

**HENRY B. GONZALEZ CONVENTION CENTER COMPLEX NEUTRAL-
HOST**

DISTRIBUTED ANTENNA SYSTEM (DAS)

LICENSE AGREEMENT

made as of _____, 2017 by

City of San Antonio, Texas

Convention and Sports, Facilities Department

and

San Antonio MTA, L.P.
d/b/a Verizon Wireless

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**HENRY B. GONZALEZ CONVENTION CENTER COMPLEX NEUTRAL-HOST
DISTRIBUTED ANTENNA SYSTEM
LICENSE AGREEMENT**

This Henry B. Gonzalez Convention Center Complex Neutral-Host Distributed Antenna System (“DAS”) License Agreement (the “Agreement”) is made on _____, 2017 (the “Effective Date”) by the **City of San Antonio**, a Texas Municipal Corporation (hereinafter referred to as “City”), acting by and through its City Manager, pursuant to Ordinance No. 2017-XX-XX-XXXX passed and approved on the _____ day of _____, 2017, and **San Antonio MTA, L.P. d/b/a Verizon Wireless** (“Verizon Wireless”), with an address at 180 Washington Valley Road, Bedminster, New Jersey 07921. The City and Verizon Wireless may be individually referred to as a “Party” or collectively as the “Parties.”

WHEREAS, the City is a home-rule city under the laws of the State of Texas and the owner of the Henry B. Gonzalez Convention Center Complex (“Facility”) located at 900 E. Market Street, San Antonio, Texas 78205, and is authorized to enter into such agreements as the City deems necessary in conjunction with the management and operations of the Facility, including, without limitation, this Agreement;

WHEREAS, on March 16, 2017, the City issued a Request for Proposal (RFP) for Henry B. Gonzalez Convention Center Complex Neutral-Host Distributed Antenna System to design, install, operate and maintain a neutral-host Distributed Antenna System at the Facility, and Verizon Wireless submitted a proposal in response to the RFP;

WHEREAS, it is the desire of the City and Verizon Wireless in response to the RFP to enter into this Agreement in order to implement a neutral-host DAS in the Facility to provide extended and improved wireless communications for their existing and future technologies including “4G” and “5G” technologies therein;

WHEREAS, the neutral-host DAS will include a Public Safety System and include a separate antenna system that incorporates certain radio frequencies and the complete rebroadcast of 139 current channels;

WHEREAS, the Parties agree and intend that the DAS is being designed and installed so that the general public will have improved wireless communications connectivity inside and outside of the Facility, including expanded data connectivity on the frequencies licensed by the CMRS Carriers;

WHEREAS, the Parties intend to implement a neutral-host DAS program to assure equal, non-discriminatory access to the DAS to all Qualified (as defined in Section 2(b)) CMRS operators. “CMRS” means Commercial Mobile Radio Systems that are existing or emerging and licensed services and technologies that include operators (Cellular, Enhanced Specialized Mobile Radio (ESMR), and Personal Communication Services (PCS)) and their commercially provided wireless services;

WHEREAS, Verizon Wireless, is the initial CMRS Carrier of what is proposed to be a group of future participating Qualified CMRS operators (each such Qualified CMRS operator

being a “Future Participating Carrier” and together with Verizon Wireless being the “CMRS Carriers” and each being a “CMRS Carrier”);

WHEREAS, Verizon Wireless is designated as the CMRS Carrier that will have the obligation for the design, installation, operation, maintenance and management of the neutral-host DAS program in the Facility; and

WHEREAS, Verizon Wireless desires to acquire and the City desires to grant Verizon Wireless a license to the Facility for the limited purposes hereinafter designated to implement the DAS.

NOW, THEREFORE, in consideration of the mutual covenants and agreements of the Parties in this Agreement, and for other good and valuable consideration, the receipt and legal sufficiency of which are hereby acknowledged, the Parties agree as follows:

1. **Project Scope.**

a. **Grant of Access to Facility.** As of the Effective Date, the City hereby grants Verizon Wireless the exclusive license, as defined further in Section 4(a), to access portions of the Facility as further defined herein to work to develop the DAS as defined herein in the Facility subject to the terms of this Agreement. The Parties understand the difficulty of the undertaking of designing, developing and installing of the DAS, and the logistical difficulty that multiple antenna systems within the Facility would present. Therefore, the City agrees to grant this license to Verizon Wireless to develop the neutral-host DAS which Verizon Wireless will make available to other Qualified CMRS operators as sub-licensees on a non-discriminatory basis such that no term of access, compensation or otherwise, will prejudice any CMRS licensed operator that desires to use the DAS. Verizon Wireless, however, shall coordinate with, and receive prior approval by, City Staff designated by the Director of the Facility to access the Facility whenever an event is scheduled to be held at the Facility during installation of the DAS. The City has provided Verizon Wireless a schedule of events to be held at the Facility during the period beginning November 1, 2017 through August 1, 2018 to facilitate scheduling of the installation of the DAS. Verizon Wireless will work with the City, using its best commercially-reasonable efforts to prioritize implementation of the DAS in the to-be-determined Final Four event locations prior to the Final Four events, including, without limitation, the installation and use of temporary antennas, both indoor and outdoor, and ancillary equipment as necessary to provide service.

b. **The DAS.** The City, as provided herein, is providing the CMRS Carriers with access to the Facility so that Verizon Wireless may install the DAS in the Facility in the areas set forth on **Exhibit A** (“Preliminary DAS Plans and Specifications”), as the same may be amended from time to time, to provide extended and improved wireless communications, including expanded broadband service, in the Facility’s “DAS Coverage Area”. The “DAS Coverage Area” includes: (i) those portions of the interior of the Facility included in the Preliminary DAS Plans and Specifications (as defined in Section 7(a) below), (ii) those portions of the Facility parking lots, loading dock areas, and adjacent sidewalks, walkways, stairs, and ramps included on the Preliminary DAS Plans and Specifications, and (iii) rooftop space on the Facility for future antenna node locations, and new power/fiber conduit paths to the roof of the Facility,

which may, or may not, be depicted on the Preliminary DAS Plans and Specifications. The DAS shall consist of the wireless network systems, including without limitation, a series of hubs, repeaters, and multiple band antennas within and on the Facility to accommodate and extend radio frequency ("RF") signals from the CMRS Carriers and their commercially-provided wireless services. The DAS includes all hardware and software associated with uplink and downlink RF including, but not limited to, power systems and back-ups, antennas, base stations, multiplexers, personal computers, cable and fiber, network monitoring and alerting systems, equipment rooms (including HVAC and fire suppression systems) and network operations systems owned, installed, operated, maintained, and managed by Verizon Wireless in and on the DAS Areas. The DAS Areas include office space, CMRS Carriers base station equipment room(s), equipment closets and a location for a backup generator. Upon approval by the City, any other additions to the DAS Areas will be automatically included in the Agreement by exchange of correspondence with Verizon Wireless.

c. Public Safety System. The DAS shall not interfere with the City's and Bexar County's public safety 700/800 MHz radio frequencies. The frequencies range from 806 MHz – 825 MHz and 851 MHz – 870 MHz for our 800 MHz; and 769 MHz – 775 MHz and 799 MHz – 805 MHz for our 700 MHz layer (InterOp). The DAS shall include a separate antenna system that incorporates these frequencies and the complete rebroadcast of 139 current channels. A complete list of channels shall be provided to Verizon Wireless by City, and 8- 12 channel "channelized" public safety repeaters shall not be acceptable. The City requires the complete rebroadcast of all channels. The coordinates of the closest 800 MHz public safety tower donor site to the Facility are: 29-25-14.1N, 98-30-23.3W, 601 S. Frio St, San Antonio, Texas 78207. The DAS must meet current San Antonio Fire Code, Section 510 Emergency Responder Radio Coverage for the installation and acceptance testing. Verizon Wireless shall purchase and install the Public Safety System, and upon completion of the Public Safety System, Verizon Wireless shall transfer ownership of the Public Safety System to the City pursuant to execution and delivery of a Bill of Sale in a form reasonably acceptable to the City and Verizon Wireless. Verizon Wireless shall maintain the Public Safety System for two (2) years from the date of the Bill of Sale; however, Verizon Wireless will not own, operate, or otherwise maintain the Public Safety System.

2. Additions to the CMRS Carriers and Sublicensing.

a. Future Participating Carriers. The City acknowledges that while Verizon Wireless is the only CMRS Carrier currently developing the DAS at the Facility, it is anticipated to include Future Participating Carriers. The City further acknowledges and agrees that from time to time, upon written notice from Verizon Wireless, a Future Participating Carrier may be added as a CMRS Carrier. Such Future Participating Carrier will be added as a CMRS Carrier when Verizon Wireless and such Future Participating Carrier execute and deliver a sublicense agreement whereby such Future Participating Carrier agrees to be bound by the obligations of a CMRS Carrier under this Agreement, including, but not limited to, its indemnification, insurance, and access requirements, and agrees to participate thereunder on an equal, pro rata basis. City is entitled to rely upon the decisions, notices, elections, and communications of Verizon Wireless as contemplated hereunder as if each such CMRS Carrier made such decisions, notices, elections or communications, and each such CMRS Carrier is hereby and forever estopped from claiming that such decisions, notices, elections or communications by Verizon

Wireless do not bind any such CMRS Carrier. Except in the event of any emergencies, Verizon Wireless will be the point of contact for the City with respect to all other CMRS Carriers regarding any communications, defaults, notices or other actions with respect to the DAS, including assistance in overall coordination between the City and the CMRS Carriers, and each CMRS Carrier hereby consents to the receipt of all notices from the City hereunder by Verizon Wireless on behalf of such CMRS Carrier. A copy of the form of sublicense agreement is attached hereto as **Exhibit E**. If Verizon Wireless materially deviates from this form, the City will be given an advanced opportunity to review any such changes to the sublicense agreement with the Future Participating Carrier(s) in order to verify compliance with this Agreement.

b. **CMRS Carrier Contracts**. Verizon Wireless may require the Future Participating Carrier(s) to enter into the contracts Verizon Wireless deems necessary with the terms of those contracts being offered to all Qualified CMRS operators on equal terms and conditions and with installation, operation, maintenance and monitoring costs and expenses being charged to all Qualified CMRS operators on a pro-rata basis. “**Qualified**” means that such CMRS operator must possess all required federal, state, local and other licenses applicable to that CMRS operator.

c. **Assignment or Sublicensing by CMRS Carriers**. Consistent with the requirements of this Agreement, each CMRS Carrier will, whenever in its sole discretion it is required or appropriate for the operation of its business, have the right without prior notice to, or consent of, the City or any other Party to this Agreement, to transfer to a third party its license or sublicense (or otherwise transfer or allow the use of) all or any portion its rights to participation in the DAS, or its equipment, connections or space used in connection with the DAS, or assign its rights under this Agreement in whole or in part, to: (a) any entity controlling, controlled by or under common control with that CMRS Carrier; (b) any entity acquiring substantially all of the assets of that CMRS Carrier; (c) any entity lawfully authorized to use the equipment, or to use, operate or resell the licensed frequencies or services, of that CMRS Carrier; (d) any successor entity in a merger or consolidation involving that CMRS Carrier; or (e) a party providing financing to the CMRS Carrier. Provided, however, that any such assignment or sublicensing is subject to all the terms and conditions of this Agreement. Otherwise, the written consent by the City will be required and approved by ordinance. Verizon Wireless will provide the City written notice of any assignment, transfer, or sublicensing event under this Section 2(c) within 30 days following such event.

3. **Development of the DAS.**

a. The City will designate a “**City Designated Representative**” who will be the point of contact with respect to the Facility for Verizon Wireless regarding the installation of the DAS in the Facility, including assistance in overall coordination.

b. Verizon Wireless will designate a “**Project Manager**” as its appointee responsible for the implementation and management of all aspects of the day-to-day operations of the DAS.

c. As between the City and Verizon Wireless, Verizon Wireless will have the sole responsibility as appropriate under the terms of the Agreement for the design, installation,

operation, repair, modification, upgrade, alteration, maintenance, relocation, and removal of the DAS.

d. Safety. Verizon Wireless is responsible for initiating and maintaining all safety precautions and programs in connection with its performance of this Agreement. The installation, operation or maintenance of the DAS shall not endanger or interfere with the safety of persons or property located at the Facility.

e. Facility information and site/floor plan. The coverage area includes the entire interior of the Henry B. González Convention Center Complex, including all levels, exhibit space, multipurpose space, meeting rooms, ballrooms, walkways, common areas, hallways (front and back of house), indoor courtyard, business center, administrative offices, security offices, maintenance offices, kitchens, storage areas, utility/mechanical rooms, and loading docks. The coverage area also includes the entire Lila Cockrell Theatre, a 2,319-seat Performing Arts Theatre, including dressing rooms, administrative and security offices, hallways, walkways, and utility rooms. Aggregate area is approximately 1.644 million sq. ft. (inside). A copy of the site and floor plans are attached hereto as **Exhibit F** (Facility Information and Site/Floor Plan).

4. **Grant of License; Use of the Facility; Marketing**

a. Subject to the terms and conditions of this Agreement, City hereby grants to Verizon Wireless, its permitted successors or assigns and any Future Participating Carrier(s) sublicensing the DAS and their permitted successors or assigns, an exclusive license (the "License") for the sole purpose of installing, operating, repairing, modifying, upgrading, altering, or replacing to accommodate future technologies, spectrum or end user requirements, and maintaining, inspecting, relocating, and removing, where necessary, but at the CMRS Carriers' sole expense, the equipment required for the operation of the DAS in and on the Facility in the DAS Areas, including but not limited to, wires, cables, fiber, and antennas, system monitoring, management, and alerting. The City represents that it has the full authority, through ordinance(s) granted by the City or otherwise, to grant the License provided in this Agreement. The City hereby reserves the right to grant, renew or extend non-DAS licenses to others, provided that such grant, renewal, or extension does not interfere with the DAS or any equipment appurtenant thereto. In the event of any such interference, the City will ensure that the interference is removed or resolved to allow for Verizon Wireless' restoration of service to the original specifications within 24 hours. Nothing contained herein will be construed as granting to any CMRS Carrier any ownership rights in the Facility or to create a partnership or joint venture between the City and the CMRS Carriers. This Agreement is limited so that the CMRS Carriers may only install, maintain, upgrade, alter, replace and operate the DAS in the DAS Areas.

b. Except as expressly provided herein, each CMRS Carrier will accept the DAS Areas in their "**As Is, With All Faults**" conditions and understands and agrees that City is under no obligation to make any improvements, perform any work, or provide any materials to prepare the DAS Areas for the CMRS Carriers. CITY HEREBY DISCLAIMS, AND VERIZON WIRELESS ON BEHALF OF ITSELF AND ALL FUTURE PARTICIPATING CARRIERS HEREBY WAIVES ANY AND ALL WARRANTIES OF ANY KIND WHATSOEVER, WHETHER STATUTORY, EXPRESS, OR IMPLIED WITH RESPECT TO THE DAS AREAS (INCLUDING, WITHOUT LIMITATION, THE WARRANTY OF FITNESS FOR A

PARTICULAR PURPOSE AND WARRANTIES ARISING FROM COURSE OF DEALING OR USAGE OR TRADE). NOTHING CONTAINED HEREIN SHALL LIMIT ANY WARRANTIES PROVIDED BY THIRD PARTY MANUFACTURERS AS TO THE DAS EQUIPMENT INSTALLED IN THE DAS AREAS.

c. Other Qualified CMRS Operators. The City hereby grants Verizon Wireless, its permitted successors or assigns, and any Future Participating Carrier(s) and their permitted successors or assigns, the exclusive right to install and offer the use of the DAS to wireless service providers for placement of wireless sites to be integrated into the DAS. The City agrees to refer all inquiries received from CMRS operators for the placement of wireless sites, or fiber-based microcellular (distributed antenna) systems, to Verizon Wireless and will use its best efforts to encourage non-participating Qualified CMRS operators to utilize the DAS. If at any time during the Term of this Agreement, less than all Qualified CMRS operators in the San Antonio, Texas market are CMRS Carriers on the DAS, Verizon Wireless will be responsible for: (1) offering use of the DAS to those non-participating Qualified CMRS operators in the San Antonio, Texas market, and (2) maintaining a plan designed to periodically inform the non-participating Qualified CMRS operators in the San Antonio, Texas market of the capabilities of the DAS, and (3) encouraging non-participating Qualified CMRS operators in the San Antonio, Texas market to participate on the DAS under the terms and conditions set forth in this Agreement. The City agrees that it is in its best interest to grant these exclusive rights to Verizon Wireless in consideration of the significant capital investment necessary to develop the DAS. Verizon Wireless will use its best commercially-reasonable efforts to enter into Sublicense Agreements with at least two (2) of the major CMRS Carriers for use of the DAS, including AT&T, Sprint, and T-Mobile, within six (6) months of the execution of the Agreement. Verizon Wireless' best commercially-reasonable efforts must include providing biweekly updates to the City of the status of negotiations for entering into Sublicense Agreements with additional CMRS Carriers. If Verizon Wireless is unable to enter into a Sublicense Agreement with at least one (1) other major CMRS Carrier for use of the DAS within one (1) year of the execution of this Agreement, Verizon Wireless and the City shall cooperate in good faith to determine if the exclusive rights granted hereunder are in the City's best interests, and the City will make a final determination. Notwithstanding anything to the contrary contained in this Agreement, if Verizon Wireless does not have the exclusive right to offer use of the DAS to other Qualified CMRS operators as provided in this Section 4(c), Verizon Wireless may terminate this Agreement at any time upon ninety (90) days prior written notice to the City. If Verizon Wireless elects to terminate this Agreement pursuant to the provisions of this Section 4.c., it shall be entitled to reimbursement of the DAS Costs (as defined below) pursuant to the provisions of Section 5.d. of this Agreement.

d. Wi-Fi not included. The provision or propagation of Wi-Fi is specifically not included in the scope of services requested by the City and Verizon Wireless shall not incorporate Wi-Fi as part of the DAS.

5. Term, Default and Termination.

a. The "Initial Term" of this Agreement will be ten (10) years commencing on the Effective Date. Upon expiration of such Initial Term and if Verizon Wireless is not in default hereunder beyond any applicable cure period, this Agreement will automatically renew for two

(2) consecutive five (5) year renewal periods, unless terminated by Verizon Wireless or the City in accordance with the provisions hereof (such renewal period together with the Initial Term being the “Term”).

b. Verizon Wireless may terminate this Agreement at the end of the Initial Term or any renewal period by providing written notice of intent to terminate to the City at least ninety (90) days prior to the end of the Initial Term or applicable renewal period.

c. If fewer than two (2) CMRS Carriers are participating in the DAS, the City may terminate this Agreement at the end of the Initial Term or any renewal period by providing written notice of intent to terminate to Verizon Wireless at least ninety (90) days prior to the end of the Initial Term or applicable renewal period. If the City elects to terminate this Agreement pursuant to the provisions of this Section 5.c., Verizon Wireless shall be entitled to reimbursement of the DAS Costs (as defined below) pursuant to the provisions of Section 5.d. of this Agreement.

d. For Convenience. The City may terminate this Agreement without cause upon giving one hundred eighty (180) days’ prior written notice to Verizon Wireless and upon payment of any applicable reimbursement amount in accordance with this Section 5.d. If the City exercises its right to terminate for convenience during the Initial Term, the City will reimburse Verizon Wireless the following percentage of the actual cost of the DAS (including without limitation, all costs relating to the design, construction, operation, maintenance and repair of the DAS) and the cost to remove all of the CMRS Carriers’ base stations or CMRS Carrier-specific equipment (collectively, the “DAS Costs”), provided that such DAS Costs shall be capped at \$5,000,000:

Year of Term	Percentage (%) Reimbursement
1	100%
2	90%
3	80%
4	70%
5	60%
6	50%
7	40%
8	30%
9	20%
10	10%

The City agrees to pay such reimbursement amount to Verizon Wireless prior to the effective date of the termination of this Agreement; provided however, that in the event that the City’s budget appropriation process cannot reasonably accommodate such reimbursement during the fiscal year that the City provides its termination notice under this Section 5(d), the City shall have thirty (30) days following the commencement of the fiscal year immediately following such year to pay such amount to Verizon Wireless.

Following installation of the DAS, and thereafter on the anniversary date of this Agreement, Verizon Wireless agrees to provide the City with an inventory of all equipment, instruments, software, and hardware installed as a part of the DAS. In the event that the City exercises the right to terminate the Agreement under this section 5(d), Verizon Wireless will provide the City a detailed accounting of the current total of all DAS Costs, documented to the City's reasonable satisfaction. The City will have no obligation to reimburse Verizon Wireless under this section 5(d) until said accounting is delivered in writing and approved by the City. Any proprietary information provided by Verizon Wireless as part of the DAS Costs will be marked as such and the City will protect such information from public disclosure subject to the protections of the Public Information Act, Chapter 552 of the Texas Government Code.

e. The City may avail itself of any remedies set forth in this Agreement, including the remedies set forth in Section 5(f) upon written notice to Verizon Wireless if: (i) the License hereunder granted is taken on execution or other process of law in any action brought against Verizon Wireless, (ii) Verizon Wireless is bankrupt, insolvent, a receiver or trustee is appointed for Verizon Wireless or Verizon Wireless petitions or has a petition filed under the US Bankruptcy Code or takes any other similar action, or (iii) Verizon Wireless fails to comply with any material provision of this Agreement and such default is not cured within sixty (60) days after receipt of written notice (unless the nature of the event takes longer to cure and Verizon Wireless commences a cure within such 60 day period and thereafter diligently pursues it).

f. Remedies. Upon the occurrence of any event or events of default by Verizon Wireless lasting beyond the applicable cure period, the City will have the option to: (i) terminate the License granted under this Agreement in which event Verizon Wireless' rights with respect to the DAS will be immediately terminated; or (ii) cure the default with Verizon Wireless agreeing to reimburse for the costs of such cure, and City will not be liable for any damages resulting to the DAS or any CMRS Carrier from such action. The City may also pursue any other remedies available under the terms of this Agreement, in law or equity.

g. If the City fails to comply with any material provision of this Agreement and such default is not cured within sixty (60) days after receipt of written notice from Verizon Wireless (unless the nature of the event takes longer to cure and the City commences a cure within such 60 day period and thereafter diligently pursues it), Verizon Wireless may terminate this Agreement upon written notice to the City and pursue any other remedies available under the terms of this Agreement, in law or equity.

h. If Verizon Wireless' rights under this Agreement are terminated, any CMRS Carrier may propose for approval by the City a substitute CMRS Carrier to assume the duties of Verizon Wireless under this Agreement, which approval will not be unreasonably withheld or delayed. If Verizon Wireless' rights under this Agreement are terminated and there are no other CMRS Carrier(s) to fulfill the role of Verizon Wireless, this Agreement shall be terminated.

6. Fees and Taxes.

a. Annual License Fee. Commencing on the first day of the month following the Effective Date and thereafter on the first day of each month during the Term, the CMRS Carriers shall pay to City a monthly payment equal to 1/12 of the Annual License Fee at the rate of

\$25,000 per year per CMRS Carrier participating in the DAS. Each CMRS Carrier will pay its applicable License Fee directly to the City, such fees to be pro-rated for any portion of a year that a CMRS Carrier participates. Each CMRS Carrier will have the option to pay its full Annual License Fee (including any pro-rated portion thereof) on a single annual installment paid in advance on January 1 of each year. Verizon Wireless will provide commercially-reasonable assistance to support the City's efforts to collect any unpaid License Fee from a CMRS Carrier, but will not be responsible for payment of any CMRS Carrier License Fee other than its own.

b. Performance Guarantee. Within thirty (30) days after the Effective Date, Verizon Wireless shall deliver to the City an irrevocable standby letter-of-credit ("LOC") to guarantee the full and faithful performance by Verizon Wireless of all the terms and conditions of this Agreement and stand as security for payment by Verizon Wireless of all claims by the City. The required amount of the LOC for this Agreement is an amount equal to ONE HUNDRED THOUSAND AND 00/100 (\$100,000.00) DOLLARS.

The LOC shall be issued in a form that is satisfactory to the City and the City must be able to draw upon the LOC at any of the financial institution's establishments. The language of the LOC will unequivocally state that at the time this Agreement terminates or is terminated by the City without cause, if there is consideration due and owing to the City from Verizon Wireless, then the amount equal to the consideration due the City shall be paid from the LOC, and shall be applied toward the settlement of said claim(s).

Provided that if Verizon Wireless is not in payment default at the end of the Term, the City agrees to release the LOC, and Verizon Wireless shall have no further obligation to provide the LOC.

c. Fees and Taxes. All costs related to the DAS, including but not limited to the design, installation, construction, operation, maintenance, improvement or otherwise will be completely funded by the CMRS Carriers and will be at no cost to the City. The CMRS Carriers will be completely responsible on a pro rata basis for paying all taxes levied on the DAS and its equipment. Except for the payment of Annual License Fees as outlined in this Agreement, there will be no other compensation due to the City by the CMRS Carriers.

d. Electricity. To the extent requested, the City will provide each CMRS Carrier access to electrical power during the construction, monitoring, operation, maintenance, or repair of the DAS, and the City will make available electrical power in quantities that are reasonably necessary for operation of the DAS (excluding the head end and base stations) at no cost to the CMRS Carriers. The CMRS Carriers will pay all costs associated with extending and connecting the DAS to such electrical power or the head end and base stations.

7. **Construction, Installation, Operation, Maintenance, Interference and Ownership of the DAS.**

a. Verizon Wireless will install the DAS in a good and workmanlike manner in accordance with: (i) industry standards and practices; (ii) the City's Cabling Standards attached as **Exhibit B**; and (iii) the drawings, plans and specifications (the "Plans and Specifications") and bill of materials that will be provided to the City for review and approval prior to

commencement of construction. The preliminary plans for the DAS are attached hereto as **Exhibit A** (“Preliminary DAS Plans and Specifications”). Review and approval of the Plans and Specifications will be provided by the Director of the City's Convention, Sports, Entertainment and Facilities Department, or his designee, by way of a written notice (which may include email) to proceed. Verizon Wireless agrees to provide the City Fire and Electrical Inspector staff with any pertinent information relating to the equipment installation and cabling upon their reasonable request. City's approval, which will not be unreasonably withheld, conditioned or delayed, of such Plans and Specifications shall not be deemed a representation that they comply with applicable laws, ordinances, rules and regulations.

b. Verizon Wireless shall utilize the Headend Space it currently occupies at the Alamodome for the Convention Center DAS throughout the Term of this Agreement. Upon full execution of this Agreement, the City shall provide Verizon Wireless with 16 strands of City-owned Single Mode Fiber between the Alamodome and the Facility (the "City's Fiber"). Verizon Wireless shall return the City's Fiber within twelve (12) months of the DAS becoming operational, unless Verizon Wireless' construction is delayed as a result of extended permitting time periods with the City or the Texas Department of Transportation, in which case, the time period for Verizon Wireless' return of the City's Fiber may be extended by an additional six (6) months. At its sole cost, Verizon Wireless shall install at least 96 new fiber strands within the City's existing fiber conduit paths: (i) between the Alamodome and the Facility's Main Distribution Facility ("MDF") (*i.e.*, the demarcation location at the Facility), and (ii) between the MDF and the Intermediate Distribution Facilities ("IDFs") in the Facility. Verizon Wireless will run coax from the IDFs to the DAS antennas and other ancillary equipment in and on the Facility. Upon completion of Verizon Wireless' installation of the new fiber between the Alamodome and the Facility's MDF, 48 strands of the new fiber between the Alamodome and the Facility's MDF will be dedicated to the City's use (the "City's New Fiber"), and the remaining fiber strands will be dedicated to Verizon Wireless' use for the DAS.

c. Verizon Wireless must coordinate with the City all activities and hardware installations that affect the use of electrical, fiber, conduit, and cable trays. All installations by Verizon Wireless shall comply with all local electrical and fire codes. Any required cabling will be installed throughout the Facility within cable trays or conduits and Verizon Wireless will supply and install all cable trays beyond what is currently available within the Facility needed for the DAS. Verizon Wireless shall obtain City approval prior to the installation of any additional cable trays, such approval not to be unreasonably withheld, conditioned, or delayed. The CMRS Carriers will provide lockable equipment cabinets. The CMRS Carriers' equipment will be stored in a neat and orderly fashion and will only be stored in areas authorized by the City for such storage. The City is not prescribing whether the DAS architecture should be dedicated for each CMRS Carrier or shared, but the City will not allow redundant cabling and antennas for each CMRS Carrier.

d. City will have the right of prior notice of any contractors performing installation, modification or maintenance work on behalf of the CMRS Carriers that will be in the Facility. Verizon Wireless will submit the name of each contractor to City prior to such contractor performing any work at the Facility.

e. The City's New Fiber shall be installed to the standards prescribed by the City's ITSD department in accordance with City's Cabling Standards attached as **Exhibit B**. Verizon Wireless shall be responsible for terminating, labeling, and testing the City's New Fiber. Notwithstanding anything to the contrary contained in this Agreement, Verizon Wireless will have no other liability or obligations with respect to the City's New Fiber. System, path loss, and continuity testing, including bi-directional OTDR testing, shall be included as a part of the acceptance testing. Following the installation of the City's New Fiber, the City's use and maintenance of the City's New Fiber shall be at its sole expense. This provision will survive the Agreement and the City will be entitled to ownership of the City's New Fiber during the Term of the Agreement. Should the Agreement be terminated by either Party pursuant to the terms and conditions of the Agreement prior to the end of the Term, the City's New Fiber will remain the property of the City.

f. **Hazardous Substances.** If any CMRS Carrier encounters any environmentally hazardous substances in the Facility, such CMRS Carrier will immediately notify City of such discovery and take all reasonable precautions to avoid the handling or disturbance of any such environmentally hazardous substances in any manner. If a CMRS Carrier handles or disturbs such environmentally hazardous substances in the Facility, then such CMRS Carrier will conduct such activities it is required to conduct according to applicable environmental and safety laws and those specific rules established by City. If environmentally hazardous substances are discovered in the DAS Areas, the CMRS Carriers and the City will make all reasonable attempts to relocate the affected DAS Areas and modify the Plans and Specifications to address the impact of the environmentally hazardous substances in the Facility and to provide for an alternative location for the DAS away from that part of the DAS Areas originally contemplated for the DAS installation. Each CMRS Carrier will agree that no semiconductors or other electronic equipment containing polychlorinated biphenyls (PCB's) or other environmentally hazardous materials will either be used or stored by any CMRS Carrier in or around the DAS Areas or in the Facility and no such materials will be used in any of the equipment installed by any CMRS Carrier as part of or connected to the DAS within the Facility; however, a CMRS Carrier may use or install those materials commonly used in the provision of telecommunications services that may contain environmentally hazardous materials, such as batteries, provided it does so in compliance with applicable law. Notwithstanding anything to the contrary, no CMRS Carrier will have any responsibility for managing, monitoring, or abating, nor be the owner of, nor have any liability for, any environmentally hazardous substances that it did not bring into the Facility.

g. Each CMRS Carrier will agree not to use or permit the use of the DAS by its employees, subcontractors, agents or representatives for any purpose which is illegal or dangerous to life, limb or property.

h. Verizon Wireless will commission the design and construction of the DAS and use commercially reasonable efforts to ensure that the DAS will be capable of accommodating the performance needs of the Future Participating Carriers.

i. The CMRS Carriers will perform the DAS "**DAS Acceptance Test Procedures**" as outlined on **Exhibit C** to ensure that the DAS is operationally acceptable and will bear any

expenses to remedy and implement any changes that are necessitated by the failure of the DAS to pass the Acceptance Test Procedures.

j. The CMRS Carriers will operate the DAS on a twenty-four (24) hour basis.

k. After the DAS is installed in accordance with the approved Plans and Specifications, no CMRS Carrier may make any improvements or alterations affecting the appearance of DAS in those areas of the Facility that are generally visible to the public ("Public Areas") without the City's prior written approval, which approval will not be unreasonably withheld, conditioned or delayed. All actions undertaken by a CMRS Carrier and all equipment, improvements or alterations made by a CMRS Carrier in any way related to this Agreement will be undertaken in compliance with all applicable laws, ordinances, building and safety codes, regulations and orders. The CMRS Carriers will have the right to upgrade or modify the DAS and the related equipment and implement new technologies or use different and additional spectrum to better serve end users of the DAS; provided however, that if additional Facility space is needed for such upgrade or modification, such additional space will be subject to the City's approval, such approval not to be unreasonably withheld, conditioned or delayed.

l. The CMRS Carriers may select and enter into a maintenance contract with a qualified third-party vendor ("Contractor") to provide for routine maintenance, monitoring and repair of the DAS. If any CMRS Carrier enters into a maintenance contract with a Contractor, that contract will include the same indemnification, insurance, and limitations on liability clauses as set forth in this Agreement. The Contractor will be subject to the access requirements set forth in Section 8 of the Agreement. The CMRS Carriers will bear the cost to maintain the DAS on an equal, pro-rata basis at no cost to the City. The CMRS Carriers will use their best commercially-reasonable efforts to maintain the DAS in accordance with the system uptime and performance criteria attached hereto and incorporated herein as **Exhibit D** ("DAS Uptime and Performance Criteria"). The CMRS Carriers will schedule any maintenance and repair, which may result in a service interruption, during periods when no major events are scheduled for the Facility, in the sole reasonable determination of the City. The CMRS Carriers will provide a copy of the maintenance, monitoring and repair contract to the City promptly after it is executed.

m. Upon completion of the DAS installation, the CMRS Carriers will conduct radio frequency interference studies as necessary to determine interference with existing third-party communications systems caused by the DAS or any CMRS Carrier's equipment. The operation of the DAS or any CMRS Carrier's equipment will not interfere with the mechanical or electrical systems of the Facility or the operation of any existing radio or telecommunication equipment operated on or from the Facility. The CMRS Carriers will take the steps necessary to correct and eliminate measurable interference with existing third-party communications systems within forty-eight (48) hours of receipt of notice. If the CMRS Carriers are unable to resolve the interference issue within this timeframe, they will voluntarily power down (turn off) the portion of DAS or CMRS Carrier's equipment causing the interference, except for intermittent testing, until such time as the interference is remedied. Any significant and or harmful interference detected throughout the operation of the DAS shall be a cause for immediate shutdown of the portion of the DAS that is causing the interference until such time the interference is corrected by the CMRS Carriers. Under no circumstances will the DAS interfere with public safety wireless

communications at the Facility. Such interference, if it occurs, will be addressed immediately by the CMRS Carriers.

n. With the exception of a termination by the City under subsection 11(b), the DAS and all equipment appurtenant thereto installed by a CMRS Carrier, (excluding the base station equipment) that is then remaining in the Facility at the expiration of this Agreement will be deemed abandoned and become the property of the City in its “**as-is,**” “**where is**” condition.

o. The CMRS Carriers will agree to keep all improvements and alterations free and clear of all mechanic liens. In the event that a lien is filed against the Facility as a result of labor or material supplied in connection with the DAS, the CMRS Carriers, agrees to diligently contest such lien, and regardless of the success of such contest, obtain the release and discharge of such lien or bond off such lien within thirty (30) days after receipt of notice of such lien.

p. All construction, installations and improvements now or hereafter placed on the Facility will be installed or made in accordance with the standards, procedures and requirements of the applicable City Building Codes. No monitoring or inspection of any work on the DAS or otherwise by City representatives will be deemed supervision of any such employees or contractors of the CMRS Carriers. The CMRS Carriers will monitor and supervise all of their employees, agents, representatives and contractors and will assume full responsibility for them and the expertise and quality of all work, and in no event will they rely upon City, or any of its agents, employees, or representatives for all or any portion of the same. The CMRS Carriers will be responsible for any and all cost or expense arising from its installation, maintenance, operation or repair of any facilities installed or used by them in relation to the DAS pursuant to this Agreement, which will be shared among the CMRS Carriers on an equal, pro rata basis.

q. Reports. Verizon Wireless will provide City with weekly construction status reports until the DAS is operational. Within sixty (60) days after the DAS is operational, Verizon Wireless and applicable CMRS Carriers (or their Contractor) will provide the following reports to the City via email, web-based portal or in HTML format, such reports to be updated on a monthly basis in the event of any changes:

- (i) A complete list of major components showing a description and location for each.
- (ii) A complete cable record and wiring diagram identifying all cable and system components by location, distribution cable, and key sheet as related to instrument assignments.
- (iii) Documentation of all technology used for the DAS including, but not limited to: software database configurations; hardware equipment itemizations and configurations; electrical requirements; space requirements; peripheral equipment diagrams; rack profile diagrams; equipment shelf profile diagrams; cable plant interconnectivity charts; and wiring diagrams sufficient to facilitate effective operational support of the DAS.

(iv)Trend analysis of data collection and coverage tests including on site investigation and data gathering of DAS performance parameters (i.e. reverse link degradation).

(v) Any changes to CMRS Carriers' frequency operations and/or power outputs if applicable; and monthly electrical usage, including sub-metered usage.

(vi)Diminished coverage, and down time for the DAS.

r. Meetings. Verizon Wireless will attend meetings or teleconferences with City staff, consisting of routine or emergency meetings concerning DAS operational issues and planning, as reasonably requested by City.

s. Verizon Wireless and City will cooperate to provide on-site maintenance and technical support for the DAS during up to six (6) major events held at the Facility, subject to fourteen (14) days advance notice to Verizon Wireless by the City.

8. **Access to the Facility.**

a. The CMRS Carriers and their Authorized Personnel must coordinate and receive prior approval by assigned City Staff to gain access to, and use of, the Facility seven (7) days per week, 24 hours per day to construct, operate and maintain, upgrade, test, repair, relocate, and replace the DAS, or a CMRS Carrier's equipment, as applicable. "Authorized Personnel" will include the employees, engineers, technicians, consultants, agents, sub-licensees, contractors and subcontractors of the CMRS Carriers. The CMRS Carriers will conduct all work in a manner to minimize interference with the operations of other contractors. If installation activities are disruptive to persons, events or activities at the Facility, the disruptive activities will be, to the maximum extent possible, completed during times that will minimize the disruption.

b. The CMRS Carriers and their employees, agents, vendors and invitees will comply with City rules and regulations governing access to and conduct on the City's property. Contractor's staff shall enter the Facility through entrances designated by the City.

c. The City will have the right upon reasonable notice to inspect the DAS to verify compliance with this Agreement. Absent a bona fide emergency, the City will refrain from accessing any portion of a CMRS Carrier's equipment without prior written notice and direct supervision by the CMRS Carrier or its authorized representative.

d. Identification. For security purposes, the CMRS Carriers and their contractors will (if required by the City) wear photo identification badges while onsite at the Facility. All badges must clearly indicate the employee and CMRS Carrier or subcontractor name. Any persons entering the Facility on behalf of the CMRS Carriers shall sign in and out at the Facility's security office upon entering and exiting the Facility and will be issued and must return proper temporary City identification badges, if any.

e. The use of any mechanical vehicles within the Facility by the CMRS Carriers, their subcontractors or suppliers shall require prior approval by City.

f. Deliveries. Deliveries of all supplies, goods and equipment shall be made at locations and times mutually agreed to by the Parties to avoid interference with Facility operations.

9. Insurance.

- a) Prior to the commencement of any work under this Agreement, CMRS Carriers shall furnish copies of all required endorsements and completed Certificate(s) of Insurance to the City's Convention, Sports Facilities Department, which shall be clearly labeled "*Distributed Antenna System for Henry B. Gonzalez Convention Center*" in the Description of Operations block of the Certificate. The Certificate(s) shall be completed by an agent and signed by a person authorized by that insurer to bind coverage on its behalf. The City will not accept a Memorandum of Insurance or Binder as proof of insurance. The Certificate(s) must be signed by the Authorized Representative of the insurance carrier, and list the agent's signature and phone number. The Certificate(s) shall be mailed, with copies of all applicable endorsements, directly from the insurer's authorized representative to the City. The City shall have no duty to pay or perform under this Agreement until the required Certificate(s) and endorsements have been received and approved by the City's Convention, Sports Facilities Department. No officer or employee, other than the City's Risk Manager, shall have authority to waive this requirement.
- b) The City reserves the right to review the insurance requirements of this Article during any extension or renewal hereof and to reasonably modify insurance coverages and their limits when deemed necessary and prudent by City's Risk Manager based upon changes in statutory law, court decisions, or circumstances surrounding this Agreement. In no instance will the City allow modification whereby City may incur increased risk.
- c) A CMRS Carrier's financial integrity is of interest to the City; therefore, subject to the CMRS Carrier's right to maintain reasonable deductibles in such amounts as are approved by the City, CMRS Carriers shall obtain and maintain in full force and effect for the duration of this Agreement, and any extension hereof, at the CMRS Carrier's sole expense, insurance coverage written on an occurrence basis, unless otherwise indicated, by companies authorized to do business in the State of Texas and with an A.M Best's rating of no less than A- (VII), in the following types and for an amount not less than the amount listed below:

TYPE	AMOUNTS
1. Workers' Compensation	Statutory
2. Employers' Liability	\$1,000,000/\$1,000,000/\$1,000,000
3. Commercial General Liability Insurance to include coverage for the following:	For Bodily Injury and Property Damage of \$3,000,000 per occurrence;
a. Premises/Operations	\$5,000,000 General Aggregate, or its

b. Products/Completed Operations c. Personal/Advertising Injury	equivalent in Umbrella or Excess Liability Coverage
4. Business Automobile Liability a. Owned/leased vehicles b. Non-owned vehicles c. Hired Vehicles	Combined Single Limit for Bodily Injury and Property Damage of \$1,000,000 per occurrence
5. Professional Liability (Claims-made basis) To be maintained and in effect for no less than two years subsequent to the completion of the professional service.	\$1,000,000 per claim, to pay on behalf of the insured all sums which the insured shall become legally obligated to pay as damages by reason of any act, malpractice, error, or omission in professional services.
6. Fidelity or Commercial Crime Insurance Employee Dishonesty Policy – City will be named as Loss Payee	\$100,000

- d) The CMRS Carriers agree to require, by written contract, that all subcontractors providing goods or services hereunder obtain the same categories of insurance coverage required of the CMRS Carriers herein, and provide a certificate of insurance and endorsement that names the CMRS Carriers and the CITY as additional insureds. Policy limits of the coverages carried by subcontractors will be determined as a business decision of the CMRS Carriers. The CMRS Carriers shall provide the CITY with said certificate and endorsement prior to the commencement of any work by the subcontractor.
- e) As they apply to the limits required by the City, the City shall be entitled, upon request and without expense, to receive copies of the declaration page, and all required endorsements. Vendor shall be required to comply with any such requests and shall submit requested documents to City at the address provided below within 10 days. Vendor shall pay any costs incurred resulting from provision of said documents.

City of San Antonio
Attn: Convention, Sports Facilities Department
P.O. Box 839966
San Antonio, Texas 78283-3966

- f) The CMRS Carriers agree that with respect to the above required insurance, all insurance policies are to contain or be endorsed to contain the following provisions:
- Name the City, its officers, officials, employees, volunteers, and elected representatives as additional insureds, as their interests may appear under this Agreement by endorsement, as respects operations and activities of, or on behalf of, the named insured performed under contract with the City, with the exception of the workers' compensation and professional liability policies;

- Provide for an endorsement that the “other insurance” clause shall not apply to the City of San Antonio where the City is an additional insured shown on the policy;
 - Workers’ compensation, employers’ liability, general liability and automobile liability policies will provide a waiver of subrogation in favor of the City.
- g) Within five (5) calendar days of a suspension, cancellation or non-renewal of coverage, the CMRS Carrier shall provide a replacement Certificate of Insurance and applicable endorsements to the City. City shall have the option to suspend Vendor’s performance should there be a lapse in coverage at any time during this contract. Failure to provide and to maintain the required insurance shall constitute a material breach of this Agreement.
- h) In addition to any other remedies the City may have upon a CMRS Carrier’s failure to provide and maintain any insurance or policy endorsements to the extent and within the time herein required, the City shall have the right to order the CMRS Carrier to stop work hereunder, and/or withhold any payment(s) which become due to the CMRS Carrier until the CMRS Carrier demonstrates compliance with the requirements hereof.
- i) Nothing herein contained shall be construed as limiting in any way the extent to which the CMRS Carriers may be held responsible for payments of damages to persons or property resulting from a CMRS Carrier’s, or its subcontractors’, performance of the work covered under this Agreement.
- j) It is agreed that the CMRS Carriers’ insurance shall be deemed primary and non-contributory with respect to any insurance or self-insurance carried by the City of San Antonio for liability arising out of operations under this Agreement.
- k) It is understood and agreed that the insurance required is in addition to, and separate from, any other obligation contained in this Agreement, and that no claim or action by or on behalf of the City shall be limited to insurance coverage provided.
- l) The CMRS Carriers and any Subcontractors are responsible for all damage to their own equipment and/or property.

10. **Indemnity and Limitation of Liability.**

Verizon Wireless and each Future Participating Carrier (each an "Indemnitor") covenant and agree to FULLY INDEMNIFY, DEFEND and HOLD HARMLESS, the CITY and the elected officials, employees, officers, directors, volunteers and representatives of the CITY, individually and collectively, from and against any and all costs, claims, liens, damages, losses, expenses, fees, fines, penalties, proceedings, actions, demands, causes of action, liability and suits of any kind and nature, including but not limited to, personal or bodily injury, death and property damage, made upon the CITY directly or indirectly arising out of, resulting from or related to the Indemnitor(s)' activities under this Agreement, including any acts or omissions of the Indemnitor, any agent, officer, director, representative, employee, vendor or subcontractor of the Indemnitor, and their respective officers, agents employees, directors and representatives while in the exercise of the rights or performance of the duties under this Agreement. The indemnity provided for in this paragraph shall not apply to any liability resulting from the negligence of the CITY, its officers or employees, in instances where such negligence causes personal injury, death, or property damage. IF THE INDEMNITOR(S) AND CITY ARE FOUND JOINTLY LIABLE BY A COURT OF COMPETENT JURISDICTION, LIABILITY SHALL BE APPORTIONED COMPARATIVELY IN ACCORDANCE WITH THE LAWS FOR THE STATE OF TEXAS, WITHOUT, HOWEVER, WAIVING ANY GOVERNMENTAL IMMUNITY AVAILABLE TO THE CITY UNDER TEXAS LAW AND WITHOUT WAIVING ANY DEFENSES OF THE PARTIES UNDER TEXAS LAW.

The provisions of this INDEMNITY are solely for the benefit of the parties hereto and not intended to create or grant any rights, contractual or otherwise, to any other person or entity. The Indemnitor(s) shall advise the CITY in writing within 24 hours of any claim or demand against the CITY or the Indemnitor(s) known to the Indemnitor(s), related to, or arising out of the Indemnitor(s)' activities under this AGREEMENT and shall see to the investigation and defense of such claim or demand at the Indemnitor(s)' cost. The CITY shall have the right, at its option and at its own expense, to participate in such defense without relieving the Indemnitor(s) of any of its obligations under this paragraph.

Defense Counsel - CITY shall have the right to select or to approve defense counsel to be retained by the Indemnitor in fulfilling its obligation hereunder to defend and indemnify CITY, unless such right is expressly waived by CITY in writing. The Indemnitor shall retain CITY approved defense counsel within ten (10) business days of CITY'S written notice that CITY is invoking its right to indemnification under this Contract. If the Indemnitor fails to retain Counsel within such time period, CITY shall have the right to retain defense counsel on its own behalf, and the Indemnitor shall be liable for all costs incurred by CITY. CITY shall also have the right, at its option, to be represented by advisory counsel of its own selection and at its own expense, without waiving the foregoing.

Employee Litigation - In any and all claims against any party indemnified hereunder by any employee of an Indemnitor, any subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, the indemnification obligation herein provided shall not be limited in any way by any limitation on the amount or type of damages,

compensation or benefits payable by or for the Indemnitor or any subcontractor under worker's compensation or other employee benefit acts.

a. THE CITY HEREBY RELEASES EACH CMRS CARRIER AND ITS DIRECTORS, OFFICERS, MEMBERS, MANAGERS, PARTNERS, JOINT VENTURERS, EMPLOYEES, REPRESENTATIVES AND AGENTS TO THE MAXIMUM EXTENT PERMITTED BY LAW FROM ANY LIABILITY THAT MAY ARISE FROM USE OF THE CITY'S FIBER AND THE CITY'S CONDUIT.

b. Limitation of Liability. NEITHER VERIZON WIRELESS, ANY FUTURE PARTICIPATING CARRIER, NOR THE CITY WILL BE LIABLE TO THE OTHER FOR ANY INDIRECT, INCIDENTAL, SPECIAL, CONSEQUENTIAL, OR PUNITIVE DAMAGES, OR LOST PROFITS FOR ANY CLAIM ARISING OUT OF THIS AGREEMENT.

