

**GROUND LEASE
AGREEMENT**

Between

**CITY AND COUNTY OF
DENVER**

And

**SOUTHWEST AIRLINES
CO.**

At

**DENVER INTERNATIONAL
AIRPORT**

**GROUND LEASE
AGREEMENT**

THIS GROUND LEASE AGREEMENT (the "Lease"), made and entered into by and between the **CITY AND COUNTY OF DENVER**, a municipal corporation of the State of Colorado, acting for and on behalf of its Department of Aviation (the "City"), and **SOUTHWEST AIRLINES CO.**, a corporation organized and existing under and by virtue of the laws of the State of Texas and authorized to do business in the State of Colorado (the "Airline");

WITNESSETH

WHEREAS, the City owns and operates Denver International Airport (the "Airport") and has the power to grant rights and privileges with respect thereto, as hereinafter provided; and

WHEREAS, the Airline is a certificated air carrier in the business of providing scheduled air passenger service and transporting property, cargo and mail, or one or more thereof, to and from the Airport by aircraft; and

WHEREAS, the Airline and the City have entered into an Airport Use and Facilities Lease Agreement dated January 1, 2012, contract number 2012066586, as amended, (the "Airport Use Agreement") pursuant to which the Airline has certain rights to use the facilities designated therein at the Airport subject to certain obligations; and

WHEREAS, the Airline seeks to construct and operate an aircraft maintenance hangar (the "Hangar") at the Airport; and

WHEREAS, the Parties are entering this early access Lease to give Airline access to the ground to allow Airline to undertake the Work, as defined herein; and

WHEREAS, the Parties will enter into two additional agreements, a Hangar Construction Agreement and a Support Facilities Hangar Lease Agreement, to govern the Hangar construction and leasing; and

NOW THEREFORE, for and in consideration of the mutual covenants and agreements herein contained, the City and the Airline do hereby mutually undertake, promise and agree, each for itself and its successors, as follows:

PART I - LEASE AND USE OF THE PROPERTY

1.01 LEASE OF GROUND.

The City hereby leases to the Airline, and the Airline hereby leases from the City, the Ground, as described in **Exhibits A-1 and A-2** hereto (the "Leased Property" or "Ground"), on the terms and conditions set forth in this Lease. The Ground includes currently unimproved land. The City expressly reserves from the lease of the Ground (i) all water, gas, oil and mineral rights in and

under the soil and (ii) a public right of flight through the air space above the Leased Property, as defined below. The parties agree that the total square footage of the Ground equals 1,535,085.87 square feet.

1.02 ACCESS.

Subject to any rules and regulations adopted and promulgated by the City regarding the Airport, including without limitation any nondiscriminatory rules and regulations governing entrance to and use of the Airport, the Airline has the right of access, ingress to and egress from the Leased Property for the Airline's employees, agents, guests, patrons, contractors, sub-contractors, and invitees, its or their suppliers of materials and furnishers of services, and its or their equipment, vehicles, machinery and other property, for the sole purpose of performing the Work; and no fee, charge or toll shall be charged directly or indirectly for access rights. The foregoing shall not preclude the City or its concessionaires or licensees from making and collecting a charge for the use of public motor vehicle parking areas located off the Ground, sightseeing facilities or ground transportation to or from the Airport furnished by the City or its concessionaires or licensees, or preclude the City from imposing any excise taxes, including without limitations, sales, use and occupation taxes, any permit or license fees, and any property taxes not inconsistent with the rights and privileges granted to the Airline hereunder.

1.03 MODIFICATION OF ACCESS ROUTE.

Upon reasonable prior written notice to the Airline, the City may, at any time, temporarily or permanently, close or consent to or request the closing of any roadway or other right-of-way for such access, ingress and egress to and from the Leased Property, and any other area at the Airport, so long as a means of access, ingress and egress reasonably equivalent to that formerly provided is substituted therefor and is concurrently made available therefor. The Airline hereby releases and discharges the City of and from any and all claims, demands or causes of action which the Airline may have against the City from time to time, arising or alleged to arise out of the closing of any roadway, taxiway/apron or other right-of-way for such access, ingress and egress to or from the Leased Property, or other area at the Airport, so long as the City has provided the Airline with reasonable, prior written notice of such closure, and makes concurrently available a means of access, ingress and egress reasonably equivalent to that existing prior to each such modification.

1.04 USE OF LEASED PROPERTY.

(A) The Airline shall have the right to use the Leased Property for purposes of preparing the site in advance of constructing the Hangar. Specifically, Airline shall be allowed to perform the following on or at the Ground: clearing and grubbing; temporary facility placement (construction trailers and batch plants); temporary utility construction (electrical and water); erosion control installation; and initial overlot grading (collectively, the "Work"). The Work shall be limited to, and performed, as set forth in the plans included at **Exhibit B**. Airline shall be exclusively responsible for obtaining, at its sole cost, any and all governmental authorizations necessary for Airline to perform the Work; provided, however the City shall assist the Airline, if necessary or required, in securing such governmental authorizations. The Airline

shall not commit waste of the Leased Property and shall not commit or permit any nuisance from or upon the Leased Property.

(B) The performance of the Work on the Leased Property shall in all respects be constructed in accordance with the ordinances and any applicable code, rule, or regulation of the City and County of Denver, including:

1. The Airport Rules and Regulations;
2. The requirements governing tenant construction specifications and other non-technical requirements in accordance with the Denver International Airport Design Standards Manual, available at <http://business.flydenver.com/bizops/bizRequirements.asp>;
3. The Denver International Airport Environmental Management System Guidelines, available at https://www.flydenver.com/about/administration/environmental_management#guidelines;
4. The Standard Specifications for Construction General Contract Conditions, 2011 Edition, available at <https://www.denvergov.org/content/dam/denvergov/Portals/743/documents/2011%20DENVER%20GENERAL%20CONTRACT%20CONDITIONS.pdf>; and
5. The requirements in any building permit obtained from the City.

(C) The performance of the Work on the Leased Property shall in all respects be constructed in accordance with the following specifications, which are attached at **Exhibit C**: 015719 – Temporary Environmental Controls; 312000 – Earthwork (For Building); 312319 – Dewatering; 315000 – Excavation Support and Protection; P-151 – Clearing and Grubbing; P-152 – Excavation, Subgrade, and Embankment; P-160 – Watering; 15000 – Temporary Facilities and Controls; 017419 – Construction Waste Management and Disposal; and 017420 -- Cleaning.

(D) In the event the parties do not enter into both (1) an Airline Support Facilities Hangar Lease Agreement and (2) a Hangar Construction Agreement, then Airline shall promptly, and at its sole cost and expense, fully restore the Ground to its condition at the time of the Effective Date.

PART II - PAYMENTS UNDER THIS LEASE

2.01 PAYMENT OF MONTHLY RENTAL.

(A) Rental payments for the Leased Property shall commence on the Effective Date (as defined in Section 9.29). The rental fee for the Ground (“Ground Rent”) shall be paid per month, pro-rata for any partial month, based upon the rental rates set forth in the City’s Airport Rules and Regulations, Part 120 Fees and Charges, at Section 120.09, available at the Airport website, https://www.flydenver.com/about/administration/rules_regulations. The current applicable annual rental rate under Section 120.09 is \$0.79 per square foot, and the Ground Rent is based upon the square footage of the Ground. The current annual Ground Rent is \$1,212,717.84 and the monthly Ground Rent is \$101,059.82. The rental rate, and thus the Ground Rent, is subject to change as

the City may update, amend or change the applicable rental rate in Part 120.

(B) The pro-rated Ground Rent for the month in which the Effective Date occurs shall be due and payable, without notice, on the Effective Date, and the Ground Rent for ensuing months shall be due and payable, without notice, on or before the first day of each month during the Lease term thereafter.

(C) Ground Rent shall be made at the office of the Airport Revenue Fund, Denver International Airport, P. O. Box 492065, Denver, Colorado 80249-2065 or at such other place in the City and County of Denver as the City may hereafter designate by notice in writing to the Airline, and shall be made in legal tender of the United States. Any check shall be received by the City subject to collection, and the Airline agrees to pay any bank charges for the collection of any such check.

(D) Any payment not made to the City when due shall accrue interest at the rate of 18% per annum commencing five (5) business days after such due date.

PART III - PROVISIONS RELATING TO THE LEASED PROPERTY

3.01 ACCEPTANCE AND INSPECTION OF THE LEASED PROPERTY.

The Airline has been given the opportunity to inspect the Ground. As of the Effective Date, subject to any representations, warranties, covenants, and obligations of the City set forth in this Lease, the Airline takes the Ground as is, where is, and with all faults.

3.02 MAINTENANCE OF THE LEASED PROPERTY.

The cost of maintenance and care of the Leased Property shall be borne by the Airline during the term of this Lease. The Airline covenants and agrees at its expense and without cost or expense to the City, during the term of this Lease, that:

(A) The Airline shall keep the Leased Property in good order and condition and will make all necessary, and appropriate repairs and replacements to the Leased Property and Work;

(B) The Airline shall not permit rubbish, debris, waste materials or anything unsightly or detrimental to health or likely to create a fire hazard or conducive to deterioration, to remain on any part of the Leased Property or to be disposed of improperly;

(C) The Airline shall at all times maintain the Leased Property in accordance with all applicable codes of the City and the Airport Rules and Regulations, as both may be amended or otherwise modified from time to time. The Airport Rules and Regulations are available at the Airport website, https://www.flydenver.com/about/administration/rules_regulations.

3.03 SUBLETTING AND ASSIGNMENT.

No interests or rights under this Lease may be transferred except as provided in this Lease.

The Airline may sublet, assign or otherwise transfer its interest in the Leased Property in whole or in part, to another company, subject, however, to each of the following conditions:

(A) No sublease, assignment, or other transfer shall relieve the Airline from primary liability for any of its obligations under this Lease, and the Airline shall continue to remain primarily liable for the payment of Ground Rent, applicable to Leased Property until such time as this Lease terminates in accordance with Section 5.01(A) or if the City re-lets the Leased Property at or above the Ground Rent amount. If the City re-lets the Leased Property for less than the Ground Rent, the Airline shall only be responsible for the difference between the new rent and the Ground Rent;

(B) The Airline shall provide written notice to the City, which notice shall include a copy of the proposed sublease, assignment, or other transfer not less than sixty (60) days prior to the effective date of such arrangement;

(C) Any sublease, assignment, or other transfer shall be subject to the prior written approval of the CEO, which approval shall not be unreasonably withheld; and

(D) No sublease, assignment or other transfer hereunder to any affiliate or subsidiary corporation of the Airline shall be permitted without compliance with all of the conditions set forth in Subsections (A), (B) and (C) above.

(E) Notwithstanding anything contained in Subsection (A) to the contrary, in the event Airline subleases, assigns, or transfers its interests under this Lease to another company ("Assignee"), Airline shall be relieved of its obligations and liabilities under the Lease if: (i) Assignee expressly assumes all of Airline's obligations and liabilities hereunder in writing and such writing is delivered to City, and (ii) Assignee has the financial capability, as reasonably determined by City, to fulfill and satisfy Airline's obligations and liabilities set forth in this Lease.

3.04 RIGHT TO ENTER AND MAKE REPAIRS.

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, upon prior written notice to the Airline, and with as little interruption to the Airline's operations as is reasonably practicable) to enter upon the Leased Property for the following purposes, it being understood and agreed that no such entry by or on behalf of the City upon the Leased Property shall cause or constitute a termination of this Lease, be deemed to constitute an interference with the Airline's possession of the Leased Property, or be considered a trespass by City:

(A) To inspect the Leased Property and Work at reasonable intervals during regular business hours (or at any time in case of emergency) to determine whether the Airline has complied and is complying with the terms and conditions of this Lease, including with respect to the Work.

(B) To perform maintenance and make repairs and replacements to the Work in any case where the Airline is obligated to do so and has failed after reasonable prior written notice to do so, in which event the Airline shall reimburse the City for the reasonable cost thereof promptly

upon demand and production by the City of documentation with respect thereto.

(C) To perform maintenance and make repairs and replacements in any case where the City is obligated to do so, and in any other case where the City, in its reasonable judgment, determines that it is necessary or desirable to do so in order to preserve the structural safety of the Leased Property and Work or to correct any condition likely to cause injuries or damages to persons or property.

(D) In the lawful exercise of the City's lawful police power.

3.05 ABANDONMENT OF LEASED PROPERTY.

If the Airline ceases to occupy and use the Leased Property for a period of six (6) consecutive months, the City, acting by and through its CEO, may consider the Leased Property abandoned, and upon not less than thirty (30) days prior written notice to the Airline, may terminate this Lease. Such notice by the City shall not relieve the Airline of its obligations under this Lease related to the termination of this Lease.

3.06 DESTRUCTION OF PROPERTY.

If the Leased Property or the Work, or any portion thereof, is damaged or destroyed by fire, flood or natural disaster (a "Casualty"), then:

(A) The Airline, after consultation and agreement with City, shall forthwith repair, reconstruct and restore the damaged or destroyed portions of the Leased Property or Work to substantially the same condition, character, utility and value as existed prior to such Casualty, unless the City and the Airline agree that no such reconstruction is necessary or that reconstruction to some other condition, character, utility and value is appropriate or desired; and

(B) If such Leased Property is damaged to such an extent that the Leased Property is untenable for the hangar in the Airline's reasonable discretion, the City, acting by and through the CEO, will make all reasonable efforts to provide substantially equivalent substitute premises, and such substitute premises will be made available to the Airline, subject to the Airline's approval, consistent with those rentals, rates, fees and charges for the use of the substitute premises at the Airport as established and modified from time to time by the City in accordance with this Lease.

3.07 ENVIRONMENTAL.

(A) Definitions.

1. "Adverse Environmental Condition" means any violation of Environmental Law or any release, threatened release, spill, or discharge of Hazardous Materials on, under, from or about the Leased Property.
2. "Environmental Law" means federal, state and local laws, ordinances, rules, regulations and common law related in any way to the protection of the environment, health or safety, including, without limitation, the Comprehensive

Environmental Response, Compensation, and Liability Act (“CERCLA”), 42 U.S.C. §9601 et seq. the Resource Conservation and Recovery Act, 42 U.S.C. §6901 et seq., whether now in effect or hereinafter enacted, promulgated, modified or amended, and including the regulations promulgated thereunder.

3. “Hazardous Materials” means any “hazardous material”, “hazardous substance,” “hazardous waste”, “toxic substance”, “pollutant”, “contaminant,” “petroleum” and “natural gas liquids,” as those terms are defined or used in Section 101 of CERCLA or any other federal, State or local law, statute, ordinance, rule or regulation applicable to the Leased Property, including any amendment of any of the foregoing, and any other substances regulated because of their effect or potential effect on public health and the environment, including, without limitation, PCBs, lead paint, asbestos (whether encapsulated or not), urea formaldehyde, and radioactive materials.
 4. “Remediation” (or its verb form “Remediate”) means any cleanup, response, removal, remedial, corrective or other action to clean up, detoxify, decontaminate, treat, contain, prevent, cure, mitigate or otherwise remedy any release, threatened release, spill, or discharge of Hazardous Materials, and any action to comply with any Environmental Law with respect to a release, threatened release, spill or discharge of Hazardous Materials.
- (B) The Airline may store and use Hazardous Materials on and at the Leased Property for lawful purposes in accordance with applicable laws, including Environmental Laws, in the ordinary course of the Airline's performance of the Work. The Airline’s use of the Leased Property shall comply with the DEN Environmental Management System Guidelines, which is subject to periodic change. Airline is responsible for keeping itself apprised of any future updated versions of the Environmental Management System Guidelines. The Airline’s use of the Leased Property shall also comply with all applicable Environmental Laws.
- (C) Remediation of Adverse Environmental Conditions.
1. Airline shall be responsible for any Adverse Environmental Conditions which occur on, at, under or from the Leased Property during the term of this Lease. Provided, however, that (i) Airline shall have no responsibility and liability for any contamination or Hazardous Materials which have migrated onto the Leased Property, except to the extent the off-site release was caused by Airline or the Airline’s officers, employees, contractors, subcontractors, or agents, and (ii) Airline shall have no responsibility or liability to the extent such adverse environmental condition was caused by the City, or its officers, employees, contractors, subcontractors, or agents (and therefore, the City shall be responsible to the extent it caused such Adverse Environmental Conditions).
 2. If there is any emergency, sudden or accidental release or threat of release of any Hazardous Materials at the Leased Property, then Airline shall (i) have the primary

responsibility for making the appropriate initial reports to the applicable federal, state or local administrative agency with applicable authority over the adverse environmental condition (the “Regulator”), and (ii) have the primary responsibility for taking the appropriate emergency actions to respond to the release or threat of release, including stopping and containing such release or threatened release.

3. Conduct of Remediation by Airline of an Adverse Environmental Conditions. The following provisions shall apply when Airline is required under this Lease to Remediate any Adverse Environmental Conditions. All of the work required to be performed by Airline under section shall be at Airline’s sole cost and expense.
 - (i) Airline shall be primarily responsible for making any and all required reports, including initial notification of any adverse environmental condition, to the Regulator.
 - (ii) Airline will conduct the Remediation of any adverse environmental condition that is the responsibility of Airline in full compliance with all applicable Environmental Laws, including when necessary removal and proper disposal of contaminants and Hazardous Materials. Unless otherwise directed by a Regulator, Airline’s Remediation shall restore the applicable contaminated soils and groundwater to non-residential cleanup standards or their equivalent. Airline will cause all such Remediation to be performed by a fully certified and licensed contractor in full compliance with applicable local, state, and federal laws, regulations, and ordinances, including DEN Rules and Regulations.
 - (iii) Airline will cause all such Remediation, including the submittal of any required periodic reports to the Regulator, to be commenced and performed within a reasonable time and with reasonable due diligence, keeping in mind Airline’s business needs, until all legally applicable Remediation standards have been met and the Regulator has issued a “No Further Action Letter”, or its reasonable equivalent, stating that no further Remediation is presently required under Environmental Law (a “No Further Action Letter”).
 - (iv) Airline shall provide the City with a copy of any environmental report prepared by Airline or its agents that is submitted to a Regulator within thirty (30) days after its submission.
 - (v) Airline shall provide the City with quarterly progress reports while there is any on-going Remediation being performed by Airline. The quarterly reports shall be submitted to the City on April 1, July 1, October 1 and January 5.

- (vi) Within ten (10) days of receiving the No Further Action Letter, Airline shall deliver a copy of the No Further Action Letter to the City. By no later than 60 days (or if more than 60 days is needed to perform such action, such reasonable time period as is necessary) after Airline's receipt of the No Further Action Letter, Airline shall, at its sole cost and expense, restore the Leased Property, and any improvements located on any other portion of the Airport impacted by the Remediation, to the condition that existed before the commencement of any Remediation, reasonable wear and tear excepted, by the Airline to address the adverse environmental condition.

- (vii) In the event the Airline is no longer in possession of the Leased Property, or no longer has access to the Airport, as necessary to perform Remediation, then prior to entry onto the Leased Property to conduct such Remediation, Airline shall provide seven (7) days prior written notice to the City, which notice shall include the identity of the entities and individuals who will require access and a description of the work to be performed. Airline agrees that, prior to accessing the Leased Property or Airport to undertake any Remediation, Airline shall provide or cause its contractors, agents and consultants to provide the City with certificates of insurance, from an insurance company licensed to do business in the State of Colorado, for each and every entity entering the Leased Property or Airport, evidencing liability insurance in the amount of at least One Million and 00/100 Dollars (\$1,000,000.00) per occurrence and Two Million and 00/100 Dollars (\$2,000,000.00) in the aggregate for personal injury and property damage, and Environmental Liability insurance and professional errors and omissions insurance with a limit of not less than Five Million and 00/100 Dollars (\$5,000,000.00) for each occurrence and in the aggregate. The City shall be named as an additional insured on all such required insurance policies.

(E) The obligations set forth in Section 3.07 shall survive the expiration or early termination of the Lease except to the extent the Support Facilities Lease Agreement supersedes such provisions.

(F) The provisions of this Section 3.07 shall be the exclusive section in this Lease governing and addressing environmental issues.

PART IV - GENERAL PROVISIONS

4.01 “CEO” DEFINED.

As used in this Lease, the term the “CEO” shall mean the Chief Executive Officer of the City’s Department of Aviation or the CEO’s successor in function having jurisdiction over the management, operation and control of the Airport.

4.02 CEO’S AUTHORIZED REPRESENTATIVE.

Wherever reference is made herein to the "CEO's authorized representative", or words of similar import are used, shall mean the Senior Vice President of Airline and Commercial Affairs or his/her successor in function (the “SVP”). The SVP shall be such authorized representative of said CEO until notice otherwise is hereafter given to the Airline.

4.03 AGREEMENTS WITH THE UNITED STATES.

This Lease is subject and subordinate to the provisions of any agreements between the City and the United States relative to the operation or maintenance of the Airport, the execution of which has been or may be required as a condition precedent to the transfer of federal rights or property to the City for airport purposes, or to the expenditure of federal funds for the extension, expansion or development of the Airport, including the expenditure of federal funds for the development of the Airport in accordance with the provisions of the Airport and Airway Improvement Act of 1982, as amended. The provisions of *Appendix 1*, attached hereto, are incorporated herein.

4.04 BOND ORDINANCE.

This Lease is in all respects subject and subordinate to any and all City bond ordinances applicable to the Airport and airport system and to any other bond ordinances which should amend, supplement or replace such bond ordinances.

The parties to this Lease acknowledge and agree that all property subject to this Lease which was financed by the net proceeds of tax-exempt bonds is owned by the City, and the Airline agrees not to take any action that would impair, or omit to take any action required to confirm, the treatment of such property as owned by the City for purposes of Section 142(b) of the Internal Revenue Code of 1986, as amended. In particular, the Airline agrees to make, and hereby makes, an irrevocable election (binding on itself and all successors in interest under this Lease) not to claim depreciation or an investment credit with respect to any property subject to this Lease which was financed by the net proceeds of tax-exempt bonds and shall execute such forms and take such other action as the City may request in order to implement such election.

4.05 LAWS, REGULATIONS AND AGREEMENTS TO BE OBSERVED; DISPUTE RESOLUTION.

(A) The Airline shall not use, or permit the use by parties authorized by the Airline, the

Leased Property, or any other portion thereof, or any part of the Airport to which it is granted a right of use or occupancy by this Lease, for any purpose or use other than those authorized by this Lease, or hereafter authorized in writing by the CEO. No use shall be considered authorized by this Lease if such use would adversely affect the tax exempt status of Airport Revenue Bonds.

(B) The Airline shall comply with and shall cause its officers, employees, agents, contractor, and any other persons over whom it has control to comply with all rules and regulations governing the use of the Leased Property and any other portion of the Airport used by the Airline pursuant to this Lease as may from time to time be adopted and promulgated by the City for the management, operation and control of the Leased Property, including those pertaining to the operation of automobile and vehicular traffic and parking facilities thereon, and with such reasonable amendments, revisions, additions and extensions thereof as may from time to time be adopted and promulgated.

(C) The Airline shall, at all times, faithfully obey and comply with all existing and future laws, rules and regulations adopted by federal, state, local or other governmental bodies and applicable to or affecting the Airline and its operations and activities in and at the Airport, including the Leased Property, and also including using the Air Operations Area, as defined in section 9.11 in accordance with the Federal Aviation Administration's (FAA) flight tracks and other restrictions and limitations regarding noise emanating from departing aircraft from the Airport, as set forth in the Final Environmental Impact Statement for the New Denver Airport.

(D) It is agreed and understood by the parties hereto that disputes arising under or related to this Lease shall be resolved by administrative hearing which shall be conducted in accordance with the procedures set forth in Section 5-17 of the Denver Revised Municipal Code ("D.R.M.C."). The parties hereto agree that the CEO's determination resulting from said administrative hearing shall be final, subject only to the Airline's right to appeal the determination under Colorado Rule of Civil Procedure 106.

PART V - TERM OF LEASE

5.01 TERM OF LEASE.

(A) The term of this Lease shall commence on the Effective Date and shall terminate on the earlier to occur of:

1. One (1) year from the Effective Date (the "Term");
2. Any early termination in accordance with this Article V or Article VIII;
3. 120 days after the Effective Date, provided that the parties mutually agree, in writing, that despite their best and reasonable efforts to come to terms on a Support Facilities Hangar Lease Agreement and a Hangar Construction Agreement, the parties cannot agree on the final terms and conditions of those agreements;
4. The Date on which both (1) an Support Facilities Hangar Lease

Agreement and (2) a Hangar Construction Agreement between the parties become effective; or

5. At the City's or Airline's option, the date on which the Airport Use Agreement expires or terminates in accordance with its terms, and no new replacement use and lease agreement is executed.

5.02 TERMINATION OF LEASE BY AIRLINE.

The Airline, at its option, may also declare this Lease terminated upon the happening of any one or more of the following events:

(A) If by reason of any action or non-action of any federal or other governmental agency having jurisdiction to grant a certificate of convenience and necessity, or similar document, authorizing the Airline to operate aircraft in or out of the Airport (including action in the nature of alteration, amendment, modification, suspension, cancellation or revocation of any such certificate, permit or document), the Airline shall cease to have authority to operate aircraft in or out of the Airport pursuant to such a certificate or document, provided that (i) such governmental action or non-action was not requested by the Airline, and the Airline made all reasonable efforts to prevent such governmental action or non-action, or in the alternate, (ii) the City had a reasonable opportunity to appear before such federal or other governmental agency and be heard in opposition to such governmental action or non-action prior to the occurrence, if it desired to do so or, in the alternate, (iii) the Airline gave the City reasonable advance notice that such governmental action or non-action was being requested or might occur, and the Airline made a reasonable effort to the end that the City might have an opportunity to appear and be heard as aforesaid; or

(B) If by legislative action of the United States the Airline is deprived of such certificate or similar document; or

(C) If a court of competent jurisdiction issues an injunction or restraining order against the City or any successor body to the City preventing or restraining the Airport for airport purposes in its entirety, or the use of any part thereof which may be used by the Airline and which is substantially necessary to the Airline for its operations, and if such injunction remains in force for a period of ninety (90) days or more and is not stayed by appeal or a writ of error; or

(D) If the City's operation of the Airport is substantially restricted by action of any federal or other governmental agency having jurisdiction with respect thereto which substantially and adversely affects, for a period of at least ninety (90) days, the Airline's use of the Airport in the conduct of its air transportation business; provided, however, that none of the foregoing is due primarily to any fault of the Airline.

5.03 EFFECTIVE DATE OF TERMINATION.

Notwithstanding anything to the contrary in this Lease, no termination declared by either party shall be effective until not less than thirty (30) days have elapsed after written notice to the other specifying the date upon which such termination shall take effect and the cause for which it is being terminated (and if such termination is by reason of a default under this Lease for which

termination is authorized, identifying such default with reasonable certainty). No such termination shall be effective if such cause shall have been cured or obviated during such thirty (30) day period, or in the event such cause is a default under this Lease (for which termination is authorized) and if by its nature such default cannot be cured within such thirty (30) day period, such termination shall not be effective if the party in default commences to correct such default within said thirty (30) days and corrects the same as promptly as reasonably practicable; provided that the thirty (30) day period shall not apply to termination declared for failure of the Airline to pay Ground Rent, for which termination may be declared by the City upon fifteen (15) days' written notice, unless the Airline remedies such default within such fifteen (15) day period; and provided further that the Airline will be allowed only two (2) notices of default with respect to non-payment of Ground Rent in any one year which it may cure. Upon termination of this Lease, the parties hereto shall be relieved from all obligations hereunder except for those provisions expressly providing survival of any termination. The right of any party hereto to terminate this Lease shall not in any manner affect or limit such party's right to exercise any other right or remedy it may then have under applicable law.

5.04 SURRENDER AND HOLDING OVER.

(A) The Airline covenants that at the expiration or early termination of the Lease, it will quit and surrender such Leased Property in good state and condition, except for reasonable wear and tear, and damage due to the negligent or willful act or omission of the City. The City shall have the right on such termination to enter upon and take possession of such Leased Property with or without process of law, without liability for trespass.

(B) Should the Airline hold over the use of or continue to occupy any portion of such Leased Property after the expiration of the term of this Lease, such holding over shall be deemed merely a tenancy from month to month. The Ground Rent for each month of such holding over shall be paid as required by Section 2.01. All conditions as herein or hereafter provided shall remain the same, except for term. If the Airline holds over, either party may, with or without cause, cancel or terminate said tenancy by giving not less than thirty (30) days prior written notice to the other party; provided, however, that notwithstanding the preceding sentence, City may undertake any lawful action to remove Airline if Airline holds over. Said notice shall set out the date of such cancellation and termination.

PART VI - PERFORMANCE BOND, INDEMNIFICATION AND INSURANCE

6.01 PERFORMANCE AND PAYMENT BOND.

(A) *Surety Bonds.*

- a. Payment and performance bonds must be issued by a corporate surety authorized to do business in the State of Colorado and approved by the Mayor, the CEO and the City Attorney.
- b. Before the Work can begin, Airline shall have furnished such surety bonds and appropriate Powers of Attorney as a guarantee of the faithful performance of the Work under this Agreement and the payment of bills for labor and materials incurred performing the

Work.

- c. The CEO may direct, at her sole discretion, that the required payment and performance bonds be combined in a format approved by the City Attorney. The Surety Bond shall be in the form set forth herein at **Exhibit D**.

(B) *Performance Bond*. Airline must procure and pay for a performance bond which, when executed by the Airline and surety, shall be a guarantee for the faithful performance and completion of the Work in strict accordance with the terms of this Agreement. The performance bond shall also be a guarantee for the repair or replacement of all Work found to be defective or otherwise unacceptable through any warranty and guarantee periods. This bond shall be in the amount of one hundred percent (100%) of the dollar value of the Contract, which is Five Million, Five-Hundred Thousand Dollars and no Cents (\$5,500,000.00).

(C) *Payment Bond*. Airline must procure and pay for a payment bond which, when executed by the Airline and surety, shall be a guarantee that all those performing labor or furnishing materials, supplies, rental items, tools, and equipment for the performance of the Work under this Agreement shall be paid. This bond shall be in the amount of one hundred percent (100%) of the dollar value of the Contract, which is Five Million, Five-Hundred Thousand Dollars and no Cents (\$5,500,000.00), and it shall meet the requirements of C.R.S. §38-26-101, et seq, as amended.

