

LICENSE & AGREEMENT

THIS LICENSE & AGREEMENT (the “**Agreement**”), made and entered into by and between the **CITY AND COUNTY OF DENVER**, a municipal corporation of the State of Colorado (the “**City**”) and the **NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION** (“**NOAA**”), an operating unit of the U.S. Department of Commerce, and an entity of the U.S. Government.

RECITALS

WHEREAS, through collaboration with NOAA’s the National Weather Service (“**NWS**”), The Urban Farm at Stapleton (“**TUF**”) and the City, these three entities found an opportunity to participate in the establishment and operation of a weather observation station (the “**Weather Station**”) which will provide both valuable weather information for the metropolitan Denver area and educational benefits for the residents of the City and the general public; and

WHEREAS, after a search of possible sites for the Weather Station in and around the City and County of Denver, a viable site was located within Stapleton Sand Creek Open Space (“**Sand Creek**”); and

WHEREAS, the site for the Weather Station is acceptable to the Department of Parks and Recreation; and

WHEREAS, the parties other than City shall coordinate and secure funding required for the procurement, improvements and transportation needed to install and operate the Weather Station; and

WHEREAS, City and NOAA will coordinate and agree on the site improvements at Sand Creek needed for the Weather Station; and

WHEREAS, NOAA is willing to complete certain improvements for and operate the Weather Station for a public purpose that will benefit of the citizens of Denver and the Denver metropolitan area, subject to the terms and conditions of this Agreement; and

WHEREAS, in accordance with 15 U.S.C. § 313, NOAA, under the direction of the United States Secretary of Commerce, shall have charge of the forecasting of weather, the issuance of storm warnings, the display of weather and flood signals for the benefit of agriculture, commerce, and navigation; the distribution of meteorological observations as may be necessary to establish

and record the climatic conditions of weather, or as essential for the proper execution of NOAA's duties; and

WHEREAS, the undertaking of this project is consistent with the purposes of the Agreement, by which the Executive Director of Parks and Recreation, on behalf of the City, has designated Mark Tabor of the Department of Parks and Recreation to coordinate with NOAA for the installation and operation of the Weather Station;

NOW, THEREFORE, in consideration of the above, and the mutual promises and covenants contained herein, the City and NOAA agree as follows:

1. **The NOAA Improvements; Statement of Work**: The "**NOAA Improvements**," as used herein, refers to the structural elements for a Weather Station and other site improvements to be specified, designed and installed by NOAA consisting of a thirty (30) foot high tower secured to a concrete footing foundation, weather instrumentation, and solar power collection equipment all of which will be entirely and securely enclosed by 15' by 15' wide by a minimum 6' tall chain-linked fence. The area within which the NOAA Improvements are sited and access to those areas are depicted in **Exhibit A** attached hereto and incorporated herein by reference. The chain-link fence is not depicted in **Exhibit A**. The NOAA Improvements are to be constructed and installed within the Stapleton Sand Creek Uplands, east of TUF (the "**Site**"). The work and installation required for the NOAA Improvements are set forth in **Exhibit B, Statement of Work**, attached hereto and incorporated herein by reference. Subject to appropriation, the City agrees to coordinate or cause to have performed, whether with its own forces or through a contractor or other partner or contributor, all capital improvements needed for the placement, assembly and installation of the Weather Station including access roadways and walks, concrete foundation and perimeter fencing ("**Site Work**"). NOAA shall be entitled to access City and land and use the Site Work as necessary to assemble, install and satisfactorily complete the NOAA Improvements in accordance with the terms and conditions of this Agreement. City shall have no responsibility or obligation to obtain funds for the NOAA Improvements installed and owned by NOAA. Nothing in this Agreement shall constitute an obligation of NOAA to transfer its funds to the City or others.

2. **Coordination and Liaison**:

A. The City's Executive Director of Parks and Recreation (the "**Director**") is vested with the authority to act on behalf of the City in performing the City's obligations under this Agreement. The Director designates Mark Tabor (the "**Designee**") to act as the authorized

representative of the Director. The City may change its authorized representative at any time by providing written notice to NOAA of such change.

B. NOAA's authorized representative under this Agreement is NOAA's Meteorologist-in-Charge and, as such, is responsible for overseeing the satisfactory completion of the NOAA Improvements, in accordance with the terms and conditions of this Agreement. NOAA may change its authorized representative at any time by providing written notice to the City of such change.

3. **License**: The City hereby grants a revocable and non-transferable license to NOAA to install, maintain, repair, and replace the NOAA Improvements at the Site and to install and maintain underground utility lines to the Site as needed for the operation of a weather observation site, subject to the terms and conditions of this Agreement. No property interests in the enclosed area of the Site or the location of the utility lines, including any lease or easement, are hereby granted in the Site or any part of Sand Creek. Title to the NOAA Improvements shall be held by NOAA.

4. **City Responsibilities**: The City shall have the following rights and obligations with respect to the NOAA Improvements:

A. Subject to appropriation, the City will coordinate or cause to have performed the construction Site Work needed prior to installation of the Weather Station

B. The Designee shall work with NOAA in the preparation of the Site for the installation of the Weather Station and arrange for the relocation or removal of any impediments to the installation and operation of the NOAA Improvements within the Site.

C. Trenching for the location of utility lines to the Site shall be arranged by the Designee. Electrical service and connections shall be provided for the operation of the NOAA Improvements through electrical systems existing on the Stapleton Sand Creek Uplands.

5. **NOAA Responsibilities**: Except as otherwise provided in this Agreement, NOAA shall have sole responsibility with respect to undertaking, maintaining, and operating the NOAA Improvements in accordance with this Agreement.

