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ADDENDUM NO. 1

Date: **January 29, 2026**
Project Name: **East Side Hangar Access Taxilanes (Phase II)**
Owner: **Fort Worth Spinks Airport (FWS)**
TxDOT CSJ No.: **2602SPINK**
Garver Project No.: **2401096**

This Addendum is hereby made a part of the Invitation to Bid documents to the same extent as if it were originally included therein. The following clarifications shall be made to the Invitation to Bid and shall become a part of, and attached to, the Invitation to Bid documents.

Revisions or additions made to the Contract Documents:

A. Technical Specifications

- a. Replace the existing specification "P-152" with revised specification "P-152" for revised section 152-2.1.

B. Construction Plans

- a. Replace the existing sheet "CG-002" with revised sheet "CG-002" to include inset view for haul route to stockpile location.
- b. Replace the existing sheet "CP-001" with revised sheet "CP-001" for revised details.

By: _____

Jim Tierney, P.E.

C. Attachments:

- a. **Pre-Bid Meeting Minutes**
- b. **Technical Specifications**
 - i. Revised Specification P-152
- c. **Construction Plans**
 - i. Revised Plan Sheet GC-002
 - ii. Revised Plan Sheet CP-001



Digitally Signed 01/27/2026



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MEETING MINUTES

To: Attendees
From: Alex Jessop, PE
RE: Fort Worth Spinks Airport (FWS)
East Side Hangar Access Taxilanes Phase II
Pre-Bid Meeting Minutes

Date: January 28, 2026

On Tuesday, January 20, 2026 at 2:00pm, a pre-bid meeting was held to discuss the FWS East Side Hangar Access Taxilanes Phase II construction project at Fort Worth Spinks Airport. The following items were discussed:

1) Introductions and Roles

- a) Sign-in sheet is attached

2) Bidding Procedures

- a) Sealed bids need to be addressed and delivered to Sheri Quinlan, TxDOT Aviation Division, 6230 E. Stassney Lane, 2nd Floor, Austin, Texas 78744.
- b) Bids will be received until **1:00pm, Tuesday, February 10, 2026**, then opened and read.
 - i) Any bids received after closing time will be returned unopened.
- c) Technical questions regarding the plans and specifications should be directed to Alex Jessop, PE at AMJessop@GarverUSA.com.
- d) The deadline for questions is 5:00pm on January 27, 2026. Answers will be provided by 5:00pm on January 29, 2026.

3) Federal Provisions

- a) It is the policy of the Department of Transportation (DOT) that disadvantaged business enterprises as defined in 49 CFR Part 26 shall have the maximum opportunity to participate in the performance of contracts financed in whole or in part with Federal funds.
 - i) DBE Goal is 0%. It is presumed that the bidders will meet the goal and no DBE plan is required to be submitted.
- b) Contractor shall follow all Davis Bacon Wage Rate Requirements.
- c) Contractor shall follow all Buy America clauses.

4) Instructions to Bidders

- a) Notice to Bidders checklist
- b) Bid Proposal
 - i) Contract Time depends on the awarded Schedule and Bid:
 - a. Base Bid (Taxilanes M4 & M5 Construction and Drainage Improvements)
 - i. Base Bid: **140 Calendar Days**
 - b. Additive Alternate 1 (Taxilane M6 Construction)
 - i. Base + Additive Alternate 1: **168 Calendar Days**
 - c. Additive Alternate 2 (Taxiway K Reconstruction)
 - i. Base + Additive Alternate 1 + Additive Alternate 2: **198 Calendar Days**
 - ii) \$1,000 Liquidated Damages per day
 - iii) Bid proposals need to be completed electronically via Adobe Reader.

