

## LICENSE AGREEMENT

**THIS LICENSE AGREEMENT** (“Agreement”) is made, effective as of the date set forth in section 2.01(a) below (“Effective Date”), by and between the **CITY AND COUNTY OF DENVER, a municipal corporation** (“City”), and **T-MOBILE WEST LLC**, a Delaware Limited Liability Company authorized to conduct business in Colorado, whose principal office is located at 12920 SE 38<sup>th</sup> Street, Bellevue, Washington 98006 (“Licensee”).

### DEFINITIONS

All capitalized terms or phrases in this Agreement, except for proper names, shall have the meanings as set forth below:

**A.** Agreement means this License Agreement during the Term or Term Extension of the Agreement.

**B.** ADA means federal 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, 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; and 9) the requirements of the ADA.

**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 means the City and County of Denver as represented by the Denver Fire Department and its Fire Chief.

**F.** City Representative means the Fire Chief’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 Denver Fire Department, 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.

**G.** City System means all existing and future communication and other electronic facilities,

equipment and instrumentation and related infrastructure and utility connections that the City requires for the operation of the Fire Station or the provision of emergency services from the Fire Station, 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.

**H.** DRMC means the Denver Revised Municipal Code as it may be amended from time to time.

**I.** Effective Date means the date this Agreement goes into effect, as specified in section 2.01(a) below.

**J.** 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.

**K.** FCC means the Federal Communications Commission.

**L.** Fire Chief means the head of the Denver Fire Department.

**M.** Fire Station means the specific fire station operated by the Denver Fire Department to which this Agreement applies, as specified in section 1.01(a).

**N.** Interference Study means a site and technical interference study, 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.

**O.** 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 revocable as specified in this Agreement. No property or leasehold interest or right is granted by the License.

**P.** Licensed Area means the location at the Fire Station where Licensee is authorized to install and operate the Licensed System, as specified in section 1.01(a).

**Q.** Licensed System means the radio frequency equipment and wireless communication facility, and related equipment, infrastructure and utility communications authorized by the City and installed and operated by Licensee within the Licensed Area of the Fire Station, as specified in section 1.01(a).

**R.** 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 or consultants to perform any of Licensee's rights and obligations under the Agreement, Licensee shall also mean those contractors and consultants.

**S.** 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 Fire Station as specified in section

3.01.

**T.** 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.

**U.** Party means either the City or Licensee, as appropriate in the context, and Parties means both the City and Licensee.

**V.** 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.

**W.** 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 Fire Station or the operation of any communication system located at the Fire Station.

**X.** 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.

**Y.** Term means the duration of the Agreement running for a five-year period from the Effective Date of the Agreement, as specified in section 2.01(a).

**Z.** Term Extension means any approved amendment to the Agreement allowing the duration of the Agreement for another five-year period subject to any new or changed terms or conditions, as specified in section 2.02.

**AA.** Tower or Towers means the existing communication structure or structures located on the Fire Station grounds on which the Licensed System shall be installed, as specified in part in 1.01(b), and on which the City System is located.

## **SECTION 1 LICENSE; PERMITTED USE; and ACCESS**

### **1.01 Grant of License**

(a) City owns property located within the City and County of Denver, State of Colorado, known as Fire Station #29, which is located at 4800 Himalaya Way, Denver, Colorado 80249 ("Fire Station"). City hereby grants a License to Licensee for the use of certain designated areas at the Fire Station 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 in **Exhibit B**. The Licensed System shall be situated within the Licensed Area and shall be located in

relation to the City System, if any, as depicted in **Exhibit A**. The Licensed Area shall not include the City System. Any proposed change to the Licensed Area depicted in **Exhibit A** shall require an amendment to this Agreement.

(b) As a condition of the grant of the License, Licensee shall construct, at its sole cost and expense, a nine foot by nine foot (9' by 9') area for equipment, as described and at the location specified in **Exhibit A**, for shared use by the City and Licensee; shall relocate the existing access gate and shed, subject to coordination with and approval by the Denver Fire Department; and shall install the equipment described in **Exhibit \_\_**, including but not limited to installation of three (3) antennae at a height of sixty-seven (67) feet, one new 8" cable tray, and new LED overhead work lights.

### **1.02 Permitted Use/Restrictions.**

(a) The Licensed Area at the Fire Station 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 Fire Station site, 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 Fire Station or City System. Such prohibited conflict or interference includes RF Interference as set forth in this Agreement. 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 Fire Station, the City System, the Licensed Area, or the Licensed System.

### **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 (8:00am to 5:00pm M-F) 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, including emergencies, 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 to arrange for access by Licensee's Personnel. Licensee shall contact Station #29 directly at (303) 373-8529; or if there are no crews at Station #29, Licensee shall call the Denver Fire Department Technical Services Division at (303) 944-4008.

(c) With respect to all access to the Fire Station, 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 Fire Department staff and search and inspection of items

brought onto the Fire Station site; and will comply with all restrictions and security protocols set by the Fire Chief and the direction of the City Representative. All equipment, vehicles, machinery and other materials brought onto the Fire Station site must be necessary for the work authorized to be performed.

(d) Should Licensee require access into a secure area of the Fire Station 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 Fire Station or the City System and may not block access at or the use of the Fire Station 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 Fire Station site 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 Fire Station site or the temporary unavailability of access to a Fire Station site.

## **SECTION 2 TERM and TERM EXTENSION**

### **2.01 Term.**

The Term of this Agreement is five years from the first day of the month following the date of the City's full execution of this Agreement (the "Effective Date"). , unless either party terminates the Agreement upon sixty (60) days written notice.

### **2.02 Term Extension.**

Licensee may exercise two (2) options to renew the License for one additional five-year period at the end of the term. Licensee shall provide notice to the City of its intent to exercise the renewal option of no shorter than sixty (60) days. All terms and conditions shall remain in effect in accordance with this Agreement during the renewal period, including the percentage fee increase under Section 3.01, unless otherwise modified by mutual written agreement. Modifications, if any, must be set forth in an amendment to this Agreement and processed for approval in the same manner as the Agreement.

## **SECTION 3 LICENSE FEE**

### **3.01 License Fee.**

(a) Licensee agrees to pay City a monthly License Fee of **Three Thousand Two Hundred Dollars and Zero Cents (\$3,200.00)**, payable in equal monthly installments beginning on the Effective Date, and continuing on the first day of each month thereafter for the Term of the Agreement and any Term renewal. The License Fee shall increase three percent (3%) each year, including each year of any renewals under Section 2.02, with the increased License Fee taking effect on the anniversary of the Effective Date of this Agreement each year.

(b) Any License Fee paid to the City shall not be refundable in the event of Cancellation, as provided in this Agreement.

### **3.02 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  
Department of Finance, Real Estate Division  
201 W. Colfax Ave, Dept. 1010  
Denver, Colorado 80202

All payments shall be made in legal tender of the United States. Any payment not made to City after 10 business days notice of non-payment accrues interest at the lesser of (i) 18% per annum, or (ii) the maximum interest rate allowed under law, 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, design, construct and install within the Licensed Area, the Licensed System in accordance with **Exhibit A** and **Exhibit B** (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, constructed and installed in accordance with Applicable Law, and pursuant to any required building permit and zoning 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, construction and installation of the Licensed System, as described and depicted in **Exhibit A** and **Exhibit B**, 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** and **Exhibit B** 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 construction and installation of any portion of the Licensed System, four (4) copies 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, in consultation with the Fire Chief, will approve the plans and specifications.

(c) To the extent that the approved plans and specifications are different from the information contained in **Exhibit A** and/or **Exhibit B**, Licensee shall prepare, to the reasonable satisfaction of the City Representative and without modifying the Licensed Area depicted in **Exhibit A**, new exhibits reflecting such changes, and the changed exhibits will replace and supersede the corresponding exhibits attached to this Agreement.

(d) Construction or 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.

[(e) In all cases, the plans and specifications must show that at least the top twenty (20) feet of each of the Towers are reserved for the City's use and that the loading of each of the Towers shall not be more than 90%, including the City System.

## **SECTION 5 USE AND OPERATION**

#### **5.01 Authorized Frequencies.**

In the operation of the Licensed System, Licensee is authorized to operate in the FCC-licensed radio bands and frequencies (and no others) set forth in **Exhibit C**. Operation in any unlicensed radio band (as defined by the FCC) or any radio band used by a City System is prohibited.

#### **5.02 RF (Radio Frequency) Interference.**

(a) Licensee acknowledges that City's unimpeded use and operation of the Fire Station is critical to the health, safety and welfare of the City and County of Denver and its inhabitants. Licensee shall use its best efforts, at all times, to avoid any RF Interference or interference of any kind with the operation or use of the Fire Station and the City System. Licensee shall diligently work to prevent and, in the event of failure to do so, immediately correct radio frequency interference to the City System and any component elements, including the City's WiFi system, and to cooperate with, and comply with the directions from, the City Representative assigned to deal with RF Interference matters. To help achieve this goal, Licensee shall comply with the following:

(a) Licensee agrees to comply with all federal, state, local, or other government regulations applicable to Licensee and its activities operating or using the Licensed System, including, but not limited to, regulations and standards published by the FCC.

(b) Upon written request by the City Representative, Licensee agrees to conduct an Interference Study prior to commencing operations and/or during the entire Term or Term Extension of this Agreement, and to furnish the City Representative with the results of the Site Study and to include it as part of Licensee's System Plans and Specifications. If Licensee should fail within a period specified by the City Representative to undertake or complete an Interference Study, the City may arrange for such an Interference Study and Licensee shall reimburse the City for the cost and expense of conducting and preparing the Interference Study.

(c) Licensee agrees to comply with the most recent edition of the Minimum Technical Standards, with the current Minimum Technical Standards attached hereto as **Exhibit B**.

(d) In order to prevent interference, Licensee shall maintain and repair, at no cost to the City, the Licensed System, in order to comply with FCC rules and the reasonable requirements of the City Representative. If this maintenance should necessitate changing out or replacing existing antennas, the requirements of section 5.04 shall be applicable.

(e) If authorized to make changes, Licensee shall notify the City Representative of the specific changes to associated RF equipment, transmit and receive frequencies, transmitter output power, antenna configurations, and effective radiated power before making the changes. An Interference Study shall be conducted by Licensee, as directed by the City Representative and at Licensee's sole cost and expense, prior to any proposed frequency changes. The requirements of section 5.04 shall be applicable to the changes addressed herein.

(f) To extent there are more than one licensee operating at the Fire Station, Licensees are encouraged to resolve potential or real interference problems amongst 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) When the City Representative, based on inquiry and evaluation, becomes aware of a potential or existing interference problem caused directly or indirectly, wholly or partially, by the Licensed System, the 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 and determine if the problem is caused directly or indirectly, wholly or partially, by the Licensed System. This Interference Study shall be conducted by a consulting engineer selected by the Fire Chief after consultation with Licensee and the City Representative. In the event there are additional licensees operating at the Fire Station, Licensee shall pay for a pro rata share of the costs of the Interference Study, unless Licensee is determined to be solely responsible for the interference, in which case Licensee shall pay all costs and expenses. Pro rata share shall be determined by dividing the costs by the number of non-City licensees operating at the Fire Station.

(h) When necessary to correct interference problems, as determined by the Chief in the Chief's reasonable discretion, Licensee agrees, at its sole cost and 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) Licensee shall ensure that its frequencies used for the operation of the Licensed System do not interfere with any operation of the Fire Station, including without limitation interference with public safety or the City System. Licensee shall provide documentation of the frequencies that it is authorized to use and is using for the Licensed System. 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 the Licensed System and shall be documented by a third-party vendor and submitted to the City Representative. Once City Representative has reviewed this documentation, the City Representative will give notice to Licensee that it can turn on its Licensed System. If the City Representative is not satisfied with the details of the study, the City Representative will give notification to Licensee as to what needs to be remedied before notice to proceed will be given.

(j) If Licensee's equipment or operations cause RF Interference, as determined by the Fire Chief in the Fire Chief's reasonable discretion, including without limitation interference with the City System, and if the interference is not eliminated within ten (10) days after written notice from the Fire Chief, then City may, at Licensee's sole cost and expense, temporarily turn off the power to the Licensed System. The City Representative shall contact Licensee at the time the Licensed System needs to be deactivated so Licensee can facilitate the effort to deactivate the Licensed System, isolate any interference, and turn the Licensed System back on with minimal interruption. Licensee, at its sole cost and expense and subject to the requirements of section 5.06, shall (i) have the right to make such repairs, maintenance, replacements or adjustments to the Licensed System as may be reasonably necessary to prevent such interference, and (ii) have the right to conduct intermittent tests of the Licensed System at times mutually agreeable to the City Representative to determine if the Licensed System will continue to cause such interference.

(k) The City requires that Licensee operate its Licensed System with no interference to other licensees' systems. Any unresolved disputes regarding the cause or resolution of specific interference problems or complaints must be evaluated by an independent third party selected by the Fire Chief 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 Licensee or other licensees operating at the Fire Station is a result of the non-compliance of those facilities with the Minimum Technical Standards, it shall be the responsibility of Licensee or other licensees to resolve the interference in accordance with the Minimum Technical Standards. If the interference continues when these facilities are brought into compliance with the Minimum Technical Standards, then it shall be Licensee's responsibility to take whatever measures are necessary to resolve the interference promptly and effectively or disengage the operation of the Licensed System until the interference is resolved to the satisfaction of the City Representative.

### **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 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 Fire Chief of any proposed change in radio cabinets, transmitter power, frequencies, filters, number of antennae, antenna locations, antenna height, antenna orientation, or related aspects of the Licensed System. Any proposed new, or proposed changes to, antennae, antenna mounts or mounting hardware, or structural changes to the Fire Station or the Towers, 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 Fire Chief and undertaken by the City Representative.

(b) Any proposed changes which are significant (as determined by the Fire Chief) 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 antennae or other equipment outside the Licensed Property, 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 Property 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 Fire Station, before any work may begin.

#### **5.05 Repairs and Maintenance; Removal.**

(a) The maintenance, care, repair, alteration, enhancement or replacement of the Licensed System 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 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 Fire Station 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 Fire Station which result from Licensee's installation and operation of its Licensed System including, but not limited to, structural caused by the Licensed System or its operation and/or other workmen and maintenance and repair activities involving the Licensed System; and

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

(b) Removal of the Licensed System by Licensee may only occur at any time or upon expiration of the Agreement or Cancellation, as provided by this Agreement or as part of the process of a replacement of the Licensed System as authorized under this Agreement.

(c) If Licensee should be of the opinion that repair, alteration or replacement of the Towers is needed ("Alteration"), Licensee shall submit in writing a request to the Fire Chief explaining the perceived need for the Alteration. The Fire Chief shall determine whether such Alteration is warranted and, if so, who should make and pay for or the Alteration or how the cost of the Alteration is to be shared. 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 Fire Chief.

#### **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 and with as little interruption of Licensee's operations as is reasonably practicable) to access Licensee's equipment 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 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 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 Fire Station 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 Fire Station 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 in respect to such repairs, maintenance, alterations, expansions, or improvements and to accommodate such work to the Licensed Systems at Licensee's sole expense.

(c) Notwithstanding anything to the contrary it is the City's responsibility to maintain and repair the tower at its expense unless such repair is required because of Licensee's Licensed System.

## **5.07 Utilities.**

(a) Licensee shall be responsible for arranging for all utility services needed for the Licensed System, including separately metered electrical service, and for paying for all service, connection, taxes, fees, surcharges and other charges associated with or resulting from the utility services for the Licensed System. Licensee shall be responsible to install all utility service locations in compliance with all applicable laws, codes and regulations and subject to the requirements of section 5.04 above and the installation requirements of section 4.03 above.

(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 Fire Station.

#### **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 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 City 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.**

(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 force at all times during the Term of the Agreement, or any extension thereof, during any warranty period, and for three (3) years after termination of the Agreement. The required insurance shall be underwritten by an insurer licensed or authorized to do business in Colorado and rated by A.M. Best Company as "A-VIII" or better. Each policy shall contain a valid provision or endorsement requiring notification to the City in the event any of the required policies is canceled or non-renewed before the expiration date thereof. Such written notice shall be sent to the parties identified in the Notices section of this Agreement and to Denver Risk Management, 201 West Colfax Avenue, Dept. 1105, Denver, Colorado 80202 and shall reference the City contract number listed on the signature page of this Agreement. Said notice shall be sent thirty (30) days prior to such cancellation or non-renewal unless due to non-payment of premiums for which notice shall be sent ten (10) days prior. If such written notice is unavailable from the insurer, Licensee shall provide written notice of cancellation, non-renewal and any reduction in limits required herein to the parties identified in the Notices section and to Denver Risk Management, 201 West Colfax Avenue, Dept. 1105, Denver, Colorado 80202 by certified mail, return receipt requested within three (3) business days of such notice by its insurer(s) and referencing the City's contract number. Licensee shall be responsible for the payment of any deductible or self-

insured retention which all coverages secured by Licensee contain. The insurance coverages specified in this Agreement are the minimum requirements, and these requirements do not lessen or limit the liability of Licensee. 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 shall provide a copy of this Agreement to its insurance agent or broker. Licensee may not commence work or uses relating to the Agreement prior to placement of coverage. Licensee certifies that the certificate of insurance attached as **Exhibit D**, preferably an ACORD certificate, provided by Licensee 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 arising out of this Agreement where the insurer denies coverage or provides coverage under a reservation of rights to the additional insured(s) required herein the Denver Risk Management Office may require additional proof of insurance, including but not limited to policies and endorsements.

(c) **Additional Insureds:** For Commercial General Liability and Business Auto Liability, Licensee and its contractor's insurer(s), if there are any contractors, 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 required coverages, Licensee's insurer shall waive subrogation rights against the City.

(e) **Subcontractors:** All subcontractors and subconsultants (including independent contractors, suppliers or other entities providing goods or services under this Agreement) shall be subject to all of the requirements herein and shall procure and maintain the same coverages required of Licensee. Licensee shall include all such subcontractors and subconsultants as additional insured under its policies (with the exception of Workers' Compensation) or shall ensure that all such subcontractors and subconsultants maintain the required coverages. Licensee agrees to provide proof of insurance for all such subcontractors and subconsultants upon request by City.

(f) **Workers' Compensation/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 accident for each bodily injury claim, \$100,000 per accident 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 with combined single limits of \$1,000,000 per occurrence for bodily injury and property damage including contractual liability, \$2,000,000 for each personal and advertising injury claim, \$2,000,000 products and completed operations aggregate, and \$2,000,000 general aggregate.

(h) Business Automobile Liability: Licensee shall maintain limits of \$1,000,000 combined single limit for bodily injury and property damage applicable to all owned, nonowned and hired vehicles operating on City property and elsewhere for work under this Agreement.

(i) Additional Provisions:

(1) For Commercial General Liability, the policy must provide the following:

- (i) That this Agreement is an Insured Contract under the policy;
- (ii) Defense costs are outside the limits of liability;
- (ii) A severability of interests or separation of insureds (insured v. insured exclusion); and
- (iii) A provision that coverage is primary and non-contributory with other coverage or self-insurance maintained by the City with respect to the negligent acts of Licensee.

(2) For claims-made coverage, if any, the retroactive date must be on or before the contract date or the first date when any goods or services were provided to the City, whichever is earlier.

(3) Licensee shall advise the City in the event any general aggregate or other aggregate limits are reduced below the required per occurrence limits. At the Licensee's own cost and expense, where such general aggregate or other aggregate limits have been reduced below the required per occurrence limit, Licensee shall procure such per occurrence limits and furnish a new certificate of insurance showing such coverage is in force.

(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 Fire Station to be ordered to cease or to be restricted, as deemed appropriate by the Fire Chief 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.

## **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 Fire Station 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

(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. Consistent with 6.02(a), above, Licensee's duty to defend, indemnify, and hold harmless City against all Claims shall be enforced unless such Claims have been specifically determined by the trier of fact to be the sole negligence or willful misconduct of City.

(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 the work. 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 Fire Station 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. Those items listed in the “T-Mobile – DFD Station 29 List of Hazardous Materials”, incorporated with this License by reference, are deemed approved to be brought on site unless Licensee is otherwise notified. Any hazardous materials not listed therein shall require prior written approval of the City Representative consistent with this subsection 6.05(c).

(d) The obligations of Licensee set out in this section 6.04 shall survive the expiration of the Agreement and Cancellation.

#### **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 Fire Station or the Towers, 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 Fire Station, the Towers, 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 6.05 shall survive the expiration of the Agreement and Cancellation.

#### **6.07 No Waiver.**

No failure of the City 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 the City 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 Towers; and such use, occupancy and ownership by the City shall be the primary use of the Fire Station 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 to the Towers 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.

(c) The City specifically reserves for itself, other lessees, 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.

(d) 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 Fire Station site to the City in the same condition as when first occupied, ordinary wear and tear and casualty excepted but subject to the repair and restoration requirements provided in this Agreement.

(e) 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 or Towers, 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 Towers.

(f) If Licensee holds over after the expiration of this Agreement or Cancellation, and so long as the Licensed System is still situated on the Fire Station 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.**

If the Licensed System or tower are damaged or destroyed by wind, fire or other casualty, Licensee shall be entitled to negotiate, compromise, receive and retain all proceeds of Licensee's insurance and other claims and Licensee may terminate the Agreement by written notice to City. If the Antenna Facilities are not operational due to casualty or condemnation, Licensee shall have the right to abate the License Fee for that period of time unless the City authorizes it to use a temporary antenna facility on the property while the tower is being repaired. The City shall decide whether to repair its tower or not.

**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. If the damage is caused by Licensee and not casualty Licensee 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 Property and to repair and restore the Towers if damaged by Licensee 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. If Licensee should fail to repair or restore the Tower it damaged as required, the City may restore the Towers, at Licensee's cost and expense, as nearly as

reasonably practicable to the value and condition thereof prior to the damage or destruction, and Licensee shall be obligated to timely and fully reimburse the City for the costs and expenses of such repairs and restoration. 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 Default.**

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

(a) Fails to timely pay to the City on the fifth (5<sup>th</sup>) 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 (10<sup>th</sup>) business 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 fifteen (15) business 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, the Towers, or the Fire Station because of any act or omission 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.

(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 Agreement.

## **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 Fire Station 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 Dispute Resolution.**

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, may be taken to administrative hearing, pursuant to the procedure established by Section 56-106, DRMC. For the purpose of that procedure, the City official rendering a determination shall be the Executive Director of the Denver Department of Safety. Licensee may at its option file suit or pursue any remedies it has at law or equity if City is in default.

## **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 Fire Chief, which consent can be given or denied in Fire Chief's sole discretion, and subject to approval, under section 10.16 below, of an amendment to this Agreement authorizing the assignment. The Fire Chief 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 Fire Chief, 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 shall not be binding on the City and shall be grounds for terminating the Agreement, at the discretion of the Fire Chief.

(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 Fire Station or the Towers.

### **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 Fire Station and to any other bond ordinances which should amend, supplement or replace such bond ordinances.

### **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, 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.

#### **10.09 No Discrimination in Employment.**

In connection with the performance of this Agreement, the Parties agree not to refuse to hire, discharge, promote or demote, or to discriminate in matters of compensation against any person otherwise qualified, solely because of race, color, religion, national origin, gender, gender identity or gender expression, age, military status, sexual orientation, marital status, or physical or mental disability or any other status or characteristic protected by federal, state, or local law; and the Parties further agree to insert the foregoing provision in all approved contracts and subcontracts for work under this Agreement.

#### **10.10 Conflict of Interest.**

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.

#### **10.11 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 10.11 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.

**10.12 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 Fire Station.

**10.13 Notices.**

All legal and administrative notices hereunder shall be given in writing to the following by hand delivery or by certified mail, return receipt requested.

To the City:

Fire Chief of the Denver Fire Department  
City and County of Denver  
745 West Colfax Avenue  
Denver, CO 80204

City Attorney's Office  
City and County of Denver

1437 Bannock Street, Room 353  
Denver, Colorado 80202

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

To Licensee:

T-Mobile USA, Inc.  
12920 SE 38<sup>th</sup> Street  
Bellevue, Washington 98006  
Attn: Property Management/DN03634A

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 Fire Chief or the Executive Director of Safety, shall be provided to both the Fire Chief 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. Licensee's telephone number for emergencies is 877-611-5868.

#### **10.14 Examination of Records.**

Licensee agrees that any duly authorized representative of the City, including the City Auditor or his representative, until the expiration of three (3) years after expiration of this Agreement or Cancellation, shall have access to and the right to examine any directly pertinent books, documents, papers and records of Licensee related to this Agreement.

#### **10.15 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 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 designated by the Fire Chief, 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) Prior to providing the Confidential Information to any consultant, the Licensee shall ensure that an executed nondisclosure agreement is in place with each consultant with protections that are substantially similar to the protections in this Agreement. 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. Notwithstanding anything to the contrary Licensee and its affiliates, employees and consultants may receive information in order to comply with its obligations under this Agreement.

#### **10.16 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. The Parties agree that this Agreement may not be revoked simply because it is a License but may only be terminated pursuant to the terms in this Agreement.

#### **10.17 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.

#### **10.18 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.

#### **10.19 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.

#### **10.20 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.

#### **10.21 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 Agreement.

#### **10.22 Electronic Signatures and Electronic Records.**

Licensee consents to the use of electronic signatures by the City. The Agreement, and any other documents requiring a signature hereunder, may be signed electronically by the City in the manner specified by the City. 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.

**Contract Control Number:**

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:

REGISTERED AND COUNTERSIGNED:

By \_\_\_\_\_

By \_\_\_\_\_

By \_\_\_\_\_



**Contract Control Number:**

By:  \_\_\_\_\_  
DocuSigned by:  
04AF77EF69E34FE...

Name: Kim Curtis  
(please print)

Title: Sr. Director, Engineering  
(please print)

**ATTEST: [if required]**

By: \_\_\_\_\_

Name: \_\_\_\_\_  
(please print)

Title: \_\_\_\_\_  
(please print)



## EXHIBIT A

### EQUIPMENT AND SPECIFICATIONS EXHIBIT

#### TOWER EQUIPMENT

Number of Antennas:	Three
Antenna Manufacturer and Type-Number:	Nokia FASA
Weight and Dimension of Antenna(s) (L x W x D)	71.6" x 14.9" x 13" / 132 lbs
Number of Transmission Lines:	One Hybrid cable / 1 5/8"
Location of Antenna(s) on Tower:	67'
Direction of Radiation (Azimuth):	340, 100, 220
Frequencies/Max. Power Output:	

TX: 1930 – 1945; 2110 – 2120; 2145 – 2155; 728 – 734 MHz  
RX 1870 – 1885; 1710 – 1720; 1745 – 1755; 698 – 704 MHz  
Max Power output: 26686 W

Additional equipment on tower:	Three (3) RRHs (Nokia FRBG L700) Three (3) RRHs (FRIJ RRH) One (1) COVP (Raycap)
--------------------------------	--

#### GROUND EQUIPMENT

Dimensions of Ground Space subleased:	9' x 9' leased area
Delta Outdoor Cabinet Nokia System Radio Modules	72" x 30"
GPS Antenna	

# EXHIBIT B



## DN03634A

### APPROVAL SIGNATURE BLOCK

The following parties have reviewed these documents.

All documents are subject to review by the local zoning/building departments and may impose changes or modifications.

<hr/> Project Manager (Print)	<hr/> Project Manager	<input type="checkbox"/> Approved <input type="checkbox"/> Rejected	<hr/> Date
<hr/> RF Engineer (Print)	<hr/> RF Engineer	<input type="checkbox"/> Approved <input type="checkbox"/> Rejected	<hr/> Date
<hr/> Site Acquisition (Print)	<hr/> Site Acquisition	<input type="checkbox"/> Approved <input type="checkbox"/> Rejected	<hr/> Date
<hr/> TMO Quality Assurance (Print)	<hr/> TMO Quality Assurance	<input type="checkbox"/> Approved <input type="checkbox"/> Rejected	<hr/> Date

PROJECT INFORMATION:

SITE NAME:  
**DENVER FIRE #29**  
SITE ID:  
**DN03634A**

4800 HIMALAYA ROAD  
DENVER, CO 80249  
DENVER COUNTY

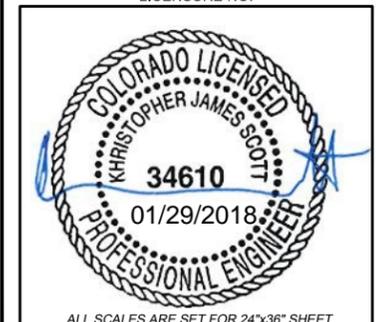
Rev:	Date:	Description:	By:
1	2/18/16	PRELIM. CONST.	AD
2	3/11/16	CONSTRUCTION	AD
3	4/5/16	CONSTRUCTION	AD
4	7/1/16	REVISED CONST.	AD
5	05/16/17	REVISED CONST.	CM
6	01/29/18	REVISED CONST.	CM

PLANS PREPARED BY:

**CENTERLINE SOLUTIONS**  
Advancing Wireless Networks

16360 TABLE MOUNTAIN PARKWAY  
GOLDEN, CO 80403  
303.993.3293  
WWW.CENTERLINESOLUTIONS.COM

LICENSURE NO.:



DRAWN BY:	CHK BY:	APV BY:
AD	CM	RG

Sheet Title:

**TITLE SHEET**

Sheet Number:

**T1**

Site Name: **DENVER FIRE #29**  
Site Number: **DN03634A**  
Site Address: **4800 HIMALAYA ROAD**  
**DENVER, CO 80249**  
Coordinates: **39.783114°, -104.754539°**

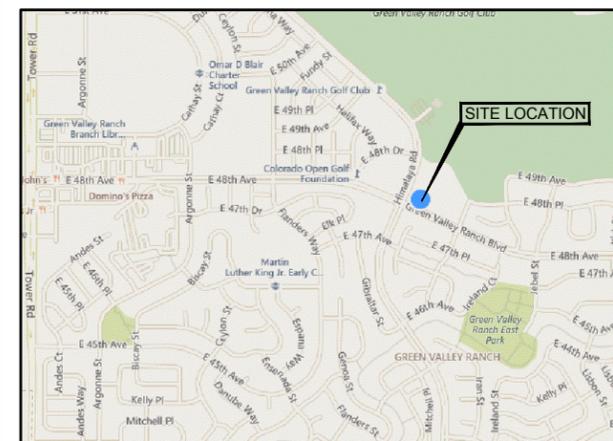
## DRAWING INDEX

T1	TITLE SHEET
LS1	LAND SURVEY
LS2	LAND SURVEY
A1.1	OVERALL SITE PLAN
A1.2	DETAILED SITE PLAN
A1.3	EXISTING & NEW EQUIPMENT LAYOUTS
A2	EXISTING & NEW SOUTH ELEVATIONS
A3	ANTENNA LAYOUT & RFDS CONFIGURATION
A4	DETAILS
A5	DETAILS
A6	DETAILS
A7	DETAILS
S1	STRUCTURAL DETAILS
E1	ABBREVIATIONS AND ELECTRICAL SYMBOLS
E2.1	OVERALL SITE ELECTRICAL PLAN
E2.2	ELECTRICAL EQUIPMENT PLAN
E3	ONE-LINE DIAGRAM AND FAULT CALCULATIONS
E4	PANEL SCHEDULE
E5	MISCELLANEOUS ELECTRICAL DETAILS
G1.1	SITE GROUNDING PLAN
G1.2	EQUIPMENT AND ANTENNA GROUNDING PLANS
G2	GROUNDING DETAILS
G3	GROUNDING DETAILS (CONT'D)
GN1	GENERAL NOTES

## GENERAL CONSTRUCTION NOTES

1. THE FACILITY IS AN UNOCCUPIED WIRELESS FACILITY.
2. PLANS ARE NOT TO BE SCALED AND ARE INTENDED TO BE A DIAGRAMMATIC OUTLINE ONLY, UNLESS NOTED OTHERWISE. THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
3. PRIOR TO THE SUBMISSION OF BIDS, THE CONTRACTORS SHALL VISIT THE JOB SITE AND BE RESPONSIBLE FOR ALL CONTRACT DOCUMENTS, FIELD CONDITIONS AND DIMENSIONS, AND CONFIRMING THAT THE WORK MAY BE ACCOMPLISHED AS SHOWN PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES ARE TO BE BROUGHT TO THE ATTENTION OF THE IMPLEMENTATION ENGINEER AND ARCHITECT/ENGINEER PRIOR TO PROCEEDING WITH THE WORK.
4. THE CONTRACTOR SHALL RECEIVE, IN WRITING, AUTHORIZATION TO PROCEED BEFORE STARTING WORK ON ANY ITEM NOT CLEARLY DEFINED OR IDENTIFIED BY THE CONTRACT DOCUMENTS.
5. CONTRACTOR SHALL CONTACT LOCAL DIGGERS HOTLINE 48 HOURS PRIOR TO PROCEEDING WITH ANY EXCAVATION, SITE WORK OR CONSTRUCTION.
6. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY INDICATED OTHERWISE OR WHERE LOCAL CODES OR REGULATIONS TAKE PRECEDENCE.
7. ALL WORK PERFORMED AND MATERIALS INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. CONTRACTOR SHALL GIVE ALL NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. MECHANICAL AND ELECTRICAL SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS, AND LOCAL AND STATE JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.