A. Before any work is commenced for installation by NOAA and for major repairs or replacement, NOAA shall submit final design documents and specifications for such work to the Designee for the written approval of said documents. The final documents and specifications will be approved or disapproved, in writing, with the reasons for any disapproval

being stated, within ten (10) days of receipt of a complete set of final documents and specifications. Any deficiencies in said documents and specifications shall be remedied by NOAA, to the reasonable satisfaction of the Director or Designee, prior to the commencement of work. A proposed schedule and operational plan shall also be submitted to assist the Designee to determine the best times and methods for minimizing impacts on and interference with Sand Creek operations or TUF operations.

B. NOAA, or an entity designated by NOAA, shall be solely responsible for securing all funds necessary for the installation, operation, maintenance, repair and replacement of the NOAA Improvements, as may be needed.

C. NOAA shall at all reasonable hours ensure right of entry to any City inspector or other authorized agent of the City to the Site to conduct tests and evaluations to determine that the work performed and materials used are of good quality and in conformance with the approved design plans and specifications and other applicable requirements. If it is determined that the work is not being so performed, the Director or Designee may order that the cessation of the work until there is satisfactory evidence that the work conforms to the approved design plans and specifications or building code requirements.

D. The City shall not charge NOAA for the City's activities under this paragraph 5, including design plan and specifications review, inspections, material testing, and monitoring of any work.

E. NOAA shall be solely responsible for assuring that the NOAA Improvements are properly contracted and performed and that the work done and the materials used are in conformance with all applicable laws (local, state, and federal) that govern the performance of the work.

F. To the extent that private contractors are retained to construct, install, repair or replace any part of the NOAA Improvements, NOAA's contractors shall obtain a bond or bonds or other financial guarantee acceptable to the City Attorney, conditioned that NOAA's contractors shall promptly make payment of all amounts lawfully due to all contractors, subcontractors, and persons or entities furnishing labor or materials used in the prosecution of the work on any phase of the NOAA's work, and NOAA's contractors shall indemnify the City to the extent of all payments in connection with performing the work.

G. Any signage, other than legally prescribed warning signs, to be installed on the Site shall be subject to the prior written approval of the Director, and any signs recognizing corporate sponsorships, grants, or gifts shall be subject to any applicable policies and rules and regulations of the Department of Parks and Recreation.

H. NOAA shall be responsible for maintaining the NOAA Improvements and for assuring that the NOAA Improvements are properly secured and do not present any danger or hazard to the public, City employees, or other persons who may come into proximity to the Site. As an agency of the United States, NOAA is limited by Federal laws as to the assumption of liability for its acts and omissions. NOAA agrees, within its legal limitations and limitations of appropriations, that it may be responsible for damages arising from injury to persons and property associated with the use and occupancy authorized by this Agreement. NOAA further agrees, to the extent legally required, to use its appropriations and resources as required to pay any claims and to repair damages to the Site covered by this Agreement. Vegetation in and around the Site shall be restored to the same or better condition as existed prior to any work being performed on Site, except for damage from the elements and circumstances beyond NOAA's control.

6. **Reporting & Audits:**

A. NOAA shall cause its contractors to provide to the City Auditor documentation of contractor expenditures for NOAA's work, in form and detail sufficient to enable the Auditor to perform his responsibilities under the Charter and ordinances of the City. Such documentation shall include periodic invoices evidencing the work performed and the payroll reporting requirements contained in DRMC Section 20-76(d) (if applicable).

B. NOAA agrees that any duly authorized representative of the City shall, until the expiration of three (3) years after completion of the NOAA's work, have access to and the right to examine any directly pertinent books, documents, papers and records of NOAA involving transactions related to this Agreement, unless such disclosure is prohibited by Federal law, regulation, or policy.

7. **Term & Revocation/Termination:**

A. The term of this Agreement shall commence on August 1, 2020 (the "Effective Date") and shall end on July 31, 2039. Mutually agreed upon renewals may subsequently occur, unless this Agreement is terminated by written notice provided by one party to the other at least ninety (90) days prior to renewal.

B. This Agreement may be terminated, without cause, by either party upon written notice to the other party. The City may elect to immediately revoke the Agreement if the Director determines, within the Director's reasonable discretion, that the NOAA Improvements have not have been properly constructed, installed, or maintained so that they present a threat of danger to public health or safety and NOAA has not undertaken prompt or sufficient measures to rectify the situation following verbal or written notice from the City. Upon any termination or revocation and in the time and manner that is mutually agreeable, NOAA shall promptly remove all NOAA Improvements and restore the Site to its original condition, to the reasonable satisfaction of the Director, except for damage from the elements and circumstances beyond NOAA's control.

8. **Governmental Immunity**: NOAA agrees to promptly consider and adjudicate any claims which may arise out of use of the Site by NOAA or duly authorized representatives or contractors of NOAA and to pay for any damage or injury as may be required by applicable law. Such adjudication may be pursued under the Federal Tort Claims Act, 28 U.S.C. § 2671 et seq., the Federal Employees' Compensation Act, 5 U.S.C. § 8101 et seq., or such other legal authority as may be pertinent. City shall be responsible for any and all of its own claims, damages, liability and court awards, including costs, expenses, and attorney fees, incurred as a result of any act or omission by the City, or its officers, employees, contractors and agents in connection with the subject matter of this Agreement. The scope of this Paragraph 9 is not limited to third party claims. Any minimum insurance held by or self-insurance carried by NOAA shall not be deemed to limit or define the obligations of NOAA. It is expressly understood and agreed that City is relying upon, and has not waived, the monetary limitations (presently \$150,000 per person, \$600,000 per occurrence) and all other rights, immunities and protections provided by the Colorado Governmental Act, C.R.S. § 24-10-101, *et seq.* Nothing in this Paragraph 9 or any other provision of this Agreement shall be construed as a waiver, express or implied, of the notice requirements, defenses, immunities and limitations the City may have under the Colorado Governmental Immunity Act (§§ 24-10-101, C.R.S., *et. seq.*), as amended or may be amended or replaced or supplemented by another statute providing immunity or similar protections to governmental entities; or NOAA may have under Federal law, rule or regulation. Likewise, except as otherwise expressly provided in this Agreement, nothing in this Agreement shall be deemed to be an assumption or acceptance of liability, or a waiver or release of any rights, privileges or protections, by NOAA or the City under federal, state or local law or regulation or under common

law. Nothing in this Agreement shall be construed as a waiver of any sovereign immunity of the United States Government.