11. **Damage, Destruction, or Actions of the City.**

a. CMRS Carriers' Rights. In the event of any damage, destruction, action of the City or Verizon Wireless or CMRS Carriers, or loss that impairs the CMRS Carriers' ability to install, maintain or operate the DAS in the Facility that is so substantial that the repair, rerouting, restoration or rehabilitation of the DAS and/or the Facility cannot reasonably be expected to be completed within one hundred eighty (180) days from the date of such damage or action, Verizon Wireless may, on behalf of itself and all CMRS Carriers, elect to terminate this Agreement and all sublicenses by giving written notice to the City within one hundred twenty (120) days of the date of the damage or action. If Verizon Wireless or the City elects not to terminate the Agreement, but such damage is not repaired or such action cannot be compensated for within one hundred eighty (180) days, Verizon Wireless and/or the City may terminate the Agreement and all sublicenses upon written notice to the City at any time prior to the completion of the repairs or modifications of the DAS and/or the Facility. With respect to damage or action of the City or Verizon Wireless or CMRS Carriers that impairs or limits any CMRS Carrier's ability to use any of the Facility or impairs the installation of the DAS in the DAS Areas, then CMRS Carriers may cease to use such portion of the Facility or request a reroute of the DAS from such impaired portion of the DAS Areas.

b. City's Rights. The City may terminate this Agreement by giving Verizon Wireless nine (9) months written notice if the City substantially alters the use of the Facility such that it is: (i) closed to the public, (ii) repurposed for non-public use, (iii) demolished, or (iv) sold to a private entity. If the City terminates this Agreement under this subsection, Verizon Wireless shall have the right to remove some or all of the DAS equipment from the Facilities at its cost, and Verizon Wireless shall be entitled to reimbursement of the DAS Costs pursuant to the provisions of Section 5.d. of this Agreement.

12. **Recovery of the Facility; Renovations; Relocation of the DAS.**

a. If the City or other governing authority, in the exercise of any of its prescribed powers decides to recover any portion of the Facility or require the relocation of all or any part of

the DAS, the City agrees to provide at least six (6) months prior written notice to Verizon Wireless; provided however, that if a governing authority other than the City exercises any such prescribed powers, the City agrees to give Verizon Wireless as much notice as reasonably possible. At the City's sole cost and expense, the City will use commercially reasonable efforts to work with the CMRS Carriers to determine a new location with the Facility to relocate any affected portions of the DAS, which new location for any part of the DAS will be subject to Verizon Wireless' reasonable approval.

b. In the event of Facility improvements which may affect the DAS, City may direct the CMRS Carriers to remove or relocate their wires, conduits, cables and other property located in, on or around the Facility. In the event of minor Facility improvements, the City will be responsible for reimbursing the CMRS Carriers for any costs to relocate portions of the DAS located in non-public areas of the Facility, and the CMRS Carriers will be responsible for any relocation costs of portions of the DAS located in the public areas of the Facility. If the City undertakes a major renovation of the Facility, the City will be responsible for all relocation costs of the DAS.

c. Except as provided in Section 12(a) or in the event of a major renovation as set forth in Section 12(b) above, in no event will Verizon Wireless be obligated to relocate the Headend room. Relocation of the Headend room provided to Verizon Wireless in the Alamodome will continue to be subject to the terms and conditions of the May 21, 2013 Alamodome DAS Agreement entered into by the Parties and approved by the City Council in Ordinance 2013-02-21-0138.

13. **Miscellaneous.**

a. Notices. Notices concerning this Agreement shall be in writing via email to Verizon Wireless and/or the City's official points of contact as provided and maintained under this agreement and must be followed by certified or registered mail, express mail or other overnight delivery service, or hand delivery, proper postage or other charges paid and addressed or directed to the respective Parties as follows:

If to Verizon Wireless:

Verizon Wireless
5804 Tri County Pkwy
Schertz, TX 78154
Attn: Manager – Network Real Estate

with a copy to:

Verizon Wireless, Legal Department
Attn.: General Counsel

180 Washington Valley Road
Bedminster, NJ 07921

If to City:

City of San Antonio
Convention, Sports, and Entertainment Facilities
Department
P.O. Box 1809
San Antonio, TX 78296-1809

Or at such other address(es) as either Party gives written notice of to the other Party. Notice shall be effective upon actual receipt or refusal as shown on the receipt obtained pursuant to the foregoing.

b. Non-Discrimination. The CMRS Carriers agree not to discriminate on the basis of race, color, religion, ancestry or national origin, sex, age, marital status, sexual orientation or, on the basis of disability or other unlawful forms of discrimination in the solicitation, selection, hiring or commercial treatment of any contractors, vendors, suppliers, or commercial customers, nor shall the company retaliate against any person for reporting instances of such discrimination in connection with its performance of this Agreement. The CMRS Carriers will incorporate the obligations in this paragraph (b) in all contracts they enter into with subcontractors or other parties with respect to the performance of this Agreement.

c. Prompt Payment of Subcontractors. If applicable, upon execution of this Agreement by Verizon Wireless, Verizon Wireless shall be required to submit to the City accurate progress payment information with each invoice regarding each of its subcontractors, including HUBZone subcontractors, to ensure that the Verizon Wireless' reported subcontract participation is accurate. Verizon Wireless shall pay its subcontractors within forty-five (45) days of receipt of undisputed invoices from subcontractors. In the event of Verizon Wireless' noncompliance with these prompt payment provisions, this Agreement may be suspended, and no new City contracts shall be issued to the Verizon Wireless, until the City's audit of previous subcontract payments is complete and payments are verified to be in accordance with the specifications of the applicable contract.

d. Non-Binding Mediation. Prior to filing suit, the Parties to this Agreement shall use non-binding mediation to resolve any controversy, claim or dispute arising under this Agreement, expressly excluding disputes involving the applicability or effect of superior laws, the constitutionality of any requirement in this Agreement or the preemptive effect of federal law.

(i) Initiation of Mediation. To initiate non-binding mediation, a Party shall give written notice to the other Party. In the mediation process, the Parties will try to resolve their differences voluntarily with the aid of an impartial mediator, who will attempt to facilitate negotiations. The mediator will be selected by agreement of the Parties. If the Parties cannot agree on a mediator, a mediator shall be designated by JAMS/Endipute at the request of either Party. Any mediator so designated must be acceptable to both Parties.

- (ii) Mediation Process. The mediation will be conducted as specified by the mediator and agreed upon by the Parties. The Parties agree to discuss their differences in good faith and to attempt with the assistance of the mediator, to reach an amicable resolution of the dispute. Any findings by the mediator shall be a non-binding determination.

e. Conflict of Interest. The City of San Antonio Ethics Code prohibits contracts between the City and its local public officials, employees and agents from being either officers or employees of City or any City agency such as City-owned utilities. It further prohibits Verizon Wireless' officers, employees and agents from having a prohibited financial interest in an agreement with the City. A prohibited financial interest means a City officer or employee, his or her parent, child or spouse, a business entity in which the officer or employee, or his or her parent, child or spouse, directly or indirectly, owns ten percent (10%) of more of the voting stock or shares of the business entity; or ten percent (10%) or more of the fair market value of the business entity; or a business entity of which any individual or entity above listed is a subcontractor on a City contract, a partner, or a parent or subsidiary business entity. Verizon Wireless warrants that it has disclosed whether there are any existing or potential conflicts of interest related to this provision and that it has completed a Discretionary Contracts Disclosure Form.

f. Ownership and Retention of Public Records. In accordance with Texas law, Verizon Wireless acknowledges and agrees that all local government records created or received in the transaction of official business pursuant to this Agreement are declared to be public property and subject to the provisions of the Local Government Records Act, Chapter 201 of the Texas Local Government Code and Subchapter J, Chapter 441 of the Texas Government Code. Thus, no such local government records produced by or on the behalf of the City pursuant to this Agreement shall be subject of any copyright or proprietary claim by Verizon Wireless or any Future Participating CMRS Carriers.

- (i) Exception to Public Records. The Parties, however, acknowledge that Verizon Wireless' internal documents with associated trade secrets may be subject to claims of confidentiality or proprietary information by Verizon Wireless. Any such documents identified by Verizon Wireless, in whole or in part, as confidential or proprietary in nature will be treated as such by the City, subject to the applicability of the Public Information Act, Chapter 552 of the Texas Government Code.

- (ii) Nature of Local Government Records. The term "local government records" as used herein shall mean any documents, papers, letter, book, map, photograph, sound or video recording, microfilm, magnetic tape, electronic medium, or other information recording medium, regardless of physical form or character and regardless of whether public access to it is open or restricted under the laws of the state, created or received by a local government or any of its officials or employees pursuant to law including an ordinance, or in the transaction of official business. Verizon Wireless acknowledges and agrees that all local government records, as described herein, produced in the course

of the work required by this Agreement, will belong to and be the property of the City.

(iii)Exception to Local Government Records. To the extent a local government record includes information Verizon Wireless considers confidential or proprietary, it will identify such information as such when providing the local government record to the City. Any information identified as confidential or proprietary by Verizon Wireless will be treated as such by the City, subject to the applicability of the Public Information Act, Chapter 552 of the Texas Government Code.

(iv)Compliance with Records Retention Laws. In accordance herewith, Verizon Wireless agrees to comply with the Public Information Act and Local Government Records Act.

g. Entire Agreement. This Agreement is the entire agreement between the Parties and supersedes any and all prior agreements and understandings, either oral or written, between the Parties.

h. No Waiver. The failure of any Party to insist at any time upon the strict performance of any provision contained herein or to exercise any option, right, power or remedy contained in this Agreement will not be construed as a waiver or a relinquishment thereof for the future.

i. Amendment, Successors and Assigns. This Agreement may only be amended by a written instrument duly executed by each Party. This Agreement will extend to and bind the heirs, personal representatives, successor and assigns of the Parties hereto.

j. GOVERNING LAW. THE INTERPRETATION, VALIDITY AND ENFORCEMENT OF THIS AGREEMENT WILL BE GOVERNED BY AND CONSTRUED UNDER THE INTERNAL LAWS OF THE STATE OF TEXAS, INCLUDING ITS PRINCIPLES OF CONFLICT OF LAWS. THE PARTIES AGREE THAT THE VENUE OF ANY LITIGATION RELATED HERETO WILL BE EXCLUSIVELY IN BEXAR COUNTY, TEXAS.

k. Quiet Enjoyment and Recordation. The City agrees that upon each CMRS Carrier's performance of all the terms, covenants and conditions to be observed and performed pursuant to the terms of this Agreement, each CMRS Carrier may peacefully and quietly enjoy that portion of the Facility where the DAS is located in accordance with the terms hereof.

l. No Personal Liability. This Agreement does not create any personal liability on the part of any officer, employee, or agent of any Party. No officer, employee, or agent of any Party will be charged personally or held contractually liable by or to the other Party under any term or provision of this Agreement.

m. Force Majeure. In the event that either Party hereto is prevented from fully and timely performing any of its obligations hereunder due to acts of public enemy, restraining by government, unavailability of materials, civil unrest, floods, hurricanes, tornadoes, earthquakes,

or other severe weather condition, or other acts of God (collectively call “Force Majeure Event”) such Party shall be relieved of the duty to perform such obligation until such time as the Force Majeure Event has been alleviated; provided, that upon the remove of the Force Majeure Event, the obligation prevented from being fulfilled will be automatically reinstated without necessity of any notice whatsoever.

n. Independent Contractors. Verizon Wireless’ relationship to the City under this Agreement will be that of independent contractor. Nothing in this Agreement will be construed to designate any Party or any of its employees, as employees, agents, joint venturers or partners of the other Party.

o. Severability. If any provision of this Agreement is determined by a court of competent jurisdiction to be void, voidable, invalid, or unenforceable, the remainder of this Agreement will not be affected thereby, and this Agreement will be valid and enforceable to the fullest extent permitted by law.

p. Counterparts. This Agreement may be executed in any number of counterparts, each of which will be deemed an original and all of which together will constitute one and the same instrument.

[SIGNATURE PAGES FOLLOW]

IN WITNESS WHEREOF, the Parties hereto have caused this Agreement to be executed by their duly authorized officers or representatives.

SAN ANTONIO MTA, L.P.,
d/b/a Verizon Wireless

CITY OF SAN ANTONIO, a Texas
municipal corporation

By: Verizon Wireless Texas, LLC
Its: General Partner

By:_____

Jason Leiker

Director - Network Field Engineering

Date:_____

By:_____

Sheryl L. Sculley

City Manager

Date:_____

ATTEST:

Leticia M. Vacek
City Clerk

APPROVED AS TO FORM:

Andrew Segovia
City Attorney

EXHIBIT A

PRELIMINARY DAS PLANS AND SPECIFICATIONS

[*See attached*]

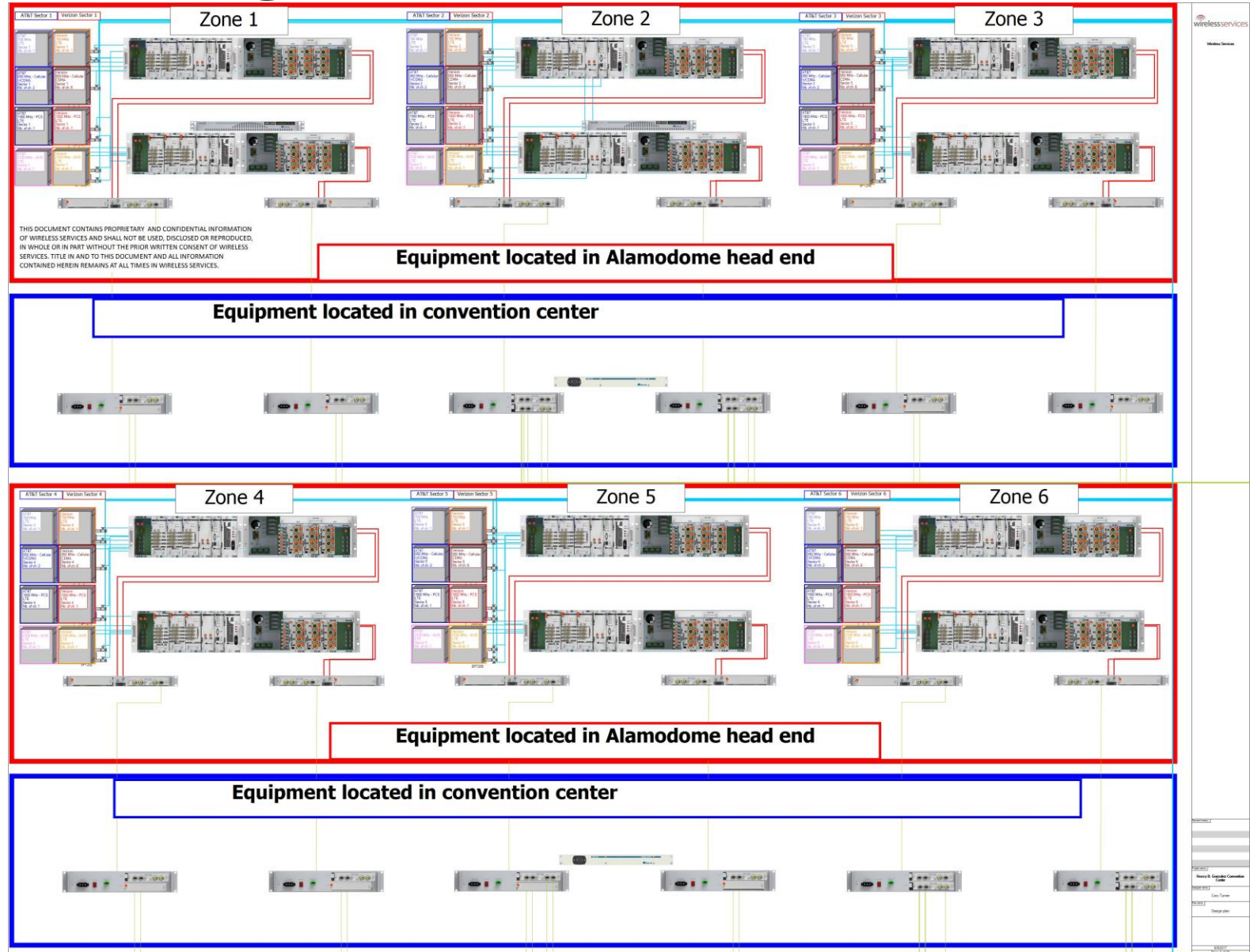


RF Design Plan

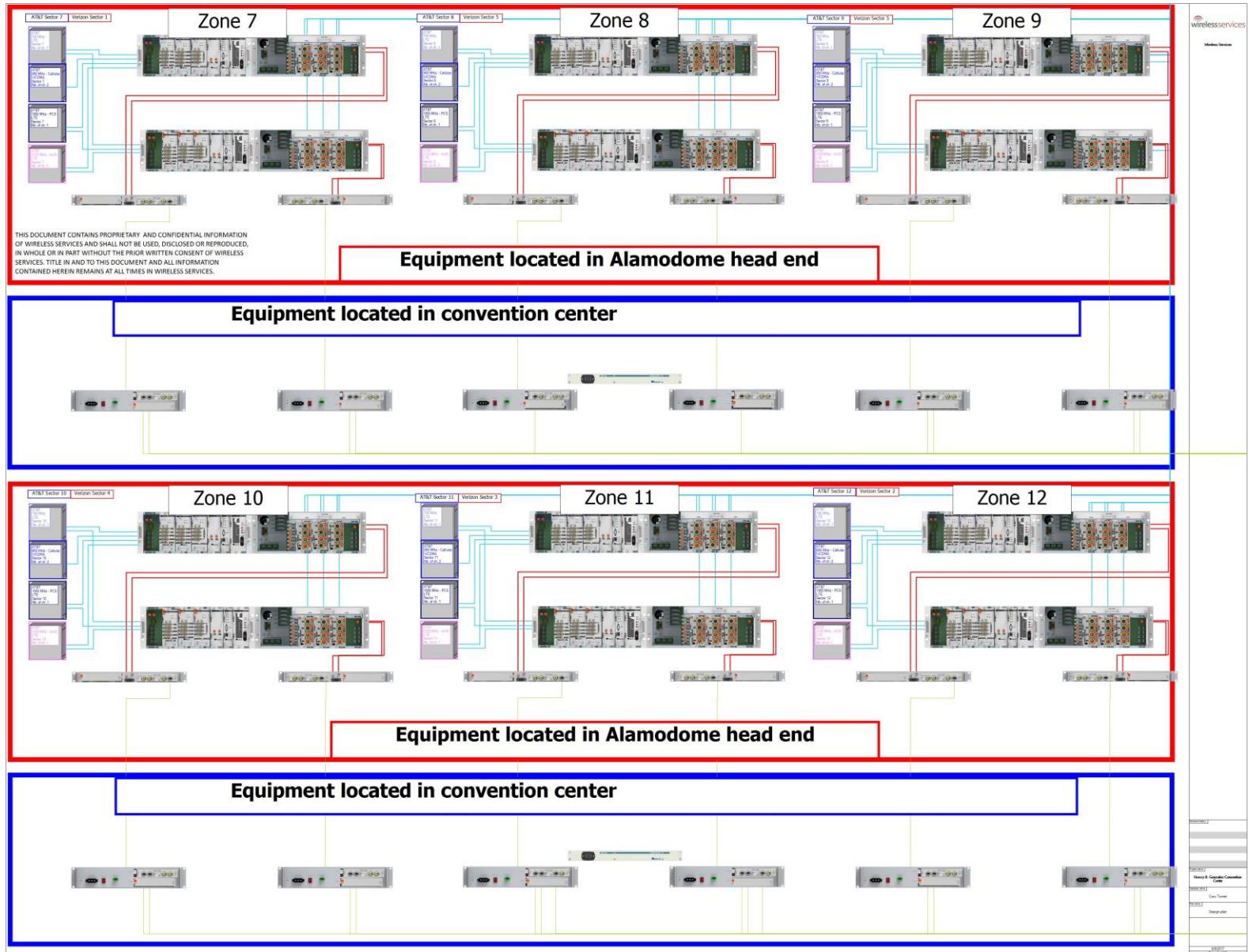
Henry B. Gonzalez Convention Center
Neutral Host Distributed Antenna System