6.02 INDEMNIFICATION.

(A) Airline agrees to indemnify and save harmless the City, its officers, agents and employees, from and against (1) any and all loss of or damage to property, or injuries to, or death of, any person or persons, including property and officers, employees and agents of the City; and (2) all claims, damages, suits, costs, expense, penalties, liability, actions or proceedings of any kind or nature whatsoever, of or by anyone whomsoever, which, with respect to clauses (1) and (2) hereof, in any way result from, or arise out of, Airline's operations under this Lease, or its use or occupancy of any portion of the Airport and the acts, omissions, or wrongful conduct of officers, employees, agents, contractors or subcontractors of the Airline, including without limitation, the provision or failure to provide security as herein required, and the use, disposal, generation, transportation or release of Hazardous Substances at the Airport by the Airline, its contractors, employees, agents, customers, or anyone claiming or acting by or through the Airline.

(B) Airline further agrees that if a prohibited incursion into the Air Operations Area occurs, or the safety or security of the Air Operations Area, the Airfield, or other sterile area safety or security is breached by or due to the negligence or willful act or omission of any of Airline's employees, agents, or contractors and such incursion or breach results in a civil penalty action being brought against the City by the U.S. Government, Airline agrees to reimburse the City for all expenses, including reasonable attorney fees, incurred by the City in defending against the civil penalty action and for any civil penalty or settlement amount paid by the City as a result of such incursion or breach of airfield or sterile area security. The City shall notify Airline of any allegation, investigation, or proposed or actual civil penalty sought by the U.S. Government for such incursion or breach. Civil penalties and settlement and associated

expenses reimbursable under this Paragraph include but are not limited to those paid or incurred as a result of violation of Transportation Security Administration (TSA) regulations, including 49 CFR, Subtitle B, Chapter XII, as it may be amended, or any similar law or regulations intended to replace or compliment such regulations.

(C) The terms of this indemnity include an agreement by Airline to indemnify, defend and hold harmless the City from and against any and all expense, loss, claim, damage, or liability suffered by City by reason of Airline's breach of any environmental requirement existing under federal, state or local law, regulation, order or other legal requirement in connection with any of Airline's acts, omissions, operations or uses of property relating to this Agreement, or such a breach by the act or omission of any of Airline's officers, employees, agents, or invitees, whether direct or indirect, or foreseen or unforeseen, including (but not limited to) all cleanup and remedial costs actually and reasonably incurred to satisfy any applicable remediation obligation required by federal, state or local law; and reasonable legal fees and costs incurred by City in connection with enforcement of this provision, but excluding damages solely relating to diminution in value of City real property.

(D) Provided however, notwithstanding anything to the contrary contained in this Lease, the City agrees that (1) the Airline need not save harmless or indemnify the City against damage to or loss of property, or injury to or death of persons, caused by the negligence or willful acts of the City, its officers, employees, contractors and agents, and (2) the City will give prompt written notice to the Airline of any claim or suit and the Airline shall have the right to assume the defense and compromise or settle the same to the extent of its own interest.

6.03 INSURANCE.

(A) *General Conditions.* Airline agrees to secure, at or before the time of execution of this Lease, the following insurance covering all operations, goods or services provided pursuant to this Lease. Airline shall keep the required insurance coverage in force at all times during the term of the Lease, or any extension thereof, during any warranty period, and for three (3) years after termination of the Lease. 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. If any policy is in excess of a deductible or self-insured retention, the City must be notified by the Airline. Airline shall be responsible for the payment of any deductible or self-insured retention. The insurance coverages specified in this Lease are the minimum requirements, and these requirements do not lessen or limit the liability of the Airline. The Airline 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 Lease.

(B) *Proof of Insurance.* Airline shall provide a copy of this Lease to its insurance agent or broker. Airline may not commence services or work relating to the Lease prior to placement of coverages required under this Lease. Airline shall provide a certificate of insurance, as an ACORD certificate, to the City as provided at Section 3.6.12.7. If Airline carries limits for required coverage in amounts greater than the minimum limits referenced herein, those greater limits shall be referenced on Airline's 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 Lease shall not act as a waiver of Airline's breach of this Lease or of any of the City's rights or remedies under this Lease. The City's Risk Management Office may require additional proof of insurance, including but not limited to policies and endorsements.

(C) *Additional Insureds.* For Commercial General Liability, Business Auto Liability and Excess Liability/Umbrella (if required), Airline and subcontractor's insurer(s) shall include the City and County of Denver, its elected and appointed officials, employees, agents and volunteers as additional insured (with the exception of Workers' Compensation).

(D) *Waiver of Subrogation.* For all coverages required under this Lease (with the exception of Professional Liability, if required), Airline's insurer shall waive subrogation rights against the City and County of Denver, its elected and appointed officials, employees, agents and volunteers.

(E) *Subcontractors and Subconsultants.* All subcontractors and subconsultants (including independent contractors, suppliers or other entities providing goods or services allowed under this Lease) (collectively "Subcontractors") shall be subject to all of the requirements herein and shall procure and maintain the same coverages required of the Airline. Airline shall include all such Subcontractors as additional insured under its policies (with the exception of Workers' Compensation) or shall ensure that all such Subcontractors maintain the required coverages. Airline shall provide the City's Risk Management Office with proof of insurance for all such Subcontractors.

(F) *Workers' Compensation and Employer's Liability Insurance.* Airline shall maintain the coverage as required by statute for each work location and shall maintain Employer's Liability insurance with limits of \$100,000 per occurrence for each bodily injury claim, \$100,000 per occurrence for each bodily injury caused by disease claim, and \$500,000 aggregate for all bodily injuries caused by disease claims. Airline expressly represents to the City, as a material representation upon which the City is relying in entering into this Lease, that none of the Airline's officers or employees who may be eligible under any statute or law to reject Workers' Compensation Insurance shall effect such rejection during any part of the term of this Lease, and that any such rejections previously effected, have been revoked as of the date Airline executes this Lease.

(G) *Commercial General Liability.* Airline shall maintain limits of \$1,000,000 for each occurrence, \$1,000,000 for each personal and advertising injury claim, \$2,000,000 products and completed operations aggregate, and \$2,000,000 policy aggregate.

(H) *Business Automobile Liability.* Airline shall maintain a limit of \$1,000,000 combined single limit applicable to all owned, leased, hired and non-owned vehicles used in performing services under this Lease; an increased limit of \$10,000,000 combined single limit is required for unescorted vehicle access airside. If transporting wastes, hazardous material, or regulated substances, Airline shall carry a pollution coverage endorsement and an MCS 90 endorsement on their policy. Transportation coverage under the Contractors Pollution Liability policy shall be an acceptable replacement for a pollution endorsement to the Business Automobile Liability policy.

(I) *Excess/Umbrella Liability.* Airline may maintain excess policy(ies) where desired to achieve minimum required coverage limits. Coverage must be written on a “follow form” or broader basis. Any combination of primary and excess coverage may be used to achieve required limits.

(J) *Professional Liability (Errors & Omissions).* Airline shall maintain limits of \$1,000,000 per claim and \$1,000,000 policy aggregate limit.

(K) *Contractors Pollution Liability.* Airline shall maintain limits of \$1,000,000 per occurrence and \$2,000,000 policy aggregate. Policy to include bodily injury; property damage including loss of use of damaged property; defense costs including costs and expenses incurred in the investigation, defense or settlement of claims; and cleanup costs.

(L) *Additional Provisions.*

1. For Commercial General Liability, the policy must provide that this Lease is an Insured Contract under the policy.
2. Defense costs are outside the limits of liability.
3. A severability of interests or separation of insureds provision (no insured vs. insured exclusion) is included.
4. A provision that coverage is primary and non-contributory with other coverage or self-insurance maintained by the City.
5. Each certificate and related policy shall contain a valid provision requiring notification to the City in the event any of the required policies be canceled or non-renewed or reduction in coverage before the expiration date thereof. Such written notice shall be sent to the parties identified in the Notices section of this Lease. Said notice shall be sent thirty (30) days prior to such cancellation or non-renewal or reduction in coverage 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, Airline shall provide written notice of cancellation, non-renewal and any reduction in coverage to the parties identified in the Notices section by certified mail, return receipt requested within three (3) business days of such notice by its insurer(s). Each provided certificate of insurance and related insurance policy endorsement shall provide a provision that “This policy will not be materially changed or altered or canceled or nonrenewed without first giving thirty (30) days written notice by certified mail, return receipt requested, to the CEO, Department of Aviation, Denver International Airport, AOB - 9th Floor, 8500 Peña Boulevard, Denver, Colorado 80249-6340.”

6. All policies shall be written on an occurrence form. If an occurrence form is unavailable, claims-made coverage may be accepted by the City provided the retroactive date is on or before the Lease effective date or the first date when any Work first commences, whichever is earlier.
7. Certificate insurance shall be issued and provided to: City and County of Denver, Attn: Risk Management, Suite 8810, Chief Executive Officer, Denver International Airport, 8500 Pena Boulevard, Denver, CO 80249.
8. Certificate of Insurance and Related Endorsements. The City's acceptance of any submitted insurance certificate is subject to the approval of DEN Risk Management. All coverage requirements specified in the certificate shall be enforced unless waived or otherwise modified in writing by DEN Risk Management. Airline is solely responsible for ensuring all formal policy endorsements are issued by their insurers to support the requirements here.
9. Governmental Immunity. The parties hereto understand and agree that the City and County of Denver, its officers, officials and employees, are relying on, and do not waive or intend to waive by any provisions of this Lease, the monetary limitations or any other rights, immunities and protections provided by the Colorado Governmental Immunity Act, § 24-10-101 to 120, C.R.S., or otherwise available to the City and County of Denver, its officers, officials and employees.

6.04 LIENS.

(A) Except to the extent inconsistent with other provisions of this Lease, the Airline covenants and agrees to pay promptly all lawful taxes, excises, license fees and permit fees applicable to its operations at the Leased Property and to take out and keep current all licenses, municipal, state or federal, required for the performance of the Work upon said Leased Property, and further agrees not to permit any of said taxes, excises or license fees to become delinquent. The Airline also covenants and agrees not to permit any mechanic's or materialman's or any other lien to be foreclosed upon the Leased Property and improvements thereto or thereon, or any part or parcel thereof, by reason of any work or labor performed or materials furnished at the request of the Airline by any mechanic or materialman. The Airline further covenants and agrees, except for amounts contested by the Airline, to pay promptly when due all bills, debts and obligations incurred by it in connection with its operation of said business on the Airport, and not to permit the same to become delinquent and to suffer no lien, mortgage, judgment or execution to be filed against the Leased Property which will in any way impair the rights of the City under this Lease. The Airline shall have the right to contest any such mechanic's, materialman's or any other lien, and the Airline shall not, pending the termination of such contest, be obligated to pay, remove or otherwise discharge such lien or claim. Airline shall provide the City with prompt notice of any such contests. The Airline agrees to indemnify and save harmless the City from any loss as a result of the Airline's action as aforesaid.

(B) If the Airline shall in good faith proceed to contest any such tax, assessment or other public charge, or the validity thereof, by proper legal proceedings which shall operate to prevent the collection thereof or to prevent the appointment of a receiver because of nonpayment of any such taxes, assessments or other public charges, the Airline shall not be required to pay, discharge or remove any such tax, assessment or other public charge so long as such proceeding is pending and not disposed of; provided, however, that the Airline, within a reasonable amount of time before any such tax, assessment or charge shall become delinquent, shall give notice to the City of the Airline's intention to contest its validity. If such notice is so given by the Airline to the City and such contest is conducted in good faith by the Airline, the City shall not, pending the termination of such legal proceedings, pay, remove or discharge such tax, assessment or other charge.

6.05 LOSS OR DAMAGE TO PROPERTY.

The City shall not be liable for any loss of property by theft or burglary from the Leased Property and Work or for any damage to person or property on the Leased Property resulting from (i) airport operations during the term of this Lease including but not limited to operating electric lighting, (ii) wind, water, rain or snow, which may come into or issue or flow from any part of said Leased Property, (iii) any pipes, plumbing, wiring, gas or sprinklers (iv) any Casualty, or (v) other cause whatsoever, and the Airline hereby covenants and agrees to make no claim for any such loss or damage at any time. This Section 6.05 shall not apply to any environmental issues at the Leased Property.

6.06 FORCE MAJEURE.

Neither the City nor the Airline shall be deemed to be in breach of this Lease by reason of failure to perform any of its obligations under this Lease if, while and to the extent that such failure is due to embargoes, shortages of materials, acts of God, acts of the public enemy, acts of superior governmental authority, sabotage, strikes, boycotts, labor disputes, weather conditions, riots, rebellion and any circumstances for which it is not responsible and which are not within its reasonable control. This provision shall not apply to failures by the Airline to pay Monthly Rental or other charges, or to make any other money payment whatsoever required by this Lease, except in those cases where provision is made in this Lease for the abatement of such rents, fees, charges or payments under such circumstances.

PART VII - QUIET ENJOYMENT; INCONVENIENCES DURING CONSTRUCTION

7.01 COVENANT OF QUIET ENJOYMENT.

Upon the payment by the Airline of the Ground Rent and all amounts payable under Section 2.01, and without prejudice to the City's rights available for uncured defaults by the Airline, the City covenants that the Airline shall peacefully have and quietly enjoy the Leased Property, licenses and privileges granted herein; provided, however, it is recognized that certain temporary inconveniences may occur during construction, as described more fully in Section 7.02, below.

7.02 INCONVENIENCES DURING CONSTRUCTION.

The Airline recognizes that from time to time during the term of this Lease it will be necessary for the City to initiate and carry forward extensive programs of construction, reconstruction, expansion, relocation, maintenance and repair in order that the Airport and its facilities may be suitable for the volume and character of air traffic and flight activity which will require accommodation, and that such construction, reconstruction, expansion, relocation, maintenance and repair may inconvenience the Airline in its operations at the Airport. The Airline agrees that no liability shall attach to the City, its officers, agents, employees, contractors, subcontractors and representatives by reason of minor inconvenience or minor discomfort as a result of such action and, for and in further consideration of the Lease, the Airline waives any right to claim damages or other consideration for such minor inconvenience or minor discomfort.

PART VIII - EVENTS OF DEFAULT AND REMEDIES

8.01 EVENTS OF DEFAULT DEFINED.

The occurrence of any one or more of the events described in the following subsections (A) through (D) of this Section 8.01 shall constitute a "default" for all purposes of this Lease; and each such default shall, after the giving of notice, if any, passage of time, if any, or occurrence of an event, if any, specified in the subsection describing such default, constitute an "event of default" for all purposes of this Lease:

(A) Failure by the Airline to pay when due any Ground Rent required to be paid under this Lease, after fifteen (15) days' prior written notice and an opportunity to cure.

(B) Any material breach by the Airline of any of its representations or warranties made in this Lease, any failure by the Airline to make any payment required to be made by it hereunder or any failure by the Airline to observe and perform any of its covenants, conditions or agreements made on its part to be observed or performed hereunder, other than failure to pay Ground Rent, which is addressed in Section 8.01(A), for a period of 30 days after written notice specifying such breach, failure to pay or failure to observe and perform and requesting that it be remedied, given to the Airline by the City in writing, unless (i) the City shall agree in writing to an extension of such time prior to its expiration or (ii) if the breach or failure to observe and perform be such that it can be corrected but cannot be corrected within the applicable period, corrective action is instituted by the Airline within the applicable period and is being diligently pursued.

(C) The dissolution or liquidation of the Airline; or the filing by the Airline of a voluntary petition in bankruptcy; or the entry of an order for relief under Title 11 of the United States Code, as the same may from time to time be hereafter amended, against the Airline; or the filing of a petition or answer proposing the entry of an order for relief against the Airline under Title 11 of the United States Code, as the same may from time to time be hereafter amended, or proposing the reorganization, arrangement or debt readjustment of the Airline under any present or future federal bankruptcy act or any similar federal or state law in any court and the failure of said petition or answer to be discharged or denied within 90 days after the filing thereof; or the appointment of a custodian (including without limitation a receiver, trustee or liquidator of the Airline) of all or a substantial part of the property of the Airline, and the failure of such a custodian

to be discharged within 90 days after such appointment; or the taking by such a custodian of possession of the Airline or a substantial part of its property, and the failure of such taking to be discharged within 90 days after such taking; or the Airline's consent to or acquiescence in such appointment or taking; or assignment by the Airline for the benefit of its creditors; or the entry by the Airline into an agreement of composition with its creditors.

(D) Any other breach by the Airline of any provision of the Airport Use and Lease Agreement for a period of 30 days after written notice from the City specifying such breach and requesting that it be remedied, (i) unless the City shall agree in writing to an extension of time, prior to the expiration of the initial period, or (ii) unless such breach is such that it can be corrected but cannot be corrected within the applicable time period and corrective action is instituted by the Airline within the applicable time period and is being diligently pursued; provided, however, that if any breach has resulted in a termination of the Airport Use and Lease Agreement in accordance with its terms, this Lease shall, at the City's or the Airline's option, terminate in accordance with Section 5.01 hereof upon the termination of the Airport Use and Lease Agreement.

8.02 REMEDIES ON DEFAULT.

Whenever any default referred to in Section 8.01 shall have happened and is continuing, the City shall have the right, at the City's election, then or at any time thereafter until such event of default has been cured or obviated, and subject to Section 5.03, to exercise any one or more of the following remedies:

(A) The City may terminate this Lease, effective at such time as may be specified by written notice to the Airline, and demand (and, if such demand is refused, recover) possession of the Leased Property from the Airline. The City shall, by notice in writing to the Airline upon the occurrence and continuation of an event of default described in subsection (A), (B) or (C) of Section 8.01, declare all Ground Rent due at such point in time and payable under this Lease to be due and payable immediately, based upon the then current ground rental rate, if concurrently with or prior to such notice the unpaid principal amount of the Performance Bonds shall have become due and payable, and upon any such declaration the Ground Rent shall become and be immediately due and payable; provided, however, that the City shall not be required to take any action under this Section 8.02(A) with respect to an event of default under subsections (A), (B) or (C) of Section 8.01 hereof;

(B) The Airline shall remain liable to the City for damages in an amount equal to the Ground Rent and other payments required to be paid under this Lease and any other sums which would have been owing by the Airline hereunder for the balance of the term;

(C) The City may reenter and take possession of the Leased Property or any part thereof, without demand or notice to the extent allowed by law, and repossess the same and expel the Airline and any party claiming by, under or through the Airline, and remove the effects of both using such force for such purposes as may be necessary, to the extent allowed by law, without being liable for prosecution on account thereof or being deemed guilty of any manner of trespass, and without prejudice to any remedies for arrears of rent or right to bring any proceeding for breach of covenants or conditions. No such reentry or taking possession of the Leased Property by the City shall be construed as an election by the City to terminate this Lease unless a written

notice of such intention is given to the Airline. No notice from the City hereunder or under a forcible entry and detainer statute or similar law shall constitute an election by the City to terminate this Lease unless such notice specifically so states. The City reserves the right, following any reentry or reletting, to exercise its right to terminate this Lease by giving the Airline such written notice, in which event the Lease will terminate as specified in said notice. After recovering possession of the Leased Property, the City shall use commercially reasonable efforts to relet the Leased Property for such term or terms and on such conditions and upon such other terms as the City, in its sole reasonable discretion, may determine. The City may make such repairs, alterations or improvements as the City may consider appropriate to accomplish such reletting, and the Airline shall reimburse the City upon demand for all costs and expenses, including attorneys' fees, which the City may incur in connection with such reletting. The City may collect and receive the rents for such reletting, but the City shall in no way be responsible or liable for any failure to relet the Leased Property following the use of commercially reasonable efforts to do so, or for any failure to collect any rent due upon such reletting. Notwithstanding the City's recovery of possession of the Leased Property, the Airline shall continue to timely pay Ground Rent payments payable under this Lease and other amounts which would be payable hereunder if such repossession had not occurred.

(D) The City may take whatever action at law or in equity may appear necessary or desirable to collect the payments and other amounts then due and thereafter to become due hereunder or to enforce performance and observance of any obligation, agreement or covenant of the Airline under this Lease.

8.03 NO REMEDY EXCLUSIVE.

No remedy herein conferred upon or reserved to the City is intended to be exclusive of any other available remedy or remedies, but each and every such remedy shall be cumulative and shall be in addition to every other remedy given under this Lease or now or hereafter existing at law or in equity or by statute. No delay or omission to exercise any right or power accruing upon any default shall impair any such right or power or shall be construed to be a waiver thereof, but any such right and power may be exercised from time to time and as often as may be deemed expedient.

8.04 AGREEMENT TO PAY FEES AND EXPENSES OF COUNSEL.

In the event the Airline should default under any of the provisions of this Lease and the City should employ Counsel or incur other expenses for the collection of the amounts due hereunder or the enforcement or performance or observance of any obligation or agreement on the part of the Airline herein contained, the Airline agrees that it will on demand therefor pay to the City or, if so directed by the City, to the Counsel for the City, the reasonable fees of such Counsel and such other reasonable expenses so incurred by or on behalf of the City.

PART IX - MISCELLANEOUS PROVISIONS

9.01 LEASE BINDING.

This Lease shall be binding on and extend to any successors of the respective parties hereto.

9.02 PARAGRAPH HEADINGS AND INDEX.

The paragraph or Section headings and index or table of contents contained herein are for convenience and reference only and are not intended to define or limit the scope of any provision of this Lease.

9.03 LEASE DOCUMENTS; ORDER OF PRECEDENCE.

(A) This Agreement consists of Articles I through IX which precede the signature page, and the following attachments which are incorporated herein and made a part hereof by reference (the "Lease Documents"):

Appendix 1	Standard Federal Assurances
Exhibits A-1 and A-2	Leased Property/Ground
Exhibit B	Airline's Work
Exhibit C	Specifications
Exhibit D	Sample Surety Bond

(B) In the event of an irreconcilable conflict between a provision of Articles I through IX and any of the listed attachments or between provisions of any attachments, such that it is impossible to give effect to both, the order of precedence to determine which document shall control to resolve such conflict, is as follows, in descending order:

- Appendix 1
- Articles I through IX hereof
- Exhibits A-1 and A-2
- Exhibit B
- Exhibit C
- Exhibit D

9.04 SIGNS.

The Airline agrees that no signs or advertising displays shall be painted on or erected in any manner upon its Leased Property without the prior written approval of the City's CEO or the CEO's authorized representative which consent shall not be unreasonably withheld, conditioned or delayed; and that signs identifying the Airline will conform to reasonable standards established by the CEO, or the CEO's authorized representative, with respect to type, size, design, location and content.

9.05 VENDING MACHINES.

No telecommunication devices, personal computers, amusement or vending machines or other machines, in each case operated by coins or tokens, cards, paper currency, or any imaging or voice process, and no cash machines or pay telephones shall be installed or maintained in or upon the Leased Property except with the permission of the Airline and the CEO and the number, type, kind and locations thereof shall be in the discretion of the CEO and the Airline. This prohibition includes, but not by way of limitation, sales from vending machines of such items as cigarettes, candy, maps, coffee, soft drinks, newspapers, stamps and insurance policies; telephones; dispensation of cash, money orders and checks; and operation of mechanical or electronic game devices, electronic video games, entertainment devices, phone cards and internet access. The Airline shall not permit the installation of any such machines, except by a concessionaire authorized by the CEO and subject to and in accordance with the concessionaire's agreement with the City. If and when the City permits the installation of vending machines in its Leased Property, the Airline shall make no charge to the concessionaire for the privilege of installing or maintaining such machines, except that if the Airline provides the electric current or water to the concessionaire a reasonable charge may be made to cover the cost of the electricity and water consumed, and all fees paid by the concessionaire for the privilege shall be the property of the City. The foregoing notwithstanding, nothing in this Section 9.05 shall prevent the Airline, or its officers, employees, agents, contractors and invitees, from operating cell phones, computers and similar business or personal equipment on and within the Leased Property.

9.06 PURCHASES BY AIRLINE.

Property, services and materials (except as otherwise provided in this Lease) may be purchased or otherwise obtained by the Airline from any person or corporation of its choice and no unjust, or unreasonable discriminatory limitations, restrictions, charges or conditions shall be imposed by the City, directly or indirectly, against the Airline or its suppliers for the privilege of purchasing, selling, using, storing, withdrawing, handling, consuming, loading, unloading or delivering any personal property of the Airline, by the Airline or its suppliers, or for the privilege of transporting such personal property to, from or on the Airport.

9.07 NON-DISCRIMINATION.

The Airline, for itself, its successors and assigns, as a part of the consideration of this Lease does hereby agree as follows:

(A) As more fully set forth in Appendix 1 attached hereto and incorporated herein by reference, if facilities are constructed, maintained or otherwise operated on the Leased Property for purposes in which federal financial assistance is extended under a Department of Transportation program or activity, or for another purpose involving the provision of a similar service or benefit, the Airline shall maintain and operate the Leased Property and services in compliance with all requirements of 49 C.F.R. Part 21, Nondiscrimination in Federally Assisted Programs of the Department of Transportation - Effectuation of Title VI of the Civil Rights Act of 1964, and as said regulations may be amended.

(B) The Airline will in all of its operations and activities in and at Leased Property comply with all applicable requirements of the Air Carrier Access Act, 49 U.S.C.A. § 41705, and regulations implementing such Act at 14 C.F.R. Part 382, and the Americans with Disabilities Act, 42 U.S.C.A. § 12101 *et seq.* and all regulations implementing such Act.

9.08 NO PERSONAL LIABILITY.

No director, officer or employee of either party shall be held personally liable under this Lease or because of its execution or attempted execution.

9.09 NOTICES.

(A) All notices required to be given to the City hereunder shall be in writing and shall be sent by certified mail, return receipt requested, addressed to:

CEO
Denver Department of Aviation
Denver International Airport
AOB - 9th Floor
8500 Peña Boulevard
Denver, Colorado 80249-6340.

(B) All notices required to be given to the Airline hereunder shall be in writing and shall be sent by certified mail, return receipt requested, addressed to:

Southwest Airlines Co.
2702 Love Field Drive, HDQ/4PF
Dallas, Texas 75235-169311
Attn: Corporate Real Estate Representative

(C) Provided that the parties or either of them, may designate in writing from time to time the addresses of substitute or supplementary persons in connection with said notices. The effective date of service of any such notice shall be the date such notice is mailed to the Airline or said CEO.

9.10 SEVERABILITY.

In the event any covenant, condition or provision contained in this Lease is held by any court of competent jurisdiction to be invalid, the invalidity of any such covenant, condition or provision shall in no way affect any other covenant, condition or provision herein contained if the invalidity of any such covenant, condition or provision does not materially prejudice either party hereto in its respective rights and obligations contained in the valid covenants, conditions or provisions in this Lease.

9.11 SECURITY.

(A) It is understood and agreed by the Airline that in addition to the Airline's responsibilities to maintain the Leased Property as stated in Section 3.02, it shall take reasonable security precautions to maintain the Leased Property in a manner as to keep it secure from unauthorized intrusion and shall with respect to any area of the Leased Property opening to an Air Operations Area of the Airport provide for an adequate security system designed to prevent unauthorized persons or vehicles from entering such Air Operations Area. An "Air Operations Area" is defined to mean any area of the Airport used or intended to be used for landing, takeoff or surface maneuvering of aircraft. An "adequate security system" is further defined as providing for security at a standard no less than required and set out in Transportation Security Administration (TSA) regulations, including 49 C.F.R., Subtitle B, Chapter XII, as it may be amended, or any similar law or regulations intended to replace or compliment such regulations.

(B) It is further understood and agreed by the Airline that at any time during the term of this Lease when requested in writing by the CEO, or her authorized representative, the Airline shall submit to the CEO the security plans that are to be used and are being used by the Airline on any or all of the Leased Property.

9.12 WAIVERS.

(A) No waiver of default by either party of any of the terms, covenants or conditions of this Lease to be performed, kept and observed by the Airline or the City shall be construed, or operate, as a waiver of such term, covenant, or condition or of any subsequent breach of the same or any other term, covenant or condition herein contained to be performed, kept and observed by the Airline or the City.

(B) The subsequent acceptance of rent hereunder by the City shall not be deemed to be a waiver of any preceding breach by the Airline of any term, covenant or condition of this Lease other than the failure of the Airline to pay the particular rental so accepted, regardless of the City's knowledge of such preceding breach at the time of acceptance of such rent.

9.13 AIRLINE BOOKS AND RECORDS.

The Airline agrees that the CEO and the Auditor of the City or any of their duly authorized representatives, until the expiration of three (3) years after the termination of this Lease, shall have the right, at any reasonable time and at their own expense, to have access to and the right to examine any books, documents, papers and records of the Airline pertinent to this Lease, including as related to the Work. The Airline, upon request by either, shall make all such books and records available for examination and copying in Denver.

9.14 CITY SMOKING POLICY.

The Airline and its officers, agents and employees shall cooperate and comply with the provisions of Denver Executive Order No. 99, or any successor executive order prohibiting smoking in all indoor buildings and facilities. The Airline agrees that it will take reasonable

actions to prohibit smoking by its employees and the public in the Leased Property except in specially designated areas.

9.15 USE, POSSESSION OR SALE OF ALCOHOL OR DRUGS.

The Airline and its officers, agents and employees shall cooperate and comply with the provisions of Denver Executive Order No. 94 and Attachment A thereto, or any successor executive order concerning the use, possession or sale of alcohol or drugs.

9.16 THIRD PARTIES.

This Lease does not, and shall not be deemed or construed to, confer upon or grant to any third party or parties (excepting parties to whom the Airline may assign this Lease or may sub-lease any part or all of the Leased Property in accordance with Section 3.03, and excepting any successor to the City) any right to claim damages or to bring any suit, action or other proceeding against either the City or the Airline because of any breach of this Lease or because of any of the terms, covenants, agreements and conditions herein contained.

9.17 TAXES.

(A) Airline shall be liable for, and shall pay throughout the Term, all taxes payable for, or on account of: (a) the activities conducted by Airline on the Leased Property; (b) all taxes on the personal property of Airline on or at the Leased Property; (c) taxes on any property interest in the Leased Property created by this Lease; (d) any taxes levied in lieu of a tax on any such property interest; and (e) any sales, use, or other taxes levied on, or measured by, the Rental Payments and any other payments payable under this Lease, whether imposed on Airline or on the City as set forth below.

