discretion of the Engineer and Architect and shall be arranged by the Engineer.

3.04 TESTING:

A. "Wireless" network cabling shall be tested as per Section 271500

END OF SECTION 27 2133