

LICENSE AGREEMENT

(Denver Fire Station 30, 4898 Dudley Street, Denver, Colorado)

This **LICENSE AGREEMENT** (“Agreement”) is made (the “Effective Date”) by and between the **CITY AND COUNTY OF DENVER**, a municipal corporation of the State of Colorado (hereinafter referred to as the “City”) and **CELLCO PARTNERSHIP** doing business as **VERIZON WIRELESS**, a Delaware General Partnership authorized to conduct business in Colorado, whose principal office is located at One Verizon Way, Basking Ridge NJ 07920 (“Licensee”).

RECITALS

WHEREAS, the City owns and operates the real property known as Denver Fire Station 30 and located at 4898 Dudley Street, Denver, Colorado, and all appurtenances thereto (the “Subject Property”);

WHEREAS, the City has right, title, and interest in and to the Subject Property together with the facilities, easements, rights, licenses, and privileges hereinafter granted, and has full power and authority to enter into an agreement in respect thereof;

WHEREAS, the Parties desire to enter into this Agreement regarding Licensee’s use of certain designated areas and a certain Licensed System at the Subject Property for Licensee’s operation of a cellular site at the Subject Property as described in **Exhibit A** attached hereto (the “Licensed Area” or “Licensed System”);

NOW, THEREFORE, in consideration of the premises and the mutual covenants and obligations herein set forth, the Parties agree as follows:

DEFINITIONS

The capitalized terms used in this Agreement and any and all exhibits hereto, will have the meanings given such terms in the paragraph in which such terms are parenthetically defined. The meanings given to terms defined will be equally applicable to the singular and plural forms of such terms. In addition, the following capitalized terms shall have the following meanings:

- A.** “Agreement” shall have the meaning set forth in the preamble hereto.
- B.** “ADA” means Americans with Disabilities Act and any other federal or state laws requiring access for the disabled to public accommodations.
- C.** “Applicable Law” means all federal, state, and local laws applicable in the context of the specific matter addressed in this Agreement, including but not limited to: 1) the constitutions, laws, and rules and regulations of the United States of America and the State of Colorado; 2) the City Charter, the Denver Revised Municipal Code, and building, fire, electrical,

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plumbing and other applicable codes, as they may be amended from time to time; 3) rules and regulations, including any standards and specifications, promulgated or amended by the Denver Department of Safety and the Denver Fire Department; 4) any rules and regulations promulgated or amended by other City departments and agencies applicable to this Agreement; 5) executive orders issued by the Mayor; 6) any court order, judgment, or decree or any appellate decision applicable to this Agreement; 7) any federal, state, or local administrative decision or order applicable to this Agreement; 8) any anti-discrimination laws;

D. “Cancellation” means the revocation of the License and the termination or cancellation of the Agreement, including mutual termination by the parties, in the manner specified in this Agreement.

E. “City Representative” means the Division of Real Estate’s designee(s) who will oversee and direct all activities of Licensee under this Agreement. The City Representative(s) may be employees or contractors of the City, Denver’s Facilities Management division, Denver’s Technology Services, the Electronic Engineering Bureau of the Department of Safety, and/or Denver’s Division of Real Estate. Contact information for the City Representative and the assigned responsibilities, if there is more than one City Representative, shall be provided to Licensee upon execution of this Agreement. The City may identify, change, add or delete City Representative(s) by written notice to Licensee.

F. “City System” means all existing and future communication and other electronic facilities, equipment and instrumentation and related infrastructure and utility connections located at the Subject Property including, but not limited to, public safety channels, radio system or other electronic means of sending, receiving, processing and recording information and data for public safety purposes.

G. “DRMC” means the Denver Revised Municipal Code as it may be amended from time to time.

H. “Effective Date” means the date this Agreement goes into effect, as specified in section 2.01.

I. “Emergency” means an occurrence or incident that presents an imminent threat of widespread or severe damage, injury, or loss of life or property resulting from any natural cause or cause of human origin, including but not limited to fire, explosion, flood, earthquake, wind, storm, structural failure, hazardous substance, environmental contamination, civil disturbance, vandalism, or breach of security.

J. “FCC” means the Federal Communications Commission.

K. “Director” means the director of the City’s Division of Real Estate.

L. “License” means the license granted as specified in section 1.01(a) which is exclusive only to the extent specified in this Agreement and which is restricted and only revocable as specified in this Agreement. No property or leasehold interest or right is granted by the License.

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M. “Licensed Area” means the location at the Subject Property where Licensee is authorized to install and operate the Licensed System, as specified in section 1.01(a).

N. “Licensed System” means the radio frequency equipment and wireless communication facility, and related equipment, infrastructure and utility connections authorized by the City and installed and operated by Licensee within the Licensed Area of the Subject Property, as specified in section 1.01(a).

O. “Licensee” means the legal entity to which the License is granted under and in accordance with this Agreement, as identified in opening paragraph of this Agreement. To the extent that Licensee retains contractors, consultants, or subcontractors to perform any of Licensee’s rights and obligations under the Agreement, Licensee shall also mean those contractors, consultants, and subcontractors.

P. “License Fee” means the compensation to be paid by Licensee to the City for the use of the Licensed Area and the operation of the Licensed System at the Subject Property as specified in section 3.01.

Q. “Minimum Technical Standards” mean those standards set forth in **Exhibit B** as these Minimum Technical Standards may be updated from time-to-time, as needed, to address the state-of-the-art.

R. “Party” means either the City or Licensee, as appropriate in the context, and Parties means both the City and Licensee.

S. “Permitted Use” means the uses (subject to restrictions) as specified in section 1.02, which Licensee may make of the Licensed Area in the installation and operation of the Licensed System.

T. “RF” (Radio Frequency) Interference means any emission, radiation or induction from or associated with the Licensed System that affects the functioning of or degrades, obstructs, or interrupts radio or other wireless communications being made by the City or other authorized parties to or from the Subject Property or the operation of any communication system located at the Subject Property.

U. “Point of Contact” means the Chief Deputy for the Technical Services Division of the Denver Fire Department, or the Chief Deputy’s designated representative, during regular business hours of the Denver Fire Department and the Denver Fire Department’s non-emergency Dispatch for Licensee’s urgent need for access after regular business hours of the Denver Fire Department.

V. “Site Study” means a site and technical interference study, **Exhibit C**, field tests or other activities or investigations related to the resolution of RF Interference that may be associated with the Licensed System as specified in section 5.02

W. “Term” means the duration of the Agreement running from the Effective Date of the Agreement, as specified in section 2.01 including any Term Extensions as specified in section 2.02.

X. “Term Extension” means any extensions of the duration of the Agreement as specified in section 2.02.

SECTION 1

LICENSE; PERMITTED USE; and ACCESS

1.01 Grant of License.

(a) City hereby grants a License to Licensee for the use of certain designated areas at the Subject Property as depicted on **Exhibit A** (the “Licensed Area”) for the installation and operation by Licensee, of the Licensed System, as the Licensed System is technically described, also in **Exhibit A**. The Licensed System shall be situated within the Licensed Area as depicted in **Exhibit A**. The Licensed Area shall not include any existing City System. Any proposed change to the Licensed Area depicted in **Exhibit A** shall require an amendment in writing to this Agreement.

1.02 Permitted Use/Restrictions.

(a) The Licensed Area at the Subject Property shall be used for the installation, maintenance, alteration, repair, replacement, operation, and removal of the Licensed System within the Licensed Area, in accordance with this Agreement (“Permitted Use”). The Licensed System shall be owned by Licensee. Except as expressly provided in this Agreement, the City may not disturb or modify the Licensed System without the prior written permission of Licensee.

(b) Licensee may access the Subject Property, use the Licensed Area, and install and operate the Licensed System only as set forth in this Agreement. The Permitted Use does not authorize any activity that would conflict or interfere with the public health, safety or welfare purpose or operation of the Subject Property or any City System. Such prohibited conflict or interference includes RF Interference as set forth in this Agreement and **Exhibit C** (“Site Study”). Licensee shall likewise take every reasonable measure to promptly and effectively avoid or remedy any emergency situation within its control that could adversely impact the Subject Property, the City System, the Licensed Area, or the Licensed System.

(c) Licensee must acquire City Approval, such approval not to be unreasonably withheld, conditioned or delayed, prior to making any change to the Licensed System as shown in **Exhibit A** and may trigger a change in license fee and a license amendment. Notwithstanding the foregoing, Licensee may add base station equipment to the Licensed System within the Licensed Area and may also repair or replace any other equipment comprising the Licensed System with “like-for-like” equipment upon notice to Licenser.

1.03 Access.

(a) Provided that Licensee gives at least forty-eight (48) hours prior notice to the Point of Contact, Licensee has the reasonable right of access, ingress to and egress from the Licensed Area during regular business hours for Licensee's employees, contractors and agents, including suppliers of materials and furnishers of service (collectively "Licensee's Personnel").

(b) In the event of an urgent situation where Licensee needs prompt access to the Licensed System during or outside of regular business hours, which shall be deemed to include any failure of Licensed System or any portion thereof, Licensee shall communicate with the Point of Contact, as defined above, to arrange for access by Licensee's Personnel. Similarly, should Licensor need to reach Licensee in the event of an emergency and regarding this agreement, Licensee's designated point of contact shall be: Verizon Network Operations Center (NOC) at (800) 224-6620 / (800) 621-2622.

(c) With respect to all access to the Subject Property, Licensee's Personnel must present legally sufficient identification, preferably in the form of a badge with picture ID issued by Licensee; will be subject to escort by the City's Designee and search and inspection of items brought onto the Subject Property; and will comply with all restrictions and security protocols set by the Director and the City Representative. All equipment, vehicles, machinery and other materials brought onto the Subject Property site must be necessary for the work authorized to be performed.

(d) Should Licensee require access into a secure area of the Subject Property which may require prior approval or escort, then the permission of the City Representative must be obtained and any security protocols must be strictly observed by Licensee.

(e) The exercise of access by Licensee or Licensee's personnel shall not conflict or interfere with the operations of the Subject Property or the City System and may not block access at or the use of the Subject Property nor be in violation of the ADA. In addition, the exercise of access shall not conflict or interfere with the City System unless prior written permission is obtained from the City Representative.

(f) Any particular access on the Subject Property may, at any time, temporarily or permanently, be closed, so long as an alternative means of access is made available to Licensee within a reasonable time. During the duration of any state of Emergency declared by the President of the United States, the Governor of the State of Colorado, or the Mayor of the City and County of Denver, access may be denied for security and public safety reasons. Licensee hereby releases and discharges the City from any and all claims, demands or causes of action which Licensee may now, or at any time hereafter, have against the City, arising or alleged to arise out of the closing of any point of access on the Subject Property site or the temporary unavailability of such access.

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SECTION 2 TERM and TERM EXTENSION

2.01 Term.

Except as otherwise specified or agreed upon, the Term of this Agreement shall be **August 1, 2024 – July 31, 2034**. The Term of this Agreement may be extended as described in section 2.02. The City shall deliver the fully executed agreement to the Licensee no later than thirty (30) calendar days after all authorized representatives for the City shall have signed, dated, and executed the Agreement by affixing their respective signatures to the Agreement.

2.02 Term Extension.

Licensee shall have three (3) options to extend this License for an additional 5-year term (“Option Term”) with a continuing 3% annual rent increase on August 1 of each year of the extended Term. Licensee shall provide written notice to the City of its intent to exercise each option no sooner than one hundred and eighty (180) days and no later than sixty (60) days before the end of the then-current Term. All terms and conditions shall remain in effect in accordance with this Agreement during the Option Term, including the percentage fee increase herein and under Section 3.01, unless otherwise modified by mutual written agreement.

SECTION 3 LICENSE FEE

3.01 License Fee.

(a) Licensee agrees to pay City a monthly License Fee of **THREE THOUSAND SIX HUNDRED DOLLARS (\$3,600.00)**, beginning upon commencement of this License and continuing the first day of each month thereafter for the Term of the Agreement and any Term renewal. License Fee shall increase three percent (3%) each year, with the increased License Fee taking effect on the **August 1** of each year and the first rent increase will occur on **August 1, 2025**. This License Fee is subject to modification should there be any modification to the Licensed System as described in **Exhibit A** by Licensee.

(b) The License Fee does not include the payment for electrical service for the Licensed System. Licensee shall bear the costs of all maintenance and repairs to the Licensed System, and Licensee shall pay for a separate electric meter for the operation of the Licensed System, as well as all monthly costs of utility and electricity associated with the use and operation of the Licensed System. Licensee shall make these payments directly to the utility provider, not to the City.

(c) Any License Fee paid to the City shall not be refundable in the event of early

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termination, as provided in this Agreement.

3.02 Maximum Contract Amount

(a) Notwithstanding any other provision of the Agreement and any renewal options exercised by the Licensee, Licensee's maximum payment obligation under this Agreement shall not exceed **ONE MILLION THREE HUNDRED NINETY-FOUR THOUSAND TWO HUNDRED AND TWO DOLLARS AND SEVENTY-TWO CENTS (\$1,394,202.72)**, (the "Maximum Contract Amount").

3.03 Place and Manner of Payments.

All sums payable to City, including the License Fee and other costs and expenses incurred by the City and reimbursable by Licensee under this Agreement, shall be made payable, without notice, to the "Manager of Finance for the City and County of Denver" and delivered to:

City and County of Denver
Division of Real Estate
201 West Colfax Avenue, Dept. 1010
Denver, Colorado 80202

All payments shall be made in legal tender of the United States. Any payment not made to City accrues interest at the lesser of (i) 18% per annum, or (ii) the maximum interest rate allowed under law, commencing on the fifth (5th) calendar day after the date such amount is due and owing until paid to City. Licensee agrees to pay any charges, fees, or costs incurred by the City for collection of unpaid License Fees or other unpaid costs and expenses of Licensee specified in this Agreement, including reasonable attorney's fees.

SECTION 4 DESIGN, CONSTRUCTION, AND INSTALLATION

4.01 General.

(a) On or after the Effective Date of this Agreement, Licensee shall, at its sole cost and expense, properly maintain and preserve within the Licensed Area, the Licensed System in accordance with **Exhibit A** (unless changes are authorized under section 4.02), and in accordance with the terms and conditions of this Agreement.

(b) The Licensed System shall in all respects be designed and maintained in accordance with Applicable Law, and pursuant to any required building permit and zoning

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permit to be obtained by Licensee from the City, and according to requirements or design guidelines of the Denver's Technology Services division, the Denver Department of Safety and the Denver Fire Department.

(c) The implementation of the design and installation of the Licensed System, as described and depicted in **Exhibit A**, as well as any changes, elaborations or additions to the design, construction and installation of the Licensed System beyond those described and depicted in **Exhibit A** shall be subject to the oversight and approval of the City Representative as well as any other approvals required in this Agreement.

4.02 Plans and Specifications.

(a) Prior to any installation or any modification to the Licensed System, a copy of complete and accurate plans and specifications for the Licensed System must be submitted to the City Representative for review. These plans and specifications must include complete specifications of transmitter power, operating frequencies, filter passband and rejection characteristics, antenna model numbers and radiation patterns (both horizontal and vertical plane patterns), antenna height and location, and placement of utilities servicing the Licensed System.

(b) Licensee shall cooperate with the City Representative in the review of the plans and specifications and shall make any reasonable modifications required by the City Representative. Upon completion of the review and any required modifications, the City Representative will approve the plans and specifications. Modifications to the Licensed System may be denied pursuant to Section 1.02(c). An amendment to this Agreement may be required to accommodate system changes.

(c) To the extent that the approved plans and specifications are different from the information contained in **Exhibit A**, Licensee shall prepare, to the reasonable satisfaction of the City Representative, new exhibits reflecting such changes, and the changed exhibits will replace and supersede the corresponding exhibits attached to this Agreement.

(d) Installation work shall not commence, nor shall continue, until Licensee has established to the City Representative's reasonable satisfaction that the work will proceed in conformance with the approved plans and specifications and that all Applicable Law has been or will be fully and appropriately satisfied. Licensee also cannot commence any cutting of concrete without the express written permission from the Denver Fire Department. If Licensee cuts concrete on City property without first obtaining written permission from the Denver Fire Department, Licensee agrees to reimburse the City for costs of concrete restoration and/or repair.

4.03 Maintenance, Preservation, and Modifications of Licensed Area and Licensed System

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(a) Licensee is responsible for undertaking all measures necessary and appropriate under Applicable Law in the maintenance of the Licensed Area and operation of the Licensed System to protect the health and safety of the public, City employees, and Licensee's employees and contractors and to lawfully conduct the work associated with the use, maintenance, and preservation of the Licensed Area and the Licensed System. Licensee shall be responsible for securing and maintaining all required and valid permits, licenses and approvals for Licensee's maintenance and preservation of the Licensed Area and Licensed System.

(b) To the extent that building codes or other City requirements mandate that modifications be made to the roof or other infrastructure of the Fire Station as part of the installation, Licensee shall be required to include those modifications in its Exhibit A plans (unless changes are authorized under section 4.02) and to make such modifications, at its sole cost and expense and subject to prior written approval of such modifications by the City Representative and the City Representative's oversight of the modifications as they are being made. The City is not obligated to make any modifications to the Fire Station, including the Licensed Area, to support the installation.

(c) Licensee shall include in Licensee's contract(s) with its consultants, contractors, and sub-contractors, provisions whereby such consultants, contractors, and subcontractors shall defend and hold harmless the City from all costs, liens, damages and expenses related to the design, construction, installation, and modification work regarding the Licensed Area or Licensed System.

(d) Licensee shall be responsible for obtaining utility locates prior to starting any authorized digging on City property. If damage should occur to any existing underground utilities or other underground facilities on City property, whether or not a utility locate was obtained, Licensee shall immediately report the damage to the City Representative and shall take all actions and incur all costs and expenses necessary to repair the damage in a manner satisfactory to the City Representative.

(e) Upon completion of the installation of any modifications or alterations, Licensee shall timely furnish to the City Representative with documented evidence of payment, contractor's affidavits and full and final waivers of all liens for labor, services, or materials.

(f) Equipment shall be located in designated locations as depicted on **Exhibit A** within the Licensed Area. The temporary placement of any equipment or materials outside of the Licensed Area shall require the prior written approval of the City Representative. No equipment or materials shall be placed so as to block access at or use of the Subject Property or in violation of the ADA.

(g) Licensee is responsible for acquiring land lines required for the installation and operation of the Licensed System. The installation or modification of land lines at the Subject Property shall be subject to the prior written approval of the City Representative. Licensee shall be solely responsible for paying any fees, charges, surcharges, taxes, assessments, and similar

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costs and expenses associated with the land lines.

(h) The City is not responsible for the Licensed System or Licensee's other authorized installations or modifications. Licensee shall be responsible for securing the Licensed System and Licensee's other authorized installations or modifications and keeping them in good working order.

SECTION 5 USE AND OPERATION

5.01 Authorized Frequencies.

In the operation of the Licensed System, Licensee may only operate Licensee's System in the radio bands and frequencies (and no others), as set forth in **Exhibit C**, which Licensee or FirstNet are authorized by the FCC to use. Operation in any radio band licensed for use by a City System is prohibited. Addition or change in radio bands or frequencies is prohibited unless Licensee first provides prior written notice to the Director and first provides an intermodulation report to the Director.

5.02 RF (Radio Frequency) Interference.

Licensee shall diligently work to prevent and, in the event of failure to do so, immediately correct radio frequency interference to the City's operations and events, event tenants and all activity therein, as well as public safety/licensee systems, licensee's or licensee's receivers and City's 802.11 WiFi system. To help achieve this goal, Licensee shall comply with the following:

(a) Compliance with Government Regulations. Licensee agrees to comply with all federal, state, local, or other government regulations applicable to Licensee and its activities in and upon the Licensed Property, hereunder including, but not limited to, regulations and standards published by the FCC.

(b) Radio Frequency Interference Study. Upon written request by City, Licensee agrees to conduct a radio frequency study prior to commencing operations and/or during the entire term of this Agreement at the Licensed Property, and to furnish City with the results of the study and include it as part of the Licensee's System Plans and Specifications.

(c) Compliance with Minimum Technical Standards. Licensee agrees to comply with the most recent edition of the Minimum Technical Standards attached hereto as **Exhibit C**. City may update the Minimum Technical Standards from time-to-time, as required, to address the state-of-the-art.

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(d) Maintenance. Licensee shall maintain, at no cost to the City, and repair Licensee's System, to comply with FCC rules and to prevent interference.

(e) Changes and Additions to System. Licensee shall notify City of any changes or additions to associated RF equipment, transmit and receive frequencies, transmitter output power, antenna configurations, and effective radiated power before making new installations or modifications to existing installations. An interference study shall be conducted by Licensee, at Licensee's expense, prior to any proposed frequency changes. All such additions or changes must be approved in writing prior to making the change. Unauthorized changes will be considered to be non-compliant with this Agreement.

(f) Cooperation. City encourages Licensees to resolve potential or real interference problems between themselves. Licensee agrees to cooperate fully with City and other licensees to diagnose and correct interference problems. Such cooperation may require Licensee to temporarily reduce or shut down transmit power to help diagnose problems.

(g) Additional Studies. When City, based on inquiry and evaluation, becomes aware of a potential interference problem caused directly or indirectly, wholly or partially, by Licensee's System, City may require Licensee to reimburse City for the cost of an interference study to include radio frequency measurements. The purpose of this interference study is to identify the problem or show that the potential problem is not caused directly or indirectly, wholly or partially by Licensee's System. This study shall be conducted by a consulting engineer selected by City after consultation with Licensee. The total cost of the study shall be equally borne by the Licensee and any other licensees which may be hereafter approved by City. Upon completion of said study the cost may be allocated directly to the Licensee(s) which caused the interference.

(h) Interference Mitigation. When necessary to correct interference problems, as determined by City in City's reasonable discretion, Licensee agrees, at Licensee's expense, to install cavity-type bandpass filters, notch filters, isolators, or other state-of-the-art equipment. These equipment items are in addition to the minimum equipment of the Minimum Technical Standards. The minimum equipment items shall be installed regardless.

(i) Radio Frequency (RF). Licensee shall ensure that its Frequencies used for the operation of the System does not interfere with any operation of the City and County of Denver. Licensee shall provide documentation of the frequencies that it is using which shall be a part of this Agreement. Licensee shall not occupy any frequencies that they are not using for the purposes of blocking other licensees from operating. Licensee shall be responsible for conducting an RF scan to verify there will be no interference with other systems. This shall occur prior to Licensee turning on its System and shall be documented by a third-party vendor and submitted to City. Once City has reviewed the study they will give notice to Licensee that it can turn on its System. City shall reasonably review the documentation within fifteen (15) business days. If City is not satisfied with the details of the study, City will give notification to Licensee as to what needs to be remedied before notice to proceed will be given.

(j) Enforcement. If Licensee's equipment or operations cause radio frequency interference, as determined by the City in City's reasonable discretion, including without limitation interference with public safety or the City's public safety channels, radio system or other electronic means of public safety enforcement, and if the interference is not eliminated within ten days after written notice from City, then City may, at Licensee's expense, temporarily turn off the power to the System. In addition, the City retains the right to turn off the Licensee's System when the City reasonably believes that the Licensee's System causes interference with the venue, show or an event's equipment and operation. City shall contact Licensee at the time the System needs to be turned off so Licensee can facilitate the effort to turn off the System, isolate any interference, and turn the System back on with minimal interruption. Licensee, at the Licensee's expense, shall (i) have the right to make such repairs, maintenance, replacements or adjustments to the System as may be reasonably necessary to prevent such interference (all such repairs, maintenance, replacements or adjustments shall be performed in accordance with this Agreement), and (ii) have the right to conduct intermittent tests of the System at times mutually agreeable to City and the Licensee (in the exercise of both parties reasonable discretion) to determine if the System will continue to cause such interference.

City will use reasonable efforts to obtain similar provisions regarding the prevention and elimination of interference in any new license entered into by City with future Licensees.

(k) Violations and Remedies. City requires that all licensees operate their respective systems with no interference to other licensees' systems. All disputes regarding the cause or resolution of specific interference problems or complaints must be evaluated by an independent third party selected by the City (and acceptable to Licensee in its reasonable discretion) who is competent to evaluate the potential causes of the interference and the measures required for its resolution. If it is determined that interference to the equipment, frequencies or channels of the Licensee or other Licensees or users at the Licensed Property is a result of the non-compliance of those facilities with the City's Minimum Technical Standards, it shall be the responsibility of the Licensee or other Licensees or users to resolve the interference. If the interference continues when these facilities are brought into compliance with the Standards, then it shall be the Licensee's responsibility to take whatever measures are necessary to resolve the interference as provided above.

(l) Definition of Interference. For the purposes of this Agreement, "interference" may include, but is not limited to, any use on Licensed Property that causes electronic or physical obstruction with, or degradation of, public safety communications signals, or City and County of Denver event-related communications signals.

(m) 3rd Order Intermodulation Products. The opening of the 600/700 MHz bands to cellular carriers has increased the possibility of 3rd order intermodulation products that fall with the 700/800 MHz public safety uplink (698-816 MHz). When 600/700 MHz wideband channels are deployed special care needs to be taken to ensure passive intermodulation from the tower is minimized. Where possible, a minimum of 20 feet of vertical isolation between the cellular antennas and the public safety receive antennas will be required.

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5.03 Operational Test Procedures.

The following test procedures shall be approved by City prior to or during, whichever is applicable, Licensee's operation of the Licensed System.

(a) Perform a desktop interference study to include all frequencies to be used by Licensee to ensure no RF Interference is likely from intermodulation products or out-of-band emissions.

(b) Verify the results of the Interference Study by conducting appropriate measurements of the installed systems.

(c) If problems are found, make recommendations for additional filtering, channel changes, greater antenna separation, or other fixes, as necessary.

5.04 Changes to Licensed System.

(a) Licensee shall provide prior written notice to the Director of any proposed change in radio cabinets, transmitter power, frequencies, filters, number of antennas, antenna locations, antenna height, antenna orientation, or related aspects of the Licensed System. Any proposed new, or proposed changes to, antennas, antenna mounts or mounting hardware, or structural changes to the Subject Property, require that Professional Engineer stamped structural drawings be provided for review and approval. All reviews of proposed changes shall be subject to such process as prescribed by the Director and undertaken by the City Representative.

(b) Any proposed changes which are significant (as determined by the Director) will require a review of the current lease rate and may result in an additional License Fee being charged to Licensee and possible other changes to the terms and conditions of the Agreement. These changes, along with any addition, relocation or replacement of antennas or other equipment outside the Licensed Area, shall require an amendment to the Agreement which must be approved in the same manner as this Agreement. Changes or occupation or use of areas outside of the Licensed Area which are not authorized as provided herein will be considered to be in breach of this Agreement.

(c) All such changes shall be subject to the Minimum Technical Standards and the installation and operational conditions set forth in this Agreement. The approval form must be attached to the scope of work and stamped structural drawings sheets (not separate). All contractors, subcontractors and vendors must have a copy of the signed approval sheets to present to the officer in charge of the Subject Property, before any work may begin.

5.05 Repairs and Maintenance; Removal.

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(a) The maintenance, care, repair, alteration, enhancement or replacement of the Licensed System or infrastructure within the Licensed Area shall be made by Licensee at its sole cost and expense. Licensee covenants and agrees during the Term or Term Extension of this Agreement, after the installation of the Licensed System and occupancy of the Licensed Area, that Licensee:

(1) shall keep the Licensed System in good order and condition, and will make all necessary and appropriate repairs or changes thereof if approved as required in section 5.04 above;

(2) shall not permit rubbish, debris, waste materials or anything unsightly or detrimental to health, or likely to create a fire or explosion hazard, or conducive to deterioration, to remain in any part of the Licensed Area or the Subject Property or to be disposed of improperly;

(3) shall at all times maintain the Licensed System in accordance with Applicable Law, the Minimum Technical Standards, FCC requirements, and manufacturer's specifications;

(4) shall promptly repair any and all damage to, among other things, the structures, equipment and surrounding property at the Subject Property which result from Licensee's installation and operation of its Licensed; and

(5) shall store tools, test equipment and work materials only in areas at Subject Property approved by the City Representative.

(6) shall restore any damage resulting from roof or other building penetrations and actions or omissions of the License in the Licensed Area or at the Fire Station so that the damaged property is restored to original condition.

(b) All portions of the Licensed System brought onto the Subject Property by Licensee will be and remain Licensee's personal property and, at Licensee's option, may be removed by Licensee at any time during or after the Term. City waives any and all lien rights it may have, statutory or otherwise, concerning the Licensed System or any portion thereof. Removal or other modifications are subject to Section 1.03 regarding access to the Licensed Area. The Licensed System shall be deemed personal property for purposes of this Agreement, regardless of whether any portion is deemed real or personal property under applicable law; City consents to Licensee's right to remove all or any portion of the Licensed System from time to time in Licensee's sole discretion subject to Section 1.03.

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(c) If Licensee should be of the opinion that repair, alteration or replacement of the Subject Property is needed (“Alteration”), Licensee shall submit in writing a request to the Director explaining the perceived need for the Alteration. City will maintain and repair the Subject Property, and all areas of the Licensed Area where Licensee does not have exclusive control, in reasonably good condition, subject to reasonable wear and tear and damage from the elements. Any obligation of the City to perform the work shall be strictly contingent upon approvals, including contracts, required by Applicable Law and obtaining all funding needed for the Alteration. If Licensee proposes to make and pay for the Alterations, it should provide plans and a budget with the request submitted to the Director.

5.06 Right to Enter, Inspect and Make Repairs and Improvements.

(a) The City and its authorized officers, employees, agents, contractors, subcontractors and other representatives shall have the right (at such times as may be reasonable under the circumstances to avoid unreasonable interruption of Licensee’s operations) to access the Licensed Area for the following purposes:

(1) to inspect such equipment at reasonable intervals during regular business hours (or at any time in case of Emergency or urgent need to protect the City System) to determine whether Licensee has complied and is complying with the terms and conditions of this Agreement;

(2) to perform maintenance and make repairs and replacements in cases where Licensee is obligated but has failed to do so, after the City has given Licensee reasonable notice so to do, in which event Licensee shall reimburse the City for the reasonable cost thereof within thirty (30) days of Licensee’s receipt of City’s invoice accompanied by reasonable substantiation of the costs incurred. The City shall have the right to seek recovery of the cost of the maintenance or repair by any judicial remedy available should Licensee fail to pay the cost of the repair. Under no circumstances will City attempt to repair or alter in any way Licensee’s Licensed System, including its operational equipment such as base station radios, other electronic equipment, alarm systems, antennas, coaxial cable, DAS, UPS, etc.; however, this restriction shall not limit the City in performing inspections and repairs and protecting the City System and the Subject Property as provided in this Agreement.

(b) The City reserves the right at all times to take any action it deems necessary, in its sole discretion, to repair, maintain, alter, expand, or improve the City System and the Subject Property and the improvements thereon in connection with their use and operation. The City agrees to give reasonable advance notice of any such activities to Licensee and to reasonably cooperate with Licensee to carry out such activities with a minimum amount of interference to Licensee’s use of the Licensed Area. Licensee agrees to cooperate with the City with respect to such repairs, maintenance, alterations, expansions, or improvements and to accommodate such

work to the extent the City deems necessary and at Licensee's sole expense..

5.07 Utilities.

(a) Licensee shall pay for a separate electric meter for the operation of the Licensed System, as well as all monthly costs of utility and electricity associated with the use and operation of the Licensed System. Licensee shall make these payments directly to the utility provider, not to the City.