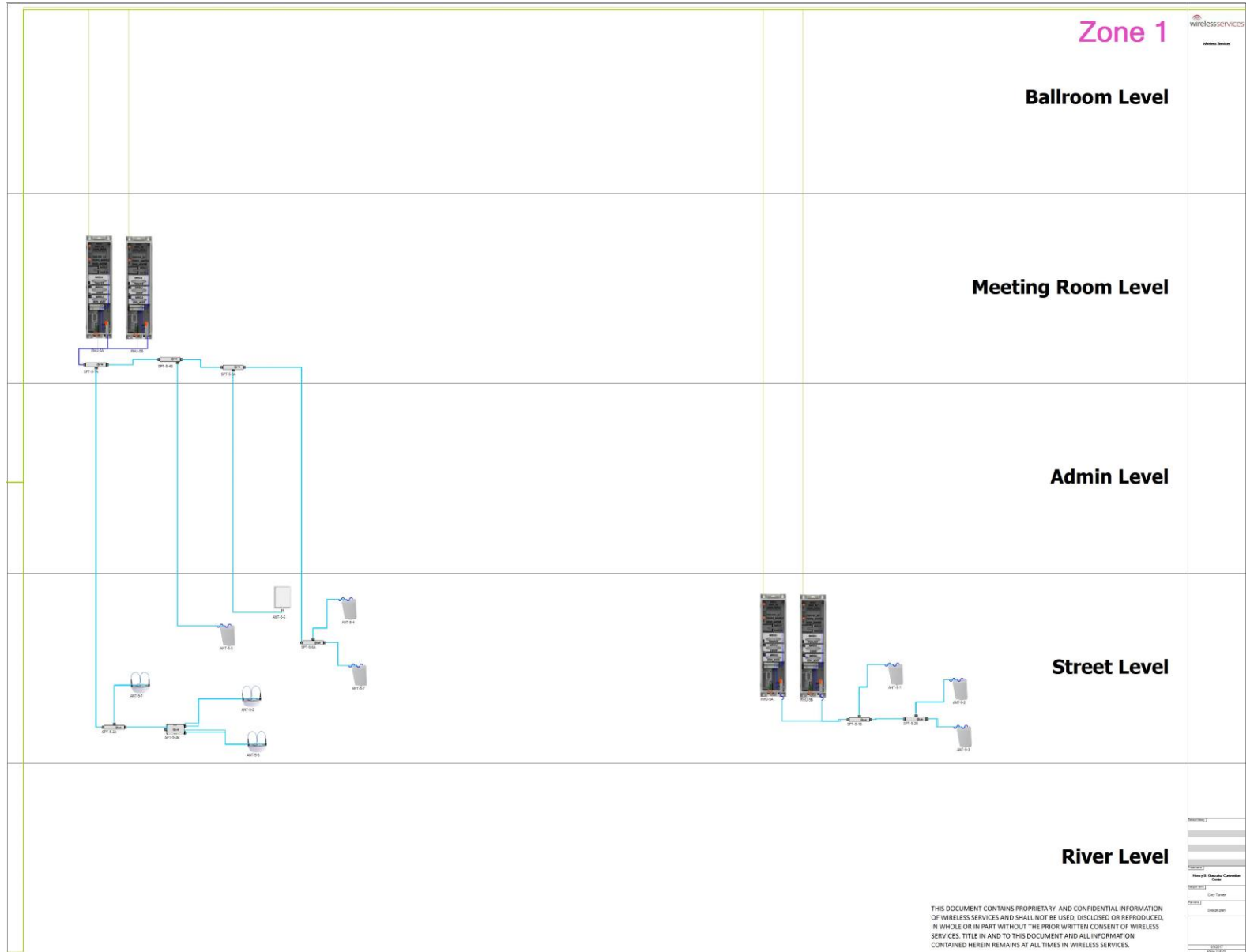
DAS Design Plan - Overview



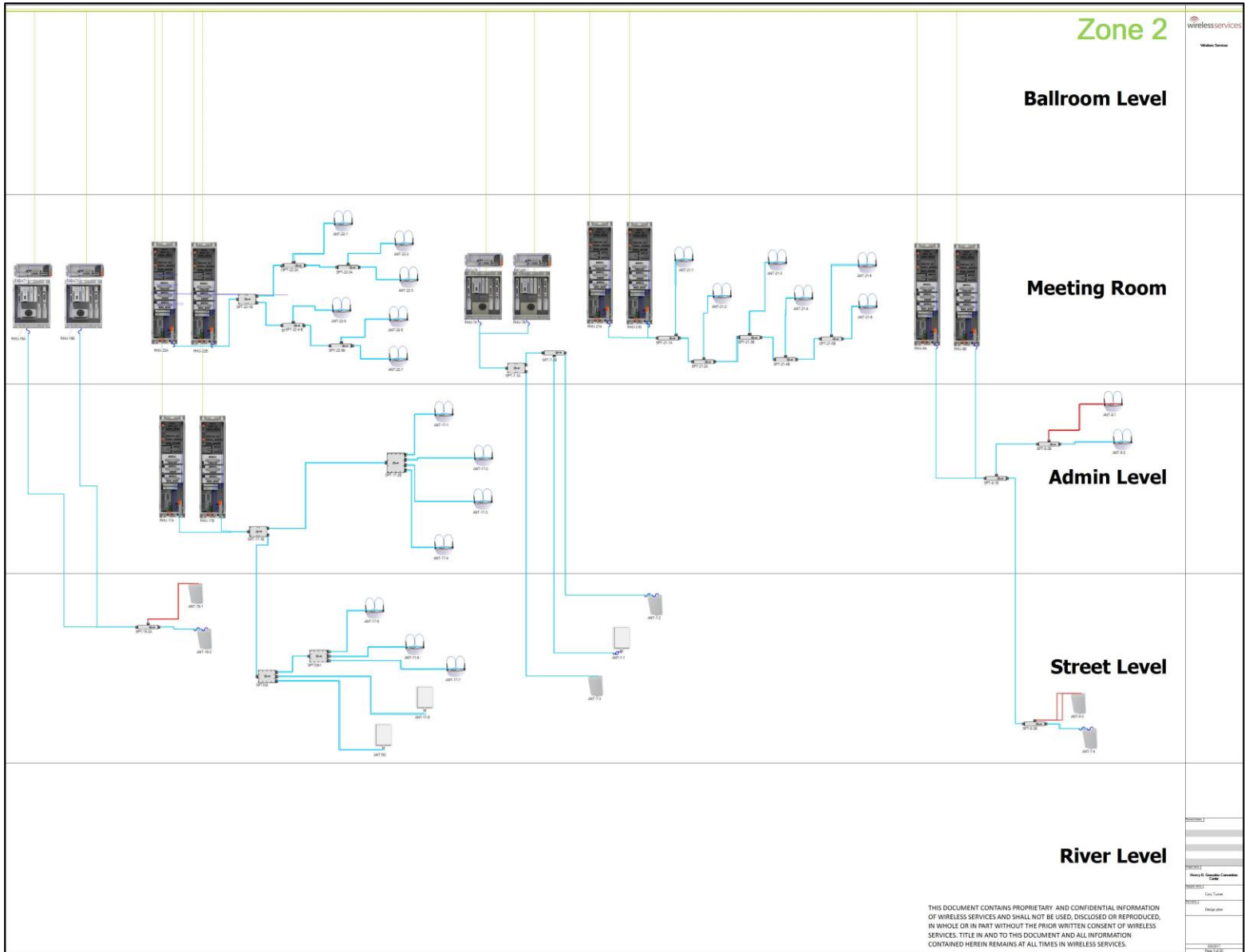
DAS Design Plan - Overview



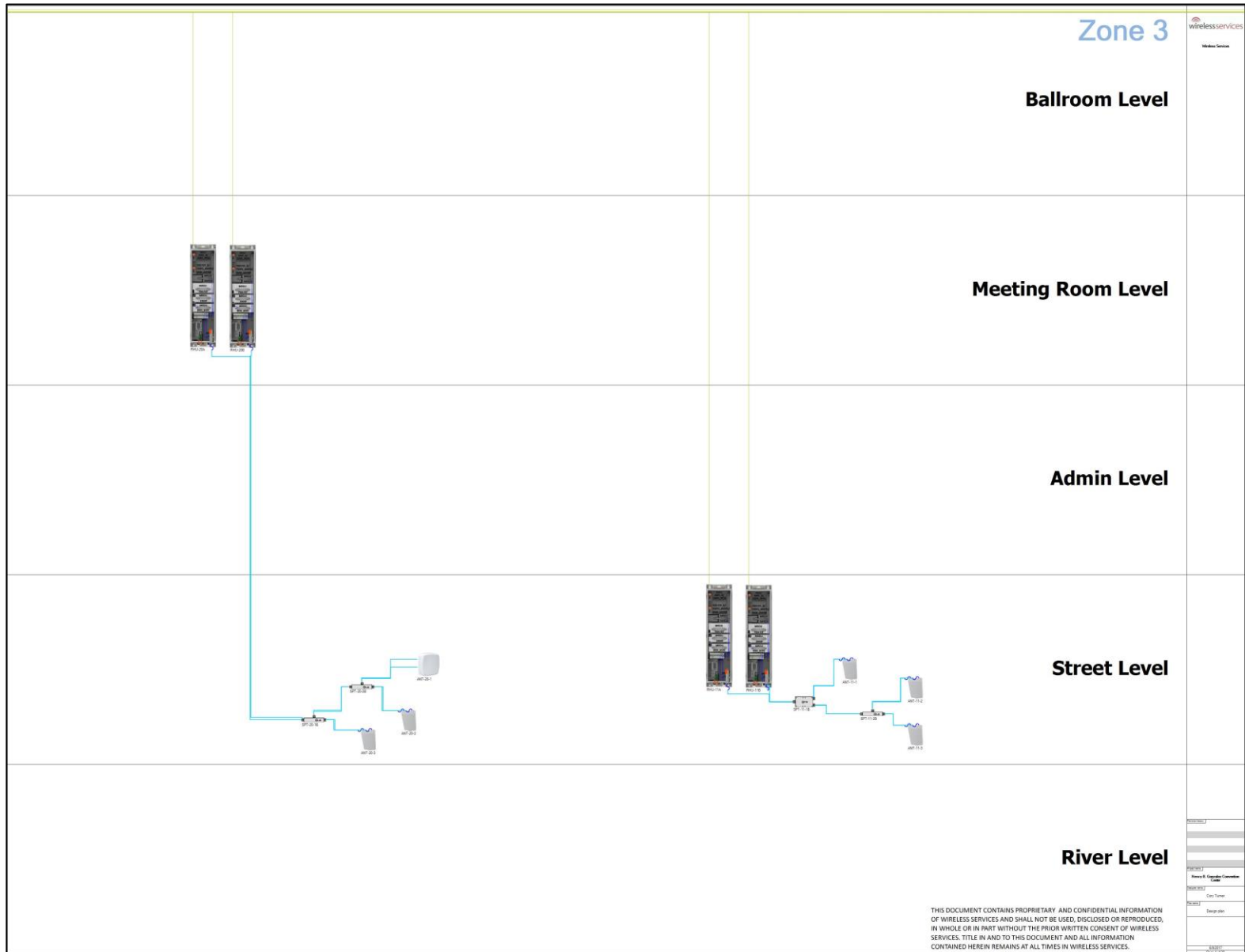
DAS Design Plan – Zone 1



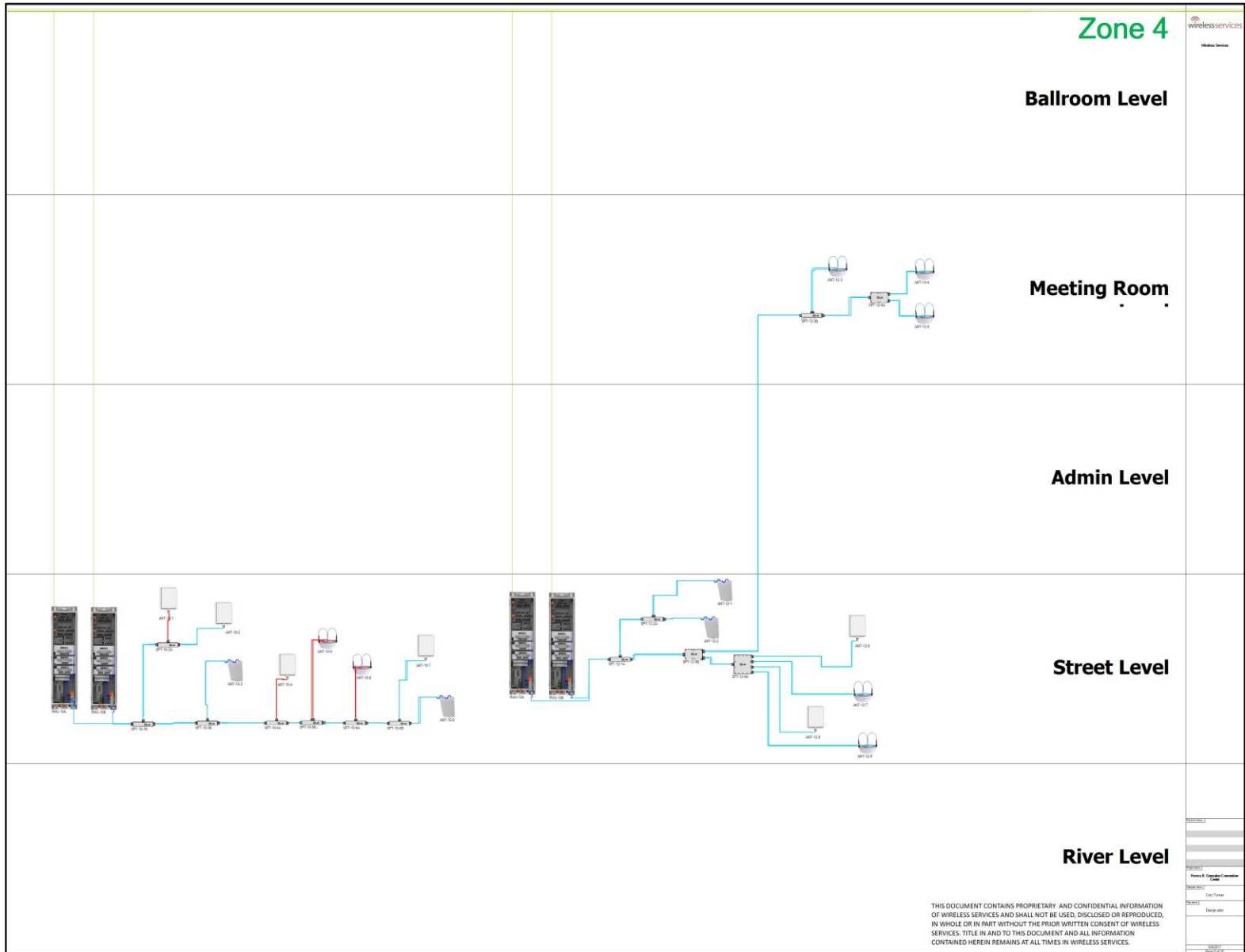
DAS Design Plan - Zone 2



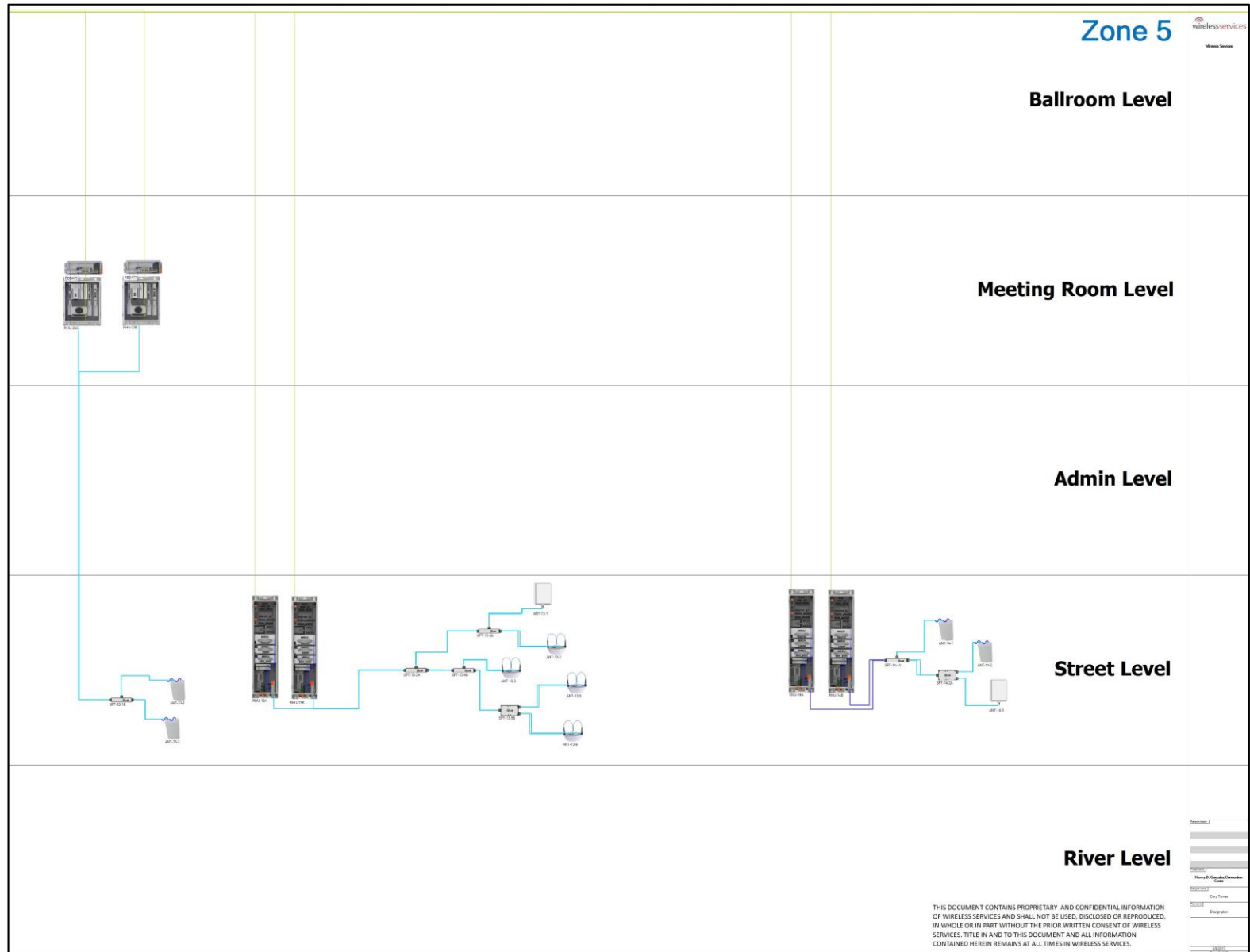
DAS Design Plan – Zone 3



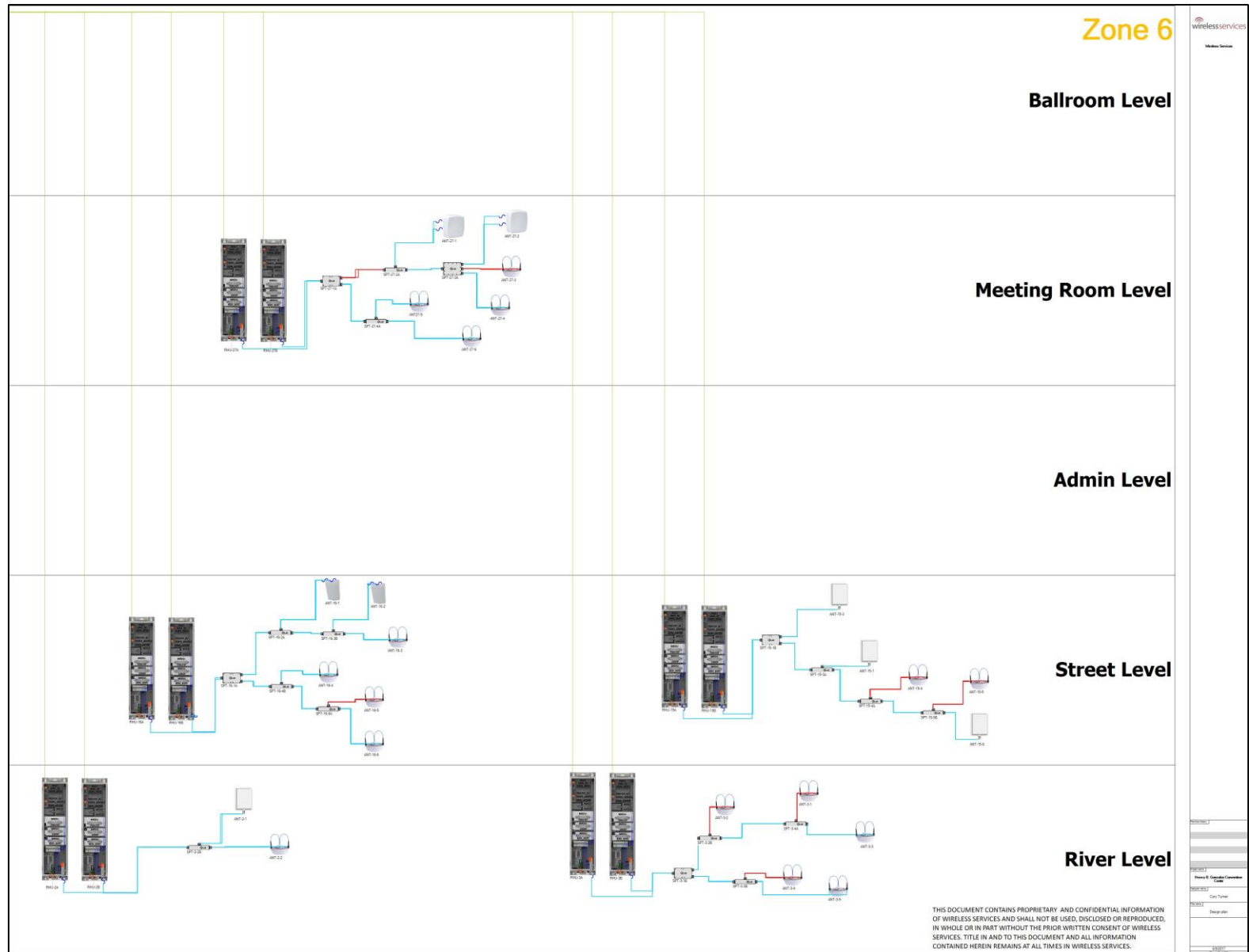
DAS Design Plan – Zone 4



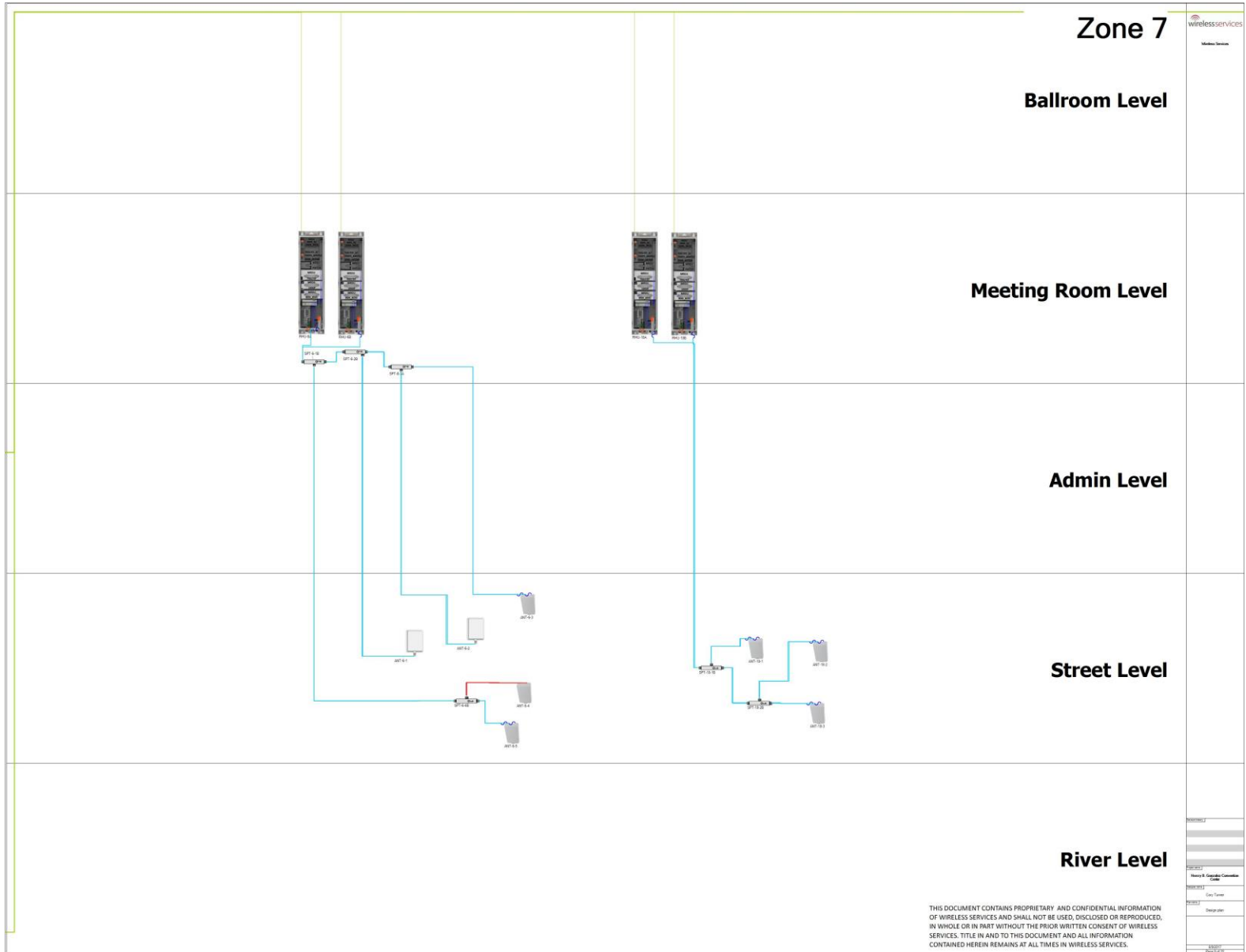
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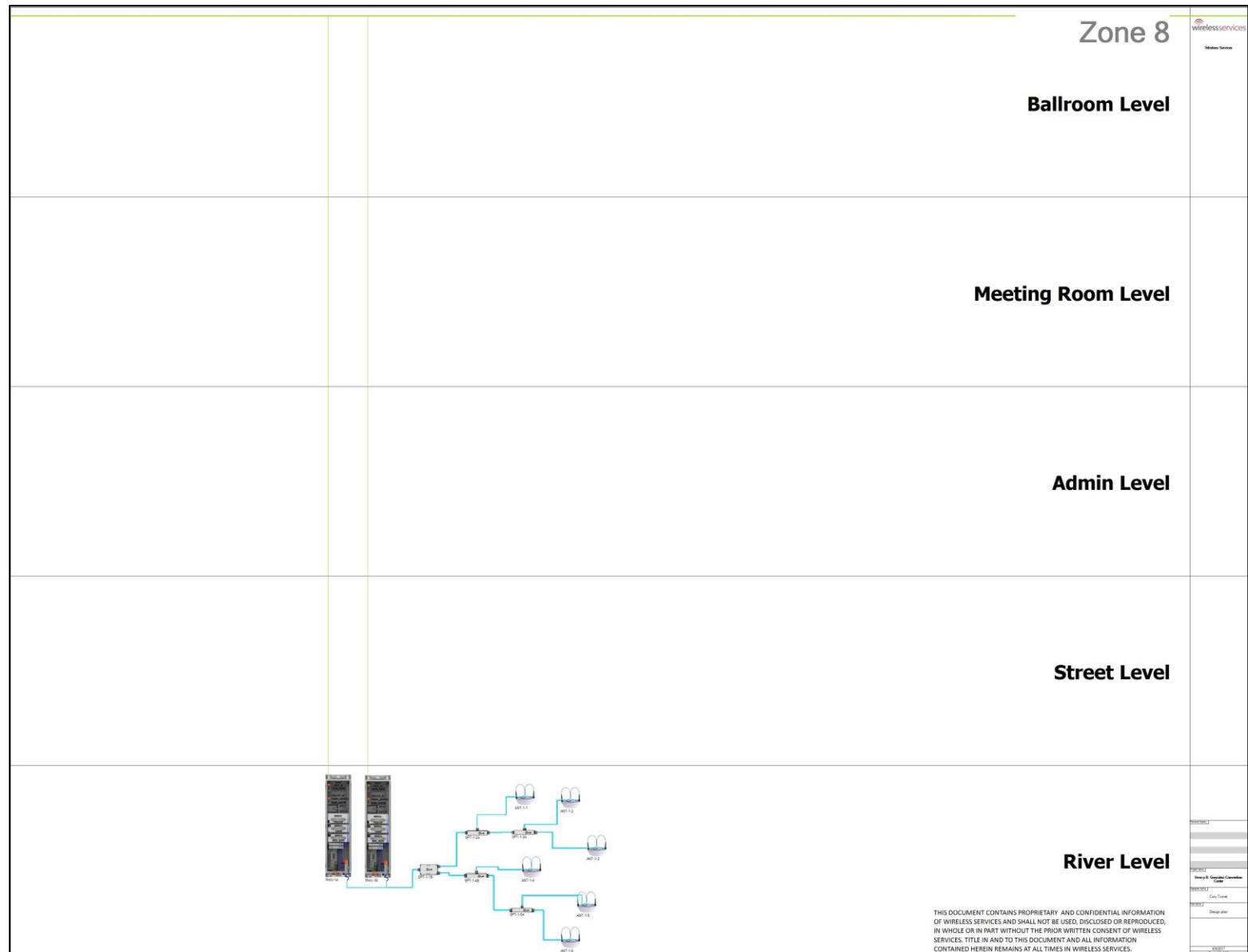
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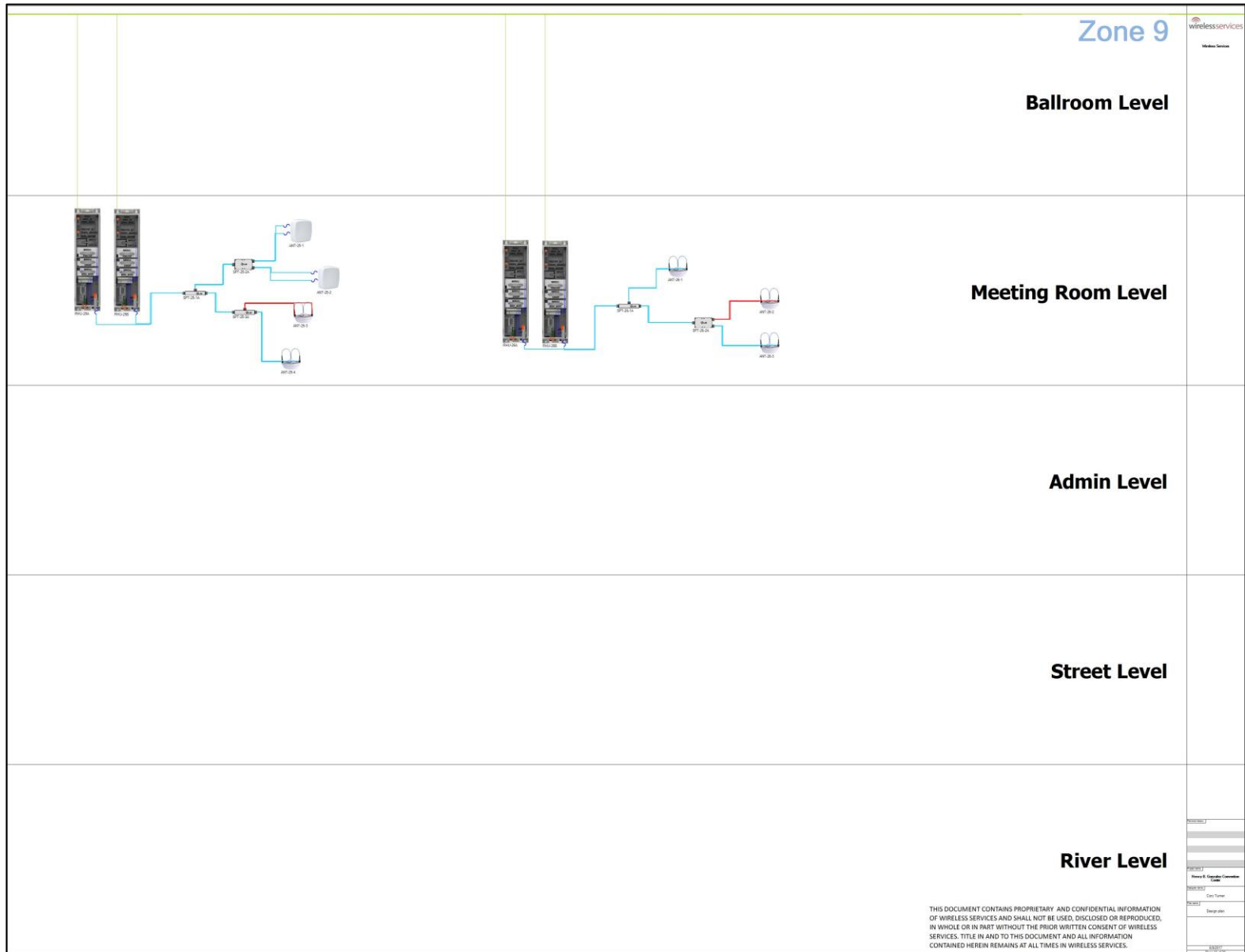
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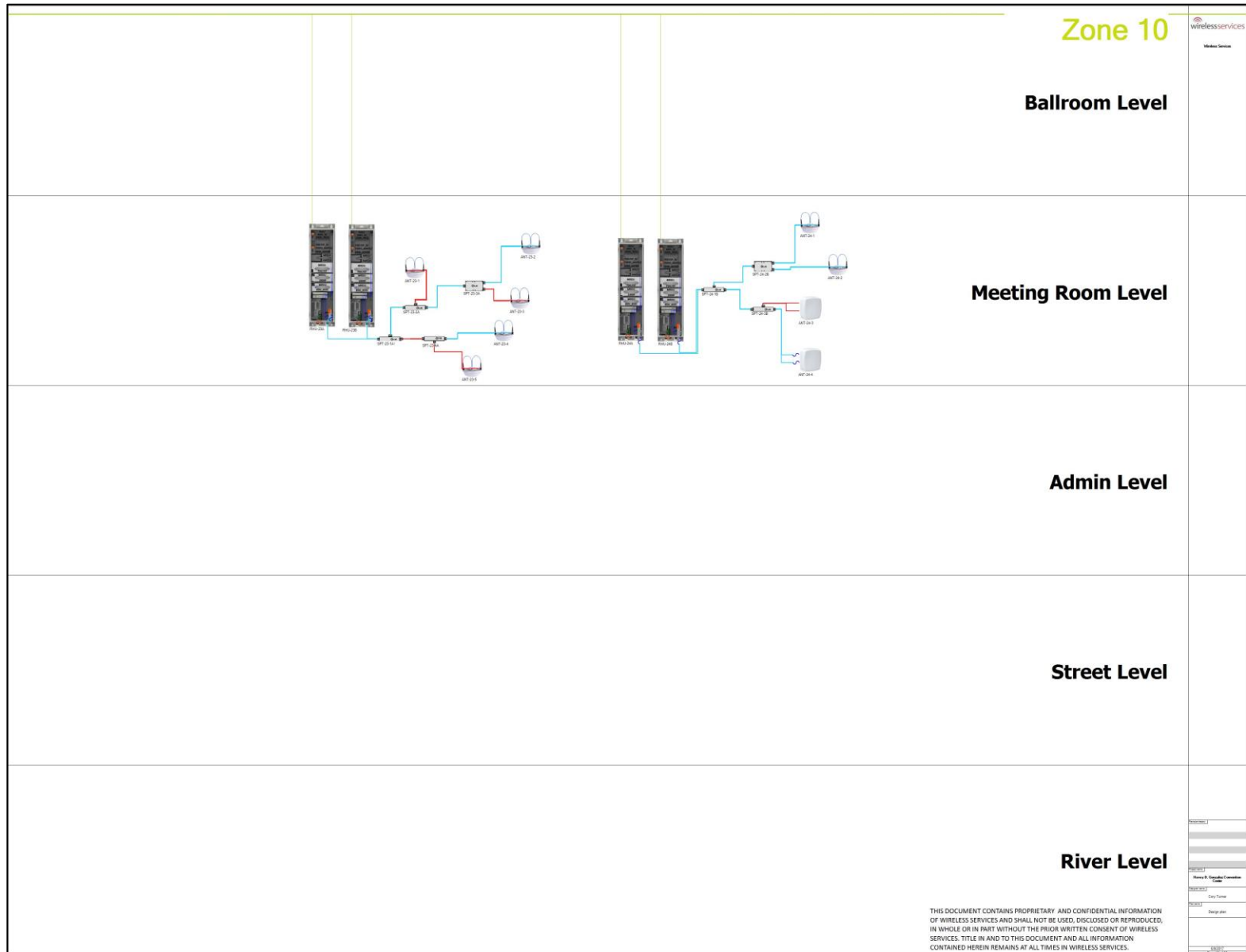
DAS Design Plan - Zone 8



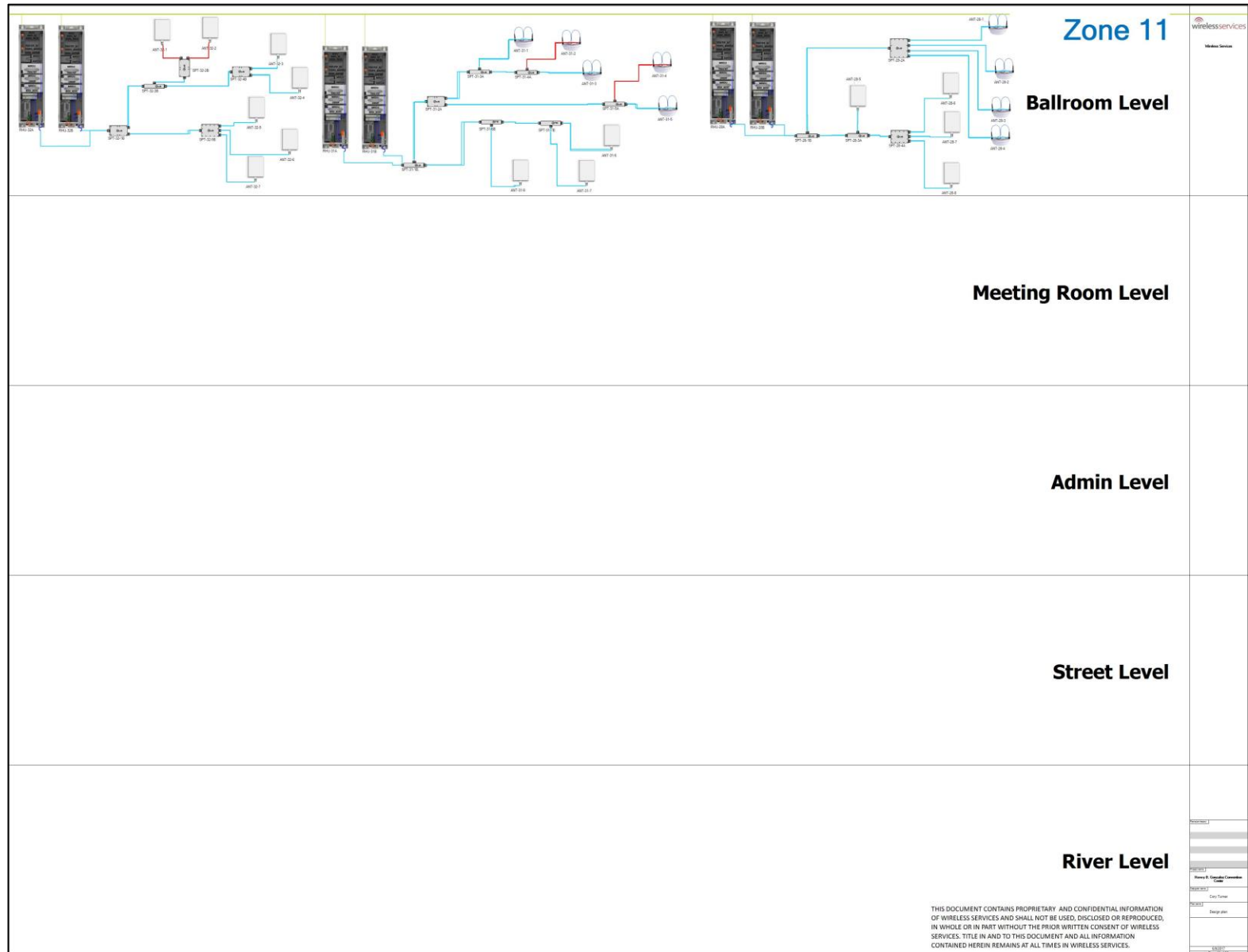
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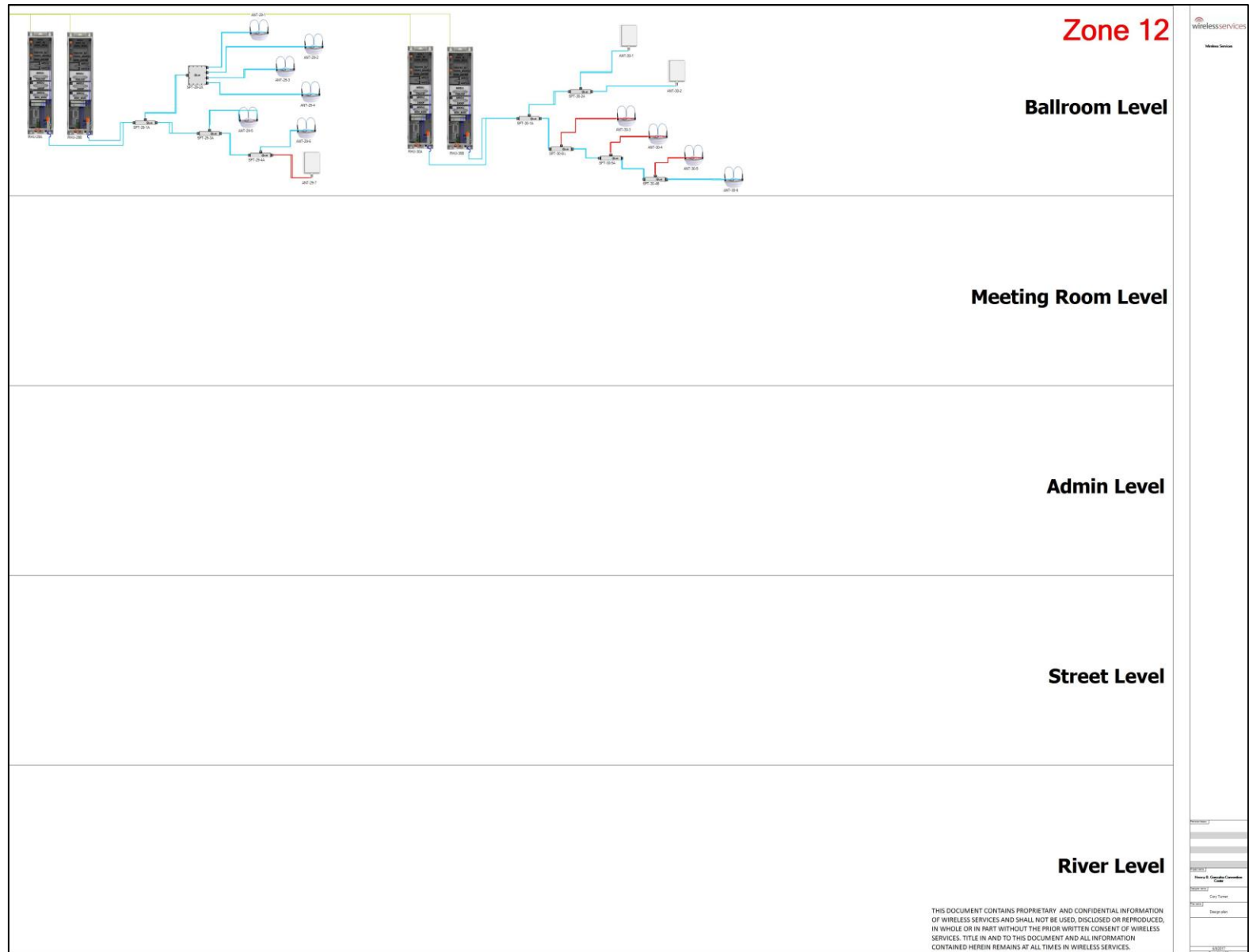
DAS Design Plan – Zone 10



DAS Design Plan – Zone 11



DAS Design Plan – Zone 12



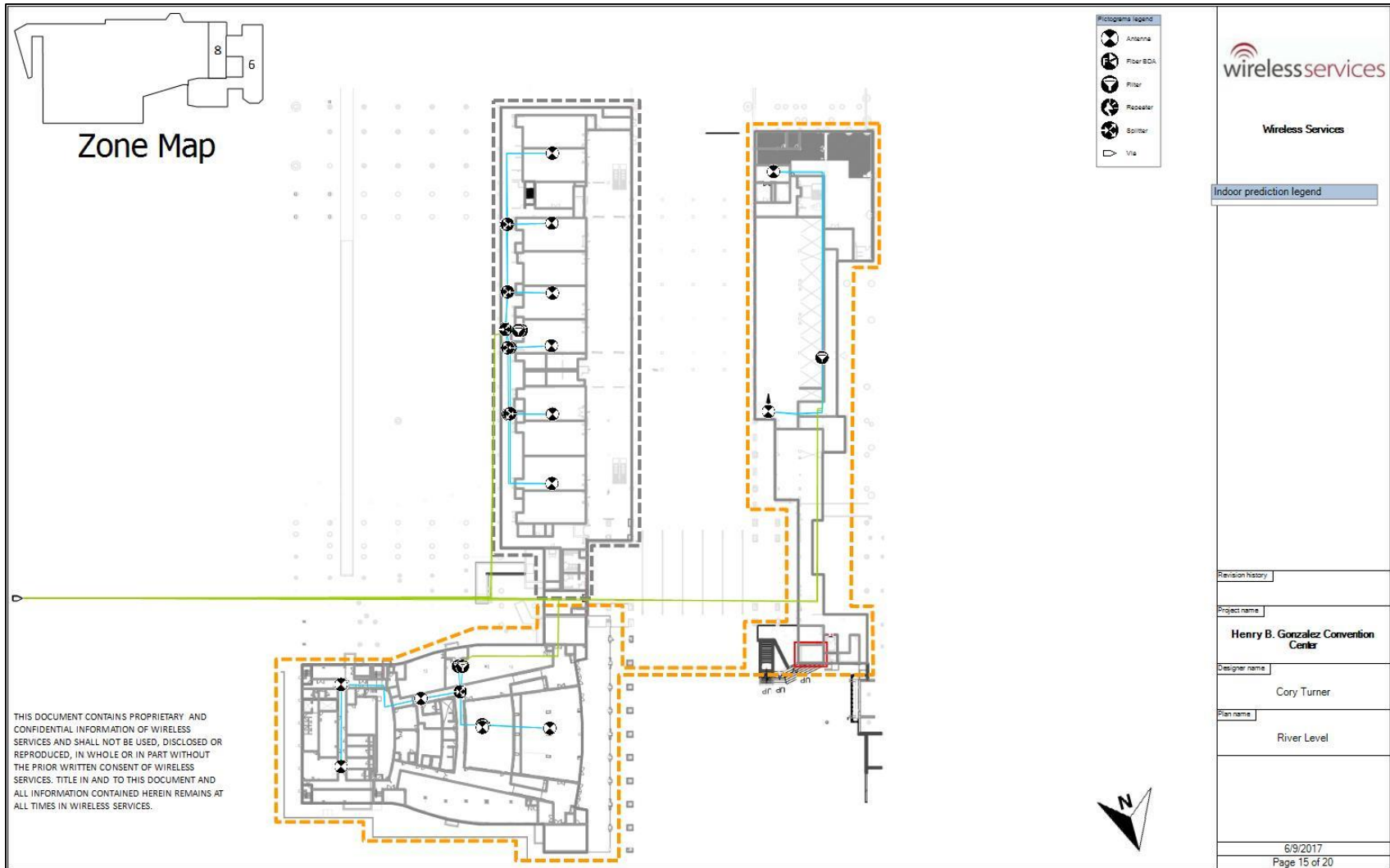


DAS FLOOR LAYOUTS

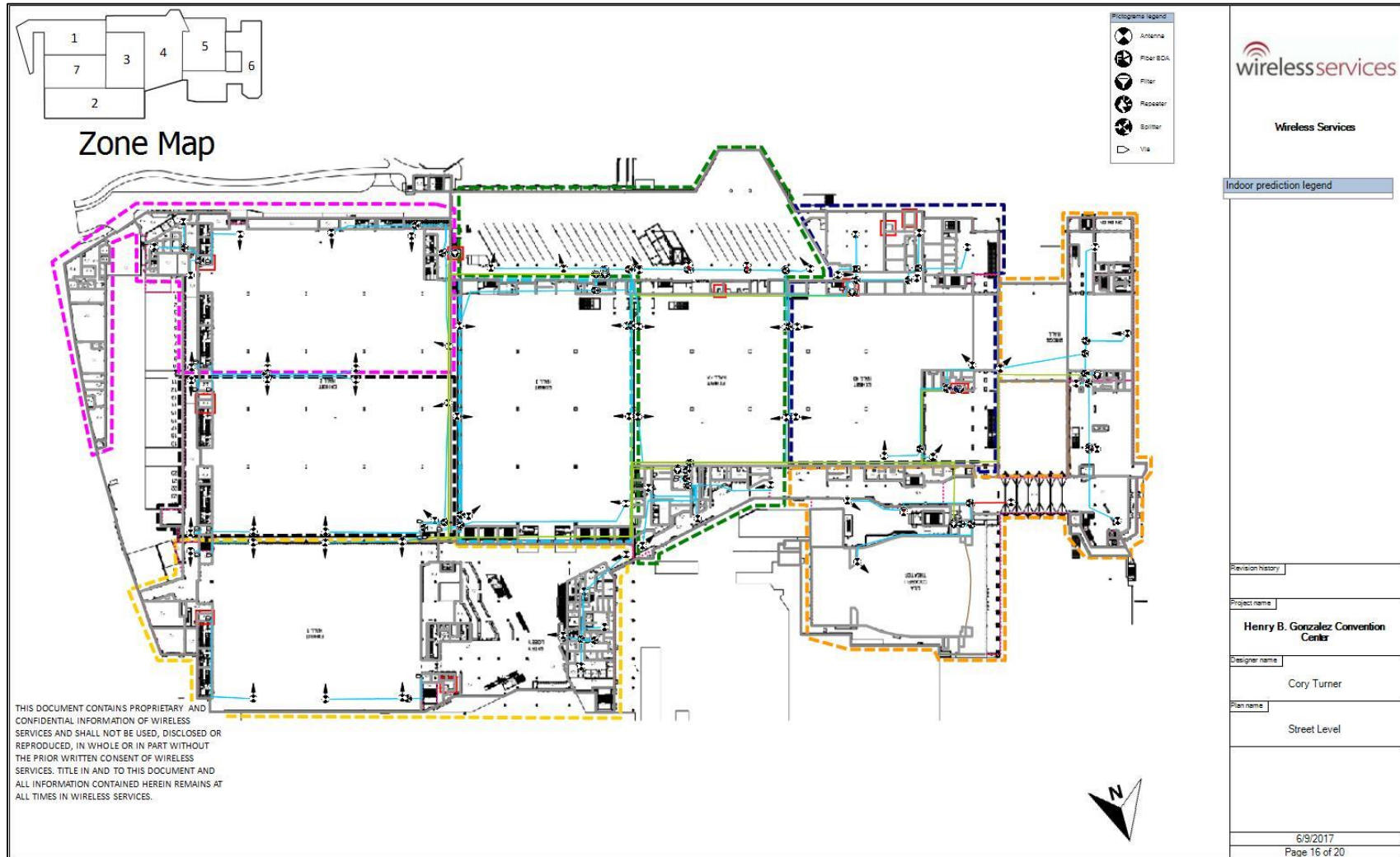
Henry B. Gonzalez Convention Center
Neutral Host Distributed Antenna System



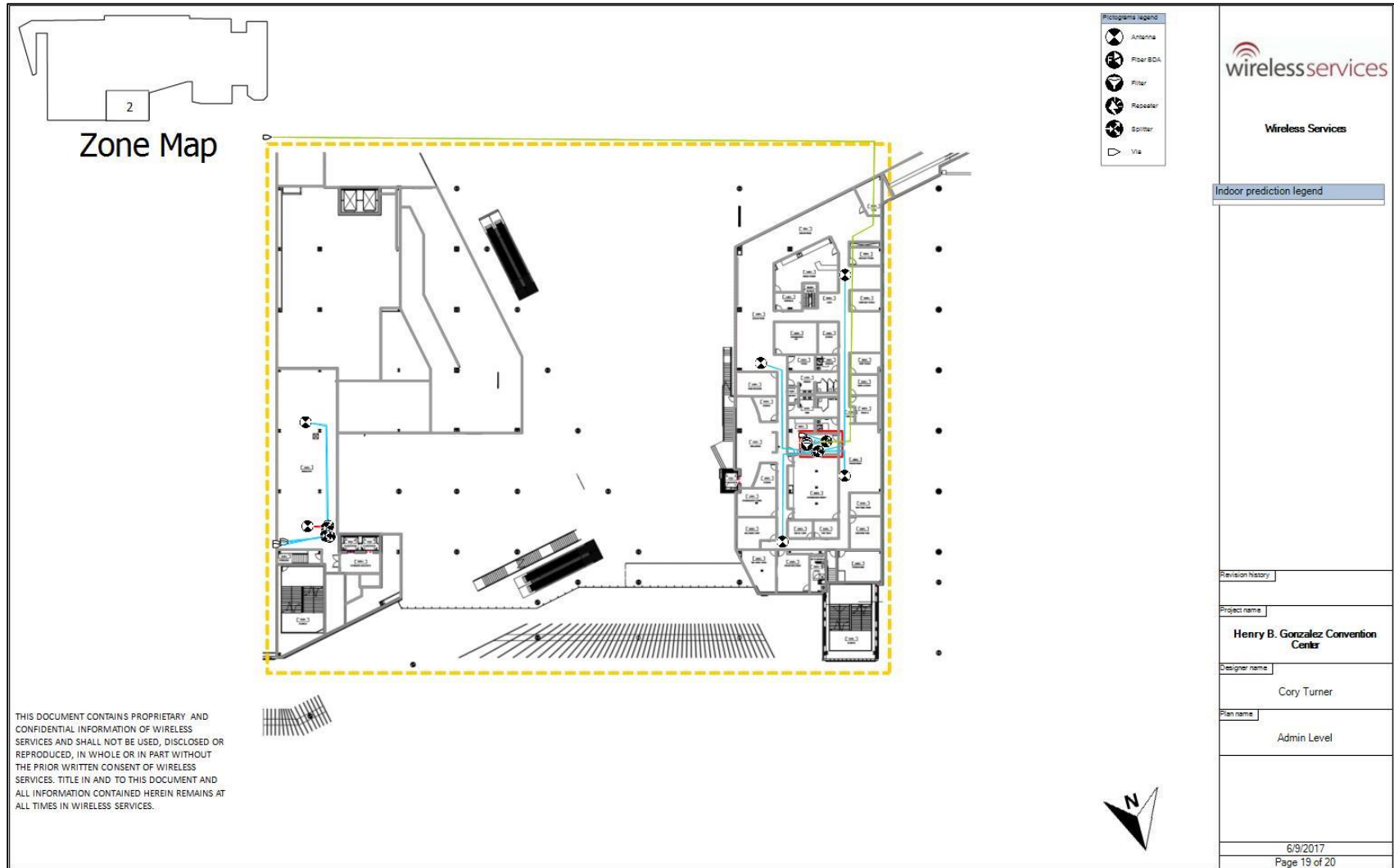
River Level Floor Layout



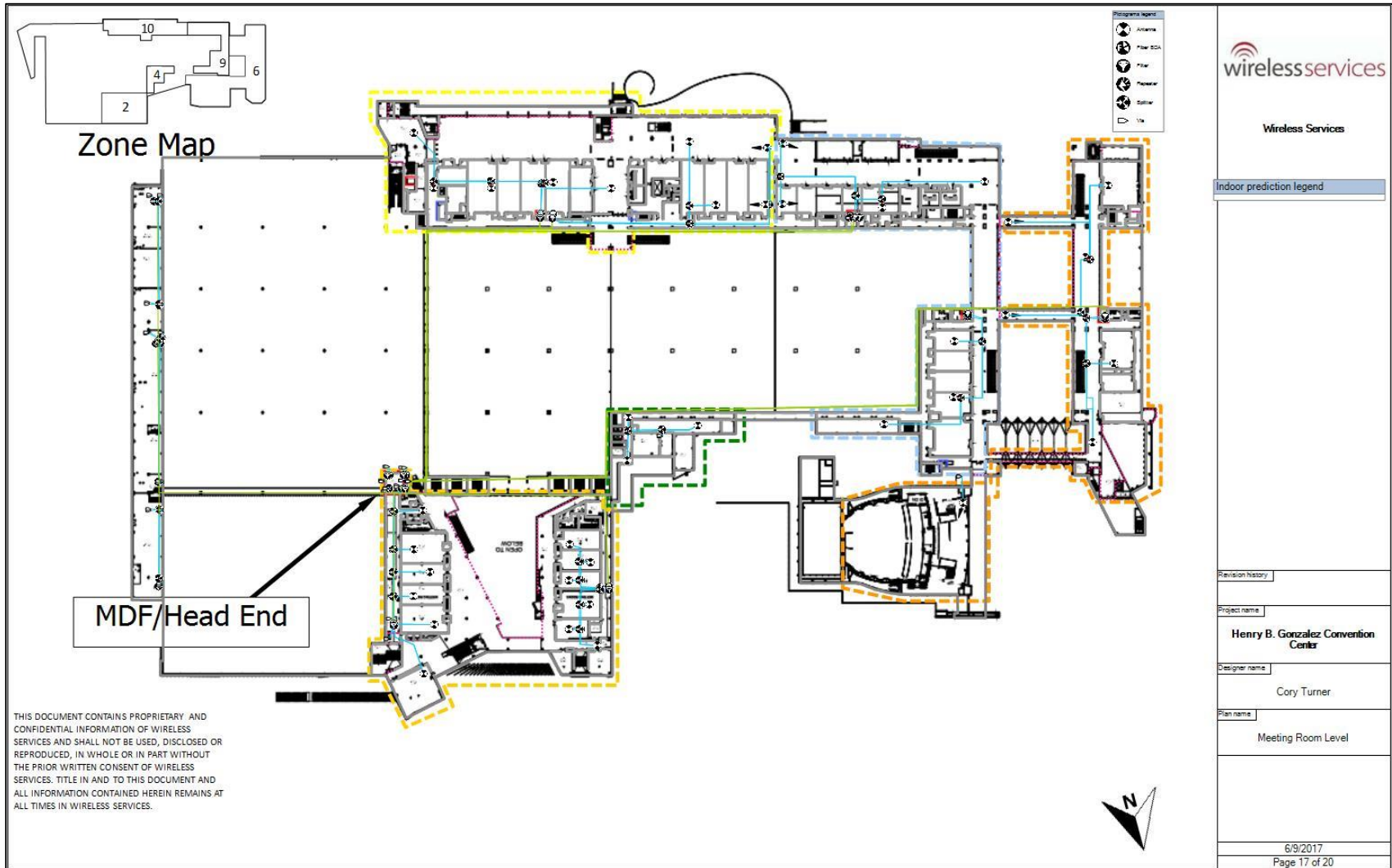
Street Level Floor Layout



Admin Level Floor Layout



Meeting Room Level Floor Layout



Zone Map

Photogram legend

- Antenna
- Fiber SDA
- Router
- Repeater
- Splitter
- Via

Indoor prediction legend

Revision history

Revision	Description
1	Initial Design
2	Revised Design
3	Final Design

Project name
Henry B. Gonzalez Convention Center

Designer name
Cory Turner

Plan name
Ballroom Level

THIS DOCUMENT CONTAINS PROPRIETARY AND CONFIDENTIAL INFORMATION OF WIRELESS SERVICES AND SHALL NOT BE USED, DISCLOSED OR REPRODUCED, IN WHOLE OR IN PART WITHOUT THE PRIOR WRITTEN CONSENT OF WIRELESS SERVICES. TITLE IN AND TO THIS DOCUMENT AND ALL INFORMATION CONTAINED HEREIN REMAINS AT ALL TIMES IN WIRELESS SERVICES.



Coverage Compliance Report

Henry B. Gonzalez Convention Center
Neutral Host Distributed Antenna System



Coverage Compliance Report

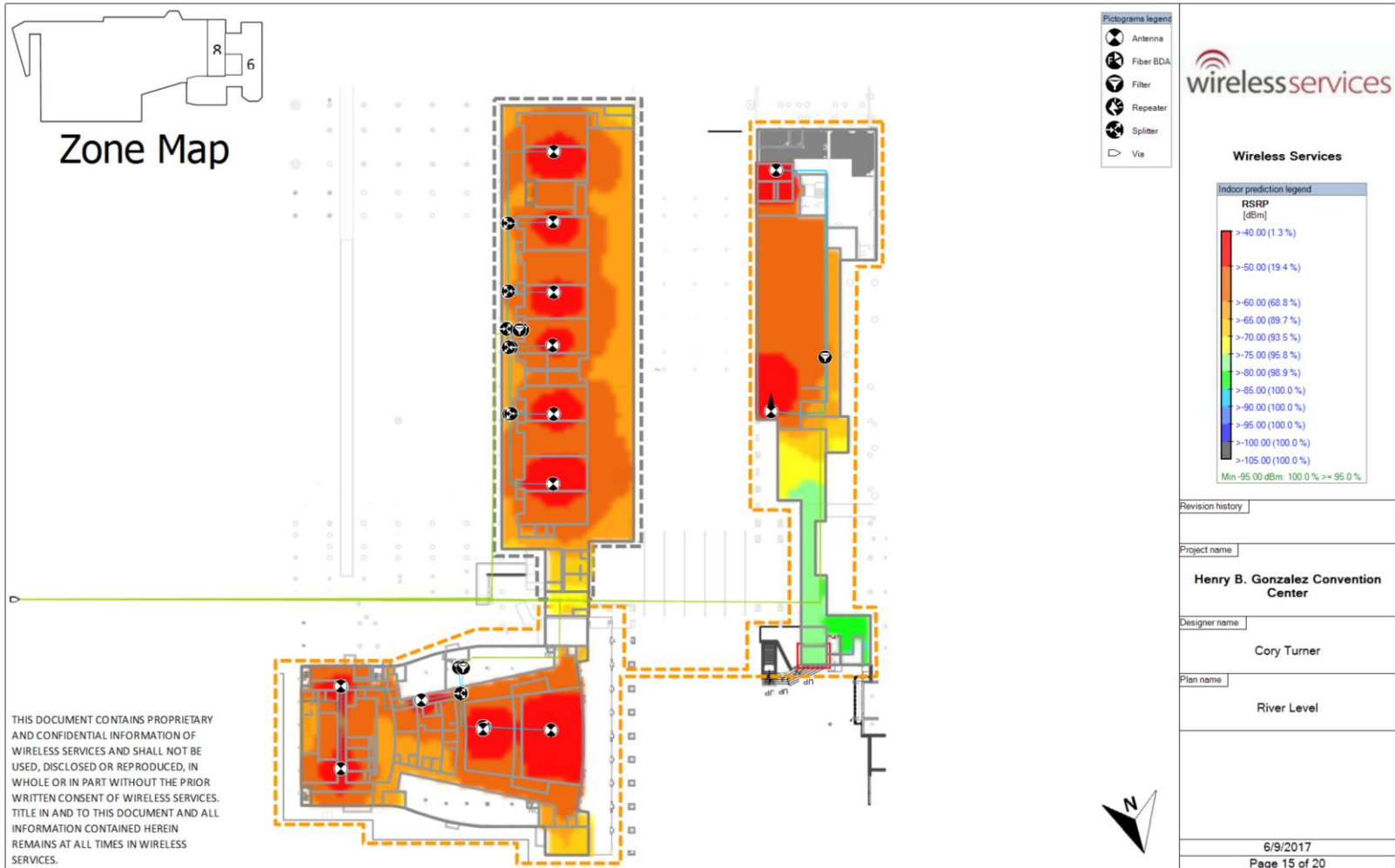
Compliance Report										
Project name:		Henry B. Gonzalez Convention Center			Design company:		Wireless Services			
Project creation date:		6/9/2017			Designer:		Cory Turner			
Verizon - 2100 MHz - AWS - LTE										
LTE RSRP			Min -95.00 dBm Target: 95.0 %							
		Total area (Sq. feet)	Result (%)	Compliant	Result	Compliant	Result	Compliant	Result	Compliant
Building 1	Admin Level	15603.01	100.0	Yes						
	Ballroom Level	275113.61	99.3	Yes						
	Meeting Room	263521.72	100.0	Yes						
	River Level	92158.10	96.0	Yes						
	Street Level	873748.23	99.8	Yes						
	All Floors	1520144.67	99.5	Yes						



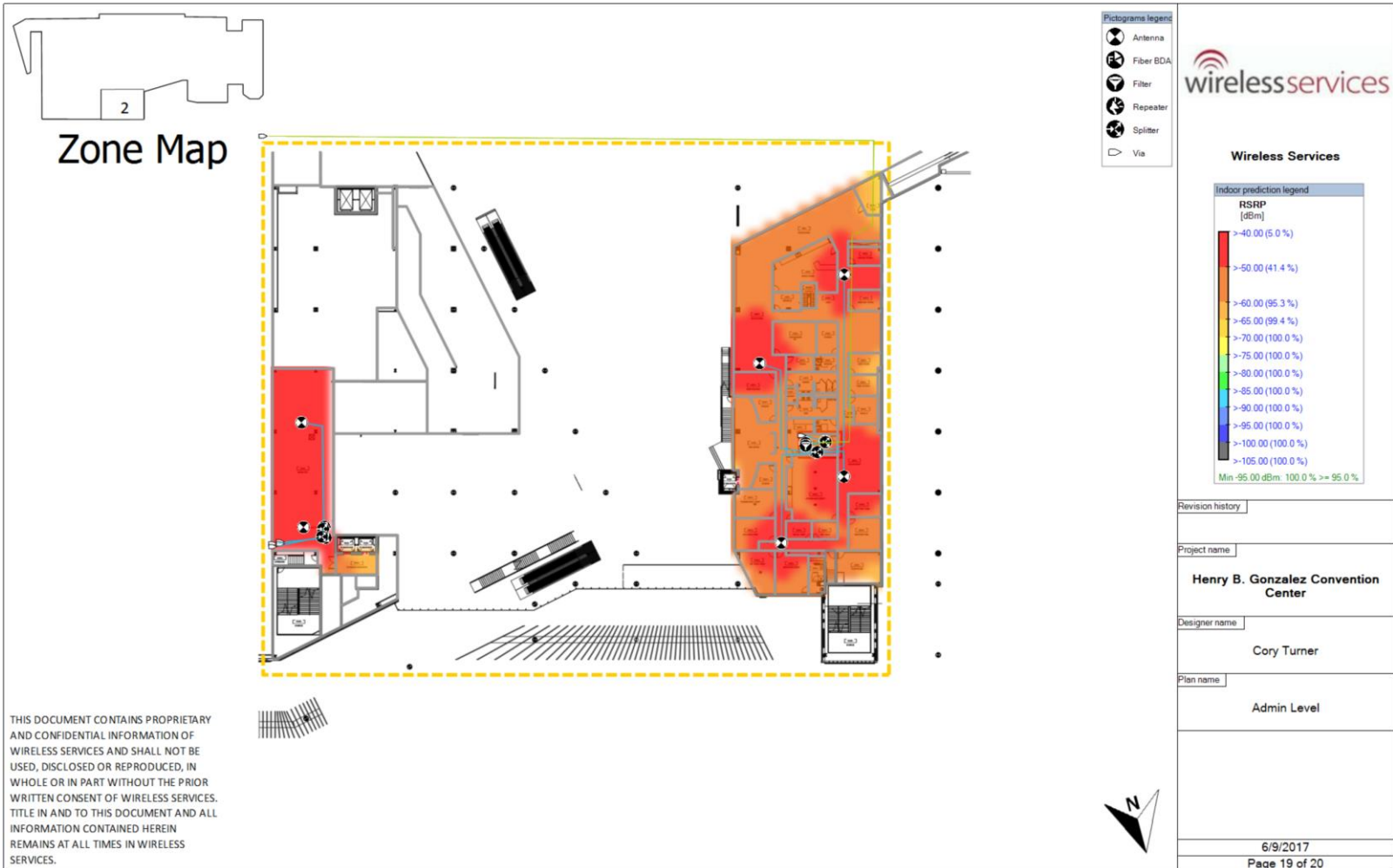
Propagation Prediction Reports

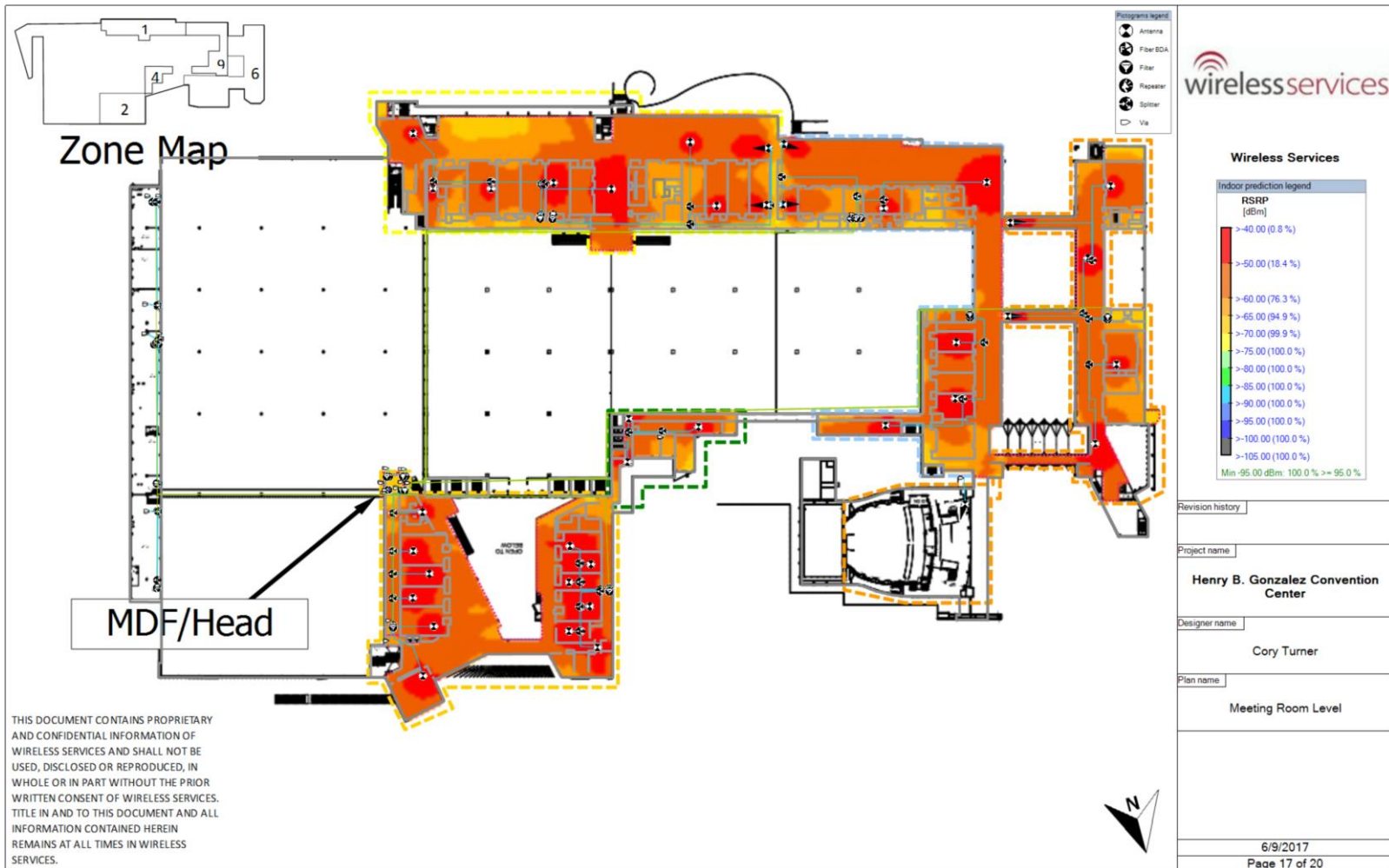
Henry B. Gonzalez Convention Center
Neutral Host Distributed Antenna System