(B) With respect to any such taxes payable by the City that are levied on, or measured by, the Rental Payments or any other payments payable under this Lease, Airline shall pay to the City with each payment an amount equal to the tax levied on, or measured by, that particular payment. All other tax amounts for which the City is or will be entitled to reimbursement from Airline shall be payable by Airline to the City at least fifteen (15) days prior to the due dates of the respective tax amounts involved; provided that Airline shall be entitled to a minimum of thirty (30) days' written notice of the amounts payable by Airline. Airline may contest, in its own name or the name of the City, the validity or amount of any tax it shall be required to pay to a taxing entity; provided, however, that Airline shall defend, indemnify and hold the City harmless from all liability and expense arising from such contest, which obligations shall survive expiration or earlier termination of this Lease. Airline shall not permit a lien or encumbrance to attach to the Leased Property or the Airport by reason of any failure to pay taxes.

9.18 COLORADO OPEN RECORDS ACT.

(A) The Airline acknowledges that the City is subject to the provisions of the Colorado Open Records Act ("CORA"), C.R.S. §24-72-201 et seq., and all documents prepared or provided by Airline under this Lease may be subject to the provisions of CORA. Any other provision of this

Lease notwithstanding, including exhibits, attachments and other documents incorporated into this Lease by reference, all materials, records and information provided by the Airline to the City shall be considered confidential by the City only to the extent provided in CORA and the Airline agrees that any disclosure of information by the City consistent with the provisions of CORA shall result in no liability of the City. The Airline agrees that it will fully cooperate with the City in the event of a request for disclosure of such documents or a lawsuit arising under such act for the disclosure of any documents or information, which the Airline asserts, is confidential and exempt from disclosure.

(B) In the event of a request to the City for disclosure of such information, time and circumstances permitting, the City will make a good faith effort to advise the Airline of such request in order to give the Airline the opportunity to object to the disclosure of any material the Airline may consider confidential, proprietary or otherwise exempt from disclosure. In the event of the filing of a lawsuit to compel disclosure, the City will tender all such material to the court for judicial determination of the issue of disclosure and the Airline agrees it will either intervene in such lawsuit to protect materials the Airline does not wish disclosed, or waive any claim of privilege or confidentiality. If the Airline chooses to intervene in such a lawsuit and oppose disclosure of any materials, the Airline agrees to defend, indemnify, and save and hold harmless the City, its officers, agents and employees, from any claim, damages, expense, loss or costs arising out of the Airline's intervention, including but not limited to prompt reimbursement to the City of all reasonable attorney fees, costs and damages that the City may incur directly or may be ordered to pay by such court.

9.19 NO EMPLOYMENT OF ILLEGAL ALIENS.

This Lease is subject to Division 5 of Article IV of Chapter 20 of the D.R.M.C., and any amendments (the "Certification Ordinance").

(A) The Airline certifies that:

(i) At the time of its execution of this Lease, it does not knowingly employ or contract with an illegal alien who will perform work under this Lease. It will participate in the E-Verify Program, as defined in § 8-17.5-101(3.7), C.R.S., to confirm the employment eligibility of all employees who are newly hired for employment to perform work under this Lease.

(B) The Airline also agrees and represents that:

(i) It shall not knowingly employ or contract with an illegal alien to perform work under the Lease. It shall not enter into a contract with a sub-consultant or subcontractor that fails to certify to the Airline that it shall not knowingly employ or contract with an illegal alien to perform work under the Lease. It has confirmed the employment eligibility of all employees who are newly hired for employment to perform work under this Lease, through participation in the E-Verify Program.

- (ii) It is prohibited from using the E-Verify Program procedures to undertake pre-employment screening of job applicants while performing its obligations under the Lease, and that otherwise requires the Airline to comply with any and all federal requirements related to use of the E-Verify Program including, by way of example, all program requirements related to employee notification and preservation of employee rights.
- (iii) If it obtains actual knowledge that a sub-consultant or subcontractor performing work under the Lease knowingly employs or contracts with an illegal alien, it will notify such subconsultant or subcontractor and the City within three (3) days. The Airline will also then terminate such sub-consultant or subcontractor if within three (3) days after such notice the sub-consultant or subcontractor does not stop employing or contracting with the illegal alien, unless during such three-day period the sub-consultant or subcontractor provides information to establish that the sub-consultant or subcontractor has not knowingly employed or contracted with an illegal alien.
- (iv) It will comply with any reasonable request made in the course of an investigation by the Colorado Department of Labor and Employment under authority of § 8-17.5-102(5), C.R.S, or the City Auditor, under authority of D.R.M.C. 20-90.3.

(C) The Airline is liable for any violations as provided in the Certification Ordinance. If Airline violates any provision of this Section or the Certification Ordinance, the City may terminate this Lease for a breach of the Lease. If the Lease is so terminated, the Airline shall be liable for actual and consequential damages to the City. Any such termination of a contract due to a violation of this Section or the Certification Ordinance may also, at the discretion of the City, constitute grounds for disqualifying Airline from submitting bids or proposals for future contracts with the City.

9.20 PREVAILING WAGE REQUIREMENTS.

(A) Airline shall require its Contractor for the work to comply with, and agrees to be bound by, all requirements, conditions and City determinations regarding the Payment of Prevailing Wages Ordinance, Sections 20-76 through 20-79, D.R.M.C. including, but not limited to, the requirement that every covered worker working on a City owned or leased building or on City-owned land shall be paid no less than the prevailing wages and fringe benefits in effect on the date the Airline's bid or request for proposal was advertised. In the event a request for bids, or a request for proposal, was not advertised, Airline shall require its Contractor to pay every covered worker no less than the prevailing wages and fringe benefits in effect on the effective date.

(B) Prevailing wage and fringe rates will adjust on, and only on, the anniversary of the effective date, and Airline's Contractor will be required to comply with such adjustments.

(C) Airline shall provide the Auditor with a list of all contractors and subcontractors providing any services under the Lease.

(D) Airline shall provide the Auditor with electronically-certified payroll records for all covered workers employed under the Lease.

(E) Airline shall require its contractor to prominently post at the work site the current prevailing wage and fringe benefit rates. The posting must inform workers that any complaints regarding the payment of prevailing wages or fringe benefits may be submitted to the Denver Auditor by calling 720-913-5000 or emailing auditor@denvergov.org.

(F) If Airlines' contractor fails to pay workers as required by the Prevailing Wage Ordinance, Airline will be in default under this Lease, and the City may, by written notice, suspend or terminate work if Airlines' contractor fails to pay required wages and fringe benefits.

9.21 FAIR LABOR STANDARDS ACT.

This Lease incorporates by reference the provisions of 29 C.F.R. Part 201, the Federal Fair Labor Standards Act (“FLSA”), with the same force and effect as if given in full text. The FLSA sets minimum wage, overtime pay, recordkeeping, and child labor standards for full and part time workers. Airline agrees to incorporate by reference the provisions of FLSA in all contracts and subcontracts resulting from this Lease. Airline has full responsibility to monitor compliance to the referenced regulation. Airline must address any claims or disputes arising from this requirement directly with the U.S. Department of Labor – Wage and Hour Division.

9.22 OCCUPATIONAL SAFETY AND HEALTH ACT.

This Lease incorporates by reference the requirements of 29 C.F.R. Part 1910 with the same force and effect as if given in full text. Airline must provide a work environment that is free from recognized hazards that may cause death or serious physical harm to the employee. Airline retains full responsibility to monitor its compliance and any subcontractor’s compliance with the applicable requirements of the Occupational Safety and Health Act of 1970 (29 C.F.R. Part 1910). Airline must address any claims or disputes that pertain to a referenced requirement directly with the U.S. Department of Labor – Occupational Safety and Health Administration.

9.23 MASTER PLAN.

Airline agrees that no liability shall attach to the City, its officers, agents and employees by reason of any efforts or action toward implementation of any present or future master layout plan for the Airport and waives any right to claim damages or other consideration arising therefrom.

9.24 PAYMENT OF MINIMUM WAGE.

Airline shall comply with, and agrees to be bound by, all requirements, conditions, and City determinations regarding the City's Minimum Wage Ordinance, Sections 20-82 through 20-84 D.R.M.C., including, but not limited to, the requirement that every covered worker shall be paid no less than the City Minimum Wage in accordance with the foregoing D.R.M.C. Sections. By executing this Agreement, Airline expressly acknowledges that Airline is aware of the requirements of the City's Minimum Wage Ordinance and that any failure by Airline, or any other individual or entity acting subject to this Agreement, to strictly comply with the foregoing D.R.M.C. Sections shall result in the penalties and other remedies authorized therein.

9.25 CITY NON-DISCRIMINATION.

In connection with the performance of work under this Lease, the Airline agrees not to fail or refuse to hire, nor to discharge, promote or demote, nor to otherwise discriminate in matters of compensation, terms, conditions or privileges of employment against any person otherwise qualified, solely because of race, color, religion, national origin, gender, age, military status, sexual orientation, marital status, or physical or mental disability; and the Airline further agrees to insert the foregoing provision in all subcontracts hereunder.

9.26 ENTIRE LEASE.

The provisions contained in this Lease constitute the entire agreement and understanding between the parties with respect to the subject matter thereof. The parties agree 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. This Lease cannot be changed or terminated orally. No alterations, amendments, changes or modification shall be valid unless executed by an instrument in writing by both parties hereto with the same formality as this Lease.

9.27 SALE OF FOOD AND BEVERAGES.

Upon written approval by the CEO's Authorized Representative, the Airline may sell, or permit the sale of food, food products or beverages upon the Leased Property on its own behalf or by a concessionaire selected by the Airline. Airline agrees to pay the same rates, fees and charges that would be applicable to an Airport concessionaire with respect to the sale of such products.

9.28 COMPLIANCE WITH MINORITY/WOMEN BUSINESS ENTERPRISE REQUIREMENTS.

(A) The Work under this Lease is subject to all applicable provisions of Article III Divisions 1 and 3, of Chapter 28 of the DRMC (the "M/WBE Ordinance") and any Rules or Regulations promulgated pursuant thereto.

(B) In accordance with the requirements of the M/WBE Ordinance, a goal of twenty percent (20%) was established for the construction of the Hangar, which includes the Work under this Lease. The Design Goal must be met with certified participants as set forth in

Section 28-55, D.R.M.C. or through the demonstration of a sufficient good faith effort under Section 28-67, D.R.M.C. For compliance with good faith effort requirements under Section 28-62(b)(2), the percentage solicitation level required for this project is 100%.

(C) In accordance with the requirements of the M/WBE Ordinance, the Airline is committed to, at a minimum, meet the participation goal of twenty percent (20%) established for the construction of the Hangar, which includes the Work under this Lease, utilizing properly certified M/WBE subcontractors and suppliers. In accordance with Section 28-60(b) and Rules and Regulations promulgated pursuant thereto, the Director has authorized the utilization of a compliance plan to address the Construction Goal for the Work. Upon execution of this Lease, the Airline's contractor will prepare and present for the review and approval of the Director a compliance plan for meeting the requirements of the M/WBE Ordinance. At a minimum, the proposed compliance plan shall comply with all requirements of the Rules and Regulations pertaining to such plans and shall be approved in writing by the Director. Upon such approval, the plan will be incorporated into this Lease by Change Order.

(D) Without limiting the general applicability of the foregoing, the Airline acknowledges its continuing duty, pursuant to Section 28-72 DRMC, to meet and maintain throughout the duration of the Work under this Lease its participation and compliance commitments and to ensure that all contractors and subcontractors subject to the Ordinance also maintain such commitments and compliance.

(F) Failure to comply with these requirements may result, at the discretion of the Director of the Division of Small Business Opportunity ("DSBO"), in the imposition of sanctions against the Airline in accordance with Section 28-77, DRMC.

(G) The Airline understands that if change orders or other modifications to the Hangar construction project are issued or developed, and such changes include an increase in Scope of Work of the Hangar construction project, whether by amendment, change order, force account or otherwise which increases the dollar value of the contract, such change orders or Hangar construction project modification shall be immediately submitted to DSBO for notification purposes. Those amendments, change orders, force accounts or other modifications that involve a changed scope of the Hangar construction project that cannot be performed by existing project subcontractors or by the contractor shall be subject to a goal for MBE/WBEs equal to the original goal on the contract which was included in the proposal. The contractor shall satisfy such goal with respect to such changed scope of the Hangar construction project by soliciting new MBE/WBEs in accordance with Section 28-73 of the Ordinance as applicable, or the Airline must show each element of modified good faith set out in Section 28-75 (c) of the Ordinance. The Airline shall supply to the Director the documentation described in Section 28-75 (c) of the Ordinance with respect to the increased dollar value of the Hangar construction project.

(H) The Airline is charged with knowledge of and is solely responsible for complying with each and every provision of the Ordinance in performing the Work. Failure to comply with these provisions could constitute cause and subject the Airline to sanctions set forth in the Ordinance. Should any questions arise regarding specific circumstances, the Airline

must consult the Ordinance or contact the project's designated DSBO representative at (303) 342-2180.

9.29 CONDITION; FINAL APPROVAL.

This Lease is expressly subject to, and shall not be or become effective or binding on the City until approved by Denver City Council and fully executed by all signatories of the City and a fully executed copy has been delivered to the Airline. This Lease shall not be binding on the Airline until it is binding on the City. The date of the final City Signature shall be the Effective Date.

[SIGNATURE PAGE FOLLOWS]

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: PLANE-201947863-00

Contractor Name: Southwest Airlines Co.

By:  _____

Name: Stephen F. Sisneros
(please print) **Managing Director-Airport Affairs**

Title: _____
(please print)

ATTEST: [if required]

By:  _____

Name: Hollye Gaman
(please print)

Title: Executive Assistant
(please print)



Appendix No. 1

Standard Federal Assurances and Nondiscrimination

APPENDIX A

COMPLIANCE WITH NONDISCRIMINATION REQUIREMENTS

NOTE: As used below the term "Contractor" shall mean and include Concessionaire, and the term "sponsor" shall mean the "City."

During the term of this Contract, the Contractor, for itself, its assignees and successors in interest (hereinafter referred to as the "Contractor") agrees as follows:

1. **Compliance with Regulations.** The Contractor will comply with the Title VI List of Pertinent Non-Discrimination Statutes and Authorities, as they may be amended from time to time, which are herein incorporated by reference and made part of this Agreement.

2. **Nondiscrimination.** The Contractor, with regard to the work performed by it during this Agreement, will not discriminate on the grounds of race, creed, color, national origin, or sex in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The Contractor will not participate directly or indirectly in the discrimination prohibited by the Acts and Regulations, including employment practices when the Agreement covers any activity, project, or program set forth in Appendix B of 49 CFR Part 21.

3. **Solicitations for Subcontractors, Including Procurements of Materials and Equipment.** In all solicitations, either by competitive bidding or negotiation, made by the Contractor for work to be performed under a subcontract, including procurements of materials or leases of equipment, each potential subcontractor or supplier will be notified by the Contractor of the Contractor's obligations under this Agreement and the Acts and Regulations relative to nondiscrimination on the grounds of race, color, or national origin.

4. **Information and Reports.** The Contractor will provide all information and reports required by the Acts, Regulations or directives issued pursuant thereto and will permit access to its books, records, accounts other sources of information, and its facilities as may be determined by the sponsor or the Federal Aviation Administration (FAA) to be pertinent to ascertain compliance with such Acts, Regulations, and instructions. Where any information required of a Contractor is in the exclusive possession of another who fails or refuses to furnish this information, the Contractor shall so certify to the sponsor or the FAA, as appropriate, and will set forth what efforts it has made to obtain the information.

5. **Sanctions for Noncompliance.** In the event of a Contractor's noncompliance with the nondiscrimination provisions of this Agreement, the sponsor will impose such Contract sanctions as it or the FAA may determine to be appropriate, including, but not limited to:

- a. Withholding of payments to the Contractor under this Agreement until the Contractor complies, and/or;
- b. Cancelling, terminating, or suspending this Agreement, in whole or in part.

6. **Incorporation of Provisions.** The Contractor will include the provisions of

paragraphs one (1) through six (6) in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Acts, the Regulations or directives issued pursuant thereto. The Contractor will take action with respect to any subcontract or procurement as the sponsor or the FAA may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, that if the Contractor becomes involved in, or is threatened with litigation by a subcontractor, or supplier because of such direction, the Contractor may request the sponsor to enter into such litigation to protect the interests of the sponsor. In addition, the Contractor may request the United States to enter into such litigation to protect the interests of the United States.

APPENDIX B

STANDARD FEDERAL PROVISIONS

Sensitive Security Information. Airline acknowledges that, in the course of performing its work under this Agreement, Airline may be given access to Sensitive Security Information ("SSI"), as material is described in federal regulations, 49 C.F.R. part 1520. Airline specifically agrees to comply with all requirements of the applicable federal regulations specifically, 49 C.F.R. Parts 15 and 1520. Airline understands any questions it may have regarding its obligations with respect to SSI must be referred to the DEN's Security Office.

DEN Security. Airline, its officers, authorized officials, employees, agents, subcontractors, and those under its control, will comply with safety, operational, or security measures required of Airline or City by the FAA or TSA. If Airline, its officers, authorized officials, employees, agents, subcontractors or those under its control, fail or refuse to comply with said measures and such non-compliance results in a monetary penalty being assessed against City, then, in addition to any other remedies available to City, Airline covenants to fully reimburse City any fines or penalties levied against City, and any attorney fees or related costs paid by City as a result of any such violation. This amount must be paid by Airline within fifteen (15) days from the date of the invoice or written notice.

Federal Rights. This Agreement is subject and subordinate to the terms, reservations, restrictions and conditions of any existing or future agreements between City and the United States, the execution of which has been or may be required as a condition precedent to the transfer of federal rights or property to City for DEN purposes and the expenditure of federal funds for the extension, expansion or development of the Denver Municipal Airport System.

General Civil Rights Provision. The Airline agrees to comply with pertinent statutes, Executive Orders and such rules as are promulgated to ensure that no person shall, on the grounds of race, creed, color, national origin, sex, age, or disability be excluded from participating in any activity conducted with or benefiting from Federal assistance.

This provision binds the Airline and subtier airlines through the completion of the contract. This provision is in addition to that required of Title VI of the Civil Rights Act of 1964.

APPENDIX E

TITLE VI LIST OF PERTINENT NONDISCRIMINATION AUTHORITIES

As used below, the term "Contractor" will mean and include Concessionaire and the term "sponsor" will mean City.

During the performance of this Agreement, the Contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the "Contractor") agrees to comply with the following nondiscrimination statutes and authorities; including but not limited to:

- Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d *et seq.*, 78 stat. 252), (prohibits' discrimination on the basis of race, color, national origin);
- 49 CFR part 21 (Non-discrimination In Federally-Assisted Programs of The Department of Transportation-Effectuation of Title VI of The Civil Rights Act of 1964);
- The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, (42 U.S.C. § 4601), (prohibits unfair treatment of persons displaced or whose property has been acquired because of Federal or Federal-aid programs and projects);
- Section 504 of the Rehabilitation Act of 1973, (29 U.S. C. § 794 *et seq.*), as amended, (prohibits discrimination on the basis of disability); and 49 CFR part 27;
- The Age Discrimination Act of 1975, as amended, (42 U.S.C. § 6101 *et seq.*), (prohibits discrimination on the basis of age);
- Airport and Airway Improvement Act of 1982, (49 USC§ 471, Section 47123), as amended, (prohibits discrimination based on race, creed, color, national origin, or sex);
- The Civil Rights Restoration Act of 1987, (PL 1 00-209), (Broadened the scope, coverage and applicability of Title VI of the Civil Rights Act of 1964, The Age Discrimination Act of 1975 and Section 504 of the Rehabilitation Act of 1973, by expanding the definition of the terms "programs or activities" to include all of the programs or activities of the Federal-aid recipients, sub-recipients and Contractors, whether such programs or activities are Federally funded or not);
- Titles II and III of the Americans with Disabilities Act of 1990, which prohibit discrimination on the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing entities (42 U.S.C. §§ 12131 -12189) as implemented by Department of Transportation regulations at 49 CFR parts 37 and 38;
- The Federal Aviation Administration's Non-discrimination statute (49 U.S.C. § 47123) (prohibits discrimination on the basis of race, color, national origin, and sex);
- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, which ensures discrimination against minority populations by discouraging programs, policies, and activities with disproportionately high

and adverse human health or environmental effects on minority and low-income populations;

- Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency, and resulting agency guidance, national origin discrimination includes discrimination because of limited English proficiency (LEP). To ensure compliance with Title VI, you must take reasonable steps to ensure that LEP persons have meaningful access to your programs (70 Fed. Reg. at 74087 to 74100);
- Title IX of the Education Amendments of 1972, as amended, which prohibits you from discriminating because of sex in education programs or activities (20 U.S. C. 1681 et seq).

EXHIBIT

Southwest Airlines Ground Lease: Exhibit A-1

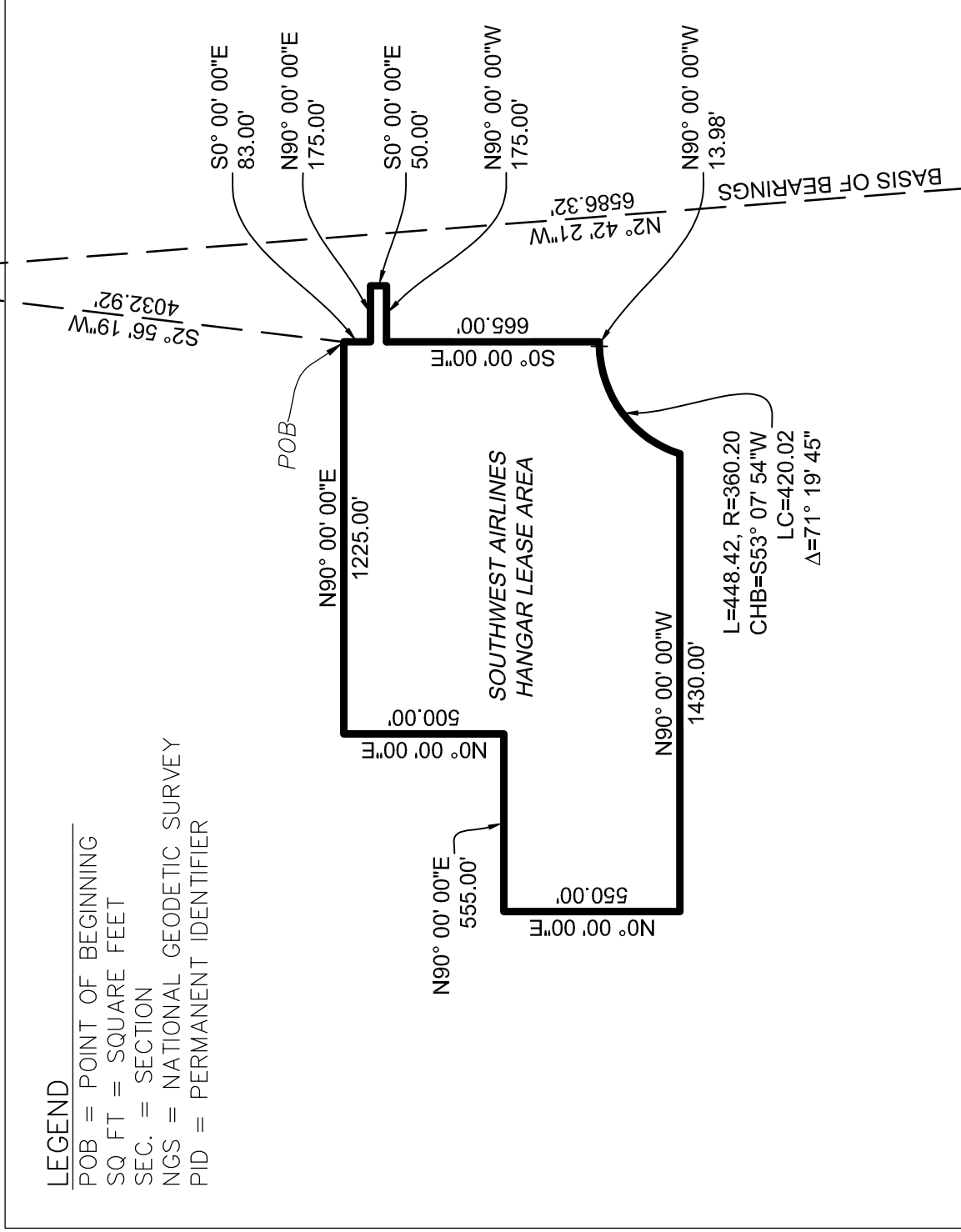


SCALE
1" = 500'

NGS PID DH9174 (CHEERS)
ALUMINUM ROD
SURROUNDED BY A
CONCRETE COLLAR

LEGEND

- POB = POINT OF BEGINNING
- SQ FT = SQUARE FEET
- SEC. = SECTION
- NGS = NATIONAL GEODETIC SURVEY
- PID = PERMANENT IDENTIFIER



SOUTHWEST AIRLINES HANGAR LEASE AREA:
1,535,085.87 SQ FT OR 35.241 ACRES



I HEREBY CERTIFY THAT THIS EXHIBIT WAS
PREPARED UNDER MY DIRECT
SUPERVISION.

NGS PID DH9147 (DR AA)
STAINLESS STEEL ROD
SURROUNDED BY A
CONCRETE COLLAR

NOTE: THIS DOES NOT REPRESENT A MONUMENTED LAND
SURVEY. NOR DOES IT REPRESENT A TITLE SURVEY BY
THIS SURVEYOR. IT IS INTENDED ONLY TO DEPICT THE
ATTACHED DESCRIPTION.

JULIAN E. SISNEROS, PLS
COLO. REGISTRATION NO. 38355



CITY AND COUNTY OF DENVER
DEPARTMENT OF AVIATION
DENVER INTERNATIONAL AIRPORT

REVISED	
NO.	DATE

SOUTHWEST AIRLINES HANGAR LEASE AREA

SITUATED IN THE SE1/4 OF SEC 8 & THE SW1/4 OF SEC 9,
TOWNSHIP 2 SOUTH, RANGE 65 WEST OF THE 6TH PRINCIPAL
MERIDIAN, CITY AND COUNTY OF DENVER, STATE OF COLORADO.

REQUESTED BY:
NA

DATE
03/11/19

SCALE
1" = 500'

DRAWN BY: CRC
FIELD BY: JS
CHECKED BY: JS

SHEET NO. 1
OF 1 SHEETS

DRAWING NO.
SOUTHWEST

EXHIBIT "A"
SOUTHWEST AIRLINES LEASE PARCEL
DENVER INTERNATIONAL AIRPORT
MARCH 11, 2019

A PARCEL OF LAND LOCATED IN THE SOUTHEAST 1/4 OF SECTION 8 AND THE SOUTHWEST 1/4 OF SECTION 9, TOWNSHIP 2 SOUTH, RANGE 65 WEST, OF THE 6TH PRINCIPAL MERIDIAN, IN DENVER COUNTY, COLORADO, SAID PARCEL BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT NATIONAL GEODETIC SURVEY (NGS) PERMANENT IDENTIFIER (PID) DH9174 (DESIGNATION-CHEERS), THENCE SOUTH 2° 56' 19" WEST, A DISTANCE OF 4,032.92 FEET TO A POINT ON SAID PARCEL, SAID POINT ALSO BEING THE POINT OF BEGINNING;

THENCE SOUTH 0° 00' 00" EAST, 83.00 FEET;

THENCE NORTH 90° 00' 00" EAST, 175.00 FEET;

THENCE SOUTH 0° 00' 00" EAST, 50.00 FEET;

THENCE NORTH 90° 00' 00" WEST, 175.00 FEET;

THENCE SOUTH 0° 00' 00" EAST, 665.00 FEET;

THENCE NORTH 90° 00' 00" WEST, 13.98 FEET TO THE BEGINNING OF A NON-TANGENT CURVE TO THE LEFT, SAID CURVE HAS A RADIUS OF 360.20 FEET, A CHORD BEARING OF SOUTH 53° 07' 54" WEST, AND A CHORD LENGTH OF 420.02 FEET;

THENCE SOUTHWESTERLY ALONG SAID CURVE THROUGH A CENTRAL ANGLE OF 71° 19' 45" AN ARC DISTANCE OF 448.42 FEET TO A POINT OF NON-TANGENCY;

THENCE NORTH 90° 00' 00" WEST, 1,430.00 FEET;

THENCE NORTH 0° 00' 00" EAST, 550.00 FEET;

THENCE NORTH 90° 00' 00" EAST, 555.00 FEET;

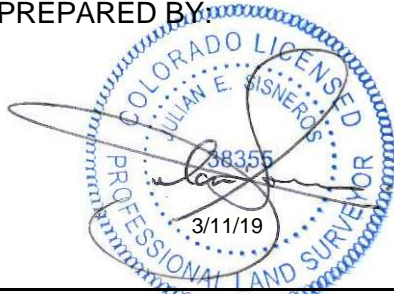
THENCE NORTH 0° 00' 00" EAST, 500.00 FEET;

THENCE NORTH 90° 00' 00" EAST, 1,225.00 FEET, MORE OR LESS, TO THE POINT OF BEGINNING.

THE ABOVE DESCRIBED PARCEL CONTAINS 1,535,085.87 SQUARE FEET (35.241 ACRES), MORE OR LESS.

BASIS OF BEARINGS: BEARINGS ARE BASED ALONG A LINE BETWEEN NGS PID DH9174 (DESIGNATION-CHEERS) AND NGS PID DH9147 (DESIGNATION-DR AA). SAID LINE IS MONUMENTED AT THE NORTH END BY A FOUND ALUMINUM ROD IN A CONCRETE COLLAR AND THE SOUTH END BY A FOUND STAINLESS STEEL ROD IN A CONCRETE COLLAR. SAID LINE BEARS NORTH 2° 42' 21" WEST.

PREPARED BY:



JULIAN E. SISNEROS, PLS 38355

FOR AND ON-BEHALF OF HCL ENGINEERING AND SURVEYING

NOTICE: ACCORDING TO COLORADO LAW YOU MUST COMMENCE ANY LEGAL ACTION BASED UPON THIS SURVEY WITHIN THREE YEARS AFTER YOU FIRST DISCOVER SUCH DEFECT. IN NO EVENT MAY ANY ACTION BASED UPON ANY DEFECT IN THIS SURVEY BE COMMENCED MORE THAN THREE YEARS FROM THE DATE OF THE CERTIFICATE SHOWN HEREON.