(b) Licensee shall be responsible for providing and properly maintaining and replacing, subject to the requirements of section 5.04 above and the installation requirements of section 4.03 above, an independent ventilation, heating, and air conditioning system for those portions of the Licensed System, if any, that are expressly required by the manufacturer of the System to maintain manufacturer's warranties based upon Licensee's installation of the Licensed System at the Subject Property.

5.08 Interruption of Utility Services.

(a) Licensee agrees that City shall not be liable for failure of any utility services to be supplied to the Licensed System, or for a failure of the electrical generator, or for any interruption of utility services to the Licensed System caused by third parties.

(b) The City reserves the right to temporarily interrupt utility services at such time as may be necessary by reason of accident, unavailability of employees, repairs, alterations or improvements or whenever by reason of *force majeure*, including any state of Emergency declared by the President of the United States, the Governor of the State of Colorado, or the Mayor of the City and County of Denver for which such interruption is reasonable for security and public safety reasons. The City shall not be liable for operational or business losses or for damages to persons or property due to such interruptions. Nor shall such interruptions in any way be construed as cause for abatement of the License Fee, unless caused by the demonstrated gross negligence or intentional misconduct of the City or its agents, contractors or employees.

(c) No backup power supplies shall be placed within the Licensed Area or elsewhere on the Subject Property without the prior, written approval of the City Representative and after obtaining any required permits, licenses or approvals for such backup power supplies.

SECTION 6 INSURANCE; INDEMNITY and DEFENSE; GOVERNMENTAL IMMUNITY; LIMITS ON LIABILITY; and TAXES, LICENSES, LIENS AND FEES

6.01 Insurance.

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(a) **General Conditions:** Licensee agrees to secure, at or before the time of execution of this Agreement, the following insurance covering all operations, goods or services provided pursuant to this Agreement. Licensee shall keep the required insurance coverage in effect at all times during the term of the Agreement, including any extension thereof, and during any warranty period. The required insurance shall be underwritten by an insurer eligible to do business in Colorado and rated by A.M. Best Company as "A-VII" or better. Each policy shall require notification to the City in the event any of the required policies be canceled before the expiration date thereof. Such written notice shall be sent to the parties identified in the Notices section of this Agreement. Said notice shall be sent thirty (30) days prior to such cancellation. If such written notice is unavailable from the insurer, Licensee shall provide written notice of cancellation, non-renewal of any required coverage that is not replaced to the parties identified in the Notices section by - mail, referencing the City's contract number. Licensee shall be responsible for the payment of any deductible or self-insured retention. The insurance coverages specified in this Agreement are the requirements, and these requirements do not lessen or limit the liability of the Licensee. The Licensee shall maintain, at its own expense, any additional kinds or amounts of insurance that it may deem necessary to cover its obligations and liabilities under this Agreement.

(b) **Proof of Insurance:** Licensee may not commence services or work relating to this Agreement prior to placement of coverages required under this Agreement. Licensee certifies that the certificate of insurance attached as **Exhibit D**, preferably an ACORD form, complies with all insurance requirements of this Agreement. The City requests that the City's contract number be referenced on the certificate of insurance. The City's acceptance of a certificate of insurance or other proof of insurance that does not comply with all insurance requirements set forth in this Agreement shall not act as a waiver of Licensee's breach of this Agreement or of any of the City's rights or remedies under this Agreement. In the event of a claim giving rise to a coverage dispute, The City reserves the right to request a copy of the applicable Policy giving rise to such dispute.

(c) **Additional Insureds:** For Commercial General Liability, Auto Liability and Excess Liability/Umbrella (if required), Licensee's insurer(s) shall include the City and County of Denver, its elected and appointed officials, employees and volunteers as additional insured.

(d) **Waiver of Subrogation:** For all coverages required under this Agreement, Licensee's insurer shall waive subrogation rights against the City.

(e) **Subcontractors and Subconsultants:** Licensee shall confirm and document that all subcontractors and subconsultants (including independent contractors, suppliers or other entities providing goods or services required by this Agreement) procure and maintain coverage as approved by the Licensee and appropriate to their respective primary business risks considering the nature and scope of services provided.

(f) **Workers' Compensation and Employer's Liability Insurance:** Licensee shall maintain the coverage as required by statute for each work location and shall maintain Employer's Liability insurance with limits of \$100,000 per occurrence for each bodily injury

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claim, \$100,000 per occurrence for each bodily injury caused by disease claim, and \$500,000 aggregate for all bodily injuries caused by disease claims.

(g) **Commercial General Liability:** Licensee shall maintain a Commercial General Liability insurance policy per ISO form CG 00 01 or equivalent with - limits of \$1,000,000 for each bodily injury and property damage occurrence, \$2,000,000 products and completed operations aggregate (if applicable), and \$2,000,000 policy aggregate.

(h) **Automobile Liability:** Licensee shall maintain Automobile Liability with - limits of \$1,000,000 per accident combined single limit applicable to all owned, hired and non-owned vehicles used at the Leased Premises.

(i) **Property Insurance:** Licensee shall provide 100% replacement cost for Licensee's tenant improvements and personal property. Business Interruption coverage shall be included with limits not less than the annual payments due to the City under this License Agreement. Licensee understands and acknowledges that the City does not provide any insurance coverage for any property of the Licensee, its agents, employees or assignees located in the Leased Premises and Licensee acknowledges and agrees that the Licensee, its agents, employees, and assignees have no claim against the City for any damage or loss of personal property and belongings of Licensee, its agents, employees or assignees in the Licensed Area.

(j) Failure to comply with the requirements of this section 6.01 shall be legal grounds under this Agreement for work by Licensee at the Subject Property to be ordered to cease or to be restricted, as deemed appropriate by the Director or the Denver Risk Management Office, until compliance is achieved and any unpaid claims are resolved to the reasonable satisfaction of the City Representative and the Denver Risk Management Office. These insurance obligations shall survive the expiration of the Agreement and Cancellation for three (3) years.

6.02 Indemnification & Defense.

(a) Licensee hereby agrees to defend, indemnify, and hold harmless City, its appointed and elected officials, agents and employees against all liabilities, claims, judgments, suits or demands for damages to persons or property arising out of, resulting from, or relating to regarding the use and occupancy of, and activities and operations on, the Subject Property site by Licensee (including its officers, employees, representatives, suppliers, contractors, subcontractors and agents) under this Agreement ("Claims"), unless such Claims have been specifically determined by the trier of fact to be the sole negligence or willful misconduct of City. This indemnity shall be interpreted in the broadest possible manner to indemnify City for any acts or omissions of Licensee (including its officers, employees, representatives, suppliers, contractors, subcontractors and agents) either passive or active, irrespective of fault, including City's concurrent negligence whether active or passive, except for the sole negligence or willful misconduct of City.

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(b) Licensee's duty to defend and indemnify City shall arise at the time written notice of the Claim is first provided to City regardless of whether an action has been filed in court on the Claim. Licensee's duty to defend and indemnify the City shall arise even if City is the only party sued and/or it is alleged that City's negligence or willful misconduct was the sole cause of the alleged damages.

(c) Licensee will defend any and all Claims which may be brought or threatened against City and will pay on behalf of City any expenses incurred by reason of such Claims including, but not limited to, court costs and attorney fees incurred in defending and investigating such Claims or seeking to enforce this indemnity obligation. Such payments on behalf of City shall be in addition to any other legal remedies available to City and shall not be considered City's exclusive remedy.

(d) Insurance coverage requirements specified in this Agreement shall in no way lessen or limit the liability of Licensee under the terms of this indemnification obligation. Licensee shall obtain, at its own expense, any additional insurance that it deems necessary for City's protection.

(e) This indemnification and defense obligation shall survive the expiration of this Agreement and Cancellation.

6.03 Colorado Governmental Immunity Act.

Licensee understands and agrees that City is relying upon, and has not waived, the monetary limitations and all other rights, immunities and protection provided by the Colorado Governmental Act, § 24-10-101 *et seq.*, C.R.S., and any related statutory protections against liability.

6.04 Limitation on Liability.

Licensee agrees that no liability shall attach to the City for any damages or losses incurred or claimed by Licensee or any other person or party on account of the installation, construction or operation of the Licensed System by Licensee. Licensee agrees that it shall not in any way seek damages or make any claims against the City for any interference or delay caused by construction in adjacent areas, other businesses or operations, including without limitation damages or losses in the nature of delay damages, lost labor productivity, and impact damages.

6.05 Environmental Requirements.

(a) Licensee and its contractor(s) and subcontractor(s) shall obtain all federal, state,

and local environmental permits necessary for the work to be performed and shall comply with all applicable federal, state, and local environmental permit requirements applicable to any work performed on the Subject Property. Licensee and its contractor(s) and subcontractor(s) shall comply with all applicable local, state, and federal environmental guidelines, rules, regulations, statutes, laws, and orders applicable to the work (collectively, “Environmental Requirements”), including but not limited to Environmental Requirements regarding the storage, use, transportation, and disposal of Hazardous Materials and regarding releases or threatened releases of Hazardous Materials to the environment.

(b) The term “Hazardous Materials” shall mean asbestos, asbestos-contaminated soils, and asbestos-containing materials, special wastes, polychlorinated biphenyls (PCBs), any petroleum products, natural gas, radioactive source material, pesticides, any hazardous waste as defined at 42 U.S.C. § 6903(5) of the Solid Waste Disposal Act, any hazardous substance as defined at 42 U.S.C. § 9601(14) of the Comprehensive Environmental Response, Compensation and Liability Act, and chemical substance as defined at 15 U.S.C. § 2602(2) of the Toxic Substances Control Act, and any guidelines issued and rules or regulations promulgated pursuant to such statutes, or any other applicable federal or state statute.

(c) No Hazardous Materials shall be brought onto, or stored on, the Subject Property site without the prior, written approval of the City Representative and, if required by the City Representative, the prior, written approval of the Denver Department of Environmental Health and/or the Colorado Department of Public Health and Environment.

(d) The obligations of Licensee set out in this section 6.05 shall survive the expiration of the Agreement.

6.06 Taxes, Licenses, Liens and Fees.

(a) Licensee agrees to promptly pay all taxes, excises, license fees and permit fees of whatever nature applicable to its operations hereunder and to take out and keep current all municipal, state or federal licenses required for the conduct of its business or operations under this Agreement and further agrees not to permit any of said taxes, excises, license fees or permit fees to become delinquent.

(b) Licensee also agrees not to permit any mechanic’s or materialman’s or any other lien to become attached or be foreclosed upon the Subject Property, or improvements thereto, or any part or parcel thereof, by reason of any work or labor performed or materials furnished by any mechanic or materialman for Licensee, as contractors or subcontractors.

(c) Licensee further agrees to promptly pay when due all bills, debts and obligations incurred by it in connection with its operations hereunder, and not to permit the same to become delinquent and to suffer no lien, mortgage, judgment or execution to be filed against the Subject

Property, the City System, the Licensed System, or related improvements, which may in any way impair the rights of the City under this Agreement or to the City's property.

(d) The obligations of Licensee set out in this section 6.06 shall survive the expiration of the Agreement and Cancellation.

6.07 No Waiver.

No failure of either Party to insist upon the strict performance of a term, covenant or agreement contained in this Agreement shall be deemed or taken to be a waiver by such Party of any succeeding failure to perform or any breach or default.

SECTION 7 CITY RIGHTS

7.01 City's Rights.

(a) City shall retain all the rights to the use, occupancy and ownership of the Subject Property; and such use, occupancy and ownership by the City shall be the primary use of the Subject Property and shall not be interfered with by the exercise of the rights granted hereunder during the Term or Term Extension of the Agreement, except to the extent interference shall be a result of Licensee's reasonable uses and actions in the installation, inspection, maintenance, alteration, repair, replacement, operation and removal of the Licensed System as authorized under this Agreement; provided, however, that Licensee shall be liable to the City for any damage to improvements that may result from such installation, inspection, maintenance, alteration, repair, replacement, operation and removal.

(b) If the City desires Licensee to leave in place any modifications made by Licensee and so states in a written notice to Licensee, then Licensee shall leave such modifications in place without compensation from or to the City. If Licensee is required to remove the modifications and does not restore damage resulting from said removal and thereby causing the City to have to undertake the restoration, then Licensee shall promptly reimburse the City for the work. The City specifically reserves for itself, other Licensees, licensees and assignees of City, all rights which do not materially and adversely interfere with Licensee's exercise of its License under this Agreement; provided, however, the City will not materially and adversely interfere with, and will not knowingly permit or allow other licensees to materially and adversely interfere with, the rights of Licensee under the terms of this Agreement except to the extent expressly provided in this Agreement.

(c) Upon expiration of the Agreement or Cancellation or on the date specified in any demand for possession by the City after any default by Licensee (after any applicable notice and cure periods), Licensee covenants and agrees to surrender possession of the Licensed Area and

all other parts of the Subject Property site to the City in the same condition as when first occupied, ordinary wear and tear excepted but subject to the repair and restoration requirements provided in this Agreement.

(d) Licensee shall remove, at its sole cost, upon expiration of the Agreement or Cancellation, the Licensed System and all of Licensee's personal property within thirty (30) calendar days after expiration or Cancellation, as applicable. If such removal should damage the Subject Property, Licensee agrees, at its sole cost, to immediately repair such damage in a good and workmanlike manner and to put the property in the same condition as it would have been if the Licensed System had not been installed, reasonable wear and tear excepted but subject to the repair and restoration requirements provided in this Agreement. If Licensee fails to remove the Licensed System and Licensee's personal property within thirty (30) calendar days after the expiration of this Agreement or Cancellation, as applicable, the City, at its option, may remove, store and/or dispose of same and retain any proceeds therefrom, and further is entitled to recover any cost incurred by the City in removing same and in restoring the Subject Property.

(e) If Licensee holds over after the expiration of this Agreement or Cancellation, and so long as the Licensed System is still situated on the Subject Property site (even if it has been disconnected), Licensee shall pay to City a holdover fee equal to 250% of the then total License Fee prorated from the effective expiration or Cancellation date, whichever is applicable, to the date the Licensed System is properly and completely removed from the property. Nothing herein shall be construed to give Licensee the right to hold over at any time, and the City may exercise any and all remedies at law or in equity to recover possession of the Property, as well as any damages caused by Licensee.

SECTION 8 LOSS OF, AND LIABILITIES PERTAINING TO THE LICENSED SYSTEM

8.01 Damage or Destruction and Restoration.

In case of damage or loss of all or any portion of the Licensed System, Licensee will give prompt notice thereof to the City; and, except as otherwise provided herein, Licensee shall promptly commence and complete with due diligence (subject to delays beyond its control), the restoration of the Licensed System as nearly as reasonably practicable to the value and condition thereof immediately prior to such damage or destruction. In the event of such damage or destruction, Licensee shall be entitled to use or receive reimbursement from the proceeds of all property insurance policy or policies held by Licensee for the Licensed System. The License Fee payable under section 3.01 shall continue to be due and owing.

8.02 Licensee's Election Not to Restore Damaged Licensed System.

In case of the damage or destruction of all or any part of the Licensed System, Licensee, within ninety (90) days thereafter, may elect not to restore or replace the Licensed System, and this Agreement shall be terminated. Licensee must notify the City within said 90 days of the damage or destruction to all or any part of the Licensed System of its intentions not to restore or replace the Licensed System and shall pay the City, in full, six (6) months of payments for the License Fee under section 3.01 from the date that the notice not to restore or replace is provided to the City. Licensee shall promptly proceed to remove the Licensed System from the Licensed Area and to repair and restore the Subject Property in accordance with Section 4 and section 7.01 and as otherwise provided in this Agreement within thirty (30) days after Licensee elects not to restore or replace the Licensed System. The obligations of Licensee under this section 8.02 shall survive the expiration of this Agreement and Cancellation.

SECTION 9 DEFAULT; REMEDIES; and DISPUTES

9.01 Licensee Default.

Licensee shall be in substantial default under this Agreement if Licensee:

(a) Fails to timely pay to the City on the fifth (5th) calendar day after the date License Fee or any other payments are due and owing under this Agreement; provided, however, default shall not occur until the tenth (10th) calendar day after written notice is provided by the City to Licensee; or

(b) Becomes insolvent, or takes the benefit of any present or future insolvency or bankruptcy statute, or makes a general assignment for the benefit of creditors, or consents to the appointment of a receiver, trustee or liquidator of any or substantially all of its property; or

(c) Transfers its interest under this Agreement, unless such transfer is specifically authorized pursuant to section 10.01; or

(d) Fails to submit or fails to timely submit complete and accurate plans and specifications, bonds, proof of insurance and other submittals as required by the express terms of this Agreement, and such failure continues for a period of thirty (30) calendar days after Licensee has received written notice from the City of such failure; or

(e) Abandons, deserts or vacates the Licensed System or Licensed Area; or

(f) Suffers any materialmen's or mechanic's lien or attachment to be filed against the Licensed System, the City System, or the Subject Property because of any act or omission

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of Licensee, and such lien or attachment is not discharged or contested by Licensee in good faith by proper legal proceedings within thirty (30) calendar days after Licensee's receipt of written notice thereof from City; or

(g) Fails to keep, perform and observe any other promise, covenant or agreement set forth in this Agreement and such failure continues for a period of more than thirty (30) calendar days after delivery by City of a written notice of such breach or default, except where a shorter period is specified herein, or where fulfillment of its obligation requires activity over a period of time and Licensee within thirty (30) days of Licensee notice Licensee commences in good faith to perform whatever may be required to correct its failure to perform and continues such performance without interruption except for causes beyond its control (which must be documented in a written notice to the City); or

(h) Gives its permission to any person to use for any illegal or unauthorized purpose any portion of the City's property made available to Licensee for its use under this Agreement; or

(i) Or any of its officers or employees are convicted, plead nolo contendere, enter into a formal agreement in which they admit guilt, enter a plea of guilty, or otherwise admit culpability to criminal offenses of bribery, kickbacks, collusive bidding, bid-rigging, antitrust, fraud, undue influence, theft, racketeering, extortion or any offense of a similar nature, in connection with the Licensee's business or operations in the State of Colorado.

9.02 Remedies.

If Licensee substantially defaults in any of the covenants, terms and conditions herein and such default is not cured within any applicable notice and cure periods, the City may exercise any one or more of the following remedies:

(a) The City may elect to allow this Agreement to continue in full force and effect and to enforce all of City's rights and remedies hereunder, including without limitation the right to collect compensation as it becomes due together with interest or recover any damages or losses resulting from the action or inaction of Licensee.

(b) The City may engage in Cancellation and repossess the Licensed Area, without liability for so doing and without having to comply with any eviction process under state law, upon giving thirty (30) calendar days written notice to Licensee of the intended Cancellation, at the end of which time all the rights hereunder of Licensee shall terminate, unless the default shall have been cured as prescribed in section 9.01 or elsewhere in this Agreement. Licensee shall be liable to the City for all amounts owing to the City or any other party with respect to Licensee's operations at the Subject Property or under this Agreement.

(c) The remedies provided in this Agreement shall be cumulative and shall in no way affect any other remedy available to the City under law or equity. The obligations of Licensee under this section 9.02 shall survive the expiration of the Agreement and Cancellation.

9.03 City Default.

City's failure to perform any term or condition under this Agreement within thirty (30) days after written notice from Licensee specifying the failure will be deemed a default by City and a breach of this Agreement. No such failure, however, will be deemed to exist if City has commenced to cure the default within such period and provided such efforts are prosecuted to completion with reasonable diligence. Delay in curing a default will be excused if due to causes beyond the reasonable control of City. If City remains in default beyond any applicable cure period, Licensee will have: (i) the right to cure City's default and to deduct the costs of such cure from any monies due to City from Licensee, and (ii) any and all other rights available to it under law and equity. The Parties agree to work diligently together and in good faith, using reasonable efforts to resolve any unforeseen issues and disputes and to expeditiously take such actions as are necessary and appropriate to perform the duties and obligations of this Agreement. Any dispute between the City and Licensee, including whether a default by Licensee is substantial or has been timely and effectively cured, shall be taken to administrative hearing, pursuant to the procedure established by Section 56-106, DRMC.

SECTION 10 MISCELLANEOUS PROVISIONS

10.01 Assignments.

(a) Licensee shall not assign or otherwise transfer its interest in this Agreement, in whole or in part, or otherwise transfer any rights or interest in or to the License granted under this Agreement, without the prior written consent of the Director, which consent can be given or denied in Director's sole discretion, and subject to approval, under section 10.16 below, of an amendment to this Agreement authorizing the assignment. The Director may require any proposed assignee to demonstrate that it is appropriately licensed and authorized to provide the same services as Licensee and has the ability to perform the terms and conditions of this Agreement including any financial obligations under this Agreement.

(b) Notwithstanding the foregoing, Licensee may assign this Agreement, and the License granted herein, in whole, to any business entity which is parent, subsidiary, affiliate of Licensee, or to any party that acquires all or substantially all of Licensee's radio spectrum assets in the Denver market area, by reason of a merger, acquisition or other business reorganization. The burden shall be on Licensee to demonstrate, to the satisfaction of the Director, that any proposed assignment qualifies under this sub-section 10.01(b).

(c) The License granted under this Agreement may not be sold under any circumstances. Any contract entered by Licensee to sell or convey the License granted herein

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shall not be binding on the City and shall be grounds for terminating the Agreement, at the discretion of the Director.

(d) Under no circumstances shall Licensee be authorized to allow any other licensee or sub-licensee to co-locate or operate any system at the Subject Property.

10.02 Fair Dealing; Further Assurances.

(a) In all cases where the consent or approval of one Party is required before the other may act, or where the agreement or cooperation of the Parties is separately or mutually required as a legal or practical matter, then in that event the Parties agree that each will act in a fair and reasonable manner with a view to carrying out the intents and goals of this Agreement as the same are set forth herein, subject to the terms hereof.

(b) From time to time, upon the request of a Party, the other Party agrees to make, execute and deliver or cause to be made, executed and delivered to the requesting Party any and all further instruments, certificates and documents consistent with the provisions of this Agreement as may, in the reasonable opinion of the requesting Party, be necessary or desirable in order to effectuate, complete or perfect the rights of said Party under this Agreement, provided said requesting Party is currently in full compliance with the provisions of this Agreement and has tendered or offered to tender any reciprocal instruments, certificates and documents to which the other Party is entitled under the Agreement.

10.03 Bond Ordinance.

This Agreement and the rights granted or conveyed hereby are in all respects subject and subordinate to any and all City bond ordinances related to the Subject Property and to any other bond ordinances which should amend, supplement or replace such bond ordinances. The parties agree that the bond ordinances permit the terms of this Agreement as written and that Licensee shall comply with all IRS regulations and take no action that would jeopardize the tax-exempt status of the bonds. This Agreement has been approved by the City's bond counsel, attached hereto as **Exhibit E**. This Agreement may not be executed and may not be amended in the future without prior written approval of the City's bond counsel.

10.04 Financial Interests.

Except for financial interests authorized by the City in accordance with the City Charter and ordinances, any financial interests created in, or used to secure financing and payment for the costs of, any work performed or improvements made under this Agreement by Licensee, including but not limited to any bonds, certificates of participation, purchase agreements, and Uniform Commercial Code filings, shall expressly exclude from such debt or financial security contained in such financial instrument(s) any title, rights and interests held by the City in the

property subject to this Agreement. The terms and conditions of this Agreement must be expressly recognized in any such financial instrument(s) created or entered by or on behalf of Licensee, which must specifically acknowledge and affirm that any financial interests created by the financial instrument(s) are subordinate to this Agreement and may not encumber the City's title, rights and interests in the subject property or under this Agreement.

10.05 Appropriation.

Notwithstanding any provision of this Agreement to the contrary, the rights and obligations of the City under this Agreement are contingent upon all funds necessary for work or expenditures contemplated under this Agreement being budgeted, appropriated and otherwise made available by the City. The Parties acknowledge that this Agreement is not intended to create a multiple-fiscal year direct or indirect debt or financial obligation of the City, except to the extent that capital improvement funds that are lawfully appropriated can be lawfully carried over to subsequent years.

10.06 Contracting or Subcontracting.

Any work that is allowed to be contracted or subcontracted under this Agreement shall be subject, by the terms of the contract or subcontract, to every provision of this Agreement. Compliance with this provision shall be the responsibility of the Party who arranged the contract or authorized the subcontract. Except as otherwise expressly stated in this Agreement, no Party shall be liable or have a financial obligation to or for any contractor, subcontractor, supplier, or other person or entity with which the other Party contracts or has a contractual arrangement.

10.07 Third Parties.

This Agreement does not, and shall not be deemed or construed to, confer upon or grant to any third party or parties any right to claim damages or to bring any suit, action or other proceeding against either the City or Licensee because of any breach hereof or because of any of the terms, covenants, agreements and conditions herein.

10.08 Force Majeure.

Neither Party hereto shall be liable to the other for any failure, delay or interruption in the performance of any of the terms, covenants or conditions of this Agreement due to causes beyond the reasonable control of that Party, including without limitation strikes, boycotts, labor disputes, embargoes, shortages of materials, acts of God, acts of the public enemy, acts of superior governmental authority, severe weather conditions, fire, floods, riots, rebellion, sabotage or any other circumstance for which such Party is not responsible or which is not in its power to control, but in no event shall this section be construed so as to allow Licensee to reduce or abate its obligation to pay the License Fee prescribed in this Agreement.

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10.09 No Discrimination in Employment (City Executive Order No. 8):

In connection with the performance of work under the Agreement, Licensee may not refuse to hire, discharge, promote, demote, or discriminate in matters of compensation against any person otherwise qualified, solely because of race, color, religion, national origin, ethnicity, citizenship, immigration status, gender, age, sexual orientation, gender identity, gender expression, marital status, source of income, military status, protective hairstyle, or disability. Licensee shall insert the foregoing provision in all subcontracts.

10.10 Non-Discrimination and Equal Employment Opportunity

(a) In carrying out its obligations under the Agreement, Licensee and its officers, employees, members, and subcontractors hereby affirm current and ongoing compliance with 29 CFR Part 37, Title VII of the Civil Rights Act of 1964, The Americans With Disabilities Act of 1990, Section 504 of the Rehabilitation Act of 1973, the Age Discrimination Act of 1975, Title IX of the Education Amendments of 1972, and all other nondiscrimination and equal employment opportunity statutes, laws, and regulations. Licensee agrees not discriminate against any employee or applicant for employment because of race, religion, national origin, ancestry, color, gender, gender identity, sexual orientation, age, disability, political affiliation or belief, or veteran status. Licensee will ensure that all qualified applicants are hired, and all employees are considered for promotion, demotion, transfer; recruitment or recruitment advertising, layoff, termination, rates of pay, other forms of compensation, selection for training (including apprenticeship), or any other employment-related opportunities, without regard to race, religion, national origin, ancestry, color, gender, gender identity, sexual orientation, age, disability, political affiliation or belief, or veteran status.

(b) Licensee agrees to post notices affirming compliance with all applicable federal and state non-discrimination laws in conspicuous places accessible to all employees and applicants for employment. Licensee will affirm that all qualified applicants will receive consideration for employment without regard to race, religion, national origin, ancestry, color, gender, gender identity, sexual orientation, age, disability, political affiliation or belief, or veteran status in all solicitations or advertisements for employees placed by or on behalf of Licensee.

(c) Licensee will incorporate the foregoing requirements of this Section in all of its subcontracts.

(d) Licensee agrees to collect and maintain data necessary to show compliance with the nondiscrimination provisions of this section.

10.11 Conflict of Interest.

4898 Dudley Street – Fire Station 30

CCN:

Added at Licensee's Request: MDG Location ID: 5000108160

The Parties agree that no official, officer or employee of the City shall have any personal or beneficial interest whatsoever in the services or property described herein, and Licensee further agrees not to hire or contract for services any official, officer or employee of the City or any other person which would be in violation of the Denver Revised Municipal Code Chapter 2, Article IV, Code of Ethics, or Denver City Charter provisions 1.2.9 and 1.2.12.

10.12 Applicable Law; Authority; Venue; Enforcement; and Claims.

(a) The Parties agree to comply with all Applicable Law in existence as of the Effective Date of this Agreement or as may be subsequently enacted or adopted and become applicable.

(b) This Agreement shall be construed and enforced in accordance with the laws of the United States, the State of Colorado, and the applicable provisions of the Charter and Revised Municipal Code of the City and County of Denver.

(c) Venue for any legal action relating to this Agreement shall lie in the District Court in and for the City and County of Denver.

(d) The Parties agree that this Agreement may be enforced in law or in equity for specific performance, injunctive, or other appropriate relief, including actual damages (notwithstanding Cancellation), as may be available according to the laws and statutes of the State of Colorado; provided, however, the Parties agree to and hereby release any claims for incidental, consequential, or punitive damages; provided, further, no provision of this Agreement may be enforced by the creation or recording of any type of lien against real property owned by the City, nor may any foreclosure process be utilized to recover any moneys owed by the City to Licensee. It is specifically understood that, by executing this Agreement, each Party commits itself to perform pursuant to these terms and conditions contained in this Agreement, and that any failure to comply which results in any recoverable damages shall not cause, by itself, the revocation or termination of any rights or obligations under this Agreement.

(e) Nothing in this section 10.12 shall be construed as a waiver, release, reduction or modification of any insurance, bond, indemnification or other liability obligations of Licensee or Licensee's design professional, contractor or sub-contractor expressly provided for in this Agreement.

(f) No official, officer, director, agent, or employee of either Party shall be charged personally or held contractually liable to the other Party or its officials, officers, directors, agents, or employees under any term or condition of this Agreement or for any breach, default, or violation under this Agreement.

(g) In the event that any claim, demand, suit, or action is made or brought in writing by any person or entity against one of the Parties related in any way to this Agreement, the Party in receipt of same shall promptly notify and provide a copy of said claim, demand, suit, or action to the other Party.

10.13 Use, Possession or Sale of Alcohol or Drugs; Smoking Policy.

(a) Licensee and its officers, agents, employees, and contractors shall cooperate and comply with the provisions of the City and County of Denver's policy or order or any successor policy or order concerning the use, possession or sale of alcohol or drugs on City property.

(b) Licensee and its officers, agents, employees, and contractors shall cooperate and comply with the provisions of the City's policy or order prohibiting smoking in buildings and certain facilities, and Licensee agrees it will take reasonable action to prohibit smoking by its employees in the public areas of the Subject Property.

10.14 Notices.

All legal and administrative notices hereunder shall be given in writing to the following, by a nationally recognized overnight courier, or by certified mail, postage prepaid, return receipt requested.

To the City:

City and County of Denver
Division of Real Estate
201 W Colfax Ave, Dept 1010
Denver, CO 80202
Attn: Director of Real Estate

City Attorney's Office
City and County of Denver
1437 Bannock Street, Room 353
Denver, CO 80202

To the Licensee:

Cellco Partnership d/b/a Verizon Wireless
180 Washington Valley Road
Bedminster NJ 07921
Attn: Network Real Estate

4898 Dudley Street – Fire Station 30

CCN:

Added at Licensee's Request: MDG Location ID: 5000108160

Cell Site Name: DPAC

With a copy to: Basking Ridge Mail Hub
Attention: Legal Intake
One Verizon Way
Basking Ridge, New Jersey 07920

All proposed amendments to the Agreement, letter approvals for proposed actions by Licensee, proposed changes to the exhibits, and any document or affidavit seeking the signature of the Director or the Executive Director of Safety, shall be provided to both the Director and the City Attorney's Office. Licensee and City shall designate local contact personnel for operational and otherwise day-to-day business communications which may be made by telephone or email. Any changes to this contact information shall be provided immediately once known.