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- iv) Once bid proposals are completed via Adobe Reader, Contractor will need to sign the proposal in ink.
- v) All addendums need to be acknowledged on the Bid Proposal. Addendums will be posted online through TxDOT.
- c) Bidder Qualifications
 - i) If Contractor is Pre-Qualified with the Texas Department of Transportation, the Contractor shall include the necessary Full Prequalification and Bidder's Questionnaire with the Bid Proposal.
 - ii) If Contractor is not Pre-Qualified, the Contractor shall include the bidder's qualifications per General Provision 20-02, Pre-qualification of Bidder along with the Bid Proposal.
- d) TxDOT General Provisions
 - i) General Provisions are provided in a standalone publication entitled General Provisions.
 - ii) Electronic copies are available on the TxDOT Aviation website.
 - a. <https://www.txdot.gov/inside-txdot/division/aviation/general-provisions.html>
 - iii) Contractors shall pay close attention to Section 100 in the General Provisions regarding the Contractor Quality Control Program and the Contractor Quality Control Testing.
 - a. The Contractor is required to prepare a Quality Control Program following the specifications where it is required.
 - b. Owner will perform Quality Assurance (QA) testing on all materials.
 - iv) Any failed tests performed by the QA lab will be deducted from the Contractor.

5) Construction Plans

- a) Drawing GI-101 was reviewed to discuss the overall project and construction items.
 - i) **The base bid** consists of 140 calendar days or work to construct Taxilane M4 and M5.
 - (1) Construction of proposed pavement section
 - (2) Earthwork Improvements
 - (3) Drainage improvements
 - (4) Electrical improvements
 - ii) **Additive alternate 1** consists of 28 calendar days in addition to the base bid. This bid schedule is for the construction of Taxilane M6. Work includes the following items
 - (1) Construction of proposed pavement section
 - (2) Earthwork Improvements
 - (3) Electrical improvements
 - iii) **Additive alternate 2** includes 30 calendar days in addition to the base bid and includes the reconstruction of Taxiway K. Work consists of the following items
 - (1) Removal of existing pavement section
 - (2) Construction of proposed pavement section
 - (3) Electrical improvements
- b) The construction safety and phasing plan overview was also reviewed, including sheet GC-100. Emphasis was placed on the following items
 - i) Airport safety and security requirements, including access routes as notated on the plans
 - ii) The location of the staging area, haul routes, and contractor access, as noted in the plans.
- c) The typical sections were reviewed (Sheet CP-001)
 - i) The taxilane pavement will consist of 6" TX-360 concrete pavement on 6" TX-247 flexible base course on 8" TX-260 lime treated subgrade.

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- ii) The pavement section for the trench cut at Taxiway M will consist of 10" of TX-360 concrete pavement on 8" TX-260 lime treated subgrade.
- iii) It was noted that the taxilane pavement sections have an inverse crown.

6) Construction Specifications

- a) The following construction specifications were reviewed:
 - i) TxDOT Specifications will be used for the pavement section materials
 - (1) The proposed pavement section will utilize TX-360, TX-247, and TX-260.
 - (2) Other TxDOT specifications that will be utilized include drainage items for TX-402, TX-432, TX-466, and TX-467.
 - ii) P-152 Excavation, Subgrade, and Embankment
 - (1) Earthwork is quantified and quantities are provided on the earthwork summary table on sheet CP-001.
 - (2) Earthwork is quantified and only paid for the larger (cut vs fill) value, refer to the earthwork summary table.
 - (3) Earthwork quantities were determined using DTM comparison surfaces.
 - (4) Refer to specification section P-152-2.8 for embankment requirements.
 - iii) FAA Specifications will be utilized for drainage and restoration including: T-901, T-904, D-701, and D-751