## VICINITY MAP



## SITE INFORMATION

**TOWER OWNER:**  
CITY & COUNTY OF DENVER  
201 W. COLFAX AVE. 401  
DENVER, CO 80202  
STEVE GARROD: 720.913.3446

**JURISDICTION:**  
CITY & COUNTY OF DENVER

**ASSESSOR'S PARCEL #:**  
0022100021000

**APPLICANT:**  
T-MOBILE WEST LLC  
2323 DELGANY STREET  
DENVER, CO 80216  
303.313.6923

**ZONING DESIGNATION:**  
C-MU

**POWER PROVIDER:**  
XCEL ENERGY 800.481.4700

**FIBER PROVIDER:**  
T.B.D.

**SITE ACQUISITION:**  
CENTERLINE SOLUTIONS  
16360 TABLE MOUNTAIN PARKWAY  
GOLDEN, CO 80403  
PAUL BATTAGLIA: 303.909.2283

**A&E:**  
CENTERLINE SOLUTIONS  
16360 TABLE MOUNTAIN PARKWAY  
GOLDEN, CO 80403  
COLE MOSSMAN: 303.993.3293 EXT: 1379

**CONSTRUCTION MANAGEMENT:**  
T-MOBILE WEST LLC  
2323 DELGANY STREET  
DENVER, CO 80216  
KEN GREENWOOD: 303.478.2444

**SURVEYOR:**  
DALEY LAND SURVEYING, INC.  
17011 LINCOLN AVE. #361  
PARKER, CO. 80134  
ROB DALEY PLS: 303.953.9841

**RFDS DATE:**  
2/19/2016

**GOVERNING CODES, AS APPLICABLE:**  
2015 IBC, 2015 IFC, 2015 IMC, 2015 IECC,  
2014 NEC, 2015 DBC

**A.D.A. COMPLIANCE:**  
NOT REQUIRED PER IBC 1103.2.9.

## PROJECT DESCRIPTION

CONSTRUCTION OF A NEW T-MOBILE EQUIPMENT "NON-INHABITABLE" TELECOMMUNICATIONS SITE CONSISTING OF INSTALLING (3) NEW ANTENNAS, (3) RRU'S, (1) COVP ON AN EXISTING 120' SELF SUPPORT TOWER & INSTALLING NEW T-MOBILE EQUIPMENT WITHIN A 9'x9' (81 SQFT.) LICENSE AREA.

## DRIVING DIRECTIONS TO SITE

FROM 2323 DELGANY STREET DENVER, CO 80216: DEPART ON DELGANY STREET TOWARD PARK AVENUE. NEXT TURN RIGHT ONTO PARK AVENUE THEN TAKE RAMP RIGHT FOR EASTBOUND I-70 TOWARD LIMON. PROCEED EAST ON I-70 THEN TAKE EXIT 284 RIGHT FOR PENA BLVD. NECT TAKE EXIT 1B RIGHT FOR GREEN VALLEY RANCH BLVD / E. 48TH AVE. TURN RIGHT ONTO E. 48TH AVE. SITE IS ON NORTHEAST CORNER OF E. 48TH AVE. & HIMALAYA RD.

## SITE PHOTO



**SURVEYOR'S CERTIFICATE**

I, Robert Daley, do hereby certify only to Centerline Solutions, that on November 6, 2015, a topographic survey was conducted under my supervision using the normal standard of care of Professional Land Surveyors and the map hereon accurately represents said survey, to the best of my knowledge.

This drawing does not represent a Land Survey, Land Survey Plat, Improvement Land Survey Plat or Improvement Location Certificate and any monuments or boundary lines shown are for information only and are not to be relied on.

This survey relied upon US Title Solutions Report of Title, Order No.: 52549-C01510-5039 for legal descriptions and easements.

This survey does not constitute a title search by this surveyor or Daley Land Surveying, Inc. of the property shown and described hereon to determine:

1. Ownership of this tract of land.
2. Rights-of-way, easements and encumbrances recorded or unrecorded affecting this tract of land.
3. Compatibility of this description with those of adjacent tracts of land.



Job No. 1203-067  
For and on behalf of  
Daley Land Surveying, Inc.  
17011 Lincoln Ave., #361  
Parker CO, 80134  
303 953 9841  
Robert Daley, PLS 35597

**BASIS OF BEARINGS:**

The bearings shown on this survey are referenced to the north line of the Northeast Quarter of Section 22, Township 3 South, Range 66 West of the 6th P.M., assumed to bear South 89°41'39" West (per City and County of Denver coordinate system), 2641.15 feet (2640.99 feet per plat) (no bearings shown on the plat of Green Valley Ranch Filing No. 9 or in deed - South 89°41'39" West per Green Valley Ranch Filing No. 32).

**COORDINATE SYSTEM AND DATUM:**

Horizontal coordinates are referenced to NAD83, Vertical datum is NAVD88 and originates from City and County of Denver (CCD) Benchmark 584, a CCD brass cap in median curb, Elevation 5417.64 feet NAVD 88, utilizing the Geoid12A model.

**UTILITIES:**

The utilities which are readily visible upon the ground, such as manholes, power and light poles, inlets, etc. were located by field surveys and shown hereon. Sub-surface utilities, if shown, are the result of field surveys of utility location marks provided by others.

**LEGAL DESCRIPTION PARENT TRACT:**

Per Report of Title Order No.: 52549-C01510-5039 Report Date: October 27, 2015, US Title Solutions.

The land referred to in this report is situated in the City and County of Denver, State of Colorado and is described as follows:

A parcel of land located in the Northeast quarter of Section 22, Township 3 South, Range 66 West of the Sixth Principal Meridian, City and County of Denver, State of Colorado, more particularly described as follows:

Commencing at the Northeast corner of said Section 22; thence Westerly along the North line of said Section 22 a distance of 441.08 feet; thence on a deflection angle to the left of 90 degrees 00 minutes 00 seconds a distance of 137.55 feet to the point of beginning, said point being on the proposed east right-of-way of Himalaya Road; thence on a deflection angle to the left of 65 degrees 49 minutes 14 seconds a distance of 140.00 feet; thence on a deflection angle to the right of 90 degrees 00 minutes 00 seconds a distance of 150.00 feet to a point on the North right-of-way of 48th Ave.; thence Westerly along said right-of-way on a deflection angle to the right of 90 degrees 00 minutes 00 seconds a distance of 140.00 feet to a point on the proposed East right-of-way of Himalaya Road, thence Northerly along said right-of-way on a deflection angle to the right of 90 degrees 00 minutes 00 seconds a distance of 150.00 feet to the point of beginning.

**ITEMS LISTED IN TITLE REPORT:**

- Item 1. Not survey related
- Item 2. Not survey related
- Item 3. Shown hereon if any
- Item 4. Not survey related
- Item 5. Not survey related
- Item 6. Not survey related
- Item 7. Shown hereon
- Item 8. Blanket statements
- Item 9. Blanket statements
- Item 10. Blanket statements
- Item 11. Not survey related/Blanket statements
- Item 12. Not survey related/Blanket statements

**TOPOGRAPHIC SURVEY**  
**T-MOBILE SITE DN03634A - FS 29**  
**SITUATED IN THE NORTHEAST QUARTER OF SECTION 22,**  
**TOWNSHIP 3 SOUTH, RANGE 66 WEST OF THE 6TH P.M.**  
**COUNTY OF DENVER, STATE OF COLORADO**

**LEGEND**

⊠ AC Unit	Ⓜ Telephone Manhole	— Building
⊡ Electric Box	Ⓢ Sanitary Manhole	— Flowline
⊕ Electric Meter	Ⓢ Storm Manhole	— Wood Fence
⊞ Electric Transformer	Ⓢ Water Manhole	— Wrought Iron Fence
⊘ Fire Hydrant	Ⓢ Water Valve	— UE — UE — Underground Electric
⊙ Gas Meter		— FO — FO — Underground Fiber Optic
⊞ Telephone Junction Box		— GAS — GAS — GAS — Aboveground Gas
		— UG — UG — Underground Gas
		— Wall



2323 DELGANY STREET  
DENVER, CO 80216

**PROJECT INFORMATION:**

SITE NAME:  
FS 29  
SITE ID:  
DN03634A

4800 HIMALAYA ROAD  
DENVER, CO 80249  
DENVER COUNTY

Rev:	Date:	Description:	By:
1	11/9/15	SURVEY	AV
2	11/20/15	LICENSE	AV
3	6/27/16	REV. LICENSE	RD
4	1/26/18	REV. LABELS	RD

**PLANS PREPARED BY:**



16035 TABLE MOUNTAIN PARKWAY  
GOLDEN, CO 80403  
303.993.3293  
WWW.CENTERLINESOLUTIONS.COM

**LICENSURE NO.:**



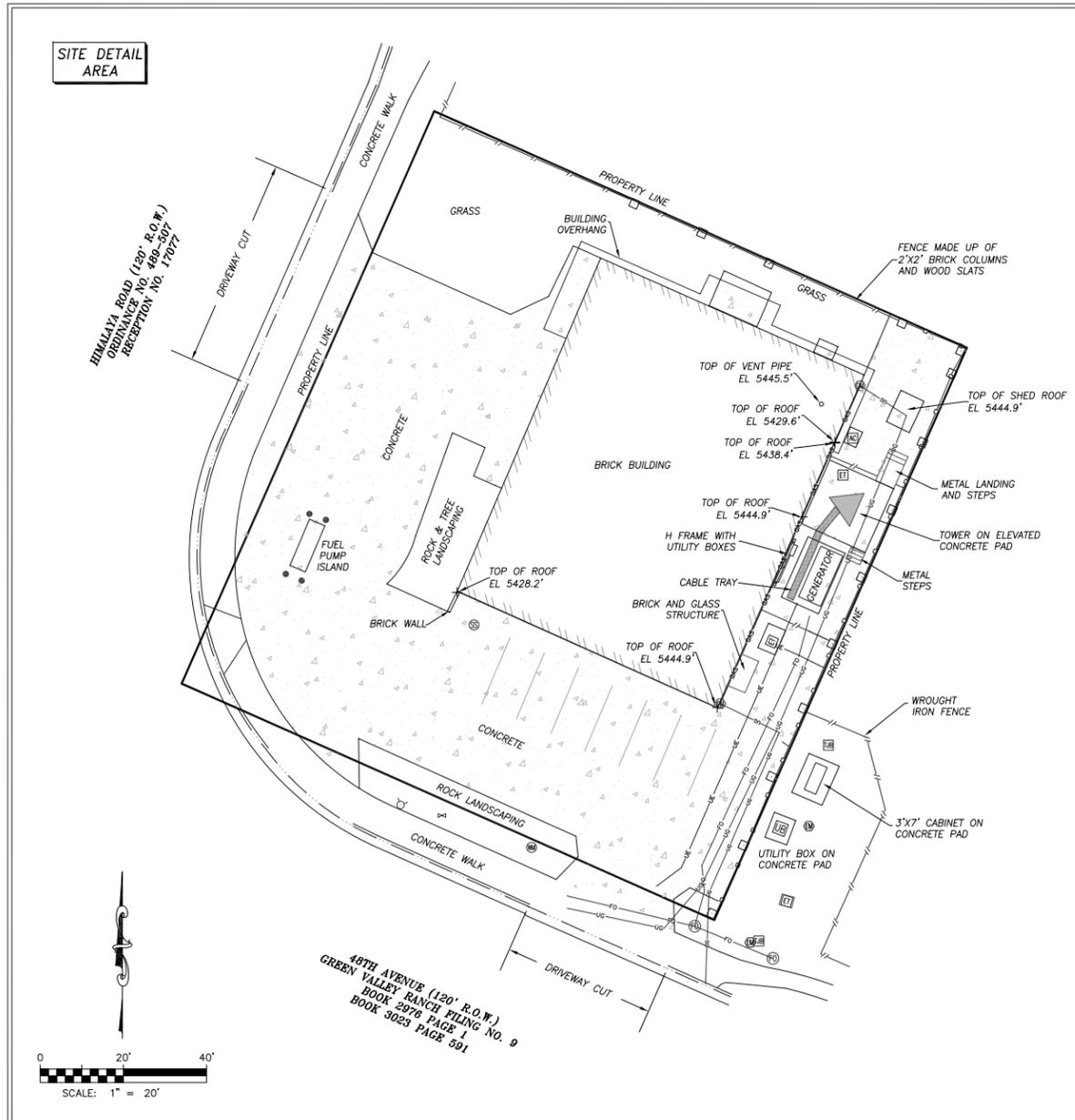
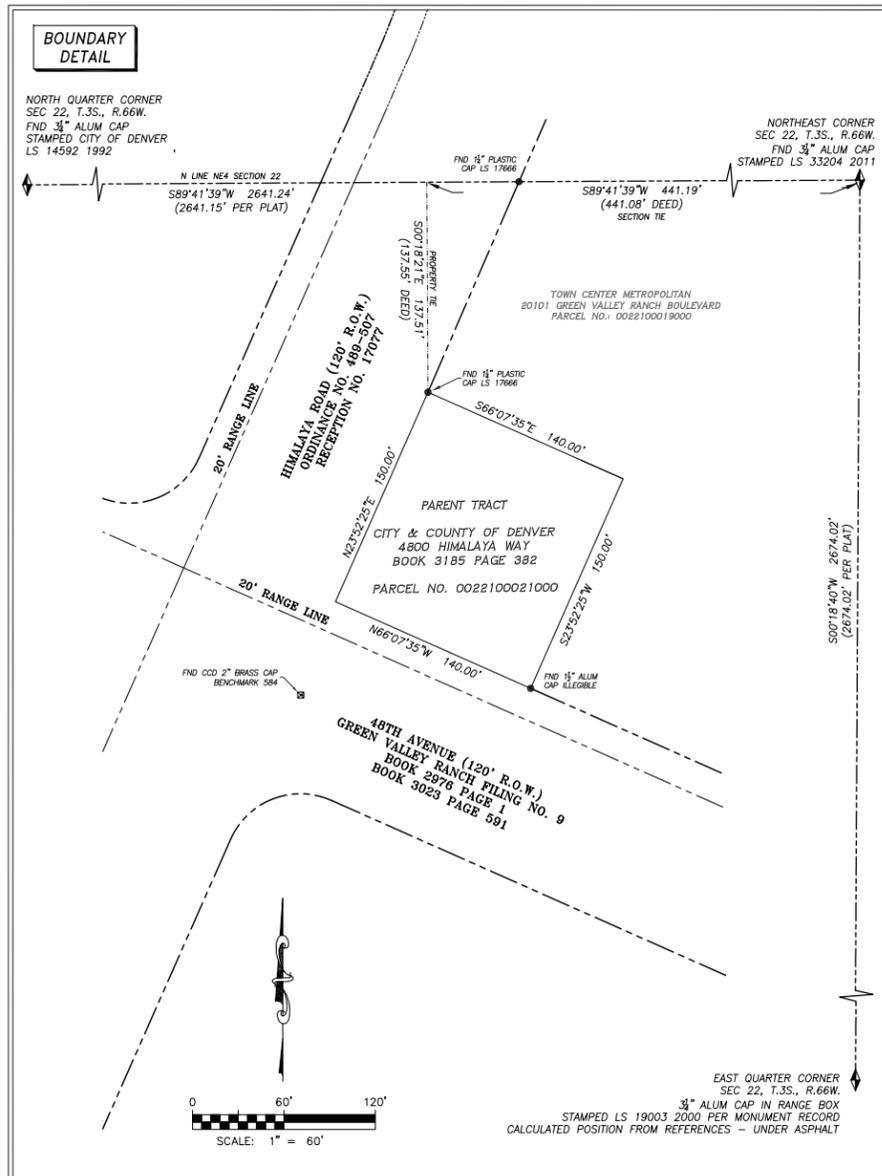
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AVV	RD	RD

**Sheet Title:**

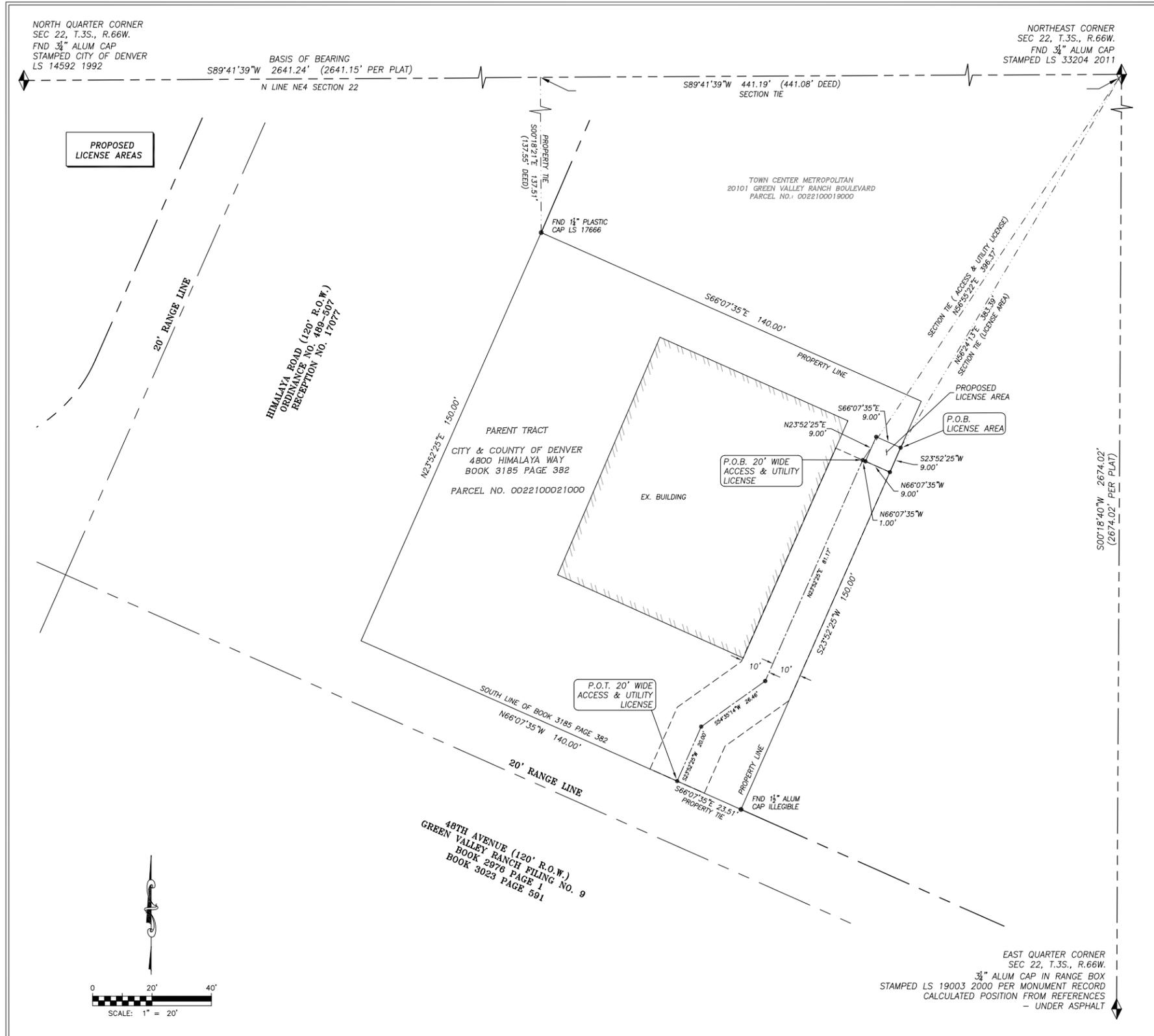
**LAND SURVEY**

**Sheet Number:**

**LS1**



**TOPOGRAPHIC SURVEY**  
**T-MOBILE SITE DN03634A - FS 29**  
 SITUATED IN THE NORTHEAST QUARTER OF SECTION 22,  
 TOWNSHIP 3 SOUTH, RANGE 66 WEST OF THE 6TH P.M.  
 COUNTY OF DENVER, STATE OF COLORADO



**LICENSE AREA LEGAL DESCRIPTION - PROPOSED:**  
 A parcel of land within that parcel of land described in Book 3185 at Page 382 of the Public Records of the City and County of Denver, located in the Northeast Quarter of Section 22, Township 3 South, Range 66 West, of the Sixth Principal Meridian, City and County of Denver, State of Colorado, more particularly described as follows:

For the purposes of this description the bearings are based on the north line of said Northeast Quarter of Section 22, T.3S., R.66W., assumed to bear S89°41'39\"/>

Beginning at a point on the easterly line of said parcel of land described in Book 3185 at Page 382 of the Public Records of the City and County of Denver, whence the Northeast Corner of said Section 22, bears North 56°24'13\"/>

THENCE South 23°52'25\"/>

Containing 81 square feet, or 0.002 Acres more or less.

**20' WIDE ACCESS AND UTILITY LICENSE - PROPOSED:**  
 A 20 foot wide strip of land over and across that parcel of land described in Book 3185 at Page 382 of the Public Records of the City and County of Denver, located in the Northeast Quarter of Section 22, Township 3 South, Range 66 West, of the Sixth Principal Meridian, City and County of Denver, State of Colorado, said 20 foot strip being 10 feet on both sides of the following described centerline:

For the purposes of this description the bearings are based on the north line of said Northeast Quarter of Section 22, T.3S., R.66W., assumed to bear S89°41'39\"/>

Beginning at a point whence the Northeast Corner of said Section 22, bears North 56°55'22\"/>

THENCE South 23°52'25\"/>

Containing 2553 Square Feet or 0.059 Acres, more or less.

The sidelines of said strip are to be lengthened or shortened to intersect said southerly line of said parcel of land described in Book 3185 at Page 382 of the Public Records of the City and County of Denver.



2323 DELGANY STREET  
 DENVER, CO 80216

PROJECT INFORMATION:

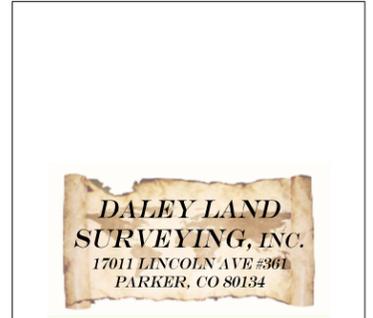
SITE NAME:  
**FS 29**  
 SITE ID:  
**DN03634A**  
 4800 HIMALAYA ROAD  
 DENVER, CO 80249  
 DENVER COUNTY

Rev:	Date:	Description:	By:
1	11/9/15	SURVEY	AV
2	11/20/15	LICENSE	AV
3	6/27/16	REV. LICENSE	RD
4	1/26/18	REV. LABELS	RD

PLANS PREPARED BY:

**CENTERLINE SOLUTIONS**  
 Advancing Wireless Networks  
 16035 TABLE MOUNTAIN PARKWAY  
 GOLDEN, CO 80403  
 303.993.3293  
 WWW.CENTERLINESOLUTIONS.COM

LICENSURE NO:



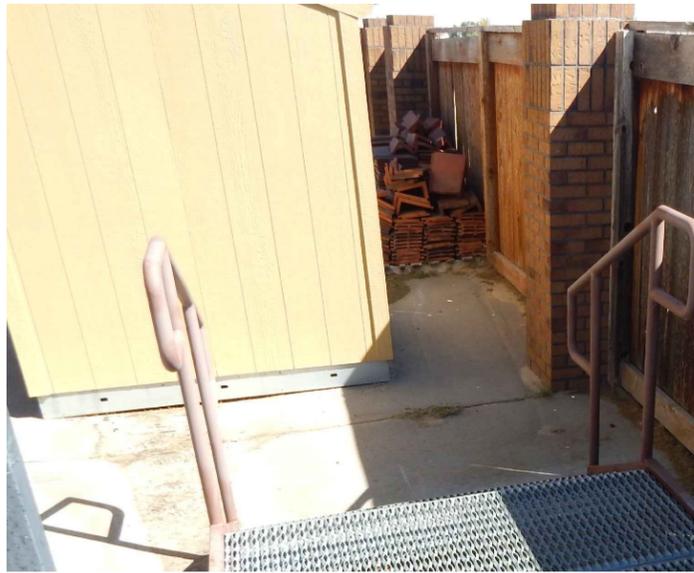
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AVV	RD	RD

Sheet Title:

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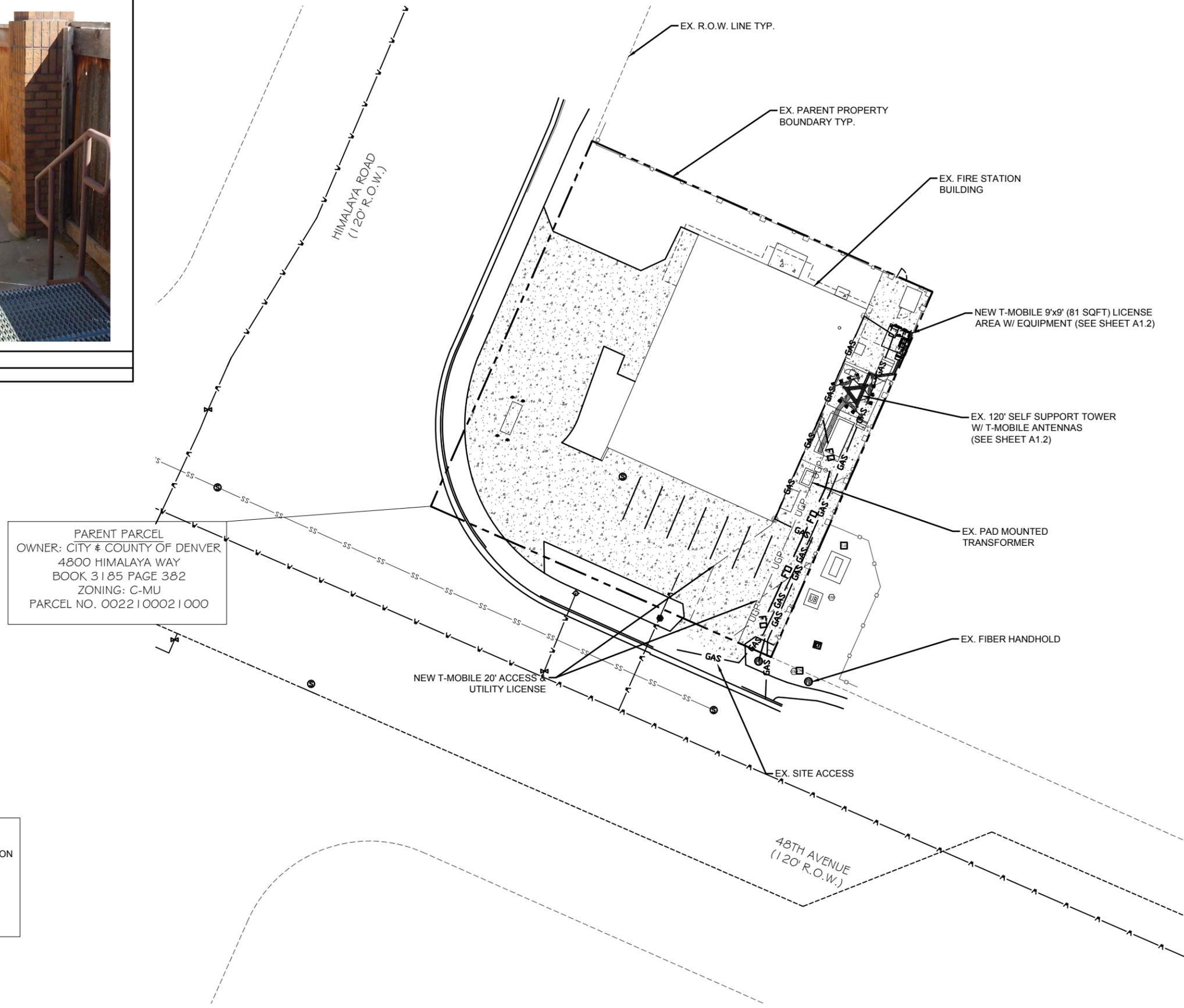
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**LS2**



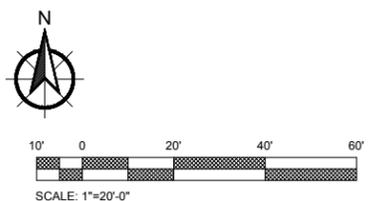
1 T-MOBILE LEASE AREA PHOTO

SCALE: N.T.S.



