SECTION 27 21 33 – WIRELESS ACCESS POINTS

PART 1 - GENERAL

1.1 SUMMARY

Provide all labor, materials, and equipment for the complete installation of Work called for in the Contract Documents.

This section includes the minimum requirements for the installation and configuration of American Airlines wireless access points.

Included in this section are the minimum composition requirements and installation methods for the following:

1. Wireless Access Points
2. Antennas

1.2 DEFINITIONS AND TERMS

Trade association names and communications terminology are frequently abbreviated. The following acronyms or abbreviations may be referenced within this Section:

1. AA American Airlines
2. AES Advanced Encryption Standard
3. ANSI American National Standards Institute
4. BICSI Building Industry Consulting Service International
5. CR Communications Room
6. DFW Dallas/Fort Worth International Airport
7. EIA Electronics Industries Association
8. IEEE Institute of Electrical and Electronics Engineers
9. LAN Local Area Network
10. NECA National Electrical Contractors Association
11. NEMA National Electric Manufacturers Association
12. NFPA National Fire Protection Association
13. OAR Owner's Authorized Representative
14. RCDD Registered Communications Distribution Designer
15. SSID Service Set Identifier
16. STD Standard
17. TIA Telecommunications Industry Association
18. TKIP Temporal Key Integrity Protocol
19. UL Underwriters Laboratories

1.3 QUALITY ASSURANCE

All cable and equipment shall be installed in a neat and workmanlike manner. All methods of construction that are not specifically described or indicated in the contract documents shall be subject to the control and approval of the OAR.

Equipment and materials shall be of the quality and manufacture indicated. The equipment specified is based upon the acceptable manufacturers listed. Where “approved equal” is stated, or a substitution is requested, equipment shall be equivalent in every way to that of the equipment specified. All substitutions are subject to the control and approval of the OAR.

Strictly adhere to all BICSI, EIA and TIA recommended installation practices when installing the products specified in this section.

Contractor’s Qualifications:

1. Firms regularly engaged in the installation of Data Communications systems and that have five (5) years of installation experience with systems similar to that required for this project.
2. Provide references to include client names, phone numbers and a summary of project details. These references will be checked, and the clients will be asked questions relative to the performance of your company.
3. Provide verification that installation personnel responsible have been properly trained to install the products described in this Section.
4. Provide full time project manager with a minimum of ten (10) years field experience in installation of communications systems and infrastructures. Project manager shall be assigned for the duration of the project and shall not be replaced without written consent from the OAR.

Manufacturer’s Qualifications:

5. Firms regularly engaged in manufacture of products of the types, ratings and capacities required for this project; whose products have been in satisfactory use in similar service for not less than five (5) years, with production capabilities per applicable NEMA standards.

Material and Work specified herein shall comply with the applicable requirements of:

6. NECA 1 – Standard Practice of Good Workmanship in Electrical Construction, 2015
7. ANSI/NECA/BICSI-568 – Standard for Installing Commercial building Telecommunications Cabling, 2006
8. ANSI/TIA-568.0-D – Generic Telecommunications Cabling for Customer Premises, 2015
9. ANSI/TIA-568.1-D – Commercial Building Telecommunications Cabling Standard, 2015
10. ANSI/TIA-606-C – Administration Standard for the Telecommunications Infrastructure of Commercial Buildings, 2017
11. ANSI-J-STD-607-C – Joint Standard for Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunications, 2015
12. ANSI/TIA-942-B – Telecommunications Infrastructure Standard for Data Centers, 2017
13. IEEE 802 – Local Area Network Standard
14. NFPA 70 – National Electric Code, 2017
15. BICSI – Telecommunications Distribution Methods Manual, 13th Edition
16. DFW Airport Design Criteria Manual
17. Applicable codes and directives of authorities having jurisdiction

Work:

18. The Work shall be performed in compliance with the applicable manufacturer’s installation instructions, Standards, and certifications listed herein, the Contract Documents, and governing codes and regulations of the authorities having jurisdiction.
19. The drawing and specification requirements govern where they exceed Code and Regulation requirements.
20. Where requirements between governing Codes and Regulations vary, the more restrictive provision applies.
21. Nothing in the Contract Documents grants authority or permission to disregard or violate any legal requirements.