7) Pre-Bid Meeting & Post Pre-Bid Meeting Bidder Questions

- a) Will a resident project representative (RPR) be onsite during construction?
 - i) Yes an RPR will be onsite at all times during construction.
- b) Will there be a borrow area available on the airport?
 - i) No, there will not be a separate borrow area onsite. Cut material obtained within the construction limits can be used as fill material in grading areas outside of the proposed pavement footprint. Imported embankment material below the proposed pavement must be tested and meet the embankment requirements of P-152-2.3.
- c) Will slip form paving be required?
 - i) Slip form paving is not required for this project.
- d) Where is the electrical vault located?
 - i) The electrical vault is located next to the control tower on the west side of the airport.
- e) Is there a water source near the construction site?
 - i) Yes, there are two hydrants onsite available for the contractor to use. The hydrants are west of the project site near the Taxiway M intersection with the existing apron pavement. The contractor shall coordinate metering with the city of Fort Worth for use.
- f) Are flaggers required?
 - i) No, however, the contractor shall provide escorts for all vehicles and material deliveries.
- g) Can you provide clarification for embankment requirements?
 - i) Refer to specification section P-152-2.3 for imported fill material requirements. "Imported material for fill or backfill under pavements shall be of clayey sands and sandy clays free from organic materials with a plasticity index of 20 or less, a liquid limit of 40 or less, and between 15 and 30 percent passing a No. 200 sieve and compatible with lime treatment. Suitable fill material that is used should be moisture conditioned, placed in loose lifts not exceeding eight (8) inches, and compacted to a minimum of 96 percent of maximum dry density determined per ASTM D698. The moisture content of these soils shall be maintained within ± 2% of optimum

moisture content until permanently covered.

- h) Are contractors required to be registered with SAM.gov?
 - i) Yes
- i) Is there a spot on-site available for excess stockpiled material?
 - i) Yes, clean material may be stockpiled on site as directed by the airport at the location.
- j) Can cut material from phase 2 be used elsewhere within the project?
 - i) No, due to phase sequencing, phase 1 will be completed first so any excavation material in phase 2 will not be able to be used in phase 1. Excavation material from within phase 1 may be used as embankment material contingent on the material being approved by the engineer.
- k) Can clarification be provided on the DBE goal for this project?
 - i) The DBE goal for this project is 0%.
- l) Is moisture conditioning required?
 - i) Yes, per Item P-152-2.3 moisture conditioning is required.
- m) Is grading still required within the area of additive alternate 1 even if it is not awarded?
 - i) Yes, there will still be grading in this area even if additive alternate 1 is not awarded. Please refer to sheets CG-101 and CG-102 for base bid grading limits.
- n) Will temporary fencing be required around the staging area?
 - i) No, temporary fencing is not required around the contractor's staging area.
- o) Will the proposed pavement grade requirement follow TxDOT 360?
 - i) Yes, the pavement shall be constructed within the grade tolerance set in TxDOT 360. Please note, the contractor will be required to survey the proposed pavement layers and provide topographical survey to the engineer for grade verification for full payment. Please refer to TX-247-6, TX-260-6, and TX-360-6 for clarification on what is required at each pavement layer.
- p) Will the proposed pavement on Taxiway K tie into existing pavement elevations?
 - i) Yes the proposed Taxiway K pavement will tie back into the existing pavement that will remain. At spalling or compromised edge the contractor may be required to repair the existing pavement edge to establish a sound pavement edge to tie into. See sheet CJ-503 for pavement rehabilitation details.
- q) The plans do not show typical sections for culvert box backfill under turf areas as shown for pipe backfill. Will the contractor be required to use select backfill for areas where the box culvert is under turf areas? (See sheet 25 and 29)
 - i) No, imported "select" fill material will only be required under pavement areas and 6' adjacent to pavement areas. See detail 4 on sheet CP-001 for required locations of imported fill material.
- r) Can you confirm that the majority of concrete pavement will be reinforced using smooth dowels only, and the only areas that have both smooth dowels and deformed steel (#3 bars) will be where reinforced concrete pavement is called out?
 - i) Correct. Reinforced concrete panels are only as designated out on sheets CJ-101 – CJ-103.
- s) Do the bid quantities for the excavation items include the volume of topsoil to be stripped?
 - i) Yes this volume is included in this quantity.
- t) Do the bid quantities for the embankment items include the volume of topsoil to be placed?
 - i) Yes, this volume is included in this quantity.
- u) Do the bid quantities for the excavation items include the volumes of any non-soil materials to be removed, such as asphalt, base, or concrete pavement?
 - i) The bid quantities for excavation items do not include the volume of pavement sections to be removed. This is accounted for by the P-101 pay items.