PARENT PARCEL  
 OWNER: CITY & COUNTY OF DENVER  
 4800 HIMALAYA WAY  
 BOOK 3185 PAGE 382  
 ZONING: C-MU  
 PARCEL NO. 0022100021000

NOTE:  
 OVERALL SITE PLAN AND LAND INFORMATION  
 DERIVED FROM DALEY LAND SURVEYING  
 SURVEY DATED: 11.20.2015



2 OVERALL SITE PLAN

SCALE: 1" = 20'-0"



2323 DELGANY STREET  
 DENVER, CO 80216

PROJECT INFORMATION:

SITE NAME:  
**DENVER FIRE #29**  
 SITE ID:  
**DN03634A**

4800 HIMALAYA ROAD  
 DENVER, CO 80249  
 DENVER COUNTY

Rev:	Date:	Description:	By:
1	2/18/16	PRELIM. CONST.	AD
2	3/11/16	CONSTRUCTION	AD
3	4/5/16	CONSTRUCTION	AD
4	7/1/16	REVISED CONST.	AD
5	05/16/17	REVISED CONST.	CM
6	01/29/18	REVISED CONST.	CM

PLANS PREPARED BY:

**CENTERLINE SOLUTIONS**  
 Advancing Wireless Networks

16360 TABLE MOUNTAIN PARKWAY  
 GOLDEN, CO 80403  
 303.993.3293  
 WWW.CENTERLINESOLUTIONS.COM

LICENSURE NO.:

ALL SCALES ARE SET FOR 24"x36" SHEET

DRAWN BY: CHK BY: APV BY:

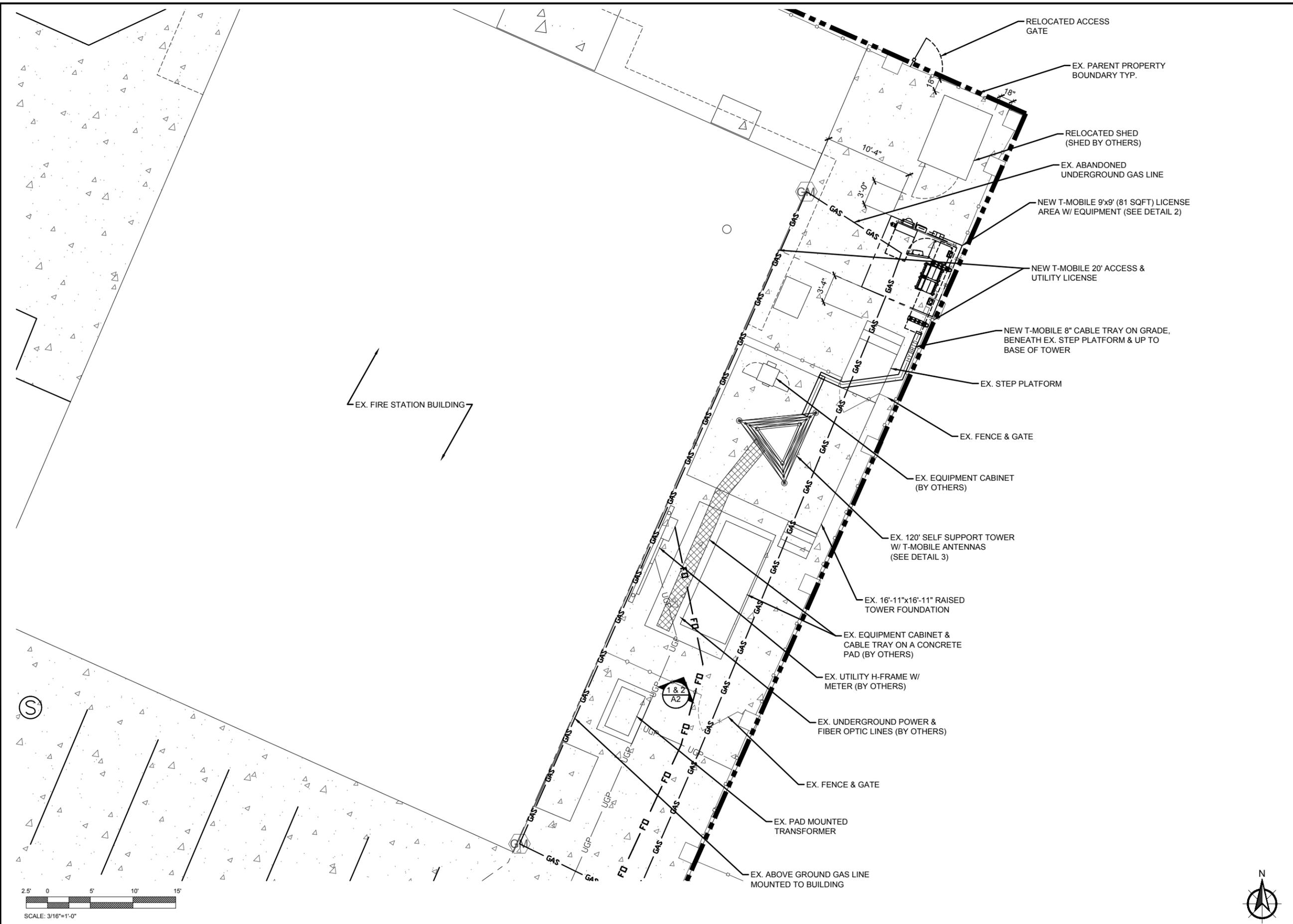
AD	CM	RG
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Sheet Title:

**OVERALL SITE PLAN**

Sheet Number:

**A1.1**



**T-Mobile**

2323 DELGANY STREET  
DENVER, CO 80216

PROJECT INFORMATION:

SITE NAME:  
**DENVER FIRE #29**

SITE ID:  
**DN03634A**

4800 HIMALAYA ROAD  
DENVER, CO 80249  
DENVER COUNTY

Rev:	Date:	Description:	By:
1	2/18/16	PRELIM. CONST.	AD
2	3/11/16	CONSTRUCTION	AD
3	4/5/16	CONSTRUCTION	AD
4	7/1/16	REVISED CONST.	AD
5	05/16/17	REVISED CONST.	CM
6	01/29/18	REVISED CONST.	CM

PLANS PREPARED BY:

**CENTERLINE SOLUTIONS**  
Advancing Wireless Networks

16360 TABLE MOUNTAIN PARKWAY  
GOLDEN, CO 80403  
303.993.3293  
WWW.CENTERLINESOLUTIONS.COM

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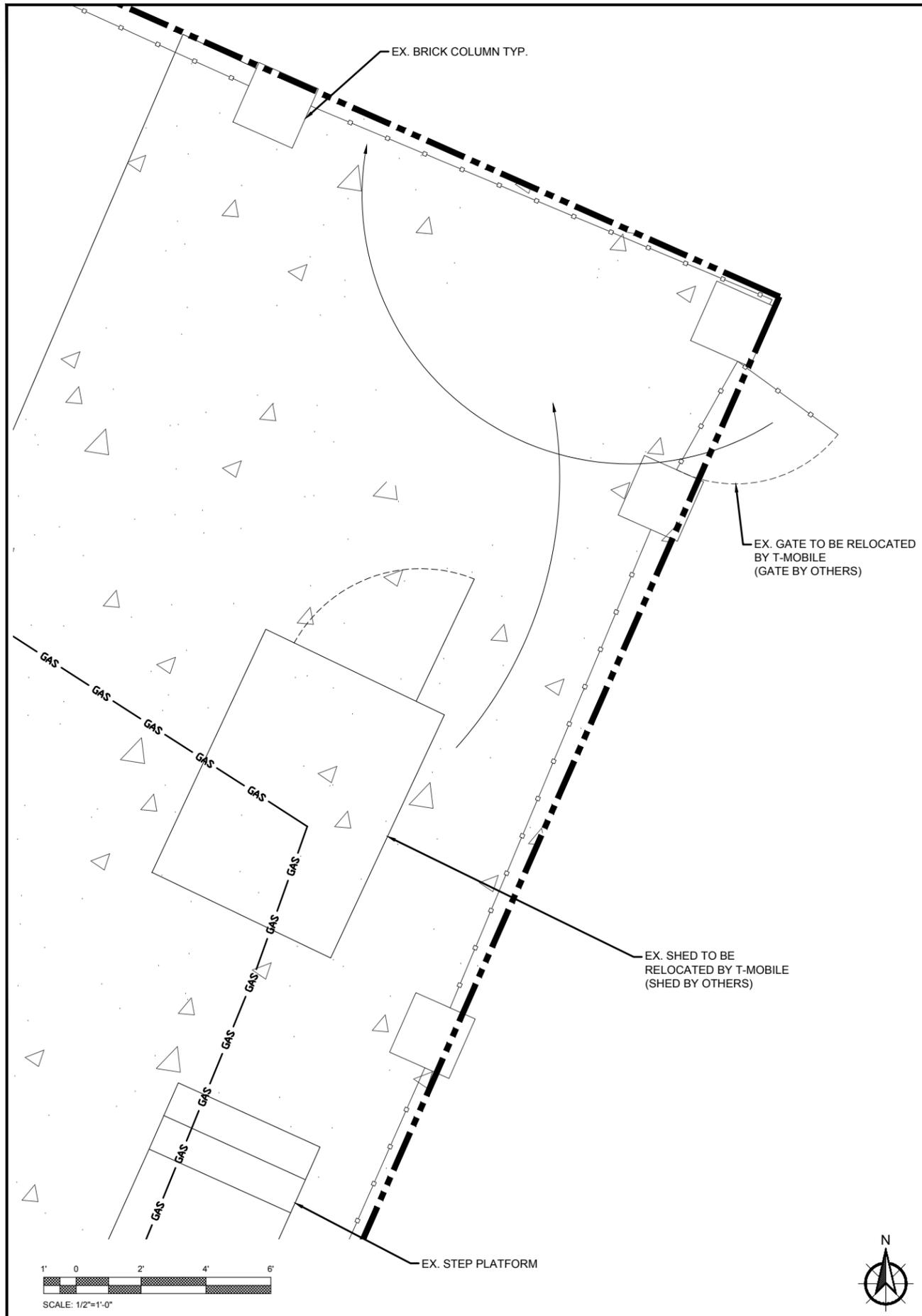
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Sheet Title:

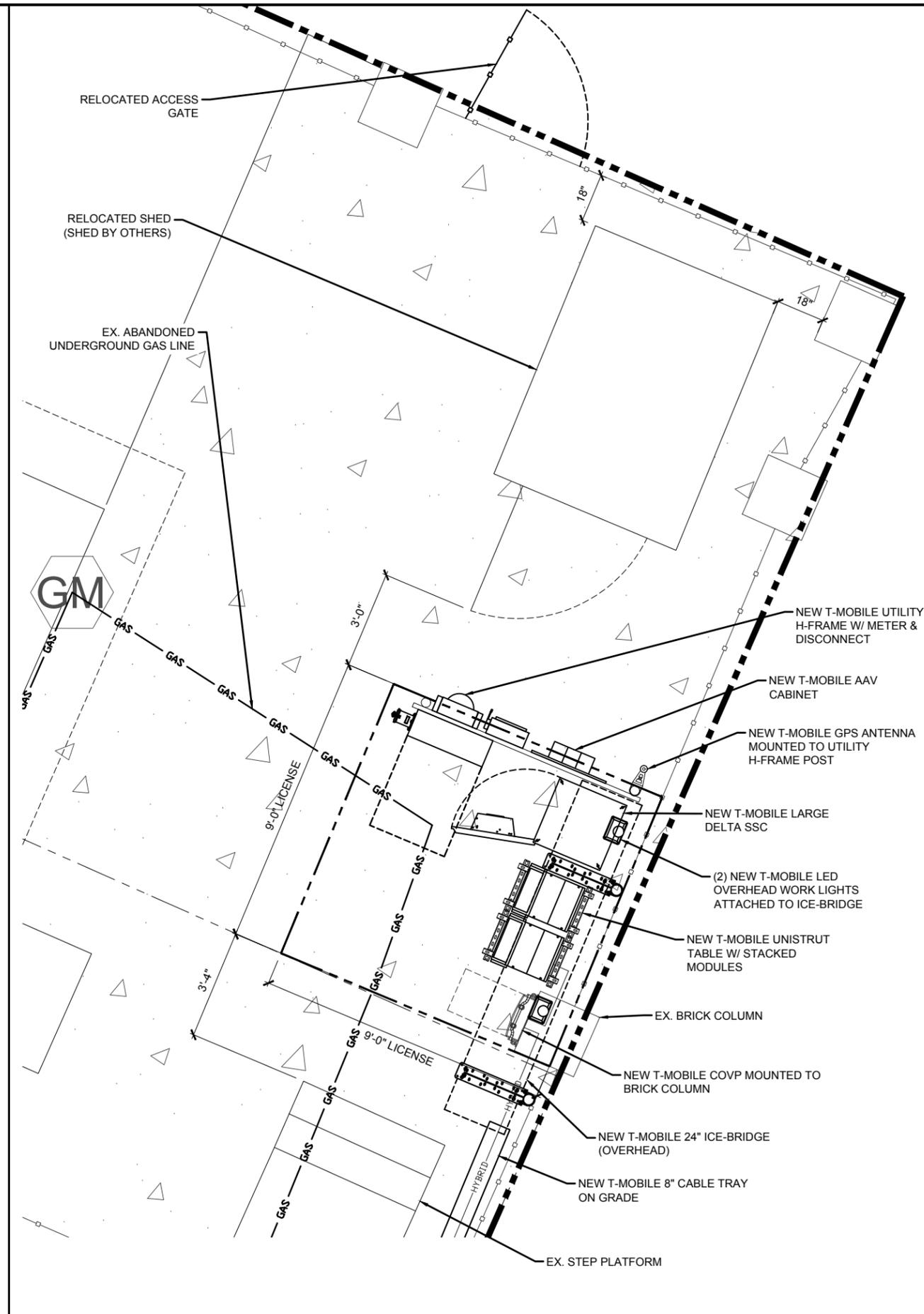
**DETAILED SITE PLAN**

Sheet Number:

**A1.2**



1 EXISTING EQUIPMENT LAYOUT  
SCALE: 1/2" = 1'-0"



2 NEW EQUIPMENT LAYOUT  
SCALE: 1/2" = 1'-0"

**T-Mobile**  
2323 DELGANY STREET  
DENVER, CO 80216

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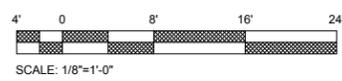
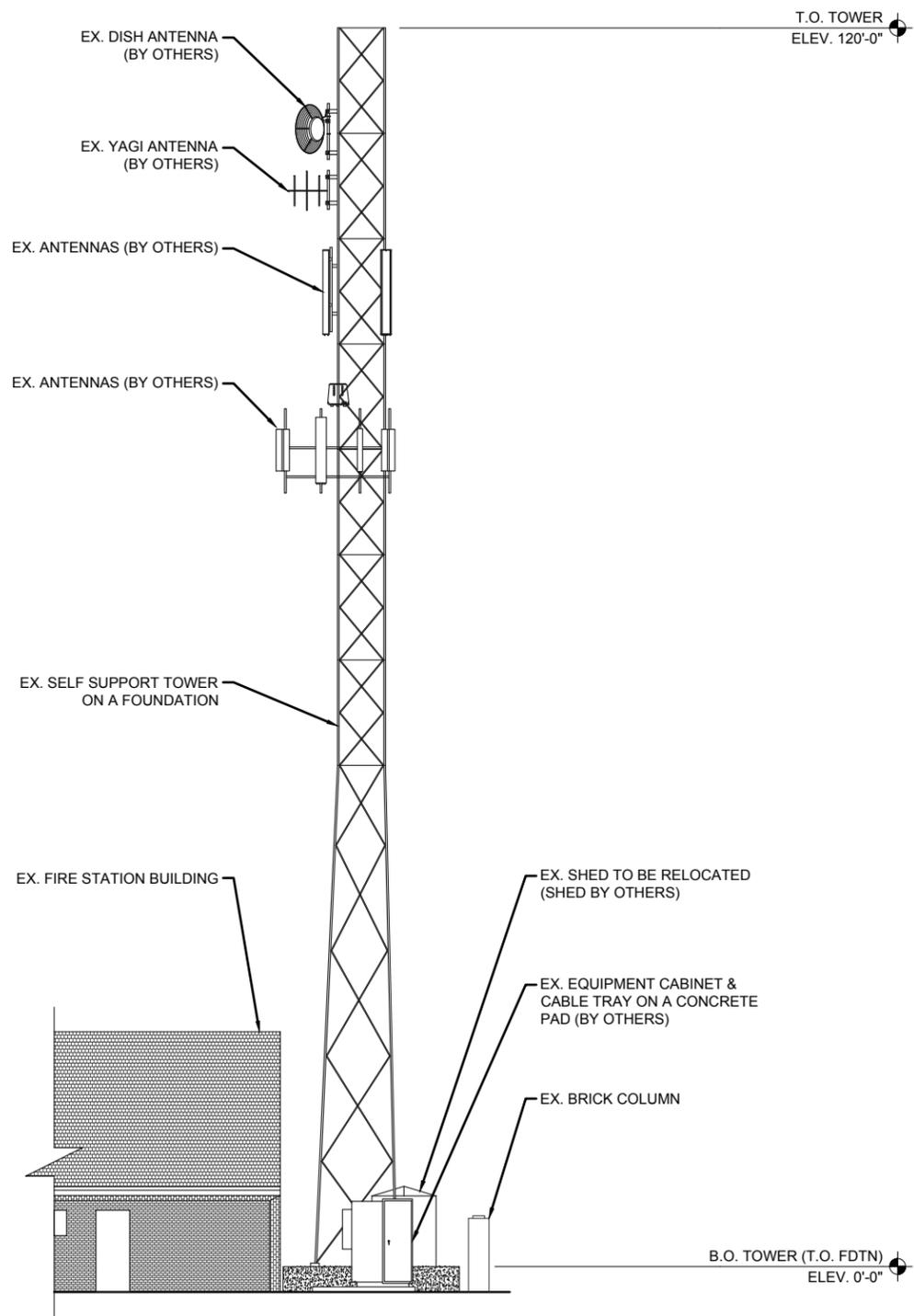
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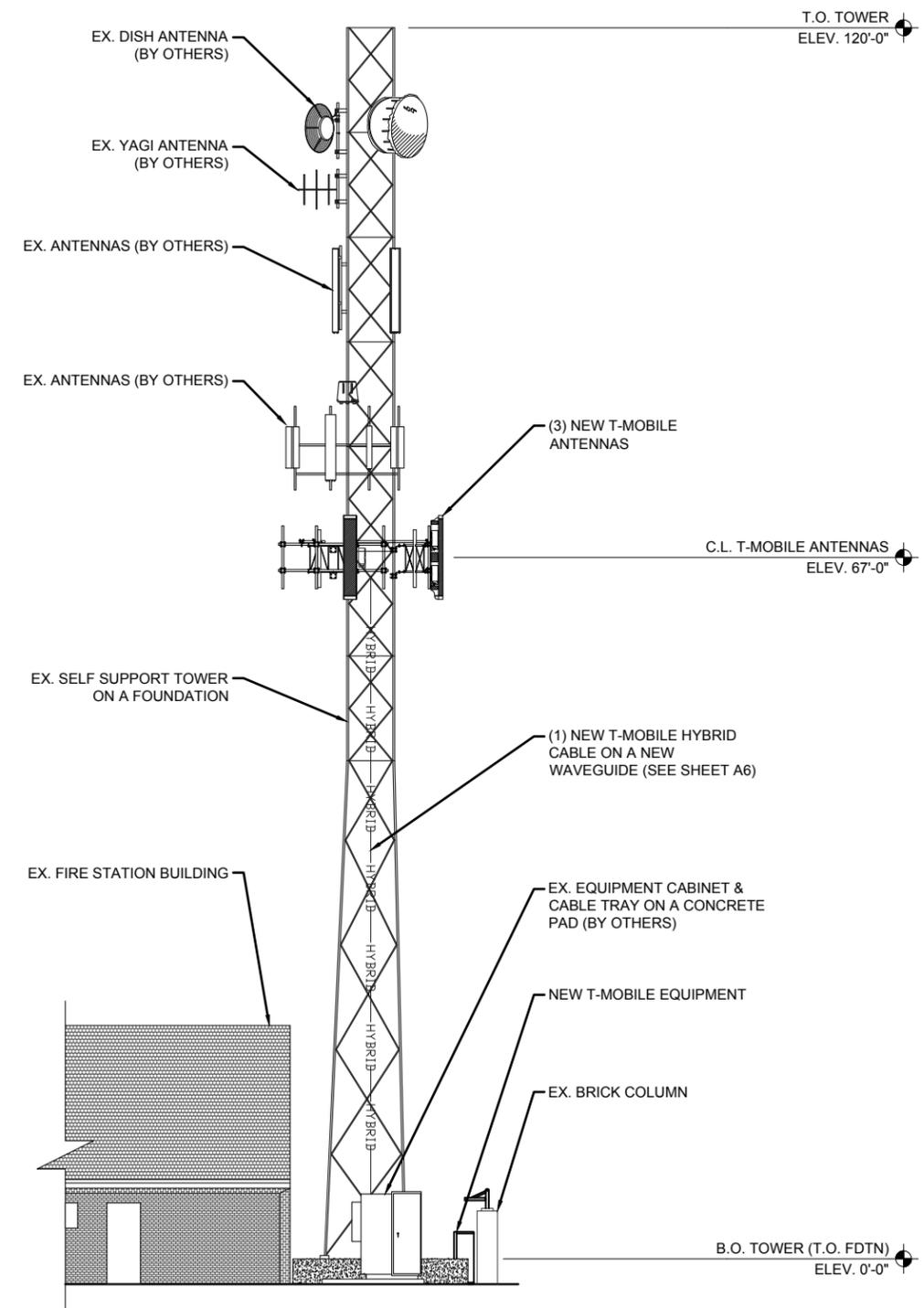
Sheet Title:  
**EXISTING & NEW EQUIPMENT LAYOUTS**

Sheet Number:  
**A1.3**

STRUCTURAL NOTE/T-MOBILE STRUCTURAL SERVICES COMPLIANCE NOTE:  
 NO WORK SHALL COMMENCE WITHOUT THE APPROVED STRUCTURAL TOWER/ANTENNA/MOUNT ANALYSIS REPORT (SIGNED AND SEALED) TO BE PROVIDED UNDER SEPARATE COVER. CONTRACTOR PRIOR TO CONSTRUCTION, SHALL REVIEW THE APPROVED TOWER/ANTENNA/MOUNT ANALYSIS REPORT SUPPLIED BY T-MOBILE AND MODIFY, IF REQUIRED, ALL APPLICABLE MEMBERS AS INDICATED IN CERTIFIED STRUCTURAL REPORT PRIOR TO INSTALLATION ON STRUCTURE.



1 EXISTING SOUTH ELEVATION  
 SCALE: 1/8" = 1'-0"



2 NEW SOUTH ELEVATION  
 SCALE: 1/8" = 1'-0"

**T-Mobile**  
 2323 DELGANY STREET  
 DENVER, CO 80216

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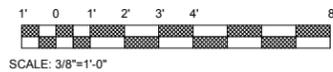
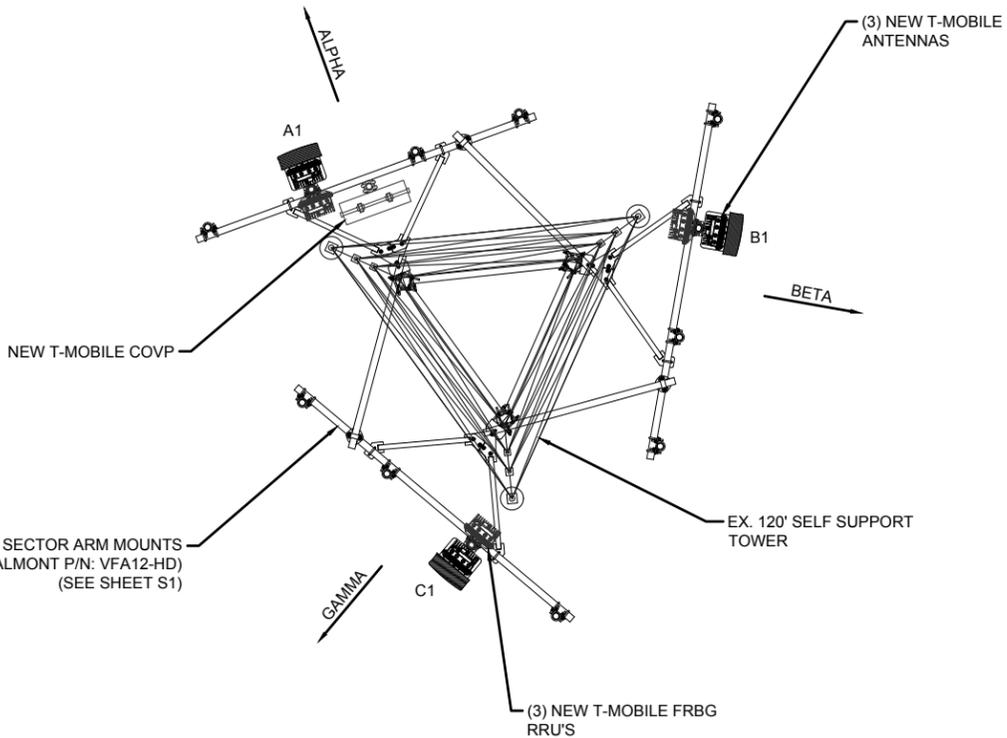
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AD	CM	RG
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Sheet Title:  
**EXISTING & NEW SOUTH ELEVATIONS**

Sheet Number:  
**A2**



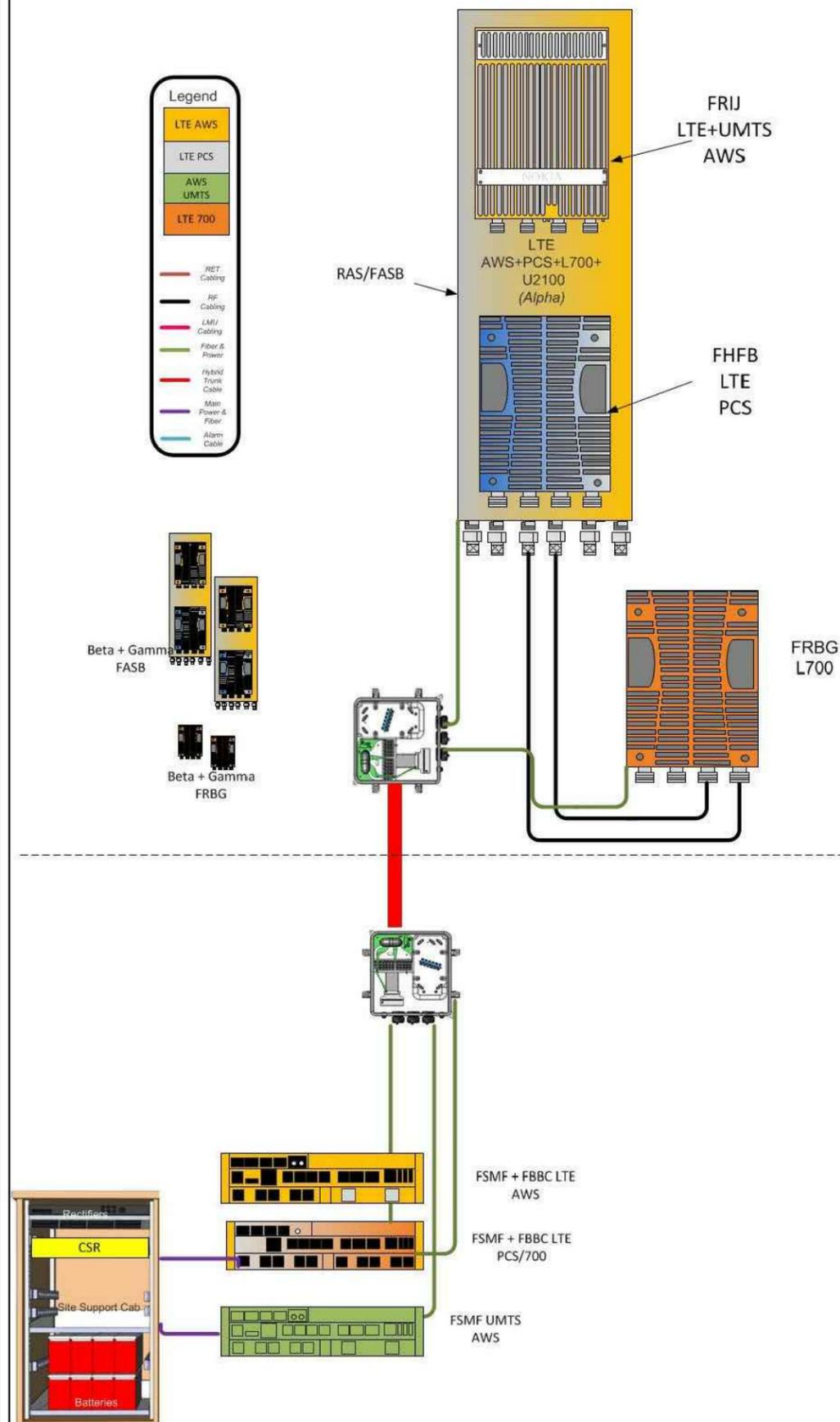
**1 ANTENNA LAYOUT**

SCALE: 3/8" = 1'-0"

- NOTES:**
1. INFORMATION PER RFDS DATED: 2/19/2016 CONTRACTOR TO REFER TO MOST RECENT RFDS BY T-MOBILE PRIOR TO COMMENCING WORK
  2. REFER TO SHEET A7 FOR ANTENNA SPECIFICATIONS

SECTOR	POSITION	TECHNOLOGY	ANTENNA		MECHANICAL TILT	ELECTRICAL TILT	FEED LINE TYPE AND LENGTH
			AZIMUTH	CL			
ALPHA	A1	L2100 / L700 / L1900 / U2100	340°	67'	0	1/6/1/1	(1) LOW CAPACITY HYBRID CABLE (80' ±)
BETA	B1	L2100 / L700 / L1900 / U2100	100°	67'	0	1/5/1/1	
GAMMA	C1	L2100 / L700 / L1900 / U2100	220°	67'	0	1/7/1/1	

**Configuration 716R\_DN**



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**PLANS PREPARED BY:**



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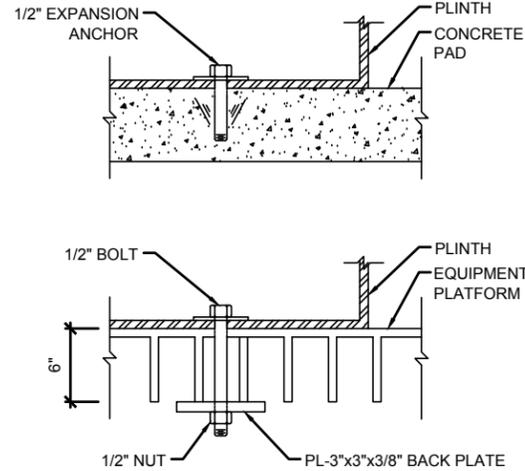
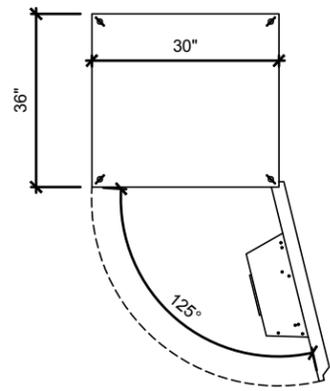
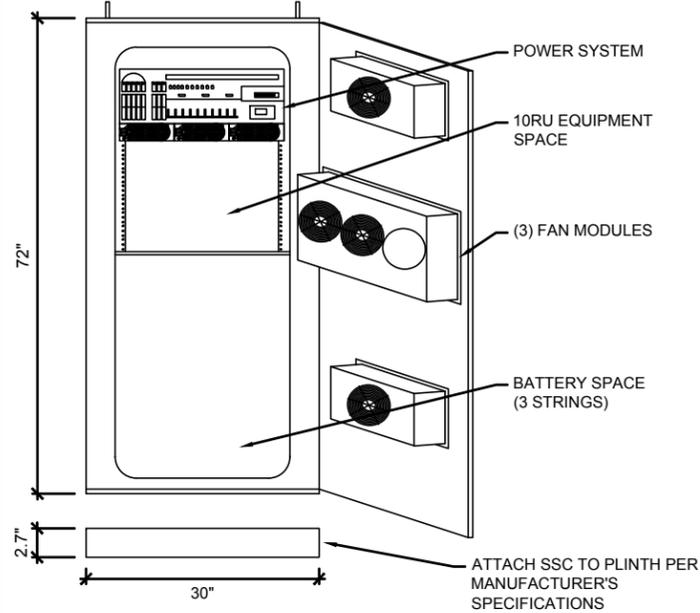
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Sheet Title:  
**ANTENNA LAYOUT  
& RFDS  
CONFIGURATION**

Sheet Number:  
**A3**

**DELTA LARGE OUTDOOR ENCLOSURE:  
ESOA-CCU03**

AC INPUT VOLTAGE: 100 - 120V/200 - 240V  
 AC INPUT CURRENT: 80A  
 DC OUTPUT CURRENT: 200A  
 DC OUTPUT VOLTAGE: 42 -56 VDC  
 CLEARANCES: 36" ON ALL SIDES  
 POWER SYSTEM: 8000W (N+1)  
 ADDITIONAL SPECS: 3 RU FOR DC DISTRIBUTION, RECTIFIER = DPR2900,  
 2Px3 POSITIONS FOR BATTERY BREAKER,, 10 RU  
 FOR EQUIPMENT 19" OR 23", (3) STRINGS FOR  
 BATTERIES  
 NOKIA FMFA PLINTH: 2.7" H x 30" W x 36" D - 20.5 lbs  
 WEIGHT: 500 lbs (WITHOUT BATTERIES)

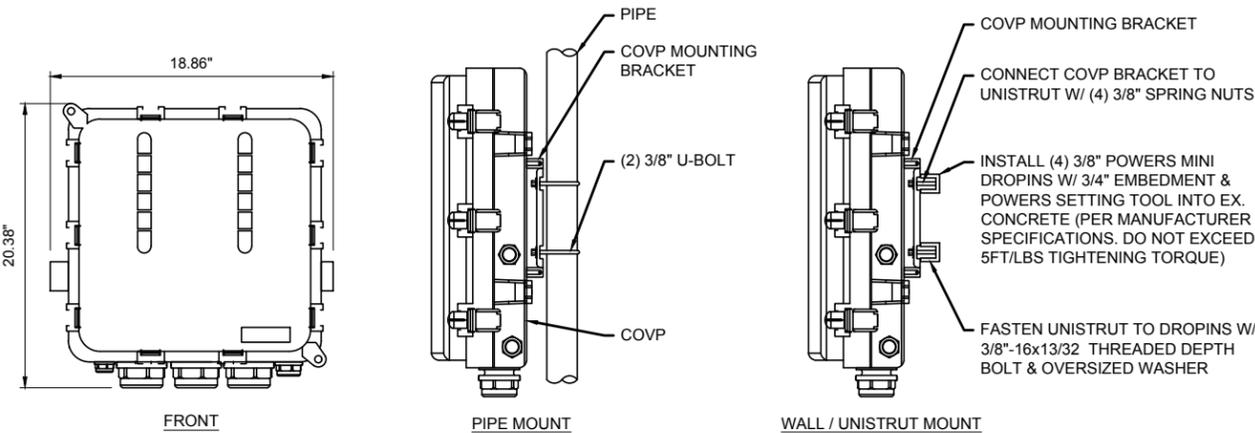
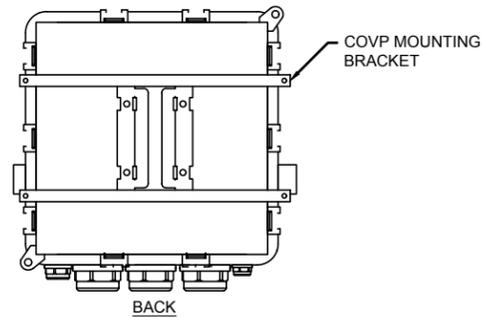


**1 SSC SPECIFICATIONS**

SCALE: N.T.S.