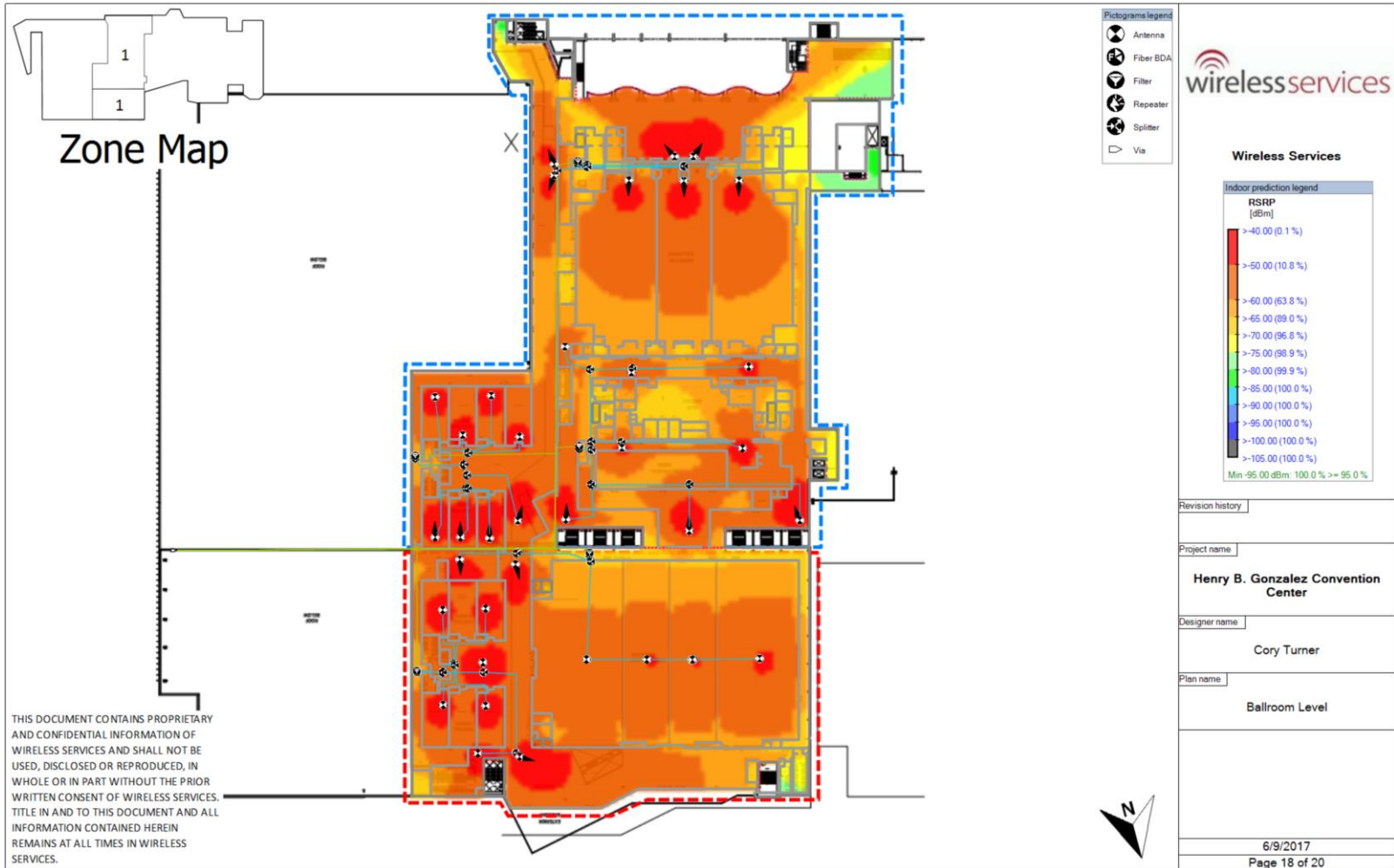


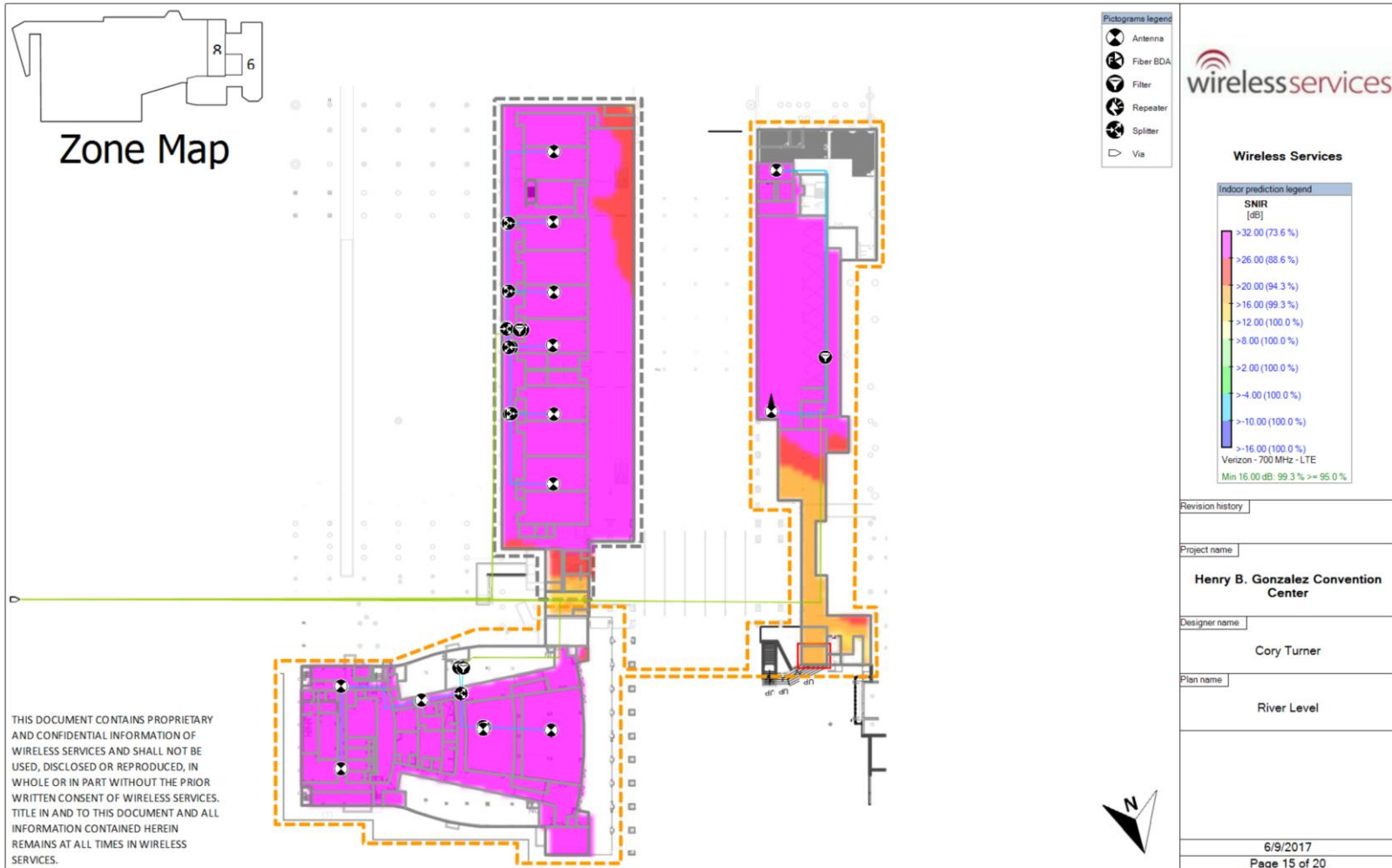


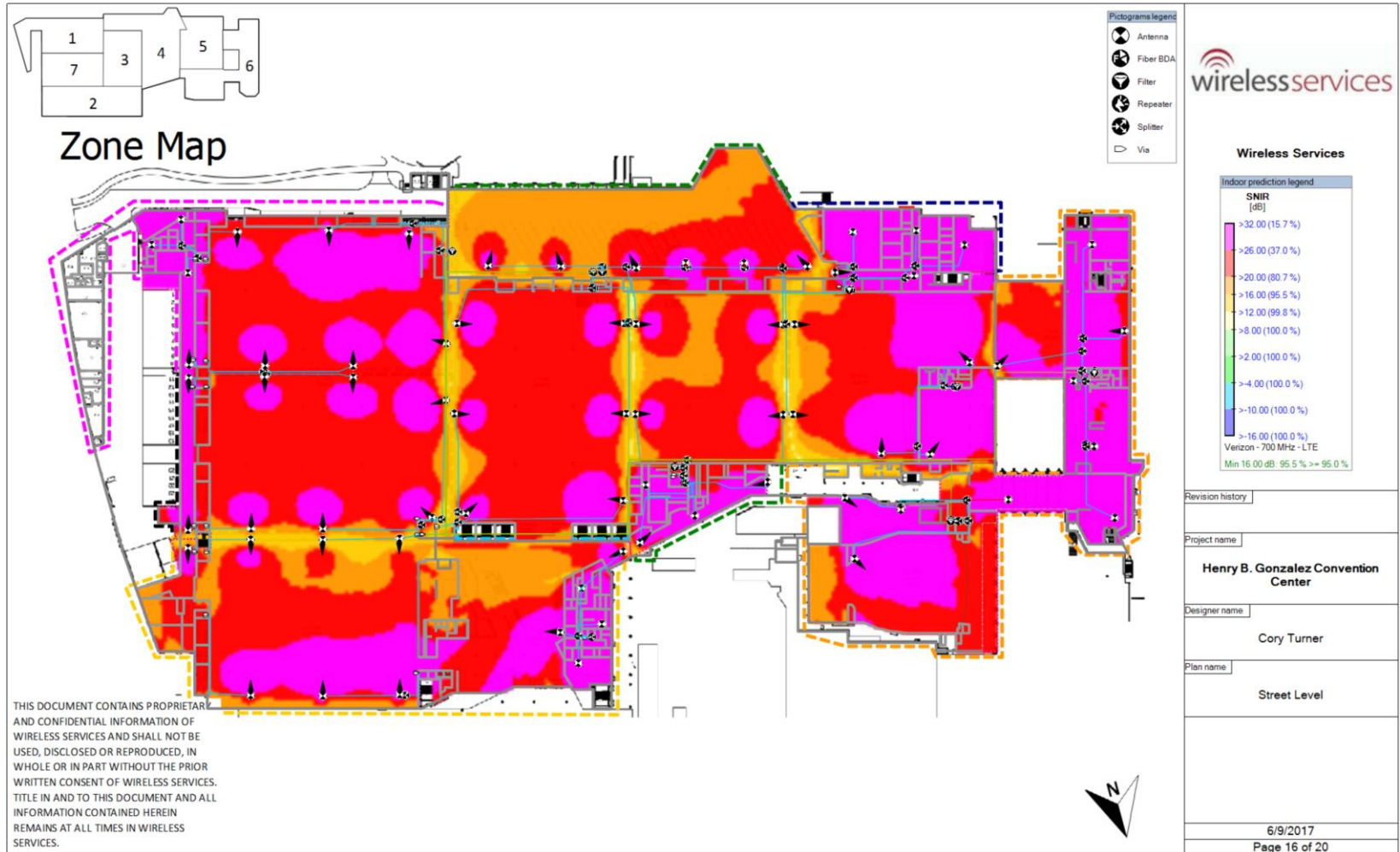


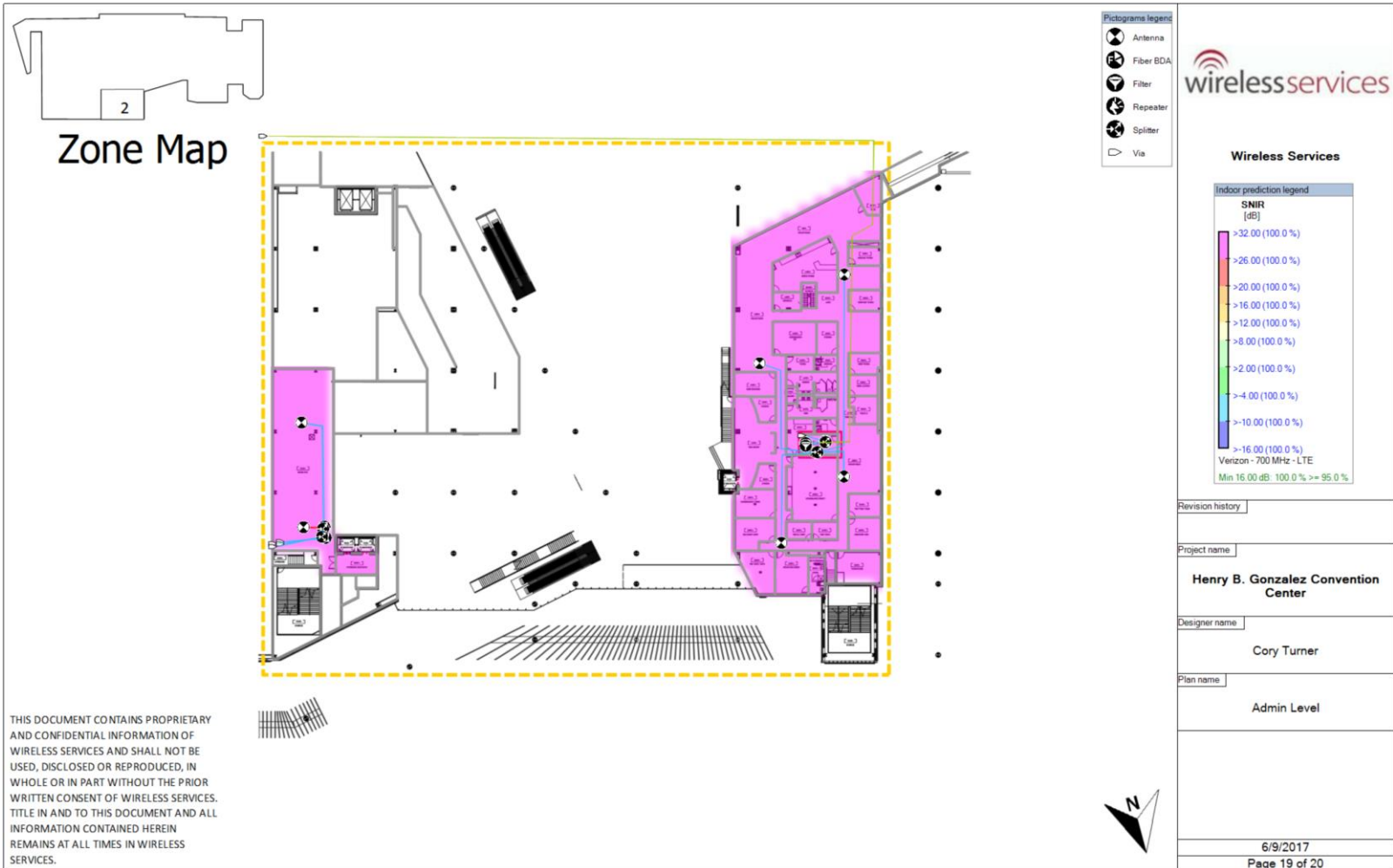


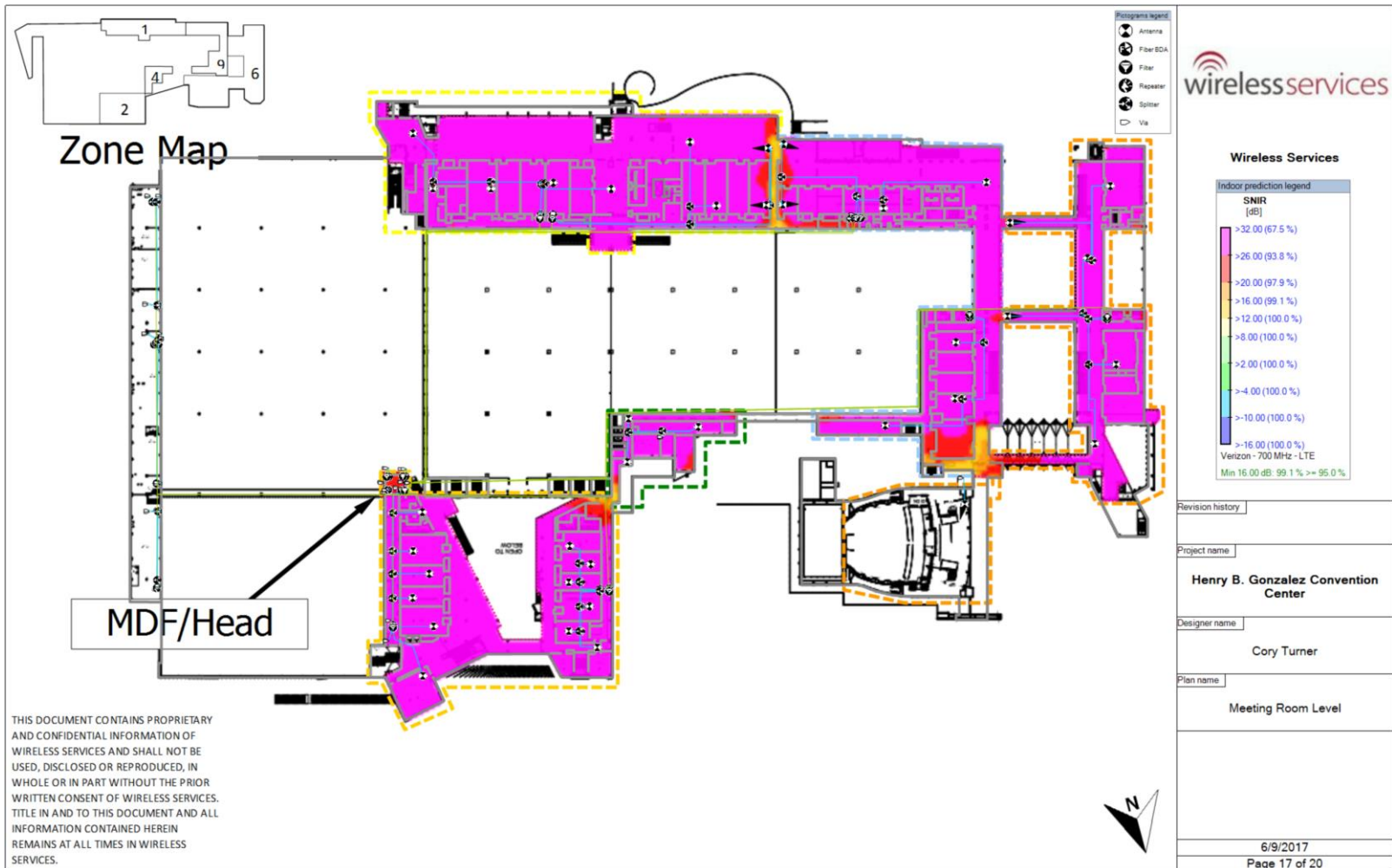


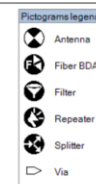
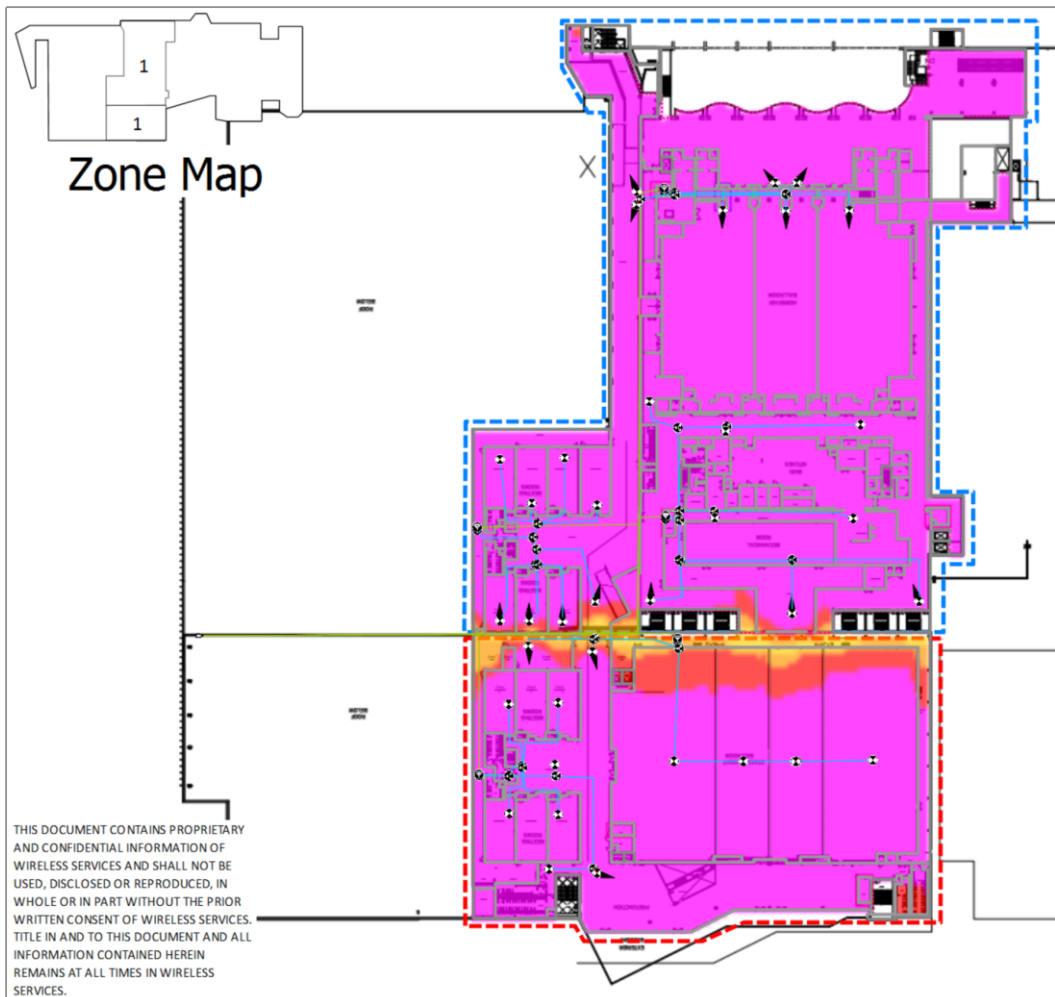




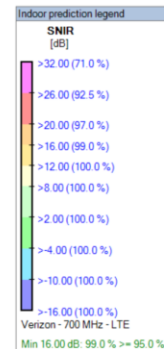








Wireless Services



Revision history

Project name

Henry B. Gonzalez Convention Center

Designer name

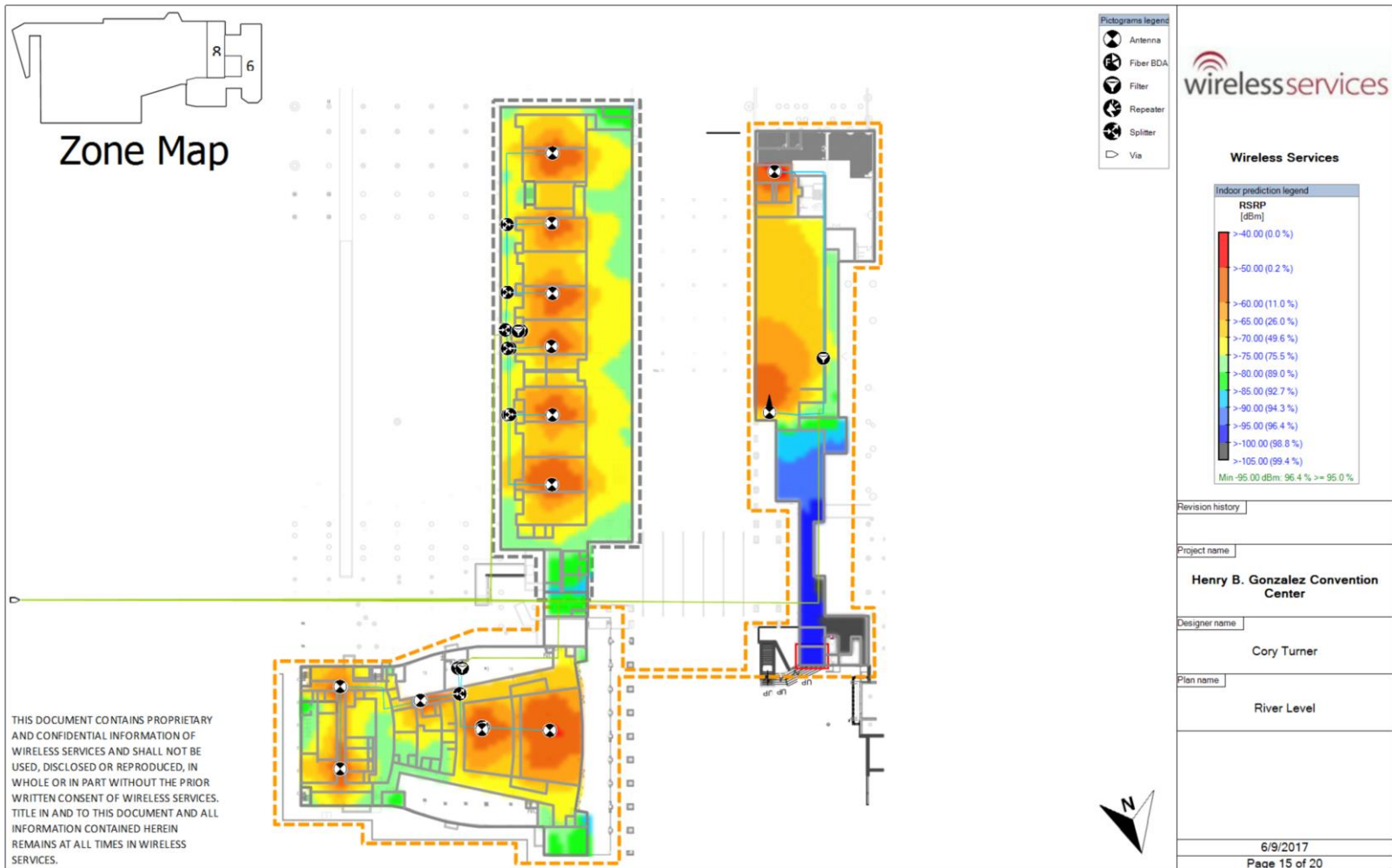
Cory Turner

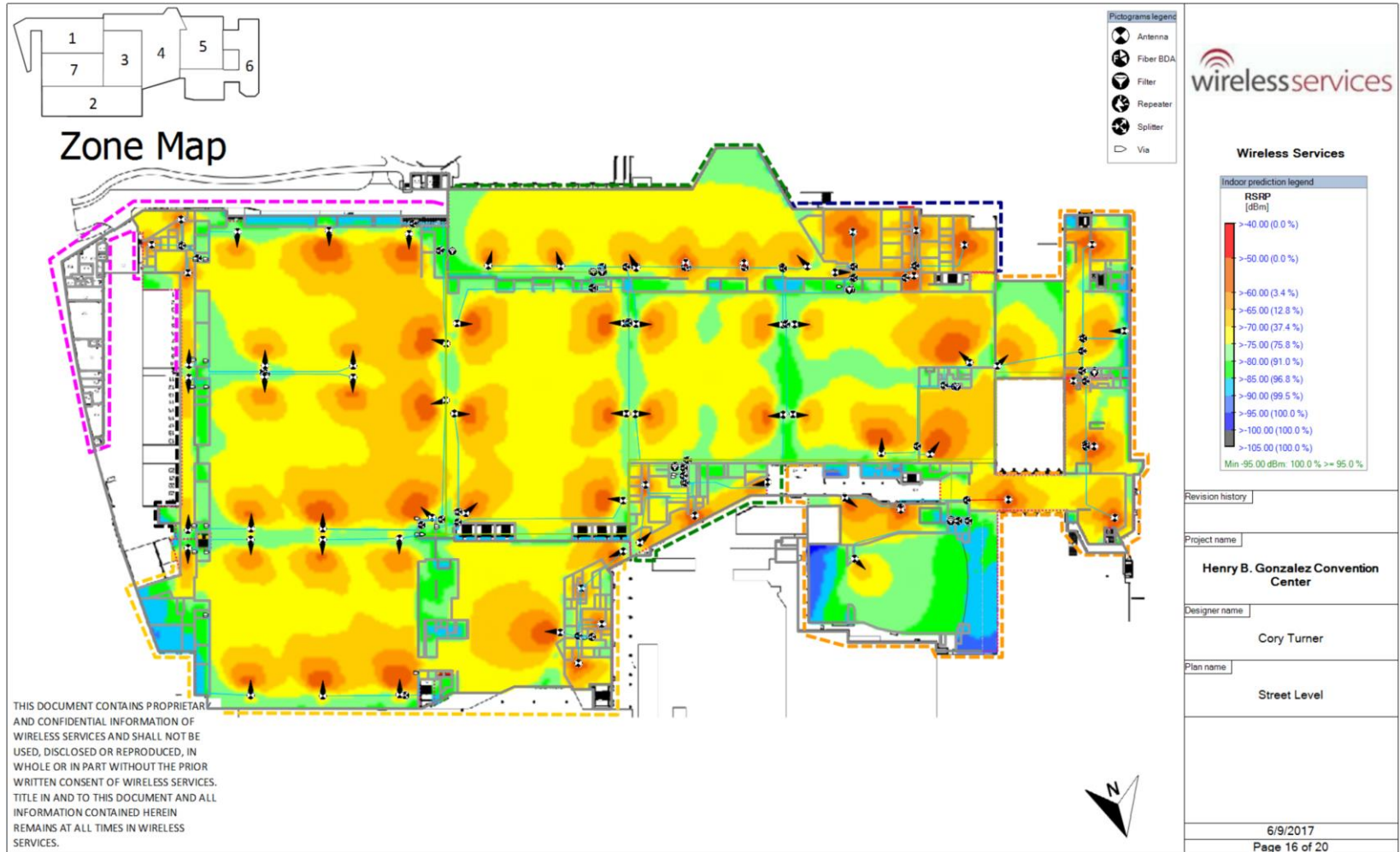
Plan name

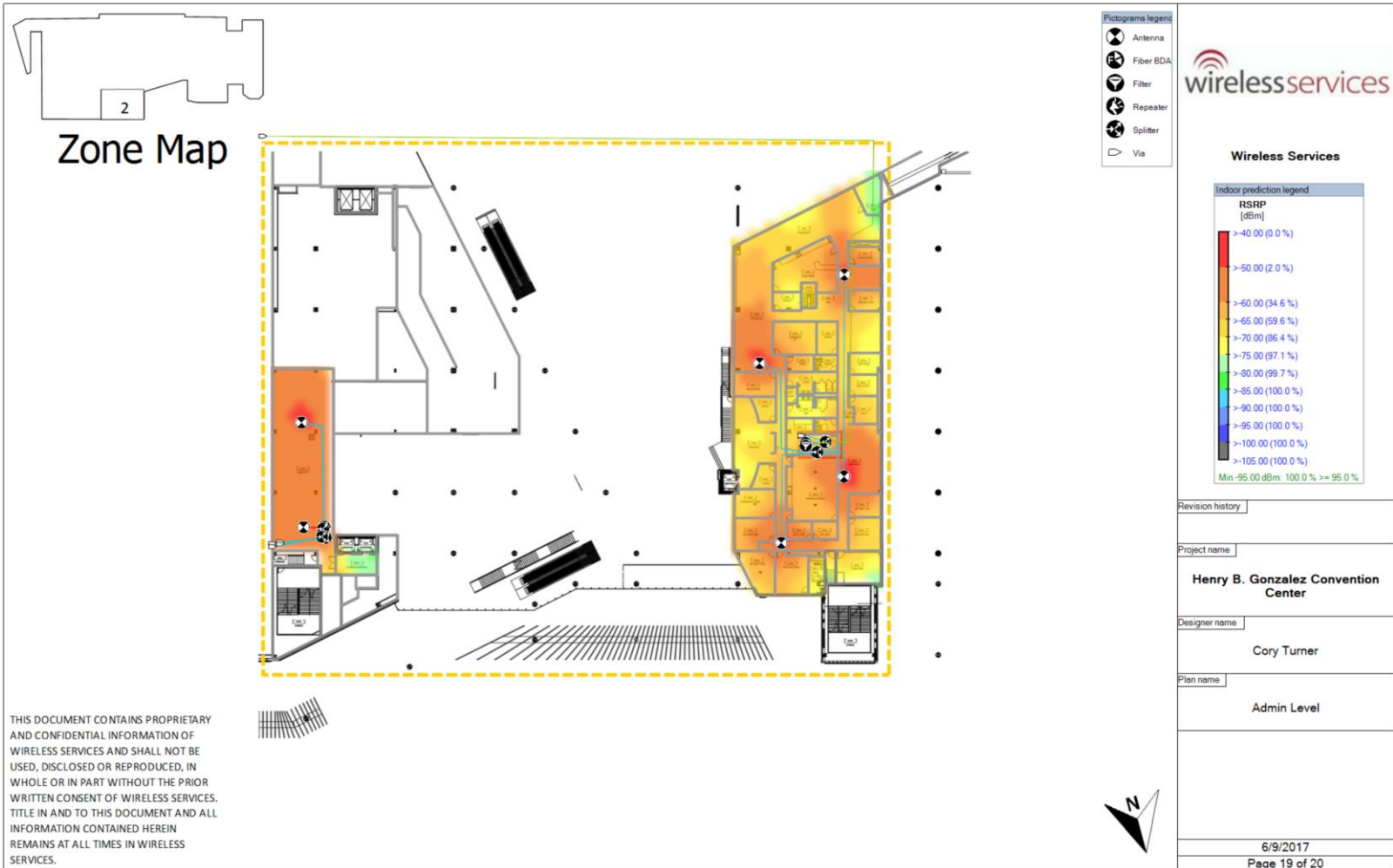
Ballroom Level

6/9/2017

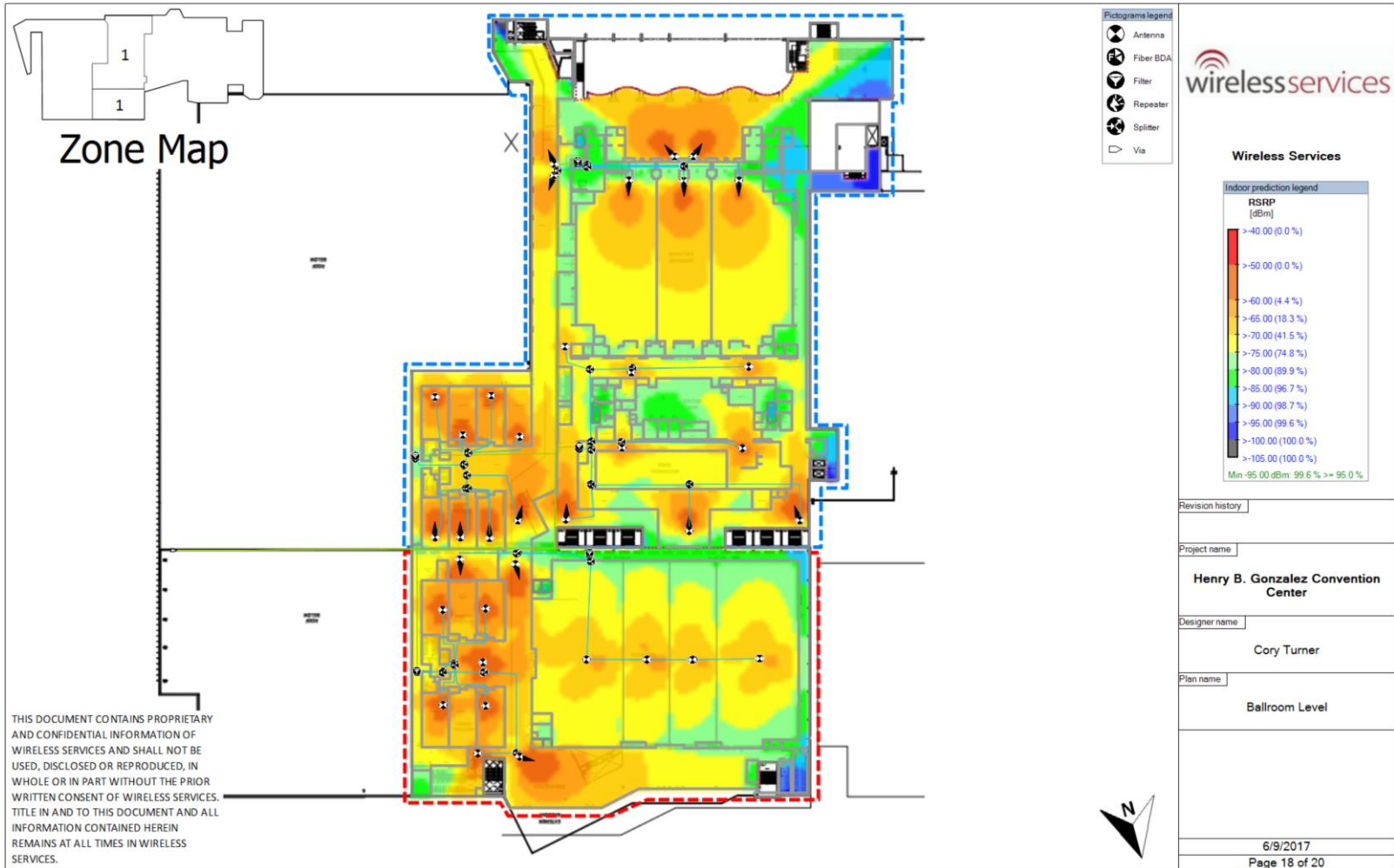
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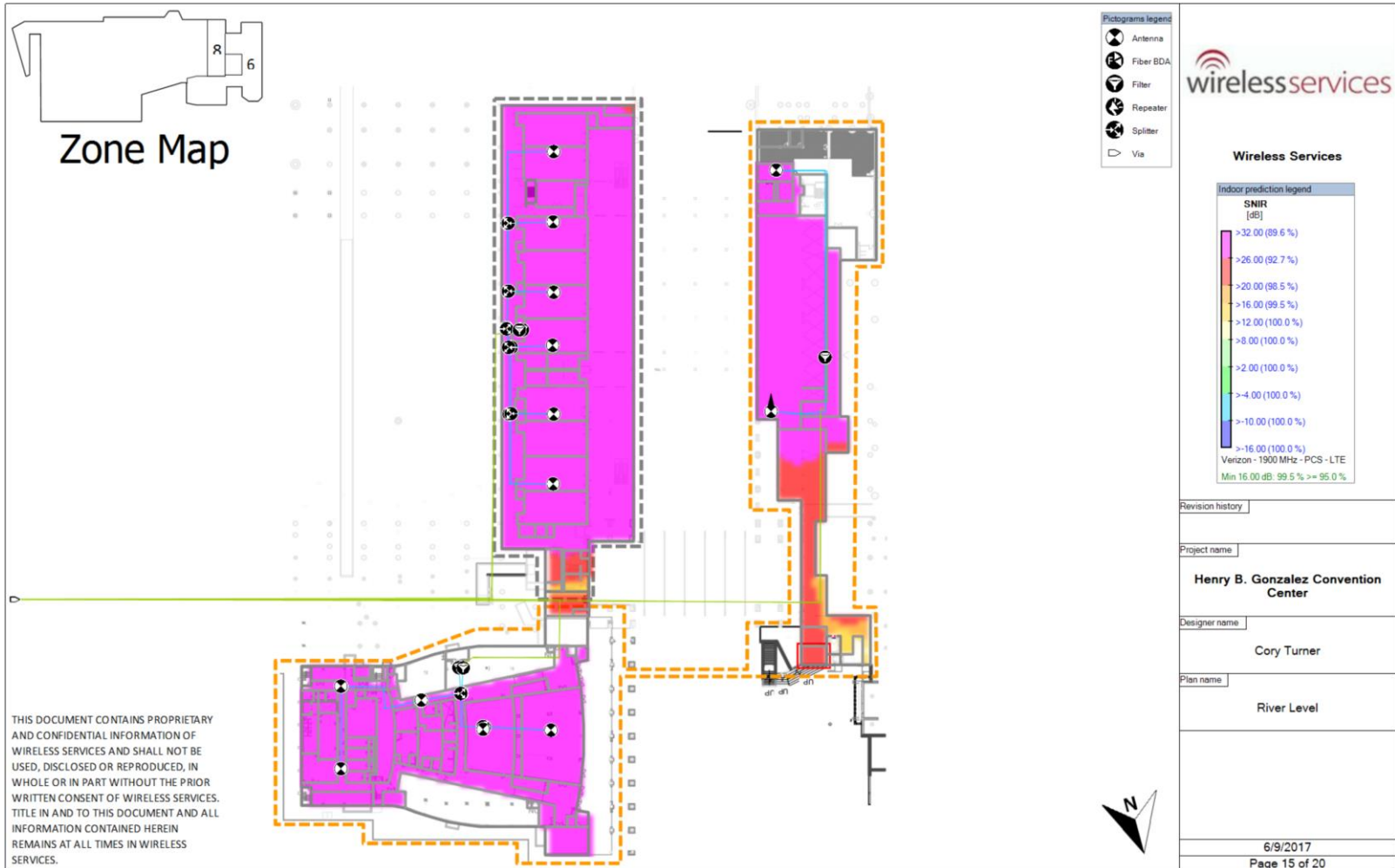