1.4 CONFLICTS

This installation shall be made in strict accordance with the Specifications, Drawings, any applicable codes, referenced publications and standards. In case of conflicts between the aforementioned, notify the OAR in writing prior to commencement of affected work.

1.5 SCHEDULING

The Contractor shall comply with all scheduling requests established by OAR, both prior to commencing Work, and during construction. The Contractor shall provide a detailed schedule of work to be performed.

1.6 REQUIREMENTS

All references to manufacturers, model numbers and other pertinent information herein are intended to establish standards of performance and quality of construction. The OAR must approve material submittal and substitutions in writing.

Verification that all the components specified and installed meet the criteria specified by the respective component manufacturer, supplier and designer is the responsibility of the Contractor.

All installation tools, special equipment and testing apparatus required to accomplish field connections and related work as described herein shall be furnished by the Contractor at no additional cost.

The requirements as given in this document are to be adhered to unless revised by the OAR in writing.

The Owner reserves the right to waive these requirements at any time.

1.7 SUBMITTALS

Comply with provisions of Division 01.

Comply with provisions of Section 27 05 00.

Provide product data for the following:

1. Product data consisting of manufacturers specifications for each type of product to be installed, all applicable certifications and elevation/plan documents supporting compliance with stated Specifications.
2. Proposed format of as-built documentation.

1.8 CONTRACTOR CLOSE OUT SUBMITTALS

Submit Closeout documentation in accordance with Division 01 of the Project Manual and any applicable supplements. The number of submittal sets required is the greater of either the requirements of Division 01 of the Project Manual, or a minimum of four (4) sets.

1. Segregate documents into separate binders containing data relevant to operational, maintenance, and warranty issues.

Warranty and Maintenance:

2. Record Drawings

1.9 DELIVERY, STORAGE, AND HANDLING

Deliver materials factory-packaged in containers or reels and handle in accordance with manufacturer's recommendations. Store in a clean, dry space and protect products from damaging fumes and traffic. Handle materials carefully to avoid damage.

Storage space on project site may be limited. Contractor shall coordinate delivery and arrange storage of materials and equipment with the OAR.

Components sensitive to damage in a harsh environment shall be stored off-site and delivered as needed.

Provide protective covering during construction to prevent damage or entrance of foreign matter.

Contractor is responsible for on-site security of tools, test equipment and materials.

Replace at no expense to Owner, product damaged during storage, handling or the course of construction.

1.10 PROJECT CONDITIONS

Verify conditions on the job site are applicable to this Work. Notify Architect in writing of discrepancies, conflicts, or omissions promptly upon discovery.

The Drawings diagrammatically show cabling and arrangements of equipment fitting the space available without interference. If conditions exist which make it impossible to install Work as shown, recommend solutions and/or submit drawings to the Architect for approval, showing how the Work may be installed.

1.11 WARRANTY

Warrant labor and product to be free of defects and deficiencies, and to conform to the drawings and specifications as to kind, quality, function, and characteristics, following Contractor Warranty requirements defined in Division 01. Repair or replace defects occurring in labor or product within the Warranty period without charge.

All surplus parts and pieces to the installation shall be maintained as a spare parts inventory at the building site. Parts replaced during the warranty period shall have a warranty matching that of the original part from date of replacement.

PART 2 - PRODUCTS

2.1 GENERAL

The products specified in this document do not necessarily constitute the exhaustive list of products required to complete the statement of work. Except where described in the SUMMARY

subpart of this document, the contractor is responsible for providing any other parts and materials needed to deliver a complete and working system.

