SECTION 27 26 26 – WIRELESS DATA NETWORK INTEGRATION

PART 1 - GENERAL

1.1 SUMMARY

A. This section includes the minimum requirements for the design and installation of DFW Airport Public Wi-Fi systems. The scope of work to be performed to this system through TRIP is limited to minimal effort required to demolish affected existing system components, provide temporary coverage during construction, and re-install the affected system components in the new space configuration. No system or infrastructure enhancements shall be completed through this scope unless the enhancement can be implemented at no additional cost to Owner.

1. Included in this section is a performance specification for the demolition, design and installation of components of the Public Wi-Fi system.
2. Performance of this scope is required to be coordinated with and/or performed by the approved DFW public wi-fi system maintenance Contractor (currently AT&T).

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

1.2 DEFINITIONS AND TERMS

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

1. ANSI American National Standards Institute
2. AWG American Wire Gauge
3. BICSI Building Industry Consulting Service International
4. DFW The Dallas/Fort Worth International Airport
5. FCC Federal Communications Commission
6. NECA National Electrical Contractors Association
7. NEMA National Electric Manufacturers Association
8. NFPA National Fire Protection Association
9. OAR Owner’s Authorized Representative
10. RCDD Registered Communications Distribution Designer
11. STD Standard
12. TGB Telecommunications Grounding Busbar
13. TIA Telecommunications Industry Association
14. TMGB Telecommunications Main Ground Bus Bar
15. UL Underwriters Laboratories

1.3 QUALITY ASSURANCE

A. 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 Owner.

B. 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 Owner.

C. Strictly adhere to all BICSI and TIA recommended installation practices when installing the systems described in this specification.

D. Contractor's Qualifications:

1. Firms regularly engaged in the design installation of wireless networks 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 Owner.

E. Manufacturer's Qualifications:

1. 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.

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

1. NECA 1 – Standard Practice of Good Workmanship in Electrical Construction, 2015
2. ANSI/TIA-568.0-D – Generic Telecommunications Cabling for Customer Premises, 2015
3. ANSI/TIA-568.0-D-1 – Generic Telecommunications Cabling for Customer Premises – Addendum 1: Updated References, Accommodation of New Media Types, 2017
4. ANSI/TIA-568.1-D – Commercial Building Telecommunications Infrastructure Standard, 2015
5. ANSI/TIA-568.1-D-1 – Commercial Building Telecommunications Infrastructure Standard – Addendum 1: Updated References, Accommodation of New Media Types, 2018
6. ANSI/TIA-606-C – Administration Standard for the Telecommunications Infrastructure of Commercial Buildings, 2017
7. ANSI/TIA-606-C – Administration Standard for Telecommunications Infrastructure, 2017
8. ANSI/TIA-607-D – Generic Telecommunications Bonding and Grounding (Earthing) for Customer Premises, 2019
9. ANSI/TIA-942-B – Telecommunications Infrastructure Standard for Data Centers, 2017
10. NFPA 70 – National Electric Code, 2017
11. BICSI – Telecommunications Distribution Methods Manual, 13th Edition
12. NEMA – VE 1 – Metal Cable Tray Systems, 2009
13. NEMA – VE 2 – Metal Cable Tray Installation Guidelines, 2006
14. DFW Airport Design Criteria Manual
15. Applicable codes and directives of authorities having jurisdiction

G. Work:

1. 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.
2. The drawing and specification requirements govern where they exceed Code and Regulation requirements.

3. Where requirements between governing Codes and Regulations vary, the more restrictive provision applies.
4. Nothing in the Contract Documents grants authority or permission to disregard or violate any legal requirements.

1.4 CONFLICTS

A. 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 Owner in writing prior to commencement of affected work.

1.5 SCHEDULING

A. Work should be scheduled not to interfere with day-to-day operations within the facility. Operations vary by area and should be given careful consideration in relation to the schedule.

B. The successful Contractor for all or any portion of the work described by this specification package will be responsible for achieving a complete and fully functional installation on or before the contract scheduled completion date.

1.6 REQUIREMENTS

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

B. 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.

C. 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.

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

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

1.7 SUBMITTALS

A. Comply with provisions of Division 01.

B. Comply with provisions of Section 27 05 00.

C. The contractor shall use the requirements of this section to complete the detailed design of the system. Design shall include computer based RF Modeling and site surveys. This design shall be delivered as part of the preconstruction submittals, including iterations for the Owner’s review.

D. 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

A. 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.
2. Provide above closeout documentation as an electronic file in PDF format.