**RAYCAP: ASU9338TYP01 (RNSNDC-7771-PF-48)**

NOMINAL OPERATING VOLTAGE: 48 VDC  
 NOMINAL DISCHARGE CURRENT: 20 kA 8/20ms  
 MAXIMUM DISCHARGE CURRENT: 60 kA 8/20ms  
 MAXIMUM CONTINUOUS OPERATING VOLTAGE: 75 VDC  
 VOLTAGE PROTECTION RATING: 400 V  
 CLEARANCE: FRONT: 36"  
 TOTAL WEIGHT: 19 lbs



**3 COVP SPECIFICATIONS**

SCALE: N.T.S.

**2 NOT USED**

SCALE: N.T.S.

**4 NOT USED**

SCALE: N.T.S.



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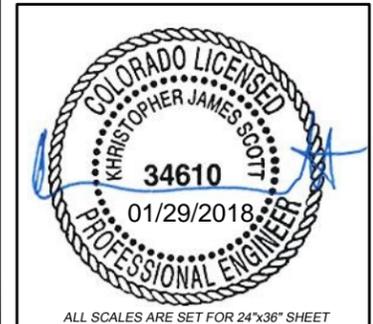
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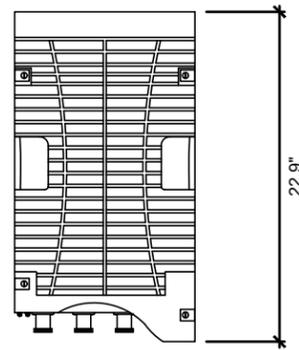
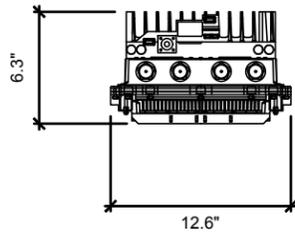
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AD	CM	RG

Sheet Title:

**DETAILS**

Sheet Number:

**A4**



**NOTE:**  
FRBG TO BE VERTICALLY MOUNTED ONLY

CHARACTERISTIC	FRBG CAPABILITY
NOMINAL SUPPLY VOLTAGE	-48.0 VDC
NOMINAL INPUT VOLT RANGE	-40.5 TO -57.0 VDC
EXTENDED INPUT VOLT RANGE	-36.0 TO -40.5 VDC -57.0 TO -60.0 VDC
VOLTAGE	14.5 V (ANT 1, ANT 3, RET)
POWER PER PORT	40 W

DIMENSION	VALUE
HEIGHT	22.9 INCHES (W/ BRACKET 34.3 INCHES)
WIDTH	12.6 INCHES
DEPTH	6.3 INCHES
WEIGHT	53 LBS (W/ BRACKET 57 LBS)

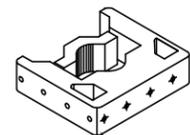
**1 RRU SPECIFICATIONS (FRBG)**

SCALE: N.T.S.

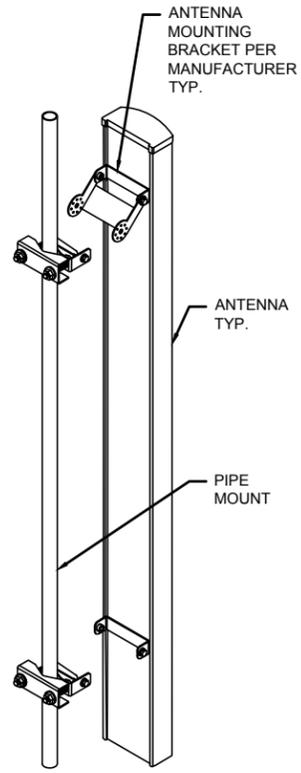
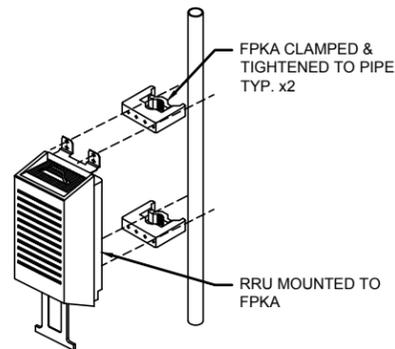
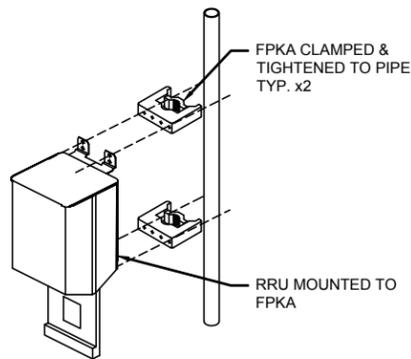
**2 NOT USED**

SCALE: N.T.S.

**NOKIA FPKA BRACKET**



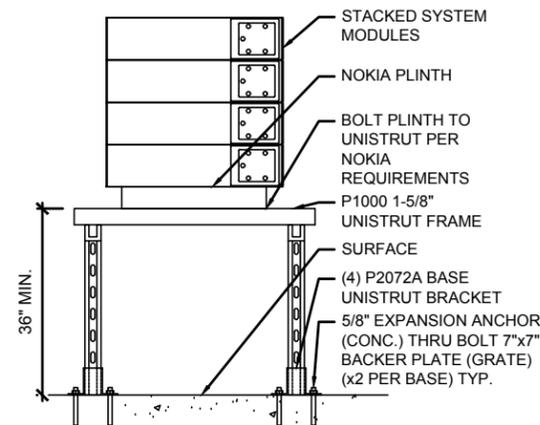
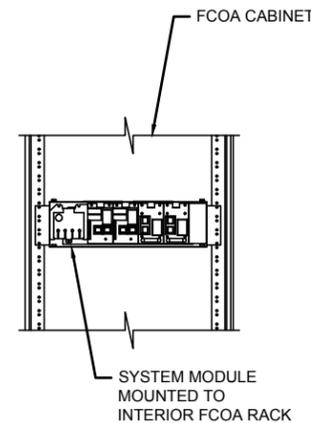
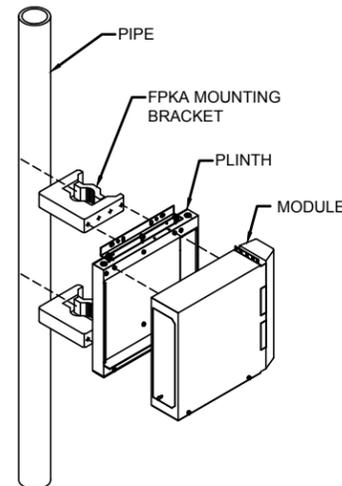
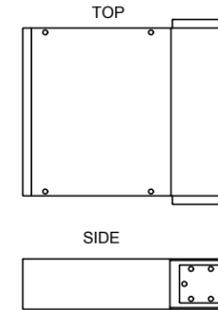
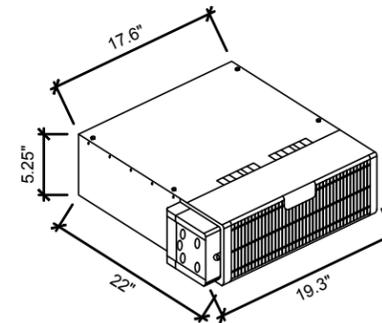
UP TO (3) RADIO HEADS AROUND (1) PAIR OF FPKA POLE MOUNTING BRACKETS



**NOTE:**  
REFER TO S-SHEETS FOR MOUNT DETAILS (IF APPLICABLE)  
ANTENNA TO PIPE MOUNTED

**NOKIA FLEXI SYSTEM/RADIO MODULES**  
FSMF, FSME, FRIE & FXFC

**CLEARANCES:** FRONT: 23.6"  
BACK: 8"  
TOP: 1.2"  
SIDES: 4"  
44 lbs  
**ADDITIONAL NOTE:** MODULE CAN BE INSTALLED VERTICALLY & HORIZONTALLY



**3 RRU & ANTENNA MOUNTING DETAIL**

SCALE: N.T.S.

**4 SYSTEM / RADIO MODULE SPECIFICATIONS**

SCALE: N.T.S.



2323 DELGANY STREET  
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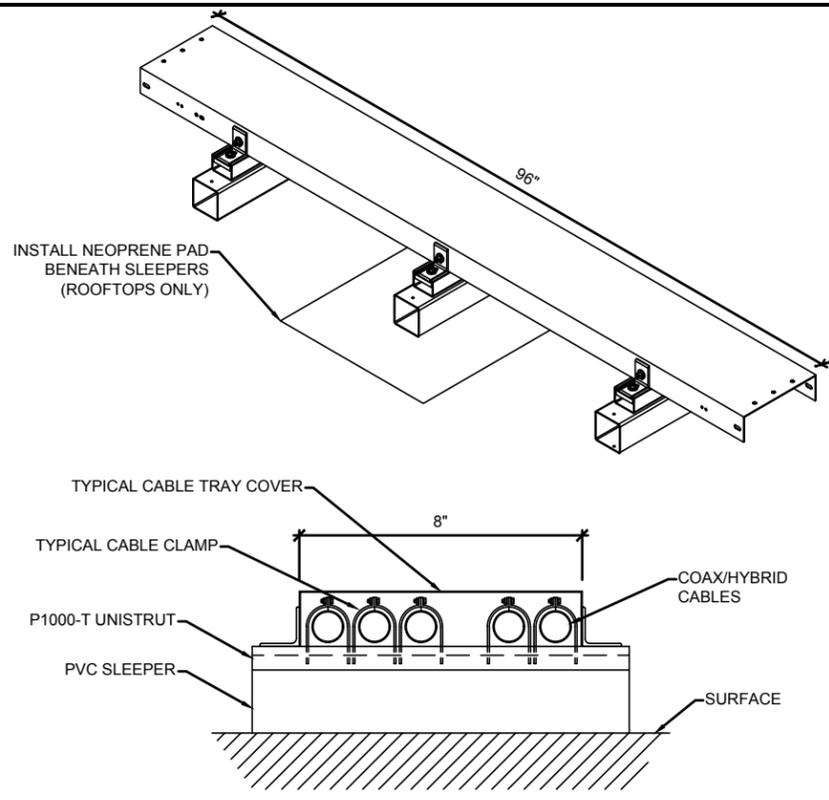
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**A5**

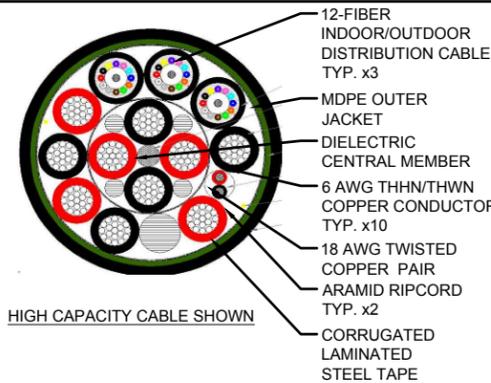


1 STEEL CABLE TRAY DETAIL

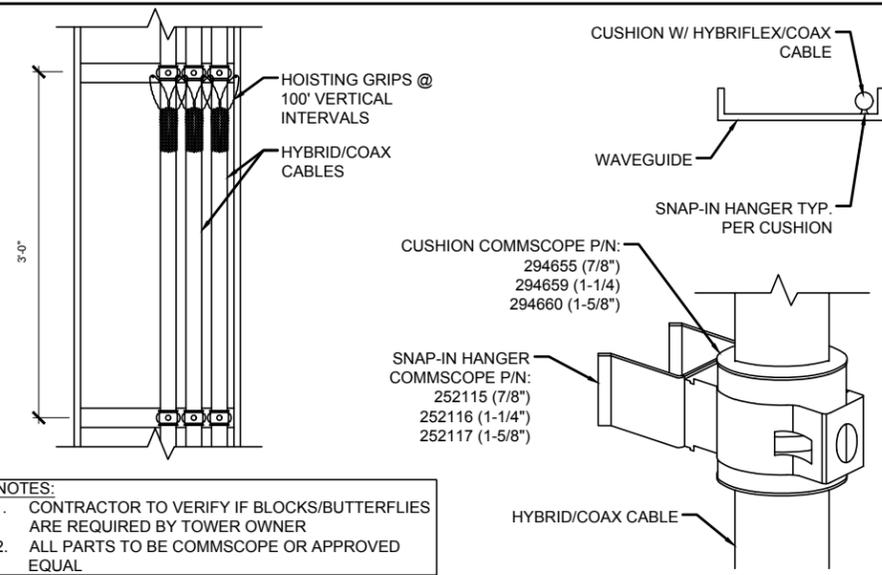
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HCS:

- HIGH CAPACITY (1-1/4" OD, 1.33 LB/FT)
- 10x6 AWG CONDUCTORS
- 18 FIBER PAIRS (36 PAIRS)



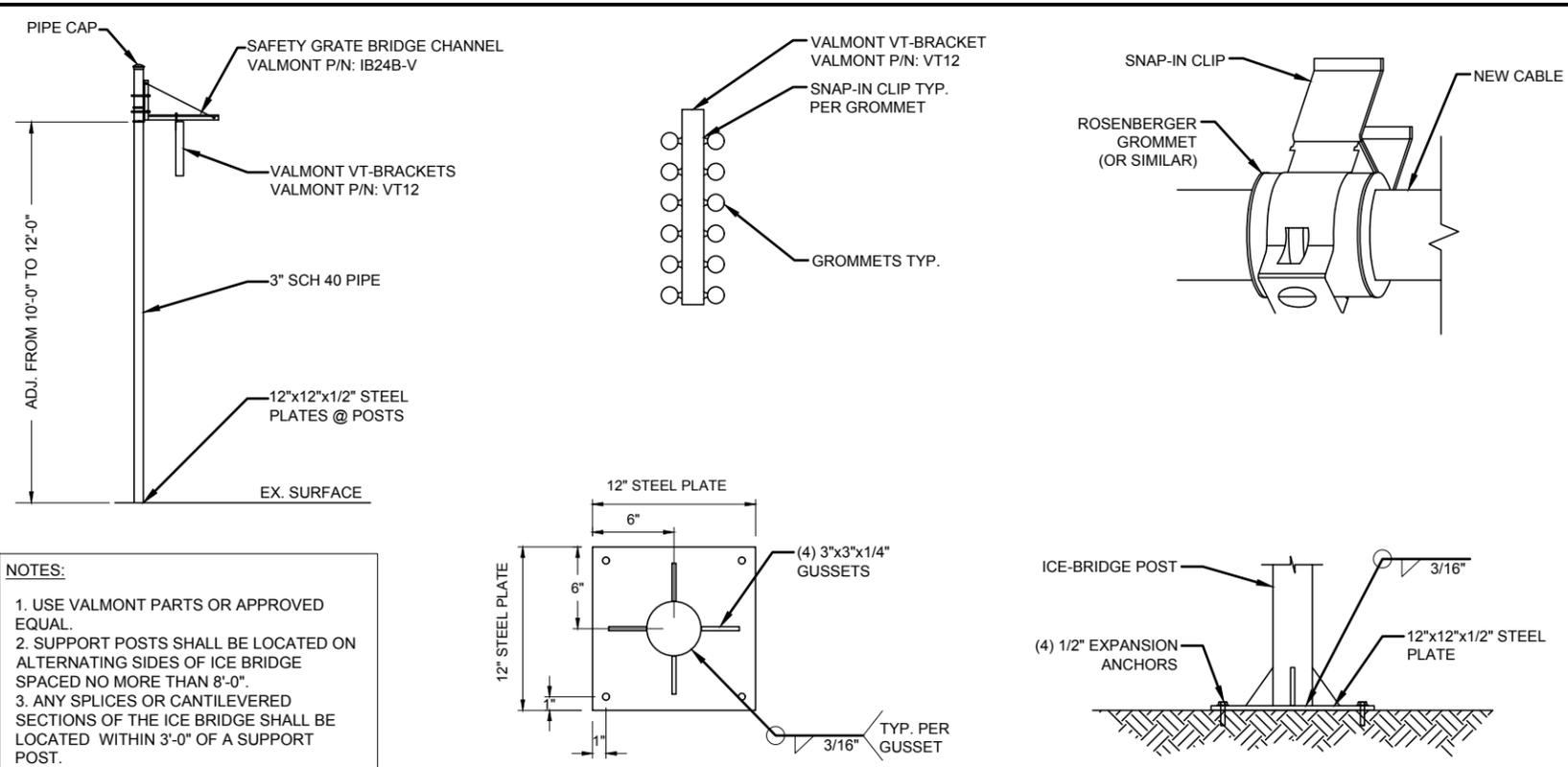
HIGH CAPACITY CABLE SHOWN



- NOTES:
- CONTRACTOR TO VERIFY IF BLOCKS/BUTTERFLIES ARE REQUIRED BY TOWER OWNER
  - ALL PARTS TO BE COMMSCOPE OR APPROVED EQUAL

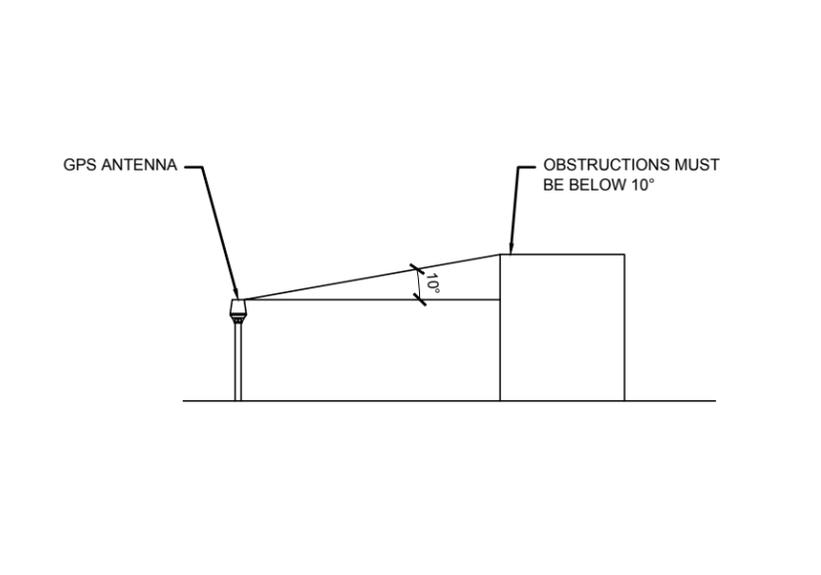
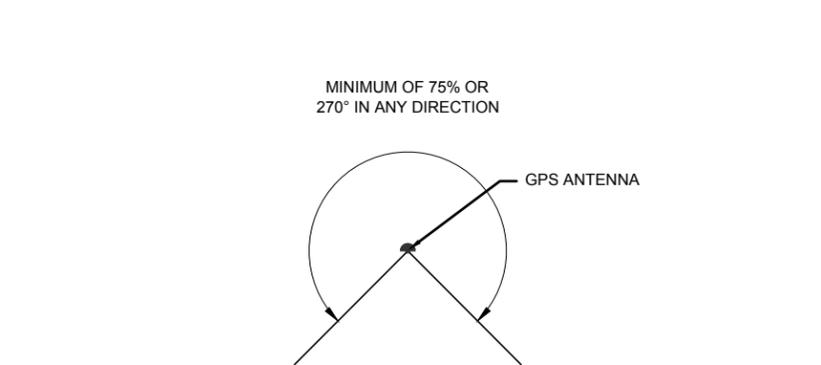
3 CABLE APPLICATION DETAIL

SCALE: N.T.S.



2 ICE BRIDGE DETAIL

SCALE: N.T.S.



FYGA GPS ANTENNA

- THE GPS ANTENNA MOUNT IS DESIGNED TO FASTEN TO A STANDARD 1-1/4" DIA. SCH. 40 GALVANIZED OR STAINLESS STEEL PIPE. THE PIPE MUST BE THREADED AT THE ANTENNA MOUNT END. THE PIPE SHALL BE CUT TO THE REQUIRED LENGTH (MIN. OF 18") USING A WAND OR ROTARY PIPE CUTTER TO ASSURE A SMOOTH PERPENDICULAR CUT. THE CUT PIPE END SHALL BE DEBURRED AND SMOOTH IN ORDER TO SEAL AGAINST THE NEOPRENE GASKET ATTACHED TO THE ANTENNA'S MOUNT.
- THE MOUNTING PLATE SHALL BE FABRICATED AS SHOWN AND ATTACHED TO THE APPROPRIATE SUPPORT STRUCTURE USING U-BOLTS. THE SUPPORT PIPE FOR THE GPS SHALL BE MOUNTED USING OVERSIZED U-BOLTS TO ALLOW ADJUSTMENT. IT IS CRITICAL THAT THE GPS ANTENNA IS MOUNTED WITHIN 2" OF VERTICAL AND THE BASE OF THE ANTENNA IS WITHIN 2" LEVEL.
- INSTALL GPS ANTENNA AS SPECIFIED ON SITE PLAN. IF INSTALLING ON ICE/CABLE BRIDGE ENSURE THAT GPS IS A MINIMUM OF 10' ABOVE GRADE, ON THE FURTHEST POST FROM THE TOWER TO ATTAIN MAXIMUM COVERAGE.
- GENERAL CONTRACTOR SHALL ENSURE THE GPS ANTENNA HAS THE REQUIRED FULL EXPOSURE TO THE SOUTHERN HEMISPHERE/HORIZON.

5 GPS ANTENNA MOUNTING

SCALE: N.T.S.

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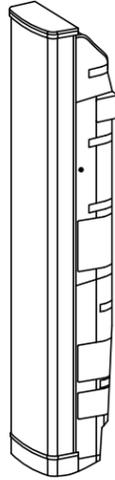
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**DETAILS**

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**A6**

# PRODUCT SPECIFICATIONS



## FLEXI RADIO ANTENNA SYSTEM FASB

THE ACTIVE ANTENNA SYSTEM INTEGRATES SEVERAL RF COMPONENTS (POWER AMPLIFIERS AND TRANSCEIVERS) DIRECTLY TO THE ANTENNA RADIATING ELEMENTS, AND ENABLES PRECISE ELECTRONIC INDIVIDUAL PHASE AND AMPLITUDE CONTROL USING SIGNAL PROCESSING TO SHAPE AND STEER RADIATED BEAM PATTERNS VERTICALLY AND HORIZONTALLY. THIS OFFERS SIGNIFICANT COVERAGE AND CAPACITY GAINS COMPARED TO THE CONVENTIONAL STATIC BEAMS OF PASSIVE ANTENNAS.

### ENVIRONMENTAL SPECIFICATIONS

OPERATING STANDARD	ETSI EN 300019-1-4 CLASS 4.1.E
MINIMUM OPERATIONAL AMBIENT AIR TEMPERATURE	-40° C (-40° F)
MAXIMUM OPERATIONAL AMBIENT AIR TEMPERATURE WITH SOLAR LOAD	+50° C (122° F)
MAXIMUM OPERATIONAL AMBIENT AIR TEMPERATURE WITHOUT SOLAR LOAD	+55° C (131° F)
EARTHQUAKE	GR-63-CORE, ZONE 4
MAXIMUM WIND SPEED	200 km/h, STEADY WIND 241.2 km/h, GUSTS OF WIND
MAXIMUM WIND LOAD (AT 200 KM/H)	FRONT: 1170 N BACK: 950 N SIDE: 1230 N
MTBF	>5000000
LIGHTING PROTECTION, GENERAL	DC GROUND, ALL CONDUCTIVE ANTENNA SURFACES ARE DC GROUNDED

### DIMENSIONS

DEPTH	340 mm / 13.4 in
LENGTH	2440.0 mm / 96.1 in
WIDTH	380.0 mm / 14.9 in
NET WEIGHT	49.0 kg / 108.0 lb - 94.0 kg / 207.2 lb DEPENDING ON THE NUMBER OF INTEGRATED RRHs



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AD	CM	RG

#### Sheet Title:

**DETAILS**

#### Sheet Number:

**A7**

PROJECT INFORMATION:

SITE NAME:  
**DENVER FIRE #29**  
SITE ID:  
**DN03634A**

4800 HIMALAYA ROAD  
DENVER, CO 80249  
DENVER COUNTY

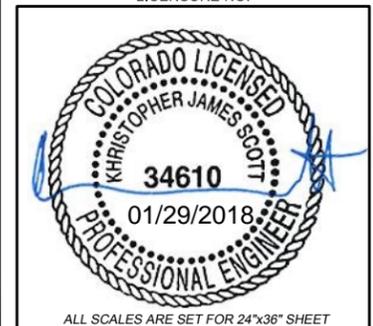
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2	3/11/16	CONSTRUCTION	AD
3	4/5/16	CONSTRUCTION	AD
4	7/1/16	REVISED CONST.	AD
5	05/16/17	REVISED CONST.	CM
6	01/29/18	REVISED CONST.	CM

PLANS PREPARED BY:



16360 TABLE MOUNTAIN PARKWAY  
GOLDEN, CO 80403  
303.993.3293  
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LICENSURE NO.:



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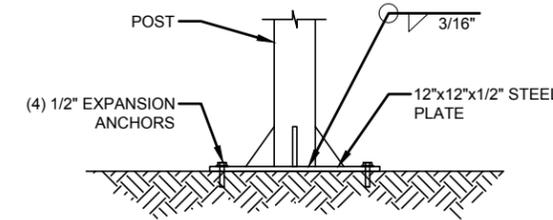
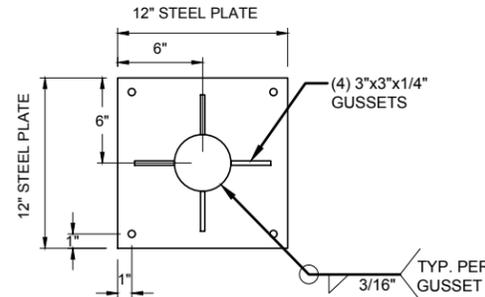
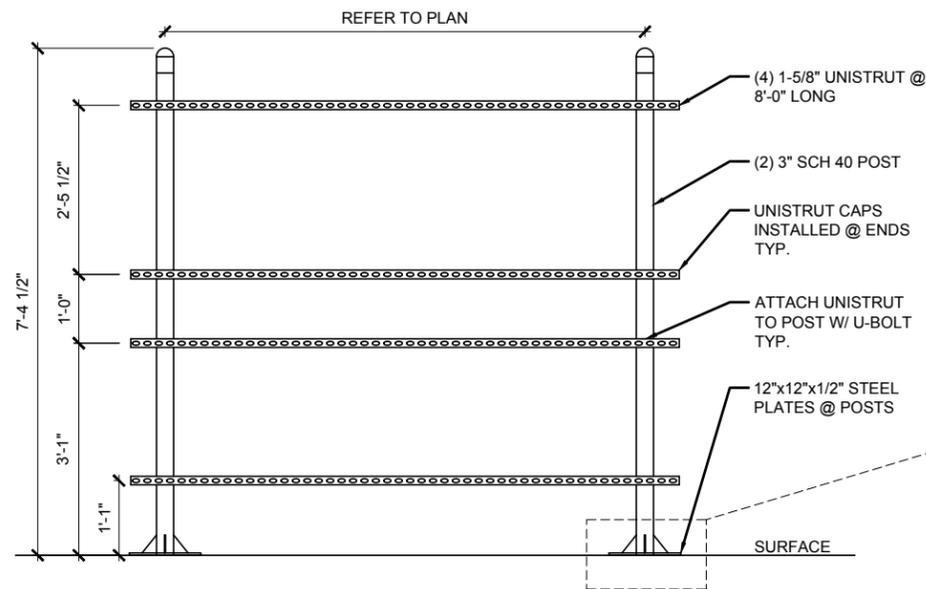
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AD	CM	RG

Sheet Title:

**STRUCTURAL  
DETAILS**

Sheet Number:

**S1**



NOTE:

1. SPRAY CUT ENDS OF ALL UNISTRUT WITH COLD-GALV. AND PAINT ON CLEAR LAQUER, OR CAP WITH PLASTIC UNISTRUT CAP.

**1 UNISTRUT H-FRAME DETAIL**

SCALE: N.T.S.