10.15 Examination of Records and Audit

Any authorized agent of the City, including the City Auditor or his or her representative, has the right to access, and the right to examine, copy and retain copies, at City's election in paper or electronic form, any pertinent books, documents, papers and records related to Licensee's performance pursuant to this Agreement, and any other transactions related to this Agreement. Licensee shall cooperate with City representatives and City representatives shall be granted access to the foregoing documents and information during reasonable business hours and until the latter of three (3) years after the final payment under the Agreement or expiration of the applicable statute of limitations. When conducting an audit of this Agreement, the City Auditor shall be subject to government auditing standards issued by the United States Government Accountability Office by the Comptroller General of the United States, including with respect to disclosure of information acquired during the course of an audit. No examination of records and audits pursuant to this paragraph shall require Licensee to make disclosures in violation of state or federal privacy laws. Licensee shall at all times comply with D.R.M.C. 20-276.

10.16 Parties' Obligation Regarding Confidential Information.

The Parties agree that issues governing the use and disclosure of Confidential Information, as defined below, provided to or made available to the City by Licensee will be governed by the following provisions:

(a) As used herein, the term "Confidential Information" means all information, of any nature and in any form, regardless of when given, that (i) is disclosed or provided by or through Licensee to the City pursuant to performance of this Agreement; and (ii) has been clearly marked or indicated in writing as being confidential by Licensee; provided, that no part of this

4898 Dudley Street – Fire Station 30

CCN:

Added at Licensee's Request: MDG Location ID: 5000108160

Agreement or the exhibits attached to this Agreement shall be deemed to contain Confidential Information. Information falling within this definition shall be treated by the City as confidential proprietary information of Licensee pursuant to the provisions of the Colorado Open Records Act and under any rule of court. Information not so marked or indicated will not be so considered.

(b) Except as expressly provided in this Agreement or as otherwise mandated by the Colorado Open Records Act or other applicable law, the City will not disclose Confidential Information to anyone other than individuals required for the administration and enforcement of this Agreement, including the City Representative, without the prior written consent of Licensee. The City will not use, or permit others to use, Confidential Information for any purpose other than actions incidental to the performance and enforcement of this Agreement between the City and Licensee, including but not limited to auditing of records of Licensee by the City Auditor and/or other representatives of the City. The City will take all reasonable measures to avoid disclosure, dissemination or unauthorized use of Confidential Information, including, at a minimum, those measures that it takes to protect its own Confidential Information of a similar nature.

(c) The Parties recognize that the mere marking of a document as "Confidential" does not render it conclusively confidential under the Colorado Open Records Act. Consequently, in the event that the City is served with an Open Records Request or subpoena from any third party requesting all or part of any Confidential Information as defined herein, the City shall give timely notice to Licensee of such request or subpoena within the time parameters of the Colorado Open Records Act or of any applicable court rule. In that event, Licensee agrees upon receipt of actual notice from the City of such Open Records Request or subpoena to immediately undertake, at its own cost and expense, to defend such Confidential Information from disclosure pursuant to the Colorado Open Records Act or applicable court rule and shall defend, save and hold harmless and indemnify the City and its agents and employees with respect to such issues.

(d) Licensee shall not at any time or in any manner, either directly or indirectly, divulge, disclose or communicate to any person, firm or corporation in any manner whatsoever any information concerning any matters which are not subject to public disclosure, including without limitation the trade secrets of businesses or entities doing business with the City, security measures utilized by the City, and other privileged or confidential information.

10.17 Entire Agreement; Amendment.

The Parties acknowledge and agree that the provisions contained herein, including all exhibits attached hereto, constitute the entire agreement and that all representations made by any officer, agent or employee of the respective Parties unless included herein are null and void and of no effect. No alterations, amendments, changes or modifications, unless expressly reserved

to the City herein, shall be valid unless executed by an instrument in writing by all the Parties with the same formality as this Agreement.

10.18 Severability.

If any term or provision of this Agreement is held by a court of law (following all legal rights of appeal or the expiration of time therefore) to be illegal or unenforceable or in conflict with any law of the State of Colorado or the City Charter or City ordinance, the validity of the remaining portions or provisions shall not be affected, and the rights and obligations of the Parties shall be construed and enforced as if the Agreement did not contain the particular term or provision held to be invalid; provided, however, if the invalidated term or provision was a critical or material consideration of either Party in entering this Agreement, the Parties shall work together, in good faith, to come up with an amendment to this Agreement that substantially satisfies the previously intended consideration while being in compliance with Applicable Law and the judgment of the court. Judicial invalidation of the License Fee, in whole or part, shall result in a failure of consideration and termination of this Agreement.

10.19 Time of Essence.

The Parties agree that in the performance of the terms and requirements of this Agreement by Licensee and the City, time is of the essence.

10.20 Section Headings.

The section headings herein are for convenience in reference only and are not intended to define or limit the scope of any provision of this Agreement.

10.21 Approval and Execution of Agreement.

This Agreement is expressly subject to and shall not be or become effective or binding on the City until City Council approval, if required by Charter, is obtained and the Agreement is fully executed by all required City signatories and all required Licensee signatories.

10.22 Authority

Each Party represents and warrants that it has taken all actions that are necessary or that are required by its applicable law to legally authorize the undersigned signatories to execute this Agreement on behalf of the Party and to bind the Party to its terms. The person(s) executing this Agreement on behalf of each Party warrants that he/she/they have full authorization to execute this Agreement. The City shall have the right, in its discretion, to either temporarily suspend or permanently terminate the Agreement if there is any valid dispute as to the legal authority of Licensee or the person signing this Agreement on behalf of Licensee to enter into this

4898 Dudley Street – Fire Station 30

CCN:

Added at Licensee's Request: MDG Location ID: 5000108160

Agreement.

10.23 Electronic Signatures and Electronic Records.

The Parties consent to the use of electronic signatures. The Agreement, and any other documents requiring a signature hereunder, may be signed electronically. The Parties agree not to deny the legal effect or enforceability of the Agreement solely because it is in electronic form or because an electronic record was used in its formation. The Parties agree not to object to the admissibility of the Agreement in the form of an electronic record, or a paper copy of an electronic document, or a paper copy of a document bearing an electronic signature, on the ground that it is an electronic record or electronic signature or that it is not in its original form or is not an original.

10.24 Compliance with Denver Wage Laws.

To the extent applicable to the Contractor's provision of Services hereunder, the Contractor shall comply with, and agrees to be bound by, all rules, regulations, requirements, conditions, and City determinations regarding the City's Minimum Wage and Civil Wage Theft Ordinances, Sections 58-1 through 58-26 D.R.M.C., including, but not limited to, the requirement that every covered worker shall be paid all earned wages under applicable state, federal, and city law in accordance with the foregoing D.R.M.C. Sections. By executing this Agreement, the Contractor expressly acknowledges that the Contractor is aware of the requirements of the City's Minimum Wage and Civil Wage Theft Ordinances and that any failure by the Contractor, or any other individual or entity acting subject to this Agreement, to strictly comply with the foregoing D.R.M.C. Sections shall result in the penalties and other remedies authorized therein.

Exhibit List:

Exhibit A – Licensed Area

Exhibit B – City's Minimum Technical Standards

Exhibit C – Site Study

Exhibit D – Certificate of Insurance

Exhibit E – Bond Counsel Approval

SIGNATURE PAGES AND EXHIBITS FOLLOW THIS PAGE

Contract Control Number:
Contractor Name:

FINAN-202578379-00
CELLCO PARTNERSHIP dba VERIZON WIRELESS

IN WITNESS WHEREOF, the parties have set their hands and affixed their seals at
Denver, Colorado as of:

SEAL**CITY AND COUNTY OF DENVER:**

ATTEST:

By: _____

APPROVED AS TO FORM:

Attorney for the City and County of Denver

By: _____


REGISTERED AND COUNTERSIGNED:

By: _____

By: _____

Contract Control Number:
Contractor Name:

FINAN-202578379-00
CELLCO PARTNERSHIP dba VERIZON WIRELESS

Signed by:

5F160F18A7F3459...

By: _____

Eric Fradette

Name: _____
(please print)

AVP-Ntwk Engring
Title: _____
(please print)

Jun 5, 2025

ATTEST: [if required]

By: _____

Name: _____
(please print)

Title: _____
(please print)

EXHIBIT A – LICENSED SYSTEM AND LOCATION

MARSTON PARK

MDG: 5000108160

FUZE PROJECT ID: 17345516

ADDRESS: 4898 SOUTH DUDLEY STREET
DENVER, CO 80123



verizon

1074 NALL AVE.
SUITE 400
OVERLAND PARK, KS 66211
PHONE: (913) 344-2800

Trylon

1825 W. WALNUT HILL LANE, SUITE 120
IRVING, TEXAS 75038
1-855-669-5421

smartlink

1362 MELLON RD. TUTE 140
HANOVER, MD 21076

ALL DRAWINGS CONTAINED HEREIN ARE FORMMATED FOR 11"x17". CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCEPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

SUBMITTALS			
REV	DATE	DESCRIPTION	BY
A	08/07/24	PRELIMINARY	SHA
0	08/30/24	FINAL	SHA
1	10/22/24	FINAL	DAB



PROJECT TITLE

MDG: 5000108160

MARSTON PARK

4898 SOUTH DUDLEY STREET
DENVER, CO 80123

SHEET DESCRIPTION

TITLE SHEET

SHEET NO.

T-1

PROJECT INFORMATION

PROJECT DESCRIPTION: PMP DONOR

SITE NAME: MARSTON PARK

LOCATION #: 5000108160

SITE ADDRESS: 4898 SOUTH DUDLEY STREET
DENVER, CO 80123

LATITUDE: 39° 37' 38.881" N (39.627467°)

LONGITUDE: 105° 5' 40.121" W (-105.094478°)

JURISDICTION: CITY OF DENVER

TELCO COMPANY: VERIZON

USE & OCCUPANCY GROUP: U

GROUND ELEVATION: ±5610'-0" AMSL

STRUCTURE TYPE: SELF-SUPPORT TOWER

STRUCTURE HEIGHT: ±90'-0"

HIGHEST APPURTENANCE: ±95'-0"

PROPERTY OWNER: CITY OF DENVER DEVELOPMENT SERVICES
201 W. COLFAX AVE. DEPT. 2033700
DENVER, CO 80202

APPLICANT: VERIZON WIRELESS

SITE ACQUISITION FIRM: SMARTLINK

CONTACT: TJ HARRIS
EMAIL: TIMOTHY.HARRIS@SMARTLINKGROUP.COM
PHONE: 443-370-5472

ENGINEERING FIRM: TRYLON
1825 W. WALNUT HILL LANE, SUITE 120
IRVING, TEXAS 75038
1-855-669-5421

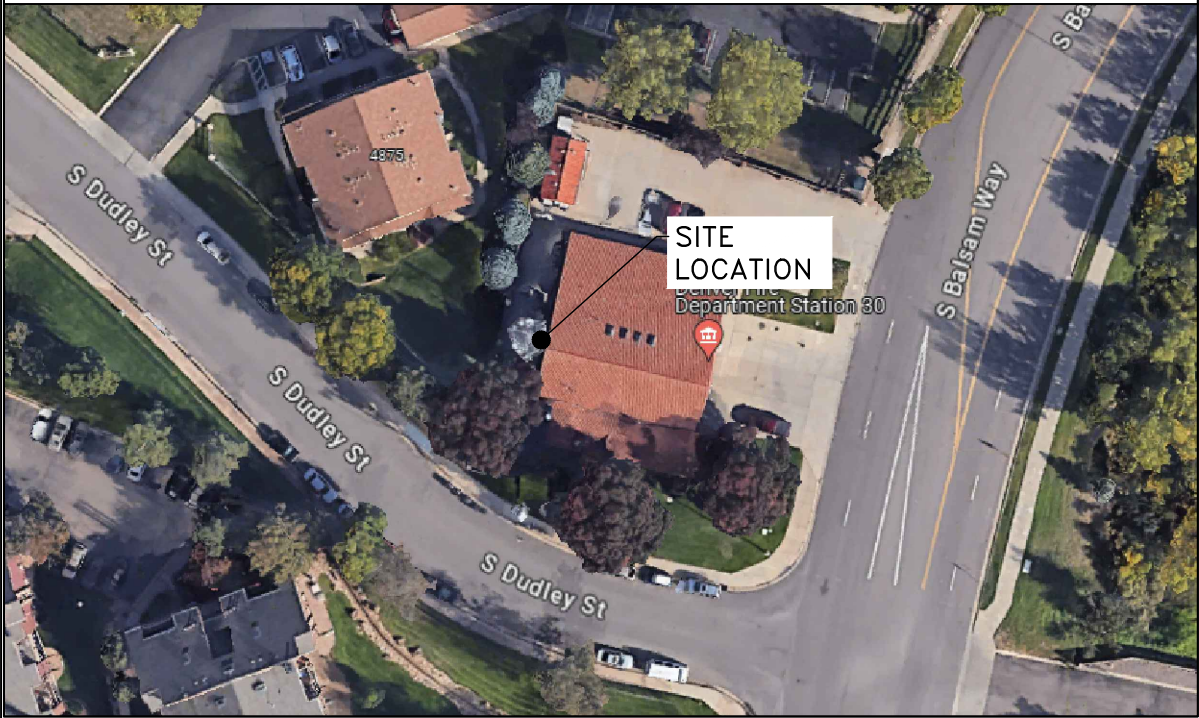
CONTACT: CLIFF ABERNATHY
EMAIL: CLIFF.ABERNATHY@TRYLON.COM

CODE COMPLIANCE

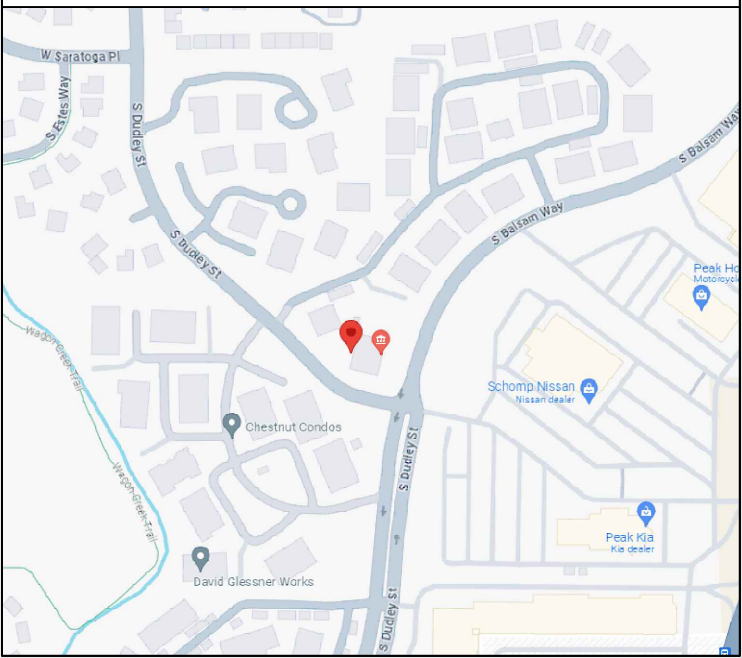
ALL WORK SHALL BE PERFORMED AND MATERIALS INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES:

- 2021 COLORADO BUILDING CODE (IBC 2021)
- 2021 COLORADO MECHANICAL CODE (IMC 2021)
- 2023 COLORADO ELECTRICAL CODE (NFPA 70, 2023)
- 2021 COLORADO PLUMBING CODE (IPC 2021 W/ AMENDMENTS)
- 2021 COLORADO FIRE CODE (IFC 2021)

AERIAL MAP



VICINITY MAP



A/E DOCUMENT REVIEW STATUS

TITLE		SIGNATURE	DATE
PROPERTY OWNER:			
SITE ACQUISITION:			
CONSTRUCTION MANAGER:			
ZONING:			
RF ENGINEER:			
STATUS CODE:			
1		ACCEPTED: WITH OR NO COMMENTS, CONSTRUCTION MAY PROCEED	
2		NOT ACCEPTED: RESOLVE COMMENTS AND RESUBMIT	
ACCEPTANCE DOES NOT CONSTITUTE APPROVAL OF DESIGN, CALCULATIONS, ANALYSIS, TEST METHODS OF MATERIALS DEVELOPED OR SELECTED BY THE SUBCONTRACTOR AND DOES NOT RELIEVE SUBCONTRACTOR FROM FULL COMPLIANCE WITH CONTRACTUAL OBLIGATIONS.			



Know what's below.
Call before you dig.

TO OBTAIN LOCATION OF PARTICIPANTS UNDERGROUND FACILITIES BEFORE YOU DIG IN COLORADO, CALL COLORADO 811
TOLL FREE: 1-800-922-1987 OR
www.co811.org
COLORADO STATUTE REQUIRES MIN OF 2 WORKING DAYS NOTICE BEFORE YOU EXCAVATE

PROJECT DESCRIPTION

VERIZON PROPOSES TO MODIFY AN EXISTING WIRELESS INSTALLATION. THE SCOPE WILL CONSIST OF THE FOLLOWING:
PMI - EVERY SITE REQUIRES A PMI SUBMISSION TO THE EOR FOR THE FINAL ANTENNA PLACEMENT

TOWER SCOPE:

- INSTALL (4) ANTENNAS (1) PER ALPHA AND BETA, (2) PER GAMMA SECTOR
- INSTALL (1) HYBRID
- INSTALL (1) OVP 6
- INSTALL (1) SITE PRO-1 SCX1-K CROSSOVER PLATE W/ 2" STD. (2.375" O.D) SCH. 40 PIPE, 4'-0" LONG (1 TOTAL)RETAIN (12) ANTENNAS
- RETAIN (9) RRH'S
- RETAIN (2) OVP 12
- RETIAN (2) HYBRID

GROUND WORK SCOPE:

- RETAIN (1) OVP 12
- RETAIN (1) OVP 6
- INSTALL (1) OVP 6

DRAWING INDEX

SHEET # SHEET DESCRIPTION

T-1	TITLE SHEET
GN-1	GENERAL NOTES I
GN-2	GENERAL NOTES II
Z-1	SITE PLAN
Z-2	COMPOUND PLAN
Z-3	TOWER ELEVATION VIEW
Z-4	ANTENNA LAYOUT
Z-5	ANTENNA SCHEDULE

1. GENERAL REQUIREMENTS

A. PURPOSE AND INTENT

- THE DRAWING AND SPECIFICATION ARE INTENDED TO BE FULLY EXPLANATORY AND SUPPLEMENTARY, HOWEVER, SHOULD ANYTHING BE SHOWN, INDICATED, OR SPECIFIED ON ONE AND NOT THE OTHER, IT SHALL BE DONE THE SAME AS IF DISCREPANCIES BETWEEN REQUIREMENTS SHOWN IN BOTH, THE MORE STRINGENT REQUIREMENTS SHALL APPLY.
- THE INTENTION OF THE DOCUMENT IS TO INCLUDE ALL LABOR AND MATERIALS REASONABLY NECESSARY FOR THE PROPER EXECUTION AND COMPLETION OF THE WORK AS STIPULATED IN THE CONTRACT.

B. CONFLICTS

- VERIFY ALL MEASUREMENTS AT THE SITE BEFORE ORDERING MATERIAL OR DOING ANY WORK, NO EXTRA CHARGE OR COMPENSATION WILL BE ALLOWED DUE TO DIFFERENCES BETWEEN ACTUAL DIMENSIONS OR DIMENSIONS SHOWN ON PLANS SUBMIT NOTICE OF ANY DISCREPANCY IN DIMENSIONS OR OTHERWISE TO VERIZON FOR RESOLUTION BEFORE PROCEEDING WITH THE WORK.
- NO PLEA OF IGNORANCE OF CONDITIONS THAT EXIST, OR OF DIFFICULTIES OR CONDITIONS THAT MAY BE ENCOUNTERED, OR OF ANY OTHER RELEVANT MATTER CONCERNING THE EXECUTION OF THE WORK WILL BE ACCEPTED AS AN EXCUSE FOR ANY FAILURE OR OMISSION ON THE PART OF THE CONTRACTOR TO FULFILL EVERY DETAIL OF ALL THE REQUIREMENTS OF THE CONSTRUCTION DOCUMENTS GOVERNING THE WORK.

C. CLEANING

- KEEP THE SITE FREE FROM ACCUMULATION OF WASTE AND RUBBISH CAUSED BY EMPLOYEES AT THE COMPLETION OF THE WORK, REMOVE ALL WASTE AND NON-CONSTRUCTION MATERIAL INCLUDING ALL CONTRACT TOOLS, SCAFFOLDING, AND SURPLUS MATERIAL AND LEAVE SITE CLEAN AND READY FOR USE.

D. CODES

- CONTRACTOR SHALL BE RESPONSIBLE FOR FOLLOWING ALL LAWS, REGULATIONS, AND RULES PROMULGATED BY FEDERAL STATE AND LOCAL AUTHORITIES WITH JURISDICTION OVER THE SALTIER. THIS RESPONSIBILITY IS IN EFFECT REGARDLESS OF WEATHER THE LAW, ORDINANCE, REGULATION OR RULE IS MENTIONED IN THESE SPECIFICATIONS.

E. LICENSING

- CONTRACTOR SHALL HAVE AND MAINTAIN A VALID CONTRACTOR'S LICENSE FOR THE LOCATION IN WHICH THE WORK IS TO BE PERFORMED. FOR JURISDICTIONS THAT LICENSE INDIVIDUAL TRADES, THE TRADESMAN OR SUBCONTRACTOR PERFORMING THOSE SHALL BE LICENSED, RESEARCHED AND COMPLY WITH THE LICENSING LAWS, PAY LICENSE FEES, AND SELECT AND INFORM SUBCONTRACTORS REGARDING THESE LAWS.

F. OSHA

- FOLLOW ALL APPLICABLE RULES AND REGULATIONS OF THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATIONS AND STATE LAWS BASED IN THE FEDERAL OCCUPATION SAFETY AND HEALTH ACT. THESE REGULATIONS INCLUDE, BUT ARE NOT LIMITED TO, REGULATIONS DEALING WITH TOWER CONSTRUCTION AND SAFETY, EXCAVATION AND TRENCHING, AND WORK IN CONFINED SPACES. ENSURE THAT EMPLOYEES AND SUBCONTRACTORS WEAR HARD HATS AT ALL TIMES DURING CONSTRUCTION.

G. PHOTOS

- PROVIDE PHOTOGRAPHIC EVIDENCE OF ALL FOUNDATION INSTALLATIONS, GROUNDING, AND TRENCHING AFTER PLACEMENT OF UTILITIES PRIOR TO BACKFILL.

H. BUILDING PERMITS

- CONTRACTOR WILL SUBMIT CONSTRUCTION DOCUMENTS TO THE JURISDICTIONAL AUTHORITY FOR PLAN CHECK AND REVIEW. CONTRACTOR WILL SUBMIT LICENSING AND WORKMAN'S COMPENSATION INFORMATION TO THE JURISDICTION AS REQUIRED TO OBTAIN THE BUILDING PERMIT, CONTRACTOR SHALL COORDINATE AND SCHEDULE REQUIRED INSPECTIONS AND POST REQUIRED PERMITS AT THE JOB SITE COMPLY WITH SPECIFIC PROJECT RELATED REQUESTS AND SUGGESTIONS MADE BY BUILDING INSPECTOR, AND INFORM CONSTRUCTION MANAGER OF ANY SUCH WORK THAT MAY BE BEYOND THE SCOPE OF THE CONTRACT OR DEVIATE FROM THE CONSTRUCTION DOCUMENT. VERIZON WILL REIMBURSE THE CONTRACTOR FEES FOR PLAN REVIEW, BUILDING PERMIT, CONNECTIONS, AND INSPECTIONS. (INCLUDED IN THE BASE PROPOSAL).

I. ZONING REGULATIONS AND CONDITIONAL USE PERMITS

- CONTRACTOR WILL SUBMIT ALL ZONING AND CONDITIONAL USE PERMITS. SOME USE PERMITS MAY HAVE SPECIFIC REQUIREMENTS FOR THE SITE RELATED TO CONSTRUCTION, SUCH AS NOISE REGULATIONS, HOURS OF WORK, ACCESS LIMITATIONS, ETC. THE CONSTRUCTION MANAGER WILL INFORM THE CONTRACTOR OF THESE REQUIREMENTS AT THE PRE-BID MEETING OR AS SHOWN IN THE CONSTRUCTION DOCUMENTS.

J. FAA PERMIT AND TOWER LIGHTING

- REFER TO CONSTRUCTION DOCUMENTS AND CONSTRUCTION MANAGER FOR FAA AND STATE LIGHTING REQUIREMENTS. CONTRACTOR SHALL PROVIDE TEMPORARY FM APPROVED LIGHTING UNTIL PERMANENT LIGHTING IS OPERATIONAL.

K. TOWER SECURITY

- IF REQUIRED, TOWER MUST BE FENCED, TEMPORARILY OR PERMANENTLY WITHIN 24 HOURS OF ERECTION. DO NOT ALLOW THE GATE ACCESSING THE TOWER AREA TO REMAIN OPEN OR UNATTENDED ANY TIME FOR ANY REASON. KEEP THE GATE CLOSED AND LOCKED WHEN NOT IN USE.

L. SITE CONTROL

- THE CONTRACTOR IS COMPLETELY RESPONSIBLE FOR CONTAINMENT OF SEDIMENT AND CONTROL OF EROSION AT THE SITE. ANY DAMAGE TO ADJACENT OR DOWNSTREAM PROPERTIES WILL BE CORRECTED BY THE CONTRACTOR AT NO EXPENSE TO VERIZON.
- THE CONTRACTOR IS TO MAINTAIN ADEQUATE DRAINAGE AT ALL TIMES. DO NOT ALLOW WATER TO STAND OR POND. ANY DAMAGE TO STRUCTURES OR WORK ON THE SITE CAUSED BY INADEQUATE MAINTENANCE OF DRAINAGE PROVISIONS WILL BE THE RESPONSIBILITY OF THE CONTRACTOR AND ANY COST ASSOCIATED WITH REPAIRS FOR SUCH DAMAGE WILL BE AT THE CONTRACTOR'S EXPENSE.
- ALL WASTE MATERIAL SHALL BE PROPERLY DISPOSED OF OFF-SITE OR AS DIRECTED BY CONSTRUCTION MANAGER AND IN ACCORDANCE WITH JURISDICTIONAL AUTHORITIES.

M. LIVESTOCK PROTECTION

- PROTECT AND SECURE LIVESTOCK. MAINTAIN AND SECURE EXISTING PERIMETER FENCE AND/OR GATE ENCLOSURES.

2. SITE PREPARATION

A. SCOPE OF WORK INCLUDES

- PROTECTION OF EXISTING TREES, VEGETATION AND LANDSCAPING MATERIALS WHICH MIGHT BE DAMAGED BY CONSTRUCTION ACTIVITIES.
- TRIMMING OF EXISTING TREES AND VEGETATION AS REQUIRED FOR PROTECTION DURING CONSTRUCTION ACTIVITIES.
- CLEANING AND GRUBBING OF STUMPS, VEGETATION, DEBRIS, RUBBISH, DESIGNATED TREES AND SITE IMPROVEMENTS.
- TOPSOIL STRIPPING AND STOCKPILING.
- TEMPORARY EROSION CONTROL, SILTATION CONTROL, AND DUST CONTROL CONFORMING TO LOCAL REQUIREMENTS AS APPLICABLE.
- TEMPORARY PROTECTION OF ADJACENT PROPERTY, STRUCTURES, BENCHMARKS, AND MONUMENTS.
- PROTECTION AND TEMPORARY RELOCATION, STORAGE AND RE-INSTALLATION OF EXISTING FENCE AND OTHER SITE IMPROVEMENTS SCHEDULED FOR RE-USE.
- REMOVAL AND DISPOSAL OF CLEARED MATERIALS.

B. PRODUCTS AND MATERIALS (AS APPROVED BY CONSTRUCTION MANAGER OR AS NOTED IN CONSTRUCTION DOCUMENTS)

- MATERIALS USED FOR TREE PROTECTION, EROSION CONTROL, SILTATION CONTROL, AND DUST CONTROL.

3. EARTHWORK

A. SCOPE OF WORK INCLUDES

- EXCAVATION, TRENCHING, FILLING, COMPACTION, AND GRADING FOR STRUCTURES, SITE IMPROVEMENTS AND UTILITIES.
- MATERIALS FOR SUB-BASE, DRAINAGE, BACKFILL AND GRAVEL FOR SLABS, PAVEMENT AND IMPROVEMENTS.
- ROCK EXCAVATION WITHOUT BLASTING.
- SUPPLY OF ADDITIONAL MATERIALS FOR OFFSITE AS REQUIRED.
- REMOVAL AND LEGDK DISPOSAL OF EXCAVATED MATERIAL AS REQUIRED.

B. QUALITY ASSURANCE

- COMPACTION
 - UNDER STRUCTURES, BUILDING SLABS, PAVEMENTS AND WALKWAYS WILL OBTAIN A 95% COMPACTION AT A MINIMUM DRY DENSITY AS DETERMINED BY ASTM 0-1557 OR WITH PLUS OR MINUS 3% OF THE MOISTURE CONTENT.
- GRADING TOLERANCES OUTSIDE BUILDING LINES
 - LAWNS, UNPAVED AREAS AND WALKS PLUS OR MINUS 1 INCH.
- UNDER PAVEMENTS PLUS OR MINUS ½ INCH.
- GRADING TOLERANCES FOR FILL UNDER CONCRETE APPLICATIONS
 - PLUS OR MINUS ½ INCH MEASURED WITH 10 FOOT STRAIGHT EDGE.

C. PRODUCTS AND MATERIALS (AS APPROVED BY CONSTRUCTION MANAGER OR AS NOTED IN CONSTRUCTION DOCUMENTS)

- SUB-BASE MATERIAL: GRADED MIXTURE OF NATURAL OR CRUSHED GRAVEL, CRUSHED STONE OR SLAG, AND NATURAL SAND.
- WASHED MATERIAL, EVENLY GRADED MIXTURE OF CRUSHED STONE OR GRAVEL WITH 95% PASSING A 1-1/2 INCH SIEVE.
- GRADING MATERIAL WILL CONSIST OF SATISFACTORY NATIVE OR IMPORTED SOIL MATERIALS FREE OF CLAY, ROCK OR GRAVEL NOT LARGER THAN 2 INCHES IN ANY DIMENSION, DEBRIS, WASTE, FROZEN MATERIALS AND OTHER UNSUITABLE MATERIALS WILL NOT BE ALLOWED FOR USE. IMPORTED MATERIALS SHALL HAVE A CLAY CONTENT OF NO MORE THAN 5%.
- GRAVEL MATERIAL: EVENLY GRADED MIXTURE OF CRUSHED STONE OR GRAVEL WITH 95% PASSING A 1-1/2 INCH SIEVE.
- GEOTEXTILE FABRIC: AS PER CONSTRUCTION DOCUMENTS.

D. CLEARING AND GRUBBING

- REMOVE ALL VEGETATION AND MATERIALS AS REQUIRED. REMOVE STUMPS COMPLETELY UNDER FOUNDATIONS AND ROADWAYS. DISPOSE OF CLEARING AND GRUBBING OFF-SITE OR IN AN ON-SITE LOCATION APPROVED BY CONSTRUCTION MANAGER.

E. STRIPPING

- STRIP NOT LESS 3 INCHES OF SOD AND TOPSOIL FROM AREAS THAT WILL UNDERLAY GRAVEL, PAVEMENT, NEW STRUCTURES OR EMBANKMENTS. STOCKPILE STRIPPING ON-SITE FOR RE-USE AND FINAL LANDSCAPING.