9. **No Discrimination in Employment:** In connection with the performance of work under this Agreement, NOAA agrees to comply with all applicable Federal laws, regulations, and policies regarding discrimination in employment matters; and further agrees to insert the foregoing provision in all contracts hereunder.

10. **Compliance With Environmental Requirements:** NOAA shall obtain all necessary federal, state, and local environmental permits and comply with all applicable federal, state, and local environmental permit requirements relating to construction, installation, and use of the NOAA Improvements. NOAA shall comply with all applicable local, state, and federal environmental rules, regulations, statutes, laws or orders (collectively, “Environmental Requirements”), including but not limited to Environmental Requirements regarding the storage, use and disposal of Hazardous Materials and regarding releases or threatened releases of Hazardous Materials to the environment. The term “Hazardous Materials” shall mean asbestos, asbestos-containing soils, asbestos-containing materials, polychlorinated biphenyls (PCBs), special wastes, any petroleum products, natural gas, radioactive source material, pesticides and 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 rules or regulations promulgated pursuant to such statutes or any other applicable federal or state statute.

11. **Limitation on Application of Agreement:** The provisions of this Agreement are intended to govern the undertaking and operation of the NOAA Improvements and shall not be construed to prohibit, limit, waive, or modify other agreements between the parties currently existing or entered in the future as to improvements at Sand Creek.

12. **Appropriation:** Notwithstanding any provision of this Agreement to the contrary, any obligations of the City including financial obligations is contingent upon all funds necessary for performance under this Agreement being budgeted, appropriated and otherwise made available, and any commitments by the City to provide services is contingent upon the necessary funds being budgeted, appropriated, and otherwise made available and the necessary discretionary actions being taken by the City Council and the Mayor. 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.

13. **Notices**: Any notices, responses, or communications given hereunder may be personally delivered or sent by first class mail, addressed to the following:

To the City:

Executive Director of the Department of Parks and Recreation
City and County of Denver
201 West Colfax Avenue, Dept. 601
Denver, CO 80202

City Attorney
1437 Bannock Street
Denver, CO 80202

To NWS/NOAA (for Technical Matters):

Meteorologist in Charge
National Weather Service – BOU
325 Broadway Street
Boulder, Colorado 80305
Office: (303) 494-3210
<http://www.weather.gov/Denver>

To NWS/NOAA (for Real Estate and License Agreement Matters):

Contracting Officer
Department of Commerce/NOAA/RPMD
601 E 12th Street, Room S-1705
Kansas City, MO 64106
Phone: 816-426-7835
jeannie.simmons@noaa.gov

The contacts and addresses specified above may be changed by the parties at any time upon written notice to the other party.

14. **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 Project or related services or property described herein.

15. **No Personal Liability**: No elected official, director, officer, agent, or employee of the City or NOAA shall be charged personally or held contractually liable by or to the other party

under any term or provision of this Agreement or because of any breach or violation thereof or because of the execution, approval, or attempted execution of this License Agreement.

16. **No Third-Party Beneficiaries:** The Parties expressly agree that enforcement of the terms and conditions of this Agreement, and all rights of action relating to such enforcement, shall be strictly reserved to the City and NOAA; and nothing contained in this Agreement shall give or allow any such claim or right of action by any other or third person on such agreements. The City and NOAA expressly agree that any person other than the City and NOAA receiving services or benefits under this Agreement shall be deemed to be an incidental beneficiary only.

17. **Subject to Local Laws; Venue:** Each and every term, provision or condition herein is subject to and shall be construed in accordance with the provisions of Federal law. To the extent permitted by Federal law, Colorado law (excluding Colorado choice of law rules) will apply in the absence of applicable Federal law; provided, however, nothing in this Agreement shall be construed as a waiver of any sovereign immunity of the United States Government. NOAA understands that the City is bound by the Charter of the City and County of Denver, and the applicable ordinances, regulations, executive orders, or fiscal rules, enacted or promulgated pursuant thereto. Venue for any legal action relating to this Agreement shall lie in the Federal District Court in and for the City and County of Denver, Colorado or other appropriate Federal court or Federal board.

18. **Agreement as Complete Integration; Amendments:** This Agreement is intended as the complete integration of all understandings between the parties, and no prior or contemporaneous addition, deletion or other amendment shall have any force or effect, unless embodied herein in writing. Amendments to this Agreement will become effective only when approved by both parties and executed in the same manner as this Agreement.

19. **Severability.** The terms and conditions contained herein are several in nature. Should any one or more of the terms or conditions be judicially adjudged invalid or unenforceable, such judgment shall not affect, impair, or invalidate the remaining terms or conditions. However, if the license granted under this Agreement should be deemed invalid or unenforceable, the Agreement shall terminate subject to the terms set forth in paragraph 8 above.

20. **Execution of Agreement:** This Agreement is expressly subject to, and shall not be or become effective or binding on the City and NOAA until fully executed by all signatories of the City and NOAA.

21. **Legal Authority**: Each party represents and warrants that it has taken all actions necessary or 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 this Agreement if there is any dispute as to the legal authority of either NOAA or the person signing the Agreement for NOAA to enter into this Agreement.