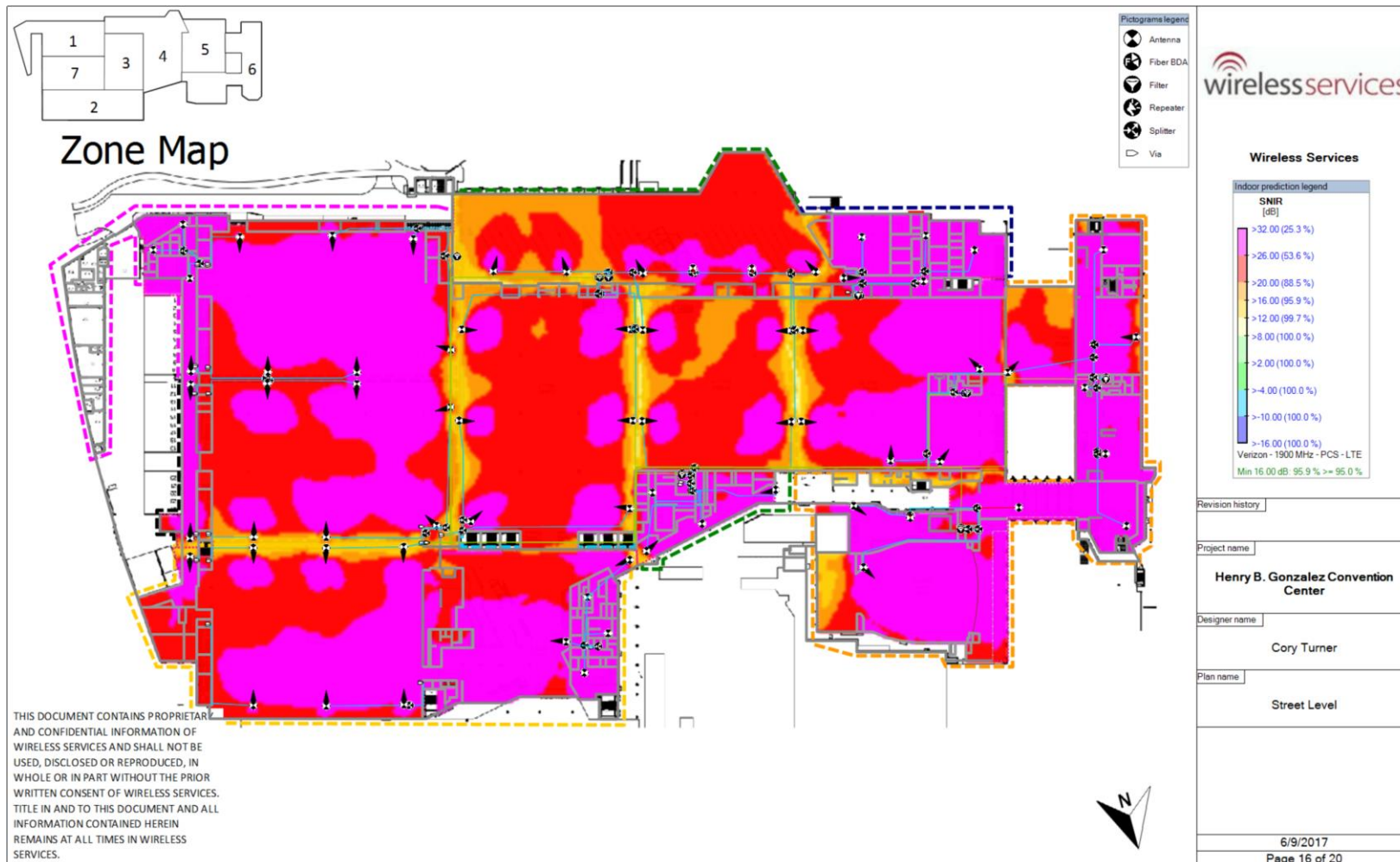


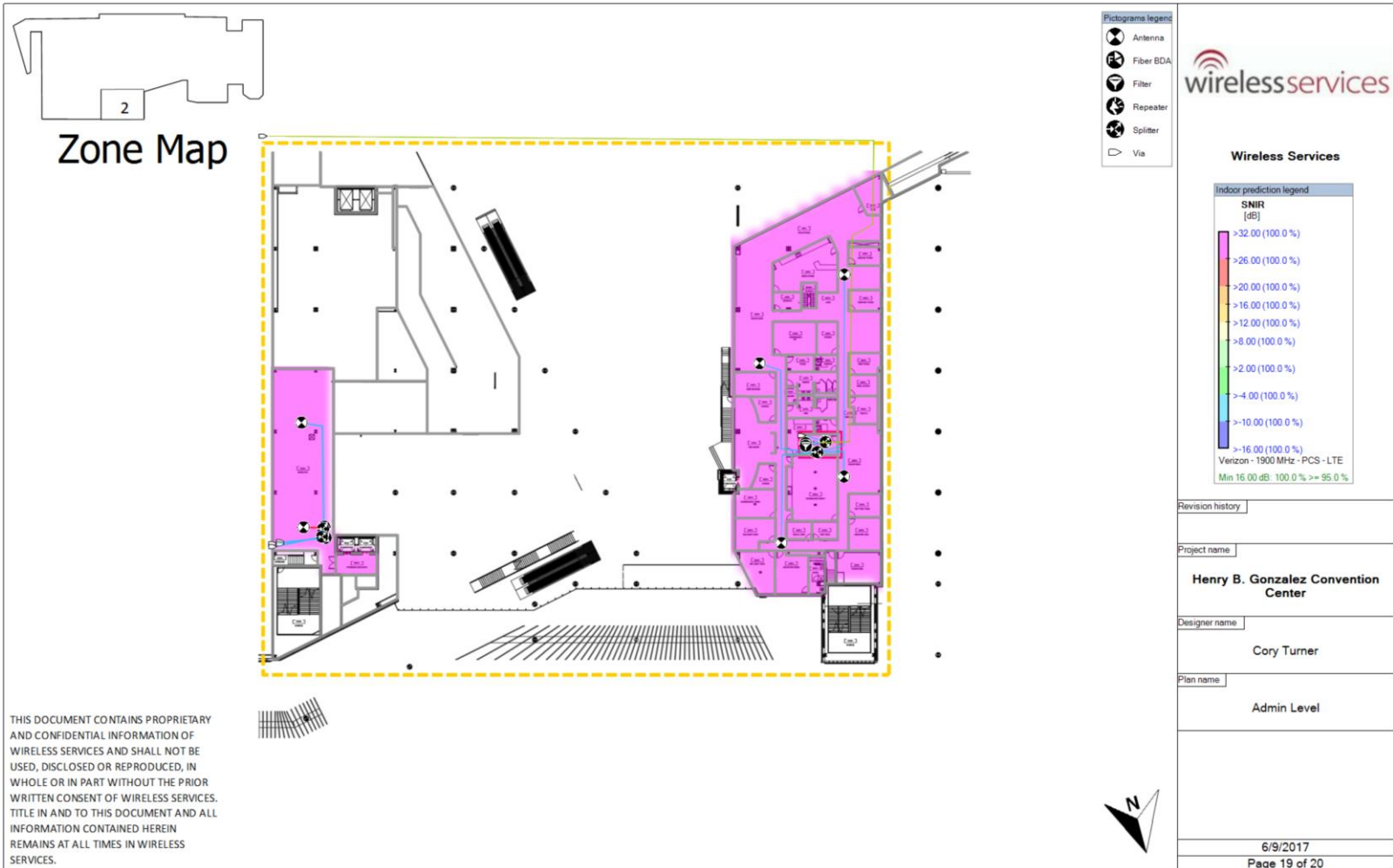


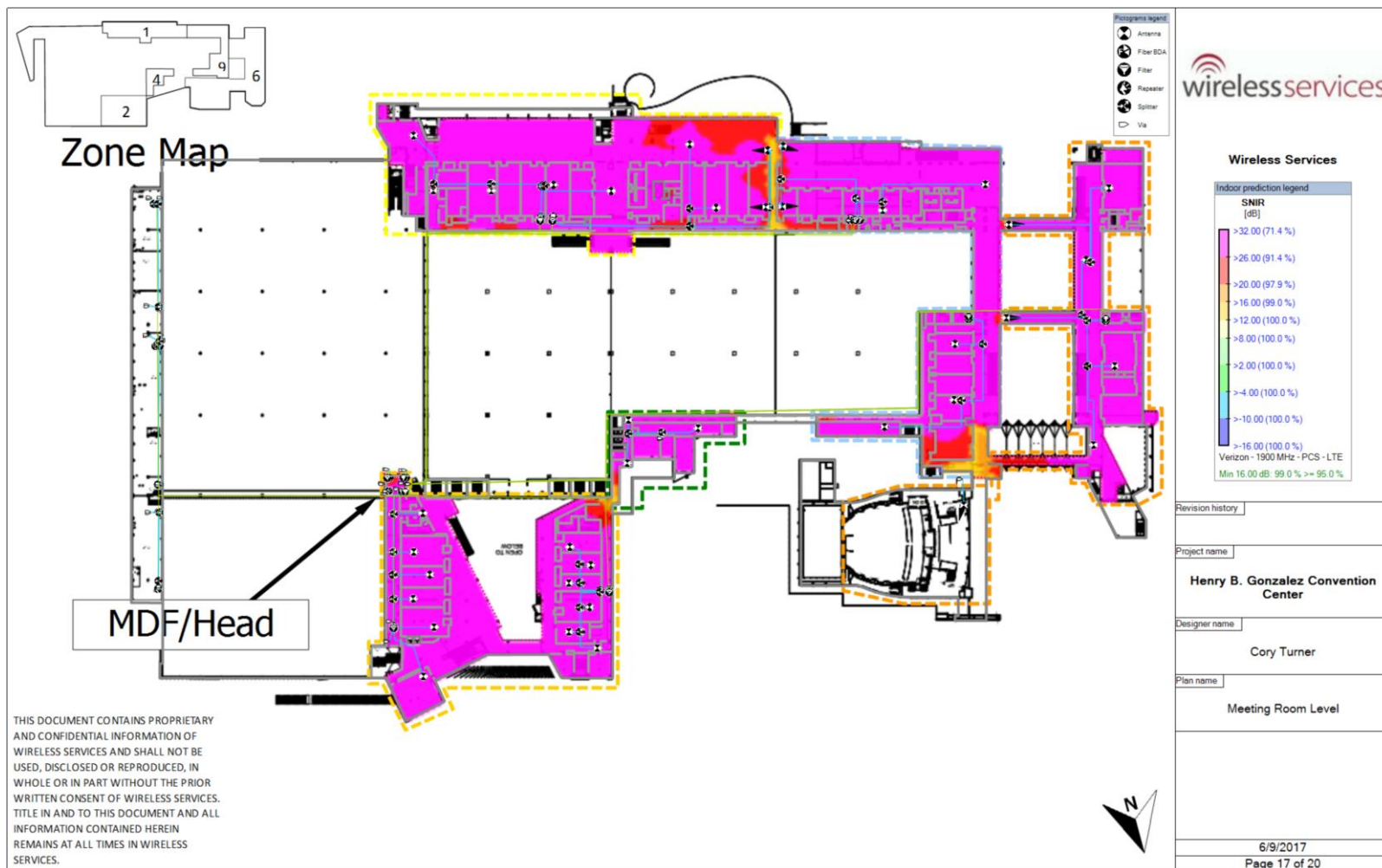


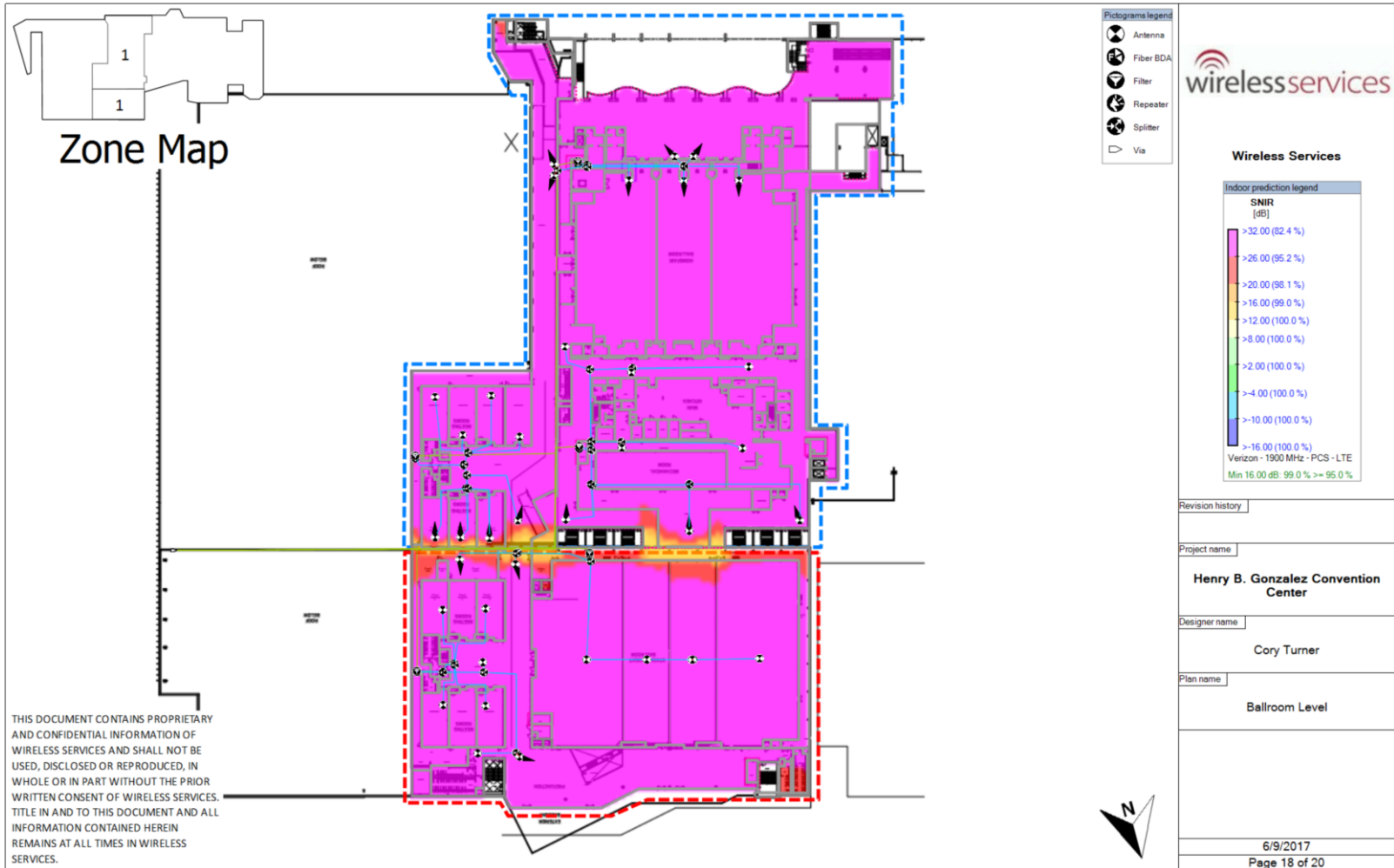


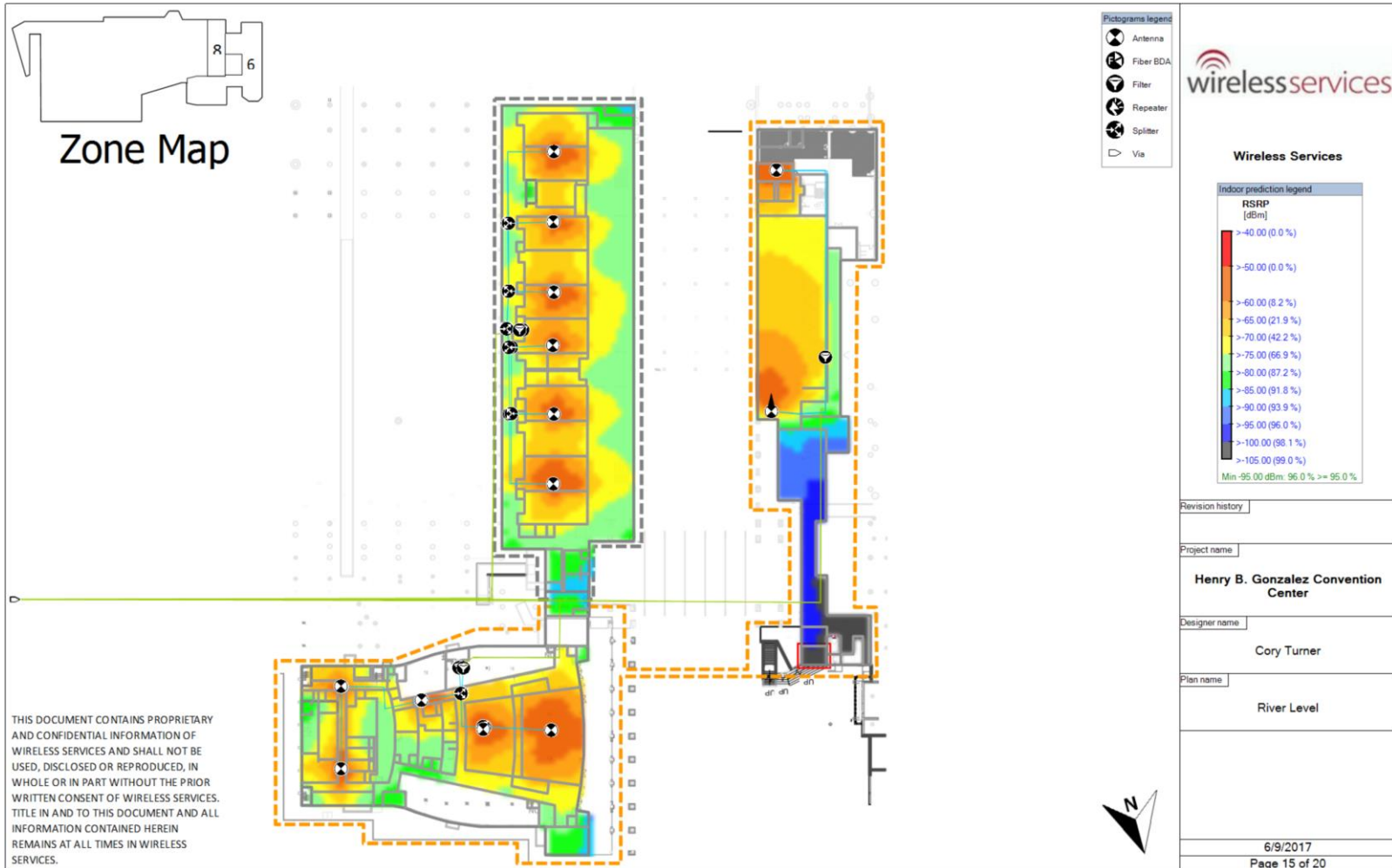






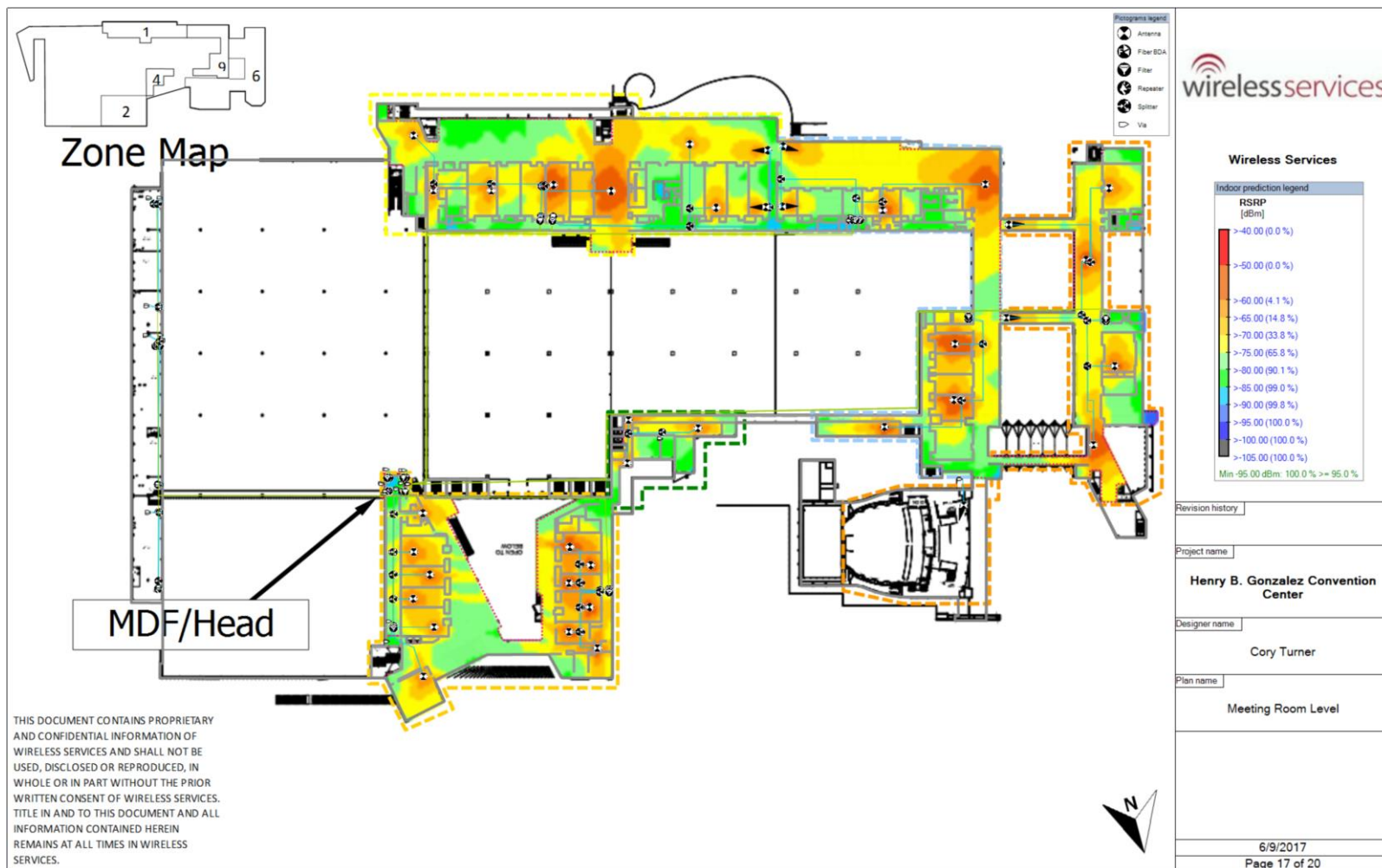


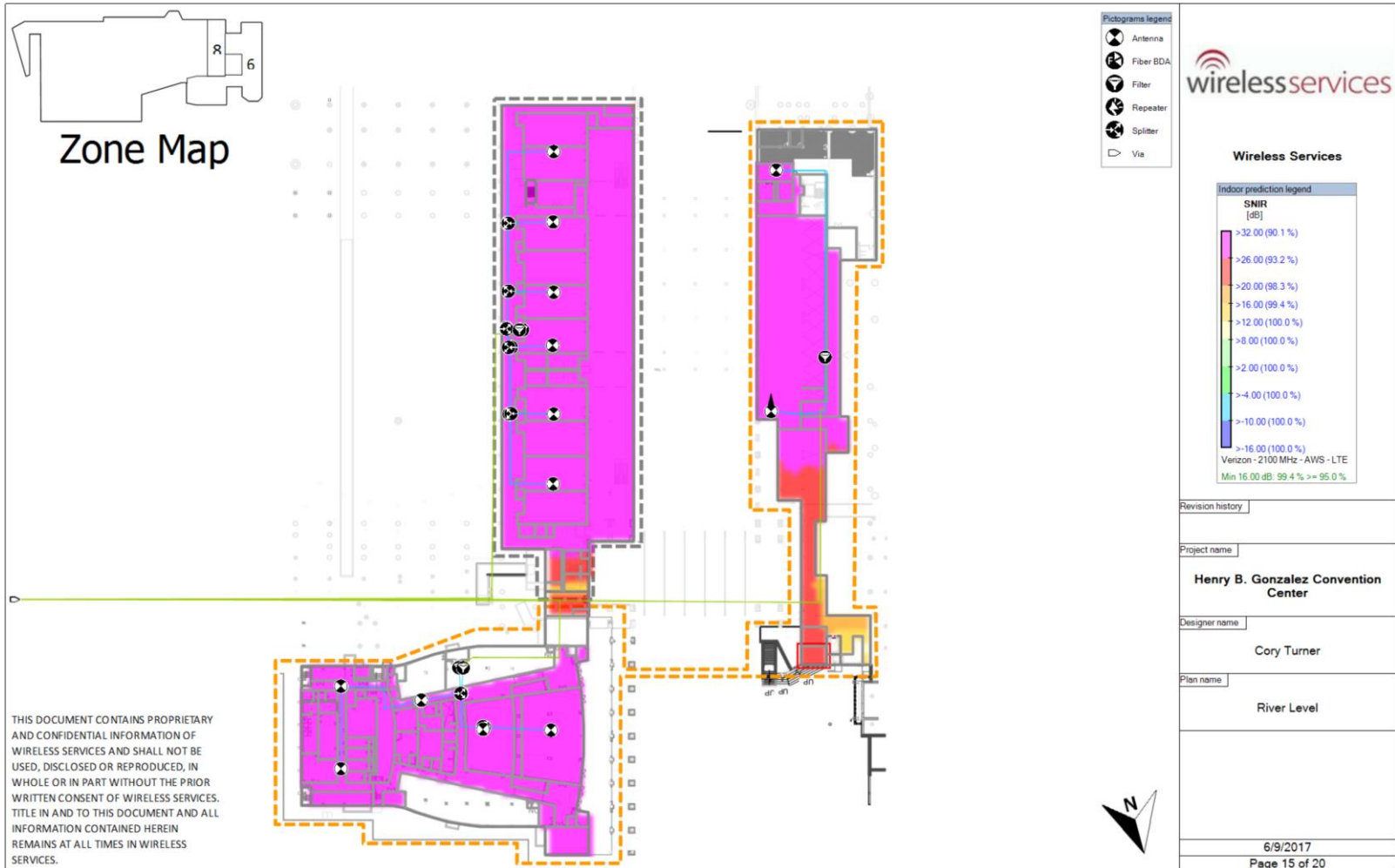




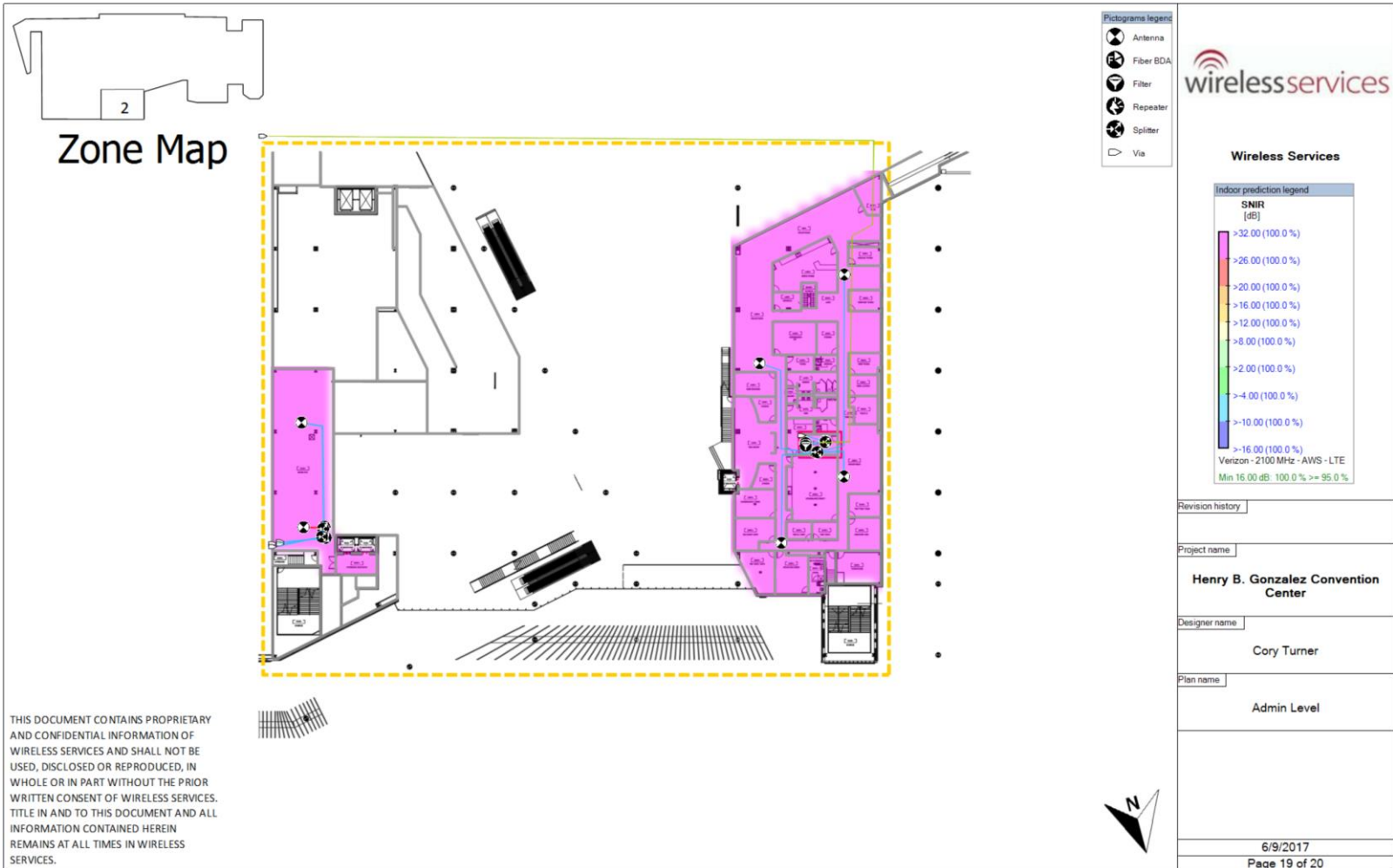


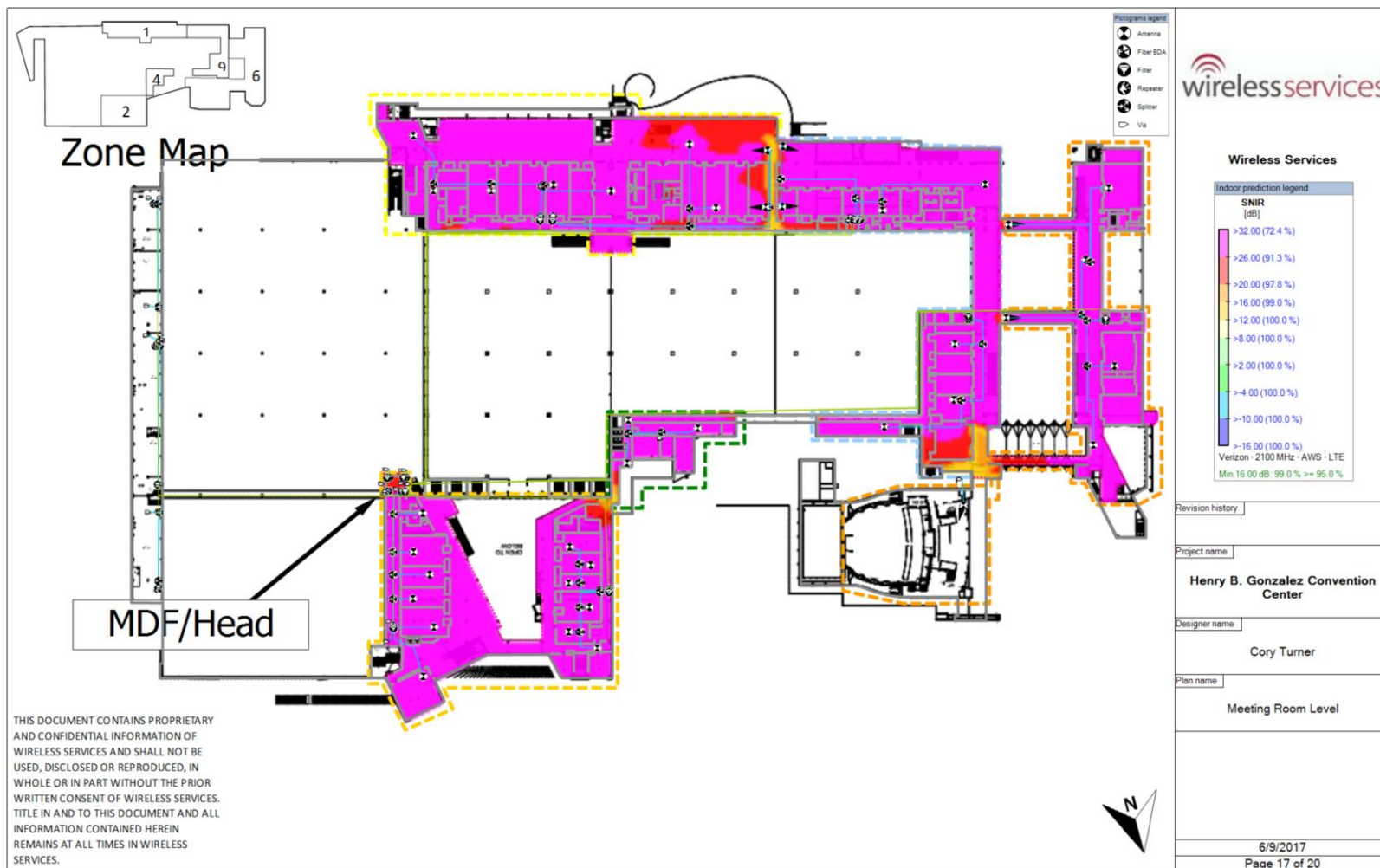


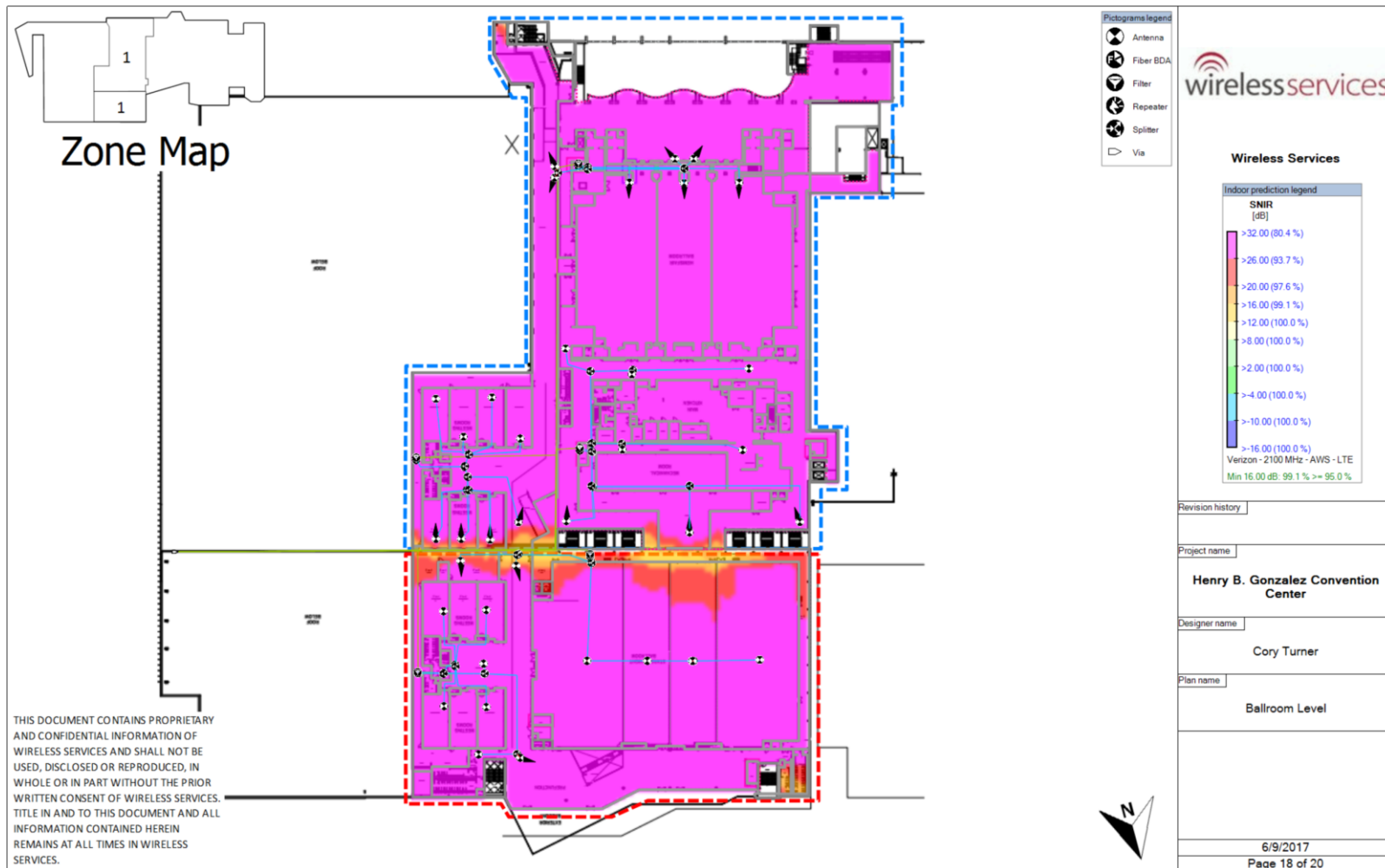














Equipment List Report

Henry B. Gonzalez Convention Center
Neutral Host Distributed Antenna System



Equipment List Report

Project name: Henry B. Gonzalez Convention Center **Design company:** Wireless Services
Project creation date: 6/9/2017 **Designer:** Cory Turner

Component Group : 3PE

Type	Manufacturer	Model	Description	Inventory#	Qty
Antenna	Galtronics	EXTENT D55011 Inverted - 2x DIN7/16	Directional One-Sector MIMO Antenna for High Capacity Venues - Beamwidth 60/30deg - 698-2700 MHz - 2x 7/16 DIN Female - <i>Insertad pattern - R/N: 04110261-05631-1</i>	N/A	33
Splitter	Microlab/FXR	D3-72FE	3-way In-Line Wilkinson, PIM -154 dBc, 50W Power Splitter - Low Loss - 694-2700 MHz - Low PIM - 4.3-10 Connectors <Last Modified: 14-06-16>	N/A	10
Splitter	Microlab/FXR	D4-72FE	4-way In-Line Wilkinson, PIM -154 dBc, 50W Power Splitter - Low Loss - 694-2700 MHz - Low PIM - 4.3-10 Connectors <Last Modified: 14-06-16>	N/A	8
Splitter	Microlab/FXR	DN-94FE	Unequal Power Splitter (Tapper), PIM -161 dBc, 30:1 (15.0 dB), 350-960 MHz/ 1710-2700 MHz, 4.3-10 Connectors, Low PIM <Last Modified: 06-10-15>	N/A	2
Splitter	Microlab/FXR	DN-74FE	Unequal Power Splitter (Tapper), PIM -161 dBc, 10:1 (10.0 dB), 350-960 MHz/ 1710-2700 MHz, 4.3-10 Connectors, Low PIM <Last Modified: 06-10-15>	N/A	18
Splitter	Microlab/FXR	D2-72FE	2-way In-Line Wilkinson, PIM -154 dBc, 50 W Power Splitter - Low Loss - 694-2700 MHz, Low PIM - 4.3-10 Connectors <Last Modified: 14-06-16>	N/A	44
Splitter	Microlab/FXR	DN-64FE	Unequal Power Splitter (Tapper), PIM -161 dBc, 6:1 (8.0 dB), 350-960 MHz/ 1710-2700 MHz, 4.3-10 Connectors, Low PIM <Last Modified: 06-10-15>	N/A	20
Splitter	Microlab/FXR	DN-84FE	Unequal Power Splitter (Tapper), PIM -161 dBc, 20:1 (13 dB), 350-960 MHz/ 1710-2700 MHz, 4.3-10 Connectors, Low PIM <Last Modified: 06-10-15>	N/A	6
Splitter	Microlab/FXR	DN-54FE	Unequal Power Splitter (Tapper), PIM -161 dBc, 4:1 (6.0 dB), 350-960 MHz/ 1710-2700 MHz, 4.3-10 Connectors, Low PIM <Last Modified: 06-10-15>	N/A	22
Splitter	Microlab/FXR	DN-34FE	Unequal Power Splitter (Tapper), PIM -161 dBc, 2:1 (3.0 dB), 350-960 MHz/1710-2700 MHz, 4.3-10 Connectors Low PIM <Last Modified: 06-10-15>	N/A	50
Splitter	Microlab/FXR	DN-44FE	Unequal Power Splitter (Tapper), PIM -161 dBc, 3:1 (4.8 dB), 350-960 MHz/ 1710-2700 MHz, 4.3-10 Connectors, Low PIM <Last Modified: 06-10-15>	N/A	56
Connector	JMA Wireless	UXP-4F-12	UXP 4.3-10 Female Connector for 1/2"	N/A	124

Antenna	Galtronics	PEAR M5277i - 4.3-10 DIN	Directional Dual Polarized MIMO Outdoor/In-Building Antenna, Port 1 and 2: 698-2700 MHz, 2x 4.3-10 DIN Female with Cable - P/N: 02130261-05277	N/A	35
Connector	JMA Wireless	UXP-4MT-12	UXP 4.3-10 Male Torque Connector for Cables 1/2" Annular	N/A	868
Antenna	Galtronics	EXTENT D5778i 4.3-10 DIN (New Model)	Directional One-Sector MIMO Antenna for High Capacity Venues - Beamwidth 60/60deg - 698-2700 MHz - 2x 4.3-10 DIN Female - P/N: 04127261-05778-1	N/A	7
Cable	Corning	12 Strand Single Mode Fiber	12 Strand Fiber Cable	N/A	27000 feet
Antenna	Galtronics	PEAR M5542i - 4.3-10 DIN	Small Size MIMO In-Building Omni Antenna, Port 1&2: 698-2700 MHz, 2x Pigtail 4.3-10 DIN Female - P/N: 02130261-05542U	N/A	88
Cable	RFS	ICA12-50JPL	Plenum Rated Low-Loss Coaxial Cable 1/2" - wideband	N/A	41000 feet
Cable	MicroLab/FXR	JA-10MX	Jumper Cable 0.141 - Length 1.0 m - Coaxial, PIM <-158 dBc, Straight 4.3-10 Male to Straight 4.3-10 Male <Last Modified: 14-05-15>	N/A	74
Cable	MicroLab/FXR	JA-10MY	Jumper Cable 0.141 - Length 1.0 m - Coaxial, PIM <-158 dBc, Straight 4.3-10 Male to Straight 7-16 DIN Male <Last Modified: 01-04-15>	N/A	116

Component Group : Head End 3PE

Type	Manufacturer	Model	Description	Inventory#	Qty
Cable	MicroLab/FXR	JA-20MX	Jumper Cable 0.141 - Length 2.0 m - Coaxial, PIM <-158 dBc, Straight 4.3-10 Male to Straight 4.3-10 Male <Last Modified: 14-05-15>	N/A	35
Splitter	MicroLab/FXR	D2-08FE	2-way Tube Style - Reactive Power Divider, PIM <-155 dBc, 380-2700 MHz - 4.3-10 Connectors, Low PIM <Last Modified: 16-11-16>	N/A	28
Splitter	MicroLab/FXR	D3-08FE	3-way Tube Style - Reactive Power Divider, PIM <-155 dBc, 380-2700 MHz - 4.3-10 Connectors, Low PIM <Last Modified: 16-11-16>	N/A	7

Component Group : Head End OEM Equipment (Alamodome)

Type	Manufacturer	Model	Description	Inventory#	Qty
Filter	SOLID	LPOI_1900P	Low Power POI Module (100mW), 1900MHz PCS, 4 Ports **Available Q4 2016	N/A	24
Miscellaneous	SOLID Technologies	ODU_C	Optical Distribution Unit Chassis	N/A	24
Miscellaneous	SOLID Technologies	DMS_1200	DAS Management System (DMS) for ALLIANCE - For use with Ref. 6	N/A	2
Filter	SOLID	LPOI_AWS13	Low Power POI Module (100mW), 2100MHz (AWS 1+3), 4 Ports **Available Q4 2016	N/A	24

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Filter	SOLID	LPOI_8085_700L TE_FN	Low Power POI Module (100mW), 800MHz Sprint, 850MHz Cellular, 700LTE + FirstNet, 4 Ports **Available Q4 2016	N/A	24
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Filter	SOLID Technologies	eMDBU_AWS13	2100MHz (AWS 1+3) Input Module for the eBIU	N/A	24
Filter	SOLID Technologies	eMDBU_1900P	1900 MHz Input Module for the eBIU	N/A	24
Filter	SOLID	eMBIU_C_DC	Master eBIU, DC Version (Includes: eMCPU, eMPSU_DC, eMCDU)	N/A	24
Fiber BDA Hub	SOLID	ODU_B / OEU_B	Blank Optical Module for the ODU and OEU	N/A	24
Fiber BDA Hub	SOLID	ODU_OM_4 / OEU_OM_4	4 Port Optical Module, Optical Expansion Module - For use with Rel. 6	N/A	24
Filter	SOLID	eMDBU_8085_700LTE_FN	817-849/862-869 MHz Cellular, 700MHz Full Band Input Module for the eBIU. Includes Extended 700 band for FirstNet	N/A	24

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Component Group : Remote OEM Equipment

Type	Manufacturer	Model	Description	Inventory#	Qty
Fiber BDA	SOLID	MROU_C_M_AC	5 WATT Remote Optical Unit Chassis - AC Power	N/A	58
Filter	SOLID	MROU_CU4	5 WATT Combiner Unit, 7-band, includes 700LTE, 800/850, 1900 PCS, 2100 AWS, 2.5TDD & 2.3WCS	N/A	58
Repeater	SOLID	MRDU_700LTEF	5 WATT 700MHz Amplifier Module	N/A	58
Repeater	SOLID	MRDU_1900P	5 WATT 1900MHz Amplifier Module	N/A	58
Repeater	SOLID	MRDU_AWS13	5 WATT 2100MHz Amplifier Module **Available Q3 2016	N/A	58
Repeater	SOLID	L2RDU_1900P_AWS13	2 WATT 1900MHz & 2100/1700MHz AWS Amplifier Module	N/A	2
Repeater	SOLID	L2RDU_8085_700FDB	2 WATT 800MHz Sprint, 850MHz Cellular & 700MHz Full Band Amplifier Module	N/A	2
Repeater	SOLID	RDU_1900P_AWS13	1900MHz & 2100/1700MHz AWS Amplifier Module **Available Q3 2016	N/A	4
Fiber BDA	SOLID	L2ROU_C_AC	2 WATT Remote Optical Unit Chassis - AC Power	N/A	2
Misc	SOLID	ROU_B	Blank for RDU Slot in ROU Chassis	N/A	4
Fiber BDA	SOLID	ROU_C_AC	Remote Optical Unit Chassis - AC Power - For use w/ Rel. 6	N/A	4
Repeater	SOLID	RDU_850C_700FDB	850MHz & 700MHz Full Band Amplifier Module (comes with cavity filter)	N/A	4

Component Group : Secondary OEM Equipment (SACC)

Type	Manufacturer	Model	Description	Inventory#	Qty
Miscellaneous	SOLID	OEU_C	Optical Expansion Unit Chassis - For use with Rel. 6 - can only connect to 4th port of ODU_OM_4/OEU_OM_4 from ODU1 and/or ODU2 **NOTE: Input Power -48VDC. Power supply not included.	N/A	24
Fiber BDA Hub	SOLID	ODU_OM_4 / OEU_OM_4	4 Port Optical Module, Optical Expansion Module - For use with Rel. 6	N/A	28
Fiber BDA Hub	SOLID	ODU_B / OEU_B	Blank Optical Module for the ODU and OEU	N/A	20
Power Supply	SOLID Technologies	RMP_480	ALLIANCE Power Supply - 48 VDC / 480 W	N/A	8



End of Design Presentation



EXHIBIT B

CITY'S CABLING STANDARDS

(attached)

CITY OF SAN ANTONIO

INFORMATION SERVICES TECHNOLOGY DEPARTMENT

For Facility Construction or Renovations
Version 1.1

**HENRY B. GONZALEZ CONVENTION CENTER COMPLEX NEUTRAL-
HOST DISTRIBUTED ANTENNA SYSTEM (DAS)**

a. Contents

<u>PART 1 - DOCUMENT PURPOSE</u>	III
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a. History

Table 1 Revision History

Version No.	Issue Date	Status	Reason for Change
1.0	3/20/2014		Initial version



Version No.	Issue Date	Status	Reason for Change
1.1	7/14/2015		Addition to section
1.2	1/7/2016		Updated COSA ROW information

PART 1 - DOCUMENT PURPOSE

- 1.01 The City of San Antonio Structured Cabling Infrastructure Standard is a guideline for structured cabling infrastructure and the associated spaces to be applied by the design team for new or renovated facilities. Information herein is applicable to the Technology Consultant, Architect, MEP, and contractors, and shall be taken into account for each project by all team members.
- A. The standards set forth parameters for the technical system in addition to the site and building requirements to facilitate a properly-installed standards-compliant structured cable system, organized as follows;
1. Telecommunications Spaces; Architectural, HVAC, Power, Entrance Pathways and Conduits
 2. System Requirements; Cable Management in Telecommunications Spaces, Cable Support in Pathways, Backbone Cabling, Horizontal Cabling, Grounding, Labelling, Testing, and As-Built Documentation.
 3. Telecommunications Diagrams
- 1.02 The standard addresses infrastructure for typical buildings and is not intended for the design of data centers or specialty facilities, of which should be considered on a case-by-case basis.
- 1.03 Designers shall not deviate from this standard without explicit written approval from the City of San Antonio Information Technology Services Department.
- 1.04 Any deviations shall immediately be brought to the attention of the owner's representative in writing for resolution.
- 1.05 Where specific product brands are mentioned, an equivalent will be considered following an official submission of product literature and written acceptance by the City of San Antonio Information Technology Services Department.
- 1.06 Where means, methods, and best practices are mentioned, contractor shall follow the manufacturers' and owner's requirements, industry standards, or code, whichever is most stringent.



- 1.07 Basic contractor qualifications are set forth, but may be made more stringent as applicable to each project based upon size and scope.
- 1.08 A Division 27 specification and T-Series drawings for the Structured Cabling System shall be commissioned and issued by the Architect during the design phases for each facility or project.

PART 2 - DOCUMENT HISTORY

- 2.01 This document supersedes all previous standards which have been fully re-evaluated and described herein by the City of San Antonio Information Technology Services Department.
- 2.02 The contents of the standards were derived by the assembly and input from the City of San Antonio Information Technology Services Department.

PART 3 - INDUSTRY STANDARDS

- 3.01 The following industry standards shall be adhered to unless specifically directed otherwise by the City of San Antonio Information technology Services Department. The list is not all-inclusive and does not alleviate compliance with the latest applicable standards, codes, and best practices:
 - A. TIA-568-C.0 Generic Telecommunications Cabling for Customer Premises
 - B. TIA-568-C.1 Commercial Building Telecommunication Cabling Standards – Part 1 General Requirements (2008)
 - C. TIA-568-C.2 Balanced Twisted-Pair Telecommunications Cabling and Components Standard (2009)
 - D. TIA-568-C.3 Optical Fiber Cabling Components Standard (2009)
 - E. TIA-569-B Commercial Building Standard for Telecommunications Pathways and Spaces - (October 2004)
 - F. TIA-598-C Optical Fiber Cable Color Coding - (January 2005)
 - G. TIA/EIA-606-B Administration Standard for Commercial Telecommunications Infrastructure - (May 2012)
 - H. ANSI J-STD-607-B Commercial Building Grounding and Bonding Requirements for Telecommunications - (October 2011)
 - I. TIA-758-A Customer-Owned Outside Plant Telecommunications Infrastructure Standard - (August 2004)
 - J. TIA-526-7 Measurement of Optical Power Loss of Installed Single-Mode Fiber Cable Plant – OFSTP-7 - (February 2002)



- K. TIA-526-14-A Optical Power Loss Measurements of Installed Multimode Fiber Cable Plant – OFSTP-14 - (August 1998)
- L. AIA
- M. Local Building Code
- N. NEC
- O. ISO
- P. ANSI
- Q. FCC
- R. UL
- S. OSHA
- T. NFPA
- U. NEMA

PART 4 - CONTRACTOR QUALIFICATIONS

- 4.01 Contractor and staff shall be a current authorized Panduit Certified Installers and certified by Panduit to provide and furnish a 20-year performance warranty for structured cabling and connectivity components.
- 4.02 Contractor and staff shall possess relevant past-experience and references for a minimum of (5) projects of similar size and scope to that of the City of San Antonio.
- 4.03 Contractor's Project Manager shall be a RCDD in good standing and shall provide Certificate.
- 4.04 Contractor shall have a local office within a 75-mile radius of the project site
- 4.05 Sub-contractors to the primary structured cabling contractor shall meet the same requirements for the primary structured cabling contractor as identified above.

PART 5 - WARRANTY ON PARTS AND LABOR.

- 5.01 The contractor shall furnish a 20-year performance warranty from Panduit for the structured cabling and connectivity components.
- 5.02 All labor and workmanship shall carry a minimum warranty period of (1) year from the date of final system acceptance.
- 5.03 Defects in material or workmanship appearing within this period of time, shall be promptly repaired without cost to the City of San Antonio.



PART 6 - NOMENCLATURE

- 6.01 Main Distribution Frame (MDF) – An environmentally controlled centralized architectural space for housing telecommunications equipment that usually serves as the demarcation point for service providers, and houses the backbone terminations for cross-connection and distribution to Intermediate Distribution Frames.
- 6.02 Intermediate Distribution Frames (IDF) – An environmentally controlled architectural space for housing telecommunications equipment and backbone terminations for cross-connection and distribution to the MDF and end-user workstations.

PART 7 - CITY INFRASTRUCTURE STANDARDS

7.01 Telecommunications Spaces

A. Main Distribution Frame (MDF)

1. Description

- a. The MDF is a telecommunications space that serves a building or multi-building facility or campus. There is only (1) on each campus.
- b. The MDF houses the entrance conduits, terminations, and cross connections for all incoming inter-building backbone cabling from the IDFs in other buildings on the campus and the intra-building backbone cabling from the IDFs in the building in which it resides, and cross-connects to user workstations.
- c. Wall and floor space shall be reserved for service provider demarcation equipment and incoming infrastructure terminations.
- d. Campus distribution network equipment, servers, and other centralized telecommunications related equipment will reside in the MDF.
- e. The MDF may share space with other systems such as security panels, paging systems, and CATV cabling. Space allocation for other systems shall be coordinated with the applicable disciplines after approval from the City of San Antonio Information Technology Service Department. All coordination shall be completed prior to installation.
- f. Fire alarm panels and building control panels shall not be located inside the MDF. Space allocation for these systems needs to occur outside of the MDF.
- g. The MDF shall not be used for storage, serve as a mechanical or electrical distribution space, nor shall it have within its space main electrical feeds, electrical switch gear, transformers, and water or sprinkler main lines.



- h. The layout of cabinets, equipment racks, wall fields, and cable management shall be as indicated on the attached diagrams.

2. Architectural Requirements

- a. The MDF shall be a minimum of 150 square feet with minimum clear lineal walls of at least 10 feet by 15 feet. The size of the MDF shall be coordinated with and approved by the City of San Antonio Information Technology Services Department during the design.
- b. All walls inside the MDF shall go to deck. When walls are drywall they shall be double layered drywall on both sides to help reduce the risk of unauthorized entry.
- c. The MDF Room shall be centrally located.
- d. The floor finish shall be sealed bare concrete or VCT.
- e. The MDF shall not contain windows.
- f. The MDF shall not be located adjacent to or below restrooms or other water-based facilities, or sources of EMI and mechanical vibration.
- g. All walls shall be covered with 4-feet x 8-feet x $\frac{3}{4}$ -inch AC Grade Void Free Fire Retardant Plywood, aligned vertically starting at 12 inches above the finished floor. The plywood shall be installed with the "A" grade side exposed and the "C" grade side against the building or structure. The plywood shall be painted with two coats of fire retardant paint and one stamp from each sheet shall be masked during the painting and uncovered after the paint has dried so the fire rated plywood stamps are visible for inspection.
- h. The minimum ceiling height shall be 9-feet above finished floor with the following preferences of finishes.
 - 1) No ceiling is the preferred finish
 - 2) Hard ceiling is acceptable if leaving open to structure is not possible.
 - 3) The last alternative is a lift-out ceiling. If a lift-out ceiling tile is required this shall be coordinated and approved by the City of San Antonio Information Technology Services Department during the design process. If this option is approved it is recommended the ceiling height inside the MDF room be higher than the ceiling height in the corridor outside the MDF so the cables entering into the MDF do not have to pass through the lift-out ceiling inside the MDF room.
- i. Entry to the space shall be through a minimum 36-inch by 80-inch clear door opening that swings outward. Door shall be solid core or steel and shall not have any windows. The door shall securely lock and access shall only be by City of San Antonio Information Technology Services Department-approved personnel.



The door shall open to an interior hallway or space it is not recommended the door open to the exterior of the building.

- j. The MDF door shall be equipped with a minimum of a City of San Antonio Information Technology Services Department approved cipher lock. When an access control security system is available, the entrance to the MDF shall be equipped with a card reader and electrified door hardware.
- k. Fire suppression for the MDF shall be determined by the specific code requirements for the fire protection scheme of the overall building. If a fire suppression system is designed, it shall be designed to avoid running distribution over the MDF equipment cabinets, racks and equipment.

3. HVAC Requirements

- a. The MDF shall be serviced by a dedicated unit that is part of the building's main system and be equipped with a Split DX system through the wall above the door which cools only when the building HVAC is inadequate or not running. The unit shall maintain a constant 24/7 cooled environment between 68° and 77° F with relative humidity of 40% - 55%.
- b. Changes in temperature and humidity shall be kept to around 1 percent.
- c. The minimum HVAC load shall be designed to displace 12KW of power, or 3.5 Tons, and shall be coordinated with the City of San Antonio Information Technology Services Department during the design and designed to load if the known load is greater at the time of design.
- d. It is recommended the MDF maintain the stated temperature and humidity in the event of building power outages or primary HVAC system failure.
- e. Air delivery shall be aligned in the front of the equipment rows and returns at the rear of the equipment rows when possible.
- f. HVAC sensors and controls shall be located in the MDF at 5-ft AFF.
- g. A hard-wired wall mounted thermostat shall be located inside the MDF Room.
- h. HVAC systems shall be alarmed for power loss, high and low temperature, high and low humidity, smoke detection, compression failures and water flooding.
- i. A simplex data drop shall be installed within 12 inches of the unit so it can be incorporated into the Building Automation System (BAS).

4. Lighting Requirements

- a. Florescent light fixtures shall be at least 24 inches above the top of the highest cabinet, rack or cable runway (approximately 84 inches), 36 inches is recommended.