F. EMBANKMENT

- CONSTRUCT EMBANKMENT TO THE LINES AND GRADES SHOWN ON THE DRAWING.
- CONSTRUCT EMBANKMENT FROM ON-SITE EXCAVATION MATERIAL WHEN SUITABLE. USE IMPORTED BACKFILL ONLY AFTER AVAILABLE ON-SITE EXCAVATION MATERIAL HAS BEEN USED.
- CONSTRUCT IN LIFTS OF NOT MORE THAN 12 INCHES IN LOOSE DEPTH. THE FULL WIDTH OF THE CROSS SECTION SHALL BE BROUGHT UP UNIFORMLY.
- MATERIAL SHALL BE PLACED IN LAYERS AND SHALL BE NEAR OPTIMUM MOISTURE CONTENT BEFORE ROLLING TO OBTAIN THE PRESCRIBED COMPACTION. WETTING OR DRYING OF THE MATERIAL AND MANIPULATION TO SECURE A UNIFORM MOISTURE CONTENT THROUGHOUT THE LAYERS MAY BE REQUIRED. SUCH OPERATIONS SHALL BE INCLUDED IN THE APPROPRIATE BID ITEM. SHOULD THE MATERIAL BE TOO WET TO PERMIT PROPER COMPACTION, IT IS THE CONTRACTOR'S RESPONSIBILITY TO UTILIZE MATERIAL WITH AN ACCEPTABLE MOISTURE CONTENT.
- DO NOT PLACE FROZEN MATERIAL IN THE EMBANKMENT AND DO NOT PLACE EMBANKMENT MATERIAL UPON FROZEN MATERIAL.
- CONTRACTOR SHALL BE RESPONSIBLE FOR THE STABILITY OF EMBANKMENTS AND THE REPLACEMENT OF ANY PORTION WHICH HAS BECOME DISPLACED DUE TO CONTRACTOR'S OPERATIONS.
- START LAYERS IN THE DEEPEST PORTION OF THE FILL AND AS PLACEMENT PROGRESSES, CONSTRUCT LAYERS APPROXIMATELY PARALLEL TO THE FINISH GRADE LINE.
- ROUTE EQUIPMENT BOTH LOADED AND EMPTY, OVER THE FULL WIDTH OF THE EMBANKMENT TO ENSURE UNIFORMITY OF MATERIAL PLACEMENT.
- COMPACT EMBANKMENT UNDERLYING NEW GRAVEL PAVING, FLOOR SLABS AND STRUCTURES TO BE 95% COMPACTION AT A MINIMUM DRY DENSITY AS DETERMINED BY ASTM 0-1557 OR WITHIN PLUS OR MINUS 3% OF OPTIMUM MOISTURE CONTENT. COMPACT NON-STRUCTURAL AREA EMBANKMENTS TO A MINIMUM OF 90% OF ASTM 0-1557.

G. SITE GRADING

- USING ON-SITE EXCAVATION MATERIAL, SHAPE, TRIM, FINISH AND COMPACT SURFACE AREAS TO CONFORM TO THE LINES, GRADES AND CROSS SECTIONS SHOWN ON THE DRAWING OR AS DESIGNATED BY THE CONSTRUCTION MANAGER.
- GRADE SURFACES TO DRAIN AND ELIMINATE ANY PONDING OR EROSION.
- ELIMINATE WHEEL RUTS BY REGRADING.
- COMPACT AREAS OF UNDERLYING NEW GRAVEL, PAVING, FLOOR SLABS AND STRUCTURES TO BE AT 95% COMPACTION AT A MAXIMUM DRY DENSITY AS DETERMINED BY THE ASTM 0-1557 OR WITHIN PLUS OR MINUS 3% OF OPTIMUM MOISTURE CONTENT.
- CONSTRUCT FINISH SURFACE OF SITE GRADING AREAS WITHIN 1 INCH FROM SPECIFIED GRADE.

H. SUBGRADE PREPARATION

- SHAPE TOP OF SUBGRADE TO THE LINES AND GRADES SHOWN ON THE DRAWINGS.
- MAINTAIN TOP OF SUBGRADE IN A FREE-DRAINING CONDITION.
- DO NOT STOCK PILE MATERIAL ON TOP OF SUBGRADE UNLESS AUTHORIZED BY CONSTRUCTION MANAGER.
- COMPACT THE TOP 12 INCHES OF SUBGRADE TO A 95% COMPACTION AT A MAXIMUM DRY DENSITY AS DETERMINED BY ASTM 0-1557 OR WITHIN PLUS OR MINUS 3% OF THE OPTIMUM MOISTURE CONTENT.
- CONSTRUCT TOP OF SUBGRADE WITHIN 1 INCH OF ESTABLISHED GRADE AND CROSS SECTION.

I. GEOTEXTILE FABRIC

- LAY GEOTEXTILE FABRIC OVER COMPACTED SUBGRADE IN THE COMPOUND AREA AND UNDER LENGTH OF ROAD (WHEN REQUIRED). LAP ALL JOINTS TO A MINIMUM OF 36 INCHES.

J. GRAVEL SURFACING

- CONSTRUCT GRAVEL SURFACING AREAS USING CRUSHED AGGREGATE BASE AND FINISH COURSES AS SPECIFIED BY CONSTRUCTION MANAGER. SPREAD GRAVEL AND RAKE TO OBTAIN A UNIFORM SURFACE AREA.

K. LANDSCAPING

- FURNISH, INSTALL AND MAINTAIN LANDSCAPE WORK AS SHOWN AND/OR REQUIRED WITHIN THE CONSTRUCTION DOCUMENTS OR AS SPECIFIED IN THE CONSTRUCTION SPECIFICATIONS.

L. CONCRETE FORM WORK

- FORMS: SMOOTH AND FREE OF SURFACE IRREGULARITIES. UTILIZE FORM RELEASE AGENTS.
- CHAMFER EXPOSED EDGES OF ALL TOWER FOUNDATION SHALL RECEIVE A ¾ INCH BY ¾ INCH 45 DEGREE CHAMFER. OTHER EXPOSED EDGES SHALL RECEIVE A TOOLED RADIUS FINISH.
- UPON COMPLETION, REMOVE ALL FORMS INCLUDING THOSE CONCEALED OR BURIED.
- REFER TO STRUCTURAL DRAWINGS FOR ADDITIONAL REQUIREMENTS.

4. GENERAL NOTES

- IT IS THE CONTRACTOR'S RESPONSIBILITY TO EXAMINE ALL PLAN SHEETS AND SPECIFICATIONS AND COORDINATE HIS WORK WITH THE WORK OF ALL OTHER CONTRACTORS TO ENSURE THAT WORK PROGRESSION IS NOT INTERRUPTED.
- THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING A NEAT AND ORDERLY SITE, YARD AND GROUNDS. CONTRACTOR SHALL REMOVE AND DISPOSE OFF SITE ALL RUBBISH, WASTE MATERIAL, LITTER AND ALL FOREIGN SUBSTANCES. REMOVE PETROCHEMICAL SPILLS, STAINS AND OTHER FOREIGN DEPOSITS. RAKE GROUND TO A SMOOTH EVEN-TEXTURED SURFACE.
- THE PLANS SHOW SOME KNOWN SUBSURFACE STRUCTURE ABOVE GROUND STRUCTURES AND/OR UTILITIES BELIEVED TO EXIST IN THE WORKING AREA, EXACT LOCATION OF WHICH MAY VARY FROM THE LOCATION INDICATED. IN PARTICULAR THE CONTRACTOR IS WARNED THAT THE EXACT OR EVEN APPROXIMATE LOCATION OF SUCH PIPELINES, SUBSURFACE STRUCTURES AND/OR UTILITIES IN THE AREA MAY BE SHOWN OR MAY NOT BE SHOWN AND IT SHALL BE HIS RESPONSIBILITY TO PROCEED WITH GREAT CARE IN 48 HOURS BEFORE YOU DIG, DRILL OR BLAST CALL LOCAL UTILITIES LOCATOR COMPANY.
- THE OWNER OR OWNER'S REPRESENTATIVE SHALL BE NOTIFIED IN WRITING OF ANY CONDITIONS THAT VARY FROM THOSE SHOWN ON THE PLANS. THE CONTRACTOR'S WORK SHALL NOT VARY FROM THE PLANS WITHOUT THE EXPRESSED APPROVAL OF THE OWNER OR THE OWNER'S REPRESENTATIVE.
- THE CONTRACTOR IS INSTRUCTED TO COOPERATE WITH ANY AND ALL OTHER CONTRACTORS PERFORMING WORK ON THE SITE DURING THE PERFORMANCE OF THIS CONTRACT.
- THE CONTRACTOR SHALL RESTORE ALL DAMAGED, PUBLIC OR PRIVATE PROPERTY TO AT LEAST AS GOOD OF CONDITION AS BEFORE DISTURBED AS DETERMINED BY THE OWNER OR OWNER'S REPRESENTATIVE.
- THE CONTRACTOR SHALL COMPLY WITH ALL REQUIRED PERMITS.
- THE CONTRACTOR SHALL PROTECT EXISTING PROPERTY LINE MONUMENTATION. ANY MONUMENTATION DISTURBED OR DESTROYED, AS JUDGED BY THE OWNER OR OWNER'S REPRESENTATIVE, SHALL BE REPLACED.
- ALL TRENCH EXCAVATION AND ANY REQUIRED SHEETING AND SHORING SHALL BE DONE IN ACCORDANCE WITH OSHA REGULATIONS FOR CONSTRUCTION.
- CONTRACTOR SHALL BE RESPONSIBLE FOR DEWATERING AND THE MAINTENANCE OF SURFACE DRAINAGE DURING THE COURSE OF WORK.
- ALL UTILITY WORK INVOLVING CONNECTIONS TO EXISTING SYSTEMS SHALL BE COORDINATED WITH THE OWNER OR OWNER'S REPRESENTATIVE BEFORE EACH AND EVERY CONNECTION TO EXISTING SYSTEMS IS MADE.
- MAINTAIN FLOW FOR ALL EXISTING UTILITIES
- ALL SITE FILL SHALL MEET SELECTED FILL STANDARDS AS DEFINED BY THE OWNER OF OWNER'S REPRESENTATIVE ON THE DRAWINGS OR GEOTECHNICAL REPORT RECOMMENDATIONS.
- CONTRACTOR TO GRADE ALL AREAS OF THE SITE TO PROVIDE POSITIVE DRAINAGE AWAY FROM THE BUILDING OR EQUIPMENT PAD AND THE TOWER.
- IF NECESSARY, THE CONTRACTOR IS RESPONSIBLE FOR REPAIRING AND REGRADING ROADWAY AND ANY DISTURBED AREAS FOLLOWING INSTALLATION OF UTILITIES.
- NO COMMERCIAL MESSAGES TO BE DISPLAYED ON TOWER
- WATER AND SEWER SERVICES ARE NOT REQUIRED FOR THE DEVELOPMENT
- THE CONTRACTOR SHALL FURNISH AND INSTALL ALL MATERIAL UNLESS OTHERWISE NOTED.
- ELECTRICAL DRAWINGS HAVE BEEN REVIEWED AND SEALED FOR STRUCTURAL PURPOSES ONLY.



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SUBMITTALS			
REV	DATE	DESCRIPTION	BY
A	08/07/24	PRELIMINARY	SHA
0	08/30/24	FINAL	SHA
1	10/22/24	FINAL	DAB



PROJECT TITLE

MDG: 5000108160

MARSTON PARK

4898 SOUTH DUDLEY STREET
DENVER, CO 80123

SHEET DESCRIPTION

GENERAL NOTES I

SHEET NO.

GN—1

ANTENNA CREW

- REVIEW ANTENNA SCHEDULE WITH CELL TECH
- FOR EACH SECTOR, LAY ANTENNAS OUT ON THE GROUND AS THEY WILL BE INSTALLED ACCORDING TO THE ANTENNA SCHEDULE
- LABEL EACH ANTENNA WITH FACE AND POSITION WITH A SHARPIE (EX: "ALPHA-4")
- LABEL ALL MOTORS WITH SHARPIE WITH BAND AND TECHNOLOGY (EX: "700LTE", "AWSLTE", "PCSLTE", "850VOICE", ETC)
- CONNECT ALL AISG CABLES (INCLUDING JUMPERS THAT WILL BE USED IN FINAL ASSEMBLY) PER THE ANTENNA SCHEDULE
 - WHEN DAISY CHAINING IS INEVITABLE, AS A GENERAL RULE
 - KEEP LOW AND HIGH BANDS ON SEPARATE AISG CHAINS AS MUCH AS POSSIBLE
 - MINIMIZE AMOUNT OF MOTORS PER CHAIN AS MUCH AS POSSIBLE
 - WHEN COMPLETED ALL RET MOTOR PORTS NEED TO BE CONNECTED, INCLUDING THE MOTORS NOT BEING USED YET. THE ONLY UNUSED PORT WILL BE THE LAST IN THE DAISY CHAIN, WHICH NEEDS TO BE CAPPED AND WEATHERPROOFED.
- ON LAPTOP, FILL OUT THE SOFTCOPY OF THE RET DEPLOYMENT FROM AND SAVE IT, REPLACING THE "#####" WITH THE 6-DIGIT ENB NUMBER IN THE FILENAME (EX: RET DEPLOYMENT FORM_0981234.XLSX")
- GIVE A SOFTCOPY OF THE RET DEPLOYMENT FORM TO VZW CELL TECH AND GC/CONSULTANT (EITHER BY EMAIL OR USB STICK)
- USING THE SAME LAPTOP WITH HAS THE RET DEPLOYMENT FORM OPENED, CONNECT THE CONTROL MODULE AND PROVISION EACH MOTOR RESPECTIVELY (NOTE: CREWS MUST USE SOFTWARE THAT IS SPECIFIC TO THE MOTOR TYPE BEING PROVISIONED (IE-JMA SOFTWARE SHOULD ONLY BE USED FOR JMA MOTORS)
 - COPY AND PASTE "RET FRIENDLY NAME" FROM SPREADSHEET (COLUMN A) TO THE "SECTOR ID" FIELD OF EACH MOTOR
 - POPULATE "SET RET TILT"
 - POPULATE "MECHANICAL TILT"
- CALIBRATE ALL MOTORS
- DISCONNECT NECESSARY AISG JUMPERS TO TRANSPORT ANTENNAS SAFELY TO ASSEMBLY
- INSTALL ANTENNAS ACCORDING TO THE ANTENNA SCHEDULE, USING THE SHARPIE LABELS AS REFERENCE
- RECONNECT ALL AISG JUMPERS
- BEFORE PLUGGING INTO EACH RRH, CONNECT MAIN AISG CABLE INTO CONTROLLER TO ENSURE ALL MOTORS ARE STILL SEEN IN THE DAISY CHAIN
- PLUG AISG INTO RRH AND NOTIFY VZW TECH OF COMPLETION

VERIZON TECH

- POWER ON RADIO EQUIPMENT AND RUN ANY NECESSARY WOS
- "DISCOVER" THE RETS
 - LOG INTO SAM
 - VERIFY RET LICENSE ALLOCATION IN SAM
 - ENBEQUIPMENT>ENB>ACTIVATIONSERVICE>IS AISGALLOWED=CHECKED
 - LOG INTO NEM LOCAL
 - GO TO TREE VIEW AND HIGHLIGHT RET SUBUNIT
 - ENABLE BUS SCAN
 - CONFIGURATION>ENABLE AISG BUS SCAN
 - ALLOCATE CONFIG RIGHTS
 - CONFIGURATION>ALLOCATION CONFIGURATION RIGHTS
 - VERIFY CORRECT NUMBER OF RET ARE DISCOVERED
 - "COMMISSION" THE RETS
 - LOG INTO NEM LOCAL
 - STILL IN TREE VIEW, RIGHT CLICK ON "HW MODULES"
 - SELECT "CREATE RET MO"
 - RELEASE CONFIG RIGHTS
 - CONFIGURATION>RELEASE CONFIGURATION RIGHTS
 - VERIFY RETSUBUNIT:SECTORNAME, ELECTRICAL TILT, AND MECHANICAL TILT ARE POPULATED
 - "PROVISION" THE RETS
 - LOG INTO SAM
 - OPEN THE ENB PROPERTIES AND COMPLETE A FULL RESYNC
 - IN THE SEARCH TEXT BOX, SEARCH FOR "RETSUBUNIT"
 - VERIFY ALL RETS ARE ACCOUNTED FOR AND "RETSUBUNIT:SECTORNAME", "ANTENNAELECTRICALTILT", AND "RETSUBUNIT:MECHANICALTILT" ARE ACCURATE

POST-MODIFICATION INSPECTION (PMI) REQUIREMENT

- PMI REQUIRED FOR ALL SITES, REFER TO VERIZON NSTD-446 SECTIONS 1.5 AND 2.3 FOR MORE INFORMATION
- REFER TO MOUNT ANALYSIS (UNLESS FLAGPOLE) BY XXX DATED XXX FOR ADDITIONAL DETAILS
- GENERAL CONTRACTOR SHALL PROVIDE THE BELOW DOCUMENTATION TO THE ENGINEER OF RECORD VIA EMAIL TO COLLIERS SMART TOOL TEAM, DROPBOX, OR OTHER FILESHARE METHOD. PROVIDE HIGH RESOLUTION PHOTOS (DO NOT COMPRESS).
- ENGINEER OF RECORD WILL CONDUCT A REVIEW OF THE PROVIDED DOCUMENTS TO PREPARE A PMI REPORT. ENGINEER OF RECORD WILL NOTIFY GENERAL CONTRACTOR IF ANY ADDITIONAL DOCUMENTATION IS REQUIRED TO COMPLETE THE PMI.
- PMI DOCUMENTATION SHALL BE SUFFICIENT TO CONFIRM THE UPGRADE WAS BUILT AS DESIGNED, INCLUDING CHANGES AND STRUCTURAL MODIFICATIONS, AND IS IN ADDITION TO ANY OTHER REQUIRED CLOSEOUT PACKAGE DOCUMENTATION
- REQUIRED DOCUMENTATION FOR PMI INCLUDES THE FOLLOWING AT A MINIMUM. REFER TO THE MOUNT ANALYSIS (UNLESS FLAGPOLE) FOR POSSIBLE ADDITIONAL INFORMATION. IF STRUCTURAL MODIFICATIONS ARE REQUIRED, REFER TO THE MODIFICATIONS DRAWINGS FOR POSSIBLE ADDITIONAL REQUIREMENTS.
 - PROVIDE PRE-AND-POST CONTRUCTION PHOTOS OF EACH SECTOR FROM THE MOUNT ELEVATION AND THE GROUND. CONTRACTOR IS RESPONSIBLE FOR ENSURING THE PHOTOS PROVIDED PROVIDE POSITIVE CONFIRMATION THAT THE MODIFICATION/UPGRADE WAS COMPLETED IN ACCORDANCE WITH THESE CONSTRUCTION DRAWINGS AND ANY STRUCTURAL/MOUNT MODIFICATIONS DRAWINGS. CONTRACTOR SHALL RELAY ANY DATA THAT CAN IMPACT THE PERFORMANCE OF THE MOUNT OR MOUNT MODIFICATION, INCLUDING SAFETY ISSUES. PHOTOS SHALL HAVE A DATE/TIME STAMP IN THE PHOTO. REFER TO THE MOUNT ANALYSIS FOR FILE STRUCTURE SCHEDULE OF PHOTOS. PROVIDE PHOTOS OF THE GATE SIGNS AND CARRIER SHELTER TO IDENTIFY THE TOWER OWNER, SITE NAME, SITE NUMBER, ETC.
 - VERIFICATION OF THE MEMBER CONNECTION, BRACING, AND RELEVANT DIMENSIONS
 - VERIFICATION OF THE ANTENNA AND OTHER EQUIPMENT CONFIGURATION (PHOTOS OF MODEL NUMBERS/TAGS FOR ALL EQUIPMENT, AS WELL AS THE FEEDLINE CONFIGURATION). TAKE PHOTOS OF THE BACK SIDE OF EACH SECTOR AS WELL AS CLOSE-UPS OF ALL EQUIPMENT. PHOTOS SHOULD CONFIRM THE HORIZONTAL AND VERTICAL POSITIONING OF THE ANTENNAS AND EQUIPMENT AND SHALL HAVE TAPE MEASURERS IN THE PHOTOS TO CONFIRM.
 - FOR TIE-BACKS, STRUTS, MOUNT PIPES, PHOTOS TO CONFIRM THE ANGLES AND LOCATION OF ATTACHMENT POINT AT BOTH ENDS OF MEMBER, AS WELL AS DIMENSIONS, THICKNESS, AND LENGTHS OF THE MEMBERS. REFER TO THE CHECKLIST IN THE MOUNT ANALYSIS (UNLESS FLAGPOLE) FOR ADDITIONAL INFORMATION
 - MOUNT ATTACHMENT TO THE SUPPORTING STRUCTURE, INCLUDING ANY KICKERS OR SUPPORTS, OR TIEBACKS
 - MATERIALS USED (TYPE, STRENGTH, DIMENSIONS, ETC.). PROVIDE BILL OF MATERIALS AND MATERIAL SPEC TO CONFIRM MATERIAL GRADES AND SIZES. PROVIDE DOCUMENTATION FOR GALVANIZATION OF MEMBERS WHETHER HOT-DIPPED OR COLD-GALVANIZED. IF MATERIALS DIFFER FROM THOSE SPECIFIED ON THE DRAWINGS, PROVIDE DOCUMENTATION THAT THE "EQUIVALENT" MATERIAL HAS THE SAME PROPERTIES
 - MOUNT ORIENTATION/AZIMUTHS AND ELEVATION. PROVIDE TAPE DROP PHOTOS OF ANTENNA CENTERLINE(S) AND MOUNT ATTACHMENT POINTS TO THE SUPPORTING STRUCTURE. IF THERE ARE MULTIPLE RAD CENTERS, PROVIDE PHOTOS OF ALL ELEVATIONS
 - VERIFICATION THAT THE INSTALL HAS NOT CAUSED DAMAGE TO OR UNPLANNED OBSTRUCTION OF THE FOLLOWING:
 - CLIMBING FACILITIES
 - SAFETY CLIMB IF PRESENT, INCLUDING PHOTOS ABOVE AND BELOW THE MOUNT
 - LIGHTING SYSTEM
 - OTHER INSTALLED SYSTEMS ON THE STRUCTURE
 - CONTRACTOR SHALL ENSURE THE SAFETY CLIMB IS SUPPORTED AND NOT ADVERSELY AFFECTED BY THE INSTALLATION OF NEW COMPONENTS. THIS MAY INVOLVE THE INSTALLATION OF WIRE ROPE GUIDES OR OTHER ITEMS TO PROTECT THE WIRE ROPE
 - OTHER ITEMS DETERMINED BY THE STRUCTURAL ENGINEER TO ENSURE THE MOUNT WILL PERFORM AS DESIGNED. PHOTOS OF RELEVANT MEASUREMENTS, WITH SUFFICIENT DETAILS TO CONFIRM CONNECTION DETAILS, PLACEMENT OF EQUIPMENT, WALL ANCHOR DETAILS, BALLAST QUANTITIES, STRUCTURAL MODIFICATIONS ETC. DIAMETER OF THICKNESS OF BOLTS/THREADED RODS/ANGLES/TUBES ETC SHALL HAVE PHOTOS CONFIRMING CALIPER MEASUREMENTS.
 - CONFIRMATION THAT ALL HARDWARE WAS PROPERLY INSTALLED, AND EXISTING HARDWARE WAS INSPECTED FOR AN ISSUES
 - FOR BALLAST SLEDS, DOCUMENTATION OF THE WEIGHT OF BALLAST IN EACH SECTOR
 - FOR WALL ANCHORS, PHOTOS AN MEASUREMENTS OF OUTSIDE AND INSIDE OF CONNECTIONS. DOCUMENTATION OF ADHESIVE USED, SIZE AND LENGTH OF ANCHORS, EFFECTIVE EMBEDMENT DEPTH OF THE ANCHORS, GROUTING OF HOLLOW WALLS, SPACING AND EDGE DISTANCE MEASUREMENTS, AND ANY THROUGH-BOLTS OR BACKING PLATES.
 - FOR STUD WELD CONNECTIONS, DOCUMENTATION TO CONFIRM SURFACE PREPARATION, STUD WELD SIZE, GRADE, LENGTH, AND SPACING
 - FOR FABRICATED PARTS, SHOP DRAWINGS TO BE APPROVED BY THE ENGINEER OF RECORD PRIOR TO CONSTRUCTION
 - FOR WELDED PARTS, CERTIFIED WELD INSPECTION
 - FOR BOLTED PARTS, BOLT INSTALLATION AND TORQUE.
 - CONTRACTOR SHALL PROVIDE, IN ADDITION TO THE ABOVE, AS-BUILT CDS WITH REDLINES IDENTIFYING AND CHANGES. THE AS-BUILTS SHALL CONTAIN THE CONTRACTOR'S NAME, PREPARER'S SIGNATURE, AND DATE.
 - IF THE MODIFICATION INSTALLATION WOULD FAIL THE PMI ("FAILED PMI"), THE CONTRACTOR SHALL WORK WITH THE ENGINEER OF RECORD TO COORDINATE A REMEDIATION PLAN IN ONE OF TWO WAYS:
 - CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE ORIGINAL CONTRACT DOCUMENTS AND COORDINATE A SUPPLEMENTAL PMI
 - OR, WITH THE EOR'S APPROVAL, THE GC MAY WORK WITH THE EOR TO RE-ANALYZE THE MODIFICATION/REINFORCEMENT/UPGRADE USING THE AS-BUILTS CONDITION
 - NOTE: IF LOADING IS DIFFERENT THAN THAT SHOWN IN THESE CONSTRUCTION DRAWINGS OR STRUCTURAL/MOUNT MODIFICATION DRAWINGS, CONTRACTOR SHALL NOTIFY THE ENGINEER OF RECORD IMMEDIATELY FOR RESOLUTION
 - THE ENGINEERING FIRM PERFORMING AN ANALYSIS SHALL PROVIDE A CONTRACTOR'S PHOTO LOG AN CHECKLIST TO BE COMPLETED BY THE INSTALLING CONTRACTOR. THE CONTRACTOR SHALL THEN PROVIDE POST-INSTALLATION INFORMATION TO THE STRUCTURAL ENGINEER. THE STRUCTURAL ENGINEER SHALL REVIEW THE DOCUMENTS FOR AN DEFICIENCIES THAT CAN BE DETERMINED FROM THE DESKTOP REVIEW OF THE DATA. THE ENGINEERING FIRM SHALL THEN PROVIDE DOCUMENTATION TO VZW THAT THE SITE IS COMPLETED, AND THE PMI REPORT IS APPROVED.



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SUBMITTALS			
REV	DATE	DESCRIPTION	BY
A	08/07/24	PRELIMINARY	SHA
0	08/30/24	FINAL	SHA
1	10/22/24	FINAL	DAB



PROJECT TITLE

MDG: 5000108160

MARSTON PARK

4898 SOUTH DUDLEY STREET
DENVER, CO 80123

SHEET DESCRIPTION

GENERAL NOTES II

SHEET NO.

GN-2



SITE PLAN

verizon

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smartlink

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A	08/07/24	PRELIMINARY	SHA
0	08/30/24	FINAL	SHA
1	10/22/24	FINAL	DAB

COLORADO LICENSED
CLIFF ABERNETHY
49913
10/22/24
PROFESSIONAL ENGINEER

PROJECT TITLE

MDG: 5000108160

MARSTON PARK

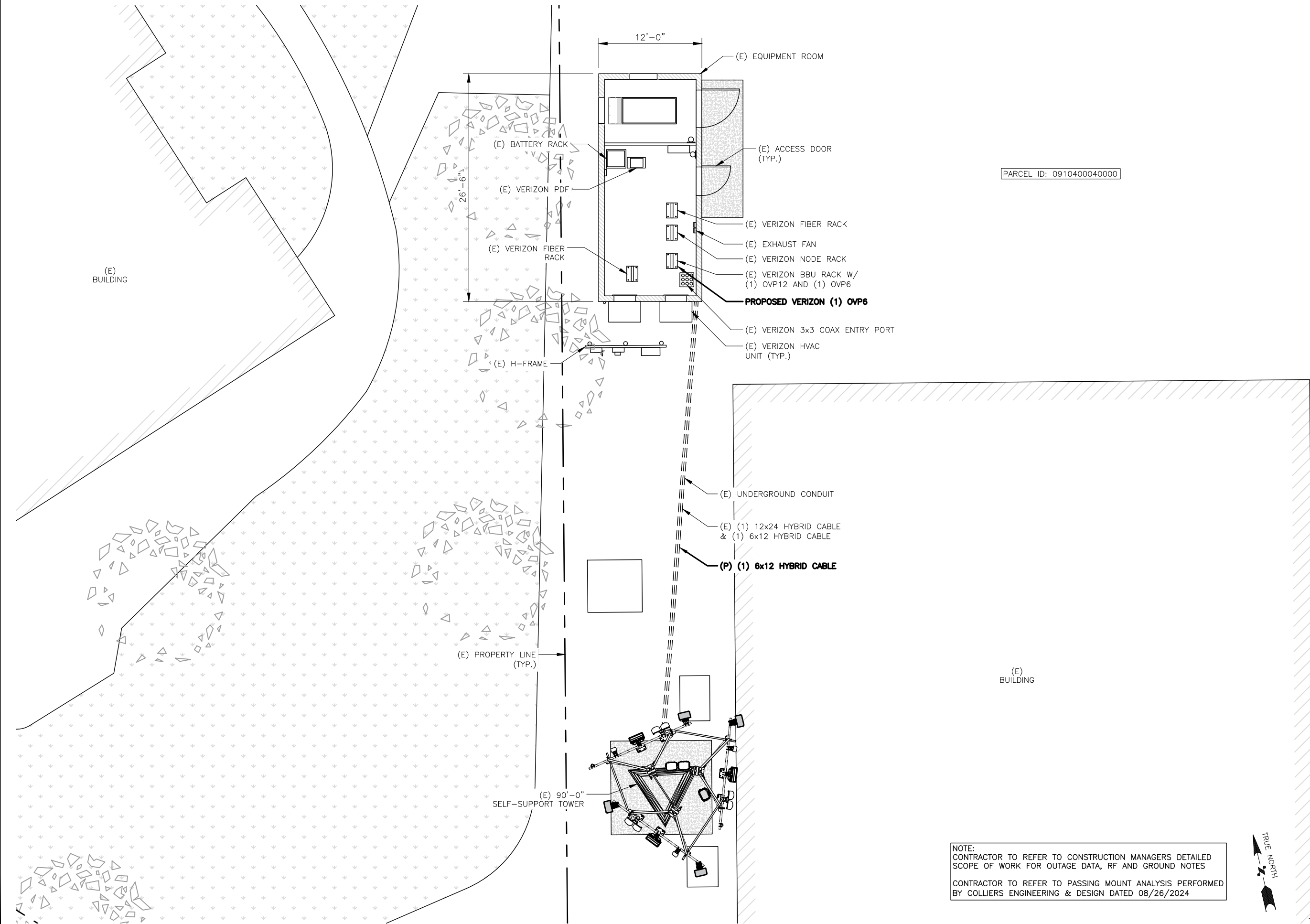
4898 SOUTH DUDLEY STREET
DENVER, CO 80123

SHEET DESCRIPTION

SITE PLAN

SHEET NO.