2.2 WIRELESS ACCESS POINTS

Wireless Access Point (AA)

1. Provide wireless access points for AA.
2. Access point shall comply with IEEE Standards:
    a. IEEE 802.11a/b/g
    b. IEEE 802.11n 2.0
    c. IEEE 802.11h
    d. IEEE 802.11d
3. Access point shall support the following security standards:
    a. 802.11i, Wi-Fi Protected Access 2 (WPA2), WPA
    b. 802.1X
    c. Advanced Encryption Standards (AES), Temporal Key Integrity Protocol (TKIP)
4. Access point shall be capable of operating in the 2.4 GHz and 5 GHz bands.
5. Access point shall be self-configuring, plug and play deployment.
6. Access point shall be deployed using 802.3af Power over Ethernet.
7. Access point shall accept external antennas and be able to operate in temperature ranges of -4 to +131°F (-20 to +55°C).
8. Access point shall be suitable for use in plenum spaces in compliance with UL 2043.
9. Acceptable products:
    a. Cisco Meraki MR46
    b. Owner Approved Equivalent.

Wireless Access Point Antennas

10. Provide MIMO antennas for wireless access points.
11. Single band antennas shall of the 3 element variety.
12. Dual band antennas shall be of the 6 element variety.
13. Refer to the schedules in the drawing set for the antenna types for each access point.
14. Acceptable products:
    a. Cisco AIR-ANT2451NV-R Dual Band MIMO Antenna, Indoor
    b. TerraWave M6060060MO1D3602O Dual Band MIMO Antenna, Indoor/Outdoor
    c. Owner Approved Equivalent.

2.3 ENCLOSURES

Wireless Access Point Enclosure

1. Provide a NEMA 4X enclosure for each wireless access point installed in environmentally harsh and exposed areas.
2. Enclosure shall be a minimum 14 inches wide, by 19 inches high, by 10 inches deep.
3. Enclosure shall have a solid door and be manufactured from polycarbonate plastic.
4. Enclosure shall be equipped with a CAT60 key lock.
5. Extend data cabling to the enclosure in conduit and terminate in a surface mount box inside the enclosure.
6. Acceptable products:

a. TerraWave V181610-HC60-O-0
b. Owner approved equivalent.

2.4 WALL MOUNT KITS

Wireless Access Point Wall Mount Kit

1. Provide a shelf for each wireless access point installed at a wall location.
2. Shelf shall be a minimum 7 inches wide, by 2.5 inches high, by 8.4 inches deep
3. Acceptable products:

   a. Oberon Shelf, model number 1008-00
   b. Owner approved equivalent.

PART 3 - EXECUTION

3.1 PREPARATION

The Owner will be responsible for providing, installing and configuring the LAN switches, and providing switch port assignments for the access points. Obtain these port assignments for later patching.

The drawing set is integral to the installation and configuration of the access points. It contains schedules, mounting locations and mounting details. Examine these documents before beginning work.

Provide the Owner with a schedule containing each access point model, serial number, MAC address, and the installation location.

Obtain asset tags from the owner for each device, and install on the devices, as instructed, before installation.

3.2 EXAMINATION

In TRs that are not equipped with PoE switches, midspan power injectors must be employed. Verify these injectors are installed and powered up.

Examine each access point location and verify the horizontal cabling has been installed.

1. At indoor locations:

   a. Verify the horizontal cabling is installed in the correct location. Report any variances to the Architect/Designer.
   b. Examine the ceiling type and obtain the appropriate access point mounting hardware.
   c. Coordinate ceiling antenna penetration locations with the architect.

2. At outdoor locations:

   a. Verify the horizontal cabling is installed in conduit and that a NEMA enclosure is affixed to the end of the conduit.
   b. Verify the enclosure provided will accommodate the mounting of the work area outlet and the access point inside the enclosure.

c. Report any mounting or clearance issues to the Designer.
d. Look for environmental issues that might degrade the performance of the equipment, or physically damage it.

In areas that require external antennas:

3. Examine the antenna mounting location and ensure it is free of any obstructions that might prevent line-of-sight transmission in the designed direction(s).
4. Verify the antenna radiation pattern is appropriate for the area being served.
5. Look for antenna cable pathway issues between the antenna(s) and the access point.
6. Verify antenna clearances with surrounding equipment and other moving items.

3.3 INSTALLATION

Mount the access point and controller according to the manufacturer's instructions.

Patch the access point to the network. If a PoE switch port is not available, patch the access point through a power injector, then to the switch port.

END OF SECTION 27 21 33

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