- b. Lighting shall be a minimum of 50 foot candles at 2 feet above the floor in the entire space.
 - c. The MDF shall be equipped with emergency lighting to keep the space lit during power outages.
- 5. Power Requirements
 - a. All electrical service outlets shall be labelled with the associated panel and circuit information.
 - b. Power shall be in two categories: dedicated and convenience.
 - c. Dedicated
 - 1) The MDF shall be equipped with a minimum of (2) dedicated 208 VAC 20 amp electrical circuits terminated in separate J-boxes and (1) dedicated 120 VAC 20 Amp circuit mounted above each equipment cabinet or rack.
 - a) The (2) 208 VAC J-boxes shall be mounted to a uni-strut above the equipment cabinets or racks and shall be provided with a 7-foot “SO Type” cord with a female NEMA L6-20R receptacle on the end.
 - b) The (1) 120 VAC J-box shall be mounted to a uni-strut above the equipment cabinets or racks and shall be provided with a 7-foot “SO Type” cord with a female NEMA 5-20R receptacle on the end.
 - c) The originating electrical panel shall be properly sized for the loads calculated and shall be located in the nearest Electrical Room.
 - 2) Additional power circuits to be allocated to security, paging CATV, and service provider equipment shall be considered and coordinated at the time of building design.
 - 3) Power distribution to the cabinets shall be achieved by installing rack mounted PDUs.
 - d. Convenience
 - 1) The MDF shall be equipped with 120 volt 20 Amp duplex NEMA 5-20R receptacles, with maximum (3) receptacles on each circuit. The originating electrical panel shall be equipped with a 20 Amp breaker per circuit.
 - 2) A duplex receptacle shall be spaced at least 1 foot from an adjacent wall and every 6 feet thereafter. A minimum of (1) duplex receptacle shall be placed in each wall and be flush mounted to the finished wall surface at 18 inches above finished floor.
- 6. Equipment Cabinets / Racks and Cable Management Requirements



- a. The MDF shall be equipped with a minimum (2) equipment cabinets or equipment racks. Coordination with and approval by City of San Antonio Information Technology Services Department during the design is required to determine with equipment cabinets or equipment racks shall be utilized.
- b. The MDF shall be equipped with cable runway encircling the room at 84-86 inches above the finished floor, and crossing the room above the equipment cabinets or racks (1) time.
 - 1) Cable runway shall not be secured to the top of the equipment cabinets.
 - 2) A vertical section of cable runway shall be attached to the wall board to manage backbone and service provider cables as they transition from the entrance conduits to the overhead cable runway.

B. Intermediate Distribution Frame (IDF)

1. Description

- a. An IDF is a telecommunications space that resides in each building that requires more than a single telecommunications space from which to terminate horizontal workstation cables. There may be multiple IDFs in each building as required to maintain horizontal cable distances of 295 feet for the permanent link.
- b. An IDF houses the terminations and cross connections for the intra or inter-building cabling from the MDF and the horizontal user workstation cabling in the area of the building that it serves.
- c. Building workstation access network equipment will reside in the IDF.
- d. The IDF may share space with other systems such as security panels and paging systems. Space allocation for other systems shall be coordinated with the applicable disciplines.
- e. Fire alarm panels and building control panels shall not be located inside the IDF. Space allocation for these systems needs to occur outside of the IDF.
- f. The IDF shall not be used for storage, serve as a mechanical or electrical distribution space, nor shall it have within its space main electrical feeds, electrical switch gear, transformers, water or main sprinkler lines.
- g. The layout of cabinets, equipment racks, wall fields, and cable management shall be as indicated on the attached diagrams.

2. Architectural Requirements

- a. The IDF shall be a minimum of 100 square feet with minimum clear lineal wall lengths of at least 10 feet by 10 feet.
- b. All walls shall go to deck. When walls are drywall they shall be double layered drywall on both sides to help reduce the risk of unauthorized entry.



- c. The floor finish shall be sealed bare concrete or VCT.
- d. The IDF shall not contain windows.
- e. IDFs shall be arranged in a stacked formation in multi-story buildings, and not be located next to or below restrooms or other water-based facilities, or sources of EMI and mechanical vibration.
- f. All walls shall be covered with 4-feet x 8-feet x $\frac{3}{4}$ -inch AC Grade Void Free Fire Retardant Plywood, aligned vertically starting at 12 inches above the finished floor. The plywood shall be installed with the "A" grade side exposed and the "C" grade side against the building or structure. The plywood shall be painted with two coats of fire retardant paint and one stamp from each sheet shall be masked during the painting and uncovered after the paint has dried so the fire rated plywood stamps are visible for inspection.
- g. The minimum ceiling height shall be 9-feet above finished floor with the following preferences of finishes.
 - 1) No ceiling is the preferred finish
 - 2) Hard ceiling is acceptable if leaving open to structure is not possible.
 - 3) The last alternative is a lift-out ceiling. If a lift-out ceiling tile is required this shall be coordinated and approved by the City of San Antonio Information Technology Services Department during the design process. If this option is approved it is recommended the ceiling height inside the MDF room be higher than the ceiling height in the corridor outside the MDF so the cables entering into the MDF do not have to pass through the lift-out ceiling inside the MDF room.
- h. Entry to the space shall be through a minimum 36-inch by 80-inch clear door opening that swings outward. Door shall be solid core or steel and shall not have any windows. The door shall securely lock and access shall only be by City of San Antonio Information Technology Services Department-approved personnel. The door shall open to an interior hallway or space it is not recommended the door open to the exterior of the building.
- i. The IDF door shall be equipped with a minimum of a City of San Antonio Information Technology Services Department approved cipher lock. When an access control security system is available, the entrance to the IDF shall be equipped with a card reader and electrified door hardware.
- j. Fire suppression for the IDF shall be determined by the specific code requirements for the fire protection scheme of the overall building. If a fire suppression system is designed, it shall be designed to avoid running distribution over the IDF equipment cabinets, racks and equipment.



3. HVAC Requirements

- a. The IDF shall be serviced by a dedicated unit that is part of the building's main system and be equipped with Split DX system through the wall above the door which cools only when the building HVAC is inadequate or not running. The unit shall maintain a constant 24/7 cooled environment between 68° and 77° F with relative humidity of 40% - 55%.
- b. Changes in temperature and humidity shall be kept to around 1 percent.
- c. The minimum HVAC load shall be designed to displace 4KW of power, or 1 Ton, and shall be coordinate with the City of San Antonio Information technology Services Department and designed to load if the load is greater and known at the time of design.
- d. It is recommended that the IDF maintain the stated temperature and humidity in the event of building power outages or primary HVAC system failure.
- e. Air delivery shall be aligned in the front of the equipment rows and returns at the rear of the equipment rows.
- f. HVAC sensors and controls shall be located in the IDF at 5-ft AFF.
- g. A hard-wired wall mounted thermostat shall be located inside the IDF Room.
- h. HVAC systems shall be alarmed for power loss, high and low temperature, high and low humidity, smoke detection, compression failures and water flooding.
- i. A simplex data drop shall be installed within 12 inches of the unit so it can be incorporated into the Building Automation System (BAS).

4. Lighting Requirements

- a. Florescent light fixtures shall be at least 24 inches above the top of the highest cabinet, rack or cable runway, 36 inches is recommended.
- b. Lighting shall be a minimum of 50 foot candles at 2 feet above the floor in the entire space.
- c. The IDF shall be equipped with emergency lighting to keep the space lit during power outages.

5. Power Requirements

- a. All electrical service outlets shall be labelled with the associated panel and circuit information.
- b. Power for the IDF shall be in two categories: dedicated and convenience.
- c. Dedicated



- 1) The IDF shall be equipped with a minimum of (2) dedicated 208 VAC 20 amp electrical circuits terminated in separate J-boxes and (1) dedicated 120 VAC 20 Amp circuit mounted above each equipment cabinet or rack.
 - a) The (2) 208 VAC J-boxes shall be mounted to a uni-strut above the equipment cabinets or racks and shall be provided with a 7-foot “SO Type” cord with a female NEMA L6-20 R receptacle on the end.
 - b) The (1) 120 VAC J-box shall be mounted to a uni-strut above the equipment cabinets or racks and shall be provided with a 7-foot “SO Type” cord with a female NEMA 5-20 R receptacle on the end.
 - c) The originating electrical panel shall be properly sized for the loads calculated and shall be located in the nearest Electrical Room.
- 2) Additional power circuits to be allocated to security, paging, and service provider equipment shall be considered and coordinated at the time of building design.
- 3) Power distribution to the cabinets shall be achieved by installing rack mounted PDUs.
- d. Convenience
 - 1) The IDF shall be equipped with 20 Amp duplex NEMA 5-20R receptacles, with maximum (3) receptacles on each circuit. The originating electrical panel shall be equipped with a 20 Amp breaker per circuit.
 - 2) A duplex receptacle shall be spaced at least 1 foot from an adjacent wall and every 6 feet thereafter. A minimum of (1) duplex receptacle shall be placed in each wall and be flush mounted to the finished wall surface at 18 inches above finished

6. Equipment Cabinets / Racks and Cable Management Requirements

- a. The IDF shall be equipped with a minimum (2) equipment cabinets or equipment racks. Coordination with and approval by City of San Antonio Information Technology Services Department during the design is required to determine with equipment cabinets or equipment racks shall be utilized.
- b. The IDF shall be equipped with cable runway encircling the room at 84-86 inches above the finished floor, and crossing the room above the equipment cabinets or racks (1) time.
 - 1) Cable runway shall not attach to the top of the equipment cabinets.
 - 2) A vertical section of cable runway shall be attached to the wall board to manage backbone and service provider cables as they transition from the entrance conduits to the overhead cable runway.



A. Design Principles

1. Pathways and conduits are described herein with regard to capacity, function, and basic design principles and shall be designed by the MEP in accordance with NEC and EIA/TIA-758, Customer-Owned Outside Plant Telecommunications Cabling.
2. Telecommunications Conduit Systems shall:
 - a. Be Schedule 80 when placed under ground.
 - b. Contain a minimum of (3) 3-inch 3-Cell Maxcell fabric innerduct inside each conduit. Coordination with and approval by the City of San Antonio Information Services Technology Department is required to determine the exact quantity and size of the Maxcell innerduct inside each conduit.
 - c. Pull tape shall be provided integral with each cell of the Maxcell fabric innerduct.
 - d. A metallic tracer wire shall be provided for the purpose of locating duct route in case of route disturbance. In a bank of conduits, tracer wire shall be provided in a least one of the conduits.
 - e. Contain no more than the equivalent of (2) 90 degree bends between pull boxes.
 - f. Maintain a minimum bend radius of 10 times the diameter of the conduit.
 - g. Not exceed 40 percent fill ratio.
 - h. Be placed at a minimum depth of 36-inches from the top of the conduit to the finished grade with 3-inches of compacted sand above and below the buried conduit and an orange metallic tracer warning tape stencilled "TELECOMMUNICATIONS" 12-inches below grade throughout the entire pathway.
 - i. Be interrupted by an adequately sized manhole or pull box at least every 600 feet for sections containing up to (1) 90 degree of bend, and at least every 350 feet for sections with the equivalent of (2) 90 degree bends.
 - 1) Manholes and pull boxes shall be of adequate depth for conduits to enter from the side of the pull box and not be required to sweep up into the bottom of box.
 - 2) Manholes shall have a minimum size of 12 feet long 6 feet wide and 7 feet high.
 - 3) Pull boxes shall be a minimum 30 inches wide, 48 inches long and 30 inches tall.
 - 4) All accessories such as racking, grounding and bonding, ladders and ancillary equipment shall be provided



- 5) All covers shall be stencilled with “**COSA COMMUNICATIONS**”.
- 6) Manholes and pull boxes shall be designed to ensure proper construction types and load ratings (i.e., traffic bearing) are observed and utilized based on the location of the pull boxes.
- j. Stub up into the MDF and/or IDF at 4-inches above the finished floor, no more than 2-inches from the finished wall and installed parallel to the finished wall.
- k. Contain a marked detectable pulling tape with 1800 lbs tension strength, be fitted with bushings, and sealed appropriately at both ends.

B. City of San Antonio - Right of Way Conduits

- a. Minimum of (3) 4-inch conduits shall route between hand-holes located in the City of San Antonio Rights of Way.
- b. All covers of any manholes or hand holes that are related to City of San Antonio infrastructure shall be stencilled with “**COSA COMMUNICATIONS**”. This applies to any infrastructure placed to serve City of San Antonio properties.
- c. Manholes and pull boxes shall be utilized as required for an ANSI, TIA and BICSI compliant conduit distribution system. The conduit, pull boxes/manholes sizing and construction shall be coordinated with the City of San Antonio Information Technology Service Department and the applicable service provider on a project by project basis.

C. Facility Service Provider Conduits

1. Minimum of (4) 4-inch conduits shall route underground from the MDF to the edge of the property Right of Way and terminate as required by the service provider(s). Additional conduits shall be added as required.
2. Manholes and pull boxes shall be utilized as required for an ANSI, TIA and BICSI compliant conduit distribution system. The conduit, pull boxes/manholes sizing and construction shall be coordinated with the City of San Antonio Information Technology Service Department and the applicable service provider on a project by project basis.
3. Where the service provider termination location is unidentified at the time of design, the conduits shall route from the MDF to an adequately-sized pull box or manhole at least 30 feet from the building edge.

D. Campus Serving Conduits

1. Minimum of (2) 4-inch conduits shall route underground from the MDF to the IDF on the first floor of each additional building on the campus. Additional conduits shall be added as required if fill capacity exceeds 40 percent.



2. Manholes and pull boxes shall be utilized as required for an ANSI, TIA and BICSI compliant conduit distribution system. The conduit, pull boxes/manholes sizing and construction shall be coordinated with the City of San Antonio Information Technology Service Department and the applicable service provider on a project by project basis.
3. Where only the first building of a campus is being designed, (2) 4-inch conduits for each additional future building shall route from the MDF to an adequately-sized manhole or pull box at least 30 feet from the building edge.

E. Building Entrance for Large Campus

1. For large campuses, the MEP and Structural Engineer shall consider a conduit entrance vault as part of the MDF sub floor.

7.03 Cable Management In Telecommunications Spaces

A. Equipment Cabinets / Equipment Racks

1. Coordination with and approval by City of San Antonio Information Technology Services Department during the design is required to determine with equipment cabinets or equipment racks shall be utilized.
2. Cabinets and racks shall be black aluminum Standard Equipment Cabinets and Racks with EIA 19-inch rails, 84-inch (45 RMU) overall height and rack mount unit markings engraved on the rails.
3. All cabinets and racks shall be equipped with horizontal and vertical cable management as indicated in Exhibit 1.
4. Racks shall be bolted to the concrete floor and to the overhead cable runway utilizing manufacturer-recommended hardware and methods.

B. Overhead Cable Management

1. Overhead Cable Management shall be a Universal Cable Runway made of 3/8" x 1-1/2" x .065" wall rectangular steel tubing with cross members welded at 12-inch intervals.
 - a. MDFs shall be provided with a minimum of 18-inch wide Universal Cable Runway.
 - b. IDFs shall be provided with a minimum of 12-inch wide Universal Cable Runway.
 - c. Universal Cable Runway shall encircle the MDF or IDF room at 84-86 inches above the finished floor, and crossing the room above the equipment cabinets or racks (1) time.



- d. The appropriate Radius Drop shall be installed over the racks or cabinets to provide the proper support for the cabling leaving the Runway and entering the rack/cabinet.
- e. Universal Cable Runway shall be installed utilizing appropriate hardware to support, join, or attach sections to structures, and shall be supported at a minimum of 5 foot intervals.
- f. A vertical section of cable runway shall be attached to the wall board to manage backbone and service provider cables as they transition from the entrance conduits to the overhead cable runway.
- g. Universal Cable Runway shall not attach to the full sized equipment cabinets.

7.04 Cable Support in Pathways

A. Main Cable Pathway

- 1. Main cable pathway shall be wire-basket cable tray with the cables exiting the cable tray supported utilizing j-hooks installed a minimum of every 4-5 feet on center. J-hooks shall be installed utilizing appropriate hardware to support, join and attach j-hooks to structures.
- 2. Cable tray and J-hook sizing and quantity shall be scaled to the application not to exceed 40 percent fill ratio.
- 3. A separate j-hook shall be provided for each media type:
 - a. Backbone Fiber
 - b. Backbone Copper
 - c. Horizontal Data
 - d. Horizontal Wireless
 - e. Horizontal Audio/Visual
 - f. Horizontal Security

B. Sleeves and Penetrations

- 1. Sleeves and penetrations are described herein with regard to capacity, function, and basic design principles and shall be designed in accordance with NEC and EIA/TIA-569-B, Commercial Building Standard for Telecommunications Pathways and Spaces.
- 2. All sleeves shall be equipped with nylon bushings.
- 3. All sleeves and penetrations shall be properly fire-stopped to meet local code and to return the wall, floor or structure, back to its original rating.



4. Scale the quantity of sleeves to maintain a 40 percent fill ratio in each sleeve.
5. Above MDF and IDFs install minimum of (4) 4-inch EMT sleeves through the partition wall between the MDF and/or IDF overhead space and the main cabling pathway.
6. Between directly aligned vertically stacked MDF and IDFs install minimum of (3) 4" EMT sleeves through the floor of the upper IDF.
7. Between skewed MDF and IDFs on adjacent floors, install minimum of (3) 4" EMT sleeves through the floor of the upper IDF into the accessible ceiling space below and utilize main cabling pathway to route cabling into the IDF or MDF on the lower floor.

C. Workstation Rough-ins and local power (Typ.)

1. At each flush wall-mounted workstation location, install a 4 11/16 inch by 4 11/16 inch by 2-1/8 inch double-gang back box with double-gang mud ring at 18 inches above the finished floor and at appropriate height for wall mounted phones and above-counter and millwork locations.
 - a. Install a minimum of (1) 1-inch conduit from the double-gang box to above accessible ceiling in the room where double-gang box is located. If ceiling is not accessible, install conduit to nearest accessible ceiling.
 - b. Conduit shall not exceed the 40 percent fill ratio.
 - c. Terminate the conduit above accessible ceiling and install nylon bushing and pull string.
 - 1) Conduit shall be installed in accordance with EIA/TIA-569-B, contain no more than the equivalent of (2) 90 degree bends and /or 98.4 feet between pull boxes, and maintain a bend radius of 6 times the diameter of the conduit.
2. At locations where the workstation outlets cannot be installed flush in the wall, a Panduit Surface Mounted Raceway that is appropriately sized and designed to meet the specific requirements shall be provided.
 - a. When power is provided in the surface mounted raceway a dual-channel surface mounted raceway shall be provided to separate the power from the structured cabling.
 - b. The use of surface mounted raceway shall only be considered when no option is available to install the workstation outlets flush in the wall and shall be approved by the City of San Antonio Information Technology Service Department during the design or prior to installation.



3. At floor-mounted workstation locations, install a floor box or poke-thru specifically designed for the application and environment adequately sized to accommodate the quantity of installed horizontal data cables.
 - a. Install a minimum of a (1) 1-inch conduit for every (6) cables from the floor box to above accessible ceiling.
 - b. Conduit shall not exceed the 40 percent fill ratio.
4. For modular furniture workstations, a rough-in pathway shall be considered and designed according to the furniture type, quantity of cables, and location as required for each furniture system.
 - a. The use of power poles shall be considered only on a case-by-case basis.
5. For ceiling-mounted outlets above accessible ceiling such as Wireless Access Points or IP Cameras, no rough-in is required. The data cable will terminate into a surface-mount box secured to the structure above the accessible ceiling.
6. The electrical engineer shall design at a minimum (1) quad NEMA 5-15R receptacle within 12" of each workstation outlet location.

7.05 Backbone Cabling

A. Service Provider Demarcation point

1. The service provider demarcation point shall be located inside the MDF when feasible.
 - a. For all new construction, the service provider demarcation point shall be located inside the MDF. The service provider demarcation point location and requirements shall be coordinated with City of San Antonio Information Technology Services Department.
 - b. For renovation projects where the service provider demarcation point is not currently located inside the MDF but is required to be relocated because of the renovation, the service provider demarcation point shall be relocated to the MDF. The service provider demarcation point location and requirements shall be coordinated with City of San Antonio Information Technology Services Department.
 - c. For renovation projects where the service provider demarcation point is not currently located inside the MDF and is not required to be relocated because of the renovation, the service provider demarcation point shall be extended to the MDF via copper and/or fiber as required. The service provider demarcation point location and requirements shall be coordinated with City of San Antonio Information Technology Services Department.

B. Inter-building Backbone Cabling (Campus)

1. Permanent Structures



a. Copper

- 1) Inter-building Backbone Copper Cabling shall be Category 3 25-pair 24 AWG flooded UTP home run from the MDF to primary IDF in each of the buildings on the campus. Provide a 10-foot service loop at both ends of each cable stored on the wall above or below the cable runway. Provide a 20-foot service loop in each manhole or pull box. Cables shall be secured with Hook-and-loop tie-wraps in the MDF or IDF.
- 2) Inter-building Backbone Copper Cabling shall terminate on UL-listed Category 3 25-pair 110 IDC in/out lightning protection panels equipped with UL-listed Category 3 5-pin solid state quick-acting protector modules. The secondary side of the panel shall be connected to a Category 3 24-Port RJ-45 rack mounted patch panel.

b. Fiber

- 1) Inter-building Backbone Fiber Optic Cabling shall be armored indoor/outdoor 48-Strand single mode home run from the MDF to the primary IDF in each of the buildings on the campus and dressed with fan-out kits as required. Provide a 10-foot service loop at both ends of each cable stored on the wall above or below the cable runway. Provide a 20-foot service loop in each manhole or pull box. Cables shall be secured with Hook-and-loop tie-wraps in the MDF or IDF.
- 2) All fiber optic terminations shall be fusion spliced to factory provided “pig-tail” LC terminated cables.

C. Intra-building Backbone Cabling

1. Copper

- a. Intra-building Backbone Copper Cabling shall be Category 3 25-pair plenum rated 24 AWG UTP home run from the MDF to each of the IDFs in the building. Provide a 10-foot service loop at both ends of each cable stored on the wall above or below the cable runway. Cables shall be secured with Hook-and-loop tie-wraps in the MDF or IDF.
- b. Intra-building Backbone Copper Cabling shall terminate on a Category 3 24-Port RJ-45 rack mounted patch panel.

2. Fiber

- a. Intra-building Backbone Fiber Optic Cabling shall be armored plenum rated 24-Strand single mode from the MDF to each of the IDFs in the building. Provide a 10-foot service loop at both ends of each cable stored on the wall above or below the cable runway. Cables shall be secured with Hook-and-loop tie-wraps in the MDF or IDF and in the cable runway.



- b. All fiber optic terminations shall be fusion spliced to factory provided “pig-tail” LC terminated cables.

7.06 Horizontal Cabling

A. Workstation Cable

1. Horizontal Data Cabling shall be Category 6 UTP, minimum factory sweep tested to 350 MHz, plenum rated, installed from the patch panel in the MDF or IDF to the workstation location not to exceed 295 feet for the permanent link. Provide a 10’ service loop in the MDF or IDF, and 1-foot of slack at the conduit stub-up above the outlet. Cable bundles shall be secured with Hook-and-loop tie-wraps.
2. At the workstation, each Category 6 cable shall be terminated in a Category 6 modular jack insert and snapped into a single or double-gang, faceplate. Jack colors are designated in Exhibit 1. Faceplates shall be equipped with designation windows for labelling and blank inserts in unused ports.
3. Wall phone workstations shall be equipped with a studded wall phone faceplate capable of accepting a modular jack insert.
4. All faceplate colors shall be coordinated with the Architect or owner at the time of installation.
5. In the MDF or IDF, each Category 6 cable shall be terminated on the back of Category 6 rack mounted patch panels which are mounted in the equipment cabinets.
6. Category 6 cable shall be terminated with the T568B sequence.

B. Workstation Configurations

1. Office Workstation

- a. Install (2) yellow Category 6 cables for data into a 6-port double-gang flush faceplate. The yellow cables shall be terminated with ivory category 6 modular jacks and placed in the first and second position in the faceplate.
 - 1) Furnish a minimum of (1) 2-port workstation on each of (2) walls in each office of approximately 100 sq. ft. Offices that are smaller or larger shall be designed with consideration given to the size of the office and number of personnel planned for the office.
 - 2) Modular furniture clusters shall be designed to accommodate the user requirements at the time of construction.

2. Ceiling-Mounted Projector Outlet

- a. Install (1) Purple (or Violet) Category 6 cable with 20-foot slack loop at each ceiling mounted projector location, terminated with a purple category 6 modular



jack placed in a surface mounted box and secured to the building structure when mounted above the accessible ceiling.

- 1) When a Ceiling Mounted Projector outlet is installed above the accessible ceiling, a purple adhesive dot shall be attached to the ceiling grid directly below the outlet location for future identification of the outlet location.
- 2) When an accessible ceiling is not available, the designer shall coordinate with the audio/visual consultant to termination requirements.
- 3) The designer shall coordinate with the audio/visual consultant to determine quantities and locations of projectors.

3. Audio/Visual Control System (Control Panel)

- a. Install (1) Purple (or Violet) Category 6 cable at each control panel location, terminated with a purple category 6 modular jack placed in a surface mounted box and secured to the building structure when mounted above the accessible ceiling.
 - 1) When an Audio/Visual Control System Panel outlet is installed above the accessible ceiling, a purple adhesive dot shall be attached to the ceiling grid directly below the outlet location for future identification of the outlet location.
 - 2) When an accessible ceiling is not available, the designer shall coordinate with the audio/visual consultant to termination requirements.
 - 3) The designer shall coordinate with the audio/visual consultant to determine quantities and locations of projectors.

4. Wireless Access Point Outlet

- a. Install (1) white Category 6 cable with 20-foot slack loop at each wireless access point location, terminated with a white Category 6 modular jack placed in a surface mounted box and secured to the building structure when mounted above the accessible ceiling.
 - 1) When a Wireless Access Point outlet is installed above the accessible ceiling, a white adhesive dot shall be attached to the ceiling grid directly below the outlet location for future identification of the outlet location.
 - 2) When an accessible ceiling is not available, the outlet for the wireless access point shall be terminated in a 2-port single gang flush mounted faceplate located 6-inches below ceiling not to exceed 12-feet above finished floor.
 - 3) The designer shall coordinate with the City of San Antonio Information Technology Services Department to determine quantities and locations of wireless access points.



5. IP Camera Outlet

- a. Install (1) red Category 6 cable with 20-foot slack loop at each IP camera location, terminated on red category 6 modular jack placed in a surface mounted box and secured to the building structure when mounted above the ceiling.
 - 1) When an IP Camera workstation is installed above the accessible ceiling, a red adhesive dot shall be attached to the ceiling grid directly below the outlet location for future identification of the outlet location.
 - 2) When an accessible ceiling is not available, the outlet for the IP camera shall be terminated in a 2-port single gang flush mounted faceplate located 6-inches below the ceiling not to exceed 12-feet above finished floor.
 - 3) The designer shall coordinate with the City of San Antonio Information technology Services Department to determine quantities and locations of IP Cameras.

C. Patch Cables

1. MDF

a. Fiber Patch Cables – Duplex

- 1) In the MDF furnish to the City of San Antonio Information technology Services Department at the time of substantial completion (1) fiber optic patch cable plus 25 percent spare for each terminated strand.
- 2) Coordinate with City of San Antonio Information technology Services Department for patch cable types, connectors, lengths and colors.

b. Copper Patch Cables

- 1) In the MDF, furnish to the City of San Antonio Information Technology Services Department at the time of final substantial completion (1) 28 AWG Category 6 modular non-booted patch cable plus 25 percent spare for each terminated cable.
- 2) Coordinate with City of San Antonio Information Technology Services Department for lengths of patch cables.
 - a) Category 6 patch cables for each end user workstation outlet terminated shall be black.
 - b) Category 6 patch cable for each audio/visual outlet terminated shall be purple.
 - c) Category 6 patch cable for each wireless access outlet terminated shall be white.



- d) Category 6 patch cable for each IP camera outlet terminated shall be red.

2. IDF

a. Fiber Patch Cables – Duplex

- 1) In each IDF furnish to the City of San Antonio Information Technology Services Department owner at the time of substantial completion (1) fiber optic patch cable plus 25 percent for each terminated strand.
- 2) Coordinate with City of San Antonio Information technology Services Department for patch cable types, connectors, lengths and colors.

b. Copper Patch Cables

- 1) In each IDF, furnish to the owner at the time of substantial completion (1) 28 AWG Category 6 modular non-booted patch cable plus 25 percent for each terminated cable.
- 2) Coordinate with City of San Antonio Information Technology Services Department for lengths of patch cables.
 - a) Category 6 patch cables for each end user workstation outlet terminated shall be black.
 - b) Category 6 patch cables for the active equipment side of each end user workstation outlet terminated shall be yellow.
 - c) Category 6 patch cable for each audio/visual outlet terminated shall be purple.
 - d) Category 6 patch cable for each wireless access outlet terminated shall be white.
 - e) Category 6 patch cable for each IP camera outlet terminated shall be red.

7.07 Grounding

A. Grounding shall be designed and installed in accordance with ANSI-J-STD-607-B.

- 1. Install (1) Telecommunications Main Grounding Busbar (TMGB) in the MDF and (1) Telecommunications Grounding Busbar (TGB) in each IDF.
 - a. The TMGB and TGB shall be labelled.
- 2. Install a Telecommunications Bonding Backbone (TBB), #3/0 AWG stranded green insulated copper conductor in a star topology between the TMGB and each TGB in each building. When IDFs are stacked a single TBB can be daisy-chained between TGBs back to the TMGB.



3. Install an Equipment Bonding Conductor (EBC), #6 AWG green insulated conductor from the TMGB or TGB as applicable to each cable runway system, equipment rack, cabinet, lightning protector, or multi-pair cable with a metallic element.
 - a. Install a #3/0 AWG stranded green insulated copper conductor from the TMGB to the main building electrical service ground in each building.
 - b. In a metal frame (structural steel) building, where the steel framework is readily accessible within or external to the room; each TGB and TMGB shall be bonded to the vertical steel metal frame using a minimum #6 AWG conductor. The connection to building steel does not eliminate the requirement for the TBB or BC to the service ground.
4. Install a Grounding Equalizer Conductor, #3/0 AWG stranded green insulated copper conductor to interconnect multiple TBBs on the top floor and every 3rd floor when required by ANSI J-STD-607-B.
5. When exceeding 13 feet the conductors shall be sized at 2 kcmil per linear foot of conductor length up to a maximum of 3/0 AWG.

7.08 Labelling

1. Coordination with and approval by the City of San Antonio Information Technology Services Department is required on the specific site labeling schema.
2. All labels shall be typed (not handwritten)
3. Verify room numbers and confirm the final room numbering scheme prior to generating labels.
4. Horizontal Cables shall be labelled within 12 inches from the termination point inside the MDF/IDF.
5. Horizontal Cables shall be labelled within 6 inches from the termination point at the workstation end.
6. Backbone Fiber and Copper Cables shall be labelled within 12 inches of the visible end of the jacket.
7. Fiber Innerduct shall be labelled within 12 inches of the point of entry of the fiber optic enclosure.
8. Cables shall be labelled identically at both ends.
9. MDFs and IDFs Room shall be labelled (signage) with the permanent room designations that match the final building signage for cable labelling.
10. Equipment cabinets or racks in each MDF or IDF shall be labelled in sequential numeric order. Labels shall be centered on the top front of the equipment rack.



11. Fiber optic backbone cable labels shall contain the cable origin room number, the cable destination room number, fiber strand numbers, and type (i.e. MDFA150-IDFC126-48SM001-048).
12. Fiber optic enclosures shall be labelled alpha-numeric starting with the 1st fiber optic enclosure in the top of the 1st equipment rack. A label for each terminated strand shall be securely placed inside each fiber optic enclosure.
13. Fiber optic couplers panels in fiber enclosures shall be labeled at each end by strand denoting MDF and/or IDF the cable comes from, and strand number to and from respectively (i.e. IDFC126-48SM001-048).
14. Copper backbone cables labels shall contain the cable origin room number, the cable destination room number, and cable pairs (i.e. MDFA150-IDFC126/001-025).
15. Horizontal cables shall be labelled identically at each end with the destination end and origin room number, patch panel number, and port number. (I.e. IDFC126-C115-B5).
16. Patch panels in each closet shall be uniquely alphabetically labelled sequentially starting with the first Patch Panel in the top of the first equipment rack (i.e. A, B, C, D, E, etc.). Each MDF or IDF starts with A and shall not repeat a letter.
17. 110-type blocks shall contain the origin room number, destination room number, and pair numbers, under each pair termination. (I.e. MDFA150-IDFC126-PR 1-50). 110-type block labels shall be printed on product-specific label strips and placed into label holders.
18. Workstation Faceplates shall be labelled denoting origin MDF/IDF Room Number, patch panel, and port number (i.e. IDFC126-B5).

7.09 Testing

- A. All test results shall be submitted to the owner along with all other final documentation. Test results shall be submitted in both PDF format and the Native Tester format along with the software needed to read the Native Tester Format.
- B. Terminated fiber optic strands shall be tested bi-directionally end to end be and certified in accordance with applicable industry standards and manufacturer certifications requirements with an OTDR field and Light Meter tester that is within their calibration period.
- C. Terminated backbone copper cable links shall be tested in accordance with applicable industry standards and manufacturer certification requirements for attenuation, continuity, and pin-mapping with approved field tester(s) that are within their calibration period.
- D. Terminated Category 6 UTP cable links shall be tested in accordance with applicable industry standards and manufacturer certification requirements for Category 6 compliance with approved field tester(s) that are within their calibration period.

7.10 As-Built Documentation



- A. Produce drawings depicting the condition of the Structured Cabling System as installed produced in AutoCAD 2010 or higher and provided in hardcopy, electronically in .DWG and .PDF format. Include the exact dimensions and locations of MDF and IDF layouts, wall elevations, equipment cabinet elevations, cable runways, cable tray, sleeves, backbone and horizontal cable pathways, workstation locations, and numbering and labelling scheme.
- B. A half-size hard copy of the as-built drawings for the applicable region served by the MDF and/or IDFs shall be provided in MDF and each IDF for reference.
- C. Produce cable records for the Structured Cabling System as installed to include a list of all horizontal and backbone cables produced in an Excel format and provided in hardcopy and electronic format indicating cable number, unique cable label, cable type, origin and destination, length, termination method, and pass/fail result.
- D. Produce (3) hard copies of all test results for each cable, to include technician's name and date stamp, a list of tested cables, and the individual results for each cable tested. Test results shall be furnished on CD ROM to include native file format and .PDF format.

a.

PART 8 - SUMMARY OF STANDARDS

8.01 Summary

- A. All aspects of this City of San Antonio Structured Cabling Infrastructure Standards shall be applied to the design process for new, leased and renovated facilities.
- B. A Division 27 specification and T-Series drawings for the Structured cabling System shall be commissioned and issued by the Architect during the design phases for each facility or project. Drawings and specifications shall be sealed with a current RCDD stamp.

PART 9 - EXHIBITS

b. EXHIBIT 1 - ACCEPTABLE MANUFACTURERS / PRODUCTS

- A. The following list of manufacturers / products are provided for reference only and are not all inclusive. All manufacturers / products shall be verified by the designer for each project and confirmed with The City of San Antonio Information Technology Services Department prior to issuing any construction documents.
- B. Where specific manufacturers / products are mentioned, an equivalent will be considered following an official submission of product literature and written acceptance by the City of San Antonio Information Technology Services Department.
- C. Fiber Optic Backbone Cable

1. Indoor

- a. 9/125µm Single-Mode Plenum Rated Armored



- 1) Panduit
- 2) Chromatic
- 3) Commscope
- 4) Corning
- 5) Systimax

2. Outdoor Underground

a. 9/125µm Indoor/Outdoor Single-Mode Armored

- 1) Panduit
- 2) Chromatic
- 3) Commscope
- 4) Corning
- 5) Systimax

3. Outdoor Aerial

a. 9/125µm Indoor/Outdoor Single-Mode Armored

- 1) Panduit
- 2) Chromatic
- 3) Commscope
- 4) Corning
- 5) Systimax

4. Fiber Optic Fabric Innerduct

a. Indoor Plenum Rated

- 1) MaxCell

b. Outdoor

- 1) MaxCell

D. Copper Backbone Cable

1. Indoor

a. Category 3 24 AWG Unshielded Twisted Pair (UTP) Plenum (White Sheath)



- 1) General
 - 2) Mohawk
 - 3) Superior
 - 4) Systimax
2. Outdoor Underground
 - a. Category 3 24 AWG Unshielded Twisted Pair (UTP) Flooded (PE-89)
 - 1) General
 - 2) Mohawk
 - 3) Superior
 - 4) Systimax
 3. Outdoor Aerial
 - a. 24 AWG Unshielded Twisted Pair (UTP) Self-Supported
 - 1) General
 - 2) Mohawk
 - 3) Superior
 - 4) Systimax
- E. Horizontal Cable
1. Category 6 UTP Plenum (Minimum 350 MHz)
 - a. Network Access (Yellow Sheath)
 - 1) General
 - 2) Panduit
 - b. Wireless Access Points (White Sheath)
 - 1) General
 - 2) Panduit
 - c. AV Access (Purple Sheath)
 - 1) General
 - 2) Panduit



d. IP Security (Red Sheath)

- 1) General
- 2) Panduit

F. Fiber Optic Cable Termination

1. Fiber Enclosure

- a. Panduit Opticom Rack Mount Fiber Enclosure – Part No. FRMEXX

2. 9µm Single-Mode Fiber Coupler Panel

- a. 9µm Panduit Opticom LC Fiber Adapter Panel – Part No. FAP6WBUDLCZ

3. Fiber Blank Panel

- a. Panduit Opticom Blank Fiber Adapter Panel – Part No. FAPB

4. 9µm Single-Mode LC Pigtails

- a. Panduit Opti-Core OS1/OS2 Single-Mode Fiber Optic Pigtails (LC to Pigtail) – Part No. F9B10-NM1Y

5. Loose Tube Fiber Fan-Out Kit

- a. Panduit

G. Copper Cable Termination

1. Building Entrance Terminals

- a. Primary Copper Protectors

- 1) Circa 50-Pair 110 Style Lightning Protection Block
- 2) Solid State Digital Series Surge Protection Modules

2. Backbone Cable Termination Panels

- a. Rack Mounted Voice Patch Panels

- 1) Panduit Voice Patch Panel – Part No. VP24382TV25Y

3. Category 6 Horizontal Rack Mounted Patch Panels

- a. Category 6 48-Port Patch Panels – Panduit Mini-Com Flush Mount Modular Patch Panels - Part No. CPP48FMWBLY

4. Category 6 Modular Jacks



- a. Network Access
 - 1) Equipment Room/Telecommunications Room End (Black)
 - a) Panduit Mini-com TX6 Plus UTP Jack Modules Part No. CJ688TGBL
 - 2) Field End (Ivory)
 - a) Panduit Mini-Com TX6 Plus UTP Jack Modules Part No. CJ688TGEI
 - b. Wireless Access Points
 - 1) Equipment Room/Telecommunications Room End (White)
 - a) Panduit Mini-Com TX6 Plus UTP Jack Modules Part No. CJ688TGWH
 - 2) Field End (White)
 - a) Panduit Mini-Com TX6 Plus UTP Jack Modules Part No. CJ688TGWH
 - c. AV Access (Violet)
 - 1) Equipment Room/Telecommunications Room End (Violet)
 - a) Panduit Mini-Com TX6 Plus UTP Jack Modules Part No. CJ688TGPL
 - 2) Field End (Violet)
 - a) Panduit Mini-Com TX6 Plus UTP Jack Modules Part No. CJ688TGPL
 - d. IP Security
 - 1) Equipment Room/Telecommunications Room End (Red)
 - a) Panduit Mini-Com TX6 Plus UTP Jack Modules Part No. CJ688TGRD
 - 2) Field End (Red)
 - a) Panduit Mini-Com TX6 Plus UTP Jack Modules Part No. CJ688TGRD
5. Telecommunications Faceplates with Designation Window
- a. 2-Port Single Gang Flush (Stainless Steel)
 - 1) Panduit Mini-Com Stainless Steel Faceplates with Labels Part No. CFPL2SY
 - b. 4-Port Single Gang Flush (Stainless Steel)
 - 1) Panduit Mini-Com Stainless Steel Faceplates with Labels Part No. CFPL4SY
 - c. 4-Port Double Gang Flush (Stainless Steel)



- 1) Panduit Mini-Com Stainless Steel Faceplates with Labels Part No. CFPL6S-2GY
6. Wall Phone Faceplate (Stainless Steel)
 - a. Panduit Phone Wall Plate Module Part No. KWP6PY
7. 2-Port Surface Mount Box (White)
 - a. Panduit Mini-Com Surface Mount Box Part No. CBXJ2HW-A
8. Blank Insert (White)
 - a. Panduit Mini-Com Blank Module – Part No. CMBWH-X
- H. Equipment Racks, Cabinets, Wire Management, and Accessories
 1. Two-Post Rack - 19" x 84" Open Frame (Black)
 - a. Panduit Part No. CMR19x84NU
 2. Four-Post Open Frame Rack – 23.3" x 84" x 30.2" (Black)
 - a. Panduit Part No. CMR4P84
 3. Equipment Cabinet (Black)
 - a. Chatsworth F-Series TeraFrame Gen 3 Cabinet Part No. FF2J-113B-C22A
 - b. Chatsworth CUBE-iT Wall-Mounted Cabinet 48" H X 24" W X 30" D Black Part No. 11996-748
 - c. Chatsworth Thin-Line II Wall-Mounted Cabinet 36" H X 26" W X 12" D 6U Part No. 13050-723
 4. Vertical Wire Managers (Black)
 - a. Patch Runner Double Sided Vertical Cable Management System Panduit - Part No. PRV6
 - b. Patch Runner Vertical Cable Management Door Panduit - Part No. PRD6
 - c. Chatsworth F-Series TeraFrame Gen 3 Finger Cable Manager – Part No. 39112-C14
 5. Horizontal Wire Managers (Black)
 - a. Net Manager Double Sided High Capacity Horizontal Cable Mangers Panduit - Part No. NCMH2
- I. Cable Runway (Ladder Type)



1. 12" Universal Cable Runway
 - a. Chatsworth - Part No. 10250-712
2. 12" Cable Runway Radius Drop, Cross Member
 - a. Chatsworth - Part No. 12100-712
3. 12" Cable Runway Radius Drop, Stringer
 - a. Chatsworth - Part No. 12101-712
4. 18" Universal Cable Runway
 - a. Chatsworth - Part No. 10250-718
5. 18" Cable Runway Radius Drop, Cross Member
 - a. Chatsworth - Part No. 12100-718
6. 18" Cable Runway Radius Drop, Stringer
 - a. Chatsworth - Part No. 12101-718
7. Cable Runway Butt-Splice Kit
 - a. Chatsworth - Part No. 11301-701
8. Cable Runway Junction-Splice Kit
 - a. Chatsworth - Part No. 11302-701
9. Cable Runway Butt-Swivel Splice Kit
 - a. Chatsworth - Part No. 10487-701
10. Rack-to-Runway Mounting Kit
 - a. Chatsworth - Part No. 10595-712
11. Cable Runway Elevation Kit for Racks
 - a. Chatsworth - Part No. 10506-706
12. Cable Runway Elevation Kit for Cabinets
 - a. Chatsworth - Part No. 10506-716
13. 12" Triangular Support Bracket, Aluminum
 - a. Chatsworth - Part No. 11312-712



14. 12" Wall Angle Support Kit, Cable Runway

- a. Chatsworth - Part No. 11421-712

15. 18" Triangular Support Bracket, Aluminum

- a. Chatsworth - Part No. 11312-718

16. 18" Wall Angle Support Kit, Cable Runway

- a. Chatsworth - Part No. 11421-718

17. 90 Degree Runway-Splice Kit

- a. Chatsworth - Part No. 11314-701

18. 45 Degree Runway-Splice Kit

- a. Chatsworth - Part No. 11313-712

19. Foot Kit, Cable Runway

- a. Chatsworth - Part No. 11309-001

20. Vertical Wall Brackets (pair)

- a. Chatsworth - Part No. 10608-701

21. Threaded Ceiling Kit, Cable Runway

- a. Chatsworth - Part No. 11310-001

22. Threaded Rod Cover

- a. Chatsworth - Part No. 11085-001

23. Protective End Caps for Cable Runway

- a. Chatsworth - Part No. 10642-001

24. End Closing Kit, Cable Runway

- a. Chatsworth - Part No. 11700-712

J. Pathway Cable Support

1. Panduit J-Mod Cable Support System

2. Erico – CADDY CAT LINKS J-Hook Series

3. Panduit Plenum Rated Hook & Loop (Black)



K. Grounding and Bonding

1. Grounding Bus Bar, 20”
 - a. Chatsworth - Part No. 40153-020
2. Grounding Bus Bar, 12”
 - a. Chatsworth - Part No. 13622-012
3. Cable Runway Ground Strap Kit
 - a. Chatsworth - Part No. 40164-001
4. One Mounting Hole Ground Terminal Block
 - a. Chatsworth - Part No. 08009-001
5. Horizontal Rack Ground Bar for Wall Mount Cabinet
 - a. Chatsworth - Part No. 10610-019
6. #6 AWG Solid Green Insulation Ground Wire
 - a. Superior Essex - Part No. 12-018-04
7. #3/0 Stranded Green Insulation Ground Wire
8. Cable Sheath Bonding Clamp

L. Labelling

1. Permanent Labels for Fiber Optic Cables
 - a. Brady
 - b. Panduit Self Laminating Labels
2. Permanent Labels for Innerduct
 - a. Panduit Dome-Top Ty Marker
3. Permanent Labels for Copper Cables
 - a. Panduit Self-Laminating Labels
4. Permanent Labels for Backbone Fiber Optic Cables
 - a. Panduit Dome-Top Ty Marker
5. Permanent Labels for Patch Panels
 - a. Panduit Component Label



6. Permanent Labels for Faceplates

a. Panduit Component Label

M. Fire Stop

1. STI Spec Seal Part No.
2. 3M Products Part No.

N. Plywood

1. 8' H x 4' W x 3/4" Sheets of BC grade fire-rated plywood

O. Fire Retardant Paint (White)

P. Fiber Patch Cables

1. Panduit
2. Corning

Q. Copper Patch Cables

1. Panduit



John Rodriguez
Assistant Director - Infrastructure

Date

Approved by:

Craig Hopkins
Chief Information Officer (CIO)

Date

EXHIBIT C

DAS SYSTEM ACCEPTANCE TEST PROCEDURES

1.1 OBJECTIVE

This document describes proposed methods, procedures and criteria for commissioning, integrating and acceptance testing the DAS. Acceptance Testing is the general name given to a process that has four main phases, which will be detailed in this document, necessary to achieve Acceptance Criteria:

- Commissioning
- Integration
- DAS Optimization
- Acceptance Testing

1.2 RESPONSIBILITIES

1.2.1 Contractor responsibilities:

- Perform the DAS commissioning
- Perform the DAS integration
- Perform the DAS optimization
- Perform the DAS acceptance testing

1.2.2 Carriers' responsibilities:

- Local engineering support: Each Carrier will provide contact information for a local RF engineer responsible for supporting the Acceptance Testing. This engineer should be available during the work hours agreed to by the Carrier and Contractor for conducting Acceptance Testing. It is expected that this resource will be capable of performing standard RF engineering tasks, such as changing its head-end room Participant Equipment ("BTS") parameters during the integration and optimization phases.
- Telco/Ethernet: Each Carrier is responsible for dimensioning, making available and testing the transmission links between BTS the mobile switching center.
- BTS Installation and Commissioning: Each Carrier is responsible for installing and commissioning the BTS, when applicable. The contractors responsible for this task should be available during the first

stages of the DAS integration, in case troubleshooting is needed at the BTS level.

2 COMMISSIONING

2.1 OBJECTIVE

The Commissioning of the DAS starts upon successful completion of installation. The purpose of commissioning is to verify that all active and passive components of the DAS are functioning as expected. At this level, any hardware malfunctions should be identified and action plans for resolving them should be implemented. It is expected that at the end of commissioning all the DAS hardware and software are functioning satisfactorily. City representatives shall have an opportunity to inspect the DAS prior to the start of official testing to verify that all key components included in the Plans and Specifications have been installed in the DAS and to confirm that they have been installed in a manner that is consistent with the City's fire and electrical codes.

2.2 ENTRY CRITERIA

- The DAS installation phase has been completed and accepted as such by the Carriers and the City, as applicable.
- A work schedule for the commissioning activities has been determined and agreed by the Carriers, based on the City's information and availability.
- The Carriers and Contractor will have access granted to all Assigned Areas, during the pre-determined work hours.
- At least one member of the Contractor's installation crew will be present throughout the commissioning phase, should any installation issues arise. This individual will be able to access any physical segment of the DAS if necessary, including the head end, the remote units and coaxial cables, splitters and antennas.