SOUTHWEST AIRLINES MAINTENANCE HANGAR

CONSTRUCTION ACTIVITIES AND STORMWATER MANAGEMENT PLAN

26405 EAST 107TH AVENUE, DENVER, CO 80249
 LOCATED IN THE SOUTHEAST QUARTER OF SECTION 8 AND SOUTHWEST QUARTER OF SECTION 9, TOWNSHIP 2 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, CITY AND COUNTY OF DENVER, STATE OF COLORADO

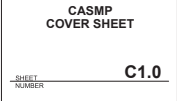


DEN Team Project No. swa_101_01A/RN/Hangar



DATE		DOCUMENT RELEASE #	

PROJECT #	187172
PROJECT MANAGER	J. DANENBERG
DESIGNED BY	A. SENESE
DRAWN BY	G. SULLIVER
QUALITY CHECK	J. DANENBERG
SHEET TITLE	



CCD CASMP STANDARD NOTES

1. THE PERMITTEE AND/OR CONTRACTOR SHALL REMOVE ALL SEDIMENT, MUD, CONSTRUCTION DEBRIS, OR OTHER POTENTIAL POLLUTANTS THAT MAY BE DISCHARGED TO OR ACCUMULATE IN THE FLOWLINE, STORMWATER APPOINTMENTS, AND PUBLIC RIGHTS OF WAYS OF THE CITY AND COUNTY OF DENVER AS A RESULT OF CONSTRUCTION ACTIVITIES ASSOCIATED WITH THIS SITE DEVELOPMENT OR CONSTRUCTION PROJECT. SAID REMOVAL SHALL BE CONDUCTED IN A TIMELY MANNER.
2. THE CONTRACTOR SHALL PREVENT SEDIMENT, DEBRIS AND ALL OTHER POLLUTANTS FROM ENTERING THE STORM SEWER SYSTEM DURING ALL DEMOLITION, EXCAVATION, TRENCHING, BORING, GRADING, OR OTHER CONSTRUCTION OPERATIONS THAT ARE PART OF THIS PROJECT. THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR REMEDIATION OF ANY ADVERSE IMPACTS TO THE MUNICIPAL, SEPARATE STORM SEWER SYSTEM, RECEIVING WATERS, WATERWAYS, WETLANDS, AND/OR OTHER PUBLIC OR PRIVATE PROPERTIES, RESULTING FROM WORK DONE AS PART OF THIS PROJECT.
3. SOIL STABILIZATION MEASURES SHALL BE IMPLEMENTED WITHIN FOURTEEN (14) DAYS FOLLOWING COMPLETION OF GRADING ACTIVITIES. STABILIZATION OF DISTURBED AREAS ADJACENT TO RECEIVING WATERS OR WITH SLOPES 3:1 OR GREATER SHALL BE COMPLETED WITHIN SEVEN (7) DAYS FOLLOWING COMPLETION OF GRADING ACTIVITIES. NOTE: FEDERAL AND STATE REGULATIONS MAY SOON REQUIRE STABILIZATION WITHIN SEVEN (7) DAYS OF COMPLETION OF GRADING ACTIVITIES. IN SUCH CASES, THE SHORTER TIMEFRAME SHALL APPLY TO PROJECTS WITHIN DENVER AS WELL.
4. THE DEVELOPER, GENERAL CONTRACTOR, GRADING CONTRACTOR AND/OR THEIR AUTHORIZED AGENTS SHALL INSURE THAT ALL LOADS OF CUT AND FILL MATERIAL, IMPORTED TO OR EXPORTED FROM THIS SITE SHALL BE PROPERLY COVERED TO PREVENT LOSS OF THE MATERIAL DURING TRANSPORT ON PUBLIC RIGHTS OF WAY" (SEC.49-562; REVISED MUNICIPAL CODE).
5. THE USE OF REBAR TO ANCHOR BEST MANAGEMENT PRACTICES IS PROHIBITED.* STEEL FENCE POSTS MAY BE USED ON A CASE BY CASE BASIS AND REQUIRES APPROVAL FROM THE CITY AND COUNTY OF DENVER SWMP REVIEWER OR THE STORMWATER ENFORCEMENT INVESTIGATOR PRIOR TO INSTALLATION.
6. SOILS THAT WILL BE STOCKPILED FOR MORE THAN THIRTY (30) DAYS SHALL BE PROTECTED FROM WIND AND WATER EROSION WITHIN FOURTEEN (14) DAYS OF STOCKPILE CONSTRUCTION. STABILIZATION OF STOCKPILES LOCATED WITHIN 100 FEET OF RECEIVING WATERS, OR WITH SLOPES 3:1 TO 1 OR GREATER SHALL BE COMPLETED WITHIN SEVEN (7) DAYS FOLLOWING STOCKPILE CONSTRUCTION. STABILIZATION AND PROTECTION OF THE STOCKPILE MAY BE ACCOMPLISHED BY ANY OF THE FOLLOWING: MULCHING, TEMPORARY PERMANENT REVEGETATION OPERATIONS, CHEMICAL SOIL STABILIZER APPLICATION, REQUIRES DENVER PUBLIC WORKS APPROVAL, OR EROSION CONTROL MATTING/GEOTEXTILES. IF STOCKPILES ARE LOCATED WITHIN 100 FEET OF RECEIVING WATERS, A DRAINAGEWAY OR THE SITE PERIMETER, ADDITIONAL SEDIMENT CONTROL S'UCH SHALL BE REQUIRED.
7. APPROVED EROSION AND SEDIMENT CONTROL "BEST MANAGEMENT PRACTICES" SHALL BE MAINTAINED AND KEPT IN GOOD REPAIR FOR THE DURATION OF THIS PROJECT. AT A MINIMUM, THE PERMITTEE OR CONTRACTOR SHALL PRODUCE AND RETAIN WEEKLY WRITTEN INSPECTION RECORDS FOR ALL BMPs AND AFTER SHOWERING ALL NECESSARY MAINTENANCE AND REPAIR SHALL BE COMPLETED IMMEDIATELY. ADDITIONALLY, STREET SWEEPING IS TO BE COMPLETED BY THE CLOSE OF THE BUSINESS DAY (OR LATER) ON AN AS NEEDED BASIS THROUGHOUT THE PROJECT.
8. WATER USED IN THE CLEANING OF CEMENT TRUCK DELIVERY CHUTES SHALL BE DISCHARGED INTO A PREDEFINED, CONCRETE WASHOUT AREA ON THE JOB SITE. BERMED CONTAINMENT OR COMMERCIALLY AVAILABLE CONCRETE WASHOUT DEVICES THAT FULLY CONTAIN ALL WASH WATER ARE ACCEPTABLE. WASH WATER DISCHARGED INTO THE CONTAINMENT AREA OR DEVICE SHALL BE ALLOWED TO INFILTRATE, EVAPORATE AND/OR BE DISPOSED OF IN ACCORDANCE WITH ALL APPLICABLE REGULATIONS. DREDGED CEMENT WASTE IS TO BE REMOVED FROM THE CONTAINMENT AREA AND PROPERLY DISPOSED OF. SHOULD THE USE OF A PREDEFINED BERMED CONTAINMENT AREA OR APPROVED WASHOUT DEVICE BE TECHNICALLY INFEASIBLE DUE TO THE PROJECT SIZE, OR LACK OF AN AREA WITH A SUITABLE GROUND SURFACE FOR ESTABLISHING CONTAINMENT, PROPER DISPOSAL OF CONCRETE WASHOUT AND WASH WATER AT THE JOB SITE SHALL CONFORM TO THE APPROVED TECHNIQUES AND PRACTICES IDENTIFIED IN THE COLORADO DEPARTMENT OF PUBLIC HEALTH'S ENVIRONMENT'S TRAINING VIDEO ENTITLED "BUILDING FOR A CLEANER ENVIRONMENT: READY MIX WASHOUT TRAINING" AND ITS ACCOMPANYING MANUAL ENTITLED "READY MIX WASHOUT GUIDEBOOK: VEHICLE AND EQUIPMENT WASHOUT AT CONSTRUCTION SITES". THE DIRECT OR INDIRECT DISCHARGE OF WATER CONTAINING WASTE CEMENT TO THE STORM SEWER SYSTEM IS PROHIBITED. (SEC.56-102A; C; REVISED MUNICIPAL CODE, CITY AND COUNTY OF DENVER).
9. THE CONTRACTOR SHALL PROTECT ALL STORM SEWER FACILITIES ADJACENT TO ANY LOCATION WHERE PAVEMENT CUTTING OPERATIONS INVOLVING WHEEL CUTTING, SAW CUTTING, OR ABRASIVE WATER JET CUTTING ARE TO TAKE PLACE. THE CONTRACTOR SHALL REMOVE AND PROPERLY DISPOSE OF ALL WASTE PRODUCTS GENERATED BY SAID CUTTING OPERATIONS ON A DAILY BASIS OR AS NEEDED THROUGHOUT THE WORK DAY. THE DISCHARGE OF ANY WATER CONTAMINATED BY WASTE PRODUCTS FROM CUTTING OPERATIONS TO THE STORM SEWER SYSTEM IS PROHIBITED. (SEC.56-102A; C; REVISED MUNICIPAL CODE, CITY AND COUNTY OF DENVER).
10. PAVED AND IMPERVIOUS SURFACES WHICH ARE ADJACENT TO CONSTRUCTION SITES MUST BE SWEEPED ON A DAILY BASIS AND AS NEEDED DURING THE DAY WHEN SEDIMENT AND OTHER MATERIALS ARE TRACKED OR DISCHARGED ONTO THEM. EITHER SWEEPING BY HAND OR USE OF STREET SWEEPERS IS ACCEPTABLE. STREET SWEEPERS USING WATER WHILE SWEEPING IS PREFERRED IN ORDER TO MINIMIZE DUST. FLUSHING OF PAVED SURFACES WITH WATER OR OTHER LIQUIDS IS PROHIBITED. (SEC.56-102A; C; REVISED MUNICIPAL CODE, CITY AND COUNTY OF DENVER).

BMP MAINTENANCE NOTE

ALL EROSION AND SEDIMENT CONTROL PRACTICES AND OTHER PROTECTIVE MEASURES IDENTIFIED IN THE SWMP MUST BE MAINTAINED IN EFFECTIVE OPERATING CONDITION. PROPER SELECTION AND INSTALLATION OF BMPs AND IMPLEMENTATION OF COMPREHENSIVE INSPECTION AND MAINTENANCE PROCEDURES, IN ACCORDANCE WITH THE SWMP, SHOULD BE ADEQUATE TO MEET THIS CONDITION. BMPs THAT ARE NOT ADEQUATELY MAINTAINED IN ACCORDANCE WITH GOOD ENGINEERING, HYDROLOGIC, AND POLLUTION CONTROL PRACTICES, INCLUDING REMOVAL OF COLLECTED SEDIMENT OUTSIDE THE ACCEPTABLE TOLERANCES OF THE BMPs, ARE CONSIDERED TO BE NO LONGER OPERATING EFFECTIVELY AND MUST BE ADDRESSED.

GENERAL PLAN NOTES:

1. ALL DIMENSIONS ARE PARALLEL OR PERPENDICULAR UNLESS NOTED OTHERWISE.
2. ALL DIMENSIONS ARE FL-FL UNLESS OTHERWISE NOTED.
3. PROPOSED CONTOURS INDICATE LIMITS OF CLEARING AND GRADING.
4. THERE ARE NO KNOWN CONTAMINATED AREAS ON THE SITE.

CONTRACTOR NOTES:

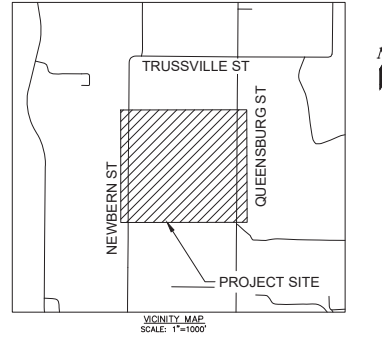
1. CONTRACTOR TO POT-HOLE AND FIELD VERIFY LOCATION, SIZE AND DEPTH OF ALL EXISTING WET AND DRY UTILITIES PRIOR TO START OF CONSTRUCTION IF THERE ARE ANY DISCREPANCIES NOTIFY ENGINEER IMMEDIATELY FOR REDSIGN.
2. CONTRACTOR TO COORDINATE RELOCATION OF ALL UNDERGROUND UTILITY CONFLICTS, IF REQUIRED, FOR CONSTRUCTION OF PROPOSED WET UTILITIES.

SITE BENCH MARK

BENCHMARK: NAVD 88 FROM NGS DR AA ELEV: 5386.88' & CHEERS ELEV: 5354.82'

SITE BASIS OF BEARING

BASIS OF BEARING: BEARINGS ARE BASED UPON THE RANGE LINE IN 50TH AVENUE BETWEEN CENTRAL PARK BOULEVARD ON THE WEST BEING A 2 5' BRASS CAP STAMPED "URS PLS 20683 DENVER RANGE POINT" AND BEELER STREET ON THE EAST BEING A NO. 5 REBAR WITH A RED PLASTIC CAP, WHICH BEARS 989°37'59".



CONTACT INFORMATION

<p>OWNER/DEVELOPER SOUTHWEST AIRLINES 1702 LOVE FIELD DALLAS, TX 75218-1780</p> <p>CIVIL ENGINEER WJE ENGINEERING & SURVEYING, LLC 5600 S QUEBEC STREET, SUITE 2058 GREENWOOD VILLAGE, CO 80111 303.773.1605</p> <p>ARCHITECT GHAFARI ASSOCIATES 122 S MICHIGAN AVE SUITE 1500 CHICAGO, IL 60603 312.984.2300</p>	<p>MECHANICAL ENGINEER GHAFARI ASSOCIATES 122 S MICHIGAN AVE. SUITE 1500 CHICAGO, IL 60603 312.984.2300</p> <p>CONTRACTOR TBD</p> <p>DENVER WATER WATER SALES PLAN REVIEW 1600 WEST 12TH AVENUE DENVER, CO, 80202 80024-3412 CONTACT: (TO BE ASSIGNED) 303.628.6000 watersalesplanreview@denverwater.org</p>
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OWNER'S CERTIFICATION:

"THIS CONSTRUCTION ACTIVITIES STORMWATER MANAGEMENT PLAN HAS BEEN SUBMITTED AS THE APPLICATION FOR A CONSTRUCTION ACTIVITIES STORMWATER DISCHARGE PERMIT FILED WITH THE WASTEWATER MANAGEMENT DIVISION OF THE CITY AND COUNTY OF DENVER. I UNDERSTAND THAT ADDITIONAL EROSION CONTROL, SEDIMENT CONTROL AND WATER QUALITY ENHANCING MEASURES MAY BE REQUIRED OF THE OWNER AND HIS OR HER AGENTS DUE TO UNFORESEEN POLLUTANT DISCHARGES OR IF THE SUBMITTED PLAN DOES NOT FUNCTION AS INTENDED. THE REQUIREMENTS OF THE PLAN SHALL BE THE OBLIGATION OF THE LAND OWNER AND/OR HIS SUCCESSORS OR HEIRS, UNTIL SUCH TIME AS THE PLAN IS PROPERLY COMPLETED, MODIFIED, OR VOIDED.

ENGINEER'S CERTIFICATION:

"I HEREBY CERTIFY THAT THIS CONSTRUCTION ACTIVITIES STORMWATER MANAGEMENT PLAN FOR THE SOUTHWEST AIRLINES MAINTENANCE HANGAR PROJECT # EC- WAS PREPARED BY ME (OR UNDER MY DIRECT SUPERVISION) IN ACCORDANCE WITH THE PROVISIONS OF THE CONSTRUCTION ACTIVITIES STORMWATER DISCHARGE PERMIT FOR THE CITY AND COUNTY OF DENVER. I UNDERSTAND THAT CITY AND COUNTY OF DENVER DOES NOT AND WILL NOT ASSUME LIABILITY FOR THE DRAINAGE FACILITIES DESIGN.

JASPER LLOYD HERRERA _____ DATE _____
 COLORADO REGISTERED PE #13293
 PROJECT DESIGN ENGINEER

CAUTION: NOTICE TO CONTRACTOR

THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES AND, WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE UTILITY LOCATION CENTER AT LEAST 48 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATIONS OF THE UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO NEGOTIATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.

CHRIS EDWARDS
 OWNER OR AUTHORIZED AGENT REPRESENTING OWNER

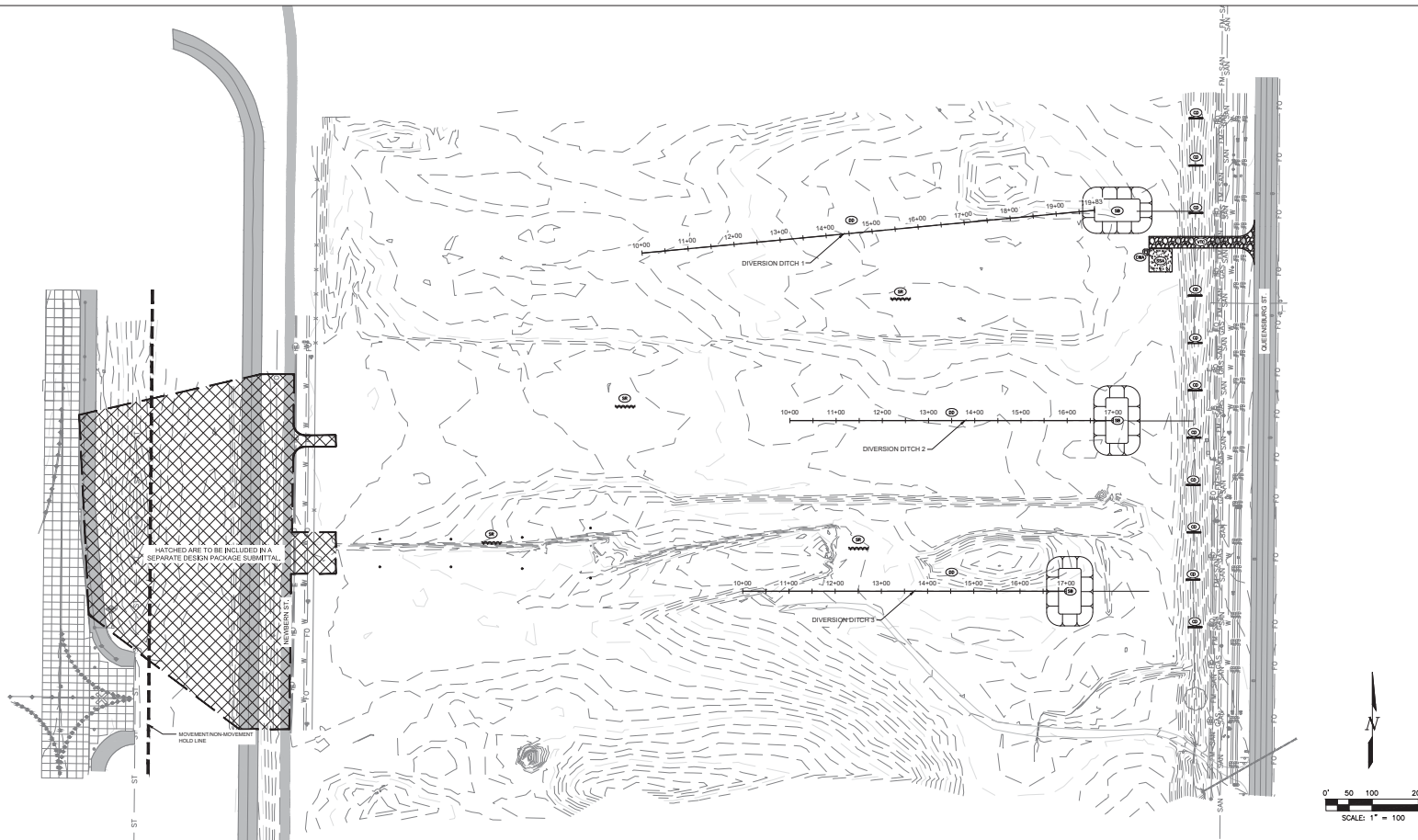
DATE _____

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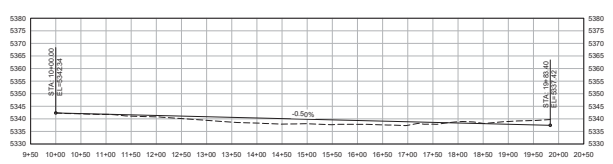


DESIGNED BY	DATE	DATE ISSUED	DRAWING NO.
DRAWN BY	DATE		
CHECKED BY	DATE		
CHECKED BY	DATE	SHEET	1. OF 3. SHEETS

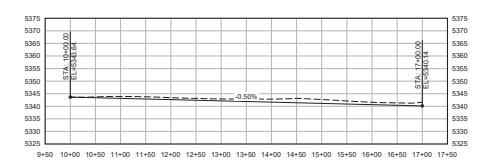
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	COMPOST BLANKET
	COMPOST FILTER BEEM
	CURB SOCK
	CONCRETE WASHOUT AREA
	CONSTRUCTION FENCE
	CONSTRUCTION MARKER
	DEMARCATING
	DIVERSION DITCH
	EROSION CONTROL BLANKET
	INLET PROTECTION
	REINFORCED CHECK DAM
	REINFORCED ROCK BEEM
	RRB FOR CULVERT PROTECTION
	SEDIMENT BASIN
	SEDIMENT CONTROL LOG
	SEDIMENT TRAP
	SEEDING AND MULCHING
	SILT FENCE
	STABILIZED STAGING AREA
	SURFACE ROUGHENING
	TEMPORARY SLOPE DRAIN
	TEMPORARY STREAM CROSSING
	TERRACING
	VEHICLE TRACKING CONTROL
	VTC WITH WHEEL WASH ROCK AND RIPRAP GRADATIONS
	LIMITS OF CONSTRUCTION



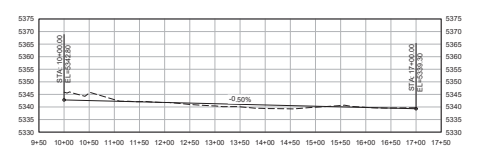
Diversion Ditch 1 PROFILE
 HORIZ. SCALE: 1" = 100'
 VERT. SCALE: 1" = 20'



Diversion Ditch 2 PROFILE
 HORIZ. SCALE: 1" = 100'
 VERT. SCALE: 1" = 20'



Diversion Ditch 3 PROFILE
 HORIZ. SCALE: 1" = 100'
 VERT. SCALE: 1" = 20'



City and County of Denver Public Works Development Engineering Services			
DES PROJECT NO. 2018-PR04MSTR-XXXXXX			
PROJECT NAME: SOUTHWEST AIRLINES MAINTENANCE HANGAR			
DESIGNED BY JMC	DATE 01/18/19	DATE ISSUED	DRAWING NO.
DRAWN BY CA	DATE 01/18/19		
CHECKED BY JMC	DATE 01/18/19	SHEET _2_ OF _8_ SHEETS	



DEN Team Project No: swe_101_SWARCNHangar



MAINTENANCE HANGAR



DESIGN CONSULTANTS:	
FIRE PROTECTION	
CIVIL	
IT/SECURITY	
STRUCTURAL	



REVISION #	DATE	DOCUMENT RELEASE #

DATE	DOCUMENT RELEASE #

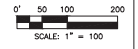
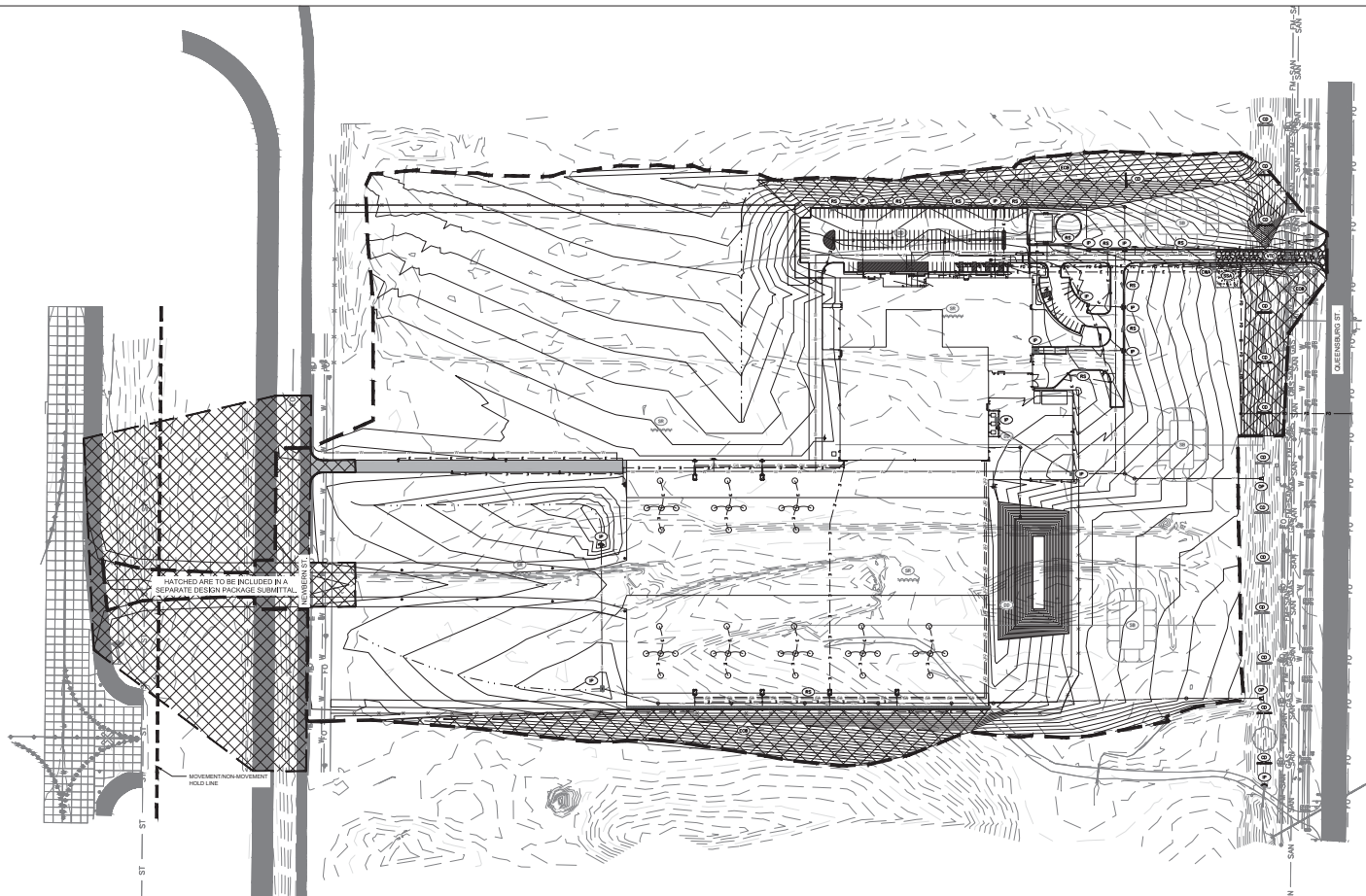
PROJECT #	187172
PROJECT MANAGER	J. DANZENBERG
DESIGNED BY	A. BENERIS
DRAWN BY	G. SULLAS
QA/CHECK	J. DANZENBERG
SHEET TITLE	

CASMP INITIAL EROSION CONTROL PLAN

C2.0

BMP LEGEND

	CD	CHECK DAM
	CB	COMPOST BLANKET
	CFB	COMPOST FILTER BEAM
	CS	CURB SOCK
	CWA	CONCRETE WASHOUT AREA
	CF	CONSTRUCTION FENCE
	CM	CONSTRUCTION MARKER
	DW	DEMATERING
	DD	DIVERSION DITCH
	ECB	EROSION CONTROL BLANKET
	IP	INLET PROTECTION
	RCD	REINFORCED CHECK DAM
	RRB	REINFORCED ROCK BEEM
	RRC	RRB FOR CLAYEY PROTECTION
	SB	SEDIMENT BASIN
	SCL	SEDIMENT CONTROL LOG
	ST	SEDIMENT TRAP
	SM	SEEDING AND MULCHING
	SF	SILT FENCE
	SSA	STABILIZED STAGING AREA
	SR	SURFACE ROUGHENING
	TSD	TEMPORARY SLOPE DRAIN
	TSC	TEMPORARY STREAM CROSSING
	TER	TERRACING
	VTC	VEHICLE TRACKING CONTROL
	WW	VTC WITH WHEEL WASH
	LOC	ROCK AND RIPRAP GRADATIONS LIMITS OF CONSTRUCTION



DEN Tenant Project No. 066, 1501 SWA RON Hangar

Southwest
SOUTHWEST AIRLINES
26405 E 107th AVE
DENVER, CO
MAINTENANCE HANGAR

GHAFFARI
GHAFARI ASSOCIATES
122 S MICHIGAN AVE, SUITE 1500
CHICAGO, IL 60603-6152 USA
TEL: +1 312 354 2300
www.ghafari.com