Z-1



COMPOUND PLAN

verizon

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smartlink

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COLORADO LICENSED
CLIFF ABERNETHY
49913
10/22/24
PROFESSIONAL ENGINEER

PROJECT TITLE

MDG: 5000108160

MARSTON PARK

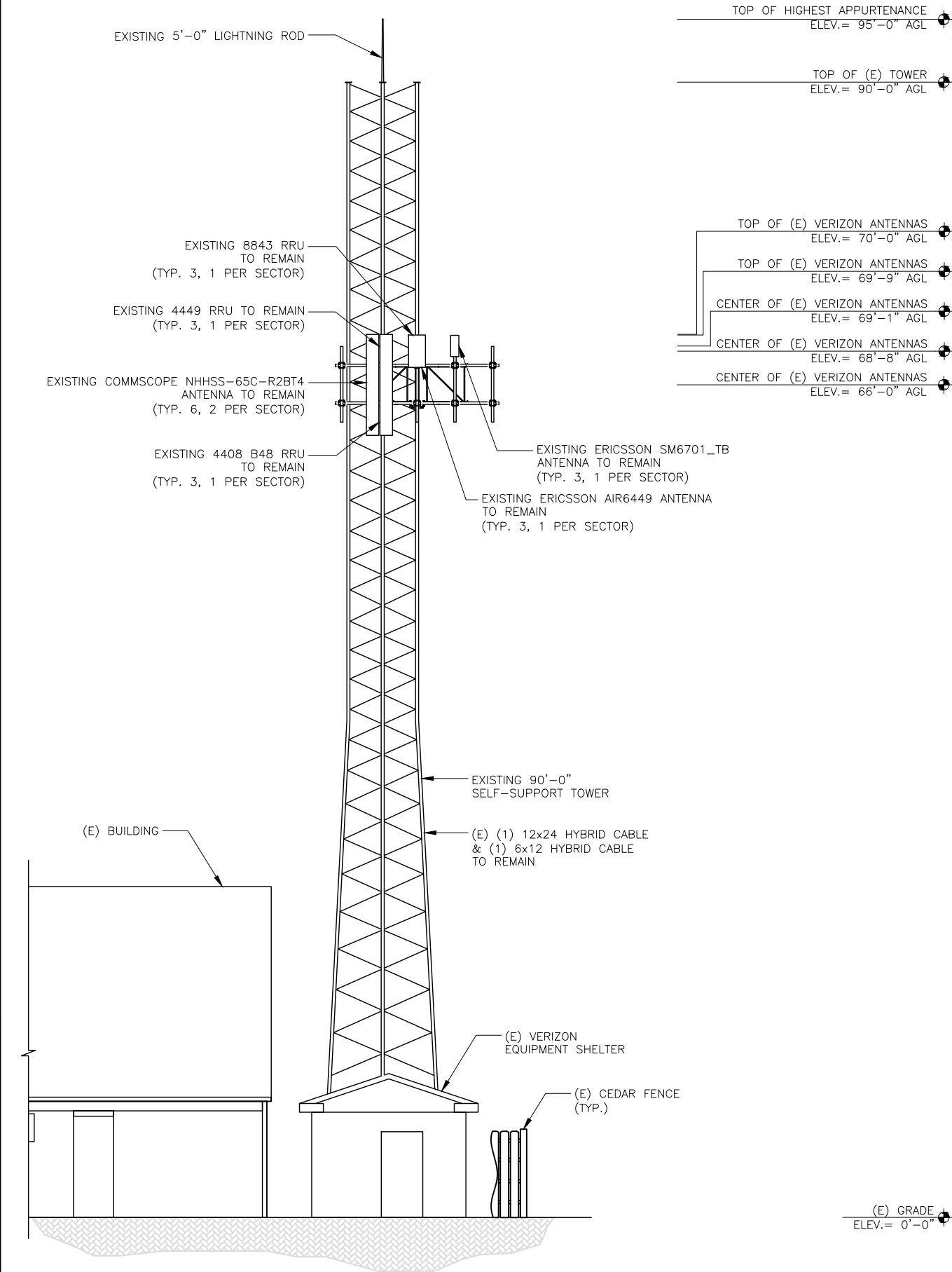
4898 SOUTH DUDLEY STREET
DENVER, CO 80123

SHEET DESCRIPTION

COMPOUND PLAN

SHEET NO.

Z-2

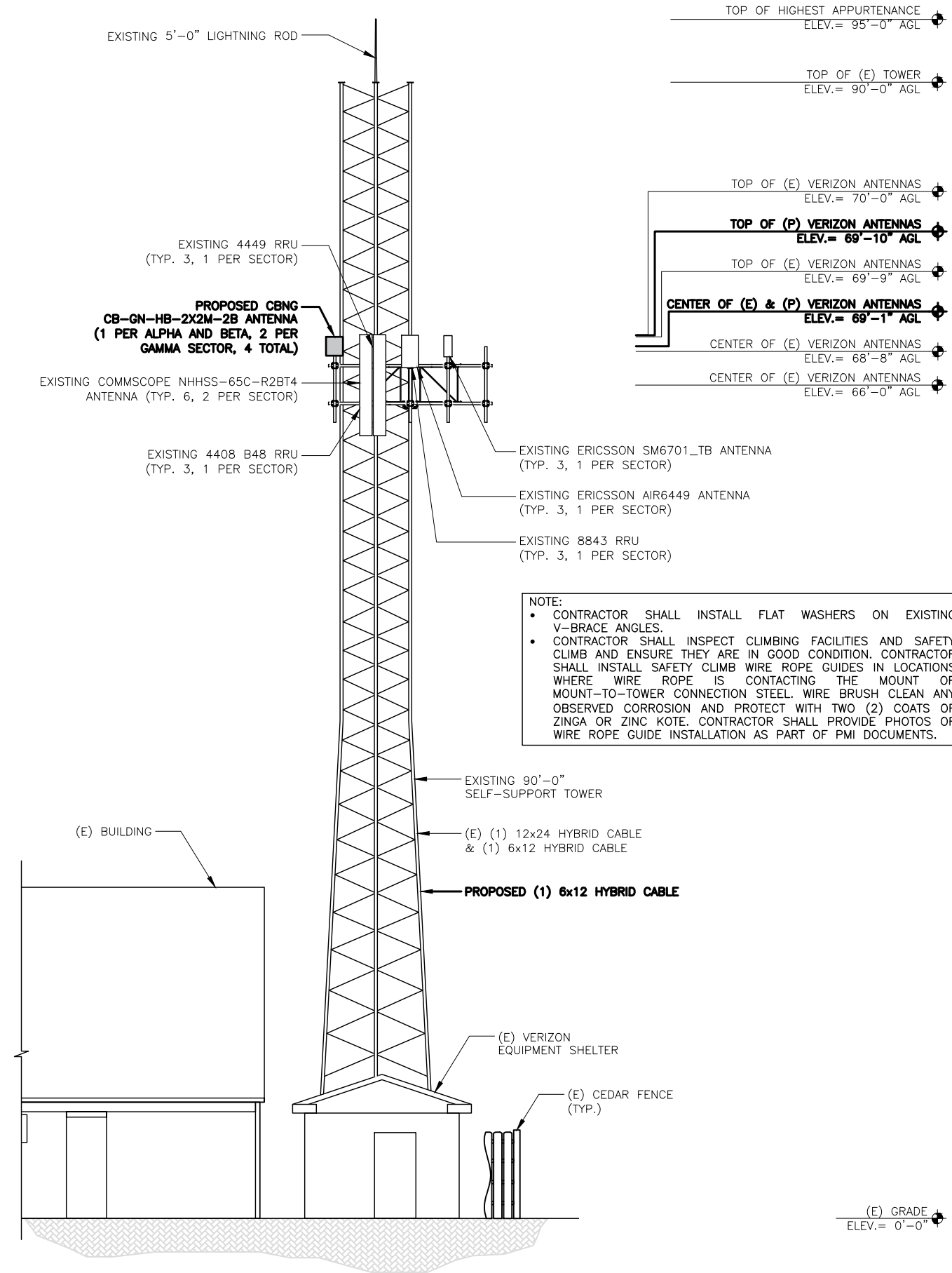


EXISTING ELEVATION VIEW



SCALE: 3/32"=1'-0" (11x17)
(OR) 3/16"=1'-0" (22x34)

1



PROPOSED ELEVATION VIEW



SCALE: 3/32"=1'-0" (11x17)
(OR) 3/16"=1'-0" (22x34)

2



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SUBMITTALS			
REV	DATE	DESCRIPTION	BY
A	08/07/24	PRELIMINARY	SHA
0	08/30/24	FINAL	SHA
1	10/22/24	FINAL	DAB



PROJECT TITLE

MDG: 5000108160

MARSTON PARK

4898 SOUTH DUDLEY STREET
DENVER, CO 80123

SHEET DESCRIPTION

TOWER ELEVATION
VIEW

SHEET NO.

Z-3



REFERENCE ANTENNA MOUNT ANALYSIS REPORT AND PMI REQUIRMENTS PER COLLIERS ENGINEERING & DESIGN DATED AUGUST 26, 2024:

- CONTRACTOR SHALL INSTALL FLAT WASHERS ON EXISTING V-BRACE ANGLES.
- CONTRACTOR SHALL INSTALL PROPOSED OVP TO TOP RIGHT (AS SEEN FROM BEHIND MOUNT) BETA SECTOR STANDOFF.
- CONTRACTOR SHALL INSPECT CLIMBING FACILITIES AND SAFETY CLIMB AND ENSURE THEY ARE IN GOOD CONDITION. CONTRACTOR SHALL INSTALL SAFETY CLIMB WIRE ROPE GUIDES IN LOCATIONS WHERE WIRE ROPE IS CONTACTING THE MOUNT OR MOUNT-TO-TOWER CONNECTION STEEL. WIRE BRUSH CLEAN ANY OBSERVED CORROSION AND PROTECT WITH TWO (2) COATS OF ZINGA OR ZINC KOTE. CONTRACTOR SHALL PROVIDE PHOTOS OF WIRE ROPE GUIDE INSTALLATION AS PART OF PMI DOCUMENTS.





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SUITE 400
OVERLAND PARK, KS 66211
PHONE: (913) 344-2800



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SUBMITTALS			
REV	DATE	DESCRIPTION	BY
A	08/07/24	PRELIMINARY	SHA
0	08/30/24	FINAL	SHA
1	10/22/24	FINAL	DAB



PROJECT TITLE

MDG: 5000108160

MARSTON PARK

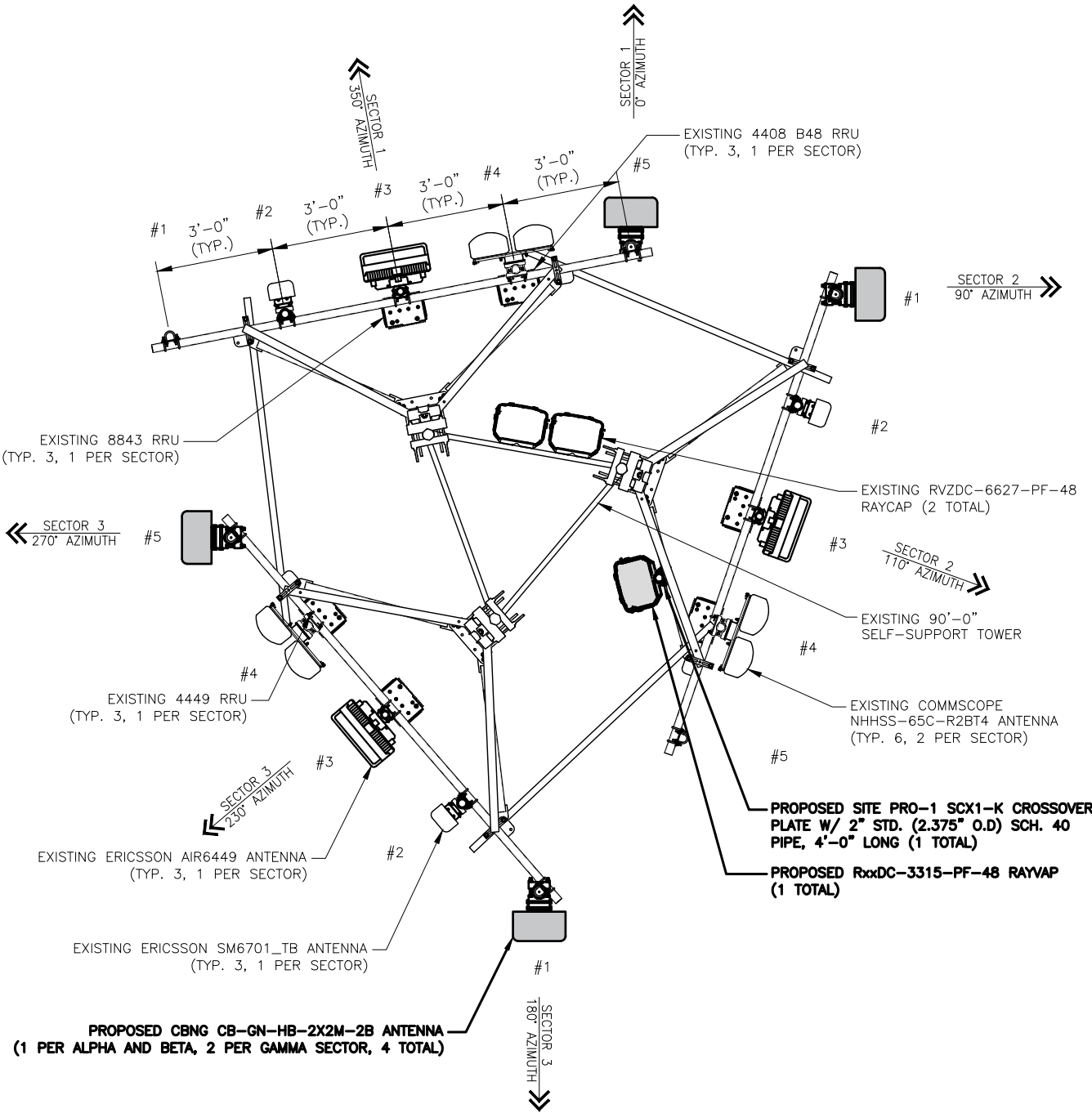
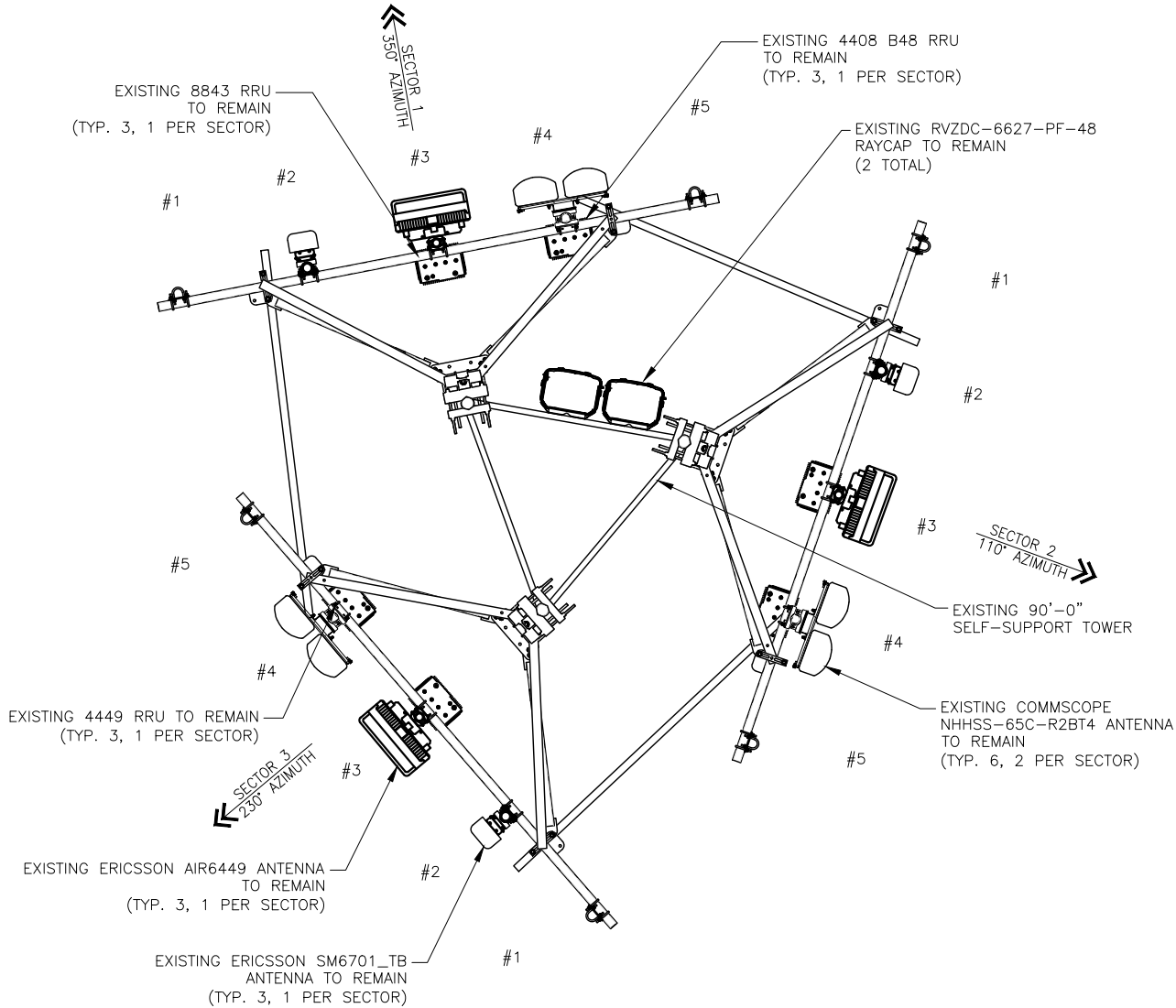
4898 SOUTH DUDLEY STREET
DENVER, CO 80123

SHEET DESCRIPTION

ANTENNA LAYOUT

SHEET NO.

Z-4



EXISTING ANTENNA LAYOUT



SCALE: 1/4"=1'-0" (11x17)
(OR) 1/2"=1'-0" (22x34)

1

PROPOSED ANTENNA LAYOUT



SCALE: 1/4"=1'-0" (11x17)
(OR) 1/2"=1'-0" (22x34)

2

EXISTING ANTENNA SCHEDULE									
SECTOR	ANTENNA POSITION	ANTENNA MAKE/MODEL	RAD CENTER	AZIMUTH	M-TILT	E-TILT	TECHNOLOGY	RRH MAKE/MODEL	TOWER MOUNTED EQUIPMENT
ALPHA	#1	EMPTY	—	—	—	—	—	—	(2) (E) RAYCAP RVZDC-6627-PF-48
	#2	(E) ERICSSON SM6701_TB	69'-1"	350°	0°	0°	28GHz 5G	(1) (E) 8843	
	#3	(E) ERICSSON AIR6449	68'-8"	350°	0°	6°	L-Sub6 5G	INTEGRATED RRU	
	#4	(E) COMMSCOPE NHHSS-65C-R2BT4	66'-0"	350°	0°	2°	LTE 700/850/1900/AWS/AWS3/CBRS	(1) (E) 4408 B48	
		(E) COMMSCOPE NHHSS-65C-R2BT4	66'-0"	350°	0°	1°	LTE 700/850/1900/AWS/AWS3/CBRS	(1) (E) 4449	
BETA	#5	EMPTY	—	—	—	—	—	—	
	#1	EMPTY	—	—	—	—	—	—	
	#2	(E) ERICSSON SM6701_TB	69'-1"	110°	0°	0°	28GHz 5G	(1) (E) 8843	
	#3	(E) ERICSSON AIR6449	68'-8"	110°	0°	6°	L-Sub6 5G	INTEGRATED RRU	
	#4	(E) COMMSCOPE NHHSS-65C-R2BT4	66'-0"	110°	0°	3°	LTE 700/850/1900/AWS/AWS3/CBRS	(1) (E) 4408 B48	
		(E) COMMSCOPE NHHSS-65C-R2BT4	66'-0"	110°	0°	1°	LTE 700/850/1900/AWS/AWS3/CBRS	(1) (E) 4449	
GAMMA	#5	EMPTY	—	—	—	—	—	—	
	#1	EMPTY	—	—	—	—	—	—	
	#2	(E) ERICSSON SM6701_TB	69'-1"	230°	0°	0°	28GHz 5G	(1) (E) 8843	
	#3	(E) ERICSSON AIR6449	68'-8"	230°	0°	6°	L-Sub6 5G	INTEGRATED RRU	
	#4	(E) COMMSCOPE NHHSS-65C-R2BT4	66'-0"	230°	0°	4°	LTE 700/850/1900/AWS/AWS3/CBRS	(1) (E) 4408 B48	
		(E) COMMSCOPE NHHSS-65C-R2BT4	66'-0"	230°	0°	2°	LTE 700/850/1900/AWS/AWS3/CBRS	(1) (E) 4449	
	#5	EMPTY	—	—	—	—	—	—	

EXISTING ANTENNA SCHEDULE

N.T.S.

1

PROPOSED ANTENNA SCHEDULE									
SECTOR	ANTENNA POSITION	ANTENNA MAKE/MODEL	RAD CENTER	AZIMUTH	M-TILT	E-TILT	TECHNOLOGY	RRH MAKE/MODEL	TOWER MOUNTED EQUIPMENT
ALPHA	#1	EMPTY	—	—	—	—	—	—	(1) (P) RAYCAP RXXDC-3315-PF-48 (2) (E) RAYCAP RVZDC-6627-PF-48
	#2	(E) ERICSSON SM6701_TB	69'-1"	350°	0°	0°	28GHz 5G	(1) (E) 8843	
	#3	(E) ERICSSON AIR6449	68'-8"	350°	0°	6°	L-Sub6 5G	INTEGRATED RRU	
	#4	(E) COMMSCOPE NHHSS-65C-R2BT4	66'-0"	350°	0°	2°	LTE 700/850/1900/AWS/AWS3/CBRS	(1) (E) 4408 B48	
		(E) COMMSCOPE NHHSS-65C-R2BT4	66'-0"	350°	0°	1°	LTE 700/850/1900/AWS/AWS3/CBRS	(1) (E) 4449	
BETA	#5	(P) CB-GN-HB-2x2M-2B	69'-1"	90°	0°	6°	39GHz	INTEGRATED RRU	
	#1	(P) CB-GN-HB-2x2M-2B	69'-1"	180°	0°	6°	39GHz	INTEGRATED RRU	
	#2	(E) ERICSSON SM6701_TB	69'-1"	110°	0°	0°	28GHz 5G	(1) (E) 8843	
	#3	(E) ERICSSON AIR6449	68'-8"	110°	0°	6°	L-Sub6 5G	INTEGRATED RRU	
	#4	(E) COMMSCOPE NHHSS-65C-R2BT4	66'-0"	110°	0°	3°	LTE 700/850/1900/AWS/AWS3/CBRS	(1) (E) 4408 B48	
		(E) COMMSCOPE NHHSS-65C-R2BT4	66'-0"	110°	0°	1°	LTE 700/850/1900/AWS/AWS3/CBRS	(1) (E) 4449	
GAMMA	#5	EMPTY	—	—	—	—	—	—	
	#1	(P) CB-GN-HB-2x2M-2B	69'-1"	0°	0°	6°	39GHz	INTEGRATED RRU	
	#2	(E) ERICSSON SM6701_TB	69'-1"	230°	0°	0°	28GHz 5G	(1) (E) 8843	
	#3	(E) ERICSSON AIR6449	68'-8"	230°	0°	6°	L-Sub6 5G	INTEGRATED RRU	
	#4	(E) COMMSCOPE NHHSS-65C-R2BT4	66'-0"	230°	0°	4°	LTE 700/850/1900/AWS/AWS3/CBRS	(1) (E) 4408 B48	
		(E) COMMSCOPE NHHSS-65C-R2BT4	66'-0"	230°	0°	2°	LTE 700/850/1900/AWS/AWS3/CBRS	(1) (E) 4449	
	#5	(P) CB-GN-HB-2x2M-2B	69'-1"	270°	0°	6°	39GHz	INTEGRATED RRU	

PROPOSED ANTENNA SCHEDULE

N.T.S.

2



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SUBMITTALS			
REV	DATE	DESCRIPTION	BY
A	08/07/24	PRELIMINARY	SHA
0	08/30/24	FINAL	SHA
1	10/22/24	FINAL	DAB



PROJECT TITLE

MDG: 5000108160

MARSTON PARK

4898 SOUTH DUDLEY STREET
DENVER, CO 80123

SHEET DESCRIPTION

ANTENNA SCHEDULE

SHEET NO.

Z-5

Exhibit B — Minimum Technical Standards

Note: Some standards may not apply to your facility due to frequency of operation or type of service.

1.0 General

1.1 Posting of Information. The following information shall be posted on or near your cabinet:

Copy of FCC license (if applicable)

Equipment Identification Card with the following information:

Transmit and receive frequencies (or frequency bands in case of wireless operators)

Type of service

Authorized output power & ERP

Antenna model number

Transmission line model number and type

Name of licensee

Contact information for responsible person (name, phone, email)

Unidentified equipment shall be considered unauthorized and may be red tagged and removed after 30 days.

1.2 Installations at City Fire Stations. The City may require that the Tenant (Licensee) upgrade City radio equipment to ensure interference-free coexistence. Specifically, there is a problem with installing an isolator on the existing 900 MHz Alligator Model 1888 MAS transceiver used at most City fire stations. The isolator must be installed only on the transmit line, but the transceiver uses a duplexed (switched) output whereby both the transmitter and the receiver share the same antenna line. Similarly, separate cavity filters are required for the receiver and transmitter, but it is not possible to install both on a single duplexed line. For this reason, the City usually directs that the Alligator Model 1888 be replaced with a Model 1800 Master unit with separate transmit and receive antenna ports. A duplexer cavity filter should be used to combine transmit and receive into the existing antenna. Contact the City's Technical Representative for recommended vendors for these components.

1.3 Changes. Notify the City's Technical Representative immediately of any changes to frequencies, antennas, or other equipment configuration. Obtain City's approval prior to making those changes as required by the Lease (License). Approved changes shall be shown on an updated Equipment ID Card.

2.0 Mobile Wireless Services

2.1 Land Mobile Radio Filter and Isolator Requirements. For land mobile radio (LMR), as a minimum, each transmitter shall employ a dual stage isolator followed by a single cavity

bandpass filter. All transmitters shall have built-in or external harmonic (low pass) filters. The low pass filter must be a true low pass filter, not a notch filter tuned to just one or two harmonic frequencies. Harmonic rejection shall be at least 60 dB at the second harmonic and at least 50 dB at the third harmonic. The following minimum isolator and bandpass cavity filter specifications apply:

30-50 MHz

Isolators - None required.

TX cavity - minimum of 20 dB rejection at + 0.5 MHz

72-76 MHz

Isolators - Minimum of 25 dB

TX cavity - minimum of 20 dB rejection at + 0.5 MHz

138-174, 216-222 MHz

Dual Stage Isolators - minimum of 60 dB

TX cavity - minimum of 20 dB rejection at + 1.5 MHz

406-512 MHz

Dual Stage Isolators - minimum of 60 dB

TX cavity - minimum of 20 dB rejection at + 3.5 MHz

698-941 MHz (excluding airphone)

Dual Stage Isolators - minimum of 60 dB

Tx cavity - minimum of 20 dB rejection at + 6 MHz

Explanation. The bandpass filter and lowpass filter must follow the isolator because ferrite isolators are nonlinear and can create harmonics. Please note that most bandpass cavity filters will pass odd harmonics of the tuned frequency, so an external lowpass filter following the isolator is also required. Transmitter combiners will be considered on a case-by-case basis. Please provide all combiner technical information to the City's Technical Representative.

2.2 Airphone (849-851 MHz transmit, 894-896 MHz receive)

Transmitter out-of-band emissions shall not cause harmful interference to cellular base station receivers (824-849 MHz). Tenant (Licensee) shall submit plans, including bandpass filter response curves, to the City's Technical Representative for approval prior to installation. Tenant (Licensee) shall install adequate receiver bandpass filtering to preclude receiver desensitization or receiver intermodulation caused indirectly by cellular base stations on the site.

2.3 LMR Duplexers. Notch duplexers are not adequate. The duplexer must also have a true bandpass characteristic to ensure other transmit signals do not enter the transmitter or overdrive the receiver. This is especially important for VHF repeaters which are vulnerable to FM broadcast signals and other closely-spaced VHF transmitters.

2.4 Personal Wireless Services. These services include, but are not limited to the 698-806, 806-

869, 1710-1755, 1850-2000, 2110-2155, 2500-2600 MHz bands (excluding 700 and 800 MHz public safety bands). Because the wireless provider is assumed to have exclusive use of a band of frequencies, out-of-band emissions are expected to be attenuated significantly by the manufacturer's standard combiners, duplexers, and cross-band couplers. Ferrite isolators may not be required. Submit your plans to the City's Technical Representative for approval.

2.5 Unlicensed Band (License-Free) Radios. Unlicensed band radios and shared-band services, including, but not limited to those operating in the 902-928 MHz, 2.4-2.4835 GHz, 3.5 GHz, 4.9 GHz (public safety only) and 5 GHz bands are not allowed unless specifically authorized in the Tenant's (Licensee's) Lease (License). When authorized, Tenant (Licensee) shall not change operating frequencies without first getting approval from City. License-free radios are notorious for their poor quality in a harsh RF environment and specific make, model and technical specifications must be provided to the City's Technical Representative for approval. Additional protective devices, shielded CAT 6 cable and shielded NEMA cases may be required before such devices can be installed on the tower.

2.6 Receivers. The site may have relatively high radio frequency (RF) levels in all mobile radio bands. Your receiver amplifier must be robust to work in this environment. Ensure the receiver has good intermodulation (IM) rejection and high 1 dB compression point. If interference is encountered and we find the receiver is not performing up to the standards exhibited by state-of-the-art equipment, the City may require receiver improvements or upgrades before requiring changes to other tenant (licensee) equipment or configurations. This requirement applies to both new and existing tenants (licensees).

Filters are required for mobile radio receivers. Single receivers must employ a minimum of a single 7" diameter (or equivalent) cavity bandpass filter with a rejection curve corresponding to 1 dB insertion loss or better. Additional filter isolation may be required in special cases. Receiver multicouplers must use a bandpass filter (preselector) prior to the multicoupler amplifier.

2.7 Antennas. Select antennas designed to minimize passive intermodulation generation. Note that antennas that pass intermodulation tests at the factory may not provide good intermodulation rejection after years of exposure to heat, cold, vibration from wind, and humidity. Only new antennas are allowed for new installations. Select antennas specifically designed to reject intermodulation over the life of the antenna. Unless the antenna is a duplex configuration, transmit and receive antennas should be separated vertically on the tower. If the tower is owned by the City, the City will designate antenna locations. Antennas must be DC grounded to the tower for lightning protection.

2.8 Transmission Lines. Coaxial cable should be grounded at the top and the bottom of the run with an Andrew ground kit or equivalent. Ensure that ground conductors run straight down with no sharp bends because bends will increase the impedance of the grounding conductor. We also require that the line be marked so we can identify it later. We suggest bands of colored electrical tape at the bottom, middle and top of the run (similar to a resistor color code). Install a Huber-Suhner (or equivalent) coaxial surge arrestor at the bulkhead. All exterior transmission lines must be solid outer conductors. If possible, receive and transmit lines should be separated by at

least one foot from cabinet to antenna.

2.9 Connectors. Connectors are often sources of RF leakage and passive intermodulation. UHF connectors (PL259) are not allowed on connections external to the radio cabinet. Type “N” connectors are allowed below 512 MHz. 7/16 DIN connectors should be used at 698 MHz and above and are required above 1.7 GHz. Connectors using dissimilar metal contacts or ferrous materials (e.g., nickel plating) are not allowed. The preferred connector uses a silver-plated body with gold plated inner conductor. Brass bodies and silver or brass inner conductors are also allowed.