2.3 EXIT CRITERIA

- All remote units working properly
- Master unit working properly
- Interconnect links working properly
- The supervision unit is working properly
- A Continuous Wave ("CW") is successfully injected and distributed through the DAS
- CW data collection plots are ready, showing the presence and strength of the Continuous Wave throughout the venue.
- DAS hardware and/or software malfunctions have been identified and action plans for resolving them have been implemented.

2.4 PROCEDURES

The following procedures will be followed for commissioning the DAS.

2.4.1 CW TEST PARAMETERS

The CW power level required for downlink testing after system start-up will depend on the interface between the DAS and the BTS. The goal is to have 0dBm reaching the laser board, in order to guarantee the remote unit will be operating at maximum power for that specific band. Hence, the power level has to be adjusted accordingly to meet that goal.

2.4.2 WALK TEST

Once all links have been checked and the system has been started up according to the process described above, a walk test will be performed to ensure that the signal is going through the system at expected levels. This will be achieved by:

- Injecting a CW signal at the head end at the ION-B and IOM-M interfaces on layers 1 and 2
- Calculating the EiRPs at each antenna.
- Calculating the expected RSSI, based on the EiRPs and free space path loss.
- Comparing these 2 values, for each band.

This test will be performed by using a CW scanner capable of recording the measured RSSI and its position relative to a floor plan. The recorded values will be then compared to the expected ones and discrepancies will be flagged for further investigation.

2.4.3 GUIDELINES

- The scanner should be set at a minimum of 8 Hertz⁽¹⁾.
- The receiving antenna will be kept at shoulder height.
- Body losses are to be avoided by making sure the engineer's body is not between the transmitting and the receiving antennas.
- The route must pass directly under the antenna in the walk route
- If antenna power abnormality is detected from the walk test, the expected RSSI can be estimated by using the following formula;

$$RSSI = EiRP - PL$$

$$PL = 32.45 + 20 * \log(f * d)$$

f in GHz. d in meters

Below is an example of estimated RSSI based on the above formula:

Antenna ID	Source ID	Antenna gain	Total loss/gain	Antenna EIRP	Expected RSSI at distance (m)				
					1.5	2	3	4	5
ANT SYS 1.D2-1	CW 1900 Data	5	-28.82	6.18	-35	-38	-41	-44	-46
ANT SYS 1.D2-2	CW 1900 Data	5	-29.63	5.37	-36	-39	-42	-45	-47
ANT SYS 1.D2-3	CW 1900 Data	5	-30.33	4.67	-37	-39	-43	-45	-47
ANT SYS 1.D2-4	CW 1900 Data	5	-27.28	7.72	-34	-36	-40	-42	-44
ANT SYS 1.D2-5	CW 1900 Data	5	-28.29	6.71	-35	-37	-41	-43	-45
ANT SYS 1.D2-6	CW 1900 Data	5	-30	5	-37	-39	-43	-45	-47
ANT SYS 1.D2-7	CW 1900 Data	5	-31.69	3.31	-38	-41	-44	-47	-49
ANT SYS 1.D2-8	CW 1900 Data	5	-31.25	3.75	-38	-40	-44	-46	-48
ANT SYS 1.D2-9	CW 1900 Data	5	-29.42	5.58	-36	-38	-42	-44	-46
ANT SYS 1.D2-10	CW 1900 Data	5	-33.13	1.87	-40	-42	-46	-48	-50
ANT SYS 1.D2-11	CW 1900 Data	5	-32.71	2.29	-39	-42	-45	-48	-50
ANT SYS 1.D2-12	CW 1900 Data	5	-30.91	4.09	-37	-40	-43	-46	-48
ANT SYS 1.D2-13	CW 1900 Data	5	-32.65	2.35	-39	-42	-45	-48	-50
ANT SYS 1.D2-14	CW 1900 Data	5	-30.69	4.31	-37	-40	-43	-46	-48
ANT SYS 1.D2-15	CW 1900 Data	5	-30.22	4.78	-37	-39	-43	-45	-47
ANT SYS 1.D2-16	CW 1900 Data	5	-31.09	3.91	-38	-40	-44	-46	-48
ANT SYS 1.D2-17	CW 1900 Data	5	-35.42	-0.42	-42	-44	-48	-50	-52
ANT SYS 1.D2-18	CW 1900 Data	5	-33.62	1.38	-40	-43	-46	-49	-51
ANT SYS 1.D2-19	CW 1900 Data	5	-32.32	2.68	-39	-41	-45	-47	-49
ANT SYS 1.D2-20	CW 1900 Data	5	-34.18	0.82	-41	-43	-47	-49	-51

Layer 1 Expected CW RSSI values

The Reverse Link attenuation values should be set both according to design and also based on the Carrier's feedback. The goal is to minimize the desensitivity of the base station sectors and also contribute to reduce the UL noise due to traffic.

2.4.4 ROUTES

The Carriers and Contractor will establish walk routes to confirm proper operation in all passive DAS across particular areas.

2.5 EQUIPMENT

- Wrenches and screwdrivers
- Laser distance measuring tool
- Berkeley Electronics Lizard 850MHz transmitter
- Berkeley Electronics Lizard 1900MHz transmitter
- Anritsu MS2711D Spectrum Master
- Berkeley Electronics Coyote Scanner
- TEMS Investigation
- TEMS Pocket
- Laptop

2.6 DELIVERABLES

Contractor will provide plots for the CW scanned signals along with the corresponding EIRP table.

3 INTEGRATING THE DAS

3.1 OBJECTIVE

The objective of integrating is to establish a functioning connection between the BTS and the DAS, allowing the DAS to become operational.

No quality related tests will be done in this phase, since the still not optimized macro network will have an expected negative impact on the Key Performance Indicators ("KPIs"). The integration tests are designed to show exclusively the system functionality, by showing that the proper PNs, BCCHs and SCs are being broadcasted in the zones as per design, and that its levels are within the design expectations. Contractor shall provide the City with documentation sufficient to verify that the appropriate testing has taken place and to provide a reference measurement of the overall performance of the DAS at the time of activation.

3.2 ENTRY CRITERIA

Before Contractor can start integrating the DAS with the BTS, the following items must have already been resolved:

- DAS Commissioning has been successfully completed
- Telco installed, tested and accepted.
- BTS have been installed
- BTS NF has been measured as baseline
- BTS data has been loaded, such as, but not limited to:
 - Neighbour lists
 - Pout
 - Soft handover criteria
- Test dial-in numbers have been provided by each Carrier
- FTP test servers have been set by each Carrier
- Walk test teams are ready
- Data collection equipment is ready
 - Floor plans are loaded on the tool
 - Routes are known by the team
 - Scripts are ready for each test type
- Pilot beacons have been commissioned

3.3 EXIT CRITERIA

The DAS are considered to have been “integrated” when:

- All BTS are commercially operational
- All BTS have been physically connected to the DAS

- DAS UL and DL attenuation values have been set
- All data collection tests have been successfully performed
- Reports and plots have been submitted to the Carriers

3.4 STEPS

The data collected in this phase should be sufficient for the first “optimization and tuning” actions to take place on the next phase.

The tests to be done for each Carrier are listed below:

- Switch on individual active DAS equipment.
- Verify that gain, attenuation, frequency and other related parameters of the DAS are set as per design recommendation.
- Perform a stand-alone "health check," as per the equipment vendor's recommended procedures.
- Apply BTS or transceiver output power to the DAS input port(s). Input power should be set as per design document. Any coupler/attenuator should be used in line with final design document.
- Perform local/remote monitoring and control of the DAS equipment using network management system (NMS).
- Confirm all alarm interfaces are connected and functioning correctly.
- Complete RF and optical power measurements at the outputs of the BTS and DAS equipment, using RF and optical power meters.
- Handover tests
 - Long call data collection between zones
 - Long call data collection between the DAS and the outdoor network
- Scanning test: Top 10 strongest servers in each zone
- Signal Bleeding: Long call data collection outside the venue, where accessible.
- NF Desensitization: Nominal numbers were set by Contractor during commissioning, but actual numbers should be measured by each Carrier, so proper adjustments can be made.
- Carrier switch team will measure BTS receiver noise floor rise (desensitization) after integration of the DAS equipment. Noise rise should not exceed the agreed upon level.
- Complete any other activity not specifically mentioned above, but required for accomplishing DAS integration.

3.5 REPORT

Upon completion of all the activities outlined above, Contractor will produce the following documents for submitting a Site Installation, Commissioning and Integration Report to all Carriers:

- Installation readiness checklist

- As-built head-end equipment room layout drawing
- As-built remote equipment room layout drawing
- As-built DAS network Interconnection Diagram for the individual sectors
- Installation, Commissioning and Integration check-list as per the following:

Sl. No.	Item Description	Compliance (Yes/No)	Comments
1.0	Installation		
1.1	Installation DAS Equipment at Head-end		
1.2	Installation of Other DAS Equipment at Remote Location		
1.3	Laying of RF, Alarm and NMS Cables		
1.4	Laying of Fiber Optic Cable		
1.5	Installation of Indoor Antennas		
1.6	Connectorization of Fiber Optic and RF Cable		
1.7	Connection of DC Power to the Active Components		
1.8	Connection of grounding terminals of all active equipment to grounding bar		
1.9	Termination of Alarm and NMS cables to the DAS equipment		
1.10	Termination of Fiber Optic Cable to Respective Equipment		
1.11	Termination of RF Cable to Respective Equipment		
1.12	Completion of All Construction Patch Works		
1.13	Cleaning of Venue (Removal of Debris)		
2.0	Commissioning		
2.1	Power up all active DAS equipment		
2.2	Download Default Database to perform Stand-Alone Test		
2.3	Set all parameters like gain, attenuation, frequency etc as per design		
2.4	Conduct All Stand-Alone Test as per manufacturer's Recommendation		
2.5	Feed CW/CDMA/GSM/UMTS signal from signal generator into the DAS		
2.6	Verify availability of test signal at each indoor antenna output (using test receiver)		
2.7	Verify smooth functioning of the network management system		
3.0	Integration		
3.1	Power up all active DAS equipment		
3.2	Verify all parameters are set as per design document		
3.3	Insert designed level of BTS output power into the DAS		
3.4	Perform walk test around each indoor antenna to ensure RF transmission		
3.5	Perform origination and termination call test at each antenna coverage		

3.6	Perform handoff/handover testing at appropriate locations		
3.7	Verify local/remote control and monitoring functionalities of NMS		
4.0	Measurement		
4.1	End-to-end Fiber Optic Link Loss		
4.2	Link loss of individual RF paths		
4.3	End-to-end VSWR of RF Chain		
4.4	RF Power Measurement at BTS Output		
4.5	BTS desensitization		
4.6	RF Power Measurement at Indoor Antenna Input		
4.7	RF Power Measurement at Remote Unit Output		
4.8	Optical Power Measurement at DAS Master Unit Output		
4.9	Preliminary coverage verification using test mobile		
5.0	Others		
5.1	Compliance with RF exposure norms		
5.2	Compliance with National Electric Code (NEC)		
5.3	Compliance with Fire Safety Rules		

- End-to-end Optical Link Loss measurement report in tabular form as per the following:

Sl. No.	Link Name	Origination Location	Termination Location	Link Length (m.)	Link Loss (dB)	Comments

- End-to-end Sweep Test measurement report in tabular form as per the following:

Sl. No.	Link Name	Origination Location	Termination Location	Sweep Freq. Band (MHz)	RF Cable Length (m.)	VSWR	Comments

- End-to-end RF cable loss measurement report in tabular form as per the following:

Sl. No.	RF Link Name	Origination Location	Termination Location	RF Cable Length (m.)	RF Cable Loss	Comments

					(dB)	

- RF Output Power measurement report in tabular form as per the following:

Sl. No.	RF Power Measurement Point	Measured RF Power (dBm)	Expected RF Power as per Design (dBm)	Comments
1.	BTS output power (sector1)			
2.	BTS output power (sector2)			
3.	BTS output power (sector 3)			
4.	Remote DAS Output 1			
5.	Indoor Antenna Number-1			

- Gain settings of active DAS equipment in tabular form as per the following:

Sl. No.	DAS Equipment Name	Gain Setting (dB)	Max. Gain (dB)	Comments
1.				
2.				
3.				

- Optical Power Measurement report in tabular form as per the following:

Sl. No.	Optical Power Measurement Point	Measured Optical Power (dBm)	Expected Optical Power as per Design (dBm)	Comments
1.				
2.				
3.				
4.				

- List of Installed Items along with their descriptions as per the following. Also, technical specifications of all equipment and accessories should be attached for reference.

Sl. No.	Item Description	Commissioned Location	Date of Commissioning	Manufacturer	Part No.	Serial No.	Comments
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1.0	<u>BTS and Related Items</u>						
1.1							
1.2							
2.0	<u>Active DAS Components</u>						
2.1							
2.2							
3.0	<u>Passive DAS Components</u>						
3.1							
4.0	<u>Fiber Optic Related Items</u>						
4.1							
4.2							
5.0	<u>Various Electrical Items and Accessories</u>						
5.1							
5.2							

A Site Installation, Commissioning and Integration Report, consisting of the above documents and as-built drawings, will be combined into a binder. The City will receive these as-builts in electronic format as well. A signed copy of the binder will be submitted by Contractor to each Carrier for approval. Also, an approved copy of the binder will be stored in the Head-End equipment room and used as reference for future expansion of the system and/or operation and maintenance work. Copies of the approved Site Installation, Commissioning and Integration Report may be made available to the City by Carriers, if required.

4 OPTIMIZATION AND ACCEPTANCE TESTING

4.1 OBJECTIVE

The objective of this phase is to provide guidelines for optimization and acceptance testing of the newly installed, commissioned and integrated DAS system. Optimization and Acceptance testing become the final milestones prior to putting the DAS into service. Listed here are pass/fail criteria to be used to measure the RF network performance of the in-building distributed antenna system.

This phase assumes that all installation, commissioning, and integration activities

have been concluded. Those activities are followed by optimization of the DAS. Acceptance testing begins after successful completion of optimization and with a written request from Verizon as Verizon Wireless to initiate the process of acceptance testing.

4.2 ENTRY CRITERIA

- Completion of Integration
- All alarm systems are functional
- All applicable neighbour lists, both internal and external to the venue, have been populated with initial values.
- All network parameters, both internal and external to the venue, have been populated with initial values.
- Initial parameter settings for active DAS equipment have been programmed.
- Optical link loss measurements have been recorded.
- All transceivers and other active DAS equipment are powered up.
- Transmit RF power measurements have been recorded
- Optical power measurements have been recorded
- Sweep tests of the RF chain have been recorded
- Synchronization of the BTS with backhaul
- Call origination and termination tests have been conducted within each individual indoor antenna coverage area.
- Soft handoff / handover checks are complete
- Submission of the Installation, Commissioning and Integration report
- Receipt of “go-ahead” from Project Manager

4.3 EXIT CRITERIA

Once all of the acceptance test results are found by each respective Carrier to meet its acceptance criteria, the DAS network will be considered fully optimized and accepted under the current simulated load condition and will be declared as “ready for launch” by the Carriers.

4.4 ROUTES AND SAMPLE SIZES

The optimization walk-test route should be a realistic representation of customer usage over the entire target coverage area of the venue. It should be conducted as thoroughly as possible and include all locations as defined by the contractual coverage area(s). In other words, it should encompass the entire area of interest within the venue. The walk test data files should be terminated after exiting the venue into RF footprint of the macro-network so as to capture the DAS to macro handoff/handover scenarios.

In addition to the above, a macro network test route will be selected to include all the walkways and portals agreed by the Carriers. Any DAS services which are expected to perform in outdoor areas adjacent to the venue should be tested and

optimized. Any DAS services which are expected to operate as Carrier's transition into and out of the Assigned Areas should be tested and optimized at each portal. Also, exclusion zones and the areas surrounding the fire exits should be part of the routes.

In order to ascertain the level of leakage from the areas in scope, all external test routes should be tested twice under similar radio network loading conditions:

- DAS powered off
- DAS powered on

The sample rate of the walk-test data should be sufficiently large to produce confidence in the measurement.

4.5 TARGET KPIs

The optimization activity should target to meet any KPIs defined in the Agreement. Typical contractual values are presented in the tables below:

GSM

.	Key Performance Indicator	Target Threshold
1	Percent of Samples with RSCP/RSSI > -85 dBm	> 95%
2	Percent of Samples with MTx < +18 dBm	> 95%
3	Percent of Samples with C/I > 12 - Local market to share responsibility for optimizing the DAS with their respective macro networks.	> 95%
4	Percent of Samples with C/A > 0 - Local market to share responsibility for optimizing the DAS with their respective macro networks.	> 95%
5	Origination Call Setup Success Rate (Voice) – BTS Vendor or Local Market Responsibility	
6	Termination Call Setup Success Rate (Voice)– BTS Vendor or Local Market Responsibility	
7	Total Call Setup Success Rate (Voice)– BTS Vendor or Local Market Responsibility	
8	BTS desensitization due to DAS	< 2 dB
9	Call Drop Rate (Voice) (NMS)	< 2%
10	Call Setup Time (Voice)	< 3 sec for 95% sample
11	Handover Success Rate - Local market to share responsibility for optimizing the DAS with their respective macro networks.	> 95%
12	Percent of Samples with Voice Quality (MOS) > 4	> 95%
13	Percent of Samples with Mean BER/FER/BLER < 2% - Local market to share responsibility for optimizing the DAS with their respective macro networks.	> 95%

14	PS / CS / Multi-RAB / Data Call Setup Success Rate - Local market to share responsibility for optimizing the DAS with their respective macro networks.	< 2%
15	PS / CS / Multi-AB / Data Call Drop Rate - Local market to share responsibility for optimizing the DAS with their respective macro networks.	< 2%
16	PS / CS / Multi-RAB / Data Call Setup Latency - Local market to share responsibility for optimizing the DAS with their respective macro networks.	< 6 sec for 95% sample
17	PS / CS / Multi-RAB / Data Call Handover Success Percent - Local market to share responsibility for optimizing the DAS with their respective macro networks.	> 95%
18	Average Application Layer Data Throughput (kbps) - Local market to share responsibility for optimizing the DAS with their respective macro networks.	> 100 kbps for 95% sample

CDMA

	Key Performance Indicator	Recommended Threshold
1	Percent of Samples with RSCP/RSSI > -88 dBm (Pilot Power)	> 95%
2	Percent of Samples with MTx < +15 dBm	> 95%
3	Percent of Samples with Ec/Io > -14 - Local market to share responsibility for optimizing the DAS with their respective macro networks.	> 95%
4	Origination Call Setup Success Rate (Voice) – BTS Vendor or Local Market Responsibility	
5	Termination Call Setup Success Rate (Voice) – BTS Vendor or Local Market Responsibility	
6	Total Call Setup Success Rate (Voice) – BTS Vendor or Local Market Responsibility	
7	BTS desensitization due to DAS under unloaded condition	< 2 dB
8	Call Drop Rate (Voice) - Local market to share responsibility for optimizing the DAS with their respective macro networks.	< 2%
9	Call Setup Time (Voice) – BTS Vendor or Local Market Responsibility	
	Handoff / handover Success Rate (Voice) – Local market to share responsibility for optimizing the DAS with their respective macro networks.	> 95%
11	Percent of Samples Mobile in Soft handoff (Voice) – Local market to share responsibility for optimizing the DAS with their respective macro networks.	< 35%
12	Percent of Samples with Voice Quality (MOS) > 4	> 95%
13	Percent of Samples with Mean BER/FER/BLER < 2%– Local market to share responsibility for optimizing the DAS with their respective macro networks.	> 95%

14	PS / CS / Multi-RAB / Data Call Setup Success Rate BTS Vendor or Local Market Responsibility	> 95%
15	PS / CS / Multi-RAB / Data Call Drop Rate– Local market to share responsibility for optimizing the DAS with their respective macro networks.	< 2%
16	PS / CS / Multi-RAB / Data Call Setup Latency BTS Vendor or Local Market Responsibility– Local market to share responsibility for optimizing the DAS with their respective macro networks.	< 6 sec for 95% sample
17	PS / CS / Multi-RAB / Data Call Handover Success Percent– Local market to share responsibility for optimizing the DAS with their respective macro networks.	> 95%
18	Average Application Layer Data Throughput (kbps) - Local market to share responsibility for optimizing the DAS with their respective macro networks.	> 100 kbps for 95% sample

LTE

Key Performance Indicator			Recommended Threshold	
	Category	Sub-Category	Target Value	Comments
1	Performance-Accessibility	RRC Setup Failure Rate	2.00%	RRC Setup Failure Rate – BTS Vendor or Local Market Responsibility
2		Attach Failure Rate	2.50%	Attach Failure Rate – BTS Vendor or Local Market Responsibility
3		Attach Delay	2 seconds	Attach Delay – BTS Vendor or Local Market Responsibility
4		Access Failure Rate	2.50%	Access Failure Rate – BTS Vendor or Local Market Responsibility
5	Performance-Retainability	Session Failure Rate	2.00%	Session Failure Rate – BTS Vendor or Local Market Responsibility
6		RRC Drop	5.00%	This is for 95% sample and Local market to share responsibility for optimizing the DAS with their respective macro networks.
7	Performance-Integrity	Access RACH Latency	0.5 seconds	Access RACH Latency – BTS Vendor or Local Market Responsibility

8		DL/UL Physical Layer Throughput, median	7/3 Mbps	This is for 95% sample and Local market to share responsibility for optimizing the DAS with their respective macro networks.
9		DL/UL Physical Layer Throughput, 5th %-ile	1/0.5 Mbps	This is for 95% sample and Local market to share responsibility for optimizing the DAS with their respective macro networks.
10		Packet Latency (round-trip delay)	30 msec	This is for 95% sample and Local market to share responsibility for optimizing the DAS with their respective macro networks.
11	Performance-Mobility	S1/X2 Handover Failure Rate	2.00%	Handover Failure Rate – BTS Vendor or Local Market Responsibility
12		S1/X2 Handover Interruption Time, intra-eNB	100 msec	Handover Interruption Time, intra-eNB – BTS Vendor or Local Market Responsibility
13	RF-SINR	Percent Included Area > 13 dB SINR	10%	This is for 95% sample and Local market to share responsibility for optimizing the DAS with their respective macro networks.
14		Percent Included Area > -5 dB SINR	90%	Percent Included Area > -5 dB SINR– Local market to share responsibility for optimizing the DAS with their respective macro networks.
15	RF-RSRP	Percent Included Area > -112 dBm	90%	Percent Included Area > -112 dBm– Local market to share responsibility for optimizing the DAS with their respective macro networks.
16	Performance - IRAT	IRAT Handover Failure Rate	5%	This is for 95% sample and Local market to share responsibility for optimizing the DAS with their respective macro networks.

4.6 CDMA BASED NETWORKS

4.6.1 UNLOADED NETWORK SCENARIO

For the case of CDMA based networks, coverage optimization is to be conducted under unloaded radio network conditions using, simultaneously, two test handsets and one scanner per operator. One test handset will be used for making a long (continuous) call during the entire period of the walk-test. In case the call is dropped, the handset will be programmed in such a way as to be able to immediately initiate another long call. The second handset, on the other hand, will originate repeated voice calls each of 30 second duration followed by an idle period of 30 seconds. The number of calls, however, should be determined based on the target percentage and acceptable error as set forth above.

4.6.2 LOADED NETWORK SCENARIO

The second stage of optimization is to be conducted under simulated radio network loading. Forward link loading should be simulated using OCNS or by adding the appropriate attenuation to only the reverse link transmit path. Similar to the earlier step, optimization will be carried out simultaneously using two test handsets per operator per service (voice/data) and one scanner.

One test handset will be used for making a long (continuous) call during the entire period of the walk-test. In case the call is dropped, the handset should be programmed to be able to immediately initiate another long call. The second handset will make repeated calls each of a 30 second duration followed by an idle period of 30 seconds. While the call setup success rate is to be determined from the short calls, the drop call rate should be derived from the long call as per the following:

The minimum number of short calls should be determined based on the target percentage and acceptable error as set forth above. Capacity optimization will target to accomplish the KPIs set forth in section 4.5.

4.7 TDMA BASED NETWORKS

The separate steps for unloaded and loaded radio network optimization may not be mandatory for all services. While these are essential for CDMA and UMTS services, Contractor may combine the two steps for the optimization of the GSM network. The coverage optimization will target to meet the KPIs set forth in section 4.5.

4.8 DAS – MACRO OPTIMIZATION

Similar to the previous step, the final stage of optimization is to be conducted under simulated radio network loading conditions. However, after completion of

the stand-alone in-building DAS optimization, the main goal will be to ensure a smooth hand-in / hand-out with the external (macro) radio network along with minimizing indoor coverage spillover (interference) into the macro network.

It is important to note that on this phase the Contractor will be able to assess issues related to DAS Macro interference only, not the other way around. Actions from the Carriers on their macro networks will be needed to assure all neighbouring sites work smoothly with the indoor DAS.

The optimization would apply to all DAS services that require interaction with the external network. It is anticipated that this would pertain primarily to commercial wireless services but other expectations of the Owner or the Carriers will also be considered.

The following steps will be followed to accomplish the above:

1. Collect macro network test data: data should be collected externally from each portal of the venue.
2. Compare the two sets of data.
3. Identify any excessive spill over areas from the in-building network.
4. Minimize the impact on the macro network by employing power reduction and any other relevant RF-related techniques on the indoor system. Any changes adopted may adversely impact the performance of the in-building system and iterative optimizations of the DAS might be required to meet optimization goals.
5. Ensure that all targets of capacity optimization are met.
6. Optimize all neighbor lists, handoff / handover parameters and any other RF related parameters to ensure smooth handoff/handover between the indoor and outdoor networks.

Indoor-macro network optimization will be accomplished by the following:

- Capacity (loaded) optimization to meet all targets
- Minimal impact on macro network quality
- Smooth handoff/handover between the indoor and outdoor networks
- Verify exclusion zones and their interaction with PS macro sites

4.9 OPTIMIZATION DATA COLLECTION

The Contractor will maintain three (3) separate data files for each service:

- One file will be created for the in-building walk-test of the entire venue;
- The other two files will be collected from macro network drive test:
 - DAS in a powered off condition
 - DAS (during busy hour) in a switched on condition.

The following nomenclature should be followed for each individual data file:

Carrier_Name-Date_Time.xxx

A summary sheet will be prepared by the Contractor which identifies the individual files for easy reference. The following format is suggested:

Sl. No.	File Name	Service	Type of File (Indoor / Outdoor)	For Outdoor Files Status of Indoor Network	Comments
1.	"Name of File"	"Name"	"Indoor"	N/A	
2.	"Name of File"	"Name"	"Outdoor"	Switched off	
3.	"Name of File"	"Name"	"Outdoor"	Switched on	

4.10 DELIVERABLES

The following plots and deliverables, pertaining to the in-building DAS optimization, will be prepared by the Contractor separately for each service and submitted to all Carriers for review and approval:

- Up-date all As-Built drawings and documentation.
- List of optimized RF and optical output power settings of all equipment.
- Inter-modulation analysis.
- Isolation between operator and technology analysis.
- Noise rise due to other operator and technology analysis.
- List of all RF and database parameter setting in the DAS equipment.
- All PN / PSC / ARFCN details of the new BTS.
- Optimization recommendation (antenna configuration etc) for the surrounding Macro BTS.
- Softcopy of the walk / drive test data along with a summary in the format above.
- Plan view (on D-size paper with scale and arrow pointing north) of the venue showing outline of estimated “service availability” (“blue” color). Definition of service availability is provided in section 4.1.5.
- Comparative map (on D-size paper with scale and arrow pointing north) showing outlines of target coverage area, pre-DAS and post-DAS service availability. The outlines should be marked with different colors. While “red” color should be used for outlining target coverage area, “green” and “blue” should respectively be used for pre-DAS and post-DAS service availability maps.
- Forward link coverage (RSCP / RSSI) plot of the venue [in D size with scale and arrow pointing north]; **i)** RSCP/RSSI > -95 dBm; [color : blue]; **ii)** RSCP/RSSI < -95dBm; [color : red]
- Reverse link coverage plot of the venue [in D size with scale and arrow pointing north] for CDMA and UMTS only; **i)** mobile transmit power <

- +18dBm; [color : blue]; **ii)** mobile transmit power > +18dBm; [color : red]
- C/I plot of the venue [in D size with scale and arrow pointing north]; **i)** C/I > target; color : blue; **ii)** C/I < target; color : red]
- Comparative C/I plot (with the DAS switched off and again switched on) of the macro network (in D size with scale and arrow pointing north; color ; blue)
- BLER / FER / RxQual plot of the venue [in D size with scale and arrow pointing north]; **i)** BLER / BER / RxQual < target percent; color : blue; **ii)** BLER / BER / RxQual > target percent; color : red]
- Plot of the venue showing the locations of dropped calls (in D size with scale and arrow pointing north; color : red)
- A handoff / handover plot of the venue showing the locations of handover / handoff failure (in D size with scale and arrow pointing north)
- Application layer data throughput (average) plot of the venue (in D-size paper with scale and arrow pointing north). Areas with expected data throughput exceeding upper limit of contracted value should marked with “blue” color; areas with throughput between two contracted limits should be marked with “yellow” color; “red” should be used for other areas.
- A statistical report showing optimized values of key performance indicators:

GSM

.	Key Performance Indicator	Target Threshold
1	Percent of Samples with RSCP/RSSI > -85 dBm	> 95%
2	Percent of Samples with MTx < +18 dBm	> 95%
3	Percent of Samples with C/I > 12 - Local market to share responsibility for optimizing the DAS with their respective macro networks.	> 95%
4	Percent of Samples with C/A > 0 - Local market to share responsibility for optimizing the DAS with their respective macro networks.	> 95%
5	Origination Call Setup Success Rate (Voice) – BTS Vendor or Local Market Responsibility	
6	Termination Call Setup Success Rate (Voice)– BTS Vendor or Local Market Responsibility	
7	Total Call Setup Success Rate (Voice)– BTS Vendor or Local Market Responsibility	
8	BTS desensitization due to DAS	< 2 dB
9	Call Drop Rate (Voice) (NMS)	< 2%
10	Call Setup Time (Voice)	< 3 sec for 95% sample
11	Handover Success Rate - Local market to share responsibility for optimizing the DAS with their respective macro networks.	> 95%
12	Percent of Samples with Voice Quality (MOS) > 4	> 95%
13	Percent of Samples with Mean BER/FER/BLER < 2% - Local market to share responsibility for optimizing the DAS with their respective macro networks.	> 95%

14	PS / CS / Multi-RAB / Data Call Setup Success Rate - Local market to share responsibility for optimizing the DAS with their respective macro networks.	< 2%
15	PS / CS / Multi-AB / Data Call Drop Rate - Local market to share responsibility for optimizing the DAS with their respective macro networks.	< 2%
16	PS / CS / Multi-RAB / Data Call Setup Latency - Local market to share responsibility for optimizing the DAS with their respective macro networks.	< 6 sec for 95% sample
17	PS / CS / Multi-RAB / Data Call Handover Success Percent - Local market to share responsibility for optimizing the DAS with their respective macro networks.	> 95%
18	Average Application Layer Data Throughput (kbps) - Local market to share responsibility for optimizing the DAS with their respective macro networks.	> 100 kbps for 95% sample

CDMA

	Key Performance Indicator	Recommended Threshold
1	Percent of Samples with RSCP/RSSI > -88 dBm (Pilot Power)	> 95%
2	Percent of Samples with MTx < +15 dBm	> 95%
3	Percent of Samples with Ec/Io > -14 - Local market to share responsibility for optimizing the DAS with their respective macro networks.	> 95%
4	Origination Call Setup Success Rate (Voice) – BTS Vendor or Local Market Responsibility	
5	Termination Call Setup Success Rate (Voice) – BTS Vendor or Local Market Responsibility	
6	Total Call Setup Success Rate (Voice) – BTS Vendor or Local Market Responsibility	
7	BTS desensitization due to DAS under unloaded condition	< 2 dB
8	Call Drop Rate (Voice) - Local market to share responsibility for optimizing the DAS with their respective macro networks.	< 2%
9	Call Setup Time (Voice) – BTS Vendor or Local Market Responsibility	
	Handoff / handover Success Rate (Voice) – Local market to share responsibility for optimizing the DAS with their respective macro networks.	> 95%
11	Percent of Samples Mobile in Soft handoff (Voice) – Local market to share responsibility for optimizing the DAS with their respective macro networks.	< 35%
12	Percent of Samples with Voice Quality (MOS) > 4	> 95%

13	Percent of Samples with Mean BER/FER/BLER < 2%– Local market to share responsibility for optimizing the DAS with their respective macro networks.	> 95%
14	PS / CS / Multi-RAB / Data Call Setup Success Rate BTS Vendor or Local Market Responsibility	> 95%
15	PS / CS / Multi-RAB / Data Call Drop Rate– Local market to share responsibility for optimizing the DAS with their respective macro networks.	< 2%
16	PS / CS / Multi-RAB / Data Call Setup Latency BTS Vendor or Local Market Responsibility– Local market to share responsibility for optimizing the DAS with their respective macro networks.	< 6 sec for 95% sample
17	PS / CS / Multi-RAB / Data Call Handover Success Percent– Local market to share responsibility for optimizing the DAS with their respective macro networks.	> 95%
18	Average Application Layer Data Throughput (kbps) - Local market to share responsibility for optimizing the DAS with their respective macro networks.	> 100 kbps for 95% sample

LTE

Key Performance Indicator			Recommended Threshold	
	Category	Sub-Category	Target Value	Comments
1	Performance-Accessibility	RRC Setup Failure Rate	2.00%	RRC Setup Failure Rate – BTS Vendor or Local Market Responsibility
2		Attach Failure Rate	2.50%	Attach Failure Rate – BTS Vendor or Local Market Responsibility
3		Attach Delay	2 seconds	Attach Delay – BTS Vendor or Local Market Responsibility
4		Access Failure Rate	2.50%	Access Failure Rate – BTS Vendor or Local Market Responsibility
5	Performance-Retainability	Session Failure Rate	2.00%	Session Failure Rate – BTS Vendor or Local Market Responsibility
6		RRC Drop	5.00%	This is for 95% sample and Local market to share responsibility for optimizing the DAS with their respective macro networks.
7	Performance-Integrity	Access RACH Latency	0.5 seconds	Access RACH Latency – BTS Vendor or Local Market Responsibility

8		DL/UL Physical Layer Throughput, median	7/3 Mbps	This is for 95% sample and Local market to share responsibility for optimizing the DAS with their respective macro networks.
9		DL/UL Physical Layer Throughput, 5th %-ile	1/0.5 Mbps	This is for 95% sample and Local market to share responsibility for optimizing the DAS with their respective macro networks.
10		Packet Latency (round-trip delay)	30 msec	This is for 95% sample and Local market to share responsibility for optimizing the DAS with their respective macro networks.
11	Performance-Mobility	S1/X2 Handover Failure Rate	2.00%	Handover Failure Rate – BTS Vendor or Local Market Responsibility
12		S1/X2 Handover Interruption Time, intra-eNB	100 msec	Handover Interruption Time, intra-eNB – BTS Vendor or Local Market Responsibility
13	RF-SINR	Percent Included Area > 13 dB SINR	10%	This is for 95% sample and Local market to share responsibility for optimizing the DAS with their respective macro networks.
14		Percent Included Area > -5 dB SINR	90%	Percent Included Area > -5 dB SINR– Local market to share responsibility for optimizing the DAS with their respective macro networks.
15	RF-RSRP	Percent Included Area > -112 dBm	90%	Percent Included Area > -112 dBm– Local market to share responsibility for optimizing the DAS with their respective macro networks.
16	Performance - IRAT	IRAT Handover Failure Rate	5%	This is for 95% sample and Local market to share responsibility for optimizing the DAS with their respective macro networks.

4.11 REPORT

An Optimization Report, consisting of the above plots and statistics, will be collected into individual binders for each operator. Signed copy of all the binders will be submitted by Contractor to all Carriers for approval.

Contractor will perform annual validation testing of the DAS and provide a copy of such testing results to the Carriers for approval. The Carriers agree to provide a copy of the test results to the City upon request.

EXHIBIT D

DAS SYSTEM UPTIME AND PERFORMANCE CRITERIA

1. System Uptime Requirement

Notwithstanding the Alarm Priority and Resolution Times Matrix set forth in Section 2 below, Verizon Wireless commits to having all DAS equipment located in the head-end rooms (as defined in the final design and located on the as-built documents) and each zone operational for use by the Carriers at least 99.99% of the time [0.9999 x 24 hours/day x 365 days/year (and 366 days per leap year)]. All “Critical” and “Major” Alarm Priorities as defined below will count against the uptime requirement. Verizon Wireless will use existing City access procedures, practices, and contact points to gain timely access to all telecom room closets and other locations at the Facility where DAS equipment and infrastructure is installed, as needed, and comply with the Alarm Notification and Resolution Times Matrix set forth in Section 2 below.

2. Fault Mitigation, Monitoring and Repair

Verizon Wireless or Contractor will maintain a twenty-four (24) hour per day, seven (7) day per week, three hundred sixty-five (365) day per year (and 366 days per leap year) DAS monitoring center and fault notification primary phone number and on-call escalation contact list that is updated at minimum monthly for the purpose of receiving notification of faults or alarms from the DAS system and/or the City. Contractor shall provide and maintain an equipment monitoring and alerting system through which the DAS will be remotely monitored by Verizon Wireless or Contractor personnel using software housed on Contractor’s dedicated computer(s) that is connected via an “always on” reliable connection to the head-end equipment. Verizon Wireless must provide suitable telephone service (minimum DSL or higher bandwidth) for its equipment and Verizon Wireless monitoring systems to accommodate remote monitoring of the DAS. Verizon Wireless will provide the City with a person and that person’s point of contact (POC) for addressing any issues, items, concerns, or questions related to any technical, operational, support, vendor or aspect related to the DAS system. These contacts will respond to all questions and/or concerns from the City regarding these or topics addressed through this communications channel.

Verizon Wireless acknowledges and agrees that the fault notification, mitigation and times specified to repair of any service impacting Outages are material terms of the Agreement. Verizon Wireless and Contractor will perform the repairs as expeditiously as possible. Upon receipt of a fault or alarm notification, Contractor will perform an initial remote diagnosis within fifteen (15) minutes of the fault or alarm notification and determine the Alarm Priority according to the Alarm Priority Definitions and Alarm Notification and Resolution Times Matrix set forth in this document. If the Contractor cannot promptly clear the fault or alarm notification within one (1) hour, then Contractor will dispatch trained repair staff to the site. The purpose of which will be to expedite the repair process and to eliminate obvious faults, such as AC power source faults, inadvertently disconnected cables, or similar faults. Upon confirmation of a maintenance related problem, Contractor will contact all CMRS Carrier personnel requiring notification. In cases requiring repairs that will involve any disruption to service, a minimum notice period of

two (2) hours will be provided to all CMRS Carrier personnel requiring notification. If a fault requires on-site maintenance action or troubleshooting, Contractor will respond according to the alarm priority identified by the equipment vendor monitoring systems in the time set forth in the following response matrix:

Alarm Priority						
Alarm Level	Network Condition	Call Impact	Head End and/or All RUs	More than 20% of all antennas in a single Zone	More than 20% of total RUs in DAS	Single RU
1	Out of service Emergency condition Complete loss	Loss	Critical	Critical	Critical	Major
2	Major degradation	Possible loss	Critical	Critical	Major	Minor
3	Minor degradation	Degraded	Minor	Minor	Minor	Minor

DEFINITIONS

Critical:

CMRS Carriers' ability to conduct business or provide service over the DAS has stopped. Critical problems will be worked on a 24 X 7 basis until resolved. CMRS Carriers will designate a contact to be available on a 24 X 7 basis to assess alternative solutions and finalize problem resolution verification.

Examples: Complete DAS outage, multiple main hub failures, power failures, interface RF failure, inter-building fiber failure. Such failures will affect multiple CMRS Carriers.

Major:

Service is seriously degraded for more than one CMRS Carrier, but the CMRS Carriers can continue operation via a workaround or incremental resource for a short period of time before business stops. Major problems will be worked during regular local business hours by production support groups.

Examples: Partial DAS outage caused by single main hub failure, multiple expansion hub failures, partial power outage, etc.

Minor:

Service is lost by a single end-user or small number of end-users of a CMRS Carriers' network, affecting significant business functionality. Problems or incidents where a workaround exists or can be developed with a small amount of incremental resources. Problem or incident where single users of a CMRS Carriers' network can operate some of the system activities normally,

but a definite problem is identified. Minor problems will be worked during regular local business hours.

Examples: UPS alarms, single antenna lost, a system that goes to battery backup, or other non-service affecting alarms.

Alarm Notification and Resolution Times Matrix

Priority Level	Notification (after alarm received and priority identified)	On Site Arrival Time (estimated)	Restoration Time (after alarm received)
Critical	< 15 minutes Hourly updates	<1 hours	<8 hours
Major	<15 minutes Updated every 4 Hours	<4 hours	<12 hours
Minor	<1 hour Daily updates	<24 hours	<48 hours

Contractor will arrive at the problem location within the applicable time interval in the above matrix. Within the time frames listed above following notification of a fault or alarm requiring a site visit, Contractor will call and email Verizon Wireless' designated representative to acknowledge having received notice of the fault, confirm the extent of the fault (Critical, Major, Minor or Warning), and advise Verizon Wireless' designated representative of Contractor's plan of action or actions taken to correct the fault. The third-party maintenance contractor will provide status updates via email to all CMRS Carrier personnel requiring notification pursuant to the list provided by the CMRS Carriers within the time frames listed above.

3. Spare Parts

Contractor will retain a sufficient inventory of replacement parts in the San Antonio, Texas area to replace faulty components in a timely manner. Contractor will provide a list of the parts being kept and those that are not along with a brief justification for either. This list shall be provided prior to the acceptance of the final design of the DAS system and must be updated in January of each subsequent year of the Term.

4. Delays

The Parties acknowledge and agree that some repairs may require Facility access approval or other approvals and may result in delays beyond Verizon Wireless' or Contractor's control. Verizon Wireless will designate a point of contact for acquiring the required access permits and approvals.

5. Reports

Verizon Wireless will provide the City with monthly reports regarding all alarms, systems uptime, and systems performance criteria as outlined under this section. These reports can be provided electronically and the timeframe for delivery of each shall be on the 1st working day of every month.

Verizon Wireless will also provide quarterly and an annual report to the City that reflects all compliance and performance measures as outlined in this section and under this Agreement.

EXHIBIT E

FORM SUBLICENSE AGREEMENT

**HENRY B. GONZALEZ CONVENTION CENTER COMPLEX NEUTRAL-
HOST**

DISTRIBUTED ANTENNA SYSTEM (DAS)

SUBLICENSE AGREEMENT

made by

and

San Antonio MTA, L.P.
d/b/a Verizon Wireless

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**HENRY B. GONZALEZ CONVENTION CENTER COMPLEX NEUTRAL-HOST
DISTRIBUTED ANTENNA SYSTEM
SUBLICENSE AGREEMENT**

This Henry B. Gonzalez Convention Center Complex Neutral-Host Distributed Antenna System (“DAS”) Sublicense Agreement (“DAS”) (the “Sublicense”) is made as of the latter of the signature dates below (the “Effective Date”) by MTA, L.P. d/b/a Verizon Wireless (“Verizon Wireless”) and _____ (“Sublicensee”). Verizon Wireless and Sublicensee may be individually referred to as a “Party” or collectively as the “Parties.”

WHEREAS, the City of San Antonio, a Texas Municipal Corporation (the “City”) is the owner of the Henry B. Gonzalez Convention Center Complex located at 900 E. Market Street, San Antonio, Texas 78205 (the “Facility”);

WHEREAS, the City and Verizon Wireless have entered into that certain Henry B. Gonzalez Convention Center Complex Neutral-Host Distributed Antenna System (DAS) License Agreement dated _____, 2017 (the “License Agreement”), a copy of which is attached hereto as **Exhibit A**, to implement a neutral-host DAS in the Facility to provide extended and improved wireless communications for existing and future technologies including “4G” and “5G” technologies therein;

WHEREAS, Verizon Wireless is a Qualified CMRS operator authorized by the City as the “Lead Carrier” to oversee the design, installation, operation, and management of the DAS program on a nondiscriminatory, equal access basis for all Qualified CMRS operators including entering into sublicense agreements with such operators (each a “CMRS Carrier” and collectively with Verizon Wireless, the “CMRS Carriers”). “CMRS” means Commercial Mobile Radio Systems that are existing or emerging and licensed services and technologies that include operators (Cellular, Enhanced Specialized Mobile Radio (ESMR), and Personal Communication Services (PCS)) and their commercially provided wireless services. “Qualified” means that such CMRS operator must possess all required federal, state, local and other applicable licenses applicable to such CMRS operator; and

WHEREAS, it is the desire of the Parties that this Sublicense be entered into to provide Sublicensee access to the DAS on a non-discriminatory, equal access basis.

NOW, THEREFORE, in consideration of the mutual covenants and agreements of the Parties in this Sublicense, and for other good and valuable consideration, the receipt and legal sufficiency of which are hereby acknowledged, the Parties agree as follows:

1. **Project Scope.**

a. Verizon Wireless intends to install the DAS in and on the Facility in the areas set forth on Exhibit A to the License Agreement (“DAS Areas”), as the same may be amended from time to time, to provide extended and improved wireless communications, including expanded broadband service, in the Facility’s “DAS Coverage Area”. The “DAS Coverage Area” includes: (i) those portions of the interior of the Facility included in the Preliminary DAS Plans and Specifications (as defined in Section 7(a) below) and (ii) those portions of the Facility

parking lots, loading dock areas, and adjacent sidewalks, walkways, stairs, and ramps included on such Preliminary DAS Plans and Specifications, and (iii) rooftop space on the Facility for future antenna node locations, and new power/fiber conduit paths to the roof of the Facility, which may, or may not, be depicted on the Preliminary DAS Plans and Specifications. The DAS shall consist of the wireless network systems, including without limitation, a series of hubs, repeaters, and multiple band antennas within and on the Facility to accommodate and extend radio frequency ("RF") signals from the CMRS Carriers and their commercially provided wireless services. The DAS includes: (i) all hardware and software associated with uplink and downlink RF, including, but not limited to, power systems and back-ups, antennas, base stations, multiplexers, personal computers, cable and fiber, network monitoring and alerting systems, equipment rooms (including HVAC and fire suppression systems), and network operations systems owned, installed, operated, maintained, and managed by Verizon Wireless on the DAS Areas, and (ii) the base station equipment and related equipment ("Wireless Attachments") of any other CMRS Carriers. The DAS Areas include office space, CMRS Carriers base station equipment room(s), equipment closets, and a location for a backup generator. Upon approval by the City and Verizon Wireless, any other additions to the DAS Areas in the License Agreement will be automatically included this Sublicense upon notice from Verizon Wireless.

b. Verizon Wireless represents and warrants that the License Agreement attached hereto as Exhibit A is a true and correct copy, is in full force and effect, and constitutes the entire agreement between the City and Verizon Wireless regarding the DAS. Sublicensee shall abide by and be subject to all applicable terms and conditions of the License Agreement necessary to ensure compliance with this Sublicense. This Sublicense is and shall be at all times subject and subordinate to the License Agreement. Sublicensee agrees to cooperate and actively work with Verizon Wireless and any other CMRS Carriers as reasonably necessary to allow Verizon Wireless to perform all of the duties and obligations under the License Agreement, this Sublicense, or any other agreements related to the DAS.

c. Sublicensee acknowledges and agrees that the City is a third-party beneficiary of this Sublicense.