DESIGN CONSULTANTS:
FIRE PROTECTION: **WJE**
CIVIL: **HOK**
ITS/SECURITY: **4b**
STRUCTURAL: **HENDERSON & ROGERS**



REVISION #	DATE	DOCUMENT RELEASE #

DATE	DOCUMENT RELEASE #

City and County of Denver
Public Works
Development Engineering Services

DES PROJECT NO. 2018-PROJMSR-XXXXXX

PROJECT NAME:
SOUTHWEST AIRLINES MAINTENANCE HANGAR

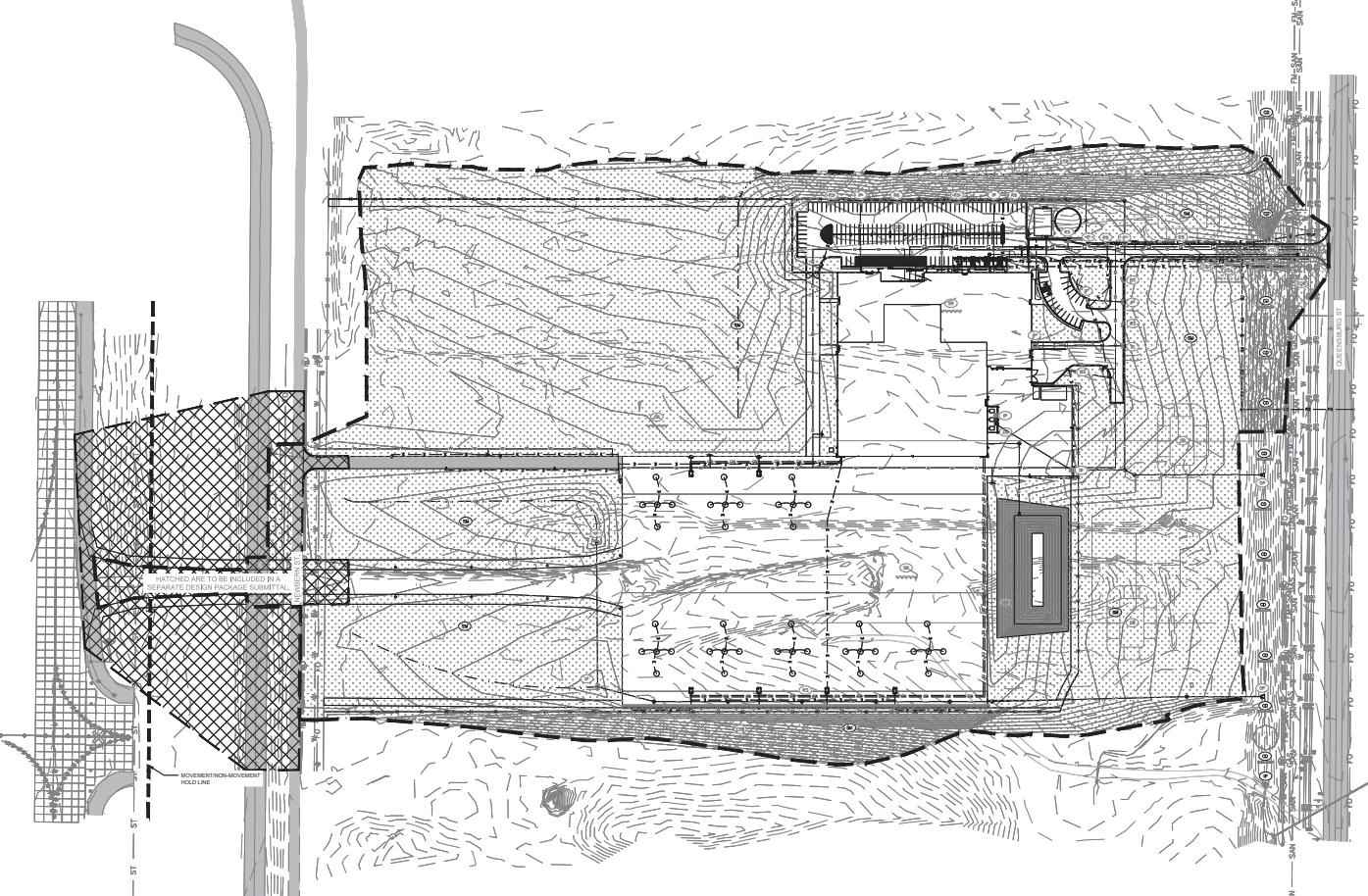
DESIGNED BY	DATE	DATE ISSUED	DRAWING NO.
JMB	01/18/19		
DRAWN BY	DATE		
CA	01/18/19		
CHECKED BY	DATE		
JNO	01/18/19	SHEET 3 OF 8 SHEETS	

PROJECT # 187172
PROJECT MANAGER: J. DANZENBERG
DESIGNED BY: A. BANNER
DRAWN BY: C. FISLER
QUALITY CHECK: J. DANZENBERG
SHEET TITLE: CASMP INTERIM EROSION CONTROL PLAN
SHEET NUMBER: C3.0

GHAFARI ASSOCIATES 03/18 PHOTO DATE: 1/18/2019 1:17:14 PM

BMP LEGEND

	CD CHECK DAM
	CB COMPOST BLANKET
	CFB COMPOST FILTER BEAM
	CS CURB SOCK
	CWA CONCRETE WASHOUT AREA
	CF CONSTRUCTION FENCE
	CM CONSTRUCTION MARKER
	DW DEMARKING
	DD DIVERSION DITCH
	ECB EROSION CONTROL BLANKET
	IP INLET PROTECTION
	RCD REINFORCED CHECK DAM
	RRB REINFORCED ROCK BEAM
	RRP RIBB FOR CULVERT PROTECTION
	SB SEDIMENT BASIN
	SCL SEDIMENT CONTROL LOG
	ST SEDIMENT TRAP
	SM SEEDING AND MULCHING
	SF SILT FENCE
	SSA STABILIZED STAGING AREA
	SR SURFACE ROUGHENING
	TSD TEMPORARY SLOPE DRAIN
	TSC TEMPORARY STREAM CROSSING
	TER TERRACING
	VTC VEHICLE TRACKING CONTROL
	WW VTC WITH WHEEL WASH
	LOC ROCK AND RIPRAP GRADATIONS
	LIM LIMITS OF CONSTRUCTION



DEN Tenant Project No. swa, 1501 SWA RON Hangar

Southwest
SOUTHWEST AIRLINES
26405 E 107th AVE
DENVER, CO

MAINTENANCE HANGAR

GHAFFARI
GHAFARI ASSOCIATES
122 S MICHIGAN AVE, SUITE 1500
CHICAGO, IL 60603-6152 USA
TEL: +1 312 354 2300
www.ghafari.com

DESIGN CONSULTANTS:

FIRE PROTECTION: **WJE**
Wm. Leary, Estor Associates, Inc.

CIVIL: **HOL**

IT/SECURITY: **4b**

STRUCTURAL: **HENDERSON & ROGERS**
Professional Engineers



REVISION #	DATE	DOCUMENT RELEASE #

City and County of Denver
Public Works
Development Engineering Services

DES PROJECT NO. 2018-PRG-MSTR-XXXXXX

PROJECT NAME: SOUTHWEST AIRLINES MAINTENANCE HANGAR

DESIGNED BY: JND	DATE: 01/18/19	DATE ISSUED:	DRAWING NO.:
DRAWN BY: CA	DATE: 01/18/19		
CHECKED BY: JND	DATE: 01/18/19	SHEET: 3 of 8 SHEETS	

DATE	DOCUMENT RELEASE #

PROJECT # 187172

PROJECT MANAGER J. DANZENBERG

DESIGNED BY A. BERNER

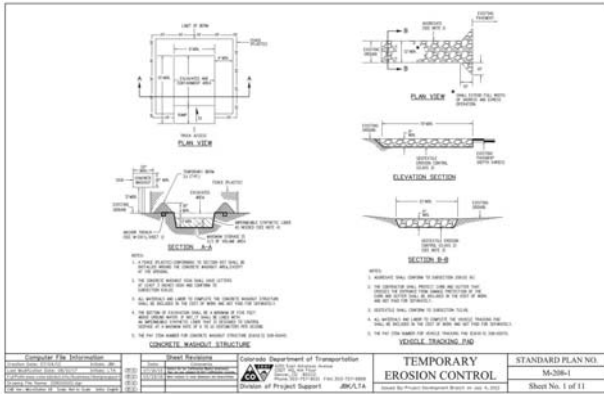
DRAWN BY G. FISHER

QUAL CHECK J. DANZENBERG

SHEET TITLE

CASMP FINAL EROSION CONTROL PLAN

SHEET NUMBER **C4.0**



Street Sweeping and Vacuuming (SS) SM-7

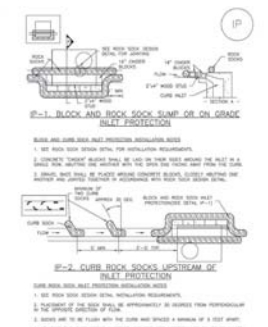
Description
Street sweeping and vacuuming are methods that have evolved over time to reduce volume transport into storm drain systems at a surface intersection.
Appropriate Uses
Use this practice at intersections that have multiple lane roads and/or urban areas (permitted).
Design and Installation
Street sweeping and vacuuming should be considered when there is relatively uniform accumulation of roadway adjacent to the curbline.
Maintenance and Removal
Inspect good roads around the perimeter of the construction site on a daily basis and more frequently, as needed.



Street Sweeping/Vacuuming
Function: Vacuum Control, Suction Control, Soil Removal Management
Number: 701, 702, 703, 704, 705

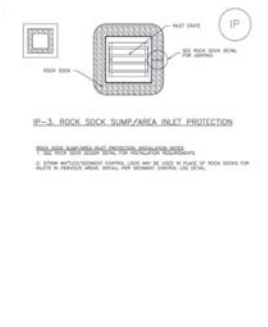
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SC-6 Inlet Protection (IP)



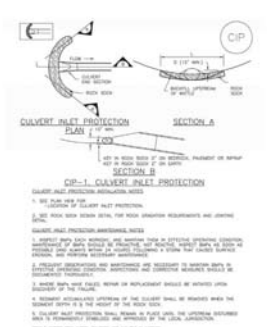
SC-6 Inlet Protection (IP) August 2013

Inlet Protection (IP) SC-6



SC-6 Inlet Protection (IP) August 2013

Inlet Protection (IP) SC-6



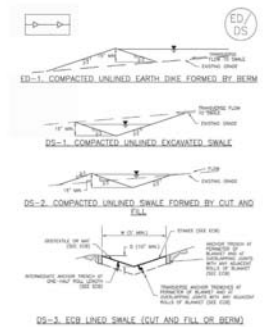
SC-6 Inlet Protection (IP) August 2013

SC-6 Inlet Protection (IP)



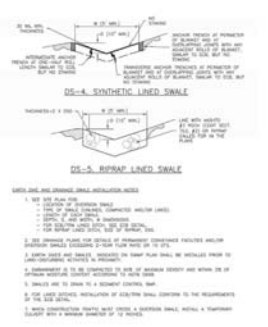
SC-6 Inlet Protection (IP) August 2013

Earth Dikes and Drainage Swales (ED/DS) EC-10



EC-10 Earth Dikes and Drainage Swales (ED/DS) November 2010

Earth Dikes and Drainage Swales (ED/DS) EC-10



EC-10 Earth Dikes and Drainage Swales (ED/DS) November 2010

Earth Dikes and Drainage Swales (ED/DS) EC-10



EC-10 Earth Dikes and Drainage Swales (ED/DS) November 2010



DEN Tenant Project No. 066, 1501 SWA, RON Hangar



MAINTENANCE HANGAR



DESIGN CONSULTANTS: FIRE PROTECTION WJE, CIVIL HOL, IT/SECURITY Ab, STRUCTURAL HENDERSON ROGERS



Table with 3 columns: REVISION #, DATE, DOCUMENT RELEASE #. Multiple empty rows.

Table with 2 columns: PROJECT #, PROJECT MANAGER, DESIGNER BY, DESIGNER, CHECK BY, SHEET TITLE.

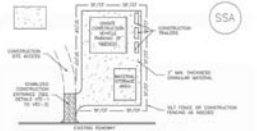
City and County of Denver Public Works Development Engineering Services
DES PROJECT NO. 2018-PR0MSTR-XXXXXX
PROJECT NAME: SOUTHWEST AIRLINES MAINTENANCE HANGAR

Table with 4 columns: DESIGNED BY, DATE, DRAWN BY, DATE, CHECKED BY, DATE, SHEET # OF # SHEETS, DRAWING NO.

CASMP EROSION CONTROL DETAILS

C5.0

Stabilized Staging Area (SSA) SM-6



STABILIZED STAGING AREA INSTALLATION NOTES
1. SEE PLAN AND ELEVATION FOR DIMENSIONS AND LOCATION OF STAGING AREA WITH APPROXIMATE, NEW CONSTRUCTION. CONSTRUCTION AND USE OF STAGING AREA SHALL BE APPROVED BY THE AIRPORT OPERATIONS AND SAFETY DIVISION (AOSD) PRIOR TO START OF CONSTRUCTION ON THE SITE.

November 2008 Urban Design and Flood Control Division Urban Storm Drainage Criteria Manual Volume 3 SM-1

Good Housekeeping Practices (GH) MM-3

Description
Implementation includes good housekeeping practices to prevent pollution associated with solid, liquid and hazardous materials.
1. Establish proper spill containment areas.
2. Establish proper handling and storage practices.
3. Establish proper separation of hazardous materials from other materials.



Appropriate Uses
Good housekeeping practices are necessary at all construction sites.

Design and Installation

The following principles and actions should be addressed in SWMP:
1. Provide for Waste Management. Implement management practices and procedures to prevent the generation and transport of pollutants in stormwater runoff, liquid and sanitary wastes.
2. Provide for Spill Prevention and Response. Implement management practices and procedures to prevent the generation and transport of pollutants in stormwater runoff, liquid and sanitary wastes.

November 2008 Urban Design and Flood Control Division Urban Storm Drainage Criteria Manual Volume 3 MM-1

SM-6 Stabilized Staging Area (SSA)



STABILIZED STAGING AREA INSTALLATION NOTES
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SM-6 Urban Design and Flood Control Division Urban Storm Drainage Criteria Manual Volume 3 November 2008

MM-3 Good Housekeeping Practices (GH)

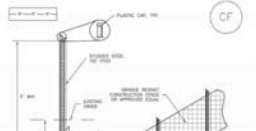
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November 2008 Urban Design and Flood Control Division Urban Storm Drainage Criteria Manual Volume 3 MM-2

SM-3 Construction Fence (CF)



CONSTRUCTION FENCE INSTALLATION NOTES
1. SEE PLAN AND ELEVATION FOR DIMENSIONS AND LOCATION OF CONSTRUCTION FENCE WITH APPROXIMATE, NEW CONSTRUCTION. CONSTRUCTION AND USE OF CONSTRUCTION FENCE SHALL BE APPROVED BY THE AIRPORT OPERATIONS AND SAFETY DIVISION (AOSD) PRIOR TO START OF CONSTRUCTION ON THE SITE.

SM-3 Urban Design and Flood Control Division Urban Storm Drainage Criteria Manual Volume 3 November 2008

MM-3 Good Housekeeping Practices (GH)

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November 2008 Urban Design and Flood Control Division Urban Storm Drainage Criteria Manual Volume 3 MM-3

SM-3 Construction Fence (CF)



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SM-3 Urban Design and Flood Control Division Urban Storm Drainage Criteria Manual Volume 3 November 2008

MM-3 Good Housekeeping Practices (GH)

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November 2008 Urban Design and Flood Control Division Urban Storm Drainage Criteria Manual Volume 3 MM-4

Good Housekeeping Practices (GH) MM-3

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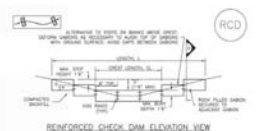
November 2008 Urban Design and Flood Control Division Urban Storm Drainage Criteria Manual Volume 3 MM-3

MM-3 Good Housekeeping Practices (GH)

1. Provide for Waste Management. Implement management practices and procedures to prevent the generation and transport of pollutants in stormwater runoff, liquid and sanitary wastes.
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November 2008 Urban Design and Flood Control Division Urban Storm Drainage Criteria Manual Volume 3 MM-3

Check Dams (CD) EC-12



REINFORCED CHECK DAM INSTALLATION NOTES
1. SEE PLAN AND ELEVATION FOR DIMENSIONS AND LOCATION OF REINFORCED CHECK DAM WITH APPROXIMATE, NEW CONSTRUCTION. CONSTRUCTION AND USE OF REINFORCED CHECK DAM SHALL BE APPROVED BY THE AIRPORT OPERATIONS AND SAFETY DIVISION (AOSD) PRIOR TO START OF CONSTRUCTION ON THE SITE.

November 2008 Urban Design and Flood Control Division Urban Storm Drainage Criteria Manual Volume 3 EC-1

EC-12 Check Dams (CD)



REINFORCED CHECK DAM INSTALLATION NOTES
1. SEE PLAN AND ELEVATION FOR DIMENSIONS AND LOCATION OF REINFORCED CHECK DAM WITH APPROXIMATE, NEW CONSTRUCTION. CONSTRUCTION AND USE OF REINFORCED CHECK DAM SHALL BE APPROVED BY THE AIRPORT OPERATIONS AND SAFETY DIVISION (AOSD) PRIOR TO START OF CONSTRUCTION ON THE SITE.

November 2008 Urban Design and Flood Control Division Urban Storm Drainage Criteria Manual Volume 3 EC-4

City and County of Denver Public Works Development Engineering Services
DES PROJECT NO. 2018-PRGMR-XXXXXX
PROJECT NAME: SOUTHWEST AIRLINES MAINTENANCE HANGAR
DESIGNED BY: JF
DATE: 01/19/19
DRAWN BY: JF
DATE: 01/19/19
CHECKED BY: JF
DATE: 01/19/19
SHEET: 5 OF 8 SHEETS



DEN Tenant Project No. 066, 1501 SWA/RON Hangar

Southwest SOUTHWEST AIRLINES 26405 E 107th Ave DENVER, CO MAINTENANCE HANGAR

GHAFFARI GHAFFARI ASSOCIATES 122 S MICHIGAN AVE, SUITE 1500 CHICAGO, IL 60603-6152 USA TEL +1 312 384 2300 www.ghaffari.com

DESIGN CONSULTANTS: FIRE PROTECTION WJE CIVIL HCL IT/SURVEY 4b STRUCTURAL HENDERSON & ROGERS

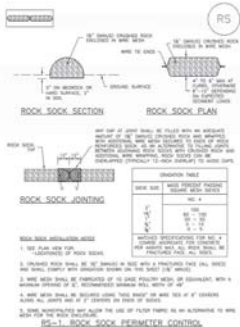
REGISTRATION SEAL: PROFESSIONAL ENGINEER STATE OF COLORADO NO. 31293

Table with columns for REVISION #, DATE, and DOCUMENT RELEASE #.

Table with columns for PROJECT #, PROJECT MANAGER, DESIGNER, DRAWN BY, CHECKED BY, SHEET TITLE, and SHEET NUMBER.

CASMP EROSION CONTROL DETAILS SHEET NUMBER C5.1

SC-5 Rock Sock (RS)



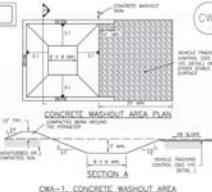
SC-5 Urban Drainage and Flood Control District Urban Storm Drainage Criteria Manual Volume 1

Rock Sock (RS) SC-5

Rock Sock Installation Notes: 1. ROCK SOCK SHALL BE INSTALLED ON EXISTING CONCRETE CURB... 2. ROCK SOCK SHALL BE INSTALLED ON EXISTING CONCRETE CURB...

November 2008 Urban Drainage and Flood Control District Urban Storm Drainage Criteria Manual Volume 1

Concrete Washout Area (CWA) MM-1



November 2008 Urban Drainage and Flood Control District Urban Storm Drainage Criteria Manual Volume 1

Concrete Washout Area (CWA) MM-1

CONCRETE WASHOUT AREA INSTALLATION NOTES: 1. CONCRETE WASHOUT AREAS SHALL BE INSTALLED ON EXISTING CONCRETE CURB...

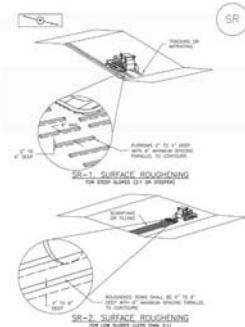
November 2008 Urban Drainage and Flood Control District Urban Storm Drainage Criteria Manual Volume 1

EC-4 Mulching (MU)

- 1. Check wind flow and seed flow control grain sizes should be applied evenly at a rate of 2 tons per acre... 2. Check wind flow and seed flow control grain sizes should be applied evenly at a rate of 2 tons per acre...

SC-2 Urban Drainage and Flood Control District Urban Storm Drainage Criteria Manual Volume 1

Surface Roughening (SR) EC-1



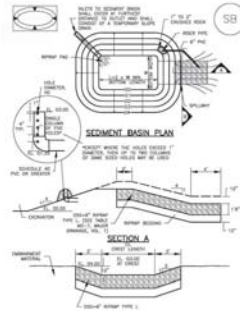
November 2008 Urban Drainage and Flood Control District Urban Storm Drainage Criteria Manual Volume 1

EC-1 Surface Roughening (SR)

SURFACE ROUGHENING INSTALLATION NOTES: 1. SURFACE ROUGHENING SHALL BE INSTALLED ON EXISTING CONCRETE CURB... 2. SURFACE ROUGHENING SHALL BE INSTALLED ON EXISTING CONCRETE CURB...

November 2008 Urban Drainage and Flood Control District Urban Storm Drainage Criteria Manual Volume 1

Sediment Basin (SB) SC-7



August 2013 Urban Drainage and Flood Control District Urban Storm Drainage Criteria Manual Volume 1

Sediment Basin (SB) SC-7

Table with 4 columns: Item No., Description, Quantity, and Unit. Lists materials for Sediment Basin (SB).

SC-7 Urban Drainage and Flood Control District Urban Storm Drainage Criteria Manual Volume 1

Sediment Basin (SB) SC-7

Sediment Basin Installation Notes: 1. SEDIMENT BASIN SHALL BE INSTALLED ON EXISTING CONCRETE CURB... 2. SEDIMENT BASIN SHALL BE INSTALLED ON EXISTING CONCRETE CURB...

August 2013 Urban Drainage and Flood Control District Urban Storm Drainage Criteria Manual Volume 1

City and County of Denver Public Works Development Engineering Services. Project information including project name, date, and sheet number.



DEN Tenant Project No. 066, 1501 SWA-RON Hangar

Southwest logo and address: SOUTHWEST AIRLINES 26405 E 107th AVE DENVER, CO

MAINTENANCE HANGAR

Ghafari Associates logo and address: GHAFARI ASSOCIATES 122 S MICHIGAN AVE, SUITE 1500 CHICAGO, IL 60603-6152 USA

DESIGN CONSULTANTS: FIRE PROTECTION (WJE), CIVIL (HCL), IT/SECURITY (4b), STRUCTURAL (HENDERSON & ROGERS)



Table with 2 columns: REVISION # and DATE. For tracking design changes.

Table with 2 columns: DATE and DOCUMENT RELEASE #. For tracking document releases.

Table with 2 columns: PROJECT # and PROJECT MANAGER. Project details.

CASMP EROSION CONTROL DETAILS

SHEET NUMBER C5.2

SECTION 015719 - TEMPORARY ENVIRONMENTAL CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Specifications Conditions and other Division 01 Specification Sections, apply to this Section.
- B. Title 8 - Protection of Persons and Property in the General Contract Conditions, 2011 Edition, specifically the following articles:
 - 1. Article 806 - Protection of Drainage Ways
 - 2. Article 807 - Protection of Environment
 - 3. Article 808 - Hazardous and Explosive Materials or Substances
 - 4. Article 809 - Archaeological and Historical Discoveries
- C. Denver Municipal Airport System Rules and Regulations, Part 180-Environmental Management.
- D. DEN Environmental Management System (EMS)

1.2 SUMMARY

- A. The Work specified in this Section consists of identifying, and avoiding or mitigating adverse environmental impacts to air, water, soil, and other natural resources caused by construction activities.
 - 1. The Contractor, in conducting any activity on airport property or in conducting work for an airport project not on airport property, shall comply with all applicable airport, local, state, and federal rules, regulations, statutes, laws, and orders.
 - 2. Work shall not commence on any project until all FAA approvals have been received, applicable permits have been issued and signed by permittee, and all inspection requirements have been satisfied in accordance with State and local permitting requirements.

1.3 SUBMITTALS

- A. Refer to Section 013300 "Submittal Procedures" and Section 013325 "Shop and Working Drawings, Product Data and Samples" for submittal procedures.

- B. Within ten (10) days after Notice to Proceed on a task order, the Contractor shall submit the following if applicable, unless waived by the Project Manager:
1. Submittals pertaining to water quality management:
 - a. Construction Activities Stormwater Discharge Permit
 - 1) City and County of Denver
 - a) Sewer Use & Drainage Permit (SUDP)
 - b) Construction Activities Stormwater Discharge Permit (CASDP)
 - 2) Colorado Department of Public Health and Environment (CDPHE) Colorado Discharge Permit System (CDPS) Authorization to Discharge (Contractor need not submit a copy of the general permit or the general permit rationale)
 - a) CDPS General Permit for Stormwater Discharges Associated with Construction Activities
 - b) CDPS General Permit for Associated with Non-Extractive Industrial Activity
 - c) CDPS General Permit for Construction Dewatering Discharges (Prior to obtaining a CDPS General Permit for Construction Dewatering Discharges permit, the Contractor shall submit a draft permit application and the final permit application for DEN review and approval PRIOR to submittal to CDPHE. The Contractor need not submit a copy of the general permit or the general permit rationale.
 - 3) Upon request the contractor shall provide the following documentation
 - a) Stormwater Management Plan (SWMP)
 - b) CASDP Inactivation Request
 - c) CDPS Notice of Termination
 - d) Permit Transfer Application
 - e) Modification Application
 - f) Discharge Monitoring Reports (DMRs)
 - g) A copy of the well permit from the state Division of Water Resources for every new well that diverts or for the monitoring of groundwater. (A draft copy of the Notice of Intent for any borehole structure filed with the state Division of Water Resources).
 - h) Section 404 related permitting (Prior to obtaining a permit issued by the US Army Corps of Engineers, the contractor shall submit a draft copy of the application and coordinate with efforts DEN Environmental Services).
 - 4) Revisions or amendments to the CASMP by the Contractor: At the completion of the Project, after final stabilization has been achieved and accepted in accordance with CASDP requirements, the Contractor shall submit a copy of the CASDP Inactivation Request.
 - a. Draft copy of the permit application for a sewage holding tank.
 2. Submittals pertaining to sewage holding tanks associated with buildings and trailers: For purposes of this Section, the generic term "sewage holding tank" means "individual sewage disposal system (ISDS)", "privy vault", "septic tank", or "septic system":
 - a. Draft copy of the permit application for a sewage holding tank.

- b. Copy of the Sewer Use & Drainage Permit issued by the Denver Department of Public Works.
 - c. Copy of the ISDS permit issued by the Denver Department of Environmental Health.
3. Submittals pertaining to air quality management:
- a. Copy of any permit issued by the CDPHE Air Pollution Control Division (APCD)
4. Submittals pertaining to storage tanks and containers:
- a. Copy of the approved application issued by the State of Colorado, Department of Labor and Employment, Division of Oil and Public Safety, for installation of petroleum, or other regulated substances, storage tanks located on airport property and used for the Project.
 - b. Copy of permits issued by the Denver Fire Department for storage tank installations, storage tank removals, and hazardous materials use/storage.
 - c. Copy of Spill Prevention, Control, and Countermeasure (SPCC) Plan for petroleum storage tanks and containers with capacity of 55 gallons of oil or greater located on airport property and used for the Project.
5. Copies of any other plans, permits, permit applications, correspondence with regulatory agencies, including violations, waste manifests, results of laboratory analyses, or other environmental documentation required for the Project not previously identified herein.

1.4 RELATED DOCUMENTS

- A. Code of Federal Regulations (CFR) Publications, including, but not limited to, the following:
1. 33 CFR 323 - Permits for discharges of dredged or fill materials into waters of the United States.
 2. 40 CFR - Protection of Environment.
 3. 49 CFR 171-180 Hazardous Materials Transportation Regulations.
- B. Colorado Revised Statutes, including, but not limited to, the following:
1. Water Quality Control, Title 25, Article 8.
 2. Air Quality Control, Title 25, Article 7.
 3. Hazardous Waste, Title 25, Article 15.
 4. Noise Abatement, Title 25, Article 12.
 5. Petroleum Storage Tanks, Title 8, Article 20.5.
 6. Liquefied Petroleum Gas (LPG) Storage Tanks, Title 8, Article 20, Part 4.
 7. Solid waste regulations.
- C. City and County of Denver Executive Orders, including, but not limited to, the following:
1. Executive Order No. 115 - Required Use of Denver-Arapahoe Disposal Site (Landfill).
 2. Executive Order No. 123 - Greenprint Denver Office and Sustainability Policy.
 3. Denver Revised Municipal Code, Title II, Sections 48-44 and 48-93 - Solid Waste.
- D. City and County of Denver Construction Sites Program.

- E. City and County of Denver Construction Activities Stormwater Management Plans Information Guide.
- F. Any other applicable rules, regulations, ordinances, and guidance must be followed as applicable.
- G. Refer to Section 013300 "Submittal Procedures" and 013325 "Shop and Working Drawings, Product Data and Samples" for submittal procedures.
- H. Refer to Section 017419 "Construction Waste Management" for waste management requirements

PART 2 - PRODUCTS

2.1 PRODUCTS

- A. Products required for the Work shall meet all Environmental Requirements.
- B. At a minimum, products for erosion and sediment control must conform to the technical requirements contained in the City and County of Denver "Construction Activities Stormwater Manual" and the current version of the "Urban Drainage and Flood Control District's Urban Storm Drainage Criteria Manual, Volume 3: Best Management Practices".

PART 3 - EXECUTION

3.1 AIR POLLUTION CONTROLS

- A. The Contractor shall use appropriate control measures to comply with applicable air quality permit requirements. Additionally, the Contractor must be aware of the following procedures and techniques while conducting construction activities on DEN property. NOTE: Application of dust control measures should be discussed and outlined in the Dust Control Plan.
 - 1. Apply water as needed to the construction site haul roads, disturbed surface areas and public access roads as needed to suppress dust. The use of chemical stabilizer can be requested by the Contractor. The type of stabilizer to be used and locations of use must be included in the Dust Control Plan, which must be approved by the Project Manager prior to application.
 - 2. The Contractor shall suspend all earthmoving activities if wind speed exceeds 30 mph. For purposes of this Section, the generic term "earthmoving" means clearing, grubbing, excavation, topsoil removal, backfilling, embankment work, grading, trenching, drilling, and installation of borings. Contractors are expected to check wind speeds with the airport's ramp tower to demonstrate compliance with this requirement. In addition, the Project may be shut down if two of three of the Runway Visual Range (RVR) instruments read visibility of 2,400 feet or less. The instruments are used by FAA Control Tower personnel to ensure safe aircraft operations. Costs for shutdowns due to wind velocities or RVR readings shall not be grounds for delay or extra cost claims.
- B. Burning of materials is strictly prohibited on DEN property.