2.10 Additional Protective Devices May Be Required. The specifications above are minimum requirements. Additional protective devices may be required based upon evaluation of the following information:

- Theoretical TX mixes, particularly second and third order
- Antenna location and type
- Combiner/multicoupler configurations
- Transmitter specifications
- Receiver specifications
- Historical problems
- Transmitter to transmitter isolation
- Transmitter to antenna isolation
- Transmitter to receiver isolation
- Calculated and measured level of IM products
- Transmitter output power
- Transmitter ERP
- Spectrum analyzer measurements
- VSWR measurements
- Existing cavity selectivity
- Antenna to antenna proximity

3.0 FM & IBOC Broadcast (Part 73, ERP > 1 kW)

3.1 FM Broadcast Transmitters. FM and IBOC Broadcast transmitters will be either combined with other stations into a common antenna or stand-alone. If combined, the combiner design shall be approved by the City's Technical Representative. If stand-alone, the transmitter shall employ a bandpass cavity filter with the following minimum performance specifications:

3.1.1. Rejection. The bandpass filter shall provide the following minimum rejection for Class C, C0 and C1 stations:

From Center +/-	Minimum Rejection
800 kHz	22 dB
1 MHz	28 dB
1.2 MHz	32 dB

1.4 MHz 38 dB
1.6 MHz 43 dB

Note that four cavities are required to meet this specification. Class C2 and C3 stations may use three-cavity filters. These filter requirements also apply to stations with FM & IBOC combined outputs. A stand alone IBOC transmitter and antenna shall comply with the following requirements: IBOC ERP greater than 5,000 Watts: 4 cavity filter (see rejection above), IBOC ERP less than or equal to 5,000 Watts: 3 cavity filter.

3.1.2 Gain Flatness. ± 0.5 dB from ± 200 kHz from center frequency.

3.1.3. Group Delay Flatness. No greater than ± 150 nanoseconds (symmetrical) in ± 200 kHz (I.e., minimum to maximum delay difference shall be no greater than 300 nanoseconds in the band $f_c - 200$ kHz to $f_c + 200$ kHz).

3.1.4. VSWR. No greater than 1.1:1 in ± 200 kHz (assuming filter is terminated in perfect 50 ohm load).

3.1.5. Insertion Loss. No greater than 0.3 dB in ± 200 kHz.

The transmitter should comply with current FCC rules regarding out-of-band emissions at transmitter output (before the bandpass cavity filter). The external filter is required to provide further rejection of out-of-band emissions to ensure electromagnetic compatibility with other users on the site.

3.2 FM Broadcast Antennas. FM Broadcast antennas mounted below 250' AGL (center of radiation) shall employ short element spacing to reduce downward radiation and ensure compliance with CFR 47, Parts 1.1307-1.1310. This requirement does not apply to stations that employ a single element antenna. Examples of short element spacing are a 6-bay antenna with half-wavelength spacing or an 8-bay antenna with $3/4$ wavelength spacing. Submit a plot of predicted power density versus distance at ground level for City's Technical Representative approval.

4.0 Full-Power Television

4.1 Full-power television transmitters shall include band pass and low pass filters.

4.2 For television transmitters, measured out-of-band emissions (including harmonics) greater than 3 MHz from the respective channel edge shall be more than 80 dB below the measured power over the entire channel. Both measurements shall use a 6 MHz measurement bandwidth.

5.0 Low Power Television (analog and digital)

5.1 Low Power Television (LPTV) transmitters and television translators must have low pass filters that attenuate all harmonics and spurious products at least 80 dB below the power

measured at the carrier frequency. To facilitate measurements of spurious products, each LPTV and translator transmitter shall have installed a line section and appropriate directional coupler element. For routine use, the line section may employ a standard DC element and be connected to a wattmeter capable of measuring forward and reflected power. In addition, the Tenant (Licensee) shall own or have access to an RF load capable of dissipating the full power of the transmitter for troubleshooting purposes.

6.0 Grounding, Bonding and Shielding

6.1 Shielding. RF interference can get directly into the electronics of a receiver or transmitter. Cabinet shielding must be in place and maintained to the manufacturer's specifications. Do not leave cabinet doors open. Open cabinet doors defeat the shielding.

6.2 Grounding. Proper grounding protects equipment against lightning damage and reduces the likelihood of radio frequency interference. Equipment grounding and bonding should be accomplished in accordance with Mil Std 188-124, Military Handbook 419, and Motorola R56. Contact the Site Manager for guidance on grounding and bonding at your particular facility. Tenants are required to provide grounding plans for Landlord's approval prior to the start of construction.

6.3 Additional Guidance. Following are some guidelines regarding grounding and bonding. Apply them in the design of your earth electrode system.

- Always bond foundation steel to the earth electrode system. This type of earth electrode system is sometimes called a "Ufer" system. This will require that you bond copper conductors (1/0 or 2/0 stranded) to the rebar and run these lines outside the concrete forms below grade.

- Chemical rods can be helpful in poor soil conditions, but a chemical rod basically increases the diameter of the rod. As Mil-Hdbk 419 shows, increasing the size of the overall earth electrode system with multiple rods in a ring around the shelter can be more effective than a single, large diameter rod.

- The purpose of the earth electrode system is to provide an equipotential ground plane with a low resistance to earth. Ensure that all buried conductors are bonded together, including the tower earth electrode system, shelter earth electrode system, any single rod grounds for propane tanks, etc., and especially the ground rod installed by the utility at the service entrance. Do not buy into the claim that the utility ground must be separate from any other grounds. This is not true. It is true, however, that the power line neutral is bonded to the ground system *only* at the service entrance.

- All bonds made outdoors, and especially buried bonds must be exothermically welded (e.g., CadWeld™). No mechanical bonds (e.g., crimps) are allowed except indoors.

- Moist soil has lower resistivity. Ensure the buried ground ring is outside the drip line of the shelter.

- Down conductor impedance is a function of the resistance and the inductance of the down conductor and the impedance due to inductance is directly proportional to frequency. Lightning contains significant energy up to 100 MHz. Long conductors and sharp bends in even short conductors have significant impedance at 100 MHz due to the inherent inductance of the conductor and the shape of the bend. At 100 MHz, a 1-foot length of AWG #2 wire has an impedance of roughly 150 Ohms. All conductors should be as short as possible with minimum bends to reduce down conductor impedance to lightning surges.

- We see many cases where long down conductors (green wires) are bonded to the antenna and then run down the tower leg to the earth electrode system. This is unacceptable. Inductance is a strong function of surface area, and the tower legs and other tower members provide a much lower inductance than the small diameter down conductor. Always bond to the tower using a short conductor and no bends.

- Single point grounds may in theory prevent lightning energy from entering the facility but are difficult to create in practice due to unobvious ground loops in the power system. Multiple short conductors to the earth electrode system can be more important than trying to maintain a single point ground.

- Measure resistance to earth of the earth electrode system using the fall of potential method *prior* to connecting the electrical supply lines as the power line neutral will create erroneous and overly optimistic results.

7.0 Site Work

7.1 Tower Work Insurance and Experience Requirements. All tower riggers or installers of antennas, transmission lines, cabinets, wiring or similar hardware or apparatus must meet the minimum basic requirements of the City. These will include, but not be limited to, the following:

- The rigging company must have a current Certificate of Insurance on file with the City. The certificate will include, but not be limited to the following:

1. General Comprehensive & Liability: \$5,000,000
2. Vehicle Liability: \$1,000,000
3. Workman's Compensation Insurance (By Statute)

- Demonstrated experience on similar tower types and similar work activity on similar towers within the past two years with a list of at least two recent clients or professional references with actual knowledge of experience and necessary qualifications, or in lieu thereof; previous working relationship with the City and known by the City's personnel.

City reserves the right, at its sole discretion, to reject the use of any person or tower rigging

company on City-owned towers or properties.

7.2 Work Standards. The installation of any and all materials on the tower and in the accompanying shelter must be pre-authorized and approved by the City's Technical Representative. The following guidelines will be strictly enforced:

7.2.1 Equipment or cabinets mounted on platforms will be constructed of galvanized or stainless steel and will be securely attached to the tower members or platforms with J-bolts, U-bolts or similar clamping devices which do not penetrate tower members or any part of the galvanized coating. All mounting hardware must be hot-dipped galvanized or stainless steel (NOT PLATED). All mounting nuts, bolts, washers or similar must be Grade 5 or better.

7.2.2 Antennas and the mounting thereof must be approved in advance of installation. Data in reference to antenna type, weight, wind loading, gain, bandwidth, and mounting details must be provided to the City's Technical Representative and may not be modified or replaced without expressed written permission of City. Installation of antennas on City-owned towers may require a new structural study at the Tenant (Licensee) 's expense.

7.2.3 Transmission lines and hardware must be approved in advance of installation by the City's Technical Representative and must be specified as to manufacturer, size and type and shown on the City's New Tenant Questionnaire. All the mounting hardware must be of appropriate type and design to support the transmission lines with strain-reliefs installed at the manufacturer's recommended intervals. Under no circumstances will stainless steel automotive-type hose clamps be used to secure transmission lines or cables to tower members. Where not previously designated, all lines will be positioned on the tower to minimize wind loading and provide a minimum of obstruction to climbing or removal/replacement of other lines. Each line will be mounted independently of other lines on the tower. Cable trays, waveguide entrances, tower ladders, elevator rails and other similar members are to be kept clear of all cables on the tower. Stainless steel lashing ties are acceptable for use on the tower but are not to be used as strain reliefs.

7.2.4 Antenna jumper cables or cables to/from crossband couplers or similar devices on the tower will be kept to minimum required lengths and will be made of solid shield outer conductor cables with outer jackets capable of withstanding severe weather and ultraviolet rays. All such cable types must be pre-approved by the City.

7.2.5 UNDER NO CIRCUMSTANCES –

- will welding or drilling of tower members be allowed.
- will modifications to the tower, bridge, building entrance fittings or similar be permitted.
- will transmission line splices (a pair of connectors at other than the top or bottom of the run on the tower) be permitted except by prior approval or necessitated by damage only repairable by splicing.

- will any tampering, retuning, rerouting, or other modifications be permitted to equipment owned by City or other tenants.

7.2.6 All installations will be performed in accordance with good engineering practice and within the guidelines of this document. Any deviation from these minimum requirements and technical standards must be approved in writing prior to installation or modification.

7.3 Removal of Unused Antennas and Lines. Tenant (Licensee) shall remove all unused antennas, transmission lines and associated mounting hardware from City's tower within 90 days of the date an antenna is no longer in service.

7.4 NO PRESENT INSTALLATION WILL BE "GRANDFATHERED" and must conform to these work standards within a reasonable time period to be determined by the City's Technical Representative. Periodic inspections may be performed to ensure that all installations meet technical standards.

8.0 Shelters

8.1 Cable Dressing Inside Building or Shelter. All wiring and cables within a given rack will be properly dressed and/or bundled with cable ties with excess cut close to the barbs. Twisted wire, tape, rope, twine, phone wire and similar bits of debris usually available on site ARE NOT ACCEPTABLE substitutes for proper securing hardware. All inter-rack cables and wiring must be properly routed and utilize the cable trays provided even if between adjacent racks. Overhead cables and RF lines must be easily removed or reworked within the cable trays. Proper care must be taken to ensure that new cables added to the trays are not stressed or intertwined with existing cables. OVERHEAD CABLES MAY NOT CROSS PERPENDICULARS OR BE SUSPENDED IN MID AIR WITHOUT SUPPORTS. NO SUPPORTS MAY BE INSTALLED WITHOUT PRIOR APPROVAL. All long cable runs must be properly identified at each end indicating the opposite cable end address. All cabling within the building must be cut to proper length except phasing harnesses, where required.

9.0 Towers

9.1 Tenant (Licensee) may not erect new towers without the City's prior written consent, which may be granted or denied in City's sole discretion, and towers that are approved may only be constructed after plans for the tower have been approved by the City and by the zoning authority.

9.2 New towers shall comply with TIA-222-G, or the most recent edition adopted by the local zoning authority. Changes to an existing tower, including addition or replacement of antennas requires that TIA-222-G or the most recent edition be used. Tenant (Licensee)-owned towers that present an immediate safety hazard shall be corrected by Tenant (Licensee) regardless of the status of the current lease or the particular edition of TIA-222 in use at the time of tower construction. Installation of antennas on City-owned towers may require a new structural study at the Tenant (Licensee) 's expense.

10.0 Permits

10.1 Tenant (Licensee) shall comply with all local and Federal regulations. Tenant (Licensee) is responsible for acquiring all applicable permits, including, but not limited to FCC construction permits and building permits. Tenant (Licensee) is also responsible for performing any required studies, including RF exposure and RF interference studies required by the FCC, local government, and City. Tenant (Licensee) shall furnish all applicable permits, studies, and approvals to the City for approval before starting any construction, including antenna installation.

11.0 Radio Frequency Safety

11.1 The engineering, design, configuration, installation, and maintenance of high power (> 1 kW ERP) radio facilities on the site shall be accomplished in a manner that minimizes downward radiation. Changes to proposed systems may be directed by City to comply with this objective.

11.2 Everyone on the site shall follow these guidelines:

- All personnel entering the site must be authorized
- Obey all posted signs
- Assume all antennas are active unless proven otherwise
- Before working on an antenna, notify the owner and disable the transmitter
- Use a radio frequency (RF) personal monitor when working near antennas
- Never operate transmitters without shields

11.3 Power densities on towers can be much higher than at ground level. For this reason, tower climbers should request power reductions from high-power tenants and carry RF personal monitors when climbing towers. The City's Technical Representative can tell you which transmitters should be turned down before climbing the tower.

11.4 Federal Government guidelines regarding human exposure to radio frequency energy are found in the Code of Federal Regulations (CFR) Title 47, Parts 1.1307-1.1310.



Figure 1 - Warning Sign to be Posted at Base of Tower
(Available from TESCO, Holaday, Narda and other Sources)

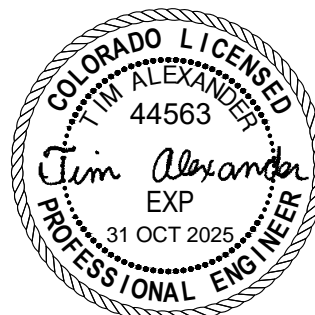
EXHIBIT C – SITE STUDY

RADIO FREQUENCY INTERFERENCE ANALYSIS REPORT

Marston Park

February 11, 2025

**No harmful interference to existing radio systems is predicted as
a result of the proposed operations on this structure**



SIGNED, 11 FEB 2025

Prepared By:
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Engineer: Tim Alexander, P.E.

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1.0 Executive Summary

This report presents a radio frequency interference (RFI) analysis which was performed on the Marston Park site. The RFI analysis consists of transmitter noise, receiver desensitization, intermodulation, harmonic and transmitter spurious output interference. The report consists of Sections that provide details of the communications site, antenna systems, operational frequencies and each interference analysis mode.

A summary of the interference analysis results is depicted in the following Table.

Interference Analysis Mode	Type Mix	Status	Summary	Worst-Case Margin (dB)
Transmitter Noise	N/A	Passed	No Interference was predicted	21.8
Receiver Desensitization	N/A	Passed	No Interference was predicted	31.3
Transmitter Intermodulation	1 Tx	Passed	No Interference was predicted	N/A
Transmitter Intermodulation	2 Tx	Passed	No Interference was predicted	N/A
Transmitter Intermodulation	3 Tx	Passed	No Interference was predicted	N/A
Transmitter Intermodulation	4 Tx	Passed	No Interference was predicted	N/A
Transmitter Intermodulation	5 Tx	Passed	No Interference was predicted	N/A
Receiver Intermodulation	1 Tx	Passed	No Interference was predicted	N/A
Receiver Intermodulation	2 Tx	Passed	No Interference was predicted	N/A
Receiver Intermodulation	3 Tx	Passed	No Interference was predicted	N/A
Receiver Intermodulation	4 Tx	Passed	No Interference was predicted	N/A
Receiver Intermodulation	5 Tx	Passed	No Interference was predicted	N/A
Transmitter Harmonics	N/A	Passed	No Interference was predicted	N/A
Transmitter Spurious Output	N/A	Passed	No Interference was predicted	N/A
Interference Level Summing - C/(I+N)	N/A	Passed	No Interference was predicted	N/A
Wideband IM Spectral Analysis	N/A	N/A	No Analysis performed	N/A

The analysis was performed with the setup options depicted in the Table below.

Analysis	Description
Receiver Performance	Receiver Sensitivity Threshold
Receiver Bandwidth	Receiver Dependent
Antenna Patterns Considered	Yes
Measured Antenna Isolation Data	No
Filters/Multicouplers Considered	Yes
Number of Simultaneous Transmitters Mixed	5
Highest Intermodulation Order Tested	5
Condense Intermodulation Hit Quantity	Yes - 300000/Order
TX IM Bandwidth Multiplication	No
Tx/Rx Systems Excluded	None
Site File Name	Marston Park.dta
Report File Name	Marston Park.docx
WirelessSiteRFI Software Version	10.1.20

2.0 Site Description

The communication systems located at this site are described in this section as well as the configuration of the antenna systems.

The site parameters are:

Site Name: Marston Park
Address: 4898 South Dudley St, Denver, CO 80123
Latitude: 39:37:38.9 N
Longitude: 105:05:40.1 W

2.1 Communications Systems

System	Provider	Technology	Frequency Band
1	Verizon 700 MHz Upper C LTE	LTE	746 - 806 MHz - 700 MHz Band
2	Verizon Cellular B LTE	LTE	806 - 896 MHz - Land Mobile
3	Verizon PCS E LTE	LTE	1710 - 1990 MHz - PCS
4	Verizon PCS F LTE	LTE	1710 - 1990 MHz - PCS
5	Verizon AWS B LTE	LTE	1710 - 2155 MHz - AWS
6	Verizon AWS J LTE	LTE	1695 - 2180 MHz - AWS
7	Verizon CBRS	TD-LTE	3500 MHz - CBRS
8	Verizon C-Band	5G	3700 MHz
9	Verizon 28 GHz	5G	28 GHz 5G
10	Verizon 39 GHz	5G	39 GHz 5G
11	LP Broadband WQZU406/WQFG744	Microwave	11 GHz Microwave
12	Denver KNNR200	Project 25	806 - 896 MHz - Land Mobile

2.2 Antenna Systems

Ant #	Mfg	Antenna Model	Gain (dBd)	Hgt (ft)	Orient (deg)	Sector	Ant Use	Transmission Line Type	Line Loss (/100')	Line Length (ft)
1	Andrew	NHHSS-65C-R2BT4 02DT 700	13.3	66	350	A	Dplx	1/2 in. Foam	0.5	10
2	Andrew	NHHSS-65C-R2BT4 03DT 700	13.3	66	110	B	Dplx	1/2 in. Foam	0.5	10
3	Andrew	NHHSS-65C-R2BT4 04DT 700	13.3	66	230	C	Dplx	1/2 in. Foam	0.5	10
4	Andrew	NHHSS-65C-R2BT4 02DT 850	13.9	66	350	A	Dplx	1-5/8 in. Foam	0.5	10
5	Andrew	NHHSS-65C-R2BT4 03DT 850	13.8	66	110	B	Dplx	1-5/8 in. Foam	0.5	10
6	Andrew	NHHSS-65C-R2BT4 04DT 850	13.8	66	230	C	Dplx	1-5/8 in. Foam	0.5	10

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7	Andrew	NHHSS-65C-R2BT4 01DT 1900	15.5	66	350	A	Dplx	1/2 in. Foam	0.5	10
8	Andrew	NHHSS-65C-R2BT4 01DT 1900	15.5	66	110	B	Dplx	1/2 in. Foam	0.5	10
9	Andrew	NHHSS-65C-R2BT4 02DT 1900	15.5	66	230	C	Dplx	1/2 in. Foam	0.5	10
10	Andrew	NHHSS-65C-R2BT4 01DT 1900	15.5	66	350	A	Dplx	1/2 in. Foam	0.5	10
11	Andrew	NHHSS-65C-R2BT4 01DT 1900	15.5	66	110	B	Dplx	1/2 in. Foam	0.5	10
12	Andrew	NHHSS-65C-R2BT4 02DT 1900	15.5	66	230	C	Dplx	1/2 in. Foam	0.5	10
13	Andrew	NHHSS-65C-R2BT4 01DT 2100	16	66	350	A	Dplx	1/2 in. Foam	0.5	10
14	Andrew	NHHSS-65C-R2BT4 01DT 2100	16	66	110	B	Dplx	1/2 in. Foam	0.5	10
15	Andrew	NHHSS-65C-R2BT4 02DT 2100	16	66	230	C	Dplx	1/2 in. Foam	0.5	10
16	Andrew	NHHSS-65C-R2BT4 01DT 2100	16	66	350	A	Dplx	1/2 in. Foam	0.5	10
17	Andrew	NHHSS-65C-R2BT4 01DT 2100	16	66	110	B	Dplx	1/2 in. Foam	0.5	10
18	Andrew	NHHSS-65C-R2BT4 02DT 2100	16	66	230	C	Dplx	1/2 in. Foam	0.5	10
19	Andrew	NHHSS-65C-R2BT4 04DT 3500	15	66	350	A	Tx/Rx	Integrated	0.1	0.1
20	Andrew	NHHSS-65C-R2BT4 04DT 3500	15	66	110	B	Tx/Rx	Integrated	0.1	0.1
21	Andrew	NHHSS-65C-R2BT4 04DT 3500	15	66	230	C	Tx/Rx	Integrated	0.1	0.1
22	Ericsson	AIR6449 2500 NR	21.35	68.7	350	A	Tx/Rx	Integrated	0.1	0.1
23	Ericsson	AIR6449 2500 NR	21.35	68.7	110	A	Tx/Rx	Integrated	0.1	0.1
24	Ericsson	AIR6449 2500 NR	21.35	68.7	230	A	Tx/Rx	Integrated	0.1	0.1
25	Ericsson	SM6701 (as omni)	25.96	69.9	0	A	Tx/Rx	Integrated	0.1	0.1
26	Other	VectaStar NR gNB as omni	26.3	69.1	0	A	Tx/Rx	Integrated	0.1	0.1
27	Other	Microwave Dish	36.3	79	295		Dplx	1/2 in. Foam	0.5	10
28	Other	Generic Omni	3	78	0	A	Dplx	7/8 in. Foam	1	100

3.0 Transmitter Frequencies

Freq #	Ant #	Provider	Model	Technology	Channel Label	ID	Frequency	Power (Watts)	BW (kHz)
1	1	Verizon 700 MHz Upper C LTE	Generic	Land Mobile	VZ-1	A	751.00000	40	10000
2	2	Verizon 700 MHz Upper C LTE	Generic	Land Mobile	VZ-2	B	751.00000	40	10000
3	3	Verizon 700 MHz Upper C LTE	Generic	Land Mobile	VZ-3	C	751.00000	40	10000
4	4	Verizon Cellular B LTE	Generic	Land Mobile	VZ-4	D	885.00000	40	10000
5	5	Verizon Cellular B LTE	Generic	Land Mobile	VZ-5	E	885.00000	40	10000
6	6	Verizon Cellular B LTE	Generic	Land Mobile	VZ-6	F	885.00000	40	10000
7	7	Verizon PCS E LTE	Generic	Land Mobile	VZ-7	G	1967.5000	40	5000
8	8	Verizon PCS E LTE	Generic	Land Mobile	VZ-8	H	1967.5000	40	5000
9	9	Verizon PCS E LTE	Generic	Land Mobile	VZ-9	I	1967.5000	40	5000
10	10	Verizon PCS F LTE	Generic	Land Mobile	VZ-10	J	1972.5000	40	5000
11	11	Verizon PCS F LTE	Generic	Land Mobile	VZ-11	K	1972.5000	40	5000
12	12	Verizon PCS F LTE	Generic	Land Mobile	VZ-12	L	1972.5000	40	5000
13	13	Verizon AWS B LTE	Generic	Land Mobile	VZ-13	M	2125.0000	40	10000
14	14	Verizon AWS B LTE	Generic	Land Mobile	VZ-14	N	2125.0000	40	10000
15	15	Verizon AWS B LTE	Generic	Land Mobile	VZ-15	O	2125.0000	40	10000
16	16	Verizon AWS J LTE	Generic	Land Mobile	VZ-16	P	2175.0000	40	10000
17	17	Verizon AWS J LTE	Generic	Land Mobile	VZ-17	Q	2175.0000	40	10000
18	18	Verizon AWS J LTE	Generic	Land Mobile	VZ-18	R	2175.0000	40	10000
19	19	Verizon CBRS	Generic	Land Mobile	VZ-19	S	3560.0000	5	20000
20	19	Verizon CBRS	Generic	Land Mobile	VZ-20	T	3580.0000	5	20000
21	19	Verizon CBRS	Generic	Land Mobile	VZ-21	U	3600.0000	5	20000
22	20	Verizon CBRS	Generic	Land Mobile	VZ-22	V	3560.0000	5	20000
23	20	Verizon CBRS	Generic	Land Mobile	VZ-23	W	3580.0000	5	20000
24	20	Verizon CBRS	Generic	Land Mobile	VZ-24	X	3600.0000	5	20000
25	21	Verizon CBRS	Generic	Land Mobile	VZ-25	Y	3560.0000	5	20000
26	21	Verizon CBRS	Generic	Land Mobile	VZ-26	Z	3580.0000	5	20000
27	21	Verizon CBRS	Generic	Land Mobile	VZ-27	AA	3600.0000	5	20000
28	22	Verizon C-Band	Generic	Land Mobile	VZ-28	AB	3710.0000	200	20000
29	22	Verizon C-Band	Generic	Land Mobile	VZ-29	AC	3730.0000	200	20000
30	22	Verizon C-Band	Generic	Land Mobile	VZ-30	AD	3750.0000	200	20000
31	22	Verizon C-Band	Generic	Land Mobile	VZ-31	AE	3770.0000	200	20000
32	22	Verizon C-Band	Generic	Land Mobile	VZ-32	AF	3790.0000	200	20000
33	22	Verizon C-Band	Generic	Land Mobile	VZ-33	AG	3810.0000	200	20000
34	22	Verizon C-Band	Generic	Land Mobile	VZ-34	AH	3830.0000	200	20000
35	22	Verizon C-Band	Generic	Land Mobile	VZ-35	AI	3850.0000	200	20000
36	23	Verizon C-Band	Generic	Land Mobile	VZ-36	AJ	3710.0000	200	20000
37	23	Verizon C-Band	Generic	Land Mobile	VZ-37	AK	3730.0000	200	20000
38	23	Verizon C-Band	Generic	Land Mobile	VZ-38	AL	3750.0000	200	20000
39	23	Verizon C-Band	Generic	Land Mobile	VZ-39	AM	3770.0000	200	20000
40	23	Verizon C-Band	Generic	Land Mobile	VZ-40	AN	3790.0000	200	20000
41	23	Verizon C-Band	Generic	Land Mobile	VZ-41	AO	3810.0000	200	20000
42	23	Verizon C-Band	Generic	Land Mobile	VZ-42	AP	3830.0000	200	20000
43	23	Verizon C-Band	Generic	Land Mobile	VZ-43	AQ	3850.0000	200	20000
44	24	Verizon C-Band	Generic	Land Mobile	VZ-44	AR	3710.0000	200	20000
45	24	Verizon C-Band	Generic	Land Mobile	VZ-45	AS	3730.0000	200	20000
46	24	Verizon C-Band	Generic	Land Mobile	VZ-46	AT	3750.0000	200	20000
47	24	Verizon C-Band	Generic	Land Mobile	VZ-47	AU	3770.0000	200	20000
48	24	Verizon C-Band	Generic	Land Mobile	VZ-48	AV	3790.0000	200	20000
49	24	Verizon C-Band	Generic	Land Mobile	VZ-49	AW	3810.0000	200	20000
50	24	Verizon C-Band	Generic	Land Mobile	VZ-50	AX	3830.0000	200	20000
51	24	Verizon C-Band	Generic	Land Mobile	VZ-51	AY	3850.0000	200	20000
52	25	Verizon 28 GHz	Generic	Land Mobile	VZ-52	AZ	27562.0000	1.6	25000
53	25	Verizon 28 GHz	Generic	Land Mobile	VZ-53	BA	27612.0000	1.6	25000
54	25	Verizon 28 GHz	Generic	Land Mobile	VZ-54	BB	27662.0000	1.6	25000
55	25	Verizon 28 GHz	Generic	Land Mobile	VZ-55	BC	27712.0000	1.6	25000
56	25	Verizon 28 GHz	Generic	Land Mobile	VZ-56	BD	27762.0000	1.6	25000

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57	25	Verizon 28 GHz	Generic	Land Mobile	VZ-57	BE	27812.0000	1.6	25000
58	25	Verizon 28 GHz	Generic	Land Mobile	VZ-58	BF	27862.0000	1.6	25000
59	25	Verizon 28 GHz	Generic	Land Mobile	VZ-59	BG	27912.0000	1.6	25000
60	26	Verizon 39 GHz	Generic	Land Mobile	VZ-60	BH	37625.0000	1.6	25000
61	26	Verizon 39 GHz	Generic	Land Mobile	VZ-61	BI	37725.0000	1.6	25000
62	26	Verizon 39 GHz	Generic	Land Mobile	VZ-62	BJ	37825.0000	1.6	25000
63	26	Verizon 39 GHz	Generic	Land Mobile	VZ-63	BK	37925.0000	1.6	25000
64	26	Verizon 39 GHz	Generic	Land Mobile	VZ-64	BL	38025.0000	1.6	25000
65	26	Verizon 39 GHz	Generic	Land Mobile	VZ-65	BM	38125.0000	1.6	25000
66	26	Verizon 39 GHz	Generic	Land Mobile	VZ-66	BN	38225.0000	1.6	25000
67	26	Verizon 39 GHz	Generic	Land Mobile	VZ-67	BO	38325.0000	1.6	25000
68	26	Verizon 39 GHz	Generic	Land Mobile	VZ-68	BP	38425.0000	1.6	25000
69	26	Verizon 39 GHz	Generic	Land Mobile	VZ-69	BQ	38525.0000	1.6	25000
70	27	LP Broadband WQZU406/WQFG744	Generic	Microwave	LP-1	BR	11095.0000	0.06	10000
71	28	Denver KNNR200	Generic	FM Land Mobile	D-1	BS	854.06250	125	20
72	28	Denver KNNR200	Generic	FM Land Mobile	D-2	BT	854.56250	125	20
73	28	Denver KNNR200	Generic	FM Land Mobile	D-3	BU	855.46250	125	20
74	28	Denver KNNR200	Generic	FM Land Mobile	D-4	BV	855.73750	125	20
75	28	Denver KNNR200	Generic	FM Land Mobile	D-5	BW	856.13750	125	20
76	28	Denver KNNR200	Generic	FM Land Mobile	D-6	BX	856.23750	125	20
77	28	Denver KNNR200	Generic	FM Land Mobile	D-7	BY	856.63750	125	20
78	28	Denver KNNR200	Generic	FM Land Mobile	D-8	BZ	856.71250	125	20
79	28	Denver KNNR200	Generic	FM Land Mobile	D-9	CA	857.06250	125	20
80	28	Denver KNNR200	Generic	FM Land Mobile	D-10	CB	857.46250	125	20
81	28	Denver KNNR200	Generic	FM Land Mobile	D-11	CC	857.73750	125	20
82	28	Denver KNNR200	Generic	FM Land Mobile	D-12	CD	858.13750	125	20
83	28	Denver KNNR200	Generic	FM Land Mobile	D-13	CE	858.21250	125	20
84	28	Denver KNNR200	Generic	FM Land Mobile	D-14	CF	858.73750	125	20
85	28	Denver KNNR200	Generic	FM Land Mobile	D-15	CG	859.21250	125	20
86	28	Denver KNNR200	Generic	FM Land Mobile	D-16	CH	859.61250	125	20
87	28	Denver KNNR200	Generic	FM Land Mobile	D-17	CI	859.71250	125	20