22. **Counterparts of Agreement**: This Agreement may be executed in counterparts, each of which shall be deemed an original, but all of which together shall constitute one Agreement.

23. **Electronic Signatures and Electronic Records**: NOAA 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.

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The Signature Block Starts on the Next Page.]**

Contract Control Number: PARKS-202056864-00
Contractor Name: NATIONAL OCEANIC AND ATMOSPHERIC
ADMINISTRATION

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:

Attorney for the City and County of Denver

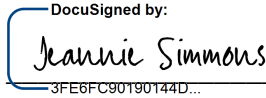
By:

By:

By:

Contract Control Number:
Contractor Name:

PARKS-202056864-00
NATIONAL OCEANIC AND ATMOSPHERIC
ADMINISTRATION

By:  _____
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Name: Jeannie Simmons
(please print)

Title: Real Property Contracting Officer
(please print)

ATTEST: [if required]

By: _____

Name: _____
(please print)

Title: _____
(please print)

Exhibit A
NOAA Meteorological Facility and Operations - Access and Use Area



NOAA Meteorological Facility and Operations

Weather Tower

Date: October 29, 2020
By: Gregory S. Neitzke PLS

Exhibit B

STAPLETON OBSERVATION STATION

Statement of Work

This document serves to highlight the different working aspects of the Stapleton Observation Station that are required to see this project come to completion.

*What was old is now
new!*

Project Outline

Overview

This project is to install an instrumented meteorological tower on Denver Urban Farms property. The free-standing tower is 30 feet in height, and will be set in a concrete base measuring 48 inches by 48 inches. All power and communications will be self-contained. All meteorological instruments and supporting equipment will be attached to the tower, including solar panels, communications antenna, and an equipment enclosure, and will protrude no further than a 3 foot radius from tower centerline. The perimeter of the site will measure 16 feet by 12 feet, and be enclosed by a 6 foot tall chain link fence. Access through the fence will be via double gate. Dimensions for the gate doors are 4 feet wide by 6 feet tall. During setup and on rare occasions to perform maintenance, the tower will be folded on its side and protrude from the gate. At no time will the tower be left unattended while in this configuration. The gate will be locked while the site is unattended.

No other equipment, site work, or services is required outside the fence perimeter. No digging is required for this project other than the installation of the perimeter fence and to pour the concrete pad.

Roles and Responsibilities

- Under the license agreement between City & County of Denver and NOAA, NOAA will take the responsibility for the work being accomplished per the license agreement and NOAA specifications. Actual work will be delegated to The Urban Farm, and paid for with donated funds. When work is completed NOAA will take ownership under the provision of the license to operate and maintain.

What is required for this project?

- Solar Power
 - o Solar power will be setup for site
 - o Total current draw for the equipment
 - Fig 1A
 - o RF Communications from tower to UA building
- Electricity: provided by on-site solar. No external commercial power required
 - o Solar Specification
 - Solar panels measure 24 inches by 36 inches
 - Mounted to tower
 - Battery contained in equipment enclosure, mounted to tower.
- Data Feed via Radio communications from tower to Upper Air building. No external communications lines required.
- Perimeter Fencing and a Double Gate
- Site Work

- Removal of existing meteorological tower
- Excavation for concrete base
- Post hole excavation for fencing
- Rock base/backfill like under an ASOS?
- Grading and smoothing to return to prior appearance.
- Equipment
 - Campbell Scientific equipment has been ordered and delivered
 - Fold over tower has been ordered and delivered
 - RF Communications equipment has yet to be ordered
 - A pair of 50W solar panels is on hand (1x as a spare)
- Concrete Installation vendor to be determined (by The Urban Farm)
 - Permit
 - We have a spec for the concrete pad that will work adequately
 - Fig 2A
 - GPS location for existing tower and new tower
 - Fig 2B
- Denver Parks and Rec.
 - Require a photo showing our existing lease
 - Fig 3A
 - Require a Wind Load chart for the fold over tower
 - Fig 3B
 - Require locates for Gas, Electric, Sewer, etc.
 - Fig 3C
 - Fencing Requirements
 - Fig 3D
 - Fencing Photos
 - Fig 4A
 - Approximate Physical Location of tower
 - Fig 4B
 - Provide equipment specifications
 - Last Page

Site Electrical Requirements

Site electrical plans will rely on solar power to maintain power to the tower site and will not require a commercial electrical power run from the Upper Air building to the site location. Data communications will utilize wireless communications between the tower and upper air building. No surface run of communications cable will be required. Power will be supplied by two 50W solar panels. The solar panels will be installed on the fold-over tower at an angle ranging from 25 degrees to 55 degrees. This is a fixed installation of the solar panel on the base of the fold-over tower.

Power produced by the solar panels will be routed to a Campbell Scientific [CH150 charge regulator](#). This charge regulator will then feed power to a Power Sonic PS 12260 12 volt storage battery. Power from this additional storage battery will be sent to the Campbell Scientific [PS150 power supply](#) with built in battery. The Campbell Scientific PS150 is the main unit that will provide power to the weather sensors and RF communications equipment, while the Power Sonic battery will provide additional backup power and storage. The total storage capacity of the two batteries will keep this site running continuously when the sun is not available to charge the batteries for an extended period of time.

The additional storage battery as well as all other electronic devices separate from the solar panel and sensors will be stored and maintained in a weatherproof electronics enclosure from Stahlin Enclosures part-number RJ1816HPL or similar. Box internal dimensions are 16" by 18" with a depth of 9 inches. The enclosure and its specifications can be found [here](#). The weatherproof enclosure will be mounted to the base of the fold-over tower.