3.2 WATER POLLUTION CONTROLS

- A. The Contractor shall conduct construction activities in accordance with all applicable permit requirements. In addition, the Contractor shall comply with the following procedures and requirements while conducting activities on DEN property:
1. Water encountered during construction cannot be discharged to the stormwater system or placed onto the ground surface without a permit AND prior written approval by the Project Manager. If groundwater or stormwater is anticipated to be encountered and the Contractor desires to discharge it to the stormwater system or onto the ground surface, then the Contractor must obtain an appropriate CDPS discharge permit in advance of the discharge unless this activity is specifically authorized under the CDPS Construction Stormwater Permit.
 2. If water is encountered and the Contractor desires to discharge these waters to the sanitary sewer system, then the Contractor must obtain approval from DEN Environmental Services in advance of the discharge.
 3. The Contractor shall ensure that stormwater that comes in contact with storage areas does not become impacted and discharged to the stormwater sewer system or to an impervious surface. Furthermore, any materials in storage areas shall not be stored directly on the ground. Refer to Section 264200 "Cathodic Protection" for cathodic protection requirements.
 4. The Contractor shall not operate any valves, sluice gates or other drainage appurtenances related to any DEN sewer system without the prior approval of both the Project Manager and DEN Environmental Services. Any violation of this directive may result in the payment of a financial penalty by the Contractor if the State of Colorado assesses such a penalty.

3.3 EROSION CONTROL AND SEDIMENTATION CONTROL

- A. This Work consists of constructing, installing, maintaining and removing, if required, temporary and permanent control measures during the life of the Contract (and possibly afterward) until the Contractor achieves final stabilization of the site to prevent or minimize erosion, sedimentation, and pollution of any state waters in accordance with all Environmental Requirements.
- B. The Contractor is responsible for compliance with all requirements in accordance with the CASDP, the City and County of Denver Construction Sites Program, the approved CASMP, and CDPS-issued permits.
- C. Temporary facilities, including but not limited to storage areas, laydowns, borrow areas, and contractor offices and work yards, shall be managed in accordance with Section 015210 "Temporary Facilities".
- D. Clean soil fill may be stockpiled in any area that has been previously approved and signed off by the DEN Section Manager of Construction, Design and Planning, and Environmental Services. Soil stockpiles are considered a potential pollutant source and must be addressed in the CASMP and/or SWMP.
- E. Make immediately available, upon the Project Managers request, all labor, material, and equipment judged appropriate by the Project Manager to maintain suitable erosion and sediment control features. These actions requested by the Project Manager take precedence over all other aspects of project construction that have need of the same labor, material and equipment, except those aspects required to prevent loss of life or severe property damage.

3.4 CONSTRUCTION OF CONTROL MEASURES FOR EROSION AND SEDIMENTATION

- A. The Contractor must install control measures in accordance with the most recent version of the "Urban Drainage and Flood Control District's Urban Storm Drainage Criteria Manual, Volume 3: Best Management Practices and the City and County of Denver Construction Activities Stormwater Manual".
 - 1. Deviations from these two documents are allowed with written consent from the City and County of Denver NPDES Inspector.

3.5 STORAGE OF OIL, FUELS, OR HAZARDOUS SUBSTANCES

- A. The Contractor shall prevent oil or other hazardous substances, as defined in federal and state regulations, from entering the ground, drainage or local bodies of water, and shall provide containment, diversionary structures, or equipment to prevent discharged oil from reaching a watercourse and take immediate action to contain and clean up any spill of oily substances, petroleum products, or hazardous substances. The Contractor shall provide one or more of the following preventive systems at each petroleum storage site:
 - 1. Dikes, berms, or retaining walls capable of containing at least 100% of the volume of the largest single tank and equipped with sufficient freeboard to contain precipitation events. The secondary containment must be "sufficiently impermeable" to prevent a release to the environment.
 - 2. Culverting, curbing, guttering, or other similar structures capable of containing at least 100% of the volume of the largest single tank and freeboarding from precipitation.
- B. The provision of such preventive systems shall be subject to acceptance by the Project Manager prior to tank installation and shall follow the SPCC regulations (40 CFR Part 112).
- C. Prior to bringing any containers of 55-gallon or above capacity onto DEN property for storage of oil, fuel, or other petroleum substances, the Contractor may be required to prepare an SPCC Plan that conforms to 40 CFR Part 112. The plan must include a certification either from a Professional Engineer or self-certification, if applicable, as well as management approval from the legally responsible Contractor representative.

3.6 SPILL RESPONSE AND NOTIFICATION

- A. The Contractor is responsible for all spills that may result from its activities. For ANY suspected or confirmed release or spill of oil, fuel, solid waste, hazardous waste, unknown materials, lavatory waste, or miscellaneous chemicals, etc., that occurs as the result of the Contractor's activities on DEN property, the Contractor is required to take immediate action to mitigate the release or spill and report it to the Project Manager and to the DEN Communications Center at (303) 342-4200.
- B. The Contractor is responsible for notifying the appropriate regulatory agency in the event suspected and/or confirmed releases are identified, in accordance with regulatory requirements.

3.7 SITE REMEDIATION AND RESTORATION

- A. The Contractor shall be required to perform any necessary site assessment and remediation activities required by applicable regulatory agency.

- B. During routine construction activities, the Contractor is required to manage soils using typical construction techniques. The Contractor must differentiate between soils and wastes, including contaminated soils versus clean soils, and determine those materials that can remain on DEN property and those that must be transported off site for disposal.
- C. During all construction activities that require the management of soils, the Contractor must notify the Project Manager and DEN Environmental Services (ES) that soils being managed may be impacted by industrial activities conducted at the airport. "Process knowledge" pertaining to previous use and/or impact for the locations under construction can be used to determine whether impacted soils are probable. Also, common indices such as soil staining and odor can be used as a determination for the probable condition. If probable contamination conditions are suspected, the Contractor will notify the Project Manager and DEN ES immediately. At that time, which may be before the Work is initiated where indicative conditions exist, all work will cease until a sampling and analysis approach is determined and implemented by the proper responder.
- D. If the site conditions warrant based on evidence of spillage or contamination, process knowledge, and/or visual or olfactory observations, the Contractor may be required to conduct sampling and analysis to confirm that no remedial action is required. Prior to conducting any removal activities, the Contractor must provide a Scope of Work to the Project Manager describing the proposed site assessment activities.
- E. The impacted project will modify its operation to include a segregation area where probable impacted soils can be placed, stored, and sampled for characterization. Should the soil materials be determined to exceed the applicable standards, the Project Manager, in conjunction with DEN ES, will be responsible for the proper disposal of these materials. Materials that are determined to contain contamination levels below the applicable standards can be considered clean soils and placed back into the excavation or reused elsewhere on DEN property. In accordance with Part 3 of this Section, materials removed that are suitable for recycling will be placed within areas designated on DEN to store these materials.
- F. The Contractor shall restore any area on the Airport that becomes contaminated as a result of its operations. Restoration shall be either to applicable standards under federal and state law or to such other levels as may be required by the Manager of Aviation, at the Manager's sole discretion. Such restoration shall be completed at the earliest possible time, and the Contractor's restoration shall be subject to inspection and approval by the Manager of Aviation or duly authorized representative. See DEN Rules & Regulations - Part 180.

PART 4 - MEASUREMENT

4.1 METHOD OF MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

PART 5 - PAYMENT

5.1 METHOD OF PAYMENT

- A. No separate payment will be made for work under this Section.

- B. The Contractor shall be responsible for payment of all fees associated with review of environmental permit applications and processing of environmental permits.

END OF SECTION 015719

SECTION 312000 - EARTHWORK (For Building)

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Excavating and filling for rough grading the Site.
2. Preparing subgrades for exterior flatwork, walks and pavements.
3. Excavating and backfilling for buildings and structures.
4. Drainage course for perimeter building drain.
5. Subbase course for concrete walks and pavements.
6. Subbase course and base course for asphalt paving.
7. Subsurface drainage backfill for walls and trenches.
8. Excavating and backfilling trenches for utilities and pits for buried utility structures.

B. Related Requirements:

1. Section 312319 "Dewatering" for lowering and disposing of ground water during construction.
2. Section 315000 "Excavation Support and Protection" for shoring, bracing, and sheet piling of excavations.
3. Division 32 and 33 for paving and other site related work.

1.2 UNIT PRICES

- A. Work of this Section is affected by unit prices for earth moving specified according to Contract provisions for unit prices.
- B. Quantity allowances for earth moving are included in the contract provisions.
- C. Rock Measurement: Volume of rock actually removed, measured in original position. Unit prices for rock excavation include replacement with approved materials.

1.3 DEFINITIONS

- A. Backfill: Soil material or controlled low-strength material used to fill an excavation.
1. Initial Backfill: Generally known as "pipe zone fill" and includes the bedding zone. For public utilities, extends at least 12 inches above the top of the pipe. Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
 2. Final Backfill: Backfill placed over initial backfill to fill a trench.
- B. Base Course: Aggregate layer placed between the subbase course and pavement.
- C. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe. See initial backfill above.

- D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.
- E. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.
 - 1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Geotechnical Engineer. Authorized additional excavation and replacement material will be paid for according to Contract provisions for unit prices.
 - 2. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Geotechnical Engineer. Unauthorized excavation, as well as remedial work directed by Geotechnical Engineer, shall be without additional compensation.
- F. Fill: Soil materials used to raise existing grades.
- G. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.
- H. Subbase Course: Aggregate layer placed between the subgrade and a cement concrete walk and other exterior flatwork.
- I. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below supporting foundations, slab-on-grade, and pavements, or topsoil materials.
- J. Utilities: On-site underground pipes, conduits, ducts, and cables as well as underground services within buildings.

1.4 PREINSTALLATION MEETINGS

- A. Pre-installation Conference: Conduct pre-excavation conference at Project Site.
 - 1. Review methods and procedures related to earthmoving, including, but not limited to, the following:
 - a. Personnel and equipment needed to make progress and avoid delays.
 - b. Coordination of Work with utility locator service.
 - c. Coordination of Work and equipment movement with the locations of tree- and plant-protection zones.
 - d. Field quality control.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of the following manufactured products required:
 - 1. Geotextiles.

2. Controlled low-strength material, including design mixture.
3. Warning tapes.
4. Include data substantiating that materials comply with requirements.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified testing agency.
- B. Material Test Reports: For each on-site and borrow soil material proposed for fill and backfill as follows:
 1. Classification according to ASTM D 2487.
 2. Laboratory compaction curve according to ASTM D 698.
 3. Swell-consolidation of remolded samples according to ASTM D4546
 4. Water-soluble sulfate concentrations for treated upper select soils according to CP-L 2103 (CDOT)
 5. 3-point mix analyses for lime- or cement-treated upper select soils according to applicable standards

1.7 QUALITY ASSURANCE

- A. Geotechnical Testing Agency Qualifications: Qualified according to ASTM E 329 and ASTM D 3740 for testing indicated.

1.8 FIELD CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earth-moving operations.
 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
 2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.
- B. Improvements on Adjoining Property: Authority for performing earth moving indicated on property adjoining Owner's property will be obtained by Owner before award of Contract.
- C. Utility Locator Service: Notify utility locator service for area where Project is located before beginning earth-moving operations.
- D. Do not commence earth-moving operations until temporary site fencing and erosion- and sedimentation-control measures specified in Section 311000 "Site Clearing" are in place.
- E. Do not commence earth-moving operations until plant-protection measures specified in Section 015639 "Temporary Tree and Plant Protection" are in place.
- F. The following practices are prohibited within protection zones:
 1. Storage of construction materials, debris, or excavated material.
 2. Parking vehicles or equipment.
 3. Foot traffic.
 4. Erection of sheds or structures.

5. Impoundment of water.
 6. Excavation or other digging unless otherwise indicated.
 7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.
- G. Do not direct vehicle or equipment exhaust towards protection zones.
- H. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

- A. General: The following material and compaction requirements are suitable for fill materials at the project site. The Owner's Geotechnical Engineer will evaluate the suitability of all proposed fill materials for the project prior to placement.
- B. General Site Grading Fill: Soil material shall consist of moisture-conditioned on-site materials, including the existing clay fills, natural clay soils, and properly processed claystone bedrock. The material shall have a maximum particle size of 2 inches, and claystone and sandstone shall be processed using discs and other methods to break the claystone and sandstone down to a soil-like consistency. Where used in fill zones beneath foundations, floor slabs, and movement sensitive exterior flatwork, the swell potential of these materials shall not exceed 3% when remolded to 95% of the Standard Proctor (ASTM D698) maximum dry density at optimum moisture content and wetted under a 200 psf surcharge pressure.
- C. General Structural Fill: Soil material shall consist of a non-expansive to low-swelling on-site or imported material having a maximum size of 3 inches and a maximum of 85% passing the No. 200 sieve. These materials shall not exceed 1.0% when remolded to 95% of the Standard Proctor (ASTM D698) maximum dry density at optimum moisture content and wetted under a 200 psf surcharge pressure.
- D. Select Structural Fill: Select structural fill shall consist of an imported material meeting the requirements for CDOT Class 5 or 6 Aggregate Base Course.
- E. Aggregate Base Course: Aggregate base course beneath pavements shall meet the requirements for CDOT Class 6 Aggregate Base Course. Refer to Division 32 sections for more information.
- F. Utility Trench Backfill: Materials other than claystone excavated from the utility trenches may be used for trench backfill above the pipe zone fill zone provided they do not contain unsuitable material, claystone fragments larger than 2 inches, or other particles larger than 3 inches, and can be placed and compacted as recommended herein.
- G. Material Suitability: Unless otherwise noted, all fill materials shall be non- to low-swelling, free of claystone, vegetation, brush, sod, trash and debris and other deleterious substances, and should not contain rocks or lumps having a diameter of more than 6 inches. Evaluation of potential fill sources shall include determination of laboratory moisture-density relationships and swell consolidation tests on remolded samples prior to acceptance.
- H. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940/D 2940M; except with 100 percent

passing a 1-inch sieve and not more than 8 percent passing a No. 200 sieve.

- I. Drainage Course: Narrowly graded mixture of washed crushed stone, or crushed or uncrushed gravel; ASTM D 448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2-inch sieve and zero to 5 percent passing a No. 8 sieve.
- J. Filter Material: Narrowly graded mixture of natural or crushed gravel, or crushed stone and natural sand; ASTM D 448; coarse-aggregate grading Size 67; with 100 percent passing a 1-inch sieve and zero to 5 percent passing a No. 4 sieve.
- K. Sand: ASTM C 33/C 33M; fine aggregate.
- L. Impervious Fill: Silty and/or clayey soil with a minimum of 30% material by weight passing the U.S. No. 200 sieve.

2.2 CONTROLLED LOW-STRENGTH MATERIAL

- A. Controlled Low-Strength Material: Self-compacting, low density flowable concrete material produced from the following:
 - 1. Portland Cement: ASTM C 150/C 150M, Type II.
 - 2. Fly Ash: ASTM C 618, Class C or F.
 - 3. Normal-Weight Aggregate: ASTM C 33/C 33M, 3/4-inch nominal maximum aggregate size.
 - 4. Foaming Agent: ASTM C 869/C 869M.
 - 5. Water: ASTM C 94/C 94M.
 - 6. Air-Entraining Admixture: ASTM C 260/C 260M.
- B. Produce low-density, controlled low-strength material with the following physical properties:
 - 1. As-Cast Unit Weight: 36 to 42 lb/cu. ft. at point of placement, when tested according to ASTM C 138/C 138M.
 - 2. Compressive Strength: 80 psi is suitable for most applications except within the structural fill zone beneath heavily loaded foundations (minimum 120 psi) and within 12 inches of the bottom of the air-craft pavement section (minimum 200 psi) when tested according to ASTM C 495/C 495M.
 - 3. Produce conventional-weight, controlled low-strength material with compressive strength as list above when tested according to ASTM C495/C495M.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth-moving operations.
- B. Protect and maintain erosion and sedimentation controls during earth-moving operations.

- C. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

3.2 TEMPORARY EXCAVATIONS

- A. Over-excavate slopes to a stable configuration where enough space is available. All excavations shall be constructed in accordance with OSHA requirements, as well as state, local and other applicable requirements. Excavations over 20-feet in depth shall be designed by a registered professional engineer. The contractor's on-site "competent person" shall confirm all necessary slope and shoring designs are performed. In addition, the slopes shall be monitored on a regular basis for signs of movement and safety considerations

3.3 DEWATERING

- A. Provide dewatering system of sufficient scope, size, and capacity to control hydrostatic pressures and to lower, control, remove, and dispose of ground water and permit excavation and construction to proceed on dry, stable subgrades.
- B. Diversion berms and other measures shall be used to prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.
- C. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.
 - 1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.
 - 2. Use of temporary perimeter drains, perimeter trenches, sumps and pumping from within the excavation may be required to handle groundwater seepage flows.
 - 3. If significant runoff into the excavations does occur, further excavation will be required to remove and replace the wet, soft or loose subgrade materials or to stabilize the slopes.
- D. Contractor shall be responsible for assessing requirements for and implementing dewatering. Proper dewatering and efficient removal of water within excavations is important to limit infiltration of water into potentially expansive material. The contractor shall submit a dewatering plan that includes measures for efficiently intercepting and removing water, including backup pumping and provisions for operating dewatering operations on a 24-hour per day, 7-day per week basis, if necessary.
- E. Dispose of water removed by dewatering in a manner that avoids endangering public health, property, and portions of work under construction or completed. Dispose of water and sediment in a manner that avoids inconvenience to others.

3.4 EXCAVATION, GENERAL

- A. Site grading shall include removal of existing fill, excavations extending to depths of up to around 10 feet or more in places, and placement of new engineered fill across the site. Excavations below building slabs and adjacent exterior flatwork shall be of sufficient depth to allow for placement of minimum of 10-feet of compacted general structural fill below the slab. Excavations will likely encounter existing clay fill, natural clay and granular soils, and claystone and sandstone bedrock. Excavations are not anticipated to encounter significant groundwater, although perched groundwater may be present in places. Excavation of the on-site overburden soils and bedrock should be feasible with typical heavy-duty excavation equipment, although isolated cemented bedrock zones may require jackhammering. Contractor shall provide all appropriate equipment

necessary to perform excavation of all materials encountered.

- B. Existing fill materials, where present, shall be considered non-engineered and unsuitable in their current condition for support of foundations, building floor slabs, movement-sensitive exterior flatwork and pavements. Existing fill soils shall be completely removed, and over-excavated areas backfilled with new engineered fill meeting the material and compaction criteria presented in this section.

3.5 EXCAVATION FOR STRUCTURES

- A. Excavate to indicated elevations and dimensions within a tolerance of zero to minus 1 inch. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.
1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.
 2. Drilled piers/shafts: Stop excavations 4 inches above bottom of pier cap . After piers have been poured, remove loose and displaced material. Scarify and compact subgrade to specified density then level to final grade, leaving solid base to receive void forms for concrete pier caps.
 3. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1 inch. Do not disturb bottom of excavations intended as bearing surfaces.

3.6 EXCAVATION FOR WALKS AND PAVEMENTS

- A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

3.7 EXCAVATION FOR UTILITY TRENCHES

- A. Excavate trenches to indicated gradients, lines, depths, and elevations.
1. Beyond building perimeter, excavate trenches to allow installation of top of pipe below frost line.
- B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches (300 mm) higher than top of pipe or conduit unless otherwise indicated.
1. Clearance: 12 inches (300 mm) each side of pipe or conduit unless otherwise noted.
- C. Trench Bottoms:
1. Excavate trenches 4 inches deeper than bottom of pipe and conduit elevations to allow for bedding course.

2. In rock or other unyielding bearing material, excavate trenches 6 inches deeper than elevation required to allow for bedding course.
 3. Hand-excavate deeper for bells of pipe.
- D. Trenches in Tree- and Plant-Protection Zones:
1. Hand-excavate to indicated lines, cross sections, elevations, and subgrades. Use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.
 2. Do not cut main lateral roots or taproots; cut only smaller roots that interfere with installation of utilities.
 3. Cut and protect roots according to requirements in Section 015639 "Temporary Tree and Plant Protection."

3.8 SUBGRADE INSPECTION

- A. Notify Geotechnical Engineer and/or Owners testing agency when excavations have reached required subgrade.
- B. If Geotechnical Engineer and/or Owners testing agency determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.
- C. Authorized additional excavation and replacement material will be paid for according to Contract provisions for unit prices.
- D. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Geotechnical Engineer, without additional compensation.

3.9 UNAUTHORIZED EXCAVATION

- A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2500 psi (17.2 MPa), may be used when approved by Geotechnical Engineer.
 1. Fill unauthorized excavations under other construction, pipe, or conduit as directed by Geotechnical Engineer.

3.10 STORAGE OF SOIL MATERIALS

- A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 1. Stockpile soil materials away from edge of excavations.

3.11 BACKFILL

- A. Place and compact backfill in excavations promptly, but not before completing the following:
 - 1. Construction below finish grade including, where applicable, subdrainage, dampproofing, waterproofing, and perimeter insulation.
 - 2. Surveying locations of underground utilities for Record Documents.
 - 3. Testing and inspecting underground utilities.
 - 4. Removing concrete formwork.
 - 5. Removing trash and debris.
 - 6. Removing temporary shoring, bracing, and sheeting.
 - 7. Installing permanent or temporary horizontal bracing on horizontally supported walls.

B.

3.12

- A. Place backfill on subgrades free of mud, frost, snow, or ice.
- B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.
- C. Backfill voids with satisfactory soil while removing shoring and bracing.
- D. Initial Backfill:
 - 1. Soil Backfill: Place and compact initial backfill of satisfactory soil, free of particles larger than 2 inch in any dimension, to a height of 12 inches (300 mm) over the pipe or conduit.
 - a. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.
 - 2. Controlled Low-Strength Material: Place initial backfill of controlled low-strength material to a height of 12 inches (300 mm) over the pipe or conduit. Coordinate backfilling with utilities testing.
- E. Final Backfill:
 - 1. Soil Backfill: Place and compact final backfill of satisfactory soil to final subgrade elevation.
 - 2. Controlled Low-Strength Material: Place final backfill of controlled low-strength material to final subgrade elevation.
- F. Warning Tape: Install warning tape directly above utilities, 12 inches below finished grade, except 6 inches (150 mm) below subgrade under pavements and slabs.

3.13 SOIL FILL

- A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 2 horizontal so fill material will bond with existing material.

- B. Prior to placing site grading or structural fill, or select embankment material, the upper 12 inches of the subgrade soils at the base of the fill zone shall be scarified, moisture conditioned, and recompacted to at least 95% of the standard Proctor (ASTM D698) maximum dry density at moisture contents within two percentage points of the optimum moisture content for granular subgrade soils and between 0 and +3 percentage points of optimum for clay subgrade materials. All other areas to receive new fill not specifically addressed shall be scarified to a depth of at least 8 inches and recompacted to at least 95% of the standard Proctor (ASTM D698) maximum dry density at the moisture contents recommended above.
- C. Place and compact fill material in layers to required elevations as follows:
 - 1. Under grass and planted areas, use general site grading fill material.
 - 2. Under walks use general site grading fill material.
 - 3. Under building slabs, steps and ramps and movement-sensitive flatwork use general structural fill.
 - 4. Under footings and foundations, use select structural fill.
- D. Place soil fill on subgrades free of mud, frost, snow, or ice.

3.14 SOIL MOISTURE CONTROL

- A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content for predominantly granular materials and between 0 and +3 percentage points of optimum for predominantly cohesive materials.
 - 1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
 - 2. For some on-site materials, a significant amount of water will be needed to raise the moisture content to within the necessary treatment band for compaction. Note that clay materials, including on-site and imported materials and processed claystone may become unstable and deform under wheel loads if placed near the upper end of the recommended moisture range
 - 3. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds recommended maximum placement moisture content or is too wet to compact to within the specified dry unit weight range.

3.15 COMPACTION OF SOIL BACKFILLS AND FILLS

- A. Place backfill and fill soil materials in accordance with soil report recommendations.
- B. Place backfill and fill soil materials evenly on all sides of structures to required elevations and uniformly along the full length of each structure.
- C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 698 :
 - 1. Under structures, building slabs, steps, and ramps, scarify and recompact top 12 inches of existing subgrade and compact each layer of select structural fill soil material to at least 95 percent.

2. Under walkways, other exterior flatwork and pavements scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material to at least 95 percent.
3. Under turf or unpaved areas, scarify and recompact top 6 inches (150 mm) below subgrade and compact each layer of backfill or fill soil material to at least 92 percent.
4. For utility trenches, compact each layer of initial and final backfill soil material to at least 95 percent.

3.16 GRADING

- A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
 1. Provide a smooth transition between adjacent existing grades and new grades.
 2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.
- B. Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to elevations required to achieve indicated finish elevations, within the following subgrade tolerances:
 1. Turf or Unpaved Areas: Plus or minus 1 inch .
 2. Walks: Zero to minus 1 inch.
- C. Grading inside Building Lines: Finish subgrade to a tolerance of 1/2 inch when tested with a 10-foot straightedge.

3.17 SUBBASE AND BASE COURSES UNDER WALKS

- A. Place subbase course and base course on subgrades free of mud, frost, snow, or ice.
- B. On prepared subgrade, place subbase course and base course under walks as follows:
 1. Shape subbase course and base course to required crown elevations and cross-slope grades.
 2. Place subbase course and base course 6 inches or less in compacted thickness in a single layer.
 3. Place subbase course and base course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches (150 mm) thick or less than 3 inches thick.
 4. Compact subbase course and base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 698.

3.18 FIELD QUALITY CONTROL

- A. Special Inspections: Geotechnical Engineer will engage a qualified special inspector to perform the following special inspections:

1. Determine prior to placement of fill that site has been prepared in compliance with requirements.
 2. Determine that fill material classification and maximum lift thickness comply with requirements.
 3. Determine, during placement and compaction, that in-place density of compacted fill complies with requirements.
- B. Testing Agency: Geotechnical Engineer will engage a qualified geotechnical engineering testing agency to perform tests and inspections.
- C. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.
- D. Footing Subgrade: At footing subgrades, at least one test of each soil stratum will be performed to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by Design-Builder.
- E. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2937, and ASTM D 6938, as applicable. Tests will be performed at the following locations and frequencies:
1. Gradation characteristics and Atterberg limits: Every 5,000 cubic yards for the lower select embankment materials. Every 2500 cubic yards of imported material for the upper select embankment materials.
 2. Water-soluble sulfate tests shall be performed for every 1,000 cubic yards for the upper select embankment material.
 3. Remolded swell-consolidation characteristics shall be evaluated for every 10,000 cubic yards for all select fill materials.
 4. Mix analyses for treated soils.
- F. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.

3.19 PROTECTION

- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, frozen or where they soften or loosen due to subsequent construction operations or weather conditions.
1. Scarify or remove and replace soil material to depth as directed by Geotechnical Engineer reshape and recompact.
- C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.

1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.20 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Transport surplus satisfactory soil to designated storage areas on Owner's property. Stockpile or spread soil as directed by Geotechnical Engineer.

1. Remove waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION 312000

312319 - DEWATERING**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes construction dewatering.
- B. Related Requirements:
 - 1. Section 013233 "Photographic Documentation" for recording preexisting conditions and dewatering system progress.
 - 2. Item P-152 "Excavation, Subgrade, and Embankment" for excavating, backfilling, site grading, and controlling surface-water runoff and ponding.
 - 3. Item D-705 "Pipe Underdrains for Airports" for permanent foundation wall, underfloor, and footing drainage.

1.3 ALLOWANCES

- A. Dewatering observation wells are part of the dewatering allowance.

1.4 PRE-INSTALLATION MEETINGS

- A. Pre-installation Conference: Conduct conference at the location and time as determined by DEN Project Manager.
 - 1. Verify availability of Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - 2. Review condition of site to be dewatered, including coordination with temporary erosion-control measures and temporary controls and protections.
 - 3. Review geotechnical report.
 - 4. Review proposed site clearing and excavations.
 - 5. Review existing utilities and subsurface conditions.
 - 6. Review observation and monitoring of dewatering system.

1.5 ACTION SUBMITTALS

- A. Shop Drawings: For dewatering system.
 - 1. Include plans, elevations, sections, and details.
 - 2. Show arrangement, locations, and details of wells and well points; locations of risers, headers, filters, pumps, power units, and discharge lines; and means of discharge, control of sediment, and disposal of water.
 - 3. Include layouts of piezometers and flow-measuring devices for monitoring performance of dewatering system.

4. Include written plan for dewatering operations including sequence of well and well-point placement coordinated with excavation shoring and bracings and control procedures to be adopted if dewatering problems arise.
5. Include Shop Drawings signed and sealed by the qualified Professional Engineer responsible for their preparation.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For installer, land surveyor, and Professional Engineer, as applicable.
- B. Photographs or videotape (sufficiently detailed) of existing conditions of adjoining construction and site improvements that might be misconstrued as damage caused by dewatering operations.
- C. Field quality-control reports. Before starting excavation, submit test results and computations demonstrating that dewatering system is capable of meeting performance requirements.
- D. Existing Conditions: Using photographs and/or video recordings, as required by the DEN Project Manager, show existing conditions of adjacent construction and site improvements that might be misconstrued as damage caused by dewatering operations. Submit before the Work begins.
- E. CLOSEOUT SUBMITTALS
- F. As-Built Plans: Submit complete as-built plans of all Work, including interface with other Work, in accordance with requirements as specified in Section 013300 "Submittal Procedures".
 1. Identify locations and depths of capped wells and well points and other abandoned-in-place dewatering equipment.

1.7 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with water disposal requirements of authorities having jurisdiction.
- B. Installer Qualifications: An experienced installer that has specialized in the design of dewatering systems and dewatering work.

1.8 FIELD CONDITIONS

- A. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others, unless permitted in writing by the DEN Project Manager, and then only after arranging to provide temporary utility services according to requirements indicated.
- B. Project-Site Information: A geotechnical report has been prepared for this Project and is available for review. The opinions expressed in this report are those of a geotechnical engineer and represent interpretations of subsoil conditions, tests, and results of analyses conducted by a geotechnical engineer. Owner is not responsible for interpretations or conclusions drawn from this data.
 1. Make additional test borings and conduct other exploratory operations necessary for dewatering according to the performance requirements.
 2. The geotechnical report is included in the Project Manual.
- C. Survey Work: Engage a qualified land surveyor or Professional Engineer to survey adjacent existing buildings, structures, and site improvements; establish exact elevations at fixed points to act as benchmarks. Clearly identify benchmarks and record existing elevations.