4.0 Receiver Frequencies

Freq #	Ant #	Provider	Model	Technology	Channel Label	ID	Frequency	Sen (dBm)	BW (kHz)
1	1	Verizon 700 MHz Upper C LTE	Generic	Land Mobile	VZ-1	A	781.00000	-123	10000
2	2	Verizon 700 MHz Upper C LTE	Generic	Land Mobile	VZ-2	B	781.00000	-123	10000
3	3	Verizon 700 MHz Upper C LTE	Generic	Land Mobile	VZ-3	C	781.00000	-123	10000
4	4	Verizon Cellular B LTE	Generic	Land Mobile	VZ-4	D	840.00000	-123	10000
5	5	Verizon Cellular B LTE	Generic	Land Mobile	VZ-5	E	840.00000	-123	10000
6	6	Verizon Cellular B LTE	Generic	Land Mobile	VZ-6	F	840.00000	-123	10000
7	7	Verizon PCS E LTE	Generic	Land Mobile	VZ-7	G	1887.5000	-123	5000
8	8	Verizon PCS E LTE	Generic	Land Mobile	VZ-8	H	1887.5000	-123	5000
9	9	Verizon PCS E LTE	Generic	Land Mobile	VZ-9	I	1887.5000	-123	5000
10	10	Verizon PCS F LTE	Generic	Land Mobile	VZ-10	J	1892.5000	-123	5000
11	11	Verizon PCS F LTE	Generic	Land Mobile	VZ-11	K	1892.5000	-123	5000
12	12	Verizon PCS F LTE	Generic	Land Mobile	VZ-12	L	1892.5000	-123	5000
13	13	Verizon AWS B LTE	Generic	Land Mobile	VZ-13	M	1725.0000	-123	10000
14	14	Verizon AWS B LTE	Generic	Land Mobile	VZ-14	N	1725.0000	-123	10000
15	15	Verizon AWS B LTE	Generic	Land Mobile	VZ-15	O	1725.0000	-123	10000
16	16	Verizon AWS J LTE	Generic	Land Mobile	VZ-16	P	1775.0000	-123	10000
17	17	Verizon AWS J LTE	Generic	Land Mobile	VZ-17	Q	1775.0000	-123	10000
18	18	Verizon AWS J LTE	Generic	Land Mobile	VZ-18	R	1775.0000	-123	10000
19	19	Verizon CBRS	Generic	Land Mobile	VZ-19	S	3560.0000	-123	20000
20	19	Verizon CBRS	Generic	Land Mobile	VZ-20	T	3580.0000	-123	20000
21	19	Verizon CBRS	Generic	Land Mobile	VZ-21	U	3600.0000	-123	20000
22	20	Verizon CBRS	Generic	Land Mobile	VZ-22	V	3560.0000	-123	20000
23	20	Verizon CBRS	Generic	Land Mobile	VZ-23	W	3580.0000	-123	20000
24	20	Verizon CBRS	Generic	Land Mobile	VZ-24	X	3600.0000	-123	20000
25	21	Verizon CBRS	Generic	Land Mobile	VZ-25	Y	3560.0000	-123	20000
26	21	Verizon CBRS	Generic	Land Mobile	VZ-26	Z	3580.0000	-123	20000
27	21	Verizon CBRS	Generic	Land Mobile	VZ-27	AA	3600.0000	-123	20000
28	22	Verizon C-Band	Generic	Land Mobile	VZ-28	AB	3710.0000	-123	20000
29	22	Verizon C-Band	Generic	Land Mobile	VZ-29	AC	3730.0000	-123	20000
30	22	Verizon C-Band	Generic	Land Mobile	VZ-30	AD	3750.0000	-123	20000
31	22	Verizon C-Band	Generic	Land Mobile	VZ-31	AE	3770.0000	-123	20000
32	22	Verizon C-Band	Generic	Land Mobile	VZ-32	AF	3790.0000	-123	20000
33	22	Verizon C-Band	Generic	Land Mobile	VZ-33	AG	3810.0000	-123	20000
34	22	Verizon C-Band	Generic	Land Mobile	VZ-34	AH	3830.0000	-123	20000
35	22	Verizon C-Band	Generic	Land Mobile	VZ-35	AI	3850.0000	-123	20000
36	23	Verizon C-Band	Generic	Land Mobile	VZ-36	AJ	3710.0000	-123	20000
37	23	Verizon C-Band	Generic	Land Mobile	VZ-37	AK	3730.0000	-123	20000
38	23	Verizon C-Band	Generic	Land Mobile	VZ-38	AL	3750.0000	-123	20000
39	23	Verizon C-Band	Generic	Land Mobile	VZ-39	AM	3770.0000	-123	20000
40	23	Verizon C-Band	Generic	Land Mobile	VZ-40	AN	3790.0000	-123	20000
41	23	Verizon C-Band	Generic	Land Mobile	VZ-41	AO	3810.0000	-123	20000
42	23	Verizon C-Band	Generic	Land Mobile	VZ-42	AP	3830.0000	-123	20000
43	23	Verizon C-Band	Generic	Land Mobile	VZ-43	AQ	3850.0000	-123	20000
44	24	Verizon C-Band	Generic	Land Mobile	VZ-44	AR	3710.0000	-123	20000
45	24	Verizon C-Band	Generic	Land Mobile	VZ-45	AS	3730.0000	-123	20000
46	24	Verizon C-Band	Generic	Land Mobile	VZ-46	AT	3750.0000	-123	20000
47	24	Verizon C-Band	Generic	Land Mobile	VZ-47	AU	3770.0000	-123	20000
48	24	Verizon C-Band	Generic	Land Mobile	VZ-48	AV	3790.0000	-123	20000
49	24	Verizon C-Band	Generic	Land Mobile	VZ-49	AW	3810.0000	-123	20000
50	24	Verizon C-Band	Generic	Land Mobile	VZ-50	AX	3830.0000	-123	20000
51	24	Verizon C-Band	Generic	Land Mobile	VZ-51	AY	3850.0000	-123	20000
52	25	Verizon 28 GHz	Generic	Land Mobile	VZ-52	AZ	27562.0000	-100	25000
53	25	Verizon 28 GHz	Generic	Land Mobile	VZ-53	BA	27612.0000	-100	25000
54	25	Verizon 28 GHz	Generic	Land Mobile	VZ-54	BB	27662.0000	-100	25000
55	25	Verizon 28 GHz	Generic	Land Mobile	VZ-55	BC	27712.0000	-100	25000
56	25	Verizon 28 GHz	Generic	Land Mobile	VZ-56	BD	27762.0000	-100	25000
57	25	Verizon 28 GHz	Generic	Land Mobile	VZ-57	BE	27812.0000	-100	25000

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58	25	Verizon 28 GHz	Generic	Land Mobile	VZ-58	BF	27862.0000	-100	25000
59	25	Verizon 28 GHz	Generic	Land Mobile	VZ-59	BG	27912.0000	-100	25000
60	26	Verizon 39 GHz	Generic	Land Mobile	VZ-60	BH	37625.0000	-100	25000
61	26	Verizon 39 GHz	Generic	Land Mobile	VZ-61	BI	37725.0000	-100	25000
62	26	Verizon 39 GHz	Generic	Land Mobile	VZ-62	BJ	37825.0000	-100	25000
63	26	Verizon 39 GHz	Generic	Land Mobile	VZ-63	BK	37925.0000	-100	25000
64	26	Verizon 39 GHz	Generic	Land Mobile	VZ-64	BL	38025.0000	-100	25000
65	26	Verizon 39 GHz	Generic	Land Mobile	VZ-65	BM	38125.0000	-100	25000
66	26	Verizon 39 GHz	Generic	Land Mobile	VZ-66	BN	38225.0000	-100	25000
67	26	Verizon 39 GHz	Generic	Land Mobile	VZ-67	BO	38325.0000	-100	25000
68	26	Verizon 39 GHz	Generic	Land Mobile	VZ-68	BP	38425.0000	-100	25000
69	26	Verizon 39 GHz	Generic	Land Mobile	VZ-69	BQ	38525.0000	-100	25000
70	27	LP Broadband WQZU406/WQFG744	Generic	Microwave	LP-1	BR	11585.0000	-123	10000
71	28	Denver KNNR200	Generic	FM Land Mobile	D-1	BS	809.06250	-119	8
72	28	Denver KNNR200	Generic	FM Land Mobile	D-2	BT	809.56250	-119	8
73	28	Denver KNNR200	Generic	FM Land Mobile	D-3	BU	810.46250	-119	8
74	28	Denver KNNR200	Generic	FM Land Mobile	D-4	BV	810.73750	-119	8
75	28	Denver KNNR200	Generic	FM Land Mobile	D-5	BW	811.13750	-119	8
76	28	Denver KNNR200	Generic	FM Land Mobile	D-6	BX	811.23750	-119	8
77	28	Denver KNNR200	Generic	FM Land Mobile	D-7	BY	811.63750	-119	8
78	28	Denver KNNR200	Generic	FM Land Mobile	D-8	BZ	811.71250	-119	8
79	28	Denver KNNR200	Generic	FM Land Mobile	D-9	CA	812.06250	-119	8
80	28	Denver KNNR200	Generic	FM Land Mobile	D-10	CB	812.46250	-119	8
81	28	Denver KNNR200	Generic	FM Land Mobile	D-11	CC	812.73750	-119	8
82	28	Denver KNNR200	Generic	FM Land Mobile	D-12	CD	813.13750	-119	8
83	28	Denver KNNR200	Generic	FM Land Mobile	D-13	CE	813.21250	-119	8
84	28	Denver KNNR200	Generic	FM Land Mobile	D-14	CF	813.73750	-119	8
85	28	Denver KNNR200	Generic	FM Land Mobile	D-15	CG	814.21250	-119	8
86	28	Denver KNNR200	Generic	FM Land Mobile	D-16	CH	814.61250	-119	8
87	28	Denver KNNR200	Generic	FM Land Mobile	D-17	CI	814.71250	-119	8

5.0 Transmitter Noise Analysis

Transmitter noise interference occurs because a transmitter radiates energy on its operating frequency as well as frequencies above and below the assigned frequency. The energy that is radiated above and below the assigned frequency is known as sideband noise energy and extends for several megahertz on either side of the operating frequency. This undesired noise energy can fall within the passband of a nearby receiver even if the receiver's operating frequency is several megahertz away. The transmitter noise appears as "on-channel" noise interference and cannot be filtered out at the receiver. It is on the receiver's operating frequency and competes with the desired signal, which in effect, degrades the operational performance.

The analysis predicts each transmitter's noise signal level present at the input of each receiver. It takes into account the transmitter's noise characteristics, frequency separation, power output, transmission line losses, filters, duplexers, combiners, isolators, multi-couplers and other RF devices that are present in both systems. Additionally, the analysis considers the antenna separation space loss, horizontal and vertical gain components of the antennas as well as how they are mounted on the structure. The gain components are derived from antenna pattern data published by each manufacturer.

The analysis determines how much isolation is required, if any, to prevent receiver performance degradation caused by transmitter noise interference. The Table below depicts the results of this analysis. For each receiver, the transmitter that has the worst-case impact is displayed. The Signal Margin represents the margin in dB, before the receiver's performance is degraded. A negative number indicates that the performance is degraded and the value indicates how much additional isolation is required to prevent receiver performance degradation.

Receiver Provider	Receive Channel	Receive Frequency (MHz)	Transmitter Provider	Transmit Channel	Transmit Frequency (MHz)	Attn Required (dB)	Attn Provided (dB)	Signal Margin (dB)
Verizon 700 MHz Upper C LTE	VZ-1	781.00000	Verizon 700 MHz Upper C LTE	VZ-1	751.00000	65.3	140.3	75
Verizon 700 MHz Upper C LTE	VZ-2	781.00000	Verizon 700 MHz Upper C LTE	VZ-2	751.00000	65.3	140.3	75
Verizon 700 MHz Upper C LTE	VZ-3	781.00000	Verizon 700 MHz Upper C LTE	VZ-3	751.00000	65.3	140.3	75
Verizon Cellular B LTE	VZ-4	840.00000	Denver KNNR200	D-1	854.06250	74.6	159.6	85.1
Verizon Cellular B LTE	VZ-5	840.00000	Denver KNNR200	D-1	854.06250	74.6	184.1	109.5
Verizon Cellular B LTE	VZ-6	840.00000	Denver KNNR200	D-1	854.06250	74.6	184.8	110.2
Verizon PCS E LTE	VZ-7	1887.5000	Verizon PCS E LTE	VZ-7	1967.5000	61.6	137.1	75.5
Verizon PCS E LTE	VZ-8	1887.5000	Verizon PCS E LTE	VZ-8	1967.5000	61.6	137.1	75.5
Verizon PCS E LTE	VZ-9	1887.5000	Verizon PCS E LTE	VZ-9	1967.5000	61.6	137.1	75.5
Verizon PCS F LTE	VZ-10	1892.5000	Verizon PCS F LTE	VZ-10	1972.5000	61.6	133.6	71.9

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Verizon PCS F LTE	VZ-11	1892.5000	Verizon PCS F LTE	VZ-11	1972.5000	61.6	133.6	71.9
Verizon PCS F LTE	VZ-12	1892.5000	Verizon PCS F LTE	VZ-12	1972.5000	61.6	133.6	71.9
Verizon AWS B LTE	VZ-13	1725.0000	Verizon AWS B LTE	VZ-13	2125.0000	61.6	169	107.4
Verizon AWS B LTE	VZ-14	1725.0000	Verizon AWS B LTE	VZ-14	2125.0000	61.6	169	107.4
Verizon AWS B LTE	VZ-15	1725.0000	Verizon AWS B LTE	VZ-15	2125.0000	61.6	169	107.4
Verizon AWS J LTE	VZ-16	1775.0000	Verizon AWS J LTE	VZ-16	2175.0000	61.6	172	110.4
Verizon AWS J LTE	VZ-17	1775.0000	Verizon AWS J LTE	VZ-17	2175.0000	61.6	172	110.4
Verizon AWS J LTE	VZ-18	1775.0000	Verizon AWS J LTE	VZ-18	2175.0000	61.6	172	110.4
Verizon CBRS	VZ-19	3560.0000	Verizon C-Band	VZ-28	3710.0000	68.6	277.7	209.1
Verizon CBRS	VZ-20	3580.0000	Verizon C-Band	VZ-28	3710.0000	68.6	277.7	209.1
Verizon CBRS	VZ-21	3600.0000	Verizon C-Band	VZ-28	3710.0000	68.6	277.7	209.1
Verizon CBRS	VZ-22	3560.0000	Verizon C-Band	VZ-44	3710.0000	68.6	282.4	213.8
Verizon CBRS	VZ-23	3580.0000	Verizon C-Band	VZ-44	3710.0000	68.6	282.4	213.8
Verizon CBRS	VZ-24	3600.0000	Verizon C-Band	VZ-44	3710.0000	68.6	282.4	213.8
Verizon CBRS	VZ-25	3560.0000	Verizon C-Band	VZ-44	3710.0000	68.6	261.6	193
Verizon CBRS	VZ-26	3580.0000	Verizon C-Band	VZ-44	3710.0000	68.6	261.6	193
Verizon CBRS	VZ-27	3600.0000	Verizon C-Band	VZ-44	3710.0000	68.6	261.6	193
Verizon C-Band	VZ-28	3710.0000	Verizon C-Band	VZ-30	3750.0000	69.5	219.4	149.9
Verizon C-Band	VZ-29	3730.0000	Verizon C-Band	VZ-31	3770.0000	69.5	219.4	149.9
Verizon C-Band	VZ-30	3750.0000	Verizon C-Band	VZ-32	3790.0000	69.5	219.4	149.9
Verizon C-Band	VZ-31	3770.0000	Verizon C-Band	VZ-29	3730.0000	69.5	220.8	151.3
Verizon C-Band	VZ-32	3790.0000	Verizon C-Band	VZ-34	3830.0000	69.5	219.4	149.9
Verizon C-Band	VZ-33	3810.0000	Verizon C-Band	VZ-35	3850.0000	69.5	91.2	21.8
Verizon C-Band	VZ-34	3830.0000	Verizon C-Band	VZ-32	3790.0000	69.5	220.8	151.3
Verizon C-Band	VZ-35	3850.0000	Verizon C-Band	VZ-28	3710.0000	68.6	310.6	242
Verizon C-Band	VZ-36	3710.0000	Verizon C-Band	VZ-38	3750.0000	69.5	219.4	149.9
Verizon C-Band	VZ-37	3730.0000	Verizon C-Band	VZ-39	3770.0000	69.5	219.4	149.9
Verizon C-Band	VZ-38	3750.0000	Verizon C-Band	VZ-40	3790.0000	69.5	219.4	149.9
Verizon C-Band	VZ-39	3770.0000	Verizon C-Band	VZ-37	3730.0000	69.5	220.8	151.3
Verizon C-Band	VZ-40	3790.0000	Verizon C-Band	VZ-42	3830.0000	69.5	219.4	149.9
Verizon C-Band	VZ-41	3810.0000	Verizon C-Band	VZ-43	3850.0000	69.5	91.2	21.8
Verizon C-Band	VZ-42	3830.0000	Verizon C-Band	VZ-40	3790.0000	69.5	220.8	151.3
Verizon C-Band	VZ-43	3850.0000	Verizon C-Band	VZ-36	3710.0000	68.6	310.6	242
Verizon C-Band	VZ-44	3710.0000	Verizon C-Band	VZ-46	3750.0000	69.5	219.4	149.9
Verizon C-Band	VZ-45	3730.0000	Verizon C-Band	VZ-47	3770.0000	69.5	219.4	149.9
Verizon C-Band	VZ-46	3750.0000	Verizon C-Band	VZ-48	3790.0000	69.5	219.4	149.9
Verizon C-Band	VZ-47	3770.0000	Verizon C-Band	VZ-45	3730.0000	69.5	220.8	151.3
Verizon C-Band	VZ-48	3790.0000	Verizon C-Band	VZ-50	3830.0000	69.5	219.4	149.9
Verizon C-Band	VZ-49	3810.0000	Verizon C-Band	VZ-51	3850.0000	69.5	91.2	21.8
Verizon C-Band	VZ-50	3830.0000	Verizon C-Band	VZ-48	3790.0000	69.5	220.8	151.3
Verizon C-Band	VZ-51	3850.0000	Verizon C-Band	VZ-44	3710.0000	68.6	310.6	242
LP Broadband WQZU406/WQ FG744	LP-1	11585.0000	LP Broadband WQZU406/WQ FG744	LP-1	11095.0000	33.4	61	27.6
Denver KNNR200	D-1	809.06250	Denver KNNR200	D-1	854.06250	59.6	160	100.4
Denver KNNR200	D-2	809.56250	Denver KNNR200	D-1	854.06250	59.7	162.1	102.4
Denver KNNR200	D-3	810.46250	Denver KNNR200	D-1	854.06250	60	161.1	101.1
Denver KNNR200	D-4	810.73750	Denver KNNR200	D-1	854.06250	60	163.4	103.4
Denver KNNR200	D-5	811.13750	Denver KNNR200	D-1	854.06250	60.1	171	111
Denver KNNR200	D-6	811.23750	Denver KNNR200	D-1	854.06250	60.1	172.8	112.7
Denver KNNR200	D-7	811.63750	Denver KNNR200	D-1	854.06250	60.1	177.9	117.8

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Denver KNNR200	D-8	811.71250	Denver KNNR200	D-1	854.06250	60.2	178.7	118.5
Denver KNNR200	D-9	812.06250	Denver KNNR200	D-1	854.06250	60.2	182.8	122.6
Denver KNNR200	D-10	812.46250	Denver KNNR200	D-1	854.06250	60.3	190.5	130.2
Denver KNNR200	D-11	812.73750	Denver KNNR200	D-1	854.06250	60.3	196.4	136.1
Denver KNNR200	D-12	813.13750	Denver KNNR200	D-1	854.06250	60.4	202.7	142.3
Denver KNNR200	D-13	813.21250	Denver KNNR200	D-1	854.06250	60.4	203.5	143.1
Denver KNNR200	D-14	813.73750	Denver KNNR200	D-1	854.06250	60.4	206.8	146.4
Denver KNNR200	D-15	814.21250	Denver KNNR200	D-1	854.06250	60.4	208.8	148.4
Denver KNNR200	D-16	814.61250	Denver KNNR200	D-1	854.06250	60.5	212	151.5
Denver KNNR200	D-17	814.71250	Denver KNNR200	D-1	854.06250	60.5	212.9	152.4

No transmitter noise interference problems were predicted.

6.0 Receiver Desensitization Analysis

Receiver desensitization interference occurs when an undesired signal from a nearby "off-frequency" transmitter is sufficiently close to a receiver's operating frequency. The signal may get through the RF selectivity of the receiver. If this undesired signal is of sufficient amplitude, the receiver's critical voltage and current levels are altered and the performance of the receiver is degraded at its operating frequency. The gain of the receiver is reduced, thereby reducing the performance of the receiver.

A transmitter can be operating several megahertz away from the receiver frequency and/or its antenna can be located several thousand feet from the receiver's antenna and still cause interference.

The analysis predicts each transmitter's signal level present at the input of each receiver. It takes into account the transmitter's power output, frequency separation, transmission line losses, filters, duplexers, combiners, isolators, multi-couplers and other RF devices that are present in both systems. Additionally, the analysis considers the antenna separation space loss, horizontal and vertical gain components of the antennas as well as how they are mounted on the structure. The gain components are derived from antenna pattern data published by each manufacturer.

The analysis determines how much isolation is required, if any, to prevent receiver performance degradation caused by receiver desensitization interference. The Table below depicts the results of this analysis. For each receiver, the transmitter that has the worst-case impact is displayed. The Signal Margin represents the margin in dB, before the receiver's performance is degraded. A negative number indicates that the performance is degraded and the value indicates how much additional isolation is required to prevent receiver performance degradation.

Receiver Provider	Receive Channel	Receive Frequency (MHz)	Transmitter Provider	Transmit Channel	Transmit Frequency (MHz)	Attn Required (dB)	Attn Provided (dB)	Signal Margin (dB)
Verizon 700 MHz Upper C LTE	VZ-1	781.00000	Verizon 700 MHz Upper C LTE	VZ-1	751.00000	29.3	159.3	130
Verizon 700 MHz Upper C LTE	VZ-2	781.00000	Verizon 700 MHz Upper C LTE	VZ-2	751.00000	29.3	159.3	130
Verizon 700 MHz Upper C LTE	VZ-3	781.00000	Verizon 700 MHz Upper C LTE	VZ-3	751.00000	29.3	159.3	130
Verizon Cellular B LTE	VZ-4	840.00000	Denver KNNR200	D-1	854.06250	49.6	172.1	122.5
Verizon Cellular B LTE	VZ-5	840.00000	Verizon Cellular B LTE	VZ-5	885.00000	30.6	171.1	140.5
Verizon Cellular B LTE	VZ-6	840.00000	Verizon Cellular B LTE	VZ-6	885.00000	30.6	171.1	140.5
Verizon PCS E LTE	VZ-7	1887.5000	Verizon PCS E LTE	VZ-7	1967.5000	26	154.1	128.1
Verizon PCS E LTE	VZ-8	1887.5000	Verizon PCS E LTE	VZ-8	1967.5000	26	154.1	128.1
Verizon PCS E LTE	VZ-9	1887.5000	Verizon PCS E LTE	VZ-9	1967.5000	26	154.1	128.1
Verizon PCS F LTE	VZ-10	1892.5000	Verizon PCS F LTE	VZ-10	1972.5000	26	155.6	129.6

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Verizon PCS F LTE	VZ-11	1892.5000	Verizon PCS F LTE	VZ-11	1972.5000	26	155.6	129.6
Verizon PCS F LTE	VZ-12	1892.5000	Verizon PCS F LTE	VZ-12	1972.5000	26	155.6	129.6
Verizon AWS B LTE	VZ-13	1725.0000	Verizon AWS B LTE	VZ-13	2125.0000	26	160.2	134.2
Verizon AWS B LTE	VZ-14	1725.0000	Verizon AWS B LTE	VZ-14	2125.0000	26	160.2	134.2
Verizon AWS B LTE	VZ-15	1725.0000	Verizon AWS B LTE	VZ-15	2125.0000	26	160.2	134.2
Verizon AWS J LTE	VZ-16	1775.0000	Verizon AWS J LTE	VZ-16	2175.0000	26	164.2	138.2
Verizon AWS J LTE	VZ-17	1775.0000	Verizon AWS J LTE	VZ-17	2175.0000	26	164.2	138.2
Verizon AWS J LTE	VZ-18	1775.0000	Verizon AWS J LTE	VZ-18	2175.0000	26	164.2	138.2
Verizon CBRS	VZ-19	3560.0000	Verizon C-Band	VZ-28	3710.0000	33	301.1	268.1
Verizon CBRS	VZ-20	3580.0000	Verizon C-Band	VZ-28	3710.0000	33	301.1	268.1
Verizon CBRS	VZ-21	3600.0000	Verizon C-Band	VZ-28	3710.0000	33	301.1	268.1
Verizon CBRS	VZ-22	3560.0000	Verizon C-Band	VZ-44	3710.0000	33	305.8	272.8
Verizon CBRS	VZ-23	3580.0000	Verizon C-Band	VZ-44	3710.0000	33	305.8	272.8
Verizon CBRS	VZ-24	3600.0000	Verizon C-Band	VZ-44	3710.0000	33	305.8	272.8
Verizon CBRS	VZ-25	3560.0000	Verizon C-Band	VZ-44	3710.0000	33	285	252
Verizon CBRS	VZ-26	3580.0000	Verizon C-Band	VZ-44	3710.0000	33	285	252
Verizon CBRS	VZ-27	3600.0000	Verizon C-Band	VZ-44	3710.0000	33	285	252
Verizon C-Band	VZ-28	3710.0000	Verizon C-Band	VZ-30	3750.0000	33.4	220.8	187.4
Verizon C-Band	VZ-29	3730.0000	Verizon C-Band	VZ-31	3770.0000	33.4	220.8	187.4
Verizon C-Band	VZ-30	3750.0000	Verizon C-Band	VZ-28	3710.0000	33.4	219.4	186
Verizon C-Band	VZ-31	3770.0000	Verizon C-Band	VZ-29	3730.0000	33.4	219.4	186
Verizon C-Band	VZ-32	3790.0000	Verizon C-Band	VZ-30	3750.0000	33.4	219.4	186
Verizon C-Band	VZ-33	3810.0000	Verizon C-Band	VZ-31	3770.0000	33.4	219.4	186
Verizon C-Band	VZ-34	3830.0000	Verizon C-Band	VZ-32	3790.0000	33.4	219.4	186
Verizon C-Band	VZ-35	3850.0000	Verizon C-Band	VZ-32	3790.0000	33	219.4	186.4
Verizon C-Band	VZ-36	3710.0000	Verizon C-Band	VZ-38	3750.0000	33.4	220.8	187.4
Verizon C-Band	VZ-37	3730.0000	Verizon C-Band	VZ-39	3770.0000	33.4	220.8	187.4
Verizon C-Band	VZ-38	3750.0000	Verizon C-Band	VZ-36	3710.0000	33.4	219.4	186
Verizon C-Band	VZ-39	3770.0000	Verizon C-Band	VZ-37	3730.0000	33.4	219.4	186
Verizon C-Band	VZ-40	3790.0000	Verizon C-Band	VZ-38	3750.0000	33.4	219.4	186
Verizon C-Band	VZ-41	3810.0000	Verizon C-Band	VZ-39	3770.0000	33.4	219.4	186
Verizon C-Band	VZ-42	3830.0000	Verizon C-Band	VZ-40	3790.0000	33.4	219.4	186
Verizon C-Band	VZ-43	3850.0000	Verizon C-Band	VZ-40	3790.0000	33	219.4	186.4
Verizon C-Band	VZ-44	3710.0000	Verizon C-Band	VZ-46	3750.0000	33.4	220.8	187.4
Verizon C-Band	VZ-45	3730.0000	Verizon C-Band	VZ-47	3770.0000	33.4	220.8	187.4
Verizon C-Band	VZ-46	3750.0000	Verizon C-Band	VZ-44	3710.0000	33.4	219.4	186
Verizon C-Band	VZ-47	3770.0000	Verizon C-Band	VZ-45	3730.0000	33.4	219.4	186
Verizon C-Band	VZ-48	3790.0000	Verizon C-Band	VZ-46	3750.0000	33.4	219.4	186
Verizon C-Band	VZ-49	3810.0000	Verizon C-Band	VZ-47	3770.0000	33.4	219.4	186
Verizon C-Band	VZ-50	3830.0000	Verizon C-Band	VZ-48	3790.0000	33.4	219.4	186
Verizon C-Band	VZ-51	3850.0000	Verizon C-Band	VZ-48	3790.0000	33	219.4	186.4
LP Broadband WQZU406/WQ FG744	LP-1	11585.0000	LP Broadband WQZU406/WQ FG744	LP-1	11095.0000	2.2	33.5	31.3
Denver KNNR200	D-1	809.06250	Denver KNNR200	D-1	854.06250	31.6	197.6	166
Denver KNNR200	D-2	809.56250	Denver KNNR200	D-1	854.06250	31.6	197.6	166
Denver KNNR200	D-3	810.46250	Denver KNNR200	D-1	854.06250	31.7	197.6	165.9
Denver KNNR200	D-4	810.73750	Denver KNNR200	D-1	854.06250	31.7	197.6	165.9
Denver KNNR200	D-5	811.13750	Denver KNNR200	D-1	854.06250	31.8	197.6	165.8
Denver KNNR200	D-6	811.23750	Denver KNNR200	D-1	854.06250	31.8	197.6	165.8
Denver KNNR200	D-7	811.63750	Denver KNNR200	D-1	854.06250	31.8	197.6	165.8

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Denver KNNR200	D-8	811.71250	Denver KNNR200	D-1	854.06250	31.8	197.6	165.8
Denver KNNR200	D-9	812.06250	Denver KNNR200	D-1	854.06250	31.8	197.6	165.8
Denver KNNR200	D-10	812.46250	Denver KNNR200	D-1	854.06250	31.9	197.6	165.7
Denver KNNR200	D-11	812.73750	Denver KNNR200	D-1	854.06250	31.9	197.6	165.7
Denver KNNR200	D-12	813.13750	Denver KNNR200	D-1	854.06250	31.9	197.6	165.6
Denver KNNR200	D-13	813.21250	Denver KNNR200	D-1	854.06250	32	197.6	165.6
Denver KNNR200	D-14	813.73750	Denver KNNR200	D-1	854.06250	32	197.6	165.6
Denver KNNR200	D-15	814.21250	Denver KNNR200	D-1	854.06250	32	197.6	165.5
Denver KNNR200	D-16	814.61250	Denver KNNR200	D-1	854.06250	32.1	197.6	165.5
Denver KNNR200	D-17	814.71250	Denver KNNR200	D-1	854.06250	32.1	197.6	165.5

No receiver desensitization interference problems were predicted.