2. Additions to the CMRS Carriers and Sublicensing.

a. Future Participating Carriers. Sublicensee acknowledges and agrees that from time to time, a Qualified CMRS operator may be added as a CMRS Carrier (each a "Future Participating Carrier"). Such Future Participating Carrier will be added as a CMRS Carrier when Verizon Wireless and such Future Participating Carrier execute and deliver a sublicense agreement to City whereby such Future Participating Carrier agrees to be bound by the obligations of a CMRS Carrier under the License Agreement, including, but not limited to, its indemnification, insurance, and access requirements, and agrees to participate thereunder on an equal, pro rata basis. Following the effective date of the addition of any Future Participating Carrier, the pre-existing CMRS Carriers will receive an offset or payment against their obligations to pay DAS Costs equal to the difference between the amount of DAS Costs paid prior to the addition of the Future Participating Carrier and the DAS Costs due with the addition of the Future Participating Carrier.

b. Sublicensee acknowledges and agrees that the City is entitled to rely upon the decisions, notices, elections, and communications of Verizon Wireless as if Sublicensee made such decisions, notices, elections or communications and Sublicensee is hereby and forever estopped from claiming that such decisions, notices, elections, or communications by Verizon Wireless do not bind Sublicensee. Except in the event of any emergencies, Verizon Wireless will be the point of contact for the City with respect to all other CMRS Carriers regarding any communications, defaults, notices, or other actions with respect to the DAS, including assistance in overall coordination with the City. Sublicensee hereby consents to the receipt of all notices from the City hereunder by Verizon Wireless on behalf of Sublicensee.

c. CMRS Carrier Contracts. Verizon Wireless may require the CMRS Carrier(s) to enter into such contracts as it deems reasonably necessary to comply with the terms of the License Agreement, with the terms of such contracts being offered to all Qualified CMRS operators on equal terms and conditions to all other CMRS operators and with installation, operation, maintenance and monitoring costs and expenses being charged to all Qualified CMRS operators on a pro rata basis.

d. Assignment or Sublicensing. Consistent with the requirements of the License Agreement, Sublicensee will, whenever in its sole discretion it is required or appropriate for the operation of its business, have the right without notice to or consent of the City or Verizon Wireless, to transfer to a third party its sublicense (or otherwise transfer or allow the use of) all or any portion its rights to participation in the DAS, or its Wireless Attachments, connections or space used in connection with the DAS, or assign its rights under this Sublicense in whole or in part, to: (a) any entity controlling, controlled by, or under common control with Sublicensee; (b) any entity acquiring substantially all of the assets of Sublicensee; (c) any entity lawfully authorized to use the equipment, or to use, operate, or resell the licensed frequencies or services, of Sublicensee; (d) any successor entity in a merger or consolidation involving Sublicensee; or (e) a party providing financing to Sublicensee. Provided, however, that any such assignment or sublicensing is subject to all the terms and conditions of the License Agreement and this Sublicense. Otherwise, Sublicensee may not assign to a third party its sublicense (or otherwise transfer or allow the use of) all or any portion its rights to participation in the DAS, or its Wireless Attachments, connections or space used in connection with the DAS, or assign its rights under this Sublicense in whole or in part, without the prior written consent of Verizon Wireless and the City (and subject to any City ordinance necessary to approve such transfer).

3. Development of the DAS.

a. Verizon Wireless will designate a "Project Manager" as its appointee responsible for the implementation and management of all aspects of the day-to-day operations of the DAS.

b. Safety. Sublicensee agrees to comply with all safety precautions and programs initiated by Verizon Wireless in connection with its performance of the License Agreement. The Parties agree that the installation, operation or maintenance of the DAS shall not endanger or interfere with the safety of persons or property located at the Facility.

4. **Grant of License; Use of the Facility; Marketing.**

a. Subject to the terms and conditions of this Sublicense, as of the Effective Date, Verizon Wireless hereby grants Sublicensee a non-exclusive right to use the DAS for placement of Wireless Attachments to be integrated into DAS.

b. The Parties acknowledge that the City reserves the right to grant, renew, or extend non-DAS licenses to others, provided that such grant, renewal or extension does not interfere with the DAS or any equipment appurtenant thereto. In the event of any such interference, Verizon Wireless anticipates, but does not represent or warrant, that the City will ensure that such interference is removed or resolved to allow for Verizon Wireless' restoration of service to the original specifications within 24 hours.

c. Nothing contained herein will be construed as granting to Sublicensee any ownership rights in the Facility, or to create a partnership or joint venture between the City and the CMRS Carriers.

d. Except as expressly provided herein, Sublicensee accepts the DAS Areas in their **"As Is, With All Faults"** conditions and understands and agrees that City is under no obligation to make any improvements, perform any work, or provide any materials to prepare the DAS Areas for the CMRS Carriers. THE CITY DISCLAIMS, AND SUBLICENSEE HEREBY WAIVES, ANY AND ALL WARRANTIES OF ANY KIND WHATSOEVER, WHETHER STATUTORY, EXPRESS, OR IMPLIED WITH RESPECT TO THE DAS AREAS (INCLUDING, WITHOUT LIMITATION, THE WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE AND WARRANTIES ARISING FROM COURSE OF DEALING OR USAGE OR TRADE). NOTHING CONTAINED HEREIN SHALL LIMIT ANY WARRANTIES PROVIDED BY THIRD PARTY MANUFACTURERS AS TO THE DAS EQUIPMENT INSTALLED IN THE DAS AREAS.

5. **Term, Default and Termination.**

a. The **"Initial Term"** of this Sublicense will commence on the Effective Date and will expire as of _____ [*Insert License Agreement Initial Term Expiration Date*], or any earlier termination of the License Agreement. Upon the expiration of the Initial Term, this Sublicense will automatically renew for two (2) consecutive five (5) year renewal periods provided the License Agreement is renewed for such period (such renewal period together with the Initial Term being the **"Sublicense Term"**). Notwithstanding the foregoing, the Sublicense Term shall not extend beyond the term of the License Agreement, and if not earlier terminated or expired, the Sublicense Term shall automatically terminate upon the expiration or earlier termination of the License Agreement.

b. Verizon Wireless or Sublicensee may terminate this Sublicense at the end of the Initial Term or any renewal period by providing written notice of intent to terminate to the other Party at least one hundred eighty (180) days prior to the end of the Initial Term or applicable renewal period.

c. **City's Right to Terminate the License Agreement for Convenience.** Following installation of the DAS, and thereafter on the annual anniversary date of the License Agreement,

Sublicensee agrees to provide the City with an inventory of all of its equipment, instruments, software, and hardware installed as a part of the DAS. If the City exercises its right to terminate the License Agreement for convenience in accordance with Section 5(d) of the License Agreement, Sublicensee agrees to provide the City a detailed accounting of any costs relating to Sublicensee's Wireless Attachments documented to the City's reasonable satisfaction. Any proprietary information provided by Sublicensee will be marked as such, and Verizon Wireless anticipates, but does not warrant or represent, that the City will protect such information from public disclosure subject to the protections of the Public Information Act, Chapter 552 of the Texas Government Code. To the extent such costs are reimbursed by the City, Verizon Wireless agrees to reimburse Sublicensee its pro-rata share of the costs related to the design, construction, operation, maintenance, repair and removal of the DAS (collectively, the "DAS Costs") within thirty (30) days following receipt of such reimbursement from the City.

d. Verizon Wireless may avail itself of any remedies set forth in this Sublicense, including the remedies set forth in Section 5(e) upon written notice to Sublicensee if: (i) the Sublicense hereunder granted is taken on execution or other process of law in any action brought against Sublicensee, (ii) Sublicensee is bankrupt, insolvent, a receiver or trustee is appointed for Sublicensee, or Sublicensee petitions, or has a petition filed under the US Bankruptcy Code or takes any other similar action, or (iii) Sublicensee fails to comply with any material provision of this Sublicense and such default is not cured within forty-five (45) days after receipt of written notice (unless the nature of the event takes longer to cure and Sublicensee commences a cure within such 45 day period and thereafter diligently pursues it).

e. Remedies. Upon the occurrence of any event or events of default by Sublicensee lasting beyond the applicable cure period, Verizon Wireless will have the option to: (i) terminate this Sublicense in which event Sublicensee's rights with respect to the DAS will be immediately terminated; or (ii) cure the default with Sublicensee agreeing to reimburse for the costs of the cure. Neither Verizon Wireless nor the City will be liable for any damages to the DAS resulting from any action in curing Sublicensee's default.

f. If Verizon Wireless fails to comply with any material provision of this Sublicense and such default is not cured within forty-five (45) days after receipt of written notice from Sublicensee (unless the nature of the event takes longer to cure and Verizon Wireless commences a cure within such 45 day period and thereafter diligently pursues it), Sublicensee may terminate this Sublicense upon written notice to Verizon Wireless.

g. If the default under this Sublicense is caused by the actions or failure to act of a Party, that Party will indemnify the other Party for any costs (which will include without limitation the attorney's fees and costs of collecting the same) incurred in connection with such default.

h. If Verizon Wireless' rights under the License Agreement are terminated, the remaining CMRS Carrier(s) may propose for approval by the City a substitute CMRS Carrier to assume the duties of Verizon Wireless under the License Agreement, which approval Verizon Wireless anticipates, but does not represent or warrant, that the City will not unreasonably withhold or delay.

6. **Fees and Taxes.**

a. **Annual License Fee.** Commencing on the Effective Date and thereafter on the first day of each month during the Sublicense Term, Sublicensee shall pay directly to the City a monthly payment equal to 1/12 of the Annual License Fee of \$25,000 per year, such fees to be pro-rated for any portion of a year. Sublicensee will have the option to pay its full Annual License Fee (including any pro-rated portion thereof) on a single annual installment paid in advance on or before January 1 of each year.

b. **DAS Costs.** The total current estimated DAS Costs are shown in Exhibit B. Sublicensee will pay to Verizon Wireless its pro rata share of the DAS Costs within ten (10) days of the Effective Date. Any increases in DAS Costs are permitted only up to the point at which the total of all such increases equals twenty percent (20%) of the DAS Costs outlined on Exhibit B. If that threshold is reached, any additional increase in DAS Costs must be approved unanimously in writing by all of the CMRS Carriers.

c. **Performance Guarantee.** Sublicensee agrees to reimburse Verizon Wireless for Sublicensee's pro-rata share of any costs related to the ONE HUNDRED THOUSAND AND 00/100 DOLLARS (\$100,000.00) letter-of-credit ("LOC") required under the License Agreement.

d. **Taxes.** Sublicensee agrees to pay its pro rata share of all taxes levied on the DAS and all taxes levied on its Wireless Attachments.

e. **Administrative Expenses.** Sublicensee agrees to pay its pro rata share of any ongoing expenses incurred by Verizon Wireless as Lead Carrier and approved by the CMRS Carriers in complying with the terms of the License Agreement.

f. **Escrow Account.** Verizon Wireless may establish an escrow account for the project. If Verizon Wireless establishes an escrow account, Sublicensee agrees to pay its pro rata share of all administrative costs and fees related to the escrow account.

g. **Maintenance Costs.** Except for costs incurred on behalf of less than all of the CMRS Carriers (which will be paid by the CMRS Carrier(s) on whose behalf such costs are incurred), Sublicensee shall be responsible for its pro rata share of maintenance, monitoring and repair costs as further described in this Sublicense.

h. **Utilities; Electricity.** To the extent requested, Verizon Wireless anticipates, but does not warrant or represent, that the City will provide each CMRS Carrier access to electrical power during the construction, monitoring, operation, maintenance, or repair of the DAS, and Verizon Wireless anticipates, but does not warrant or represent, that the City will make available electrical power in quantities that are reasonably necessary for operation of the DAS (excluding the headend and base stations) at no cost to the CMRS Carriers. Sublicensee will pay its pro-rata share of all costs associated with extending and connecting the DAS to such electrical power or the headend and base stations, and for any other utilities used in connection with the DAS.

i. Late Fee. Should Sublicensee fail to timely make any payments required hereunder, Verizon Wireless may impose a late fee in the amount of 1½% per month or partial month such amount remains due and unpaid.

j. Payment Instructions. Any amounts due hereunder for which the process for payment has not been specifically addressed herein, whether for utilities or maintenance or other charges provided herein, will be paid to Verizon Wireless within thirty (30) days of the date of invoice thereof. All payments to be made by Sublicensee to Verizon Wireless hereunder shall be payable [to an escrow account designated by Verizon Wireless] to the following address:

Verizon Wireless may revise such payment forwarding instructions upon notice to Sublicensee.

7. **Construction, Installation, Operation, Maintenance, Interference and Ownership of the DAS.**

a. The DAS will be installed in a good and workmanlike manner in accordance with: (i) industry standards and practices; (ii) the City's General Building and Cabling Specifications attached as Exhibit B to the License Agreement; and (iii) the drawings, plans and specifications (the "Plans and Specifications") and bill of materials provided to the City for review and approval prior to commencement of construction. The preliminary plans for the DAS (including the head-end room) ("Preliminary DAS Plans and Specifications") are attached as Exhibit A to the License Agreement. Review and approval of the Plans and Specifications will be provided by the Director of the City's Convention, Sports, Entertainment and Facilities Department, or his/her designee, by way of a written notice (which may include email) to proceed. Sublicensee agrees to provide the City Fire and Electrical Inspector staff with any pertinent information relating to the equipment installation and cabling upon their reasonable request. Any approval by City of such Plans and Specifications shall not be deemed a representation that they comply with applicable laws, ordinances, rules and regulations.

b. Verizon Wireless is responsible for monitoring, auditing and controlling costs and expenditures for the DAS. All installations shall comply with all local electrical and fire codes. Verizon Wireless will coordinate all activity and hardware installation that affects the use of electrical, fiber, conduit, and cable trays. Any required cabling will be installed throughout the Facility within cable trays or conduits, and Verizon Wireless will supply and install all cable trays beyond what is currently available within the Facility needed for the DAS. The CMRS Carriers through Verizon Wireless will obtain City approval prior to the installation of any additional cable trays, which approval Verizon Wireless anticipates, but does not represent or warrant, will not be unreasonably withheld or delayed by the City.

c. The CMRS Carriers will provide lockable equipment cabinets. The CMRS Carriers' equipment will be stored in a neat and orderly fashion and will only be stored in areas authorized by the City for such storage.

d. The City through Verizon Wireless will have the right of prior notice of any contractors that will be in the Facility performing installation, modification or maintenance work on behalf of Sublicensee. Sublicensee will submit the name of each contractor to Verizon Wireless and the City prior to such contractor performing any work at the Facility.

e. Verizon Wireless has agreed to install at least 96 new fiber strands within the existing conduit paths: (i) between the Alamodome and the Facility, and (ii) between the Facility's Main Distribution Facility ("MDF") (i.e., the demarcation location at the Facility) and the Intermediate Distribution Facilities ("IDFs") in the Facility. Verizon Wireless will run coax from the IDFs to the DAS antennas and other ancillary equipment in and on the Facility. Upon completion of Verizon Wireless' installation of the new fiber between the Alamodome and the Facility's MDF, 48 strands of the new fiber between the Alamodome and the Facility's MDF will be dedicated to the City's use (the "City's New Fiber"), and the remaining fiber strands will be dedicated to Verizon Wireless' use for the DAS. The City's New Fiber will not be available for use by the Sublicensee. Should the License Agreement be terminated by either Verizon Wireless or the City pursuant to the terms and conditions of the License Agreement, the City will retain ownership of the City's New Fiber.

f. Hazardous Substances. If Sublicensee encounters any environmentally hazardous substances in the Facility, the Sublicensee will immediately notify the City through Verizon Wireless of such discovery, and take all reasonable precautions to avoid the handling or disturbance of any such environmentally hazardous substances in any manner. If such environmentally hazardous substances in the Facility are handled or disturbed, then Sublicensee will conduct such activities according to applicable environmental and safety laws and those specific rules established by City. If environmentally hazardous substances are discovered in the DAS Areas, the CMRS Carriers and the City will make all reasonable attempts to relocate the affected DAS Areas and modify the Plans and Specifications to address the impact of the environmentally hazardous substances in the Facility and to provide for an alternative location for the DAS away from that part of the DAS Areas originally contemplated for the DAS installation. Sublicensee agrees that no semiconductors or other electronic equipment containing polychlorinated biphenyls (PCB's) or other environmentally hazardous materials will either be used or stored by Sublicensee in or around the DAS Areas or in the Facility and no such materials will be used in any of the equipment installed by Sublicensee as part of or connected to the DAS within the Facility.

g. Sublicensee agrees not to use or permit the use of the DAS by its employees, subcontractors, agents or representatives for any purpose which is illegal or dangerous to life, limb or property.

h. Verizon Wireless will commission the design and construction of the DAS and use commercially reasonable efforts to ensure that the DAS will be capable of accommodating the performance needs of the Future Participating Carriers.

i. Sublicensee agrees to cooperate with Verizon Wireless and any other CMRS Carriers to perform the “DAS Acceptance Test Procedures” as outlined on Exhibit C to the License Agreement to ensure that the DAS is operationally acceptable and the CMRS Carriers will bear any expenses to remedy and implement any changes that are necessitated by the failure of the DAS to pass the Acceptance Test Procedures.

j. The CMRS Carriers will operate the DAS on a twenty-four (24) hour basis.

k. Modifications to the DAS. Subject to the requirements of the License Agreement and any approval required by the City, modifications to the Plans and Specifications or the DAS (“Modifications”) may only be made by unanimous written agreement of the CMRS Carriers and final approval by Verizon Wireless, which approval shall not be unreasonably withheld. All of the CMRS Carriers benefitting from the Modifications will bear a pro rata share of the cost of the Modifications (“Modification Costs”). If less than all of the CMRS Carriers will benefit from the Modifications and the CMRS Carrier(s) not electing to participate in the Modifications agree in writing that the Modifications will not affect them financially, technically, or otherwise, then the CMRS Carrier(s) benefitting from Modifications will be entirely responsible for and pay the Modification Costs if they elect to proceed without the others. Verizon Wireless will coordinate engagement of the vendor(s) and quantification of the cost and payment terms of proposed Modification Costs. If any CMRS Carrier desires to participate in any Modifications after other CMRS Carrier(s) have funded any Modification Costs, such CMRS Carrier will first reimburse the CMRS Carrier(s) already participating in the Modifications for its pro rata share of the Modification Costs and will be responsible for its pro rata share of any subsequent Modification Costs related to such Modifications.

l. Sublicensee will install its Wireless Attachments to access and use the DAS, in each case in a lien-free, good and workmanlike manner, and in compliance with all applicable laws, building, electric, communications, and safety codes, ordinances, standards, regulations, and requirements of the federal government, including, without limitation, the Federal Aviation Administration (“FAA”), the FCC, or any successor agency having jurisdiction over radio or telecommunications, the State of Texas or the City (“Laws”). If Sublicensee needs to modify the connection between its Wireless Attachments and the DAS, Sublicensee will coordinate the modifications and any necessary approval by the City with Verizon Wireless.

m. Sublicensee shall not make any improvement or alteration to the DAS which will affect the appearance of DAS in those areas of the Facility that are generally visible to the public (“Public Areas”), without the City’s prior written approval obtained through Verizon Wireless. All actions undertaken by Sublicensee and all equipment, improvements or alterations made by Sublicensee in any way related to this Sublicense will be undertaken in compliance with all applicable Laws. Should Sublicensee install any DAS related equipment without written any required approval from City obtained through Verizon Wireless, Sublicensee may be required to remove such equipment and bear all costs associated with such removal. Verizon Wireless anticipates but does not represent or warrant that the CMRS Carriers will have the right to upgrade or modify the DAS and the related equipment and implement new technologies or use different and additional spectrum to better serve end users of the DAS under the License Agreement.

n. Verizon Wireless may select and enter into a maintenance contract with a qualified third-party vendor ("Contractor") to provide for routine maintenance, monitoring and repair of the DAS. The CMRS Carriers will bear the cost to maintain the DAS on an equal, pro-rata basis at no cost to the City. The CMRS Carriers will use their best efforts to maintain the DAS in accordance with the system uptime and performance criteria attached hereto and incorporated herein as Exhibit D to the License Agreement ("DAS Uptime and Performance Criteria"). The CMRS Carriers through Verizon Wireless will schedule any maintenance and repair, which may result in a service interruption, during periods when no major events are scheduled for the Facility, in the sole determination of the City. The CMRS Carriers through Verizon Wireless will provide a copy of the maintenance, monitoring and repair contract to the City promptly after it is executed.

o. Upon completion of the DAS installation, the CMRS Carriers will conduct radio frequency interference studies as necessary to determine interference with existing third-party communications systems caused by the DAS or any CMRS Carrier's equipment. The operation of the DAS or any CMRS Carrier's equipment will not interfere with the mechanical or electrical systems of the Facility or the operation of any existing radio or telecommunication equipment operated on or from the Facility. The CMRS Carriers will take the steps necessary to correct and eliminate measurable interference with existing third-party communications systems within forty-eight (48) hours of receipt of notice. If the CMRS Carriers are unable to resolve the interference issue within this timeframe, they will voluntarily power down (turn off) the portion of DAS or CMRS Carrier's equipment causing the interference, except for intermittent testing, until such time as the interference is remedied. Any significant and/or harmful interference detected throughout the operation of the DAS shall be a cause for immediate shutdown of the portion of the DAS that is causing the interference until such time the interference is corrected by the CMRS Carriers. Under no circumstances will the DAS interfere with public safety wireless communications at the Facility. Such interference, if it occurs, will be addressed immediately by the CMRS Carriers.

p. With the exception of a termination by the City under subsection 11(b) of the License Agreement, the DAS and all equipment appurtenant thereto installed by a CMRS Carrier, (excluding the base station equipment) that is then remaining in the Facility at the expiration of this Sublicense will be deemed abandoned and become the property of the City in its "**as-is,**" "**where is**" condition.

q. Sublicensee agrees to keep all improvements and alterations free and clear of all mechanic liens. If a lien is filed against the Facility as a result of labor or material supplied by Sublicensee in connection with the DAS, Sublicensee agrees to diligently contest the lien, and regardless of the success of such contest, obtain the release and discharge of the lien, or bond over the lien, within thirty (30) days after receipt of notice of the lien.

r. All construction, installations and improvements now or hereafter placed on the Facility will be installed or made in accordance with the standards, procedures and requirements of the applicable City Building Codes. No monitoring or inspection of any work on the DAS or otherwise by City representatives will be deemed supervision of any such employees or contractors of the CMRS Carriers. Sublicensee will monitor and supervise all of its employees, agents, representatives and contractors and will assume full responsibility for them and the

expertise and quality of all work, and in no event will they rely upon Verizon Wireless, the City, or any of their agents, employees, or representatives for all or any portion of the same. Sublicensee will be responsible for its pro rata share of any and all cost or expense arising from its installation, maintenance, operation or repair of any facilities installed or used by the CMRS Carriers in relation to the DAS.

s. Reports. Within sixty (60) days after the DAS is operational, the CMRS Carriers through Verizon Wireless (or the Contractor) will provide the following reports to the City via email, web-based portal or in HTML format, such reports to be updated on a monthly basis in the event of any changes:

- (i) A complete list of major components showing a description and location for each.
- (ii) A complete cable record and wiring diagram identifying all cable and system components by location, distribution cable, and key sheet as related to instrument assignments.
- (iii) Documentation of all technology used for the DAS including, but not limited to: software database configurations; hardware equipment itemizations and configurations; electrical requirements; space requirements; peripheral equipment diagrams; rack profile diagrams; equipment shelf profile diagrams; cable plant interconnectivity charts; and wiring diagrams sufficient to facilitate effective operational support of the DAS.
- (iv) Trend analysis of data collection and coverage tests including on site investigation and data gathering of DAS performance parameters (i.e. reverse link degradation).
- (v) Any changes to CMRS Carriers' frequency operations and/or power outputs if applicable; and monthly electrical usage, including sub-metered usage.
- (vi) Diminished coverage, and down time for the DAS.

t. Meetings. Upon request by Verizon Wireless, Sublicensee will attend meetings or teleconferences with City staff, consisting of routine or emergency meetings concerning DAS operational issues and planning, as reasonably requested by City.

u. The CMRS Carriers and the City will cooperate to provide on-site maintenance and technical support for the DAS during up to six (6) major events held at the Facility.

8. Access to the Facility.

a. Verizon Wireless anticipates, but does not represent or warrant, that Sublicensee and its Authorized Personnel will have reasonable access to and may use the Facility seven (7) days per week, twenty-four (24) hours per day to construct, operate and maintain, upgrade, test, repair, relocate, and replace Sublicensee's equipment, as applicable. "Authorized Personnel" includes the employees, engineers, technicians, consultants, agents, sub-licensees, contractors

and subcontractors of Sublicensee. Sublicensee will conduct all work in a manner to minimize interference with the operations of other contractors. If installation activities are disruptive to persons, events or activities at the Facility, the disruptive activities will be, to the maximum extent possible, completed during times that will minimize the disruption.

b. Sublicensee and its employees, agents, vendors and invitees will comply with City rules and regulations governing access to and conduct on the City's property.

c. The City will have the right upon reasonable notice to inspect the DAS to verify compliance with the License Agreement. Verizon Wireless anticipates, but does not represent or warrant, that absent a bona fide emergency, the City will refrain from accessing any portion of a CMRS Carrier's equipment without prior written notice and direct supervision by the CMRS Carrier or its authorized representative.

d. Identification. For security purposes, Sublicensee and its contractors will (if required by the City) wear photo identification badges while onsite at the Facility. All badges must clearly indicate the employee and Sublicensee or subcontractor name. Any persons entering the Facility on behalf of Sublicensee shall sign in and out at the Facility's security office upon entering and exiting the Facility and will be issued and must return proper temporary City identification badges, if any.

e. The use of any mechanical vehicles within the Facility by Sublicensee, its subcontractors or suppliers shall require prior approval by City through Verizon Wireless.

f. Deliveries. Deliveries of all supplies, goods and equipment shall be made at locations and times agreed to by Verizon Wireless and the City to avoid interference with Facility operations.

9. Insurance.

- a) Prior to the commencement of any work under this Agreement, CMRS Carriers shall furnish copies of all required endorsements and completed Certificate(s) of Insurance to the City's Convention, Sports Facilities Department, which shall be clearly labeled "*Distributed Antenna System for Henry B. Gonzalez Convention Center*" in the Description of Operations block of the Certificate. The Certificate(s) shall be completed by an agent and signed by a person authorized by that insurer to bind coverage on its behalf. The City will not accept a Memorandum of Insurance or Binder as proof of insurance. The Certificate(s) must be signed by the Authorized Representative of the insurance carrier, and list the agent's signature and phone number. The Certificate(s) shall be mailed, with copies of all applicable endorsements, directly from the insurer's authorized representative to the City. The City shall have no duty to pay or perform under this Agreement until the required Certificate(s) and endorsements have been received and approved by the City's Convention, Sports Facilities Department. No officer or employee, other than the City's Risk Manager, shall have authority to waive this requirement.

- b) The City reserves the right to review the insurance requirements of this Article during any extension or renewal hereof and to reasonably modify insurance coverages and their limits when deemed necessary and prudent by City's Risk Manager based upon changes in statutory law, court decisions, or circumstances surrounding this Agreement. In no instance will the City allow modification whereby City may incur increased risk.
- c) A CMRS Carrier's financial integrity is of interest to the City; therefore, subject to the CMRS Carrier's right to maintain reasonable deductibles in such amounts as are approved by the City, CMRS Carriers shall obtain and maintain in full force and effect for the duration of this Agreement, and any extension hereof, at the CMRS Carrier's sole expense, insurance coverage written on an occurrence basis, unless otherwise indicated, by companies authorized to do business in the State of Texas and with an A.M Best's rating of no less than A- (VII), in the following types and for an amount not less than the amount listed below:

TYPE	AMOUNTS
1. Workers' Compensation	Statutory
2. Employers' Liability	\$1,000,000/\$1,000,000/\$1,000,000
3. Commercial General Liability Insurance to include coverage for the following: a. Premises/Operations b. Products/Completed Operations c. Personal/Advertising Injury	For Bodily Injury and Property Damage of \$3,000,000 per occurrence; \$5,000,000 General Aggregate, or its equivalent in Umbrella or Excess Liability Coverage
4. Business Automobile Liability a. Owned/leased vehicles b. Non-owned vehicles c. Hired Vehicles	Combined Single Limit for Bodily Injury and Property Damage of \$1,000,000 per occurrence
5. Professional Liability (Claims-made basis) To be maintained and in effect for no less than two years subsequent to the completion of the professional service.	\$1,000,000 per claim, to pay on behalf of the insured all sums which the insured shall become legally obligated to pay as damages by reason of any act, malpractice, error, or omission in professional services.
6. Fidelity or Commercial Crime Insurance Employee Dishonesty Policy – City will be named as Loss Payee	\$100,000

- d) The CMRS Carriers agree to require, by written contract, that all subcontractors providing goods or services hereunder obtain the same categories of insurance coverage required of the CMRS Carriers herein, and provide a certificate of insurance and endorsement that names the CMRS Carriers and the CITY as additional insureds. Policy limits of the coverages carried by subcontractors will be determined as a business decision of the CMRS Carriers. The CMRS Carriers shall provide the CITY with said certificate and endorsement prior to the commencement of any work by the subcontractor.

- e) As they apply to the limits required by the City, the City shall be entitled, upon request and without expense, to receive copies of the declaration page, and all required endorsements. Vendor shall be required to comply with any such requests and shall submit requested documents to City at the address provided below within 10 days. Vendor shall pay any costs incurred resulting from provision of said documents.

City of San Antonio
Attn: Convention, Sports Facilities Department
P.O. Box 839966
San Antonio, Texas 78283-3966

- f) The CMRS Carriers agree that with respect to the above required insurance, all insurance policies are to contain or be endorsed to contain the following provisions:
- Name the City, its officers, officials, employees, volunteers, and elected representatives as additional insureds, as their interests may appear under this Agreement by endorsement, as respects operations and activities of, or on behalf of, the named insured performed under contract with the City, with the exception of the workers' compensation and professional liability policies;
 - Provide for an endorsement that the "other insurance" clause shall not apply to the City of San Antonio where the City is an additional insured shown on the policy;
 - Workers' compensation, employers' liability, general liability and automobile liability policies will provide a waiver of subrogation in favor of the City.
- g) Within five (5) calendar days of a suspension, cancellation or non-renewal of coverage, the CMRS Carrier shall provide a replacement Certificate of Insurance and applicable endorsements to the City. City shall have the option to suspend Vendor's performance should there be a lapse in coverage at any time during this contract. Failure to provide and to maintain the required insurance shall constitute a material breach of this Agreement.
- h) In addition to any other remedies the City may have upon a CMRS Carrier's failure to provide and maintain any insurance or policy endorsements to the extent and within the time herein required, the City shall have the right to order the CMRS Carrier to stop work hereunder, and/or withhold any payment(s) which become due to the CMRS Carrier until the CMRS Carrier demonstrates compliance with the requirements hereof.

- i) Nothing herein contained shall be construed as limiting in any way the extent to which the CMRS Carriers may be held responsible for payments of damages to persons or property resulting from a CMRS Carrier's, or its subcontractors', performance of the work covered under this Agreement.
- j) It is agreed that the CMRS Carriers' insurance shall be deemed primary and non-contributory with respect to any insurance or self-insurance carried by the City of San Antonio for liability arising out of operations under this Agreement.
- k) It is understood and agreed that the insurance required is in addition to, and separate from, any other obligation contained in this Agreement, and that no claim or action by or on behalf of the City shall be limited to insurance coverage provided.
- l) The CMRS Carriers and any Subcontractors are responsible for all damage to their own equipment and/or property.

10. **Indemnity and Limitation of Liability.**

Verizon Wireless and each Future Participating Carrier (each an "**Indemnitor**") covenant and agree to **FULLY INDEMNIFY, DEFEND and HOLD HARMLESS**, the CITY and the elected officials, employees, officers, directors, volunteers and representatives of the CITY, individually and collectively, from and against any and all costs, claims, liens, damages, losses, expenses, fees, fines, penalties, proceedings, actions, demands, causes of action, liability and suits of any kind and nature, including but not limited to, personal or bodily injury, death and property damage, made upon the CITY directly or indirectly arising out of, resulting from or related to the Indemnitor(s)' activities under this Agreement, including any acts or omissions of the Indemnitor(s), any agent, officer, director, representative, employee, vendor or subcontractor of the Indemnitor(s), and its respective officers, agents employees, directors and representatives while in the exercise of the rights or performance of the duties under this Agreement. The indemnity provided for in this paragraph shall not apply to any liability resulting from the negligence of the CITY, its officers or employees, in instances where such negligence causes personal injury, death, or property damage. **IF THE INDEMNITOR(S) AND CITY ARE FOUND JOINTLY LIABLE BY A COURT OF COMPETENT JURISDICTION, LIABILITY SHALL BE APPORTIONED COMPARATIVELY IN ACCORDANCE WITH THE LAWS FOR THE STATE OF TEXAS, WITHOUT, HOWEVER, WAIVING ANY GOVERNMENTAL IMMUNITY AVAILABLE TO THE CITY UNDER TEXAS LAW AND WITHOUT WAIVING ANY DEFENSES OF THE PARTIES UNDER TEXAS LAW.**

The provisions of this INDEMNITY are solely for the benefit of the parties hereto and not intended to create or grant any rights, contractual or otherwise, to any other person or entity. The Indemnitor(s) shall advise the CITY in writing within 24 hours of any claim or demand against

the CITY or the Indemnitor(s) known to the Indemnitor(s), related to, or arising out of the Indemnitor(s)' activities under this AGREEMENT and shall see to the investigation and defense of such claim or demand at the Indemnitor(s)' cost. The CITY shall have the right, at its option and at its own expense, to participate in such defense without relieving the Indemnitor(s) of any of its obligations under this paragraph.

Defense Counsel - CITY shall have the right to select or to approve defense counsel to be retained by the Indemnitor in fulfilling its obligation hereunder to defend and indemnify CITY, unless such right is expressly waived by CITY in writing. The Indemnitor shall retain CITY approved defense counsel within ten (10) business days of CITY'S written notice that CITY is invoking its right to indemnification under this Contract. If the Indemnitor fails to retain Counsel within such time period, CITY shall have the right to retain defense counsel on its own behalf, and the Indemnitor shall be liable for all costs incurred by CITY. CITY shall also have the right, at its option, to be represented by advisory counsel of its own selection and at its own expense, without waiving the foregoing.

Employee Litigation - In any and all claims against any party indemnified hereunder by any employee of an Indemnitor, any subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, the indemnification obligation herein provided shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Indemnitor or any subcontractor under worker's compensation or other employee benefit acts.

a. THE CITY HEREBY RELEASES EACH CMRS CARRIER AND ITS DIRECTORS, OFFICERS, MEMBERS, MANAGERS, PARTNERS, JOINT VENTURERS, EMPLOYEES, REPRESENTATIVES AND AGENTS TO THE MAXIMUM EXTENT PERMITTED BY LAW FROM ANY LIABILITY THAT MAY ARISE FROM USE OF THE CITY'S CONDUIT.

b. Limitation of Liability. NEITHER VERIZON WIRELESS, ANY FUTURE PARTICIPATING CARRIER, NOR THE CITY WILL BE LIABLE TO THE OTHER FOR ANY INDIRECT, INCIDENTAL, SPECIAL, CONSEQUENTIAL, OR PUNITIVE DAMAGES, OR LOST PROFITS FOR ANY CLAIM ARISING OUT OF THIS AGREEMENT.

11. **Damage, Destruction, or Actions of the City.**

a. CMRS Carriers' Rights. In the event of any damage, destruction, action of the City or Verizon Wireless or CMRS Carriers, or loss that impairs the CMRS Carriers' ability to install, maintain or operate the DAS in the Facility that is so substantial that the repair, rerouting, restoration or rehabilitation of the DAS and/or the Facility cannot reasonably be expected to be completed within one hundred eighty (180) days from the date of such damage or action, Verizon Wireless may, on behalf of itself and all CMRS Carriers, elect to terminate the License Agreement and this Sublicense by giving written notice to Sublicensee within one hundred twenty (120) days of the date of the damage or action. If Verizon Wireless or the City elects not to terminate the Agreement, but such damage is not repaired or such action cannot be compensated for within one hundred eighty (180) days, Verizon Wireless and/or the City may

terminate the License Agreement and all sublicenses upon written notice to Sublicensee at any time prior to the completion of the repairs or modifications of the DAS and/or the Facility. With respect to damage or action of the City or Verizon Wireless or CMRS Carriers that impairs or limits any CMRS Carrier's ability to use any of the Facility or impairs the installation of the DAS in the DAS Areas, then CMRS Carriers may cease to use such portion of the Facility or request a reroute of the DAS from such impaired portion of the DAS Areas.

b. City's Rights. The Parties acknowledge that the City may terminate the License Agreement by giving Verizon Wireless nine (9) months' written notice if the City substantially alters the use of the Facility such that it is: (i) closed to the public, (ii) repurposed for non-public use, (iii) demolished, or (iv) sold to a private entity. If the City terminates the License Agreement, this Sublicense shall automatically terminate and Verizon Wireless shall have the right to remove some or all of the DAS equipment from the Facility and the CMRS Carriers shall each pay their pro rata share of such costs.

12. Recovery of the Facility; Renovations; Relocation of the DAS. The Parties acknowledge that the City has the following rights pursuant to the License Agreement:

a. In the event that the City or other governing authority, in the exercise of any of its prescribed powers decides to recover any portion of the Facility or require the relocation of all or any part of the DAS, the City agrees to provide at least six (6) months prior written notice to Verizon Wireless; provided however, that in the event a governing authority other than the City exercises any such prescribed powers, the City agrees to give Verizon Wireless as much notice as reasonably possible. At the City's sole cost and expense, the City will use commercially reasonable efforts to work with the CMRS Carriers to determine a new location with the Facility to relocate any affected portions of the DAS, which new location for any part of the DAS will be subject to Verizon Wireless' reasonable approval.

b. In the event of Facility improvements which may affect the DAS, City may direct the CMRS Carriers (which costs shall be shared on a pro rata basis) to remove or relocate their wires, conduits, cables and other property located in, on or around the Facility. In the event of minor Facility improvements, the City will be responsible for reimbursing the CMRS Carriers for any costs to relocate portions of the DAS located in non-public areas of the Facility and the CMRS Carriers will be responsible for any relocation costs of portions of the DAS located in the public areas of the Facility (which costs shall be shared on a pro rata basis). If the City undertakes a major renovation of the Facility, the City will be responsible for all relocation costs of the DAS.

c. Except as provided in Section 12(a) or in the event of a major renovation as set forth in Section 12(b) above, in no event will the CMRS Carriers be obligated to relocate the headend room.

13. Miscellaneous.

a. Notices. Notices concerning this Sublicense shall be in writing via email to Verizon Wireless and/or Sublicensee's official points of contact as provided and maintained under this Sublicense and must be followed by certified or registered mail, express mail or other

overnight delivery service, or hand delivery, proper postage or other charges paid and addressed or directed to the respective Parties as follows:

If to Verizon Wireless:

Verizon Wireless
Attn: Manager – Network Real Estate
5804 Tri County Pkwy
Schertz, TX 78154

with a copy to:

Verizon Wireless, Legal Department
Attn.: General Counsel
180 Washington Valley Road
Bedminster, NJ 07921

If to Sublicensee:

Or at such other address(es) as either party gives written notice of to the other party. Notice shall be effective upon actual receipt or refusal as shown on the receipt obtained pursuant to the foregoing.

b. Non-Discrimination. Sublicensee agrees not to discriminate on the basis of race, color, religion, ancestry or national origin, sex, age, marital status, sexual orientation or, on the basis of disability or other unlawful forms of discrimination in the solicitation, selection, hiring or commercial treatment of any contractors, vendors, suppliers, or commercial customers, nor shall the company retaliate against any person for reporting instances of such discrimination in connection with its performance of this Sublicense. Sublicensee will incorporate the obligations in this paragraph (b) in all contracts they enter into with subcontractors or other parties with respect to the performance of this Sublicense.

c. Prompt Payment of Subcontractors. Sublicensee shall pay its subcontractors within forty-five (45) days of receipt of undisputed invoices from subcontractors. In the event of Sublicensee's noncompliance with these prompt payment provisions, the City may require that this Sublicensee may be suspended, and no new City contracts shall be issued to Sublicensee until the City's audit of previous subcontract payments is complete and payments are verified to be in accordance with the specifications of the applicable contract.

d. Non-Binding Mediation. Prior to filing suit, the Parties to this Sublicense shall use non-binding mediation to resolve any controversy, claim or dispute arising under this Sublicense, expressly excluding disputes involving the applicability or effect of superior laws, the constitutionality of any requirement in this Sublicense or the preemptive effect of federal law.

- (i) Initiation of Mediation. To initiate non-binding mediation, a Party shall give written notice to the other party. In the mediation process, the Parties will try to resolve their differences voluntarily with the aid of an impartial mediator, who will attempt to facilitate negotiations. The mediator will be selected by agreement of the parties. If the Parties cannot agree on a mediator, a mediator shall be designated by JAMS/Endipute at the request of either Party. Any mediator so designated must be acceptable to both Parties.
- (ii) Mediation Process. The mediation will be conducted as specified by the mediator and agreed upon by the parties. The Parties agree to discuss their differences in good faith and to attempt with the assistance of the mediator, to reach an amicable resolution of the dispute. Any findings by the mediator shall be a non-binding determination.

e. Conflict of Interest. If requested by the City, Sublicensee agrees to complete and execute a Discretionary Contracts Disclosure Form.

f. Ownership and Retention of Public Records. In accordance with Texas law, Sublicensee acknowledges and agrees that all local government records created or received in the transaction of official business pursuant to this Sublicense are declared to be public property and subject to the provisions of the Local Government Records Act, Chapter 201 of the Texas Local Government Code and Subchapter J, Chapter 441 of the Texas Government Code. Thus, no such local government records produced by or on the behalf of the City pursuant to this Sublicense shall be subject of any copyright or proprietary claim by Sublicensee or any CMRS Carrier.

- (i) Exception to Public Records. The Parties, however, acknowledge that CMRS Carriers' internal documents with associated trade secrets may be subject to claims of confidentiality or proprietary information by such CMRS Carrier. Verizon Wireless anticipates but does not represent or warrant that any such documents identified by such CMRS Carrier, in whole or in part, as confidential or proprietary in nature will be treated as such by the City, subject to the applicability of the Public Information Act, Chapter 552 of the Texas Government Code.
- (ii) Nature of Local Government Records. The term "local government records" as used herein shall mean any documents, papers, letter, book, map, photograph, sound or video recording, microfilm, magnetic tape, electronic medium, or other information recording medium, regardless of physical form or character and regardless of whether public access to it is open or restricted under the laws of the state, created or received by a local government or any of its officials or employees pursuant to law including an ordinance, or in the transaction of official business. Sublicensee acknowledges and agrees that all local government records, as described herein, produced in the course of the work required by this Sublicense, will belong to and be the property of the City.

(iii)Exception to Local Government Records. To the extent a local government record includes information Sublicensee considers confidential or proprietary, it will identify such information as such when providing the local government record to the City. Verizon Wireless anticipates but does not represent or warrant that any information identified as confidential or proprietary by Sublicensee will be treated as such by the City, subject to the applicability of the Public Information Act, Chapter 552 of the Texas Government Code.

(iv)Compliance with Records Retention Laws. In accordance herewith, Sublicensee agrees to comply with the Public Information Act and Local Government Records Act.

g. Exchange of Information and Confidentiality; Inventions and Intellectual Property. The Parties agree to exchange only information that is necessary to participate in the DAS. The Parties agree not to make use of confidential information in furtherance of their own individual commercial interests. Nothing contained in this Sublicense will be deemed, whether by implication, estoppel, or otherwise, to grant any right or license with respect to inventions, copyrights, trademarks, service marks, patents or other intellectual property at any time owned individually, or in conjunction with a third party, by any Party.

h. Return of Information. Upon termination of this Sublicense, each Party will promptly return to the disclosing Party all confidential or trade secret materials, marks and information disclosed under this Sublicense, and will not act as if the relationship were continuing. The rights and obligations of the Parties under this Section will survive any expiration or termination of this Sublicense.

i. Entire Agreement. This Sublicense is the entire agreement between the Parties and supersedes any and all prior agreements and understandings, either oral or written, between the Parties.

j. No Waiver. The failure of any Party to insist at any time upon the strict performance of any provision contained herein or to exercise any option, right, power or remedy contained in this Sublicense will not be construed as a waiver or a relinquishment thereof for the future.

k. Amendment, Successors and Assigns. This Sublicense may only be amended by a written instrument duly executed by each Party. This Sublicense will extend to and bind the heirs, personal representatives, successor and assigns of the Parties hereto.

l. GOVERNING LAW. THE INTERPRETATION, VALIDITY AND ENFORCEMENT OF THIS SUBLICENSE WILL BE GOVERNED BY AND CONSTRUED UNDER THE INTERNAL LAWS OF THE STATE OF TEXAS, INCLUDING ITS PRINCIPLES OF CONFLICT OF LAWS. THE PARTIES AGREE THAT THE VENUE OF ANY LITIGATION RELATED HERETO WILL BE EXCLUSIVELY IN BEXAR COUNTY, TEXAS.

m. Quiet Enjoyment. Verizon Wireless anticipates, but does not represent or warrant, that upon each CMRS Carrier's performance of all the terms, covenants and conditions

to be observed and performed pursuant to the terms of this Sublicense, each CMRS Carrier may peacefully and quietly enjoy that portion of the Facility where the DAS is located in accordance with the terms hereof.

n. No Personal Liability. This Sublicense does not create any personal liability on the part of any officer, employee, or agent of any Party. No officer, employee, or agent of any Party will be charged personally or held contractually liable by or to the other Party under any term or provision of this Sublicense.

o. Force Majeure. In the event that either Party hereto is prevented from fully and timely performing any of its obligations hereunder due to acts of public enemy, restraining by government, unavailability of materials, civil unrest, floods, hurricanes, tornadoes, earthquakes, or other severe weather condition, or other acts of God (collectively call "Force Majeure Event") such Party shall be relieved of the duty to perform such obligation until such time as the Force Majeure Event has been alleviated; provided, that upon the remove of the Force Majeure Event, the obligation prevented from being fulfilled will be automatically reinstated without necessity of any notice whatsoever.

p. Independent Contractors. Sublicensee's relationship to Verizon Wireless under this Sublicense will be that of independent contractor. Nothing in this Sublicense will be construed to designate any Party or any of its employees, as employees, agents, joint venturers or partners of the other Party.

q. Severability. If any provision of this Sublicense is determined by a court of competent jurisdiction to be void, voidable, invalid, or unenforceable, the remainder of this Sublicense will not be affected thereby, and this Sublicense will be valid and enforceable to the fullest extent permitted by law.

r. Counterparts. This Sublicense may be executed in any number of counterparts, each of which will be deemed an original and all of which together will constitute one and the same instrument.

[SIGNATURE PAGES FOLLOW]

IN WITNESS WHEREOF, the Parties hereto have caused this Sublicense to be executed by their duly authorized officers or representatives.

SAN ANTONIO MTA, L.P.,
d/b/a Verizon Wireless

By: Verizon Wireless Texas, LLC
Its: General Partner

By: _____

By: _____

Name: _____

Name: _____

Title: _____

Title: _____

Date: _____

Date: _____

EXHIBIT A (SUBLICENSE AGREEMENT)

LICENSE AGREEMENT

(to be attached)

EXHIBIT B (SUBLICENSE AGREEMENT)

DAS COSTS

(to be attached)

EXHIBIT F

Facility Information and Site/Floor Plans

HENRY B. GONZALEZ CONVENTION CENTER COMPLEX NEUTRAL-HOST DISTRIBUTED ANTENNA SYSTEM (DAS)

FACILITY INFORMATION AND SITE/FLOOR PLANS

1. Desired coverage area
 - a. The entire interior of the Henry B. González Convention Center, including all levels, exhibit space, multipurpose space, meeting rooms, ballrooms, walkways, common areas, hallways (front and back of house), indoor courtyard, business center, administrative offices, security offices, maintenance offices, kitchens, storage areas, utility/mechanical rooms, and loading docks.
 - b. The entire Lila Cockrell Theatre, a 2,319-seat Performing Arts Theatre, including dressing rooms, administrative and security offices, hallways, walkways and utility rooms.
2. The Facility currently has no active BDA for the public safety signals and two carrier-specific DAS in some limited areas. The City has temporary license agreements with the two wireless service providers for the placement of DAS microcells/antennas inside the Facility until the installation of a permanent solution.
3. Aggregate area – approximately 1.644 million sq. ft. (inside)
 - a. Henry B Gonzalez Convention Center – approximately 1.6 million sq.ft.
 - b. Lila Cockrell Theatre – approx. 44,000 sq.ft.
 - c. Ballroom spaces- two ballroom equaling approx. 96,000 sq. ft.
 - d. Total capacity – During the course of the year, there are multiple events that will bring upwards of 25,000 to 30,000 attendees to the entire facility on any given event day.
4. Eurospan— The facility has a Eurospan ceiling system in the newly expanded areas. Extra care is required when working in these areas as any damages will result in full replacement of the ceiling and all costs shall be the sole responsibility of the respondent.
5. There are over 300 – 30,000 badged employees, vendors, contractors, visitors and tenants that can be onsite at any given time.
6. The Convention Center receives over 800,000 attendees per year.