1. During dewatering, regularly re-survey benchmarks, maintaining an accurate log of surveyed elevations for comparison with original elevations. Promptly notify DEN Project Manager if changes in elevations occur or if cracks, sags, or other damage is evident in adjacent construction.

1.9 CONSTRUCTION WASTE MANAGEMENT

- A. Construction waste shall be managed in accordance with provisions of Section 017419 "Construction Waste Management and Disposal". Documentation shall be submitted to satisfy the requirements of that Section.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Dewatering Performance: Design, furnish, install, test, operate, monitor, and maintain dewatering system of sufficient scope, size, and capacity to control hydrostatic pressures and to lower, control, remove, and dispose of ground water and permit excavation and construction to proceed on dry, stable subgrades. Contractor shall reference the Erosion Control Plans for dewatering provisions.
 1. Design dewatering system, including comprehensive engineering analysis by a qualified Professional Engineer.
 2. Continuously monitor and maintain dewatering operations to ensure erosion control, stability of excavations and constructed slopes, prevention of flooding in excavation, and prevention of damage to subgrades and permanent structures.
 3. Prevent surface water from entering excavations by grading, dikes, or other means.
 4. Accomplish dewatering without damaging existing buildings, structures, and site improvements adjacent to excavation.
 5. Remove dewatering system when no longer required for construction.
- B. Regulatory Requirements: Comply with governing EPA notification regulations, before beginning dewatering. Comply with water and debris disposal regulations of authorities having jurisdiction.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect airfield facilities, structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by dewatering operations.
 1. Prevent surface water and subsurface or ground water from entering excavations, from ponding on prepared subgrades, and from flooding site or surrounding area.
 2. Protect subgrades and foundation soils from softening and damage by rain or water accumulation.
- B. Install dewatering system to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.
 1. Do not close or obstruct airfield facilities, aircraft operations, streets, walks, or other adjacent occupied or used facilities without permission from the DEN Project Manager and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways, if required by authorities having jurisdiction.

- C. Provide temporary grading to facilitate dewatering and control of surface water.
- D. Protect and maintain temporary erosion and sedimentation controls, which are specified in Section 015210 "Temporary Facilities," during dewatering operations.

3.2 INSTALLATION

- A. Install dewatering system utilizing wells, well points, or similar methods complete with pump equipment, standby power and pumps, filter material gradation, valves, appurtenances, water disposal, and surface-water controls.
 - 1. Space well points or wells at intervals required to provide sufficient dewatering.
 - 2. Use filters or other means to prevent pumping of fine sands or silts from the subsurface.
- B. Place dewatering system into operation to lower water to specified levels before excavating below ground-water level.
- C. Provide sumps, sedimentation tanks, and other flow-control devices as required by authorities having jurisdiction.
- D. Provide standby equipment on-site, installed and available for immediate operation, to maintain dewatering on continuous basis if any part of system becomes inadequate or fails.

3.3 OPERATION

- A. Operate system continuously until drains, sewers, and structures have been constructed and fill materials have been placed or until dewatering is no longer required.
- B. Operate system to lower and control ground water to permit excavation, construction of structures, and placement of fill materials on dry subgrades. Install sufficient dewatering equipment to drain water-bearing strata above and below bottom of foundations, drains, sewers, and other excavations.
 - 1. Do not permit open-sump pumping that leads to loss of fines, soil piping, subgrade softening, and slope instability.
 - 2. Reduce hydrostatic head in water-bearing strata below subgrade elevations of foundations, drains, sewers, and other excavations.
 - 3. Maintain piezometric water level a minimum of 60 inches (1,500 mm) below bottom of excavation.
- C. Dispose of water removed by dewatering in a manner that avoids endangering public health, property, and portions of work under construction or completed. Dispose of water and sediment in a manner that avoids inconvenience to others and impacts to airfield operations.
- D. Remove dewatering system from Project site on completion of dewatering. Plug or fill well holes with sand or cut off and cap wells a minimum of 36 inches (900 mm) below overlying construction.
- E. Damages: Promptly repair damages to adjacent facilities caused by dewatering operations.

3.4 FIELD QUALITY CONTROL

- A. Observation Wells: Provide observation wells or piezometers, take measurements, and maintain at least the minimum number indicated; additional observation wells may be required by authorities having jurisdiction.

1. Observe and record daily elevation of ground water and piezometric water levels in observation wells.
 2. Repair or replace, within 24 hours, observation wells that become inactive, damaged, or destroyed. In areas where observation wells are not functioning properly, suspend construction activities until reliable observations can be made. Add or remove water from observation-well risers to demonstrate that observation wells are functioning properly.
 3. Fill observation wells, remove piezometers, and fill holes when dewatering is completed.
- B. Survey-Work Benchmarks: Re-survey benchmarks at an interval designated by the DEN Project Manager during dewatering, and maintain an accurate log of surveyed elevations for comparison with original elevations. Promptly notify the DEN Project Manager if changes in elevations occur or if cracks, sags, or other damage is evident in adjacent construction.
- C. Provide continual observation to ensure that subsurface soils are not being removed by the dewatering operation.
- D. Prepare reports of observations.

3.5 PROTECTION

- A. Protect and maintain dewatering system during dewatering operations.
- B. Promptly repair damages to adjacent facilities caused by dewatering.

END OF SECTION 312319

SECTION 315000 - EXCAVATION SUPPORT AND PROTECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes temporary excavation support and protection systems.
- B. Related Requirements:
 - 1. Section 013233 "Photographic Documentation" for recording preexisting conditions and excavation support and protection system progress.
 - 2. Section 312000 "Earth Moving" for excavating and backfilling, for controlling surface-water runoff and ponding, and for dewatering excavations.

1.2 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Review geotechnical report.
 - 2. Review existing utilities and subsurface conditions.
 - 3. Review coordination for interruption, shutoff, capping, and continuation of utility services.
 - 4. Review proposed excavations.
 - 5. Review proposed equipment.
 - 6. Review monitoring of excavation support and protection system.
 - 7. Review coordination with waterproofing.
 - 8. Review abandonment or removal of excavation support and protection system.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, performance properties, and dimensions of individual components and profiles, and calculations for excavation support and protection system.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For the following:
 - 1. Land surveyor.
 - 2. Professional Engineer: Experience with providing delegated-design engineering services of the type indicated, including documentation that engineer is licensed in the state in which Project is located.

- B. Contractor Calculations: For excavation support and protection system. Include analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- C. Existing Conditions: Using photographs or video recordings, show existing conditions of adjacent construction and site improvements that might be misconstrued as damage caused by inadequate performance of excavation support and protection systems. Submit before Work begins.

1.5 CLOSEOUT SUBMITTALS

- A. Record Drawings: Identify locations and depths of capped utilities, abandoned-in-place support and protection systems, and other subsurface structural, electrical, or mechanical conditions.

1.6 FIELD CONDITIONS

- A. Interruption of Existing Utilities: Do not interrupt any utility-serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility according to requirements indicated:
 - 1. Notify Architect, Construction Manager and Owner no fewer than five days in advance of proposed interruption of utility.
 - 2. Do not proceed with interruption of utility without Owner's written permission.
- B. Survey Work: Engage a qualified land surveyor or professional engineer to survey adjacent existing buildings, structures, and site improvements; establish exact elevations at fixed points to act as benchmarks. Clearly identify benchmarks and record existing elevations.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design excavation support and protection systems to resist all lateral loading and surcharge, including but not limited to, retained soil, groundwater pressure, adjacent building loads, adjacent traffic loads, construction traffic loads, material stockpile loads, and seismic loads, based on the following:
 - 1. Compliance with OSHA Standards and interpretations, 29 CFR 1926, Subpart P.
 - 2. Compliance with AASHTO Standard Specification for Highway Bridges or AASHTO LRFD Bridge Design Specification, Customary U.S. Units.
 - 3. Compliance with requirements of authorities having jurisdiction.
 - 4. Compliance with utility company requirements.
 - 5. Compliance with railroad requirements.

2.2 MATERIALS

- A. Provide materials that are either new or in serviceable condition.

- B. Structural Steel: ASTM A 36/A 36M, ASTM A 690/A 690M, or ASTM A 992/A 992M.
- C. Steel Sheet Piling: ASTM A 328/A 328M, ASTM A 572/A 572M, or ASTM A 690/A 690M; with continuous interlocks.
- D. Tiebacks: Steel bars, ASTM A 722/A 722M.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards that could develop during excavation support and protection system operations.
 - 1. Shore, support, and protect utilities encountered.

3.2 INSTALLATION - GENERAL

- A. Locate excavation support and protection systems clear of permanent construction, so that construction and finishing of other work is not impeded.
- B. Install excavation support and protection systems to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.
 - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
 - 2. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.
- C. Install excavation support and protection systems without damaging existing buildings, structures, and site improvements adjacent to excavation.

3.3 SHEET PILING

- A. Before starting excavation, install one-piece sheet piling lengths and tightly interlock vertical edges to form a continuous barrier.
- B. Accurately place the piling using templates and guide frames unless otherwise recommended in writing by the sheet piling manufacturer.
 - 1. Limit vertical offset of adjacent sheet piling to 60 inches.
 - 2. Accurately align exposed faces of sheet piling to vary not more than 2 inches from a horizontal line and not more than 1:120 out of vertical alignment.
- C. Cut tops of sheet piling to uniform elevation at top of excavation.

3.4 TIEBACKS

- A. Drill, install, grout, and tension tiebacks.
- B. Test load-carrying capacity of each tieback, and replace and retest deficient tiebacks.
 - 1. Have test loading observed by a qualified professional engineer responsible for design of excavation support and protection system.
- C. Maintain tiebacks in place until permanent construction is able to withstand lateral earth and hydrostatic pressures.

3.5 BRACING

- A. Locate bracing to clear columns, floor framing construction, and other permanent work. If necessary to move brace, install new bracing before removing original brace.
 - 1. Do not place bracing where it will be cast into or included in permanent concrete work unless otherwise approved by Architect.
 - 2. Install internal bracing if required to prevent spreading or distortion of braced frames.
 - 3. Maintain bracing until structural elements are supported by other bracing or until permanent construction is able to withstand lateral earth and hydrostatic pressures.

3.6 MAINTENANCE

- A. Monitor and maintain excavation support and protection system.
- B. Prevent surface water from entering excavations by grading, dikes, or other means.
- C. Continuously monitor vibrations, settlements, and movements to ensure stability of excavations and constructed slopes and to ensure that damage to permanent structures is prevented.

3.7 FIELD QUALITY CONTROL

- A. Survey-Work Benchmarks: Resurvey benchmarks regularly during installation of excavation support and protection systems, excavation progress, and for as long as excavation remains open.
 - 1. Maintain an accurate log of surveyed elevations and positions for comparison with original elevations and positions.
 - 2. Promptly notify Architect if changes in elevations or positions occur or if cracks, sags, or other damage is evident in adjacent construction.
- B. Promptly correct detected bulges, breakage, or other evidence of movement to ensure that excavation support and protection system remains stable.
- C. Promptly repair damages to adjacent facilities caused by installation or faulty performance of excavation support and protection systems.

3.8 REMOVAL AND REPAIRS

- A. Remove excavation support and protection systems when construction has progressed sufficiently to support excavation and earth and hydrostatic pressures.
 - 1. Remove in stages to avoid disturbing underlying soils and rock or damaging structures, pavements, facilities, and utilities.
 - 2. Fill voids immediately with approved backfill compacted to density specified in Section 312000 "Earth Moving."
 - 3. Repair or replace, as approved by Architect, adjacent work damaged or displaced by removing excavation support and protection systems.
- B. Leave excavation support and protection systems permanently in place.

END OF SECTION 315000

P-151 CLEARING AND GRUBBING**DESCRIPTION**

151-1.1 This item shall consist of clearing or clearing and grubbing, including the disposal of materials, for all areas within the limits designated on the plans or as required by the Project Manager. The designated areas shall be cleared and grubbed of six (6) inches of topsoil and vegetation prior to beginning any excavation or embankment operations. In addition, the Contractor shall clear, grub and strip an area 10 feet beyond the top of cut slopes and the toe of fill slopes.

- a. Clearing shall consist of the cutting and removal of all trees, stumps, brush, logs, hedges, the removal of fences and other loose or projecting material from the designated areas. The grubbing of stumps and roots will not be required.
- b. Clearing and grubbing shall consist of clearing the surface of the ground of the designated areas of all trees, stumps, down timber, logs, snags, brush, undergrowth, hedges, heavy growth of grass or weeds, fences, structures, debris, and rubbish of any nature, natural obstructions or such material which in the opinion of the Project Manager is unsuitable for the foundation of strips, pavements, or other required structures, including the grubbing of stumps, roots, matted roots, foundations, and the disposal from the project of all spoil materials resulting from clearing and grubbing.

CONSTRUCTION METHODS

151-2.1 GENERAL. The areas denoted on the plans to be cleared or cleared and grubbed shall be staked on the ground by the Contractor. The Contractor shall employ a Land Surveyor registered in the State of Colorado for the surveying work required. The clearing and grubbing shall be done at a satisfactory distance in advance of the grading operations.

All spoil materials removed by clearing or by clearing and grubbing shall be disposed of outside the Airport's limits at the Contractor's responsibility, except when otherwise directed by the Project Manager.

All hazardous waste materials shall be disposed of offsite in accordance with Division 1 Technical Specification Section 015719, Temporary Environmental Controls. The Contractor shall furnish the Project Manager a written statement from the disposal site facility which confirms that the waste material is allowed at the disposal site in accordance with all pertinent Federal, State, and local rules, regulations, and ordinances. All other waste material shall be disposed of as specified under Section P-152 Excavation and Embankment.

Blasting shall not be allowed

The removal of existing structure and utilities required to permit orderly progress of work shall be accomplished by local agencies, unless otherwise shown on the plans. Whenever a telephone or telegraph pole, pipeline, conduit, sewer, roadway, or other utility is encountered and must be removed or relocated, the Contractor shall advise the Project Manager who will notify the proper local authority or owner to secure prompt action.

151-2.2 CLEARING. The Contractor shall clear the staked or indicated area of all objectionable materials. Trees unavoidably falling outside the specified clearing limits must be cut up, removed, and disposed of in a satisfactory manner. To minimize damage to trees that are to be left standing, trees shall be felled toward the center of the area being cleared. The Contractor shall preserve and protect from injury all trees not to be removed. The trees, stumps, and brush shall be cut flush with flush with the original ground surface. The grubbing of stumps and roots will not be required.

Fences shall be removed and disposed of as directed by the Project Manager. Fence wire shall be neatly rolled and the wire and posts stored on the airport if they are to be used again, or stored at a designated by the Project Manager if the fence is to remain the property of a local owner or authority.

151-2.3 CLEARING AND GRUBBING. In areas designated to be cleared and grubbed, all stumps, roots, buried logs, brush, grass, and other unsatisfactory materials shall be removed, except where embankments exceeding 3-1/2 feet in depth will be constructed outside of paved areas. For embankments constructed outside of paved areas, all unsatisfactory materials shall be removed, but sound trees, stumps, and brush can be cut off flush with the original ground and allowed to remain. Tap roots and other projections over 1- 1/2 inches in diameter shall be grubbed out to a depth of at least 18 inches below the finished subgrade or slope elevation.

Any buildings and miscellaneous structures that are shown on the plans to be removed shall be demolished or removed, and all materials shall be disposed of by removal from the site. The cost of removal is incidental to this item. The remaining or existing foundations, wells, cesspools, and like structures shall be destroyed by breaking down the materials of which the foundations, wells, cesspools, etc., are built to a depth at least 2 feet below the existing surrounding ground. Any broken concrete, blocks, or other objectionable material that cannot be used in backfill shall be removed and disposed of at the Contractor's expense. The holes or openings shall be backfilled with acceptable material and properly compacted.

All holes under embankment areas remaining after the grubbing operation shall have the sides of the holes flattened to facilitate filling with acceptable material and compacting as required in Item P-152. The same procedure shall be applied to all holes remaining after grubbing in areas where the depth of holes exceeds the depth of the proposed excavation.

END OF P-151

P-160 WATERING**DESCRIPTION**

160-1.1 This work shall consist of obtaining, conveying, and applying water for compaction of embankments and subgrades; for concrete; haul road; for dust control; and for any other purposes in accordance with the requirements of the Contract Documents or as designated by the Project Manager.

MATERIALS

160-2.1 WATER QUALITY. Water required for construction use shall be clean and free from sewage, oil, acid, strong alkalis, organic material, and other substances injurious to the finished product. Water obtained from the City supplied source is acceptable for use as construction water. If the Contractor provides an alternative source for water supply, water of questionable quality shall be tested in accordance with ASTM C1602. All alternative supply sources shall be subject to approval by the Project Manager.

160-2.2 CITY SUPPLIED WATER SOURCE. Refer to construction drawings for source of construction water from the water line close to the Contractor's Staging Area. There is not an unlimited supply of water available and the Contractor will be held responsible for misuse of water. The tap size shall be limited to 1-1/2 inches (38 mm).

It shall be the Contractor's responsibility to contact the Denver Water Department (DWD) and the Project Manager and arrange for connection to the above referenced waterline, to include installation of meter. The Contractor's connection plan, its distribution system, and its filling operations must be coordinated with, submitted to, and approved by the DWD prior to installation. All costs associated with waterline connections and distribution shall be included in the unit prices bid for the applicable items of construction.

160-2.3 POTABLE WATER. Potable water may be hauled in and stored by the Contractor.

CONSTRUCTION METHODS

160-3.1 TRANSPORT OF WATER. The Contractor may transport water overland to an approved temporary storage facility, or construct temporary supply piping to his primary use point. The approximate location and alignment of the Contractor's temporary supply/distribution system must be approved by the Project Manager in writing prior to its installation and must be removed by the Contractor upon completion of work. Potential contamination of existing domestic water system shall be held as the responsibility of the contractor.

160-3.2 EQUIPMENT. The water equipment shall be of capacity and designed to assure uniform application of water in the amounts required.

160-3.3 PERMITS. The Contractor shall obtain the required DWD permit(s) relative to tapping the water line and/or the use of said water.

TESTING REQUIREMENTS

ASTM C1602 Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete

END OF P-160

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Related Requirements:
 - 1. Section 011000 "Summary" for work restrictions and limitations on utility interruptions.
 - 2. Section 011200 "Multiple Contract Summary" for responsibilities for temporary facilities and controls for projects utilizing multiple contracts.
 - 3. Section 312000 "Earth Moving" for disposal of ground water at Project site.

1.2 USE CHARGES

- A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities engaged in the Project to use temporary services and facilities without cost, including, but not limited to, Architect, testing agencies, and authorities having jurisdiction.
- B. Sewer Service: Pay sewer-service use charges for sewer usage by all entities for construction operations.
- C. Water Service: Pay water-service use charges for water used by all entities for construction operations.
- D. Electric Power Service: Pay electric-power-service use charges for electricity used by all entities for construction operations.

1.3 INFORMATIONAL SUBMITTALS

- A. Site Utilization Plan: Show temporary facilities, temporary utility lines and connections, staging areas, construction site entrances, vehicle circulation, and parking areas for construction personnel.
- B. Implementation and Termination Schedule: Within 15 days of date established for commencement of the Work, submit schedule indicating implementation and termination dates of each temporary utility.
- C. Project Identification and Temporary Signs: Show fabrication and installation details, including plans, elevations, details, layouts, typestyles, graphic elements, and message content.
- D. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.

- E. Moisture- and Mold-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage and mold.
- F. Dust- and HVAC-Control Plan: Submit coordination drawing and narrative that indicates the dust- and HVAC-control measures proposed for use, proposed locations, and proposed time frame for their operation. Include the following:
 - 1. Locations of dust-control partitions at each phase of work.
 - 2. HVAC system isolation schematic drawing.
 - 3. Location of proposed air-filtration system discharge.
 - 4. Waste-handling procedures.
 - 5. Other dust-control measures.

1.4 QUALITY ASSURANCE

- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

1.5 PROJECT CONDITIONS

- A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Chain-Link Fencing: Minimum 2-inch, 0.148-inch-thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet high with galvanized-steel pipe posts; minimum 2-3/8-inch-OD line posts and 2-7/8-inch-OD corner and pull posts, with 1-5/8-inch-OD top rails.
- B. Dust-Control Adhesive-Surface Walk-Off Mats: Provide mats minimum 36 by 60 inches.
- C. Insulation: Unfaced mineral-fiber blanket, manufactured from glass, slag wool, or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively.

2.2 TEMPORARY FACILITIES

- A. Common-Use Field Office: Of sufficient size to accommodate needs of Owner, Architect, and construction personnel office activities and to accommodate Project meetings specified in other Division 01 Sections. Keep office clean and orderly. Furnish and equip offices as follows:

1. Furniture required for Project-site documents including file cabinets, plan tables, plan racks, and bookcases.
 2. Conference room of sufficient size to accommodate meetings of 10 individuals. Provide electrical power service and 120-V ac duplex receptacles, with no fewer than one receptacle on each wall. Furnish room with conference table, chairs, and 4-foot-square tack and marker boards.
 3. Drinking water and private toilet.
 4. Heating and cooling equipment necessary to maintain a uniform indoor temperature of 68 to 72 deg F.
 5. Lighting fixtures capable of maintaining average illumination of 20 fc at desk height.
- B. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.
1. Store combustible materials apart from building.

2.3 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.
- B. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
 2. Heating Units: Listed and labeled for type of fuel being consumed, by a qualified testing agency acceptable to authorities having jurisdiction, and marked for intended location and application.
 3. Permanent HVAC System: If Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter with MERV of 8 at each return-air grille in system and remove at end of construction. and clean HVAC system as required in Section 017700 "Closeout Procedures."
- C. Air-Filtration Units: Primary and secondary HEPA-filter-equipped portable units with four-stage filtration. Provide single switch for emergency shutoff. Configure to run continuously.

PART 3 - EXECUTION

3.1 TEMPORARY FACILITIES, GENERAL

- A. Conservation: Coordinate construction and use of temporary facilities with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.
1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as Owner's property.

3.2 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
 - 1. Locate facilities to limit site disturbance as specified in Section 011000 "Summary."
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.3 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary service or connect to existing service.
 - 1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.
 - 1. Connect temporary sewers to municipal system or private system indicated as directed by authorities having jurisdiction.
- C. Water Service: Install water service and distribution piping in sizes and pressures adequate for construction.
- D. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
- E. Temporary Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.
 - 1. Provide temporary dehumidification systems when required to reduce ambient and substrate moisture levels to level required to allow installation or application of finishes and their proper curing or drying.
- F. Electric Power Service: Provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations.
 - 1. Install electric power service underground unless otherwise indicated.
 - 2. Connect temporary service to Owner's existing power source, as directed by Owner.
- G. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
 - 1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.

- H. Telephone Service: Provide temporary telephone service in common-use facilities for use by all construction personnel. Install WiFi cell phone access equipment.
1. Post a list of important telephone numbers.
 - a. Police and fire departments.
 - b. Ambulance service.
 - c. Contractor's home office.
 - d. Contractor's emergency after-hours telephone number.
 - e. Architect's office.
 - f. Engineers' offices.
 - g. Owner's office.
 - h. Principal subcontractors' field and home offices.
- I. Electronic Communication Service: Provide a desktop computer in the primary field office adequate for use by Architect and Owner to access Project electronic documents and maintain electronic communications. Equip computer with not less than the following:
1. Processor: Intel Core i5 or i7.
 2. Memory: 4 gigabyte.
 3. Disk Storage: 500 gigabyte hard-disk drive and combination DVD-RW/CD-RW drive.
 4. Display: 24-inch LCD monitor with 256-Mb dedicated video RAM.
 5. Full-size keyboard and mouse.
 6. Network Connectivity: 10/100BaseT Ethernet.
 7. Operating System: Microsoft Windows 7 Professional.
 8. Productivity Software:
 - a. Microsoft Office Professional, 2010 or higher, including Word, Excel, and Outlook.
 - b. Adobe Reader 11.0 or higher.
 - c. WinZip 7.0 or higher.
 9. Printer: "All-in-one" unit equipped with printer server, combining color printing, photocopying, scanning, and faxing, or separate units for each of these three functions.
 10. Internet Service: Broadband modem, router and ISP, equipped with hardware firewall, providing minimum 1.0 Mbps upload and 15 Mbps download speeds at each computer.
 11. Internet Security: Integrated software, providing software firewall, virus, spyware, phishing, and spam protection in a combined application.
 12. Backup: External hard drive, minimum 2 terabyte, with automated backup software providing daily backups.

3.4 SUPPORT FACILITIES INSTALLATION

- A. General: Comply with the following:
1. Provide construction for temporary offices, shops, and sheds located within construction area or within 30 feet of building lines that is noncombustible according to ASTM E 136. Comply with NFPA 241.
 2. Maintain support facilities until Architect schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.

- B. Temporary Roads and Paved Areas: Construct and maintain temporary roads and paved areas adequate for construction operations. Locate temporary roads and paved areas within construction limits indicated on Drawings.
1. Provide dust-control treatment that is nonpolluting and nontracking. Reapply treatment as required to minimize dust.
- C. Temporary Use of Planned Permanent Roads and Paved Areas: Locate temporary roads and paved areas in same location as permanent roads and paved areas. Construct and maintain temporary roads and paved areas adequate for construction operations. Extend temporary roads and paved areas, within construction limits indicated, as necessary for construction operations.
1. Coordinate elevations of temporary roads and paved areas with permanent roads and paved areas.
 2. Prepare subgrade and install subbase and base for temporary roads and paved areas according to Section 312000 "Earth Moving."
 3. Recondition base after temporary use, including removing contaminated material, regrading, proofrolling, compacting, and testing.
 4. Delay installation of final course of permanent hot-mix asphalt pavement until immediately before Substantial Completion. Repair hot-mix asphalt base-course pavement before installation of final course according to Section 321216 "Asphalt Paving."
- D. Traffic Controls: Comply with requirements of authorities having jurisdiction.
1. Protect existing site improvements to remain including curbs, pavement, and utilities.
 2. Maintain access for fire-fighting equipment and access to fire hydrants.
- E. Parking: Provide temporary parking areas for construction personnel.
- F. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.
1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties or endanger permanent Work or temporary facilities.
 2. Remove snow and ice as required to minimize accumulations.
- G. Project Signs: Provide Project signs as indicated. Unauthorized signs are not permitted.
1. Identification Signs: Provide Project identification signs as indicated on Drawings.
 2. Temporary Signs: Provide other signs as indicated and as required to inform public and individuals seeking entrance to Project.
 - a. Provide temporary, directional signs for construction personnel and visitors.
 3. Maintain and touch up signs so they are legible at all times.
- H. Waste Disposal Facilities: Comply with requirements specified in Section 017419 "Construction Waste Management and Disposal."
- I. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with progress cleaning requirements in Section 017300 "Execution."

- J. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
 - 1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.
- K. Temporary Stairs: Until permanent stairs are available, provide temporary stairs where ladders are not adequate.
- L. Existing Stair Usage: Use of Owner's existing stairs will be permitted, provided stairs are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore stairs to condition existing before initial use.
 - 1. Provide protective coverings, barriers, devices, signs, or other procedures to protect stairs and to maintain means of egress. If stairs become damaged, restore damaged areas so no evidence remains of correction work.
- M. Temporary Use of Permanent Stairs: Use of new stairs for construction traffic will be permitted, provided stairs are protected and finishes restored to new condition at time of Substantial Completion.

3.5 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.
 - 1. Where access to adjacent properties is required in order to affect protection of existing facilities, obtain written permission from adjacent property owner to access property for that purpose.
- B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
 - 1. Comply with work restrictions specified in Section 011000 "Summary."
- C. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to undisturbed areas and to adjacent properties and walkways, according to erosion- and sedimentation-control Drawings.
 - 1. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross tree- or plant-protection zones.
 - 2. Inspect, repair, and maintain erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
 - 3. Clean, repair, and restore adjoining properties and roads affected by erosion and sedimentation from Project site during the course of Project.
 - 4. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.
- D. Stormwater Control: Comply with requirements of authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.

- E. Tree and Plant Protection: Comply with requirements specified in Section 015639 "Temporary Tree and Plant Protection."
- F. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.
- G. Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals so Project will be free of pests and their residues at Substantial Completion. Perform control operations lawfully, using materials approved by authorities having jurisdiction.
- H. Site Enclosure Fence: Before construction operations begin, furnish and install site enclosure fence in a manner that will prevent people from easily entering site except by entrance gates.
 - 1. Extent of Fence: As indicated on Drawings.
 - 2. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Furnish one set of keys to Owner.
- I. Security Enclosure and Lockup: Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each workday.
- J. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- K. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.
- L. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
 - 1. Where heating or cooling is needed and permanent enclosure is incomplete, insulate temporary enclosures.
- M. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.
 - 1. Prohibit smoking in construction areas. Comply with additional limits on smoking specified in other Sections.
 - 2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
 - 3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
 - 4. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

3.6 MOISTURE AND MOLD CONTROL

- A. Contractor's Moisture-Protection Plan: Describe delivery, handling, storage, installation, and protection provisions for materials subject to water absorption or water damage.
1. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water-damaged Work.
 2. Indicate sequencing of work that requires water, such as sprayed fire-resistive materials, plastering, and terrazzo grinding, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.
 3. Indicate methods to be used to avoid trapping water in finished work.
- B. Exposed Construction Period: Before installation of weather barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect as follows:
1. Protect porous materials from water damage.
 2. Protect stored and installed material from flowing or standing water.
 3. Keep porous and organic materials from coming into prolonged contact with concrete.
 4. Remove standing water from decks.
 5. Keep deck openings covered or dammed.
- C. Partially Enclosed Construction Period: After installation of weather barriers but before full enclosure and conditioning of building, when installed materials are still subject to infiltration of moisture and ambient mold spores, protect as follows:
1. Do not load or install drywall or other porous materials or components, or items with high organic content, into partially enclosed building.
 2. Keep interior spaces reasonably clean and protected from water damage.
 3. Periodically collect and remove waste containing cellulose or other organic matter.
 4. Discard or replace water-damaged material.
 5. Do not install material that is wet.
 6. Discard and replace stored or installed material that begins to grow mold.
 7. Perform work in a sequence that allows wet materials adequate time to dry before enclosing the material in gypsum board or other interior finishes.
- D. Controlled Construction Period: After completing and sealing of the building enclosure but prior to the full operation of permanent HVAC systems, maintain as follows:
1. Control moisture and humidity inside building by maintaining effective dry-in conditions.
 2. Use temporary or permanent HVAC system to control humidity within ranges specified for installed and stored materials.
 3. Comply with manufacturer's written instructions for temperature, relative humidity, and exposure to water limits.
 - a. Hygroscopic materials that may support mold growth, including wood and gypsum-based products, that become wet during the course of construction and remain wet for 48 hours are considered defective and require replacing.
 - b. Measure moisture content of materials that have been exposed to moisture during construction operations or after installation. Record readings beginning at time of exposure and continuing daily for 48 hours. Identify materials containing moisture levels higher than allowed. Report findings in writing to Architect.
 - c. Remove and replace materials that cannot be completely restored to their manufactured moisture level within 48 hours.