**VALMONT SUPER XLD HEAVY-DUTY V-FRAME**

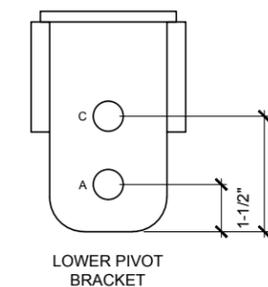
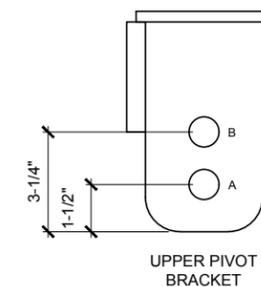
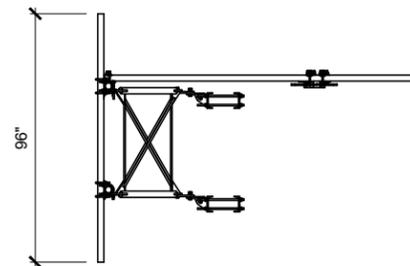
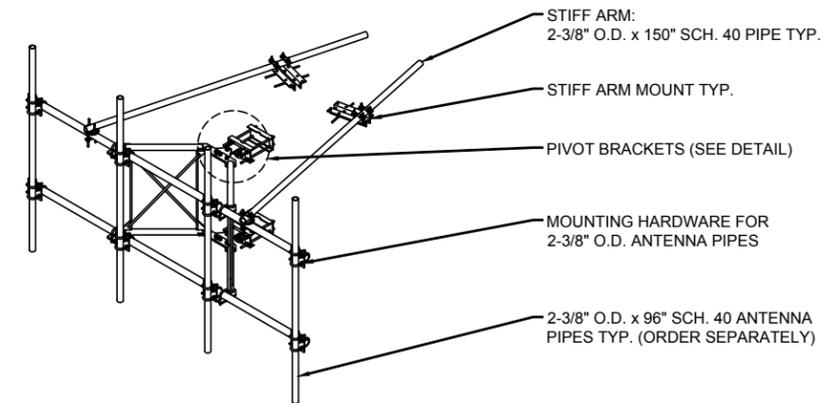
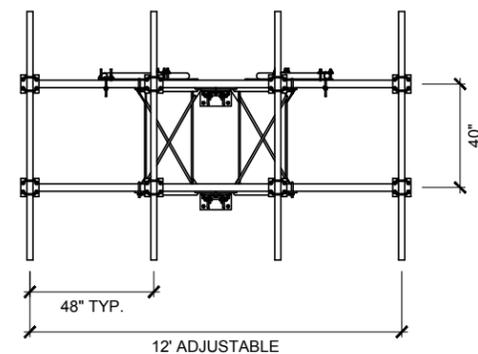
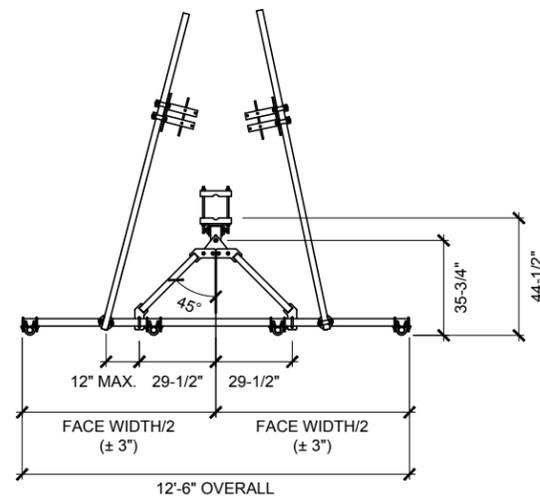
P/N: VFA12-HD

FACE WIDTH: 12'-6"  
HARDWARE TO MOUNT (X) ANTENNAS: 4  
WEIGHT: 620#

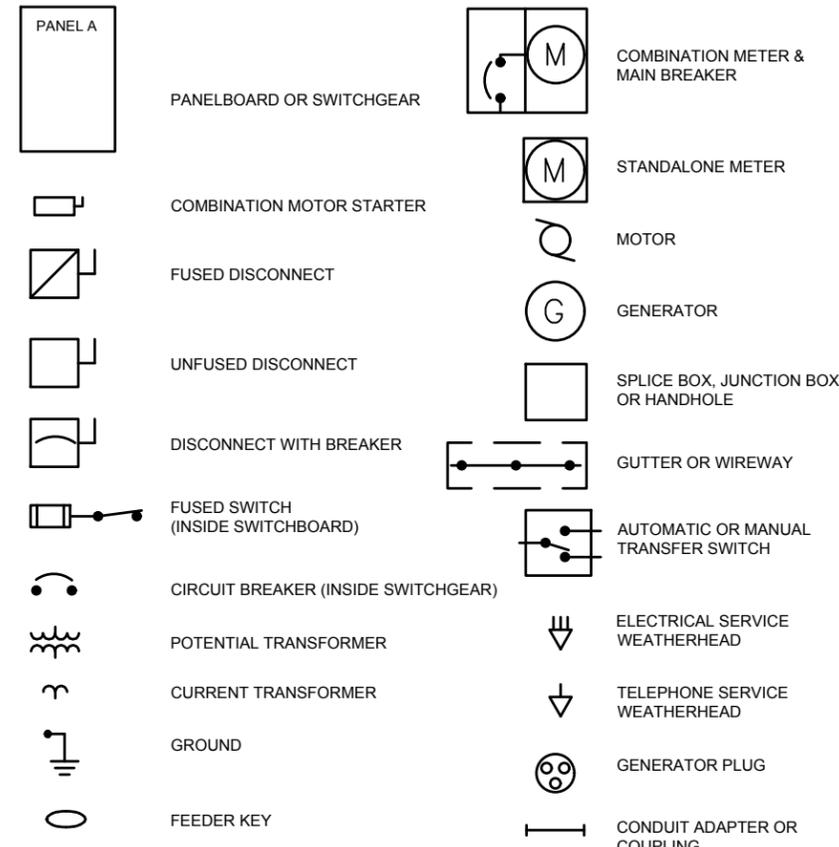
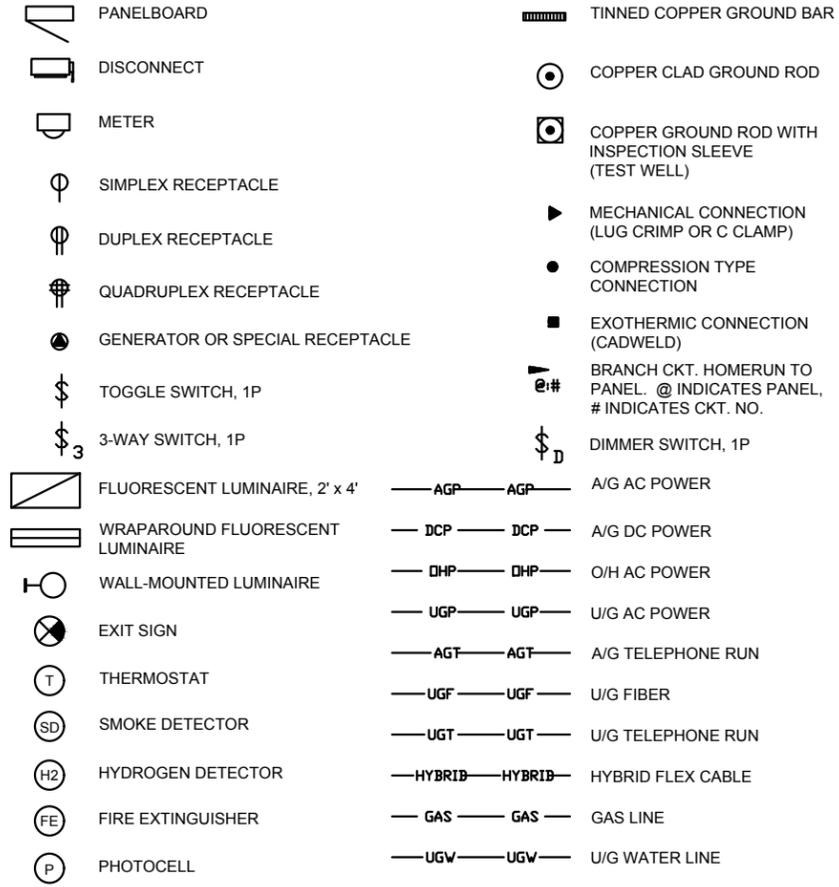
- SUPER XLD - VALMONT'S MOST ROBUST SECTOR FRAME DESIGNED FOR THE MOST EXTREME LOADING CONDITIONS
- DESIGNED FOR EQUIPMENT WIND LOADS UP TO 3,000 LBS. AND EQUIPMENT DEAD LOADS UP TO 2,000 LBS.
- RATED FOR BASIC WIND SPEED OF 140 MPH AND 2-1/2" OF ICE AT 60 MPH
- TWO STIFF ARMS AND HARDWARE TO MOUNT 2-3/8" & 2-7/8" ANTENNA MOUNTING PIPES INCLUDED. ORDER ANTENNA MOUNTING PIPES SEPARATELY
- FRAME ROTATES FOR EASY AZIMUTH ADJUSTMENT. ADJUSTS EASILY FOR STANDARD TOWER TAPERS
- MOUNTS TO 1-1/2" - 8-5/8" ROUND TOWER LEGS
- CONTACT VALMONT FOR LOAD AND ENGINEERING DATA

**PIVOT BRACKET NOTES:**

1. USE HOLE "A" IN UPPER AND LOWER BRACKETS FOR STRAIGHT LEGS.
2. USE HOLE "A" IN UPPER BRACKET AND HOLE "C" IN LOWER BRACKET FOR 2" IN 20' TAPER LEGS (3.309")
3. USE HOLE "B" IN UPPER BRACKET AND HOLE "C" IN LOWER BRACKET FOR 6" IN 20' TAPER LEGS. (0.827")



AAV ALTERNATE ACCESS VENDOR  
AC ALTERNATING CURRENT  
AFF ABOVE FINISHED FLOOR  
AFG ABOVE FINISHED GRADE  
AIC AMPERES INTERRUPT CURRENT  
AL ALUMINUM  
A/G ABOVE GROUND  
AGB ANTENNA GROUND BAR  
ATS AUTOMATIC TRANSFER SWITCH  
AWG AMERICAN WIRE GAUGE  
AWS ADVANCED WIRELESS SERVICES  
BATT BATTERY  
BBU BASEBAND UNIT  
BCW BARE COPPER WIRE  
BSCW BARE STRANDED COPPER WIRE  
BTCW BARE TINNED COPPER WIRE  
C CONDUIT  
CAB CABINET  
CE CONCRETE ENCASED  
CGB COLLECTOR GROUND BAR  
CKT CIRCUIT  
COVP CAPACITOR OVERVOLTAGE PROTECTION  
CT CURRENT TRANSFORMER  
CU COPPER  
DB DIRECT BURIED  
DC DIRECT CURRENT  
DEI DIGITAL EXPANSION INTERFACE  
DISC DISCONNECT  
DPDT DOUBLE POLE DOUBLE THROW  
EGB EXTERIOR GROUND BAR  
EMT ELECTRICAL METALLIC TUBING  
FMT FLEXIBLE METALLIC TUBING  
FCOA FLEXI CABINET FOR OUTDOOR  
G or GND GROUND  
GEN GENERATOR  
GFCI GROUND FAULT CURRENT INTERRUPTER  
GND GROUND  
GPS GLOBAL POSITIONING SYSTEM  
GR GROWTH (CABINET)  
GRC GALVANIZED RIGID (STEEL) CONDUIT  
HVAC HEATING, VENTILATING, & AIR CONDITIONING  
IGB INTERIOR GROUND BAR  
IGR INTERIOR GROUND RING (HALO)  
IMC INTERMEDIATE METALLIC CONDUIT  
ISCW INSULATED STRANDED COPPER WIRE  
KAIC KILOAMPERES INTERRUPT CURRENT  
LTFC LIQUID TIGHT FLEXIBLE CONDUIT  
LTE LONG TERM EVOLUTION  
MGB MAIN (OR MASTER) GROUND BAR  
MIN MINIMUM  
MTS MANUAL TRANSFER SWITCH  
MW MICROWAVE  
N NEUTRAL  
NEC NATIONAL ELECTRIC CODE  
NO NORMALLY OPEN  
NC NORMALLY CLOSED  
NID NETWORK INTERFACE DEVICE  
OC ON CENTER  
OVP OVERVOLTAGE PROTECTION  
O/H OVERHEAD  
PCS PERSONAL COMMUNICATION SERVICES  
PPC POWER PROTECTION CABINET  
PRC PRIMARY RADIO CABINET  
PT POTENTIAL TRANSFORMER  
PVC POLYVINYL CHLORIDE  
PWR POWER  
RAC RIGID ALUMINUM CONDUIT  
REC RECEPTACLE  
RECT RECTIFIER  
RET REMOTE ELECTRICAL TILT  
RGS RIGID GALVANIZED STEEL  
RMT RIGID METALLIC TUBING  
RRH REMOTE RADIO HEAD  
RRU REMOTE RADIO UNIT  
RU RACK UNIT  
SCA SHORT CIRCUIT AMPERES  
SCCR SHORT CIRCUIT CURRENT RATING  
SPD SURGE PROTECTIVE DEVICE  
SPDT SINGLE POLE DOUBLE THROW  
SPST SINGLE POLE SINGLE THROW  
SSC SITE SUPPORT CABINET  
S/S STAINLESS STEEL  
TMA TOWER MOUNTED AMPLIFIER  
TVSS TRANSIENT VOLTAGE SURGE SUPPRESSOR  
TYP TYPICAL  
U/G UNDERGROUND  
UTP UNSHIELDED TWISTED PAIR  
VZW VERIZON WIRELESS  
WP WEATHERPROOF  
WW WIREWAY  
XFMR TRANSFORMER



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PLANS PREPARED BY:  
  
**CENTERLINE SOLUTIONS**  
*Advancing Wireless Networks*  
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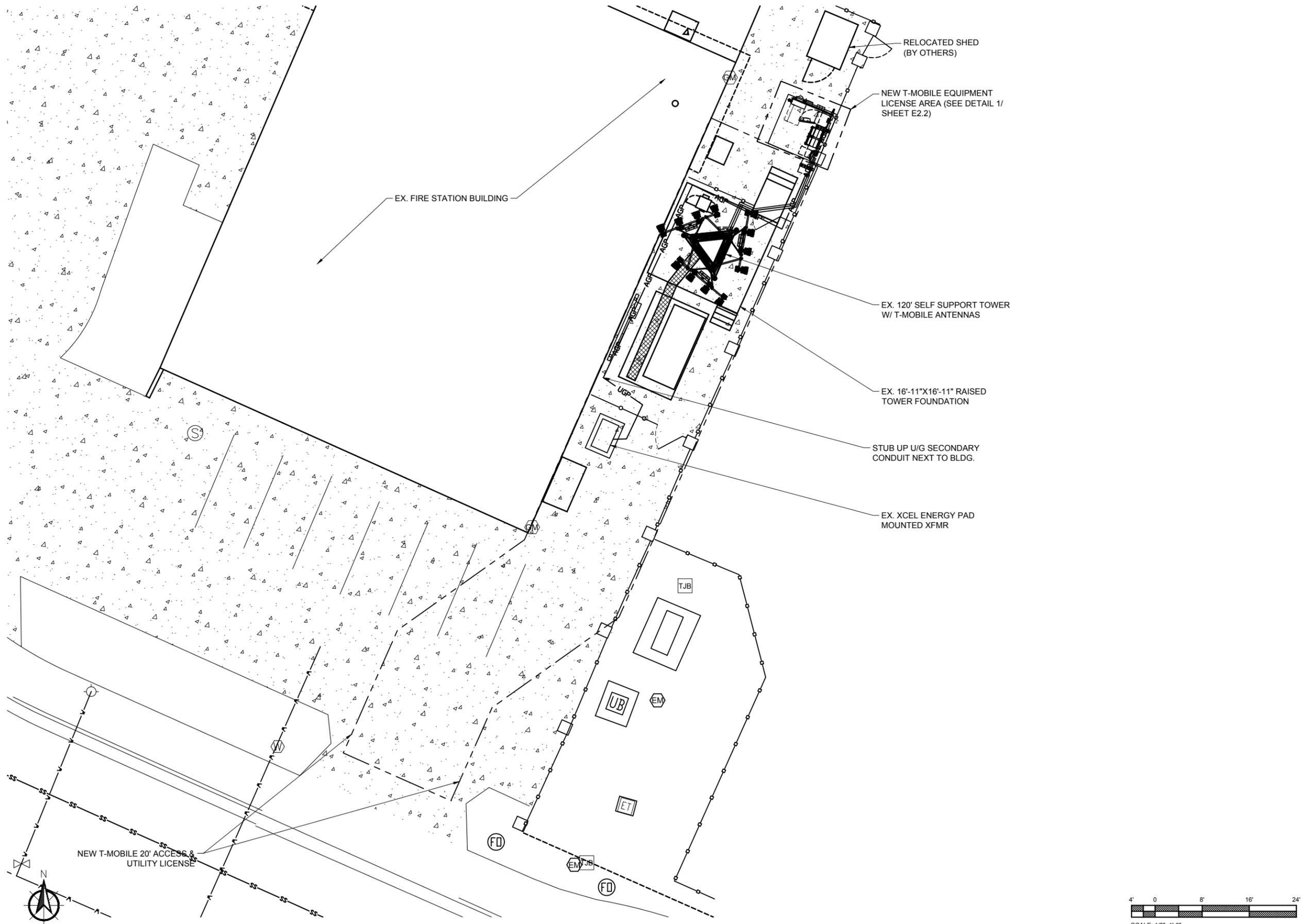
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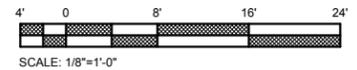
YK/JR	AD	PK
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Sheet Title:  
**ABBREVIATIONS AND ELECTRICAL SYMBOLS**

Sheet Number:  
**E1**



1 OVERALL SITE ELECTRICAL PLAN  
SCALE: 1/8"=1'-0"



**T-Mobile**  
18400 EAST 22ND AVENUE  
AURORA, CO 80011

PROJECT INFORMATION:  
SITE NAME:  
**FIRE STATION #29**  
SITE ID:  
**DN03634A**  
  
4800 HIMALAYA ROAD  
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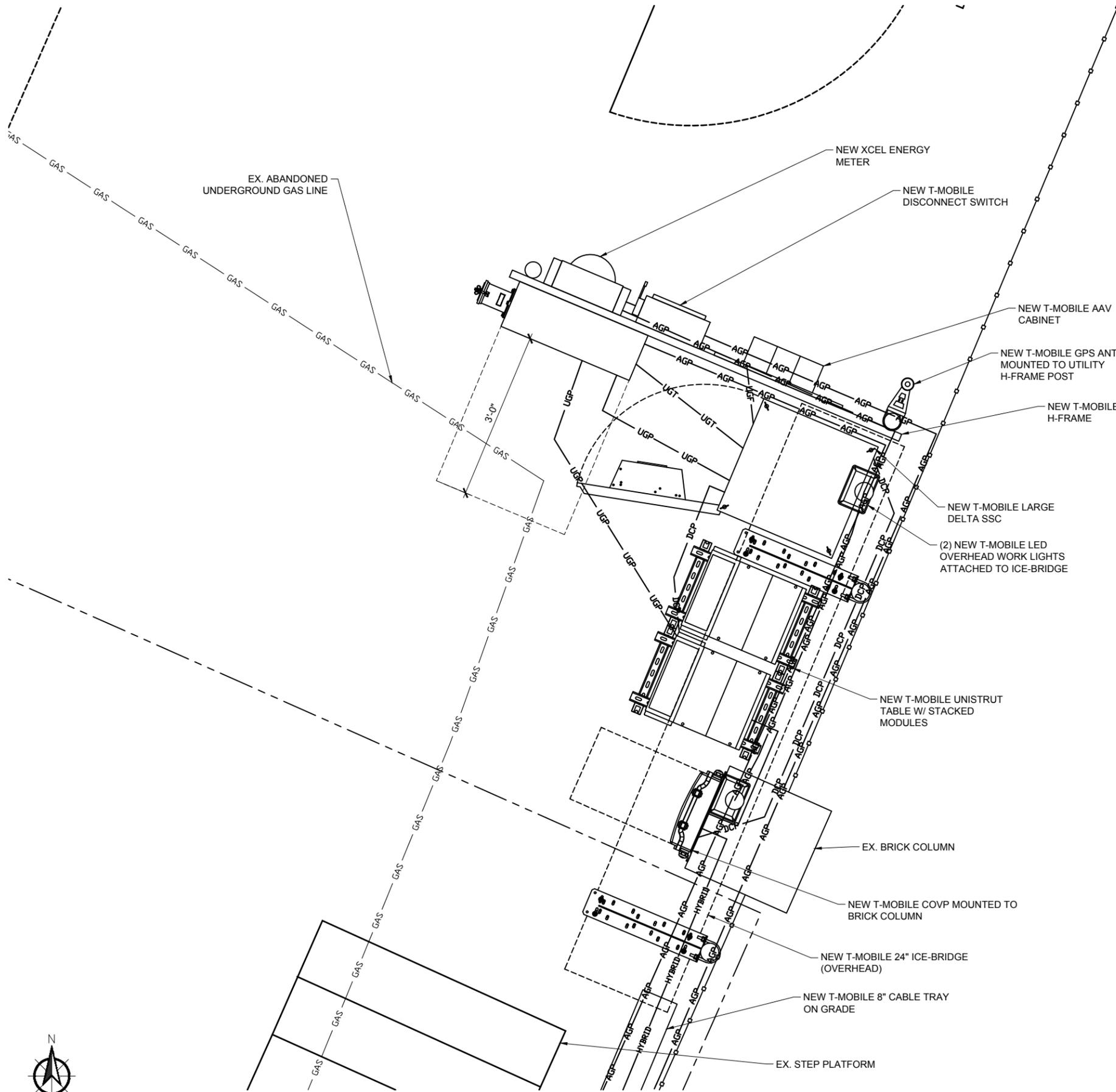
PLANS PREPARED BY:  
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Sheet Title:  
**OVERALL SITE ELECTRICAL PLAN**

Sheet Number:  
**E2.1**



**NOTES:**

1. CONTRACTOR SHALL STUB UP MINIMUM OF 2 CONDUITS FOR EACH CABINET POSITION (NEW AND FUTURE), REGARDLESS OF WHETHER THE CABINET IS INSTALLED OR THE CONDUIT IS CURRENTLY REQUIRED. EQUIPMENT CONDUITS SHALL BE SIZED AS FOLLOWS (MINIMUM): POWER (1½" C), TELCO/ALARMS (1" C), FIBER (2" C).
2. SURFACE MOUNTED CONDUITS SUBJECT TO FOOT TRAFFIC SHALL BE GRC. FINAL RUN TO EQUIPMENT CABINET SHALL BE LTFC.



18400 EAST 22ND AVENUE  
AURORA, CO 80011

**PROJECT INFORMATION:**

SITE NAME:  
**FIRE STATION #29**  
SITE ID:  
**DN03634A**

4800 HIMALAYA ROAD  
DENVER, CO 80249  
DENVER COUNTY

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**PLANS PREPARED BY:**



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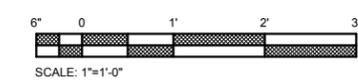


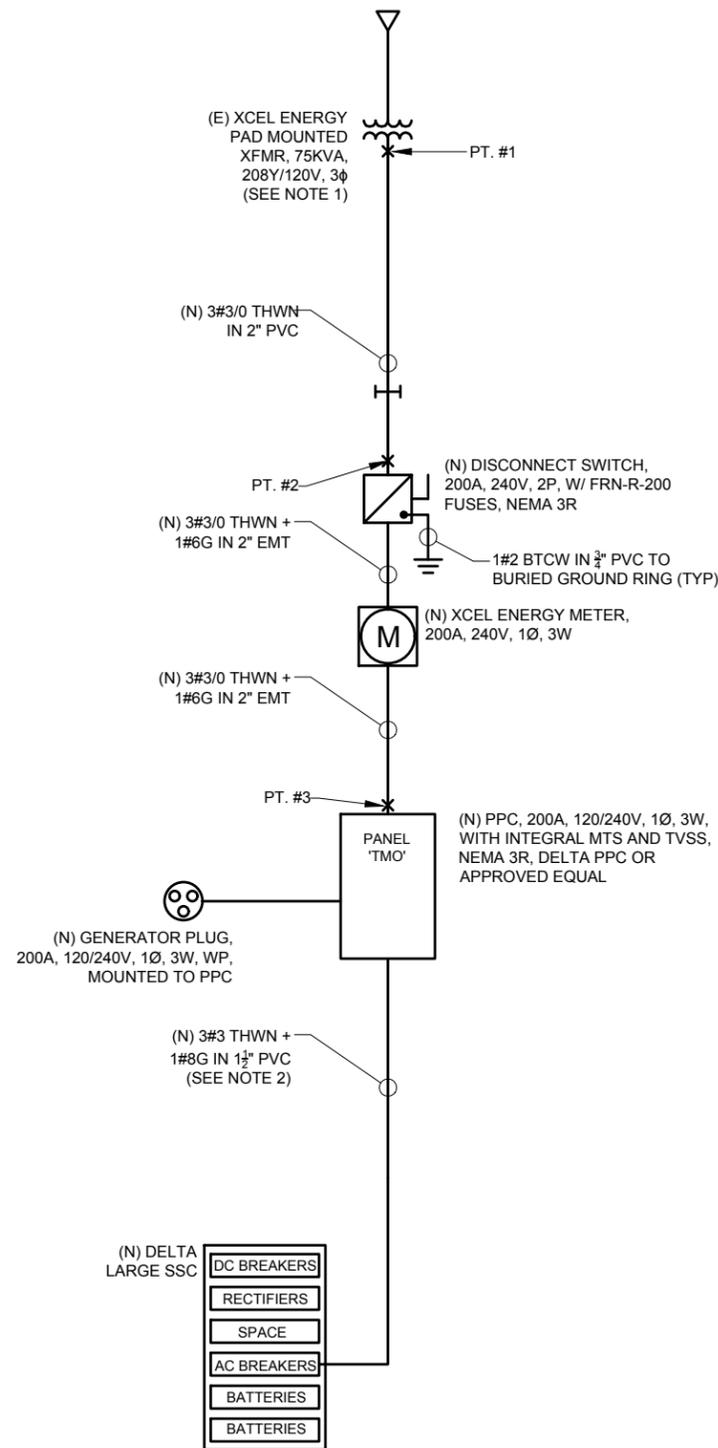
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YK/JR	AD	PK

Sheet Title:  
**ELECTRICAL  
EQUIPMENT PLAN**

Sheet Number:  
**E2.2**





**NOTES:**

1. FINAL TRANSFORMER LOCATION AND SIZING PER XCEL ENERGY. IF A LARGER TRANSFORMER IS INSTALLED, CONTRACTOR SHALL RE-EVALUATE SECONDARY FAULT CURRENT AS NECESSARY.
2. CONDUIT SUBJECT TO FOOT TRAFFIC SHALL BE GRC. FINAL RUN TO CABINET SHALL BE LTFC.
3. ACTUAL VALUES FOR FAULT CURRENT SHOWN IN DETAIL 2.

SHORT CIRCUIT CALCULATIONS BASED UPON POINT METHOD AS ILLUSTRATED IN BUSSMAN PUBLICATION SPD-90. FAULT VALUES SHOWN ARE FOR LINE-TO-LINE FAULT @ 208 VAC

FAULT CURRENT AT TRANSFORMER SECONDARY PER XCEL ENERGY

$$I_{sc1} = \frac{V_{P-UT}/V_{S-UT} \times M_{UT} \times I_{SCP-UT}}{1} = \frac{2 \times 93 \times 13000}{1} = 13000 \text{ A}$$

$$f_1 = \frac{2 \times L \times I_{SC(L-L)}}{C_1 \times \pi \times V_{L-L}} = \frac{2 \times 93 \times 13000}{13923 \times 1 \times 208} = 0.8349$$

$$M_1 = \frac{1}{1 + f_1} = \frac{1}{1 + 0.8349} = 0.5450$$

FAULT CURRENT AT DISCONNECT

$$I_{sc2} = \frac{M_1 \times I_{sc1}}{1} = \frac{0.545 \times 13000}{1} = 7085 \text{ A}$$

$$f_2 = \frac{2 \times L \times I_{SC(L-L)}}{C_2 \times \pi \times V_{L-L}} = \frac{2 \times 3 \times 7085}{12844 \times 1 \times 208} = 0.0159$$

$$M_2 = \frac{1}{1 + f_2} = \frac{1}{1 + 0.0159} = 0.9843$$

FAULT CURRENT AT PANEL 'TMO'

$$I_{sc3} = \frac{M_2 \times I_{sc2}}{1} = \frac{0.9843 \times 7085}{1} = 6974 \text{ A}$$

**2 FAULT CALCULATIONS**

SCALE: N.T.S.

**3 NOT USED**

SCALE: N.T.S.

**T-Mobile**

18400 EAST 22ND AVENUE  
AURORA, CO 80011

PROJECT INFORMATION:

SITE NAME:  
**FIRE STATION #29**

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Sheet Title:

**ONE-LINE DIAGRAM AND FAULT CALCULATIONS**

Sheet Number:

**E3**

**1 ONE-LINE DIAGRAM**

SCALE: N.T.S.

PROJECT INFORMATION:

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SITE ID:  
**DN03634A**

4800 HIMALAYA ROAD  
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YK/JR	AD	PK
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Sheet Title:

**PANEL SCHEDULE**

Sheet Number:

**E4**

PANEL NAME	TMO		ENCL. TYPE	NEMA 3R	NOTES:
VOLTAGE RATING	120/240	VAC	MOUNTING TYPE	SURFACE	
CONN. LINE VOLTAGE	240	VAC	LOCKABLE CABINET?	YES	
PHASE	1	WIRE 3	DOOR-IN-DOOR?	YES	
BUS TYPE	MAIN BREAKER		MFR.	DELTA	
BUS RATING	200	AMPS	MODEL	POWER PEDESTAL CAB	
MAIN BREAKER	200	AMPS	CAT. NO.	---	
BREAKER TYPE	PLUG-IN		SERIES OCPD REQUIRED?	NO	
INTERRUPTING RATING	65	KAIC	FUSE TYPE	NA	

LOAD	POS	CB	A	B	CB	POS	LOAD
GFCI RECEPTACLE	1	1P20	180	---	2P30	2	TVSS
LIGHTS	3	1P20	---	52	---	4	
BLANK	5		4690	---	2P100	6	DELTA SSC
BLANK	7		---	4510	---	8	
BLANK	9		---	---	---	10	BLANK
BLANK	11		---	---	---	12	BLANK
BLANK	13		---	---	---	14	BLANK
BLANK	15		---	---	---	16	BLANK
BLANK	17		---	---	---	18	BLANK
BLANK	19		---	---	---	20	BLANK
BLANK	21		---	---	---	22	BLANK
BLANK	23		---	---	---	24	BLANK
			4870	4562			

LOAD TYPE	CONN. LOAD		NEC D.F.	=	NEC LOAD	TOTAL LOAD
RECEPTACLES < 10 KVA	360	x	100%	=	360	9.4 KVA
RECEPTACLES > 10 KVA	---	x	50%	=	---	19.7 %
LIGHTING	52	x	125%	=	65	39.4 AMPS
LARGEST MOTOR	---	x	125%	=	---	
UNITARY HVAC EQUIPMENT	---	x	100%	=	---	
DC RECTIFIERS	8320	x	100%	=	8320	
OTHER	700	x	100%	=	700	
TOTAL	9432	VA			9445	VA

(SUBPANEL LOCATED IN SSC)

LOAD	POS	CB	A	B
MAIN (BOTTOM)	---	2P100	---	---
RECTIFIER #1 & #3	1	2P50	2080	---
	2		---	2080
RECTIFIER #2 & #4	3	2P50	2080	---
	4		---	2080
HEATER	5	2P10	350	---
	6		---	350
GFCI RECEPT.	7	1P15	180	---
			4690	4510

NOTES:

- CONTRACTOR SHALL MODIFY PANEL SCHEDULE TO SHOW ACTUAL EQUIPMENT LOADS ON REDLINED 'AS BUILT' CONSTRUCTION DRAWINGS.

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Sheet Title:  
**MISCELLANEOUS ELECTRICAL DETAILS**

Sheet Number:  
**E5**

1 NOT USED

SCALE: N.T.S.

2 NOT USED

SCALE: N.T.S.

4 NOT USED

SCALE: N.T.S.

5 NOT USED

SCALE: N.T.S.

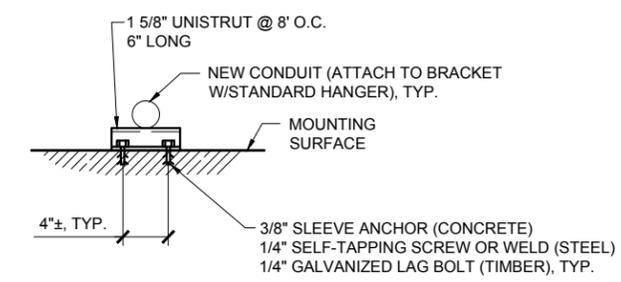
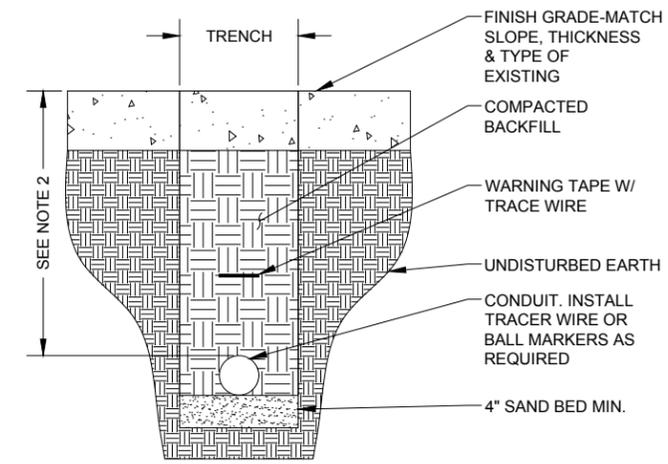
6 TYPICAL PLATFORM/PAD CONDUIT

SCALE: N.T.S.