B. Warranty and Maintenance:

1. Record Drawings

1.9 DELIVERY, STORAGE, AND HANDLING

A. 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.

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

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

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

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

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

1.10 PROJECT CONDITIONS

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

B. 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

A. 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.

B. 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.

C. Wi-Fi components removed and then reinstalled are not required to carry a warranty unless the warranty is existing at the time of removal and reinstallation.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. The existing public Wi-Fi system is an 802.11b/g system operating in the 2.4 GHz band. The head-end is established and operational by AT&T. The head-end serves as the Internet gateway and contains a distribution switch which connects to a number of edge switches via fiber optic cabling. The edge switches are currently housed in communications rooms throughout the terminal and connect to wireless access points located above the ceiling. The wireless access points have external antennas that protrude below the ceiling line.

B. The Wi-Fi head-end includes the following basic equipment.

1. Wide area data circuit from the ISP.
2. Border router
3. Internet gateway appliance
4. Fiber optic distribution switch

C. The Wi-Fi system is monitored and alarmed with an automated Network Management System.

2.2 PERFORMANCE REQUIREMENTS

A. The public Wi-Fi system shall be capable of providing a minimum of 802.11g service.

B. Minimum average RSL in the coverage areas shall be -75 dBm.

PART 3 - EXECUTION

3.1 GENERAL

A. The public Wi-Fi system allows passengers to gain Internet access from public spaces within the terminal using a personal Wi-Fi device. It is to remain active and operational.

B. The public Wi-Fi is a continuously active communication system that is required to be operational at all times. If any portion of the Wi-Fi system is damaged as a result of pre-construction or construction activities, it is to be repaired and restored to its original performance.

C. The Wi-Fi system is monitored and alarmed with an automated Network Management System. Contractor shall be responsible to properly notify all parties involved in the Wi-Fi network whenever any equipment or cabling in the active system is involved in construction activities.

3.2 DEMOLITION

A. Contractor shall make provisions to provide substitute temporary equipment for coverage whenever installed system components are planned for demolition. The temporary coverage equipment shall remain in place until the permanent reinstallation of the public Wi-Fi is complete.

B. Contractor shall identify for the Owner the equipment components and cabling associated with the public Wi-Fi. Label existing public Wi-Fi cabling to assist project personnel in maintaining system continuity during project demolition phases, and prior to public Wi-Fi equipment removal.

C. Should public Wi-Fi equipment require removal, Contractor shall disable the equipment and safely remove it for storage until it is reinstalled.

D. When project conditions require existing equipment removal, contractor shall take care to remove system electronics and preserve electronics in weather tight plastic or other enclosure for storage. Contractor shall also remove all passive devices and other equipment for storage. All removed equipment shall be labeled with original location, model and serial number and date of removal.

E. Equipment not scheduled for re-use shall be catalogued and turned over to the Owner.

3.3 INSTALLATION

A. The contractor shall design, install, commission and test the public Wi-Fi in accordance with this Section and the manufacturer's instructions and recommendations.

B. The public Wi-Fi system shall be installed to provide uniform consistent coverage. The signal level and coverage area shall meet or exceed the existing conditions found prior to construction.

C. Edge switches are to be installed in MCR and CR locations.

D. Access points shall be affixed to walls and/or structural building elements with mounting systems that allow for immediate mounting and removal (snap-on mounts with permanent bolting after).

E. Data cabling from the edge switches to the access points shall be Category 6 compliant. The products used and testing methods shall comply with Section 27 15 00 of the specifications. Labeling shall comply with Section 27 05 53 of the specifications.

F. The fiber optic cabling between the distribution and edge switches shall be singlemode. The products used and testing methods shall comply with Section 27 13 00 of the specifications.

3.4 ACTIVATION AND TESTING

A. Public Wi-Fi activation shall include the turn-up and test of individual edge switches and associated access points. Signal levels may require some tuning to meet proper levels required for optimum system operation.

B. Overall system performance shall be measured and compared to system design. All system settings and test records shall be transmitted at the end of the project.

C. Contractor shall also be responsible to activate public Wi-Fi NMS connectivity.

D. After public Wi-Fi activation the contractor shall perform complete walk-testing of the system coverage and performance throughout the coverage areas to confirm performance. Walk-testing shall be performed using automated test equipment and accurate floor plans of the facility.

3.5 Test Reports and As-Built Drawings

A. Provide Category 6 Cable test reports subsequent to testing in the ACTIVATION AND TESTING Article of this Section.

B. Provide Fiber Optic Cable Testing reports subsequent to testing in the ACTIVATION AND TESTING Article of this Section.

C. Provide Activation reports subsequent to testing in the ACTIVATION AND TESTING Article of this Section.

D. Provide Walk Test coverage and signal level reports subsequent to activation and testing in the ACTIVATION AND TESTING Article of this Section.

3.6 ACCEPTANCE

A. Complete the acceptance testing as prescribed in the accepted Testing Procedures submittal.

B. Acceptance testing shall confirm performance in accordance with the PERFORMANCE REQUIREMENTS Article of this Section.

C. All punch items have been addressed compliant to the requirements of Section 27 05 00.

END OF SECTION 27 26 26

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