3.7 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.
 - 1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
- C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.
- D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
 - 1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
 - 2. Remove temporary roads and paved areas not intended for or acceptable for integration into permanent construction. Where area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.
 - 3. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 017700 "Closeout Procedures."

END OF SECTION 015000

SECTION 017419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
 - 1. Disposing of nonhazardous demolition and construction waste.
- B. Related Requirements:
 - 1. Section 042000 "Unit Masonry" for disposal requirements for masonry waste.
 - 2. Section 311000 "Site Clearing" for disposition of waste resulting from site clearing and removal of above- and below-grade improvements.

1.3 DEFINITIONS

- A. Construction Waste: Building, structure, and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building, structure, and site improvement materials resulting from demolition operations.
- C. Disposal: Removal of demolition or construction waste and subsequent salvage, sale, recycling, or deposit in landfill, incinerator acceptable to authorities having jurisdiction, or designated spoil areas on Owner's property.
- D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
- F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.4 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition and construction waste becomes property of Contractor.

1.5 ACTION SUBMITTALS

- A. Waste Management Plan: Submit plan within 7 days of date established for commencement of the Work.

1.6 INFORMATIONAL SUBMITTALS

- A. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- B. Qualification Data: For waste management coordinator.

1.7 QUALITY ASSURANCE

- A. Waste Management Coordinator Qualifications: Experienced firm, or individual employed and assigned by General Contractor, with a record of successful waste management coordination of projects with similar requirements. Superintendent may serve as Waste Management Coordinator.
- B. Waste Management Conference(s): Conduct conference(s) at Project site to comply with requirements in Section 013100 "Project Management and Coordination." Review methods and procedures related to waste management including, but not limited to, the following:
 - 1. Review and discuss waste management plan including responsibilities of each contractor and waste management coordinator.
 - 2. Review requirements for documenting quantities of each type of waste and its disposition.
 - 3. Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
 - 4. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
 - 5. Review waste management requirements for each trade.

1.8 WASTE MANAGEMENT PLAN

- A. General: Develop a waste management plan according to requirements in this Section. Plan shall consist of waste identification, waste reduction work plan, and cost/revenue analysis. Distinguish between demolition and construction waste. Indicate quantities by weight or volume, but use same units of measure throughout waste management plan.
- B. Waste Identification: Indicate anticipated types and quantities of demolition, site-clearing, and construction waste generated by the Work. Include estimated quantities and assumptions for estimates.
- C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.
 - 1. Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the

Work in compliance with Section 024116 "Structure Demolition," and Section 024119 "Selective Demolition."

2. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
3. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location where materials separation will be performed.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

- A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
 1. Comply with operation, termination, and removal requirements in Section 015000 "Temporary Facilities and Controls."
- B. Waste Management Coordinator: Engage a waste management coordinator to be responsible for implementing, monitoring, and reporting status of waste management work plan. Coordinator shall be present at Project site full time for duration of Project.
- C. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work.
 1. Distribute waste management plan to everyone concerned within three days of submittal return.
 2. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.
- D. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged and recycled.
 2. Comply with Section 015000 "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.

3.2 DISPOSAL OF WASTE

- A. General: Except for items or materials to be salvaged or recycled, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
 - 1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. General: Except for items or materials to be salvaged or recycled, remove waste materials and legally dispose of at designated spoil areas on Owner's property.
- C. Burning: Do not burn waste materials.

END OF SECTION 017419

SECTION 017420 - CLEANING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. The Work specified in this section consists of maintaining a clean, orderly, hazard free work site during construction, and final cleaning for the City's Final Acceptance. Failure to maintain the work site will be grounds for withholding monthly payments until corrected to the satisfaction of the Project Manager.
- B. Refer to Article 325, Cleanup During Construction in the General Contract Conditions, 2011 Edition

1.3 JOB CONDITIONS

A. Safety Requirements

- 1. Maintain the work site in a neat, orderly, and hazard-free manner in conformance with all federal, state, and local rules, codes, regulations, and orders, including all OSHA requirements, until Final Acceptance of the Work. Keep catwalks, underground structures, work site walks, sidewalks, roadways, and streets, along with public and private walkways adjacent to the work site, free from hazards caused by construction activities. Inspect those facilities regularly for hazardous conditions caused by construction activities.

B. Hazards Control:

- 1. Store waste materials in properly labeled waste containers. This includes solid wastes, hazardous wastes, universal wastes, etc.
- 2. Store volatile wastes in covered metal containers and remove those wastes from work site daily.
- 3. Do not accumulate wastes that create hazardous conditions.
- 4. If volatile and noxious substances are being used in spaces that are not naturally ventilated adequately, provide artificial ventilation.
- 5. Hazard controls shall conform to the applicable federal, state, and local rules and regulations.
- 6. Provide appropriate waste receptacles in all areas in which employees are working. Waste receptacles shall be kept covered at all times. All materials on site shall be anchored and covered to prevent any objects from becoming wind-borne.

C. Access:

1. Maintain the work site to permit access by other City contractors as required and to allow access by emergency personnel.

1.4 SUBMITTALS

A. Washing Plan: The Contractor shall prepare a plan describing the specific procedures and materials to be utilized for any equipment, vehicle, etc., washing activities. The plan must be submitted to the Project Manager and approved by the Project Manager and Environmental Services.

1. Outdoor washing at DEN is not allowed unless the materials will be collected or managed in a manner to ensure that they will not enter the municipally owned separate storm sewer system (MS4). The materials can only be disposed at a location pre-approved by DEN Environmental Services (refer to DEN SWMP).

Failure to comply with this requirement would result in the discharge of non-stormwater.

- a. Outdoor wash materials that contain soaps or other cleaning chemicals must be collected and disposed of off site

2. Indoor washing must be conducted in accordance with the Best Management Practices (BMPs) detailed in the DEN SWMP. Refer to Section 015719 "Environmental Controls". In addition, all indoor washing must be conducted in a manner that ensures that there are no prohibited discharges to the sanitary sewer system.

- a. All wash-water that will be disposed of into the sanitary sewer must comply with City and County Denver rules and regulations pertaining to prohibited discharges.

PART 2 - PRODUCTS

2.1 CLEANING MATERIALS

- A. Utilize the type of cleaning materials recommended by the manufacturer for the surfaces to be cleaned.
- B. Maintain current Safety Data Sheets (SDS) on site for all chemicals. DEN Environmental Services must approve the chemicals used prior to discharge to the sanitary sewer system.
- C. Ensure proper disposal of all wastes generated from the use of these materials. The Contractor must ensure compliance with all environmental regulations. No wastes can be disposed of on DEN property.

PART 3 - EXECUTION**3.1 INTERIM CLEANING**

- A. Clean the work site every shift/workday for the duration of the construction Contract. Maintain structures, grounds, storage areas and other areas of work site, including public and private properties immediately adjacent to work site, free from accumulations of waste materials caused by construction operations. Place waste materials in covered metal containers. All hard concrete, steel, wood, and finished walking surfaces shall be swept clean daily.
- B. Remove or secure loose material on open decks and on other exposed surfaces at the end of each workday or more often in a manner that will maintain the work site hazard free. Secure material in a manner that will prevent dislodgment by wind and other forces.
- C. Sprinkle waste materials with water or acceptable chemical palliative to prevent blowing of dust.
- D. Promptly empty waste containers when they become full and legally dispose of the contents at dumping areas off the City's property.
- E. Control the handling of waste materials. Do not permit materials to be dropped or thrown from structures.
- F. Immediately remove spillage of construction related materials from haul routes, work site, private property, public rights of way, or on the Denver International Airport site.
- G. Clean only when dust and other contaminants will not precipitate upon newly painted surfaces.
- H. Cleaning shall be done in accordance with manufacturer's recommendation.
- I. Cleaning shall be done in a manner and using such materials as to not damage the Work.
- J. Clean areas prior to painting or applying adhesive.
- K. Clean all heating and cooling systems prior to operations. If the Contractor is allowed to use the heating and cooling system, it shall be cleaned prior to testing.
- L. Clean all areas that will be concealed prior to concealment.
- M. Dispose of all fluids according to the approved Washing Plan.

3.2 FINAL CLEANING

- A. Refer to Article, Clean-up Upon Completion in the General Contract Conditions, 2011 Edition. Additionally, the Contractor, shall at a minimum, complete the following:
 - 1. Inspect interior and exterior surfaces, including concealed spaces, in preparation for completion and acceptance.

2. Remove dirt, dust, litter, corrosion, solvents, discursive paint, stains, and extraneous markings.
3. Remove surplus materials, except those materials intended for maintenance.
4. Remove all tools, appliances, equipment, and temporary facilities used in the construction.
5. Remove detachable labels and tags. File them with the manufacturer's specifications for that specific material for the City's records.
6. Repair damaged materials to the specified finish or remove and replace.
7. After all trades have completed their work and just before Final Acceptance, all catch basins, manholes, drains, strainers and filters shall be cleaned; roadway, driveways, floors, steps and walks shall be swept. Interior building areas shall be vacuum cleaned and mopped.
8. Final cleanup applies to all areas, whether previously occupied and operational or not.
9. Dispose of all fluids according to the approved Washing Plan.

PART 4 - MEASUREMENT

4.1 METHOD OF MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

PART 5 - PAYMENT

5.1 METHOD OF PAYMENT

- A. No separate payment will be made for work under this Section.

END OF SECTION 017420

Item P-152 Excavation, Subgrade, and Embankment

DESCRIPTION

152-1.1 This item covers excavation, disposal, placement, and compaction of all materials within the limits of the work required to construct safety areas, runways, taxiways, aprons, and intermediate areas as well as other areas for drainage, building construction, parking, or other purposes in accordance with these specifications and in conformity to the dimensions and typical sections shown on the plans.

152-1.2 Classification. All material excavated shall be classified as defined below:

a. Unclassified excavation. Unclassified excavation shall consist of the excavation and disposal of all material, regardless of its nature which is not otherwise classified under one of the following items.

b. Rock excavation. Not Applicable

c. Muck excavation. Muck excavation shall consist of the removal and disposal of deposits or mixtures of soils and organic matter not suitable for foundation material. Muck shall include materials that will decay or produce subsidence in the embankment. It may consist of decaying stumps, roots, logs, humus, or other material not satisfactory for incorporation in the embankment.

d. Drainage excavation. Drainage excavation shall consist of all excavation made for the primary purpose of drainage and includes drainage ditches, such as intercepting, inlet or outlet ditches; temporary levee construction; or any other type as shown on the plans.

e. Borrow excavation. Not Applicable

152-1.3 Unsuitable excavation. Any material containing vegetable or organic matter, such as muck, peat, organic silt, or sod shall be considered unsuitable for use in embankment construction. Material, suitable for topsoil may be used on the embankment slope when approved by the Engineer.

CONSTRUCTION METHODS

152-2.1 General. Before beginning excavation, grading, and embankment operations in any area, the area shall be completely cleared and grubbed in accordance with Item P-151.

The suitability of material to be placed in embankments shall be subject to approval by the Engineer. All unsuitable material shall be disposed of in waste areas shown on the plans. All waste areas shall be graded to allow positive drainage of the area and of adjacent areas. The surface elevation of waste areas shall not extend above the surface elevation of adjacent usable areas of the airport, unless specified on the plans or approved by the Engineer.

When the Contractor's excavating operations encounter artifacts of historical or archaeological significance, the operations shall be temporarily discontinued and the Engineer notified. At the direction of the Engineer, the Contractor shall excavate the site in such a manner as to preserve the artifacts encountered and allow for their removal. Such excavation will be paid for as extra work.

Those areas outside of the limits of the pavement areas where the top layer of soil material has become compacted by hauling or other Contractor activities shall be scarified and disked to a depth of 4 inches (100 mm), to loosen and pulverize the soil.

If it is necessary to interrupt existing surface drainage, sewers or under-drainage, conduits, utilities, or similar underground structures, the Contractor shall be responsible for and shall take all necessary precautions to preserve them or provide temporary services. When such facilities are encountered, the Contractor shall notify the Engineer, who shall arrange for their removal if necessary. The Contractor, at his or her expense, shall satisfactorily repair or pay the cost of all damage to such facilities or structures that may result from any of the Contractor's operations during the period of the contract.

152-2.2 Excavation. No excavation shall be started until the work has been staked out by the Contractor and the Engineer has obtained from the Contractor, the survey notes of the elevations and measurements of the ground surface. All areas to be excavated shall be stripped of vegetation and topsoil. Topsoil shall be stockpiled for future use in areas designated on the plans or by the Engineer. All suitable excavated material shall be used in the formation of embankment, subgrade, or other purposes shown on the plans. All unsuitable material shall be disposed of as shown on the plans.

When the volume of the excavation exceeds that required to construct the embankments to the grades indicated, the excess shall be used to grade the areas of ultimate development or disposed as directed by the Engineer. When the volume of excavation is not sufficient for constructing the embankments to the grades indicated, the deficiency shall be obtained from borrow areas.

The grade shall be maintained so that the surface is well drained at all times. When necessary, temporary drains and drainage ditches shall be installed to intercept or divert surface water that may affect the work.

a. Selective grading. When selective grading is indicated on the plans, the more suitable material designated by the Engineer shall be used in constructing the embankment or in capping the pavement subgrade. If, at the time of excavation, it is not possible to place this material in its final location, it shall be stockpiled in approved areas so that it can be measured for payment as specified in paragraph 152-3.3.

b. Undercutting. Rock, shale, hardpan, loose rock, boulders, or other material unsatisfactory for safety areas, subgrades, roads, shoulders, or any areas intended for turf shall be excavated to a minimum depth of 12 inches (300 mm) below the subgrade or to the depth specified by the Engineer. Muck, peat, matted roots, or other yielding material, unsatisfactory for subgrade foundation, shall be removed to the depth specified. Unsuitable materials shall be airport property and disposed of at locations agreed to with Houston Airport System. The excavated area shall be backfilled with suitable material obtained from the grading operations or borrow areas and compacted to specified densities. The necessary backfill will constitute a part of the embankment. Where rock cuts are made, backfill with select material. Any pockets created in the rock surface shall be drained in accordance with the details shown on the plans.

c. Overbreak. Overbreak, including slides, is that portion of any material displaced or loosened beyond the finished work as planned or authorized by the Engineer. All overbreak shall be graded or removed by the Contractor and disposed of as directed by the Engineer. The Engineer shall determine if the displacement of such material was unavoidable and his or her decision shall be final. Payment will not be made for the removal and disposal of overbreak that the Engineer determines as avoidable. Unavoidable overbreak will be classified as "Unclassified Excavation."

d. Removal of utilities. The removal of existing structures and utilities required to permit the orderly progress of work will be accomplished by someone other than the Contractor; for example, the utility unless otherwise shown on the plans. All existing foundations shall be excavated at least 2 feet (60 cm) below the top of subgrade or as indicated on the plans, and the material disposed of as directed by the Engineer. All foundations thus excavated shall be backfilled with suitable material and compacted as specified.

e. Compaction requirements. The subgrade under areas to be paved shall be compacted to a depth of 8 inches and to a density of not less than 95 of standard proctor maximum density as determined by

ASTM D1557. The material to be compacted shall be within $\pm 2\%$ of optimum moisture content before being rolled to obtain the prescribed compaction (except for expansive soils).

The in-place field density shall be determined in accordance with ASTM D1556. Stones or rock fragments larger than 4 inches (100 mm) in their greatest dimension will not be permitted in the top 6 inches (150 mm) of the subgrade. The finished grading operations, conforming to the typical cross-section, shall be completed and maintained at least 1,000 feet (300 m) ahead of the paving operations or as directed by the Engineer.

All loose or protruding rocks on the back slopes of cuts shall be pried loose or otherwise removed to the slope finished grade line. All cut-and-fill slopes shall be uniformly dressed to the slope, cross-section, and alignment shown on the plans or as directed by the Engineer.

Blasting shall not be allowed

f. Proof rolling. After compaction is completed, the subgrade area shall be proof rolled with a heavy pneumatic-tired roller having four or more tires abreast, each tire loaded to a minimum of 30,000 pounds (13.6 metric tons) and inflated to a minimum of 125 psi (0.861 MPa)

Apply a minimum of 100 percent coverage, or as specified by the Engineer, to all paved areas. A coverage is defined as the application of one tire print over the designated area. Soft areas of subgrade that deflect more than 1 inch (25 mm) or show permanent deformation greater than 1 inch (25 mm) shall be removed and replaced with suitable material or reworked to conform to the moisture content and

152-2.3 Borrow excavation. Borrow areas within the airport property are indicated on the plans. Borrow excavation shall be made only at these designated locations and within the horizontal and vertical limits as staked or as directed by the Engineer.

When borrow sources are outside the boundaries of the airport property, it shall be the Contractor's responsibility to locate and obtain the borrow sources, subject to the approval of the Engineer. The Contractor shall notify the Engineer at least 15 days prior to beginning the excavation so necessary measurements and tests can be made. All borrow pits shall be opened up to expose the various strata of acceptable material to allow obtaining a uniform product. All unsuitable material shall be disposed of by the Contractor. Borrow pits shall be excavated to regular lines to permit accurate measurements, and they shall be drained and left in a neat, presentable condition with all slopes dressed uniformly.

152-2.4 Drainage excavation. Drainage excavation shall consist of excavating for drainage ditches such as intercepting; inlet or outlet ditches; for temporary levee construction; or for any other type as designed or as shown on the plans. The work shall be performed in sequence with the other construction. Intercepting ditches shall be constructed prior to starting adjacent excavation operations. All satisfactory material shall be placed in embankment fills; unsuitable material shall be placed in designated waste areas or as directed by the Engineer. All necessary work shall be performed true to final line, elevation, and cross-section. The Contractor shall maintain ditches constructed on the project to the required cross-section and shall keep them free of debris or obstructions until the project is accepted.

152-2.5 Preparation of embankment area. Where an embankment is to be constructed to a height of 4 feet (1.2 m) or less, all sod and vegetative matter shall be removed from the surface upon which the embankment is to be placed. The cleared surface shall be broken up by plowing or scarifying to a minimum depth of 6 inches (150 mm) and shall then be compacted as indicated in paragraph 152-2.6. When the height of fill is greater than 4 feet (1.2 m), sod not required to be removed shall be thoroughly disked and recompacted to the density of the surrounding ground before construction of embankment.

Sloped surfaces steeper than one (1) vertical to four (4) horizontal shall be plowed, stepped, benched, or broken up so that the fill material will bond with the existing material. When the subgrade is part fill and

part excavation or natural ground, the excavated or natural ground portion shall be scarified to a depth of 12 inches (300 mm) and compacted as specified for the adjacent fill.

No direct payment shall be made for the work performed under this section. The necessary clearing and grubbing and the quantity of excavation removed will be paid for under the respective items of work.

152-2.6 Formation of embankments. Embankments shall be formed in successive horizontal layers of not more than 8 inches (200 mm) in loose depth for the full width of the cross-section, unless otherwise approved by the Engineer.

The layers shall be placed, to produce a soil structure as shown on the typical cross-section or as directed by the Engineer. Materials such as brush, hedge, roots, stumps, grass and other organic matter, shall not be incorporated or buried in the embankment.

Earthwork operations shall be suspended at any time when satisfactory results cannot be obtained because of rain, freezing, or other unsatisfactory weather conditions in the field. Frozen material shall not be placed in the embankment nor shall embankment be placed upon frozen material. Material shall not be placed on surfaces that are muddy, frozen, or contain frost. The Contractor shall drag, blade, or slope the embankment to provide surface drainage at all times.

The material in each layer shall be within $\pm 2\%$ of optimum moisture content before rolling to obtain the prescribed compaction. To achieve a uniform moisture content throughout the layer, the material shall be moistened or aerated as necessary. Samples of all embankment materials for testing, both before and after placement and compaction, will be taken for each 1,000 square yards. Based on these tests, the Contractor shall make the necessary corrections and adjustments in methods, materials or moisture content to achieve the specified embankment density.

It is recommended that density tests be made for each 1,000 square yards (840 square meters) of material placed per layer. The Engineer may specify other frequencies as appropriate to the job size. If it is necessary (because of the presence of expansive soils or other unusually sensitive soils) to apply special controls to the moisture content of the soil during or after compaction to ensure strength, the Engineer shall specify the appropriate moisture content. The moisture limitations shall be specified using acceptable moisture ranges as determined by ASTM D698 or ASTM D1557.

If nuclear density machines are to be used for density determination, the machines shall be calibrated in accordance with ASTM D6938.

Include testing frequencies per square yard for density and moisture acceptance tests.

Rolling operations shall be continued until the embankment is compacted to not less than 95% of maximum density for noncohesive soils, and 90% of maximum density for cohesive soils as determined by ASTM D1557. Under all areas to be paved, the embankments shall be compacted to a depth of 8 inches and to a density of not less than 95 percent of the maximum density as determined by ASTM D6938.

On all areas outside of the pavement areas, no compaction will be required on the top 4 inches (100 mm).

The in-place field density shall be determined in accordance with ASTM 6938 using Procedure A, the direct transmission method, and ASTM D6938 shall be used to determine the moisture content of the material. The machine shall be calibrated in accordance with ASTM D6938. The Contractor's laboratory shall perform all density tests in the Engineer's presence and provide the test results upon completion to the Engineer for acceptance.

Compaction areas shall be kept separate, and no layer shall be covered by another layer until the proper density is obtained.

During construction of the embankment, the Contractor shall route all construction equipment evenly over the entire width of the embankment as each layer is placed. Layer placement shall begin in the deepest portion of the embankment fill. As placement progresses, the layers shall be constructed approximately parallel to the finished pavement grade line.

When rock and other embankment material are excavated at approximately the same time, the rock shall be incorporated into the outer portion of the embankment and the other material shall be incorporated under the future paved areas. Stones or fragmentary rock larger than 4 inches (100 mm) in their greatest dimensions will not be allowed in the top 6 inches (150 mm) of the subgrade. Rockfill shall be brought up in layers as specified or as directed by the Engineer and the finer material shall be used to fill the voids with forming a dense, compact mass. Rock or boulders shall not be disposed of outside the excavation or embankment areas, except at places and in the manner designated on the plans or by the Engineer.

When the excavated material consists predominantly of rock fragments of such size that the material cannot be placed in layers of the prescribed thickness without crushing, pulverizing or further breaking down the pieces, such material may be placed in the embankment as directed in layers not exceeding 2 feet (60 cm) in thickness. Each layer shall be leveled and smoothed with suitable equipment by distribution of spalls and finer fragments of rock. The layer shall not be constructed above an elevation 4 feet (1.2 m) below the finished subgrade.

There will be no separate measurement of payment for compacted embankment. All costs incidental to placing in layers, compacting, discing, watering, mixing, sloping, and other operations necessary for construction of embankments will be included in the contract price for excavation, borrow, or other items.

152-2.7 Finishing and protection of subgrade. After the subgrade is substantially complete, the Contractor shall remove any soft or other unstable material over the full width of the subgrade that will not compact properly. All low areas, holes or depressions in the subgrade shall be brought to grade with suitable select material. Scarifying, blading, rolling and other methods shall be performed to provide a thoroughly compacted subgrade shaped to the lines and grades shown on the plans.

Grading of the subgrade shall be performed so that it will drain readily. The Contractor shall protect the subgrade from damage and limit hauling over the finished subgrade to only traffic essential for construction purposes. All ruts or rough places that develop in the completed subgrade shall be graded and recompact.

No subbase, base, or surface course shall be placed on the subgrade until the subgrade has been approved by the Engineer.

152-2.8 Haul. All hauling will be considered a necessary and incidental part of the work. The Contractor shall include the cost in the contract unit price for the pay of items of work involved. No payment will be made separately or directly for hauling on any part of the work.

152-2.9 Tolerances. In those areas upon which a subbase or base course is to be placed, the top of the subgrade shall be of such smoothness that, when tested with a 12-foot (3.7-m) straightedge applied parallel and at right angles to the centerline, it shall not show any deviation in excess of 1/2 inch (12 mm), or shall not be more than 0.05 feet (15 mm) from true grade as established by grade hubs. Any deviation in excess of these amounts shall be corrected by loosening, adding, or removing materials; reshaping; and recompacting.

On safety areas, intermediate and other designated areas, the surface shall be of such smoothness that it will not vary more than 0.10 feet (3 mm) from true grade as established by grade hubs. Any deviation in excess of this amount shall be corrected by loosening, adding or removing materials, and reshaping.

152-2.10 Topsoil. When topsoil is specified or required as shown on the plans or under Item T-905, it shall be salvaged from stripping or other grading operations. The topsoil shall meet the requirements of Item T-905. If, at the time of excavation or stripping, the topsoil cannot be placed in its final section of finished construction, the material shall be stockpiled at approved locations. Stockpiles shall not be placed within 1000 feet of runway pavement or 400 feet of taxiway pavement and shall not be placed on areas that subsequently will require any excavation or embankment fill. If, in the judgment of the Engineer, it is practical to place the salvaged topsoil at the time of excavation or stripping, the material shall be placed in its final position without stockpiling or further rehandling.

Upon completion of grading operations, stockpiled topsoil shall be handled and placed as directed, or as required in Item T-905.

No direct payment will be made for topsoil under Item P-152. The quantity removed and placed directly or stockpiled shall be paid for at the contract unit price per cubic yard (cubic meter) for "Unclassified Excavation."

When stockpiling of topsoil and later rehandling of such material is directed by the Engineer, the material so rehandled shall be paid for at the contract unit price per cubic yard (cubic meter) for "topsoiling," as provided in Item T-905.

METHOD OF MEASUREMENT

152-3.1 Not Applicable

BASIS OF PAYMENT

152-4.1 Not Applicable

TESTING REQUIREMENTS

ASTM D698	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft ³ (600 kN-m/m ³))
ASTM D1556	Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D1557	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft ³ (2700 kN-m/m ³))
ASTM D2167	Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method

ASTM D6938

Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

END OF ITEM P-152

APPROVED FORM

PAYMENT AND PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS, that Southwest Airlines Co. (“Airline”), and _____, a corporation organized and existing under and by virtue of the laws of the State of _____, and authorized to transact business in the State of Colorado, (“Surety”), are held and firmly bound unto the City And County Of Denver, a Municipal Corporation of the State of Colorado (the “City”), in the penal sum of Five Million, Five-Hundred Thousand Dollars and no Cents (\$5,500,000.00), lawful money of the United States of America, for the payment of which sum, well and truly to be made, we bind ourselves and our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents:

THE CONDITION OF THE FOREGOING OBLIGATION IS SUCH THAT:

WHEREAS, the Airline has, on the _____ day of _____, 2019, been granted a Lease (the “Early Access Ground Lease”) by the City for certain City property located at Denver International Airport to allow Airline to perform the Work identified in the Early Access Ground Lease, a copy of said Permit being made a part hereof;

NOW, THEREFORE, if the said Airline shall and will, in all particulars well and truly faithfully observe, perform and abide by each and every covenant, condition and part of the Early Access Ground Lease, and the conditions, specifications, plans and other Early Access Ground Lease documents thereto attached, or by reference made part thereof, and any alternations in and additions thereto, according to the true intent and meaning in such case, then this obligation shall be and become null and void; otherwise it shall remain in full force and effect;

PROVIDED FURTHER, that if said Airline shall satisfy all claims and demands incurred by the Airline in the performance of the Work, and shall fully indemnify and save harmless the City from all damages, claims, demands, expense and charge of every kind (including claims of patent infringement) arising from any act, omission or neglect of said Airline, its agents or employees with relation to the Work; and shall fully reimburse and repay to the City all costs, damages and expenses which it may incur in making good any default based upon the failure of the Airline to fulfill its obligation to furnish maintenance, repairs or replacements, then this obligation shall be and become null and void; otherwise it shall remain in full force and effect;

PROVIDED FURTHER, that if said Airline shall at all times promptly make payments of all amounts lawfully due all persons supplying or furnishing it or its subcontractors with labor and materials, rental machinery, tools or equipment used or performed in the prosecution of the Work and if the Airline will indemnify and save harmless the City for the extent of any and all payments in conjunction with the carrying out of such Work, then this obligation shall be and become null and void; otherwise it shall remain in full force and effect;

PROVIDED FURTHER, that if said Airline fails to duly pay for any labor, materials, team hire, sustenance, provisions, provender, gasoline, lubricating oils, fuel oils, grease, coal or any other supplies or materials consumed by said Airline or its subcontractors in the performance of the Work, or fails to pay any person who supplies rental machinery tools or equipment, all amounts due as a result of the use of such machinery, tools or equipment in the prosecution of the Work,

the Surety will pay the same in any amount not exceeding the amount of this obligation, together with interest as provided by law;

PROVIDED FURTHER, that the said Surety, for the value received hereby, stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Early Access Ground Lease, or to contracts with others in connection with this project, or the Work to be performed thereunder, or the specification and plans accompanying the same, or incorporated by reference into such Early Access Ground Lease, shall in any way effect its obligation on this bond and it does hereby waive notice of any change, extension of time, alteration or addition to the terms of the Early Access Ground Lease, or contracts, or to the Work, or to the specifications and plans.

IN WITNESS WHEREOF, Airline and Surety have executed these presents as of this ____ Day of ____, 2019.

SOUTHWEST AIRLINES CO

By: _____

[SURETY]

By: _____
Attorney-in-Fact

Evidence of Attorney-in-Fact authority to execute, in the form of a valid Surety Power of Attorney certified to include the date of the bond, must accompany this Bond.

APPROVED FOR THE CITY AND COUNTY OF DENVER:

By: _____
Mayor

By: _____
CEO, Department of Aviation

APPROVED AS TO FORM

Kristin Bronson, Attorney for the
City and County of Denver

By: _____
David Steinberger
Assistant City Attorney