7 NOT USED

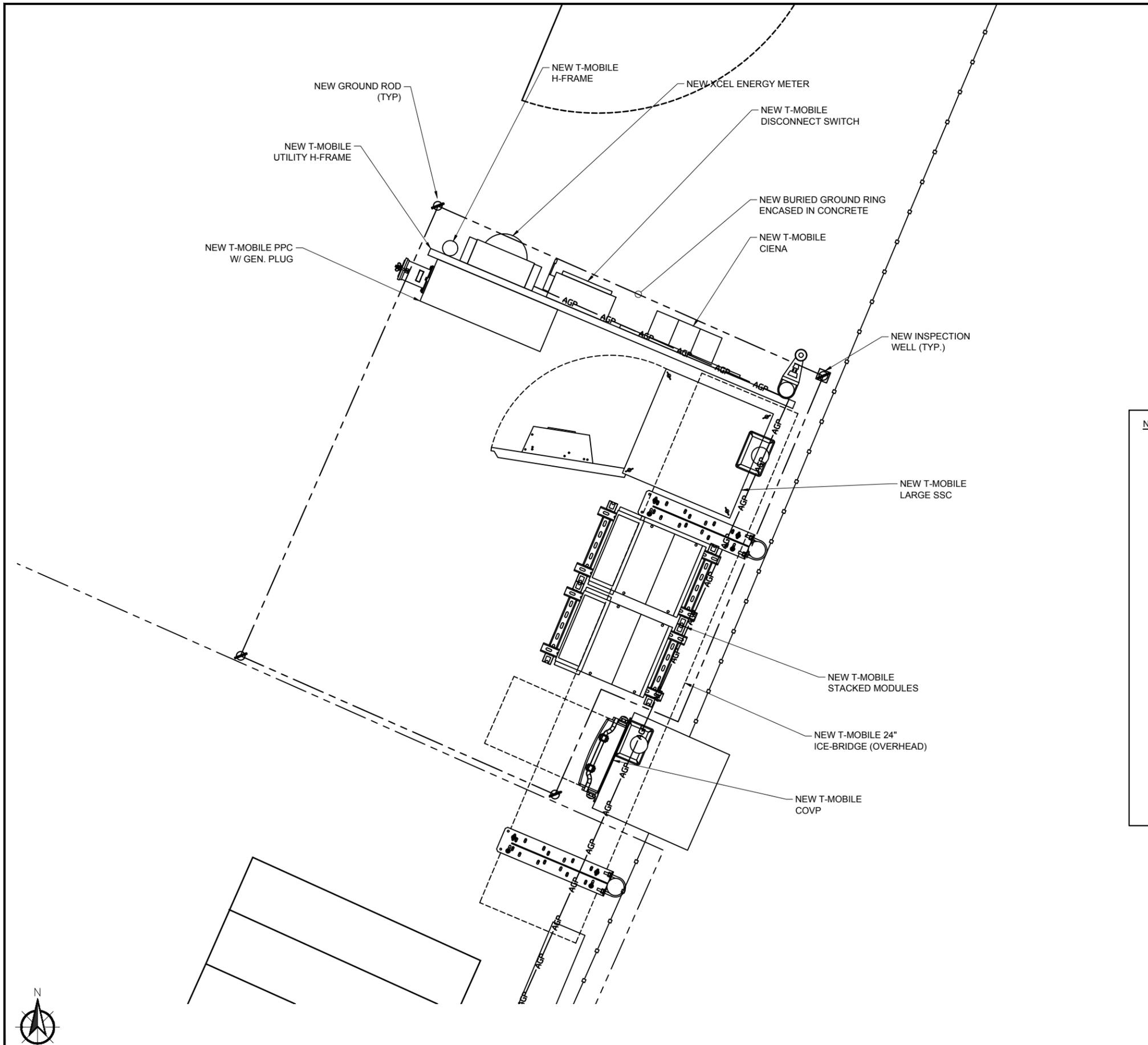
SCALE: N.T.S.

- NOTES:**
- LOCATE ALL UNDERGROUND UTILITIES PRIOR TO TRENCHING / EXCAVATION.
  - FOR LOCATIONS AHEAD OF METER, INSTALL ALL BURIED CONDUIT AT 24" MINIMUM DEPTH PER XCEL ENERGY; FOR LOCATIONS AFTER METER, INSTALL BURIED CONDUIT PER NEC ARTICLE 300.5.
  - COORDINATE SIZE AND TYPE OF CONDUIT WITH XCEL ENERGY REQUIREMENTS.
  - REFER TO ELECTRICAL PLAN & ONE-LINE DIAGRAM FOR SIZE AND LOCATION.
  - COMPACT BACKFILL TO 95% PROCTOR DENSITY AT ALL DRIVEWAY OR HARD SURFACED AREAS. COMPACT TO 90% PROCTOR DENSITY ALL OTHER AREAS UNLESS NOTED OTHERWISE, REFER TO GEOTECHNICAL REPORT.
  - BACKFILL AND SAND BED NOT REQUIRED WHEN BORING.
  - IF TRENCH IS SHARED WITH OTHER UTILITIES, MAINTAIN MINIMUM 12" HORIZONTAL SEPARATION. VERIFY WITH UTILITY PROVIDER BEFORE BACKFILLING.



3 DB ELECTRICAL CONDUIT IN PAVEMENT

SCALE: N.T.S.



### GROUNDING SYMBOLS

	EXOTHERMIC CONNECTION
	MECHANICAL CONNECTION
	BARE TINNED COPPER WIRE STUBBED UP IN PVC
	CHEMICAL ELECTROLYTIC GROUNDING SYSTEM
	TEST CHEMICAL ELECTROLYTIC GROUNDING SYSTEM
	EXOTHERMIC WITH INSPECTION SLEEVE
	GROUNDING BAR
	GROUND ROD
	TEST GROUND ROD WITH INSPECTION SLEEVE
	BURIED GROUND RING
	INSULATED STRANDED COPPER WIRE
	BARE TINNED COPPER WIRE
	BARE STRANDED COPPER WIRE

- NOTES:**
- ALL DETAILS ARE SHOWN IN GENERAL TERMS; ACTUAL GROUNDING INSTALLATION AND CONSTRUCTION MAY VARY DUE TO SITE SPECIFIC CONDITIONS.
  - NEW GROUNDING BARS SHOWN IN APPROXIMATE LOCATIONS, AND LARGER THAN ACTUAL SIZE FOR CLARITY.
  - BURIED GROUND CONDUCTORS SHALL BE #2 SOLID BTCW UNLESS NOTED OTHERWISE. ABOVE GROUND CONNECTIONS TO EQUIPMENT CABINETS SHALL BE #2 ISCW AND PROTECTED IN 1/2" PVC UNLESS NOTED OTHERWISE. WHERE NEW EQUIPMENT PADS ARE BEING POURED, CONTRACTOR SHALL CLAMP #2 BTCW TO REBAR AND STUB UP IN 1/2" PVC AND COIL FOR FUTURE CONNECTION TO GROUND RING AND/OR MGB. GROUND RINGS ARE TO BE INSTALLED A MINIMUM OF 2'-0" FROM PAD, TOWER OR FENCE (AS APPLICABLE). GROUND RODS SHALL BE 5/8"Ø X 8'-0", AND SHALL BE SPACED AT 10' O.C. MAXIMUM.
  - ALL EXTERIOR GROUNDING AND TOP OF GROUNDING RODS SHALL BE BURIED TO A MINIMUM DEPTH OF 3'-0" BELOW FINISH GRADE (ELECTRIC METER GROUND EXCEPTED).
  - GROUND SYSTEM MUST BE INDEPENDENTLY TESTED AND SHALL HAVE A RESISTANCE OF 5 OHMS OR LESS. SUBMIT AN INDEPENDENT FALL OF POTENTIAL TESTING REPORT.
  - NOTIFY PROJECT MANAGER IF THERE ARE ANY DIFFICULTIES INSTALLING GROUNDING SYSTEM DUE TO SITE SOIL CONDITIONS.
  - CHEMICAL GROUNDS SHALL BE XIT, CHEM-ROD OR APPROVED EQUAL, WHEN REQUIRED. BEFORE INSTALLING CHEMRODS, SECURE APPROVAL FROM PROJECT MANAGER.
  - ALL UNDERGROUND GROUNDING CONNECTORS ARE TO BE CADWELDED; ABOVE GRADE CONNECTIONS SHALL BE EITHER CADWELDED OR MECHANICAL AS SPECIFIED ON DRAWINGS.
  - ALL GROUNDING INSTALLATION TO BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS AND SUPPLEMENTS PROVIDED BY THE PROJECT MANAGER.
  - ALL EXTERIOR METAL BOXES (INCLUDING OVP, CIENA, ETC) SHALL BE GROUNDED WITH 2-HOLE LUG.

18400 EAST 22ND AVENUE  
AURORA, CO 80011

PROJECT INFORMATION:  
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SITE ID:  
**DN03634A**

4800 HIMALAYA ROAD  
DENVER, CO 80249  
DENVER COUNTY

Rev:	Date:	Description:	By:
1	02/19/16	PRELIM. CONST.	YK
2	04/05/16	CONSTRUCTION	JR
3	06/28/16	REVISED CONST.	JR
4	05/16/17	REVISED CONST.	JR
5	01/29/18	REVISED CONST.	CM

PLANS PREPARED BY:

16035 TABLE MOUNTAIN PARKWAY  
GOLDEN, CO 80403  
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LICENSURE NO:

ALL SCALES ARE SET FOR 24"x36" SHEET

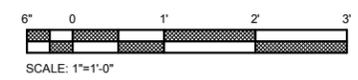
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Sheet Title:

## SITE GROUNDING PLAN

Sheet Number:

# G1.1



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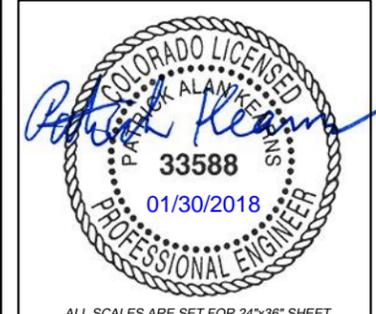
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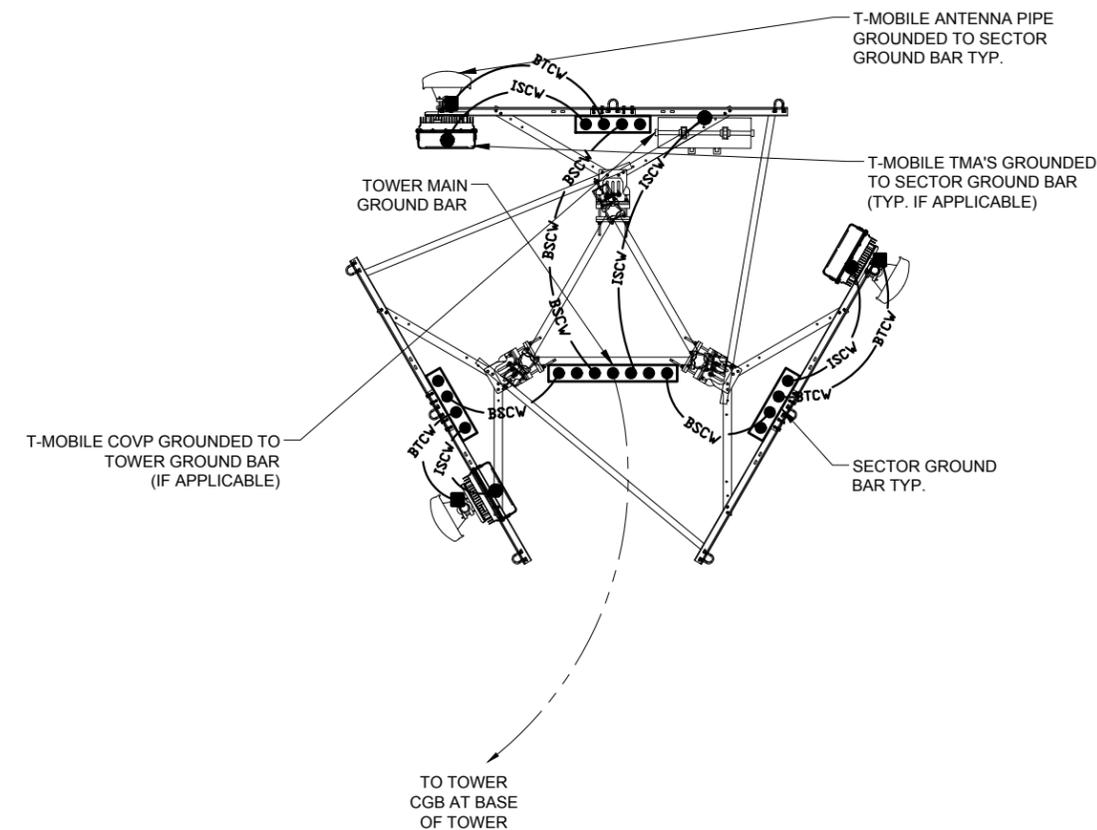
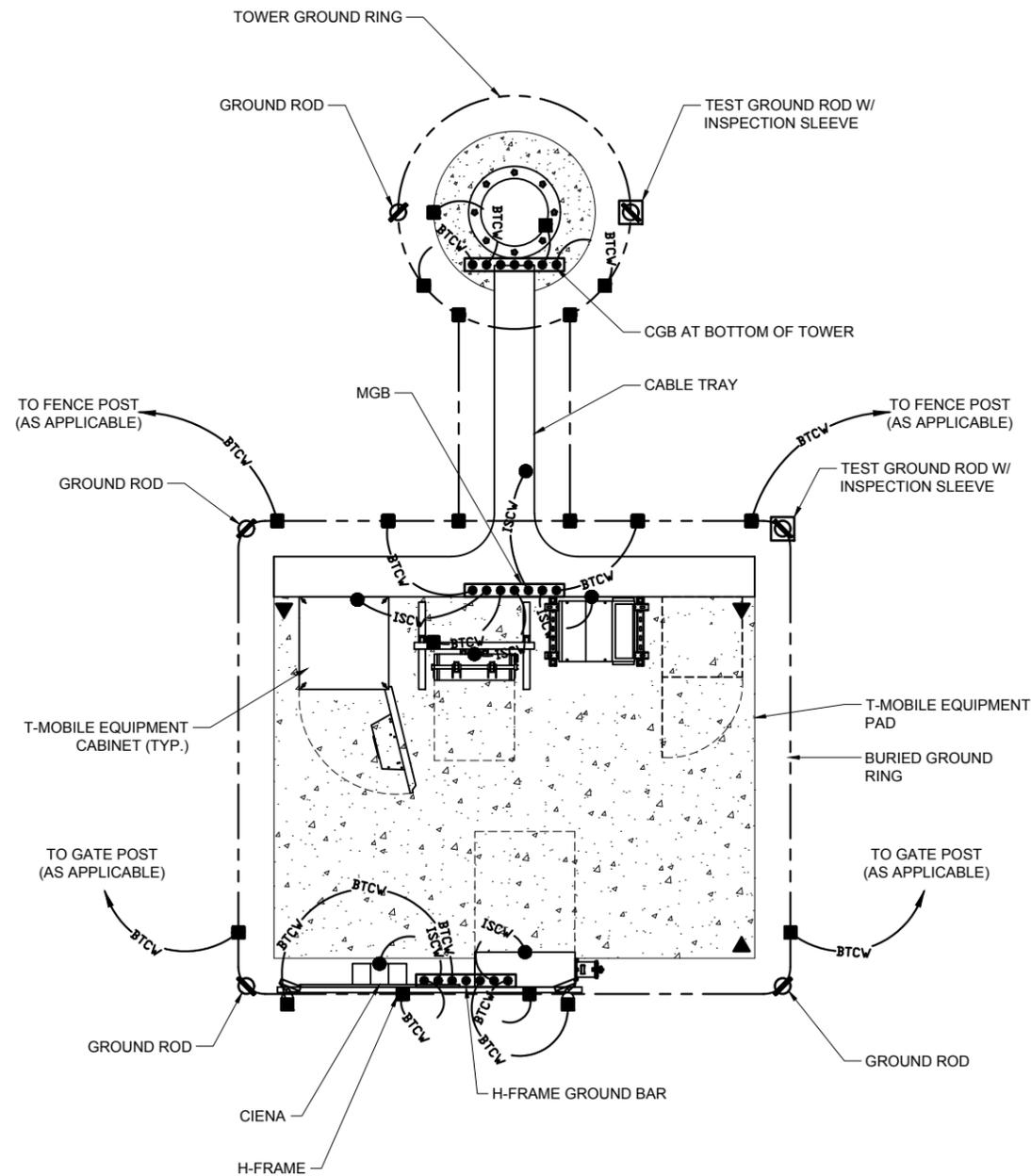
**EQUIPMENT AND  
ANTENNA  
GROUNDING PLANS**

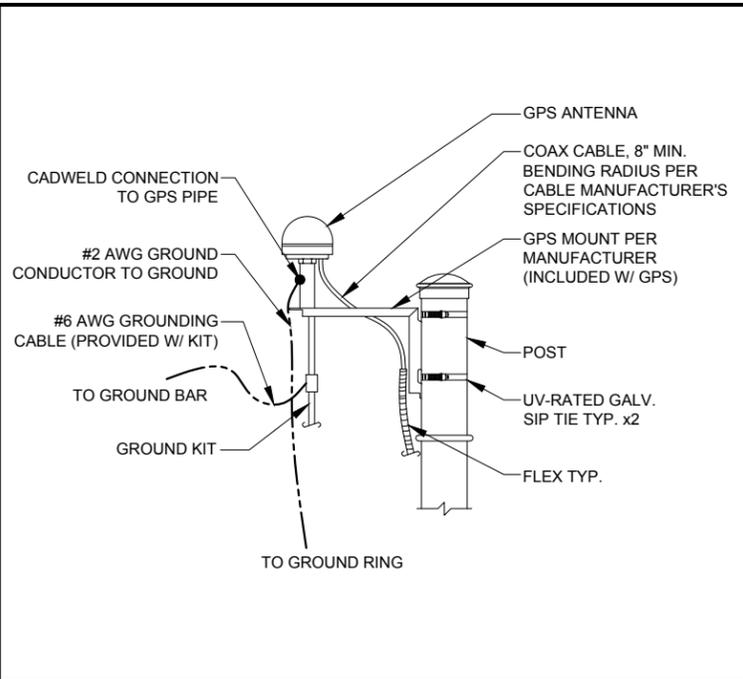
Sheet Number:

**G1.2**

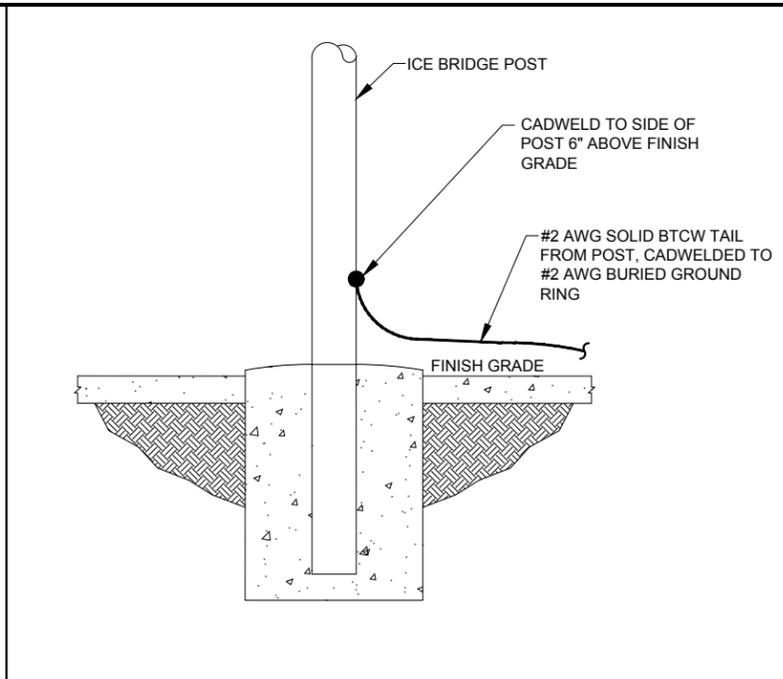
**GROUNDING SYMBOLS**

■	EXOTHERMIC CONNECTION
●	MECHANICAL CONNECTION
▲	BARE TINNED COPPER WIRE STUBBED UP IN PVC
⊙	CHEMICAL ELECTROLYTIC GROUNDING SYSTEM
⊙T	TEST CHEMICAL ELECTROLYTIC GROUNDING SYSTEM
⊠	EXOTHERMIC WITH INSPECTION SLEEVE
●●●●●	GROUNDING BAR
⊘	GROUND ROD
⊠	TEST GROUND ROD WITH INSPECTION SLEEVE
-----	BURIED GROUND RING
—ISCW—ISCW—	INSULATED STRANDED COPPER WIRE
—BTCW—BTCW—	BARE TINNED COPPER WIRE
—BSCW—BSCW—	BARE STRANDED COPPER WIRE

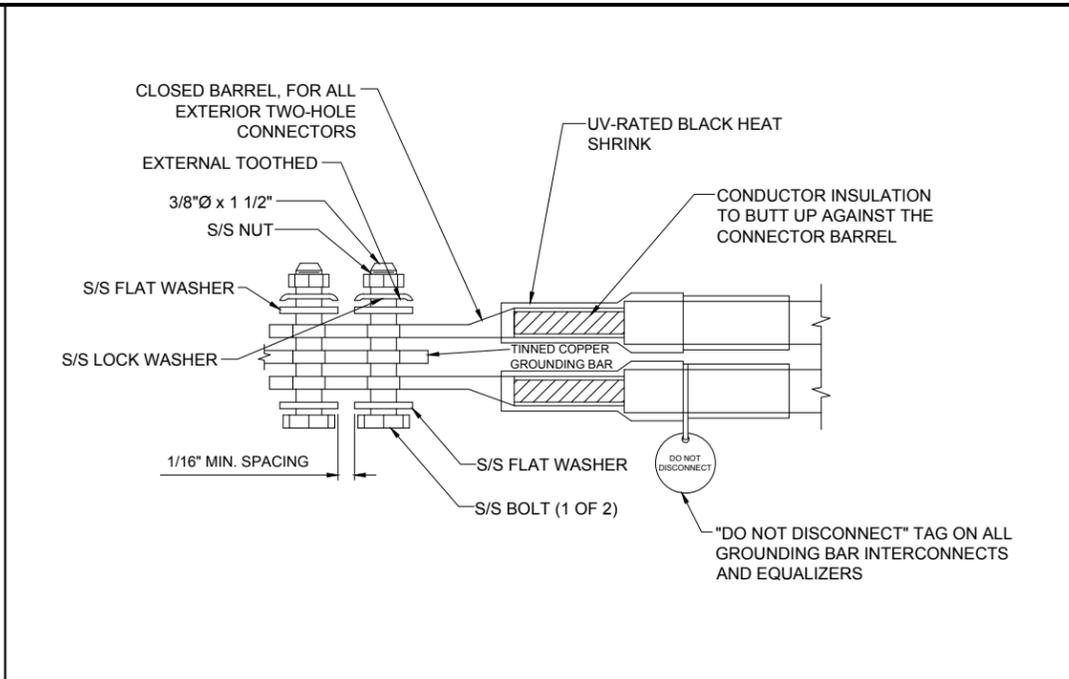




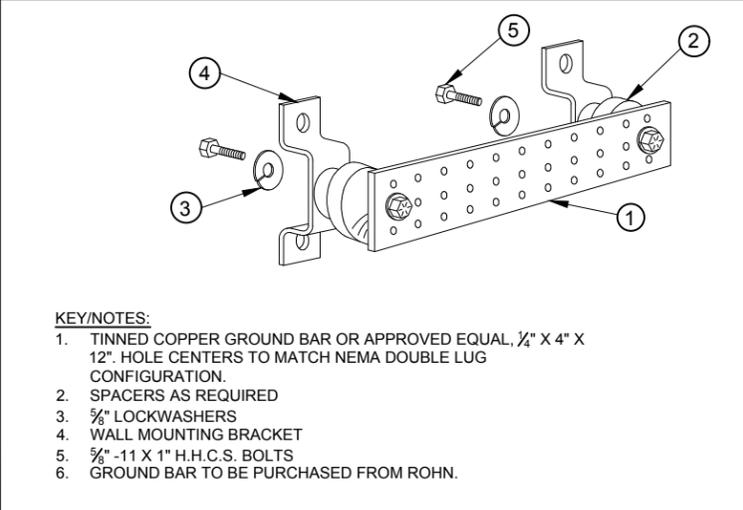
**1 TYPICAL GPS ANTENNA GROUNDING**  
SCALE: N.T.S.



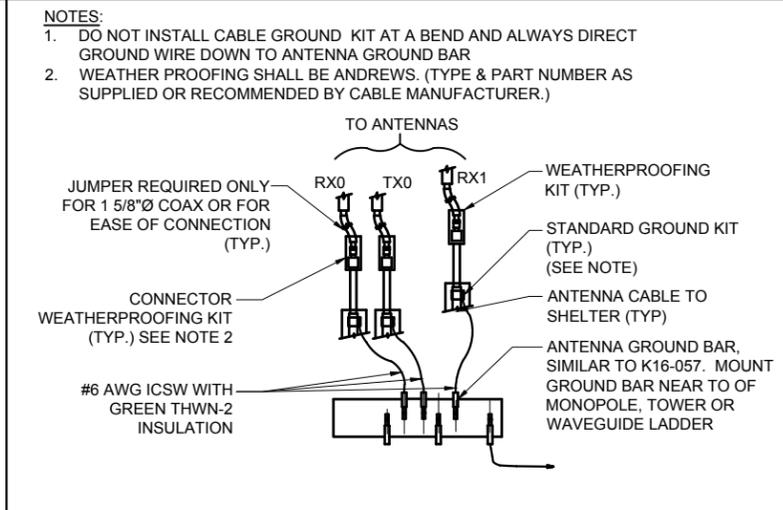
**2 ICE BRIDGE GROUNDING**  
SCALE: N.T.S.



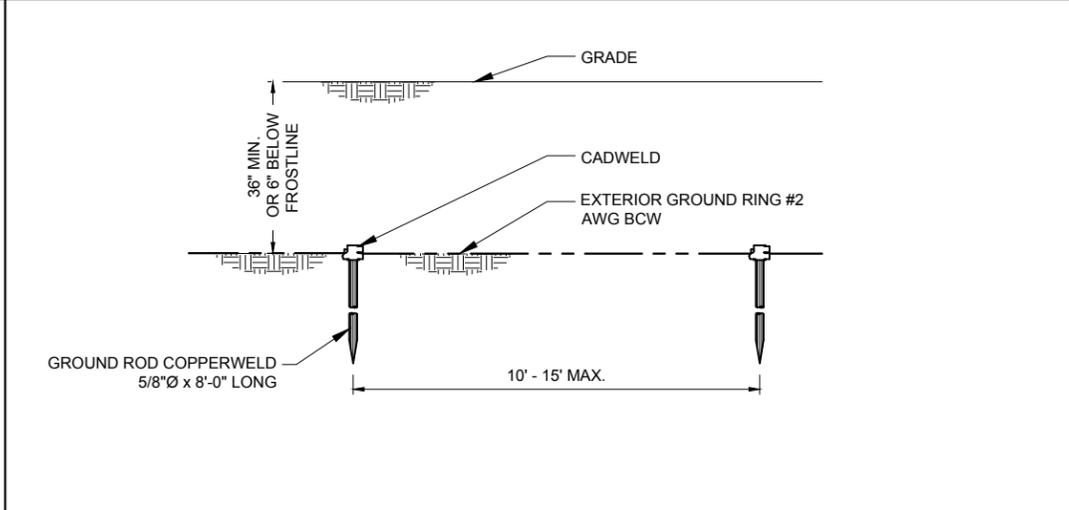
**3 EXTERIOR TWO HOLE LUG CONNECTION**  
SCALE: N.T.S.



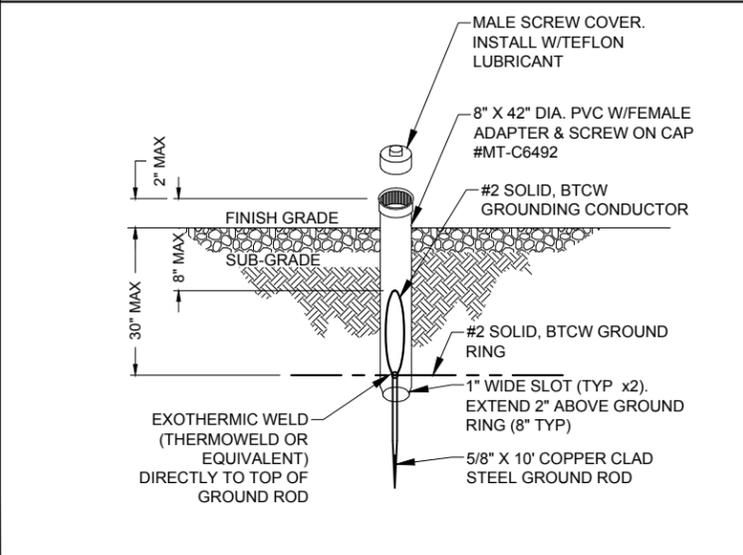
**4 TYPICAL GROUND BAR**  
SCALE: N.T.S.



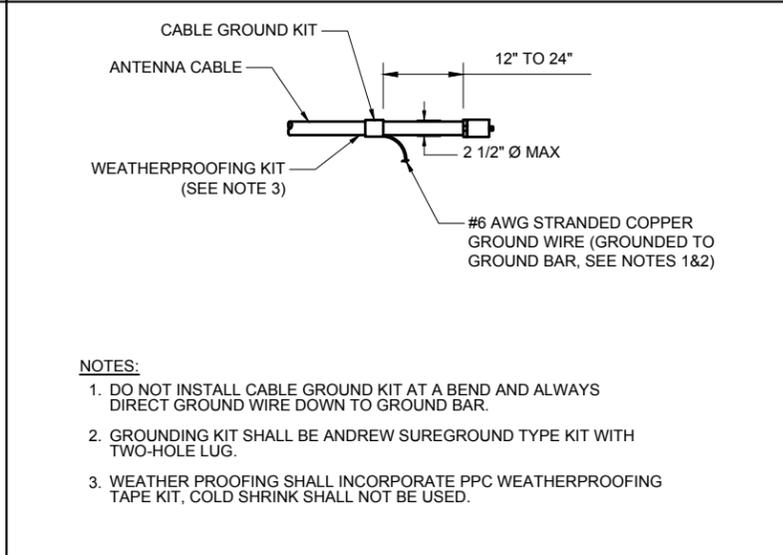
**5 TYPICAL GROUND WIRE TO GROUND BAR**  
SCALE: N.T.S.



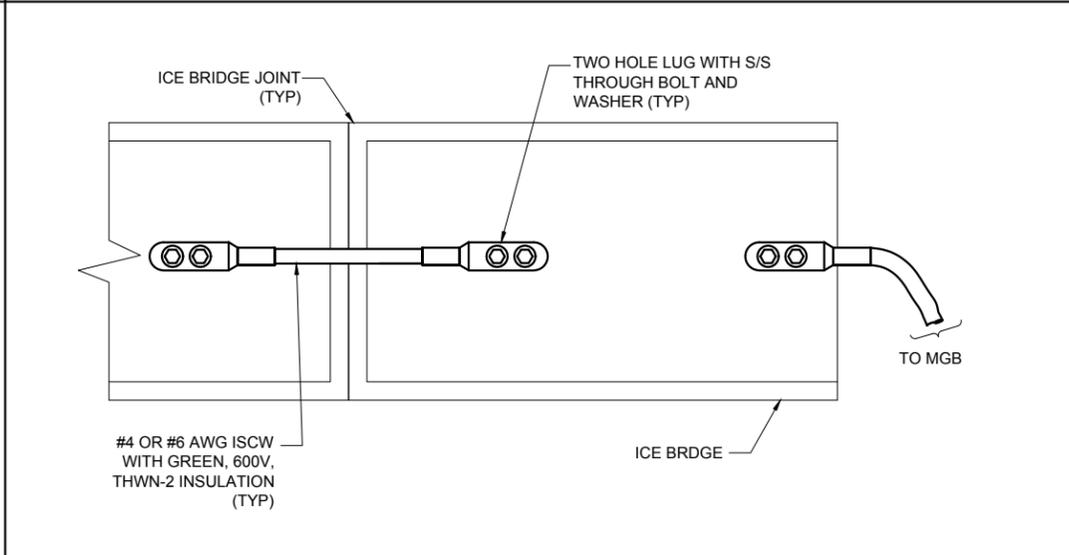
**6 TYPICAL BURIED GROUND ROD**  
SCALE: N.T.S.