The weather sensors will be attached to the fold-over tower in their appropriate positions so as to provide accurate and reliable weather data and are subject to move around the tower. The [RF communications antenna](#) will also be attached to the fold-over tower in a manner and position that will best provide a direct [line-of-sight transmission of 900MHz](#) to the antenna that will be stationed at the Upper Air building.

Site weather sensor technical specifications are included later in this package.

Glen-Martin MF-1333 Fold-Over Tower

[The Glen-Martin MF-1333](#) fold-over tower is a 30 foot weather station tower. The MF-1333 offers a 10 foot galvanized base for additional support in harsh environments for the antenna tower. Proper tower installation will require the installation of a concrete pad reinforced with rebar. This fold-over tower does not require or facilitate the use of guy wires.

The center of the concrete pad will rest at approximately N 39degrees 46.082' and W 104 degrees 52.168' according to our handheld GPS unit. This parcel of land is currently the Property of Denver Parks and Recreation and is being leased to The Urban Farm at Stapleton. The concrete pad and tower will reside approximately 200 feet to the North of the Upper Air building adjacent to the existing tower.

The concrete pad will have a 48 inch length by a 48 inch width and a depth of 60 inches. The concrete pad will be reinforced with rebar. The concrete pad will rest on 6 inches of compacted sand according to the specifications for the concrete pad.

The Glen-Martin MF-1333 fold-over tower will have a lightning rod installed at the top of the tower. The tower will be properly earth grounded according to the specifications for the concrete pad.

Specifications for the correct placement of the reinforcing rebar and the tower base bolts can be seen at Figure 2A.

A wind load chart for the MF-1333 can be found at Figure 3B.

Fencing Requirements

The Stapleton Observation Project will require a chain-link metal fence around the tower and equipment so as to protect the sensor group from unauthorized entry. The fencing will be 16 foot by 12 foot and 6 foot in height. A gated access will allow entry into the enclosure and this gated access will face the concrete walkway to the East.

The gated access will also be comprised of the same fencing material as the rest of the enclosure. At this time there are several different options available that will accommodate the needs of the technicians and the fold-over tower. Preference for the gate would be two 4 ft wide by 6 ft tall gates or two 6 ft by 6 ft gates on the East side of the enclosure. The gate must be wide enough so that the fold-over tower will be unhindered from fencing material when folded over and facing the East. Once folded over there must be sufficient room on both sides of the tower for the technicians to get into and out of the enclosure unhindered.

The gated access will require a gate latch with a provision for a lock. The lock is intended for securing of the enclosure from unauthorized intrusion.

A diagram for the layout of the fencing can be seen at Figure 3D. A physical layout of where the fencing is to be located can be found at Figure 4A.

Weather Sensors

The Stapleton Observation Station will utilize a variety of sensors obtained from Campbell Scientific that will provide the National Weather Service with an accurate picture of the local environment. Our current line-up of sensors include:

1. Met One Temperature and Relative Humidity sensor. This sensor calculates relative humidity by measuring the capacitance change of a one micron thick dielectric polymer layer. This sensor also measures temperature with an internal thermistor.
2. Vaisala Barometer. This sensor measure barometric pressure for the range of 500 to 1100 hPa (mBar). This range equates to from below sea level to over 15,000 feet above sea level.
3. RM Young Heavy Duty Wind Monitor. This sensor is a lightweight, robust instrument that measures wind speed and direction.
4. Texas Electronics Rain Gauge. The TE525WS funnels precipitation into a bucket mechanism that tips when filled to its calibrated level. A magnet attached to the tipping mechanism actuates a switch as the bucket tips. The momentary switch closure is counted by the pulse-counting circuitry of the data logger.

Installation, maintenance and operation of the Stapleton Observation Station's electronics, sensors, communications, and data logging equipment will be the sole responsibility of the National Weather Service technicians from the Boulder WFO.

More information about the weather sensors for the Stapleton Observation Station can be found at the end of this packet.

Figure 1A

Total current draw:

A	B	C	D
Item	Part Number	Input	Output
Power Supply	GT-46401-4024	100-240VAC @ 50-60Hz, 1A	24VDC @ 1.66A, 40W
12 V Charging Regulator	PS150	AC – (18 to 24) VRMS internally limited to 1.2 ARMS	Unregulated 12 V from Battery 4.65 A solid-state circuit breaker
All other voltages are supplied by the CR800			
Datalogger	CR800	12VDC, >10mA with a 1 Hz sample rate	12VDC
Barometric Pressure Sensor	CS106	10-30VDC @ <4 mA	0 to 2.5 Vdc signal that corresponds to 500 to 1100 mb.
Temperature and Relative Humidity Probe	HMP155A	7 to 28VDC @ <3 mA	0 to 1VDC
WIND MONITOR-HD	5108	Regulated DC voltage, 15 VDC max	Analog DC voltage proportional to azimuth angle with regulated excitation voltage applied across potentiometer.
Tipping Bucket Rain Gage	TE525	Switch Ratings: 30 Vdc at 2 A	
Serial to Ethernet Interface	NL201	50 mA (@ 13 Vdc)	
RF Comms	RF407	100-240 VAC @50-60 HZ, 800 mA	12 VDC at 800 mA

Figure 2A

Concrete pad specifications:

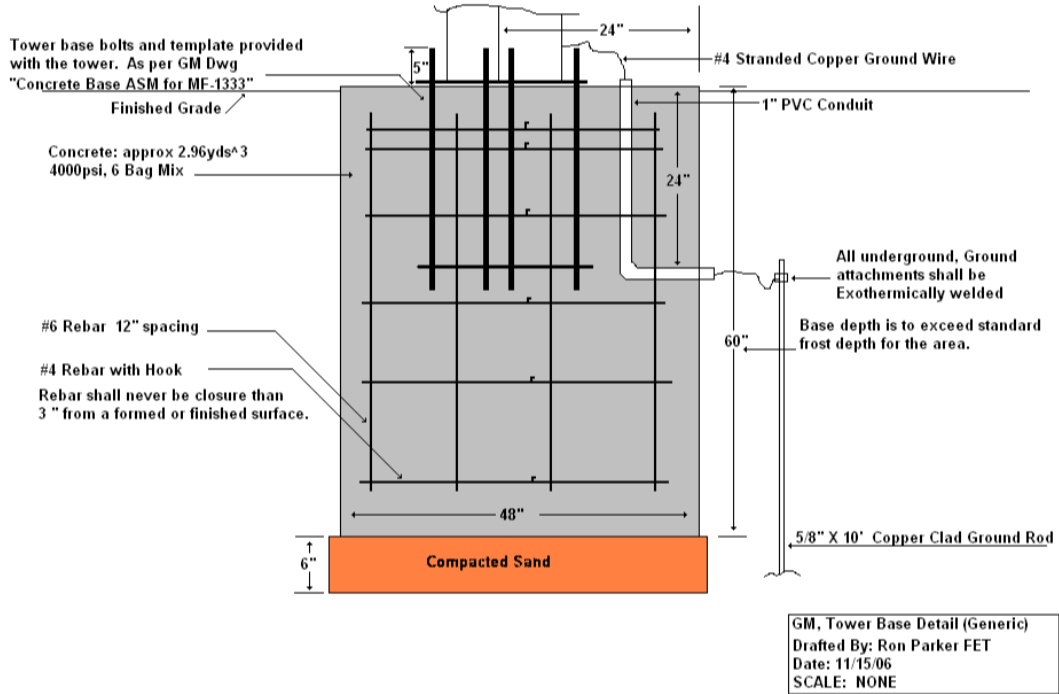


Figure 2B

GPS Location:

New Tower



Existing Tower

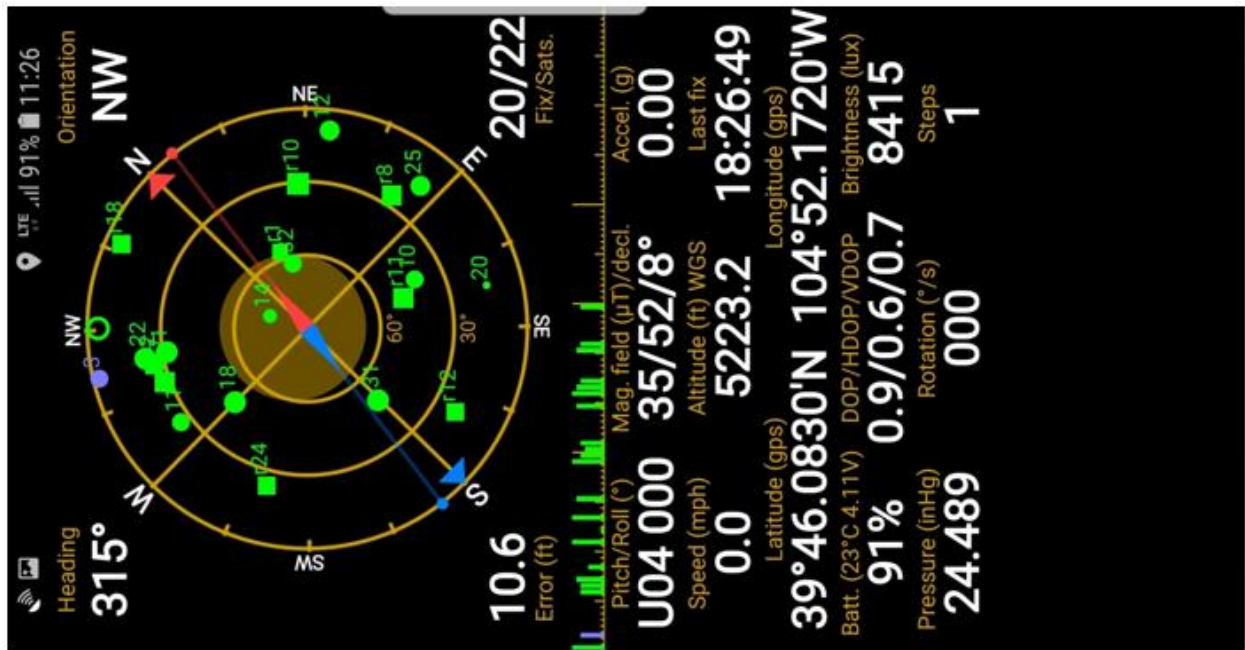


Figure 3A

Existing Lease Picture:

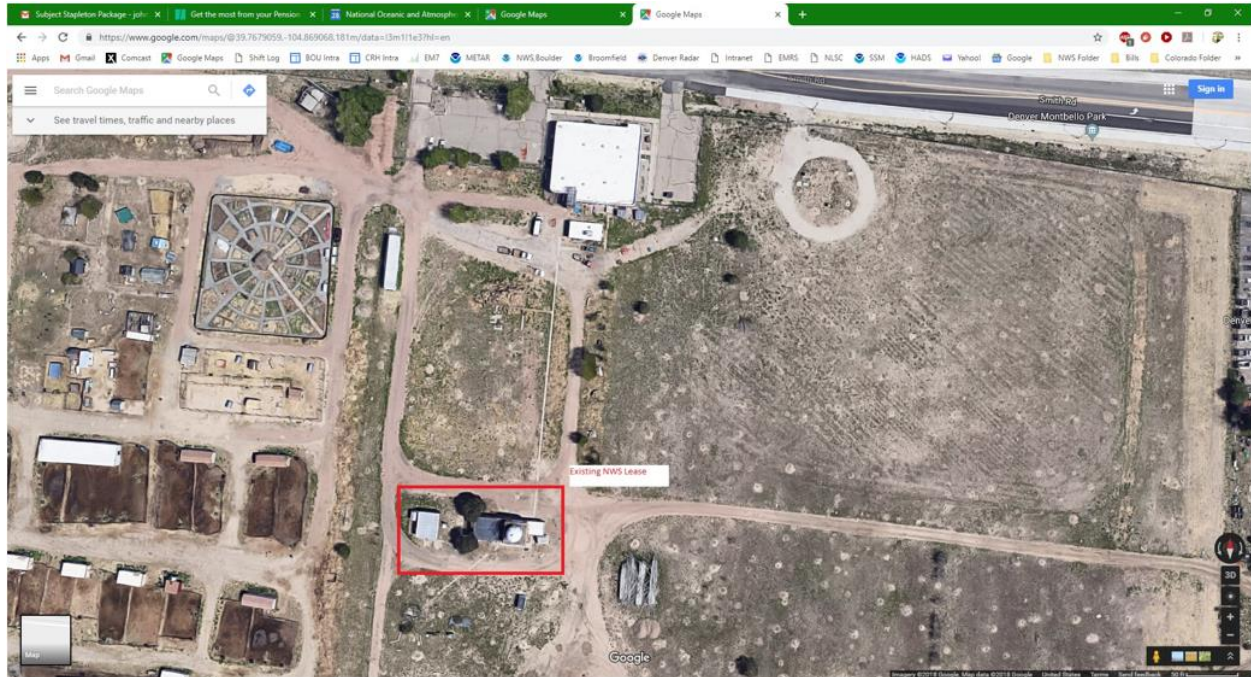


Figure 3B

MF-1333 Wind Load Chart:

12/20/2018

MF-1333 Fold Over Tower - GlenMartin

Wind Load Chart – MF-1333

Wind speed (mph)	85	90	95	100	105	110	115	120
Max. projected area (sq.ft)	10.5	9.3	8.2	7.2	6.5	5.8	5.2	4.7
Down at leg (kip)	18.86	19.42	19.91	20.35	21.07	21.68	22.55	23.30
Uplift at leg (kip)	16.23	17.01	17.74	18.41	19.35	20.19	21.06	22.04
Shear at leg (kip)	1.78	1.80	1.82	1.82	1.85	1.87	1.90	1.93
Down at base (kip)	2.03	1.96	1.89	1.82	1.75	1.69	1.69	1.62
Shear at base (kip)	0.72	0.77	0.81	0.86	0.92	0.97	1.03	1.09
O.T.M (kip-ft)	17.57	18.10	18.57	18.99	19.67	20.25	21.07	21

Figure 3C

Locates:

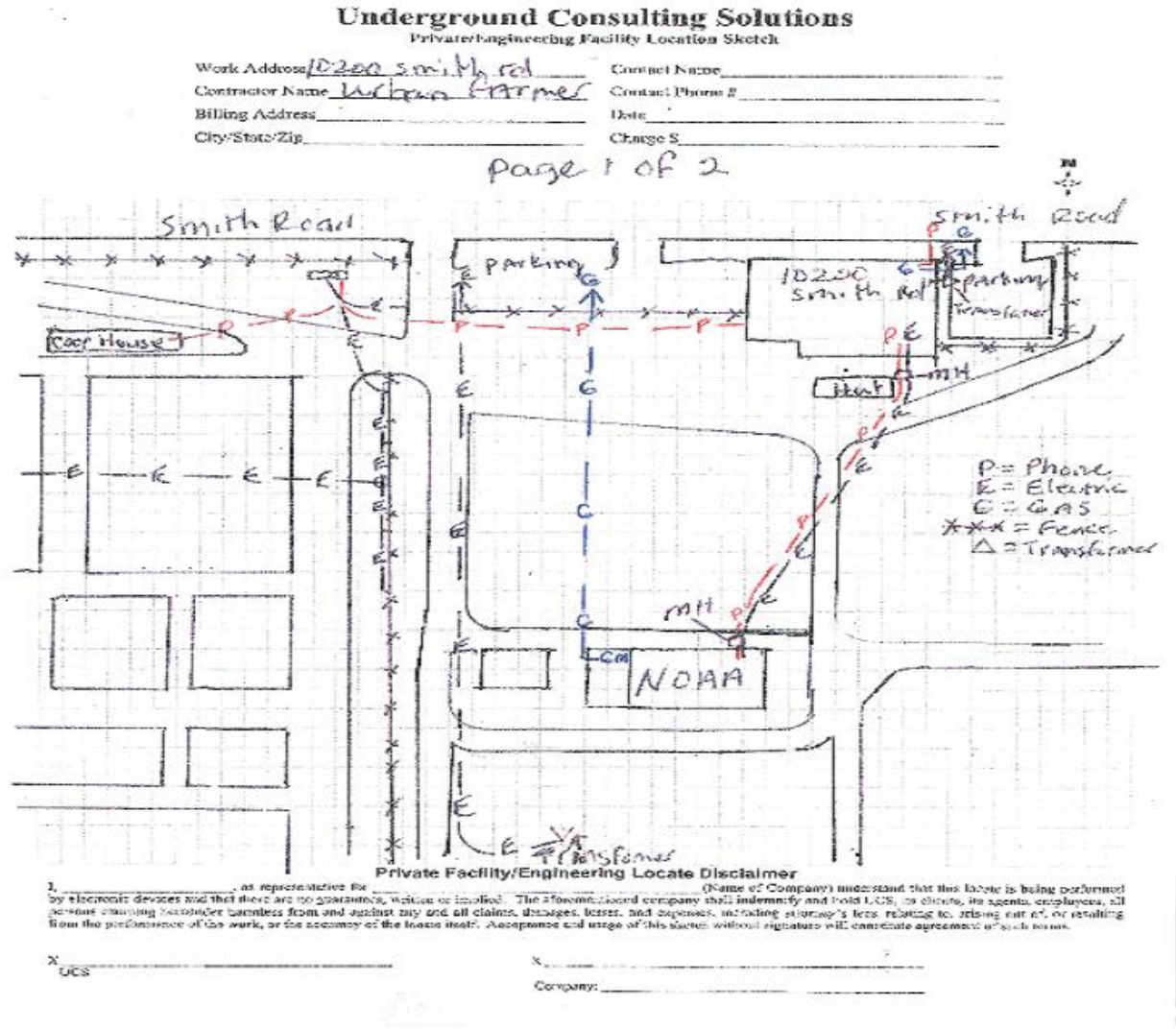


Figure 3D

Fencing requirements:

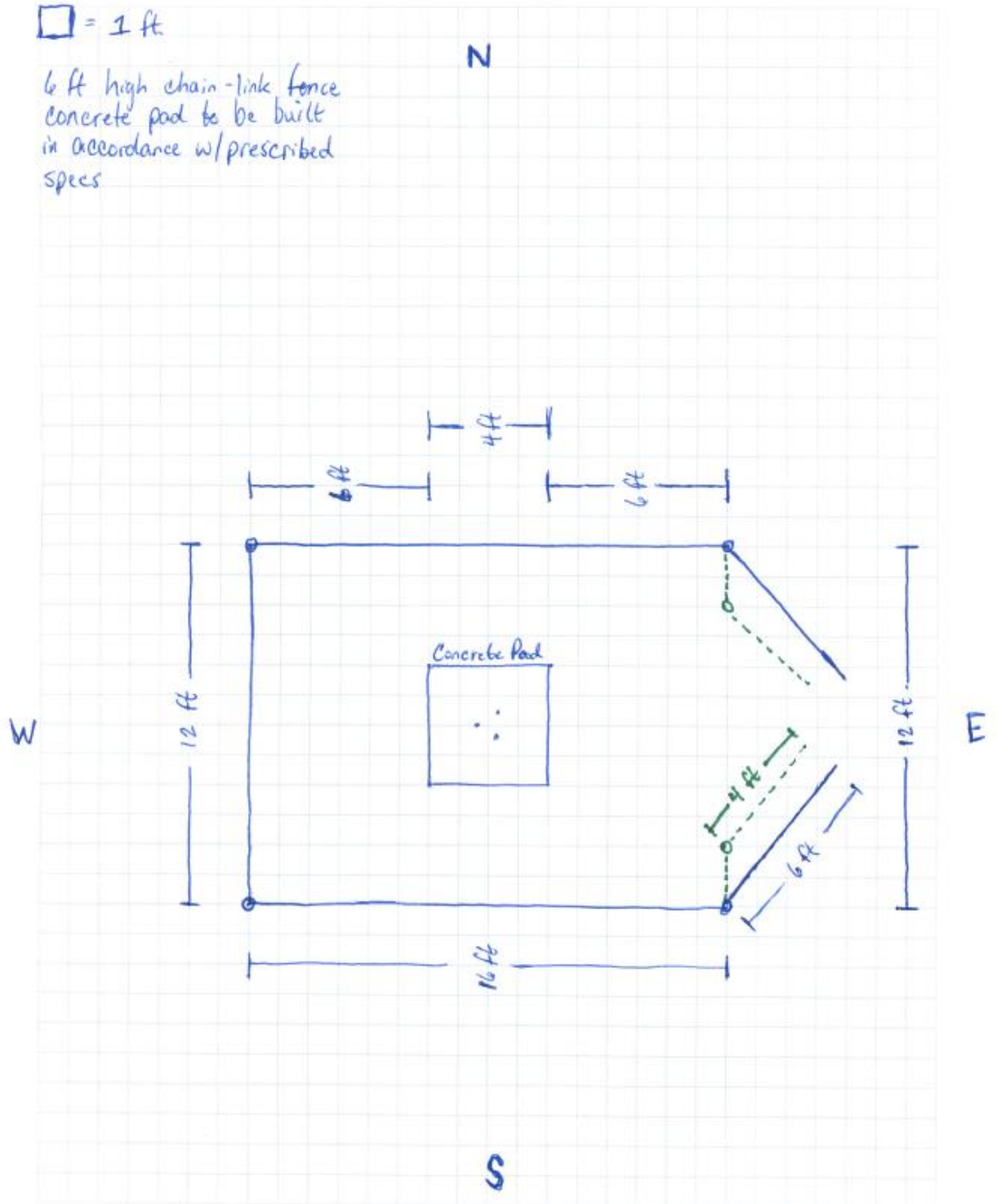


Figure 4A

Physical location



Figure 4B

Approximate Physical Location of tower:



Equipment Specifications

Campbell Scientific Web Links

- **NL201 Ethernet Interface** - <https://www.campbellsci.com/nl201>
- **CR800 Datalogger** - <https://www.campbellsci.com/cr800-datalogger>
- **HMP155A** - <https://www.campbellsci.com/hmp155a>
- **MetOne 083E** - <https://www.campbellsci.com/083e>
- **PS150** - <https://www.campbellsci.com/ps150>
- **RMYoung 05108** - <https://www.campbellsci.com/05108-l>
- **TE525WS** - <https://www.campbellsci.com/te525ws-l>
- **Vaisala CS106** - <https://www.campbellsci.com/cs106>
- **RF 407 Spread-Spectrum Radio** - <https://www.campbellsci.com/rf407>
- **900MHz Whip Antenna** - <https://www.campbellsci.com/p14204>