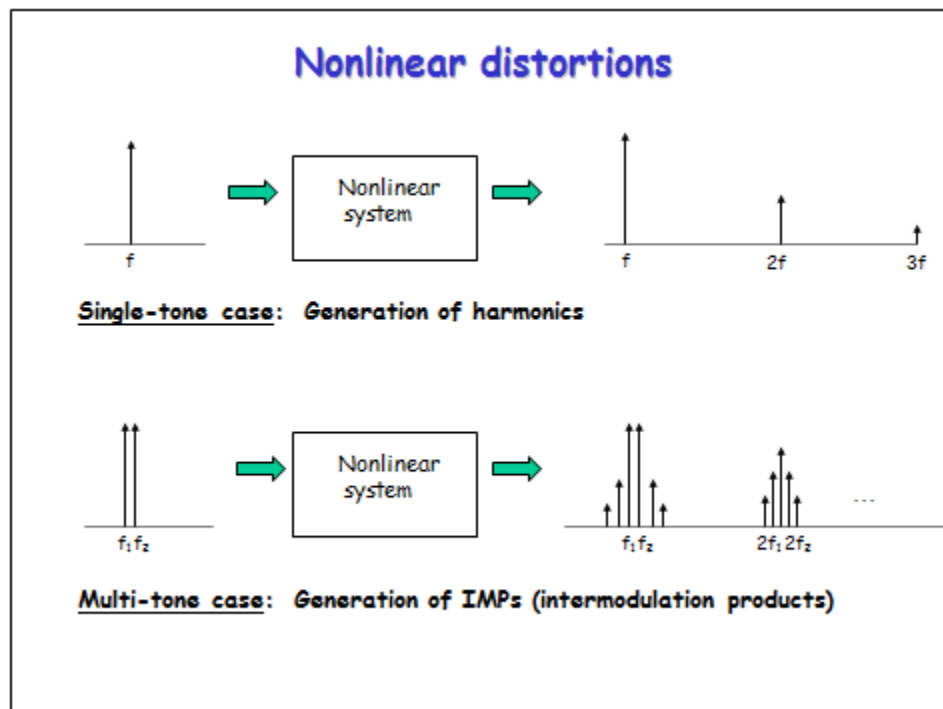
7.0 Intermodulation Interference Analysis

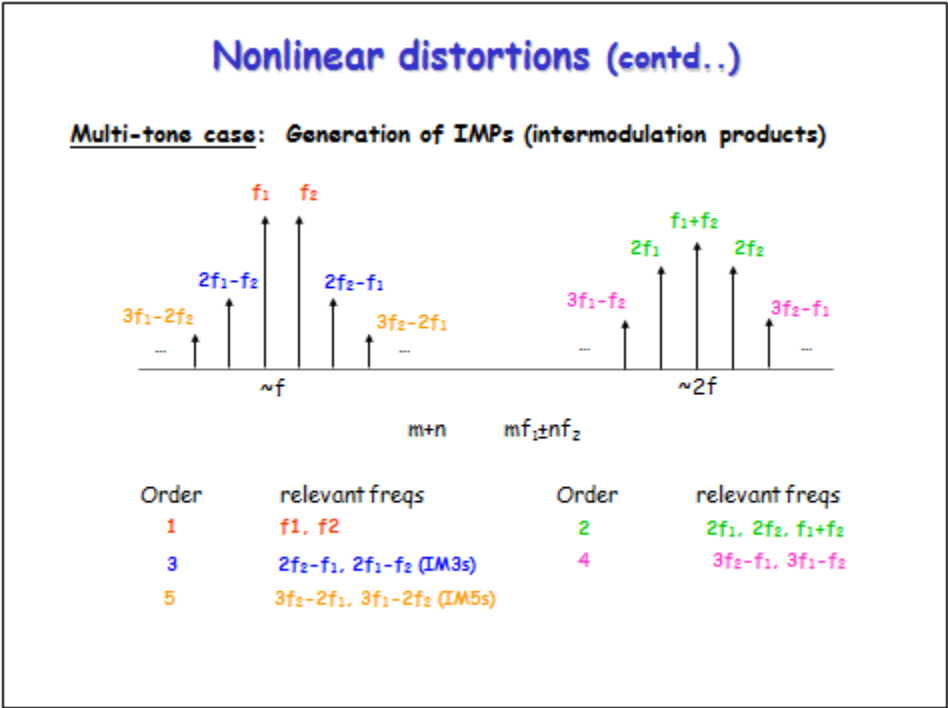
There are three basic categories of Intermodulation (IM) interference. They are receiver produced, transmitter produced, and "other" radiated IM. Transmitter produced IM is the result of one or more transmitters impressing a signal in the non-linear final output stage circuitry of another transmitter, usually via antenna coupling. The IM product frequency is then re-radiated from the transmitter's antenna. Receiver produced IM is the result of two or more transmitter signals mixing in a receiver RF amplifier or mixer stage when operating in a non-linear range.

"Other" radiated IM is the result of transmitter signals mixing in other non-linear junctions. These junctions are usually metallic, such as rusty bolts on a tower, dissimilar metallic junctions, or other non-linear metallic junctions in the area. IM products can also be caused by non-linearity in the transmission system such as antenna, transmission line, or connectors.

Communication sites with co-located transmitters, usually have RF coupling between each transmitter and antenna system. This results in the signals of each transmitter entering the nonlinear final output (PA) circuitry of the other transmitters. When intermodulation (IM) products are created in the output circuitry and they fall within the passband of the final amplifier, the IM products are re-radiated and may interfere with receivers at the same site or at other nearby sites. Additionally, these strong transmitter signals may directly enter a receiver and drive the RF amplifier into a nonlinear operation, or if not filtered effectively by the receiver input circuitry, these signals could mix in the nonlinear circuitry of the receiver front-end or mixer, creating IM products directly in the receiver.

The frequencies of IM mixing are known as nonlinear distortions. The images below depict how these IM products are derived when passing through a nonlinear junction/system.





Not all of the mixing possibilities are significant in creating interference signals. Some fall “out-of-band” of the receiver and the higher order IM products are usually weaker in signal strength.

7.1 Transmitter Generated Intermodulation Analysis

Intermodulation in transmitters occurs when a signal from another transmitter is impressed on the nonlinear final output stage circuitry, usually via antenna coupling. The power level of the IM product is determined by the power level of the incoming extraneous signal from another transmitter and by a conversion loss factor. The conversion loss factor takes into account the mixing efficiency of the transmitter's final output stage. Conversion loss differs with transmitter design, adjustment, frequency separation of the source signals, and with the order of the IM product.

The analysis calculates all possible IM product frequencies that could potentially interfere with receivers at the communications site based on each receiver’s individual bandwidth. It then predicts each IM signal level present at the input of each affected receiver. For each IM frequency, the analysis considers all possible sources of IM generation in the transmitters. For example, if there are four transmitters involve, the analysis will calculate the IM signal level that would be generated in each transmitter. For this example, that would be four possible mixing conditions.

The analysis takes into account the transmitter’s power output, modulation bandwidth, conversion losses, transmission line losses, filters, duplexers, combiners, isolators, multi-couplers and other RF devices that are present in each system. Additionally, the analysis considers the antenna

Marston Park

separation space loss, horizontal and vertical gain components of the antennas as well as how they are mounted on the structure. The gain components are derived from antenna pattern data published by each manufacturer.

The analysis determines how much isolation is required to prevent receiver performance degradation for each IM interference signal that occurs. Receivers experiencing transmitter generated intermodulation interference are depicted in the following Table.

Tx 1 Source Mix		Tx 2 Source		TX 3 Source		Tx 4 Source		Tx 5 Source		Intermod		Affected Receiver		Attn
ID	Freq (MHz)	I	Freq (MHz)	ID	Freq (MHz)	ID	Freq (MHz)	ID	Freq (MHz)	Freq (MHz)	Ord	ID	Freq (MHz)	Need
None														

No transmitter generated intermodulation interference problems were predicted.

7.2 Receiver Generated Intermodulation Analysis

Within a receiver, when two or more strong off-channel signals enter and mix in the receiver and one of the IM product frequencies created coincides with the receiver operating frequency, potential interference results. This internal IM mixing process takes place in the receiver's RF amplifier when it operates in a nonlinear range and/or in the first mixer, which, of course, has been designed to operate as a nonlinear device.

Receivers have a similar conversion loss type factor and receiver performance is commonly described in terms of conversion loss with respect to the 2A - B type products. Here, conversion loss is the ratio of a specified level of A and B to the level of the resulting IM product, when the product is viewed as an equivalent on-channel signal. Receiver conversion loss varies with input levels, AGC action, and product order.

The analysis calculates all possible IM product frequencies that could potentially interfere with receivers at the communications site based on each receiver's individual bandwidth. It then predicts each IM signal level present at the input of each affected receiver. For each IM frequency, the analysis considers that the IM signal is generated directly in the receiver.

The analysis takes into account the transmitter's power output, modulation bandwidth, conversion losses, transmission line losses, filters, duplexers, combiners, isolators, multi-couplers and other RF devices that are present in each system. Additionally, the analysis considers the antenna separation space loss, horizontal and vertical gain components of the antennas as well as how they are mounted on the structure. The gain components are derived from antenna pattern data published by each manufacturer.

The analysis determines how much isolation is required to prevent receiver performance degradation for each IM interference signal that occurs. Receivers experiencing receiver generated intermodulation interference are depicted in the following Table.

Tx 1 Source		Tx 2 Source		Tx 3 Source		Tx 4 Source		Tx 5 Source		Intermod Hit		Affected Receiver		Attn Need
ID	Freq (MHz)	ID	Freq (MHz)	ID	Freq (MHz)	ID	Freq (MHz)	ID	Freq (MHz)	Freq (MHz)	Ord	ID	Freq (MHz)	
None														

No receiver generated intermodulation interference problems were predicted.

8.0 Transmitter Harmonic Output Interference Analysis

Transmitter harmonic interference is due to non-linear characteristics in a transmitter. The harmonics are typically created due to frequency multipliers and the non-linear design of the final output stage of the transmitter. If the harmonic signal falls within the passband of a nearby receiver and the signal level is of sufficient amplitude, it can degrade the performance of the receiver.

The analysis takes into account the transmitter's harmonic characteristics, output level, transmission line losses, filters, duplexers, combiners, isolators, multi-couplers and other RF devices that are present in each system. Additionally, the analysis considers the antenna separation space loss, horizontal and vertical gain components of the antennas as well as how they are mounted on the structure. The gain components are derived from antenna pattern data published by each manufacturer.

The analysis determines how much isolation is required to prevent receiver performance degradation for any harmonics that fall within a receiver's passband. Receivers experiencing transmitter harmonic interference are depicted in the following Table.

Transmitter		Harmonic		Affected Receiver		Attn Needed
ID	Frequency (MHz)	Frequency (MHz)	Order	ID	Frequency (MHz)	
None						

No transmitter generated harmonic interference problems were predicted.

9.0 Transmitter Spurious Output Interference Analysis

Transmitter spurious output interference can be attributed to many different factors in a transmitter. The generation of spurious frequencies could be due to non-linear characteristics in a transmitter or possibly the physical placement of components and unwanted coupling. If a spurious signal falls within the passband of a nearby receiver and the signal level is of sufficient amplitude, it can degrade the performance of the receiver.

The analysis takes into account a transmitter's spurious output specification, output levels, transmission line losses, filters, duplexers, combiners, isolators, multi-couplers and other RF devices that are present in each system. Additionally, the analysis considers the antenna separation space loss, horizontal and vertical gain components of the antennas as well as how they are mounted on the structure. The gain components are derived from antenna pattern data published by each manufacturer.

The analysis determines how much isolation is required to prevent receiver performance degradation for any transmitter spurious signals that fall within a receiver's passband. Receivers experiencing transmitter spurious output interference are depicted in the following Table.

Transmitter		Affected Receiver		Attn Needed
ID	Frequency (MHz)	ID	Frequency (MHz)	
None				

No transmitter generated spurious interference problems were predicted.

10.0 Interference Power Level Summing Analysis

This section of the report provides a simulation of Intermodulation (IM) interference, transmitter wideband noise and receiver desensitization interference occurring on each individual receiver when all transmitters at the site are active at the same instance in time. Even though individual interference modes may not be reported in other report sections, this summing analysis represents a worst-case interference scenario.

However, the probability of this interference occurrence for an individual receiver could be low since it depends on the utilization of the transmitters involved in the interference generation.

The carrier-to-noise $C/(I + N)$ ratio for each receiver is based on the aggregate of interference power levels. A negative $C/(I + N)$ ratio indicates that the performance of the receiver could possibly be degraded by the value shown.

The following Table presents this data:

Receiver		Interference Power Level (dBm)				
Channel Label	Freq (MHz)	Tx Noise	Rx Desense	IM Power	Aggregate	C / (I+N)
None						

11.0 Discussion and Recommendations

Information regarding existing and proposed equipment, cabling and antennas has been provided by Verizon Wireless' representatives. Waterford Consultants, LLC has considered specific frequency information as well as spectrum blocks licensed to licensees listed herein based on FCC database query results. For wireless service providers, Waterford Consultants, LLC has assumed band and technology deployment based on available consumer sources that monitor wireless voice and data providers in specific markets. Typical channel plans have been assumed for this study and these results are limited to the information contained within this report.

No site visit was performed for this analysis and the condition of the structure and installed appurtenances as well as nearby environmental factors that could be potential sources of passive intermodulation interference have not been considered.

12.0 Professional Certification

Engineering Statement Re:

Potential for Interference to Existing Services

At

Marston Park

My signature on the cover of this study hereby certifies and affirms:

That I am a registered as a Professional Engineer in the jurisdiction indicated; and

That I am employed by Waterford Consultants, which provides engineering services to clients in the Radio Communications field; and

That I am familiar with the Rules and Regulations and the policies of the Federal Communications Commission both in general and specifically as they apply to the treatment of interference to other services such as may be created by Commission licenses; and

That I have examined the technical information supplied by Verizon Wireless and their representatives relating to their intention to install antennas, transmitters and associated technical equipment on an existing communication site, on an existing tower/structure, currently identified as the Marston Park Co-location Study site; and

That the technical equipment to be installed by Verizon Wireless represents the state of the art and that it has been carefully designed to preclude the possibility of interference to other services, including the transmission and reception of broadcast AM, FM, and Television and other communications services, such as police, fire, utility and other public safety and public service facilities as well as private communications installations, such as cordless telephones, and Citizen's Band and Radio Amateur stations; and

That the equipment to be installed by Verizon Wireless, meets or exceeds all Federal Communications Commission emission requirements to avoid interfering with other services and home/business equipment; and

That frequency information provided by Verizon Wireless concerning existing installations on this structure has been examined to estimate the potential for interference to existing and proposed operations, resulting from the introduction of the Verizon Wireless' operation; and

That this examination involved the computation of intermodulation products, transmitter harmonics, receiver desensitization, and transmitter spurious emissions produced by the combination of frequencies associated with existing services known to currently operate at the

Marston Park

Marston Park Co-location Study site, and these frequencies, which could be used by others at the Marston Park Co-location Study site; and

That intermodulation products were computed (as a minimum) for the fundamental (f_0), second ($2f_0$) thru seventh ($7f_0$) harmonic components of frequencies at this site; and

That predicted products were not found to potentially cause intermodulation to Verizon Wireless' proposed operations or to the other licenses currently operating at the Marston Park Co-location Study site; and

That no additional isolation needs to be provided between antennas in the horizontal and vertical planes, and the attenuation along the nadir and zenith associated with vertical plane radiation patterns; and

That after examination the levels of RF energy present at the Marston Park Co-location Study site, receiver sensitivity will not be degraded by either the existing or Verizon Wireless' proposed operations; and

That, if interference were to occur as a result of Verizon Wireless' operations, Verizon Wireless would be expected to recognize its responsibility to act promptly to take steps necessary to correct the interference, including, but not limited to, filtering and frequency coordination; and

In summary, it is stated here that there is not an indication that the installation being proposed by Verizon Wireless will create interference to their own operations, or the operations of any of the services currently operating at the Marston Park Co-location Study site. In the event that interference is identified after installation and is attributable to Verizon Wireless' equipment, frequency coordination and filtering would be Verizon Wireless' primary corrective course of action to resolve the problem.

EXHIBIT D – Certificate of Insurance



CERTIFICATE OF LIABILITY INSURANCE

 DATE(MM/DD/YYYY)
06/18/2024

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER Aon Risk Services Northeast, Inc. New York NY Office One Liberty Plaza 165 Broadway, Suite 3201 New York NY 10006 USA	CONTACT NAME: PHONE (A/C. No. Ext): (866) 283-7122 FAX (A/C. No.): (800) 363-0105		
	E-MAIL ADDRESS:		
INSURED Verizon Wireless, LLC 1095 Avenue of the Americas New York NY 10036 USA	INSURER(S) AFFORDING COVERAGE		NAIC #
	INSURER A: LM Insurance Corporation		33600
	INSURER B: Liberty Insurance Corporation		42404
	INSURER C: Liberty Mutual Fire Ins Co		23035
	INSURER D:		
	INSURER E:		
INSURER F:			

COVERAGES
CERTIFICATE NUMBER: 570106449949

REVISION NUMBER:

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

Limits shown are as requested

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
C	<input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR <input checked="" type="checkbox"/> XCU Coverage is Included GEN'L AGGREGATE LIMIT APPLIES PER: <input checked="" type="checkbox"/> POLICY <input type="checkbox"/> PRO-JECT <input type="checkbox"/> LOC OTHER:			TB2691550588144	06/30/2024	06/30/2025	EACH OCCURRENCE \$1,000,000 DAMAGE TO RENTED PREMISES (Ea occurrence) \$2,000,000 MED EXP (Any one person) \$10,000 PERSONAL & ADV INJURY \$1,000,000 GENERAL AGGREGATE \$2,000,000 PRODUCTS - COMP/OP AGG \$2,000,000
C	AUTOMOBILE LIABILITY			AS2-691-550588-124 AOS	06/30/2024	06/30/2025	COMBINED SINGLE LIMIT (Ea accident) \$1,000,000
C	<input checked="" type="checkbox"/> ANY AUTO <input type="checkbox"/> OWNED AUTOS ONLY <input type="checkbox"/> HIRED AUTOS ONLY <input type="checkbox"/> SCHEDULED AUTOS <input type="checkbox"/> NON-OWNED AUTOS ONLY			AS2-691-550588-134 NH - Primary	06/30/2024	06/30/2025	BODILY INJURY (Per person)
C				TL2-691-550588-184 NH - Excess	06/30/2024	06/30/2025	BODILY INJURY (Per accident)
	<input type="checkbox"/> UMBRELLA LIAB <input type="checkbox"/> EXCESS LIAB <input type="checkbox"/> DED <input type="checkbox"/> RETENTION						EACH OCCURRENCE AGGREGATE
A	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR / PARTNER / EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	Y/N	N/A	WA569D550588094 AOS	06/30/2024	06/30/2025	<input checked="" type="checkbox"/> PER STATUTE <input type="checkbox"/> OTH-ER
A				WC5691550588084 WI, MN	06/30/2024	06/30/2025	E.L. EACH ACCIDENT \$1,000,000 E.L. DISEASE-EA EMPLOYEE \$1,000,000 E.L. DISEASE-POLICY LIMIT \$1,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

RE: Site Location: 4898 S. Dudley St., City Reference: DFD 30, VZW Site Name: DEN Marston Park, Location Code: 157703. The City and County of Denver, its elected and appointed officials, employees and volunteers are included as Additional Insured with respect to the General Liability policy, where permitted by law, the Named Insured parties listed herein waive all rights against The City and County of Denver, its elected and appointed officials, employees and volunteers listed herein for recovery of damages to the extent these damages are covered by the above-referenced General Liability, Automobile Liability and workers' Compensation policies and, as further limited by written contract between the parties.

CERTIFICATE HOLDER
CANCELLATION

City and County of Denver Attn: Real Estate 201 W. Colfax Ave., Dept. 1010 Denver CO 80202 USA	SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.
	AUTHORIZED REPRESENTATIVE

Holder Identifier :

Certificate No : 570106449949



ADDITIONAL REMARKS SCHEDULE

AGENCY Aon Risk Services Northeast, Inc.		NAMED INSURED Verizon Wireless, LLC	
POLICY NUMBER See Certificate Number: 570106449949			
CARRIER See Certificate Number: 570106449949	NAIC CODE	EFFECTIVE DATE:	

ADDITIONAL REMARKS

THIS ADDITIONAL REMARKS FORM IS A SCHEDULE TO ACORD FORM,
FORM NUMBER: ACORD 25 FORM TITLE: Certificate of Liability Insurance

INSURER(S) AFFORDING COVERAGE	NAIC #
INSURER	
INSURER	
INSURER	
INSURER	

ADDITIONAL POLICIES If a policy below does not include limit information, refer to the corresponding policy on the ACORD certificate form for policy limits.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YYYY)	POLICY EXPIRATION DATE (MM/DD/YYYY)	LIMITS	
	WORKERS COMPENSATION							
B		N/A		WA769D550588074 MA	06/30/2024	06/30/2025		



CERTIFICATE OF PROPERTY INSURANCE

DATE (MM/DD/YYYY)
02/18/2025

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

PRODUCER Aon Risk Services Northeast, Inc. New York NY Office One Liberty Plaza 165 Broadway, Suite 3201 New York NY 10006 USA	CONTACT NAME: PHONE (A/C. No. Ext): (866) 283-7122 FAX (A/C. No.): (800) 363-0105 E-MAIL ADDRESS: PRODUCER CUSTOMER ID #: 570000027366	
INSURED Cellco Partnership dba Verizon wireless 1095 Avenue of the Americas New York NY 10036 USA	INSURER(S) AFFORDING COVERAGE	NAIC #
	INSURER A: Zurich American Ins Co	16535
	INSURER B:	
	INSURER C:	
	INSURER D:	
	INSURER E:	
	INSURER F:	

Holder Identifier :

COVERAGES	CERTIFICATE NUMBER: 570110899194	REVISION NUMBER:
LOCATION OF PREMISES/ DESCRIPTION OF PROPERTY (Attach ACORD 101, Additional Remarks Schedule, if more space is required) RE: Verizon Site: DEN Marston Park.		

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE		POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YYYY)	POLICY EXPIRATION DATE (MM/DD/YYYY)	COVERED PROPERTY	LIMITS
A	X	PROPERTY	PPR373455023	12/31/2024	12/31/2025	BUILDING	
		CAUSES OF LOSS				PERSONAL PROPERTY	
		BASIC				BUSINESS INCOME	
		BROAD				EXTRA EXPENSE	
		CONTENTS				RENTAL VALUE	
	X	SPECIAL				BLANKET BUILDING	
		EARTHQUAKE				BLANKET PERS PROP	\$10,000,000
		WIND				BLANKET BLDG & PP	
		FLOOD					
		Bikt PP Ded					
		INLAND MARINE	TYPE OF POLICY				
		CAUSES OF LOSS	POLICY NUMBER				
		NAMED PERILS					
		CRIME					
		TYPE OF POLICY					
		BOILER & MACHINERY / EQUIPMENT BREAKDOWN					

CERTIFICATE NUMBER: 570110899194

SPECIAL CONDITIONS / OTHER COVERAGES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)
Coverage is provided on a Replacement Cost basis. A waiver of Subrogation is granted in favor of Certificate Holder in accordance with the policy provisions of the Property policy.

CERTIFICATE HOLDER The City and County of Denver a Municipal Corporation Attn: Real Estate 201 W. Colfax Avenue, Dept. 1010 Denver CO 80202 USA	CANCELLATION SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS. AUTHORIZED REPRESENTATIVE <i>Aon Risk Services Northeast, Inc.</i>
---	--



EXHIBIT E – Bond Council Approval

Corica, Gabrielle S. - CAO CL0357 Assistant City Attorney Senior

From: Edrich, Matthias M. <Matthias.Edrich@KutakRock.com>
Sent: Tuesday, January 28, 2025 12:03 PM
To: Corica, Gabrielle S. - CAO CL0357 Assistant City Attorney Senior
Cc: Heydman, Laurie J. - CAO Asst City Attorney - Sr
Subject: [EXTERNAL] RE: Another Private Use Analysis

This Message Is From an External Sender

This message came from outside your organization.

Report Suspicious

Hello Gaby,

Thanks for your email. That sounds great. In this case, the license agreement for the Verizon Wireless antenna will not have any private business use impact and is "approved" for purposes of the bond counsel approval.

Thanks!

Matthias

Matthias M. Edrich

Tax Partner

Kutak Rock LLP

2001 16th Street, Suite 1800, Denver, CO 80202

matthias.edrich@kutakrock.com

office: 303-297-2400 **direct:** 303-292-7887 **mobile:** 303-759-4002

From: Corica, Gabrielle S. - CAO CL0357 Assistant City Attorney Senior <Gabrielle.Corica@denvergov.org>

Sent: Tuesday, January 28, 2025 2:00 PM

To: Edrich, Matthias M. <Matthias.Edrich@KutakRock.com>

Cc: Heydman, Laurie J. - CAO Asst City Attorney - Sr <Laurie.Heydman@denvergov.org>

Subject: RE: Another Private Use Analysis

[CAUTION - EXTERNAL SENDER]

Hi Matthias,

I've connected with our bond team within our Finance Department, and they have confirmed for me that \$65,000 was spent out of Elevate funding on the DFD30 building (not the land) for some temperature control upgrades. Since tax exempt funds were not used to purchase the land, how do this impact the site private use analysis?

Thank you!

From: Edrich, Matthias M. <Matthias.Edrich@KutakRock.com>

Sent: Monday, January 27, 2025 7:09 AM

To: Corica, Gabrielle S. - CAO CL0357 Assistant City Attorney Senior <Gabrielle.Corica@denvergov.org>

Cc: Heydman, Laurie J. - CAO Asst City Attorney - Sr <Laurie.Heydman@denvergov.org>

Subject: [EXTERNAL] RE: Another Private Use Analysis

Good morning, Gaby,

Thank you for your email last week. I am sorry for not responding sooner.

On Google Maps (please see attached screenshot), it looks like the antenna may be located right next to the building, but not on top of the roof. Is there any way you can find out what was bond-financed at Fire Station 30? Were bond proceeds used to acquire the land originally, or are bond proceeds only tied up with building improvements? If bond proceeds were not used for the land, I would conclude that the license agreement has no private business use impact.

Thank you!

Matthias

Matthias M. Edrich
Tax Partner

Kutak Rock LLP
2001 16th Street, Suite 1800, Denver, CO 80202
matthias.edrich@kutakrock.com
office: 303-297-2400 **direct:** 303-292-7887 **mobile:** 303-759-4002

From: Corica, Gabrielle S. - CAO CL0357 Assistant City Attorney Senior <Gabrielle.Corica@denvergov.org>
Sent: Wednesday, January 22, 2025 2:54 PM
To: Edrich, Matthias M. <Matthias.Edrich@KutakRock.com>
Cc: Heydman, Laurie J. - CAO Asst City Attorney - Sr <Laurie.Heydman@denvergov.org>
Subject: Another Private Use Analysis

[CAUTION - EXTERNAL SENDER]

Hello again Matthias!

I have another private use analysis question for you, please. We are planning to let space to Version Wireless to place an antenna on the roof of the fire station 30 located at 4898 Dudley Street. Attached is a draft of the license agreement for this use. When you are able, could you please review this from a private use perspective. The license agreement would run through July 2034 and total \$1,394,202.72 in revenue for the City over that time. Please have a look when you are able.

Thank you and please let me know what other info I should send along.

Gaby



DENVER
THE MILE HIGH CITY

Gabrielle Corica | Assistant City Attorney
Municipal Operations Section, City Attorney's Office
City and County of Denver
[Pronouns](#) | She/Her/Hers
p: (720) 913-3261 | Gabrielle.Corica@denvergov.org

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Certificate Of Completion

Envelope Id: EE00887C-C05E-4472-9F2F-94E9110126C1

Status: Delivered

Subject: Complete with Docusign: Verizon-2095889DENMarstonParkpdf.pdf

Source Envelope:

Document Pages: 90

Signatures: 1

Envelope Originator:

Certificate Pages: 5

Initials: 0

Tanya Turner-Belton

AutoNav: Enabled

Tanya.Turner-Belton@VerizonWireless.com

Envelopeld Stamping: Enabled

IP Address: 162.115.44.29

Time Zone: (UTC-08:00) Pacific Time (US & Canada)

Record Tracking

Status: Original

Holder: Tanya Turner-Belton

Location: DocuSign

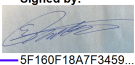
6/5/2025 9:49:28 AM

Tanya.Turner-Belton@VerizonWireless.com

Signer Events

Eric Fradette
eric.fradette@verizonwireless.com
AVP-Ntwk Engring
Security Level: Email, Account Authentication (None)

Signature

Signed by:

5F160F18A7F3459...
Signature Adoption: Uploaded Signature Image
Using IP Address: 69.78.66.90

Timestamp

Sent: 6/5/2025 10:07:10 AM
Viewed: 6/5/2025 10:30:57 AM
Signed: 6/5/2025 10:31:24 AM

Electronic Record and Signature Disclosure:
Accepted: 6/5/2025 10:30:57 AM
ID: c2487414-0d56-470f-965a-47de0c74c00f

1st witness
vzwsare-1stwitness@verizonwireless.com
Engr Spec-Ntwk Reg/RE
Security Level: Email, Account Authentication (None)

Sent: 6/5/2025 10:31:29 AM
Viewed: 6/6/2025 6:43:55 AM

Electronic Record and Signature Disclosure:
Accepted: 6/6/2025 6:43:55 AM
ID: cbb64884-4d58-46cb-962d-b6305a87a0db

In Person Signer Events	Signature	Timestamp
Editor Delivery Events	Status	Timestamp
Agent Delivery Events	Status	Timestamp
Intermediary Delivery Events	Status	Timestamp
Certified Delivery Events	Status	Timestamp
Carbon Copy Events	Status	Timestamp
Debbie Lutz debbie.lutz@verizonwireless.com Assoc Director Network Real Estate Security Level: Email, Account Authentication (None)	<div>COPIED</div>	Sent: 6/5/2025 10:07:08 AM Viewed: 6/5/2025 11:54:55 AM

Electronic Record and Signature Disclosure:
Accepted: 6/2/2025 6:49:52 AM
ID: 6bac671a-eff8-4770-9208-efe53f4db768

Carbon Copy Events	Status	Timestamp
<div>Pam Goss pam.goss@retherfordenterprises.com Security Level: Email, Account Authentication (None) Electronic Record and Signature Disclosure: Not Offered via DocuSign</div>	COPIED	<div>Sent: 6/5/2025 10:07:09 AM Viewed: 6/9/2025 7:33:38 AM</div>
<div>Robert Krebs robert.krebs@verizonwireless.com Security Level: Email, Account Authentication (None) Electronic Record and Signature Disclosure: Not Offered via DocuSign</div>	COPIED	<div>Sent: 6/5/2025 10:07:09 AM Viewed: 6/5/2025 10:38:58 AM</div>
<div>Warren Tock warrentock@tocolaw.com Partner Security Level: Email, Account Authentication (None) Electronic Record and Signature Disclosure: Not Offered via DocuSign</div>	COPIED	<div>Sent: 6/5/2025 10:07:09 AM</div>
Witness Events	Signature	Timestamp
Notary Events	Signature	Timestamp
Envelope Summary Events	Status	Timestamps
Envelope Sent	Hashed/Encrypted	6/5/2025 10:07:09 AM
Certified Delivered	Security Checked	6/6/2025 6:43:55 AM
Payment Events	Status	Timestamps
Electronic Record and Signature Disclosure		

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