**7 TYPICAL INSPECTION WELL**  
SCALE: N.T.S.



**8 TYPICAL CABLE GROUNDING**  
SCALE: N.T.S.



**9 CABLE TRAY GROUNDING**  
SCALE: N.T.S.

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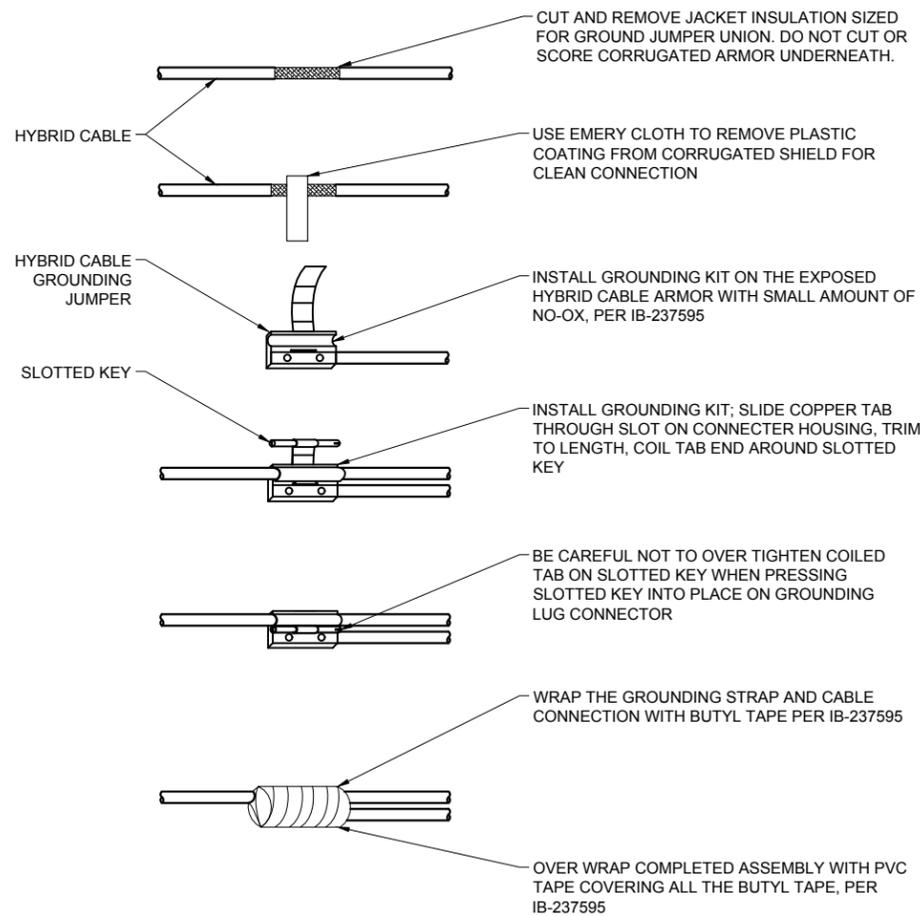
YK/JR	AD	PK
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Sheet Title:  
**GROUNDING DETAILS**

Sheet Number:  
**G2**

**GROUNDING KIT NOTES**

1. THE NUMBER OF GROUNING KITS REQUIRED IS DETERMINED BY THE LENGTH OF THE HYBRID TRUNK CABLE:
  - A. UP TO 125' REQUIRES 2 KITS; ONE TOP / ONE BOTTOM.
  - B. 150' TO 225' REQUIRES 3 KITS; ONE TOP / ONE BOTTOM / ONE MIDDLE.
  - C. 250' TO 325' REQUIRES 4 KITS; ONE TOP / ONE BOTTOM / TWO MIDDLE.
  - D. 350' TO 400' REQUIRES 5 KITS; ONE TOP / ONE BOTTOM / THREE MIDDLE.
  - E. 425' TO 500' REQUIRES 6 KITS; ONE TOP / ONE BOTTOM / FOUR MIDDLE.
2. MAKE THE FINAL GROUND JUMPER LUG ATTACHMENT TO THE GROUND BAR USING NO-OX AND STAINLESS STEEL HARDWARE.



1 | HYBRID CABLE GROUNDING KIT  
SCALE: N.T.S.

2 | NOT USED  
SCALE: N.T.S.

3 | NOT USED  
SCALE: N.T.S.

4 | NOT USED  
SCALE: N.T.S.



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Sheet Title:  
**GROUNDING DETAILS (CONT'D)**

Sheet Number:  
**G3**

**GENERAL CONSTRUCTION NOTES**

- THE FACILITY IS AN UNOCCUPIED WIRELESS FACILITY.
- PLANS ARE NOT TO BE SCALED AND ARE INTENDED TO BE A DIAGRAMMATIC OUTLINE ONLY, UNLESS NOTED OTHERWISE. THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
- PRIOR TO THE SUBMISSION OF BIDS, THE CONTRACTORS SHALL VISIT THE JOB SITE AND BE RESPONSIBLE FOR ALL CONTRACT DOCUMENTS, FIELD CONDITIONS AND DIMENSIONS, AND CONFIRMING THAT THE WORK MAY BE ACCOMPLISHED AS SHOWN PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES ARE TO BE BROUGHT TO THE ATTENTION OF THE IMPLEMENTATION ENGINEER AND ARCHITECT/ENGINEER PRIOR TO PROCEEDING WITH THE WORK.
- THE CONTRACTOR SHALL RECEIVE, IN WRITING, AUTHORIZATION TO PROCEED BEFORE STARTING WORK ON ANY ITEM NOT CLEARLY DEFINED OR IDENTIFIED BY THE CONTRACT DOCUMENTS.
- CONTRACTOR SHALL CONTACT LOCAL DIGGERS HOTLINE 48 HOURS PRIOR TO PROCEEDING WITH ANY EXCAVATION, SITE WORK OR CONSTRUCTION.
- THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY INDICATED OTHERWISE OR WHERE LOCAL CODES OR REGULATIONS TAKE PRECEDENCE.
- ALL WORK PERFORMED AND MATERIALS INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. CONTRACTOR SHALL GIVE ALL NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. MECHANICAL AND ELECTRICAL SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS, AND LOCAL AND STATE JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
- THE GENERAL CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK, USING THE BEST SKILLS AND ATTENTION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT INCLUDING CONTACT AND COORDINATION WITH THE CONSTRUCTION FIELD ENGINEER AND WITH THE LANDLORD'S AUTHORIZED REPRESENTATIVE.
- DETAILS ARE INTENDED TO SHOW END RESULT OF DESIGN. MINOR MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS, AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK.
- REPRESENTATIONS OF TRUE NORTH, OTHER THAN THOSE FOUND ON THE PLOT OF SURVEY DRAWING, SHALL NOT BE USED TO IDENTIFY OR ESTABLISH THE BEARING OF TRUE NORTH AT THE SITE. THE CONTRACTOR SHALL RELY SOLELY ON THE PLOT OF SURVEY DRAWING AND ANY SURVEYOR'S MARKINGS AT THE SITE FOR THE ESTABLISHMENT OF TRUE NORTH, AND SHALL NOTIFY THE ARCHITECT/ENGINEER PRIOR TO PROCEEDING WITH THE WORK IF ANY DISCREPANCY IS FOUND BETWEEN THE VARIOUS ELEMENTS OF THE WORKING DRAWINGS AND THE TRUE NORTH ORIENTATION AS DEPICTED ON THE PLAT OF SURVEY. THE CONTRACTOR SHALL ASSUME SOLE LIABILITY FOR ANY FAILURE TO NOTIFY THE ARCHITECT/ENGINEER.

**STRUCTURAL NOTES**

- 1.0 GENERAL CONDITIONS
- DESIGN AND CONSTRUCTION OF ALL WORK SHALL CONFORM TO THE APPROVED EDITION OF THE IBC EDITION AND ALL OTHER APPLICABLE STATE CODES, ORDINANCES, AND REGULATIONS, IN CASE OF CONFLICT BETWEEN THE CODES, STANDARDS, AND REGULATIONS. SPECIFICATIONS, GENERAL NOTES AND/OR MANUFACTURER'S REQUIREMENTS. USE THE MOST STRINGENT PROVISION.
  - IT IS THE EXPRESS INTENT OF THE PARTIES INVOLVED IN THIS PROJECT THAT THE CONTRACTOR OR SUBCONTRACTOR OR INDEPENDENT CONTRACTOR OR THEIR RESPECTIVE EMPLOYEES SHALL EXCULPATE THE ARCHITECT, THE ENGINEER, THE CONSTRUCTION MANAGER, THE OWNER, AND THEIR AGENTS, FROM ANY LIABILITY WHATSOEVER AND HOLD THEM HARMLESS AGAINST LOSS, DAMAGES, LIABILITY OR ANY EXPENSE ARISING IN ANY MATTER FROM THE WRONGFUL OR NEGLIGENT ACT, OR FAILURE TO CARRY OUT THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, OR THE CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES OR PROCEDURES OR FAILURE TO CONFORM TO THE STATE SCAFFOLDING ACT IN CONNECTION WITH THE WORK.
  - DO NOT SCALE DRAWINGS.
  - VERIFY ALL EQUIPMENT MOUNTING DIMENSIONS PER MANUFACTURER DRAWINGS.
  - SUBMIT ONE SEPIA AND TWO PRINTS OF ALL STRUCTURAL SHOP DRAWINGS. MARKED UP SEPIA SHALL BE RETURNED.

**STRUCTURAL STEEL NOTES:**

- CHANNELS, ANGLES AND PLATES SHALL BE ASTM A36 MATERIAL, UNLESS NOTED OTHERWISE.
- SQUARE AND RECTANGULAR TUBE STEEL HSS SECTIONS SHALL BE ASTM A500 (Fy = 46 ksi) MATERIAL.
- ROUND PIPE SECTIONS SHALL BE ASTM A53, GRADE B (Fy =35 ksi) MATERIAL.
- DESIGN, FABRICATION, AND ERECTION SHALL BE IN ACCORDANCE WITH THE "AISC SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS", WITH COMMENTARY AND THE "CODE OF STANDARD PRACTICE".
- ALL STEEL SHALL HAVE ONE COAT OF SHOP PRIMER. DO NOT PAINT AREAS WITHIN 3" OF BOLTS, WELDS OR HEADED STUDS.
- BOLTS SHALL BE HIGH STRENGTH BOLTS, A325, CONFORMING TO ASTM SPECIFICATIONS. ALL CONNECTIONS SHALL HAVE A MINIMUM OF 2 BOLTS.
- WELDING SHALL BE CONDUCTED BY CERTIFIED WELDERS AND SHALL CONFORM TO THE AWS CODES FOR ARC AND GAS WELDING IN BUILDING CONSTRUCTION.
- WELDS SHALL BE MADE USING E70XX ELECTRODES AND SHALL BE 3/16" MINIMUM UNLESS OTHERWISE NOTED.
- WELDING SHALL BE PERFORMED IN ACCORDANCE WITH A WELDED PROCEDURE SPECIFICATION (WPS) AS PER AWS D1.1, D1.3 AND D1.4.
- ONLY PRE-QUALIFIED WELDING PROCEDURES SHALL BE USED.
- UNLESS SPECIFICALLY ADDRESSED IN THE SPECIFICATIONS OR THE DETAILS, ALL STEEL ITEMS PERMANENTLY EXPOSED TO EARTH OR WEATHER SHALL BE CORROSION-RESISTANT BY GALVANIZING OR BY THE USE OF STAINLESS STEEL.
- ALL FIELD WELDS ON GALVANIZED MATERIAL SHALL BE BRUSH-COATED WITH A ZINC-RICH PAINT.

**FRP Notes:**

- ALL FRP MATERIAL SHALL BE EXTREN SERIES 500 OR EQUIVALENT, PRODUCED BY THE PULTRUSION METHOD.
- ALL ADHESIVE RESIN SHALL BE PLEXUS METHACRYLATE OR AN EQUIVALENT ADHESIVE RESIN THAT IS COMPATIBLE WITH THE RESIN MATRIX USED IN THE STRUCTURAL SHAPES.
- ALL FRP CONNECTIONS SHALL BE FULLY-BONDED AT EACH SIDE WITH A 1/4" PLATE AND A

- MINIMUM OF (2) 3/8" DIAMETER FLATHEAD FRP SCREWS PER MEMBER.
- ISOPLAST NUTS AND BOLTS SHALL BE TIGHTENED TO A SNUG-TIGHT FIT PLUS AN ADDITIONAL 1/2 TURN, PRIOR TO BEING LOCKED WITH EPOXY.
- ALL PANELS / SHEATHING SHALL BE FULLY BONDED WITH 3/8" FLATHEAD FRP SCREWS AT 12" O.C.
- ALL FIELD CUT AND DRILLED EDGES, HOLES AND ABRASIONS SHALL BE SEALED WITH A CATALYZED EPOXY RESIN COMPATIBLE WITH THE MANUFACTURER'S ORIGINAL RESIN.

**3.0 STANDARDS FOR ALL CONCRETE WORK**

- ALL CONCRETE WORK SHALL CONFORM WITH ACI 318 OR LATEST. DETAIL REINFORCING IN CONFORMANCE WITH ACI SP66 LATEST.
- NO SPLICES OF REINFORCEMENT SHALL BE MADE EXCEPT AS DETAILED OR AUTHORIZED BY THE STRUCTURAL ENGINEER. LAP SPLICES WHERE PERMITTED SHALL BE A MINIMUM OF 30 BAR DIAMETERS.
- PROVIDE ALL ACCESSORIES NECESSARY TO SUPPORT REINFORCING AT POSITIONS SHOW ON DRAWINGS.
- WIRE FABRIC REINFORCEMENT MUST LAP ONE FULL MESH AT SIDE AND END LAPS SHALL BE TIED TOGETHER.
- CURE AFTER FINISHING CONCRETE. KEEP MOIST FOR 7 DAYS AFTER POURING.
- COMPACT STRUCTURAL FILL 95% PROCTOR DENSITY PRIOR TO PLACING CONCRETE UNDER SLABS.
- 1/4" CHAMFER ON ALL CORNERS AND EDGES.
- ALL CONCRETE SHALL BE PORTLAND, TYPE 1 CEMENT WITH A MINIMUM OF 28 DAY STRENGTH OF 3000 PSI., 4" SLUMP AND A MINIMUM AIR ENTRAPMENT OF 4%.
- ALL REINFORCING STEEL SHALL BE GRADE 60. ALL REINFORCING MESH SHALL CONFORM TO ASTM A 185.

**ELECTRICAL NOTES**

- SUBMITTAL OF BID INDICATES CONTRACTOR IS COGNIZANT OF ALL JOB SITE CONDITIONS AND WORK TO BE PERFORMED UNDER THIS CONTRACT. CONTRACTOR IS RESPONSIBLE FOR ALL FIELD VERIFICATION.
- THESE PLANS ARE DIAGRAMMATIC ONLY, AND NOT TO BE SCALED.
- ELECTRICAL CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS, INSURANCE, EQUIPMENT, INSTALLATION, CONSTRUCTION TOOLS, TRANSPORTATION, ETC. FOR A COMPLETE AND PROPERLY OPERATIVE SYSTEM ENERGIZED THROUGHOUT AND AS INDICATED ON DRAWINGS, AS SPECIFIED HEREIN AND/OR AS OTHERWISE REQUIRED.
- ALL MATERIALS AND EQUIPMENT SHALL BE NEW AND IN PERFECT CONDITION WHEN INSTALLED AND SHALL BE OF THE BEST GRADE OR GROUP OF EQUIPMENT. MATERIALS SHALL BE LISTED AND APPROVED BY UNDER-WRITER'S LABORATORY AND SHALL BEAR THE INSPECTION LABEL "J" WHERE SUBJECT TO SUCH APPROVAL MATERIALS SHALL MEET WITH APPROVAL OF THE DIVISION OF INDUSTRIAL SAFETY AND ALL GOVERNING BODIES HAVING JURISDICTION. MATERIALS SHALL BE MANUFACTURED IN ACCORDANCE WITH APPLICABLE STANDARDS ESTABLISHED BY ANSI, NEMA AND NBFU.
- ALL CONDUIT INSTALLED SHALL BE SURFACE MOUNTED UNLESS OTHERWISE NOTED.
- ELECTRICAL CONTRACTOR SHALL CARRY OUT HIS WORK WITH ACCORDANCE WITH ALL GOVERNING STATE, COUNTY, LOCAL CODES AND O.S.H.A.
- ELECTRICAL CONTRACTOR SHALL SECURE ALL NECESSARY ELECTRICAL PERMITS, AND PAY ALL REQUIRED FEES.
- COMPLETE JOB SHALL BE GUARANTEED FOR A PERIOD OF NO LESS THAN ONE YEAR AFTER THE DATE OF JOB COMPLETION. ANY WORK, MATERIAL, OR EQUIPMENT FOUND TO BE FAULTY DURING THAT PERIOD SHALL BE CORRECTED AT ONCE, UPON WRITTEN NOTIFICATION, AT THE EXPENSE OF THE ELECTRICAL CONTRACTOR.
- ALL CONDUIT ONLY (C.O.) SHALL HAVE A PULL WIRE OR ROPE, AND TRUE TAPE.
- PROVIDE THE OWNER WITH ONE SET OF COMPLETE DIMENSIONS AND CIRCUITS, WITHIN 10 WORKING DAYS OF PROJECT COMPLETION. ELECTRICAL "AS BUILT" DRAWINGS, SHOWING ACTUAL LOCATION OF CONDUITS.
- ALL BROCHURES, OPERATING MANUALS, CATALOGS, SHOP DRAWINGS, ETC. SHALL BE TURNED OVER TO PROJECT MANAGER AT JOB COMPLETION.
- USE T-TAP CONNECTIONS ON ALL MULTI-CIRCUITS WITH COMMON NEUTRAL CONDUCTOR FOR LIGHTING FIXTURE. ALL CONDUCTORS SHALL BE COPPER.
- THE EXTERIOR GROUND RING SHALL BE TESTED PER CCI SPECIFICATIONS AND SHALL HAVE A RESISTANCE TO EARTH OF 5 OHMS OR LESS. IF NOT NOTIFY ENGINEER.
- ALL CIRCUIT BREAKERS, FUSES AND ELECTRICAL EQUIPMENT SHALL HAVE AN INTERRUPTING RATING NOT LESS THAN THE MAXIMUM SHORT-CIRCUIT CURRENT TO WHICH THEY MAY BE SUBJECTED, AND A MINIMUM OF 10,000 A.I.C.
- THE ENTIRE ELECTRICAL INSTALLATION SHALL BE GROUNDED AS REQUIRED BY ALL APPLICABLE CODES.
- PATCH, REPAIR, AND PAINT ANY AREA THAT HAS BEEN DAMAGED IN THE COURSE OF THE ELECTRICAL WORK.
- IN DRILLING HOLES INTO CONCRETE (WHETHER FOR FASTENING OR ANCHORING PURPOSES OR PENETRATIONS THROUGH THE FLOOR FOR CONDUIT RUNS, PIPE RUNS, ETC.) IT MUST BE CLEARLY UNDERSTOOD THAT TENDONS AND RE-BARS WILL NOT BE DRILLED INTO, CUT, OR DAMAGED UNDER ANY CIRCUMSTANCES.
- LOCATION OF TENDONS AN RE-BARS ARE NOT DEFINITELY KNOWN AND THEREFORE MUST BE SEARCHED FOR BY APPROPRIATE METHODS AND EQUIPMENT VIA X-RAY, OR OTHER DEVICES THAT CAN ACCURATELY LOCATE THE REINFORCING STEEL TENDONS.
- PENETRATIONS IN FIRE RATED WALLS SHALL BE FIRE STOPPED IN ACCORDANCE WITH APPLICABLE LOCAL BUILDING CODES. USING U.L. RATED MATERIALS.

- ELECTRICAL CONTRACTOR IS TO COORDINATE WITH UTILITY COMPANY FOR CONNECTION OF TEMPORARY AND PERMANENT POWER TO THE SITE. THE TEMPORARY POWER AND ALL HOOK-UP COSTS SHALL BE PAID BY THE CONTRACTOR.
- ELECTRICAL CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AND/OR CATALOG CUT-SHEETS ON ALL NON-SPECIFIED ORIGINAL MATERIALS AND EQUIPMENT, TO PROJECT MANAGER PRIOR TO COMMENCEMENT OF THE WORK.
- UPON COMPLETION OF WORK, CONDUCT CONTINUITY AND SHORT CIRCUIT, AS WELL AS, GROUNDING TEST, GROUNDING TEST SHALL BE PERFORMED BY INDEPENDENT TESTING AGENCY, WITH WRITTEN REPORT SUBMITTED TO THE PROJECT MANAGER FOR REVIEW AND APPROVAL.
- CLEAN PREMISES DAILY OF ALL DEBRIS RESULTING FROM WORK AND LEAVE WORK PREMISES IN A COMPLETE AND UNDAMAGED CONDITION.
- ALL EXTERIOR WALL PENETRATIONS SHALL BE SEALED WITH POLYSEAM SEALANT.
- ALL #2 TINNED BARE COPPER DOWNLEADS TO BE PROTECTED BY 1/2" P.V.C. PIPE AND SECURED.
- COMPRESSION FITTINGS TO BE USED ON ALL CONDUITS (NO SET SCREWS).
- ALL #6 STRANDED COPPER WITH GREEN INSULATION TO BE ATTACHED WITH CRIMPED DOUBLE LUG, ATTACHED WITH NUTS, BOLTS AND STAR WASHERS TYPICAL AND NO-OX GREASE BETWEEN LUG AND BUS BAR.
- ALL ABOVE GROUND CONDUIT SHALL BE RIGID GALVANIZED CONDUIT WITH WEATHERPROOF FITTINGS.

**GROUNDING**

- ALL METALLIC PARTS OF ELECTRICAL EQUIPMENT WHICH DO NOT CARRY CURRENT SHALL BE GROUNDED IN ACCORDANCE WITH THE REQUIREMENTS OF THE BUILDING MANUFACTURER, T-MOBILE GROUNDING AND BONDING STANDARDS, AND THE NATIONAL ELECTRICAL CODE.
- PROVIDE ELECTRICAL GROUNDING AND BONDING SYSTEM INDICATED WITH ASSEMBLY OF MATERIALS, INCLUDING GROUNDING ELECTRODES, BONDING JUMPERS AND ADDITIONAL ACCESSORIES AS REQUIRED FOR A COMPLETE INSTALLATION.
- ALL GROUNDING CONDUCTORS SHALL PROVIDE A STRAIGHT DOWNWARD PATH TO GROUND WITH GRADUAL BEND AS REQUIRED. GROUNDING CONDUCTORS SHALL NOT BE LOOPED OR SHARPLY BENT. ROUTE GROUNDING CONNECTIONS AND CONDUCTORS TO GROUND IN THE SHORTEST AND STRAIGHTEST PATHS POSSIBLE TO MINIMIZE TRANSIENT VOLTAGE RISES. BUILDINGS AND/OR NEW TOWERS GREATER THAN 75 FEET IN HEIGHT AND WHERE THE MAIN
- GROUNDING CONDUCTORS ARE REQUIRED TO BE ROUTED TO GRADE, THE CONTRACTOR SHALL ROUTE TWO GROUNDING CONDUCTORS FROM THE ROOFTOP, TOWERS, AND WATER TOWERS GROUND RING, TO THE EXISTING GROUNDING SYSTEM, THE GROUNDING CONDUCTORS SHALL NOT BE SMALLER THAN #2 AWG COPPER. ROOFTOP GROUND RING SHALL BE BONDED TO THE EXISTING GROUNDING SYSTEM, THE BUILDING STEEL COLUMNS, LIGHTNING PROTECTION SYSTEM, AND BUILDING MAIN WATER LINE (FERROUS OR NONFERROUS METAL PIPING ONLY).
- TIGHTEN GROUNDING AND BONDING CONNECTORS, INCLUDING SCREWS AND BOLTS, IN ACCORDANCE WITH MANUFACTURER'S PUBLISHED TORQUE TIGHTENING VALUES FOR CONNECTORS AND BOLTS. WHERE MANUFACTURER'S TORQUING REQUIREMENTS ARE NOT AVAILABLE, TIGHTEN CONNECTIONS TO COMPLY WITH TIGHTENING TORQUE VALUES SPECIFIED IN UL TO ASSURE PERMANENT AND EFFECTIVE GROUNDING. CONTRACTOR SHALL VERIFY THE LOCATIONS OF GROUNDING TIE-IN-POINTS TO THE EXISTING
- ALL UNDERGROUND GROUNDING CONNECTIONS SHALL BE MADE BY THE GROUNDING SYSTEM. EXOTHERMIC WELD PROCESS AND INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
- ALL GROUNDING CONNECTIONS SHALL BE INSPECTED FOR TIGHTNESS. EXOTHERMIC WELDED CONNECTIONS SHALL BE APPROVED BY THE INSPECTOR HAVING JURISDICTION BEFORE BEING PERMANENTLY CONCEALED.
- APPLY CORROSION-RESISTANCE FINISH TO FIELD CONNECTIONS AND PLACES WHERE FACTORY APPLIED PROTECTIVE COATINGS HAVE BEEN DESTROYED.
- A SEPARATE, CONTINUOUS, INSULATED EQUIPMENT GROUNDING CONDUCTOR SHALL BE INSTALLED IN ALL FEEDER AND BRANCH CIRCUITS.
- BOND ALL INSULATED GROUNDING BUSHINGS WITH A BARE 6 AWG GROUNDING CONDUCTOR TO A GROUND BUS.
- DIRECT BURIED GROUNDING CONDUCTORS SHALL BE INSTALLED AT A NOMINAL DEPTH OF 36" MINIMUM BELOW GRADE, OR 6" BELOW THE FROST LINE, USE THE GREATER OF THE TWO DISTANCES.
- ALL GROUNDING CONDUCTORS EMBEDDED IN OR PENETRATING CONCRETE SHALL BE INSTALLED IN SCHEDULE 40 PVC CONDUIT.
- THE INSTALLATION OF CHEMICAL ELECTROLYTIC GROUNDING SYSTEM IN STRICT ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. REMOVE SEALING TAPE FROM LEACHING AND BREATHER HOLES. INSTALL PROTECTIVE BOX FLUSH WITH GRADE.
- DRIVE GROUND RODS UNTIL TOPS ARE A MINIMUM DISTANCE OF 36" DEPTH OR 6" BELOW FROST LINE, USING THE GREATER OF THE TWO DISTANCES.
- IF COAX ON THE ICE BRIDGE IS MORE THAN 6 FT. FROM THE GROUND BAR AT THE BASE OF THE TOWER, A SECOND GROUND BAR WILL BE NEEDED AT THE END OF THE ICE BRIDGE, TO GROUND THE COAX CABLE GROUNDING KITS AND IN-LINE ARRESTORS
- CONTRACTOR SHALL REPAIR, AND/OR REPLACE, EXISTING GROUNDING SYSTEM COMPONENTS DAMAGED DURING CONSTRUCTION AT THE CONTRACTORS EXPENSE.



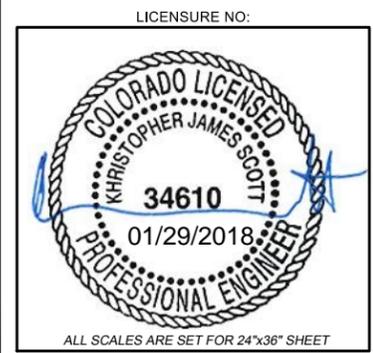
PROJECT INFORMATION:

SITE NAME:  
**DENVER FIRE #29**

SITE ID:  
**DN03634A**

4800 HIMALAYA ROAD  
DENVER, CO 80249  
DENVER COUNTY

Rev:	Date:	Description:	By:
1	2/18/16	PRELIM. CONST.	AD
2	3/11/16	CONSTRUCTION	AD
3	4/5/16	CONSTRUCTION	AD
4	7/1/16	REVISED CONST.	AD
5	05/16/17	REVISED CONST.	CM
6	01/29/18	REVISED CONST.	CM



DRAWN BY:    CHK BY:    APV BY:

AD	CM	RG
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Sheet Title:

**GENERAL NOTES**

Sheet Number:

**GN1**

# Exhibit C

## CO-LOCATION INTERFERENCE ANALYSIS REPORT

DN03634A

December 28, 2017

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**Prepared By:**  
Centerline Solutions  
4636 E Elwood St  
Phoenix, AZ  
(602) 892-5025  
Engineer: Wayne Neal



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## 1.0 Certification

This interference analysis, prepared by Centerline Solutions, LLC for T-Mobile, is intended to identify any potential sources of interference at the site between co-located carriers. The computations, analysis, and resulting report and conclusions were based on widely accepted methods and algorithms, which are implemented in the ComSitePro™ software. Additionally, Centerline Solutions, LLC certifies that the assumptions are valid and that the data used within Centerline Solutions' control are accurate, including information collected as part of Centerline Solutions' field surveys. Centerline Solutions, LLC does not however certify the accuracy or correctness of any data provided to Centerline Solutions, LLC for this analysis and report by T-Mobile or other third parties working on behalf of T-Mobile.

I certify that the attached interference report is correct to the best of my knowledge, and all calculations, assumptions and conclusions are based on generally acceptable engineering practices:



---

Patrick Kearns, P.E.  
Expires 10/31/19

**Report Prepared By: Wayne Neal, 12/28/17**  
**Report Approved By: Robert Meurer, 1/2/2018**

## 2.0 Executive Summary

This report presents a radio frequency interference (RFI) analysis which was performed on the DN03634A 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.

It should be noted that the scope of this analysis is to determine if the hand-held radios used by the Denver Fire Department at Station 29 will be impacted by T-Mobile's proposed equipment and carriers. As such, any predicted interference that is not created by T-Mobile will not be reported. For example, predicted interference between City of Denver carriers alone are outside of the scope of this report.

With that in mind, the addition of T-Mobile's equipment and carriers is not predicted to cause any interference.

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	N/A
Receiver Desensitization	N/A	Passed	No Interference was predicted	N/A
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

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

Analysis	Description
Receiver Performance	Receiver sensitivity threshold plus 6/12 dB margin
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 - 1000/Order
TX IM Bandwidth Multiplication	Yes
Tx/Rx Systems Excluded	None
Site File Name	T Mobile DN03634A.dta
Report File Name	T-Mo Test.docx
ComSitePro Software Version	8.1.18

### 3.0 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:** DN03634A  
**Owner:**  
**Site Description:** Self Support tower at Fire Station 29  
**Address:** 4800 Himalaya Rd., Denver, CO  
**Latitude:** 39:46:59.14N  
**Longitude:** 104:45:16.36W  
**Elevation:**  
**Notes:**

### 3.1 Communications Systems

System	Provider	Technology	Frequency Band
1	T-Mobile 700MHz	LTE	746 - 806 MHz - 700 MHz Band
2	T Mobile L2100	LTE	1710 - 2200 MHz - AWS
3	T Mobile L21 F1	LTE	1710 - 2200 MHz - AWS
4	T Mobile U21 F2	UMTS	1710 - 2200 MHz - AWS
5	T Mobile L19	LTE	1710 - 1990 MHz - PCS
6	Verizon 700 LTE	LTE	746 - 806 MHz - 700 MHz Band
7	Verizon 2100 LTE	LTE	1710 - 2200 MHz - AWS
8	VZW CDMA	W-CDMA	806 - 896 MHz - Land Mobile
9	Public Safety	FM Land Mobile	806 - 896 MHz - Land Mobile
10	RMRS	FM Land Mobile	806 - 896 MHz - Land Mobile
11	Data Radio	FM Land Mobile	806 - 896 MHz - Land Mobile
12	Conventional	FM Land Mobile	806 - 896 MHz - Land Mobile
13	Public Utilities	FM Land Mobile	806 - 896 MHz - Land Mobile
14	P25	FM Land Mobile	806 - 896 MHz - Land Mobile
15	DFD	FM Land Mobile	896 - 960 MHz - Land Mobile
16	DFD	FM Land Mobile	806 - 896 MHz - Land Mobile
17	DFD VocAlarm	FM Land Mobile	806 - 896 MHz - Land Mobile
18	DFD Hand Held Radios	FM Land Mobile	806 - 896 MHz - Land Mobile

### 3.2 Antenna Systems

Ant #	Mfg	Antenna Model	Gain (dBd)	Hgt (ft)	Orient (deg)	Sector	Ant Use	Transmission Line Type	Line Loss	Line Length (ft)
1	Nokia	FASB (RAS) (Penta)	13	67	100	A	Tx/Rx	7/8 in. Foam	0.2	15
2	Nokia	FASB (RAS) (Penta)	13	67	220	B	Tx/Rx	7/8 in. Foam	0.2	15
3	Nokia	FASB (RAS) (Penta)	13	67	340	C	Tx/Rx	7/8 in. Foam	0.2	15
4	Nokia	FASB (RAS) (Penta)	15	67	100	A	Tx/Rx	7/8 in. Foam	0.2	15
5	Nokia	FASB (RAS) (Penta)	15	67	220	B	Tx/Rx	7/8 in. Foam	0.2	15
6	Nokia	FASB (RAS) (Penta)	15	67	340	C	Tx/Rx	7/8 in. Foam	0.2	15
7	Nokia	FASB (RAS) (Penta)	15	67	100	A	Tx/Rx	7/8 in. Foam	0.2	15
8	Nokia	FASB (RAS) (Penta)	15	67	220	B	Tx/Rx	7/8 in. Foam	0.2	15
9	Nokia	FASB (RAS) (Penta)	15	67	340	C	Tx/Rx	7/8 in. Foam	0.5	15
10	Nokia	FASB (RAS) (Penta)	15	67	100	A	Tx/Rx	7/8 in. Foam	0.5	15
11	Nokia	FASB (RAS) (Penta)	15	67	220	B	Tx/Rx	7/8 in. Foam	0.5	15
12	Nokia	FASB (RAS) (Penta)	15	67	340	C	Tx/Rx	7/8 in. Foam	0.5	15
13	Nokia	FASB (RAS) (Penta)	15	67	100	A	Tx/Rx	7/8 in. Foam	0.5	15
14	Nokia	FASB (RAS) (Penta)	15	67	220	B	Tx/Rx	7/8 in. Foam	0.5	15
15	Nokia	FASB (RAS) (Penta)	15	67	340	C	Tx/Rx	7/8 in. Foam	0.5	15
16	Amphenol	HEX656CW0000G	13	77.5	0	A	Tx/Rx	7/8 in. Foam	1.16	107.5
17	Amphenol	HEX656CW0000G	13	77.5	120	B	Tx/Rx	7/8 in. Foam	1.16	107.5
18	Amphenol	HEX656CW0000G	13	77.5	240	C	Tx/Rx	7/8 in. Foam	1.16	107.5
19	Amphenol	HEX656CW0000G	15	77.5	0	A	Tx/Rx	7/8 in. Foam	1.5	107.5
20	Amphenol	HEX656CW0000G	15	77.5	120	B	Tx/Rx	7/8 in. Foam	1.5	107.5
21	Amphenol	HEX656CW0000G	15	77.5	240	C	Tx/Rx	7/8 in. Foam	1.5	107.5
22	Amphenol	LPA-80063/4CF	13	77.5	0	A	Tx/Rx	7/8 in. Foam	1.16	107.5
23	Amphenol	LPA-80063/4CF	13	77.5	120	B	Tx/Rx	7/8 in. Foam	1.16	107.5
24	Amphenol	LPA-80063/4CF	13	77.5	240	C	Tx/Rx	7/8 in. Foam	1.16	107.5
25	Amphenol	BXA-70063-4BF-EDIN-0-850	13	100	0		Tx/Rx	7/8 in. Foam	1.16	130
26	Amphenol	BXA-70063-4BF-EDIN-0-850	13	100	0		Tx/Rx	7/8 in. Foam	1.16	130
27	Amphenol	BXA-70063-4BF-EDIN-0-850	13	100	0		Tx/Rx	7/8 in. Foam	1.16	130
28	Amphenol	BXA-70063-4BF-EDIN-0-850	13	100	0		Tx/Rx	7/8 in. Foam	1.16	130
29	Amphenol	BXA-70063-4BF-EDIN-0-850	13	100	0		Tx/Rx	7/8 in. Foam	1.16	130
30	Amphenol	BXA-70063-4BF-EDIN-0-850	13	100	0		Tx/Rx	7/8 in. Foam	1.16	130
31	Amphenol	BXA-70063-4BF-EDIN-0-850	13	100	0		Dplx	7/8 in. Foam	1.16	130
32	Amphenol	BXA-70063-4BF-EDIN-0-850	13	100	0		Tx/Rx	7/8 in. Foam	1.16	130
33	Amphenol	BXA-70063-4BF-EDIN-0-850	13	100	0		Tx/Rx	7/8 in. Foam	1.16	130
34	Sinclair	SC473-HF1LDF_0869	0	4	0		Rx	7/8 in. Foam	0.01	0.01

## 4.0 Transmitter Frequencies

Freq #	Ant #	Provider	Model	Technology	Channel Label	ID	Frequency	Power (Watts)	BW (KHz)
1	1	T-Mobile 700MHz	Generic	FM Land Mobile	Tx Alpha	A	731.000000	80	10000
2	2	T-Mobile 700MHz	Generic	FM Land Mobile	Tx Beta	B	731.000000	80	10000
3	3	T-Mobile 700MHz	Generic	FM Land Mobile	Tx Gamma	C	731.000000	80	10000
4	4	T Mobile L2100	Generic	FM Land Mobile	Tx1 L21 Alpha	D	2115.000000	80	10000
5	5	T Mobile L2100	Generic	FM Land Mobile	Tx1 L21 Beta	E	2115.000000	80	10000
6	6	T Mobile L2100	Generic	FM Land Mobile	Tx1 L21 Gamma	F	2115.000000	80	10000
7	7	T Mobile L21 F1	Generic	FM Land Mobile	Tx L21 F1 Alpha	G	2147.500000	80	5000
8	8	T Mobile L21 F1	Generic	FM Land Mobile	Tx L21 F1 Beta	H	2147.500000	80	5000
9	9	T Mobile L21 F1	Generic	FM Land Mobile	Tx L21 F1 Gamma	I	2147.500000	80	5000
10	10	T Mobile U21 F2	Generic	FM Land Mobile	Tx U21 F2 Alpha	J	2152.500000	80	5000
11	11	T Mobile U21 F2	Generic	FM Land Mobile	Tx U21 F2 Beta	K	2152.500000	80	5000
12	12	T Mobile U21 F2	Generic	FM Land Mobile	Tx U21 F2 Gamma	L	2152.500000	80	5000
13	13	T Mobile L19	Generic	FM Land Mobile	Tx L19 Alpha	M	1975.500000	160	5000
14	14	T Mobile L19	Generic	FM Land Mobile	Tx L19 Beta	N	1975.500000	160	5000
15	15	T Mobile L19	Generic	FM Land Mobile	Tx L19 Gamma	O	1975.500000	160	5000
16	16	Verizon 700 LTE	Generic	FM Land Mobile	Tx VZW 700 Alpha	P	751.000000	80	10000
17	17	Verizon 700 LTE	Generic	FM Land Mobile	Tx VZW 700 Beta	Q	751.000000	80	10000
18	18	Verizon 700 LTE	Generic	FM Land Mobile	Tx VZW 700 Gamma	R	751.000000	80	10000
19	19	Verizon 2100 LTE	Generic	FM Land Mobile	Tx VZW Alpha	S	2120.000000	120	10000
20	20	Verizon 2100 LTE	Generic	FM Land Mobile	Tx VZW Beta	T	2120.000000	120	10000
21	21	Verizon 2100 LTE	Generic	FM Land Mobile	Tx VZW Gamma	U	2120.000000	120	10000
22	22	VZW CDMA	Generic	FM Land Mobile	384 Tx	V	881.520000	20	1230
23	22	VZW CDMA	Generic	FM Land Mobile	425 Tx	W	882.750000	20	1230
24	22	VZW CDMA	Generic	FM Land Mobile	466 Tx	X	883.980000	20	1230
25	23	VZW CDMA	Generic	FM Land Mobile	384 Tx	Y	881.520000	20	1230
26	24	VZW CDMA	Generic	FM Land Mobile	384 Tx	Z	881.520000	20	1230
27	23	VZW CDMA	Generic	FM Land Mobile	425 Tx	AA	882.650000	20	1230
28	24	VZW CDMA	Generic	FM Land Mobile	425 Tx	AB	882.650000	20	1230
29	23	VZW CDMA	Generic	FM Land Mobile	466 Tx	AC	883.980000	20	1230
30	24	VZW CDMA	Generic	FM Land Mobile	466 Tx	AD	883.980000	20	1230
31	25	Public Safety	Generic	FM Land Mobile	1	AE	854.9875	45	25
32	25	Public Safety	Generic	FM Land Mobile	2	AF	855.4875	45	25
33	25	Public Safety	Generic	FM Land Mobile	3	AG	855.9875	45	25
34	25	Public Safety	Generic	FM Land Mobile	4	AH	856.4875	45	25
35	25	Public Safety	Generic	FM Land Mobile	5	AI	857.2375	45	25
36	25	Public Safety	Generic	FM Land Mobile	6	AJ	857.7375	45	25
37	25	Public Safety	Generic	FM Land Mobile	7	AK	858.4875	45	25
38	25	Public Safety	Generic	FM Land Mobile	8	AL	859.2375	45	25
39	25	Public Safety	Generic	FM Land Mobile	9	AM	859.7375	45	25
40	25	Public Safety	Generic	FM Land Mobile	10	AN	854.4375	45	25
41	25	Public Safety	Generic	FM Land Mobile	11	AO	855.2375	45	25
42	25	Public Safety	Generic	FM Land Mobile	12	AP	855.7375	45	25

43	25	Public Safety	Generic	FM Land Mobile	13	AQ	856.2375	45	25
44	25	Public Safety	Generic	FM Land Mobile	14	AR	856.7375	45	25
45	25	Public Safety	Generic	FM Land Mobile	15	AS	857.4875	45	25
46	25	Public Safety	Generic	FM Land Mobile	16	AT	858.2375	45	25
47	25	Public Safety	Generic	FM Land Mobile	17	AU	858.7375	45	25
48	25	Public Safety	Generic	FM Land Mobile	18	AV	859.4875	45	25
49	25	Public Safety	Generic	FM Land Mobile	19	AW	854.0625	45	25
50	25	Public Safety	Generic	FM Land Mobile	20	AX	854.5625	45	25
51	26	RMRS	Generic	FM Land Mobile	1	AY	858.0875	45	25
52	26	RMRS	Generic	FM Land Mobile	2	AZ	858.3375	45	25
53	26	RMRS	Generic	FM Land Mobile	3	BA	859.0875	45	25
54	26	RMRS	Generic	FM Land Mobile	4	BB	859.6375	45	25
55	27	Data Radio	Generic	FM Land Mobile	MM	BC	855.9125	45	25
56	27	Data Radio	Generic	FM Land Mobile	STN 2	BD	856.7875	45	25
57	27	Data Radio	Generic	FM Land Mobile	STN 26	BE	855.6875	45	25
58	27	Data Radio	Generic	FM Land Mobile	STN 28	BF	851.1875	45	25
59	27	Data Radio	Generic	FM Land Mobile	DHA	BG	851.8875	45	25
60	27	Data Radio	Generic	FM Land Mobile	BRDWY	BH	854.2375	45	25
61	28	Conventional	Generic	FM Land Mobile	8CALL90	BI	851.0125	45	25
62	28	Conventional	Generic	FM Land Mobile	8TAC91	BJ	851.5125	45	25
63	28	Conventional	Generic	FM Land Mobile	8TAC92	BK	852.0125	45	25
64	28	Conventional	Generic	FM Land Mobile	8TAC93	BL	852.5125	45	25
65	28	Conventional	Generic	FM Land Mobile	8TAC94	BM	853.0125	45	25
66	28	Conventional	Generic	FM Land Mobile	STAC	BN	853.7875	45	25
67	28	Conventional	Generic	FM Land Mobile	(CONV) CLEER	BO	460.4250	45	25
68	28	Conventional	Generic	FM Land Mobile	VLAW31(NLEEC )	BP	155.4750	45	25
69	28	Conventional	Generic	FM Land Mobile	VMED28(HEAR)	BQ	155.3400	45	25
70	28	Conventional	Generic	FM Land Mobile	R.A.C.E.S.	BR	147.3000	45	25
71	28	Conventional	Generic	FM Land Mobile	METRO	BS	851.8875	45	25
72	29	Public Utilities	Generic	FM Land Mobile	1	BT	858.4625	45	25
73	29	Public Utilities	Generic	FM Land Mobile	2	BU	859.2125	45	25
74	29	Public Utilities	Generic	FM Land Mobile	3	BV	859.4625	45	25
75	29	Public Utilities	Generic	FM Land Mobile	4	BW	856.6375	45	25
76	29	Public Utilities	Generic	FM Land Mobile	5	BX	856.1375	45	25
77	29	Public Utilities	Generic	FM Land Mobile	6	BY	855.4625	45	25
78	29	Public Utilities	Generic	FM Land Mobile	7	BZ	856.2125	45	25
79	29	Public Utilities	Generic	FM Land Mobile	8	CA	856.7125	45	25
80	29	Public Utilities	Generic	FM Land Mobile	9	CB	857.4625	45	25
81	29	Public Utilities	Generic	FM Land Mobile	10	CC	858.2125	45	25
82	29	Public Utilities	Generic	FM Land Mobile	11	CD	859.7125	45	25
83	29	Public Utilities	Generic	FM Land Mobile	12	CE	859.2625	45	25
84	29	Public Utilities	Generic	FM Land Mobile	13	CF	859.7125	45	25
85	29	Public Utilities	Generic	FM Land Mobile	14	CG	854.5875	45	25
86	29	Public Utilities	Generic	FM Land Mobile	15	CH	857.1375	45	25
87	30	P25	Generic	FM Land Mobile	P25 1	CI	851.5625	45	25
88	30	P25	Generic	FM Land Mobile	P25 2	CJ	852.3750	45	25
89	30	P25	Generic	FM Land Mobile	P25 3	CK	852.7750	45	25
90	30	P25	Generic	FM Land Mobile	P25 4	CL	853.1500	45	25
91	30	P25	Generic	FM Land Mobile	P25 5	CM	853.2750	45	25
92	30	P25	Generic	FM Land Mobile	P25 6	CN	853.4250	45	25
93	30	P25	Generic	FM Land Mobile	P25 7	CO	853.7250	45	25
94	30	P25	Generic	FM Land Mobile	P25 8	CP	853.8625	45	25
95	30	P25	Generic	FM Land Mobile	P25 9	CQ	857.0625	45	25
96	30	P25	Generic	FM Land Mobile	P25 10	CR	858.1375	45	25
97	30	P25	Generic	FM Land Mobile	P25 11	CS	859.6125	45	25
98	30	P25	Generic	FM Land Mobile	P25 12	CT	852.1250	45	25
99	31	DFD	Generic	FM Land Mobile	Repeater1	CU	853.0875	45	25
100	31	DFD	Generic	FM Land Mobile	Repeater2	CV	852.8625	45	25
101	31	DFD	Generic	FM Land Mobile	Repeater3	CW	853.3250	45	25
102	32	DFD	Generic	FM Land Mobile	4	CX	859.5875	45	25
103	32	DFD	Generic	FM Land Mobile	5	CY	855.0625	45	25
104	32	DFD	Generic	FM Land Mobile	6	CZ	855.5375	45	25
105	33	DFD VocAlarm	Generic	FM Land Mobile	1	DA	928.75625	45	25
106	33	DFD VocAlarm	Generic	FM Land Mobile	2	DB	928.8375	45	25

## 5.0 Receiver Frequencies

Freq #	Ant #	Provider	Model	Technology	Channel Label	ID	Frequency	Sen (dBm)	BW (KHz)
1	1	T-Mobile 700MHz	Generic	FM Land Mobile	Rx Alpha	A	701.000000	-105	10000
2	2	T-Mobile 700MHz	Generic	FM Land Mobile	Rx Beta	B	701.000000	-105	10000
3	3	T-Mobile 700MHz	Generic	FM Land Mobile	Rx Gamma	C	701.000000	-105	10000
4	4	T Mobile L2100	Generic	FM Land Mobile	Rx1 L21 Alpha	D	1715.000000	-105	10000
5	5	T Mobile L2100	Generic	FM Land Mobile	Rx1 L21 Beta	E	1715.000000	-105	10000
6	6	T Mobile L2100	Generic	FM Land Mobile	Rx1 L21 Gamma	F	1715.000000	-105	10000
7	7	T Mobile L21 F1	Generic	FM Land Mobile	Rx L21 F1 Alpha	G	1747.500000	-105	5000
8	8	T Mobile L21 F1	Generic	FM Land Mobile	Rx L21 F1 Beta	H	1747.500000	-105	5000
9	9	T Mobile L21 F1	Generic	FM Land Mobile	Rx L21 F1 Gamma	I	1747.500000	-105	5000
10	10	T Mobile U21 F2	Generic	FM Land Mobile	Rx U21 F2 Alpha	J	1752.500000	-105	5000
11	11	T Mobile U21 F2	Generic	FM Land Mobile	Rx U21 F2 Beta	K	1752.500000	-105	5000
12	12	T Mobile U21 F2	Generic	FM Land Mobile	Rx U21 F2 Gamma	L	1752.500000	-105	5000
13	13	T Mobile L19	Generic	FM Land Mobile	Rx L19 Alpha	M	1877.500000	-109	5000
14	14	T Mobile L19	Generic	FM Land Mobile	Rx L19 Beta	N	1877.500000	-109	5000
15	15	T Mobile L19	Generic	FM Land Mobile	Rx L19 Gamma	O	1877.500000	-109	5000
16	16	Verizon 700 LTE	Generic	FM Land Mobile	Rx VZW 700 Alpha	P	782.000000	-105	10000
17	17	Verizon 700 LTE	Generic	FM Land Mobile	Rx VZW 700 Beta	Q	782.000000	-105	10000
18	18	Verizon 700 LTE	Generic	FM Land Mobile	Rx VZW 700 Gamma	R	782.000000	-105	10000
19	19	Verizon 2100 LTE	Generic	FM Land Mobile	Rx VZW Alpha	S	1720.000000	-105	10000
20	20	Verizon 2100 LTE	Generic	FM Land Mobile	Rx VZW Beta	T	1720.000000	-105	10000
21	21	Verizon 2100 LTE	Generic	FM Land Mobile	Rx VZW Gamma	U	1720.000000	-105	10000
22	22	VZW CDMA	Generic	FM Land Mobile	384 Rx	V	863.520000	-116	1230
23	22	VZW CDMA	Generic	FM Land Mobile	425 Rx	W	864.750000	-116	1230
24	22	VZW CDMA	Generic	FM Land Mobile	466 Rx	X	865.980000	-116	1230
25	23	VZW CDMA	Generic	FM Land Mobile	384 Rx	Y	863.520000	-116	1230
26	23	VZW CDMA	Generic	FM Land Mobile	425 Rx	Z	864.750000	-116	1230
27	23	VZW CDMA	Generic	FM Land Mobile	466 Rx	AA	865.980000	-116	1230
28	24	VZW CDMA	Generic	FM Land Mobile	384 Rx	AB	863.520000	-116	1230
29	24	VZW CDMA	Generic	FM Land Mobile	425 Rx	AC	864.750000	-116	1230
30	24	VZW CDMA	Generic	FM Land Mobile	466 Rx	AD	865.980000	-116	1230
31	25	Public Safety	Generic	FM Land Mobile	1	AE	809.9875	-119	25
32	25	Public Safety	Generic	FM Land Mobile	2	AF	810.4875	-119	25
33	25	Public Safety	Generic	FM Land Mobile	3	AG	810.9875	-119	25
34	25	Public Safety	Generic	FM Land Mobile	4	AH	811.4875	-119	25
35	25	Public Safety	Generic	FM Land Mobile	5	AI	812.2375	-119	25
36	25	Public Safety	Generic	FM Land Mobile	6	AJ	812.7375	-119	25
37	25	Public Safety	Generic	FM Land Mobile	7	AK	813.4875	-119	25
38	25	Public Safety	Generic	FM Land Mobile	8	AL	814.2375	-119	25
39	25	Public Safety	Generic	FM Land Mobile	9	AM	814.7375	-119	25
40	25	Public Safety	Generic	FM Land Mobile	10	AN	809.4375	-119	25
41	25	Public Safety	Generic	FM Land Mobile	11	AO	810.2375	-119	25
42	25	Public Safety	Generic	FM Land Mobile	12	AP	810.7375	-119	25
43	25	Public Safety	Generic	FM Land Mobile	13	AQ	811.2375	-119	25

44	25	Public Safety	Generic	FM Land Mobile	14	AR	811.7375	-119	25
45	25	Public Safety	Generic	FM Land Mobile	15	AS	812.4875	-119	25
46	25	Public Safety	Generic	FM Land Mobile	16	AT	813.2375	-119	25
47	25	Public Safety	Generic	FM Land Mobile	17	AU	813.7375	-119	25
48	25	Public Safety	Generic	FM Land Mobile	18	AV	814.4875	-119	25
49	25	Public Safety	Generic	FM Land Mobile	19	AW	809.0625	-119	25
50	25	Public Safety	Generic	FM Land Mobile	20	AX	809.5625	-119	25
51	26	RMRS	Generic	FM Land Mobile	1	AY	813.0875	-119	25
52	26	RMRS	Generic	FM Land Mobile	2	AZ	813.3375	-119	25
53	26	RMRS	Generic	FM Land Mobile	3	BA	814.0875	-119	25
54	26	RMRS	Generic	FM Land Mobile	4	BB	814.6375	-119	25
55	27	Data Radio	Generic	FM Land Mobile	MM	BC	810.9125	-119	25
56	27	Data Radio	Generic	FM Land Mobile	STN 2	BD	811.7875	-119	25
57	27	Data Radio	Generic	FM Land Mobile	STN 26	BE	810.6875	-119	25
58	27	Data Radio	Generic	FM Land Mobile	STN 28	BF	806.1875	-119	25
59	27	Data Radio	Generic	FM Land Mobile	DHA	BG	806.8875	-119	25
60	27	Data Radio	Generic	FM Land Mobile	BRDWY	BH	809.2375	-119	25
61	28	Conventional	Generic	FM Land Mobile	8CALL90	BI	806.0125	-119	25
62	28	Conventional	Generic	FM Land Mobile	8TAC91	BJ	806.5125	-119	25
63	28	Conventional	Generic	FM Land Mobile	8TAC92	BK	807.0125	-119	25
64	28	Conventional	Generic	FM Land Mobile	8TAC93	BL	807.5125	-119	25
65	28	Conventional	Generic	FM Land Mobile	8TAC94	BM	808.0125	-119	25
66	28	Conventional	Generic	FM Land Mobile	STAC	BN	808.7875	-119	25
67	28	Conventional	Generic	FM Land Mobile	(CONV) CLEER	BO	460.4250	-119	25
68	28	Conventional	Generic	FM Land Mobile	VLAW31(NLEEC )	BP	155.4750	-119	25
69	28	Conventional	Generic	FM Land Mobile	VMED28(HEAR)	BQ	155.3400	-119	25
70	28	Conventional	Generic	FM Land Mobile	R.A.C.E.S.	BR	147.3000	-119	25
71	28	Conventional	Generic	FM Land Mobile	METRO	BS	806.8875	-119	25
72	29	Public Utilities	Generic	FM Land Mobile	1	BT	813.4625	-119	25
73	29	Public Utilities	Generic	FM Land Mobile	2	BU	814.2125	-119	25
74	29	Public Utilities	Generic	FM Land Mobile	3	BV	814.4625	-119	25
75	29	Public Utilities	Generic	FM Land Mobile	4	BW	811.6375	-119	25
76	29	Public Utilities	Generic	FM Land Mobile	5	BX	811.1375	-119	25
77	29	Public Utilities	Generic	FM Land Mobile	6	BY	810.4625	-119	25
78	29	Public Utilities	Generic	FM Land Mobile	7	BZ	811.2125	-119	25
79	29	Public Utilities	Generic	FM Land Mobile	8	CA	811.7125	-119	25
80	29	Public Utilities	Generic	FM Land Mobile	9	CB	812.4625	-119	25
81	29	Public Utilities	Generic	FM Land Mobile	10	CC	813.2125	-119	25
82	29	Public Utilities	Generic	FM Land Mobile	11	CD	813.7175	-119	25
83	29	Public Utilities	Generic	FM Land Mobile	12	CE	814.2625	-119	25
84	29	Public Utilities	Generic	FM Land Mobile	13	CF	814.7125	-119	25
85	29	Public Utilities	Generic	FM Land Mobile	14	CG	809.5875	-119	25
86	29	Public Utilities	Generic	FM Land Mobile	15	CH	812.1375	-119	25
87	30	P25	Generic	FM Land Mobile	P25 1	CI	806.5625	-119	25
88	30	P25	Generic	FM Land Mobile	P25 2	CJ	807.3750	-119	25
89	30	P25	Generic	FM Land Mobile	P25 3	CK	807.7750	-119	25
90	30	P25	Generic	FM Land Mobile	P25 4	CL	808.1500	-119	25
91	30	P25	Generic	FM Land Mobile	P25 5	CM	808.275	-119	25
92	30	P25	Generic	FM Land Mobile	P25 6	CN	808.4250	-119	25
93	30	P25	Generic	FM Land Mobile	P25 7	CO	808.7250	-119	25
94	30	P25	Generic	FM Land Mobile	P25 8	CP	808.8625	-119	25
95	30	P25	Generic	FM Land Mobile	P25 9	CQ	812.0625	-119	25
96	30	P25	Generic	FM Land Mobile	P25 10	CR	813.1375	-119	25
97	30	P25	Generic	FM Land Mobile	P25 11	CS	814.6125	-119	25
98	30	P25	Generic	FM Land Mobile	P25 12	CT	807.1250	-119	25
99	31	DFD	Generic	FM Land Mobile	Repeater1	CU	808.0875	-116	12.5
100	31	DFD	Generic	FM Land Mobile	Repeater2	CV	807.8625	-116	12.5
101	31	DFD	Generic	FM Land Mobile	Repeater3	CW	808.3250	-116	12.5
102	32	DFD	Generic	FM Land Mobile	4	CX	814.5875	-119	25
103	32	DFD	Generic	FM Land Mobile	5	CY	810.0625	-119	25
104	32	DFD	Generic	FM Land Mobile	6	CZ	810.5375	-119	25
105	33	DFD VocAlarm	Generic	FM Land Mobile	1	DA	952.75625	-119	25
106	33	DFD VocAlarm	Generic	FM Land Mobile	2	DB	952.8375	-119	25
107	34	DFD Hand Held Radios	Generic	FM Land Mobile	1	DC	853.0875	-119	25

108	34	DFD Hand Held Radios	Generic	FM Land Mobile	2	DD	852.8625	-119	25
109	34	DFD Hand Held Radios	Generic	FM Land Mobile	3	DE	853.3250	-119	25
110	34	DFD Hand Held Radios	Generic	FM Land Mobile	4	DF	859.5875	-119	25
111	34	DFD Hand Held Radios	Generic	FM Land Mobile	5	DG	855.0625	-119	25
112	34	DFD Hand Held Radios	Generic	FM Land Mobile	6	DH	855.5375	-119	25

### 6.0 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)
None								

No transmitter noise interference problems were predicted.

### 7.0 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)
None								

No receiver desensitization interference problems were predicted.

## 8.0 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 products are derived from mathematical formulae. IM products are classified by their "order" (2nd, 3rd, 4th, ...Nth). Some of the more common forms of mixing are illustrated in the following examples. Note that the "A", "B", and "C" designations are the mixing frequencies. The numerical number assigned to the letter designation indicates the harmonic relationship of the frequency. Thus, 2A means the 2nd harmonic of frequency A.

<u>Order</u>	<u>Mixing Formulae</u>
First	$A=B, A=C, \text{ etc.}$
Second	$A \pm B, A \pm C, \text{ etc.}$
Third	$A + B - C, A \pm 2B, 2A \pm B, \text{ etc.}$
Fourth	$A \pm 3B, 2A \pm 2B, 3A \pm B, \text{ etc.}$
Fifth	$A \pm 4B, 2A \pm 3B, 3A \pm 2B, 4A \pm B, \text{ etc.}$
Sixth	$A \pm 3B \pm 2C, 2A \pm 2B \pm 2C, 3A \pm 2B \pm C, \text{ etc.}$
Seventh	$A \pm 6B, 2A \pm 5B, 3A \pm 4B, 4A \pm 3B, 5A \pm 2B, \text{ etc.}$
Eighth	$A \pm 7B, 2A \pm 6B, 3A \pm 5B, 4A \pm 4B, 5A \pm 3B, 6A \pm 2B, \text{ etc.}$
Ninth	$A \pm 8B, 2A \pm 7B, 3A \pm 6B, 4A \pm 5B, 5A \pm 4B, 6A \pm 3B, \text{ etc.}$

The above IM product formulae are just a few of the many possible combinations. When there are four frequencies involved at one time, the mixing possibilities increase tremendously. 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.

**8.1 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 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		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 transmitter generated intermodulation interference problems were predicted.

8.2 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)	Freq (MHz)	Ord	ID	Freq (MHz)									
None														

No receiver generated intermodulation interference problems were predicted.

### 9.0 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 multiples 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.

### 10.0 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.



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5/1/2018

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4/19/2017

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INSURER F:														
<b>INSURED</b> 1358772 T-Mobile US, Inc. Its Subsidiaries and Affiliates 12920 SE 38th Street Bellevue WA 98006														

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INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
B	<input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR  GEN'L AGGREGATE LIMIT APPLIES PER: <input type="checkbox"/> POLICY <input type="checkbox"/> PRO-JECT <input checked="" type="checkbox"/> LOC OTHER: _____			RGD5000259-06	5/1/2017	5/1/2018	EACH OCCURRENCE \$ 1,000,000 DAMAGE TO RENTED PREMISES (Ea occurrence) \$ 1,000,000 MED EXP (Any one person) \$ 5,000 PERSONAL & ADV INJURY \$ 1,000,000 GENERAL AGGREGATE \$ 2,000,000 PRODUCTS - COM/OP AGG \$ 2,000,000 \$
B	<input checked="" type="checkbox"/> AUTOMOBILE LIABILITY <input type="checkbox"/> ANY AUTO <input type="checkbox"/> OWNED AUTOS ONLY <input type="checkbox"/> SCHEDULED AUTOS <input type="checkbox"/> HIRED AUTOS ONLY <input type="checkbox"/> NON-OWNED AUTOS ONLY			RAD5000257-06	5/1/2017	5/1/2018	COMBINED SINGLE LIMIT (Ea accident) \$ 2,000,000 BODILY INJURY (Per person) \$ XXXXXXXX BODILY INJURY (Per accident) \$ XXXXXXXX PROPERTY DAMAGE (Per accident) \$ XXXXXXXX \$ XXXXXXXX
C C C	<input checked="" type="checkbox"/> UMBRELLA LIAB <input checked="" type="checkbox"/> OCCUR <input type="checkbox"/> EXCESS LIAB <input type="checkbox"/> CLAIMS-MADE <input type="checkbox"/> DED <input checked="" type="checkbox"/> RETENTION \$ 25,000			28189156 SIR applies per policy terms & conditions	5/1/2017	5/1/2018	EACH OCCURRENCE \$ 5,000,000 AGGREGATE \$ 5,000,000 \$ XXXXXXXX
A A	<b>WORKERS COMPENSATION AND EMPLOYERS' LIABILITY</b> ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) <input checked="" type="checkbox"/> Y <input type="checkbox"/> N If yes, describe under DESCRIPTION OF OPERATIONS below		N/A	RWD5000301-05 AOS RWR5000302-05 WI	5/1/2017 5/1/2017	5/1/2018 5/1/2018	<input checked="" type="checkbox"/> PER STATUTE <input type="checkbox"/> OTH-ER 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)**  
 The Certificate Holder and other entities defined by written contract, statute, permit application or written agreement are additional insureds on a primary and non-contributory basis under general liability and are additional insured under automobile liability as required by written contract. Waiver of Subrogation applies under general liability and automobile liability as required by written contract. \*\*See Attached Endorsements\*\*

<b>CERTIFICATE HOLDER</b> _____	<b>CANCELLATION</b> See Attachments
	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 

**ENDORSEMENT**

This endorsement, effective 12:01 a.m., May 1, 2017 forms a part of  
Policy No. RGD5000259-06 issued to T-MOBILE US, INC.  
by Greenwich Insurance Company

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY

**WASHINGTON - CANCELLATION NOTIFICATION  
TO OTHERS ENDORSEMENT**

In the event coverage is cancelled for any statutorily permitted reason, other than nonpayment of premium, advanced written notice will be mailed or delivered to person(s) or entity(ies) according to the notification schedule shown below:

<u>Name of Person(s) or Entity(ies):</u>	<u>Mailing Address:</u>	<u>Number of Days Advanced Notice of Cancellation:</u>
Per the most current schedule Of Certificate Holders maintained by Lockton Companies and furnished to XL Insurance on a monthly basis		30

In the event of cancellation for nonpayment of premium, ten (10) days notice will be given.  
All other terms and conditions of the Policy remain unchanged.

IXI 405-WA 1210

**ENDORSEMENT**

This endorsement, effective 12:01 a.m., May 1, 2017 forms a part of  
Policy No. RAD5000257-06 issued to T-MOBILE US, INC.  
by Greenwich Insurance Company

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY

**WASHINGTON - CANCELLATION NOTIFICATION  
TO OTHERS ENDORSEMENT**

In the event coverage is cancelled for any statutorily permitted reason, other than nonpayment of premium, advanced written notice will be mailed or delivered to person(s) or entity(s) according to the notification schedule shown below:

<u>Name of Person(s) or Entity(ies):</u>	<u>Mailing Address:</u>	<u>Number of Days Advanced Notice of Cancellation:</u>
Per the most current schedule Of Certificate Holders maintained by Lockton Companies and furnished to XL Insurance on a monthly basis		30

In the event of cancellation for nonpayment of premium, ten (10) days notice will be given.

All other terms and conditions of the Policy remain unchanged.

IXI 405-WA 1210