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- v) Will an owner's field office be required?
 - i) No, an owner's field office is not required, however the prime contractor shall be onsite at all times while a subcontractor is performing work.
- w) Can soil excavated from the project be used as embankment material?
 - i) Yes, however any soil to be used as embankment under proposed pavement and 6' adjacent to proposed pavement must meet the requirements outlined in section P-152-2.3 of the specifications.
- x) What are the required properties for embankment material?
 - i) The material properties outlined in section P-152-2.3 will be used for any soil material to be placed under proposed paving and 6' adjacent to proposed paving. For any areas not under proposed paving, common/general fills may consist of on-site or off-site soils that are compacted to at least 95% of the maximum dry density and within +/- 2% of the optimum moisture content.
- y) What is the specification for the TX-247 flexbase material? Will type D be allowed?
 - i) This is the TxDOT specification for flexible base material. The material shall be Type D, Grade 1-2.
- z) Will contractor provided gate guards be required during all working hours?
 - i) No, however the contractor is responsible for providing an escort whenever there is construction traffic entering or exiting the gate such that the gate is never left unattended while opened.
- aa) There are discrepancies with the bid quantities shown on the bid form and the engineer's estimate of quantities for the same items as shown on plan sheet 3 for the excavation and embankment items. Please clarify.
 - i) The bid quantities in the bid form and the values shown in the plans are correct. Payment will only be made for the larger of the earthwork values for each base bid, additive alternate 1, and additive alternate 2. For example, for the base bid, the contractor will be paid only for embankment in place, while unclassified excavation will be considered subsidiary to embankment. Unsuitable excavation will be paid for only if encountered on-site.

Attachments:	Sign-In Sheet	Pages(incl.): 7
Copy to File:	2401096	Copies to Garver: AMJ, RJT, SCA

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SIGN-IN SHEET

Representing	Name	Phone Number	Email	Present at Meeting
TXDOT - AVN	Fengpin An	281-221-6395	Fengpin.An@txdot.gov	✓
TXDOT - AVN	Michael Van Vliet	737-406-9626	Michael.vanvliet@gmail.com	✓
TXDOT	Ryan Hindman	(512) 520-7467	ryan.hindman@txdot.gov	✓
CFW	Tyler Dale	817-392-9116	tyler.dale@fortworthtxs.gov	✓
Ambrozi	John Rieke	913 915 9316	jrieke@ambrozi.com	✓
McMahon Contracting	Chris Johnson	(972) 263-6907	estimating@mcmahoncontracting.com	✓
Mollie Klenzendorf	TXDOT AVN	512-897-0008	Mollie.Klenzendorf@txdot.gov	✓
Eric Terry DDM	Eric Terry	942-895-8572	estimators@ddmec.net	✓
TxDOT - AVN	Stephanie Kleiber	512 736 4121	Stephanie.Kleiber@txdot.gov	✓
Nu-Way Construction	Sal Murelli	817-821-0358	Sal@nu-wayconstruction.net	✓
Nu-Way Construction	Nick Murelli	929 267 6583	nickolas@nu-wayconstruction.net	✓
Longholf	Taylor Jern	817 739 5733	Taylor.Jern@longholf.com	✓
O.Trevino Const	Daniel O.	469-602-0683	Daniel@otconst.com	✓
ALEX JESS GANVEL	ALEX JESS	214-451-2963	AMJESS@GANVELUSA.com	✓
Ed Bell Constr.	Stan Allen	469-951-0303	Estimating@EdBellConstruction.com	✓
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Texas Sterling Construction Co.	Eric Wright	817-320-6158	eric.wright@stlco.com	✓
TXDot	Eli Lopez		eli.lopez@txdot.gov	Virtual
GARVER	Sara Andrews		SCAndrews@GarverUSA.com	Virtual



SIGN-IN SHEET

ITEM P-152 EXCAVATION, SUBGRADE, AND EMBANKMENT - MODIFICATION

Item P-152 Excavation, Subgrade, and Embankment is hereby amended with respect to the paragraphs and sections below.

Revise the following section 152-1.2b as noted:

b. Borrow excavation. Borrow excavation shall consist of approved material required for the construction of embankments or for other portions of the work in excess of the quantity of usable material available from required excavations. Borrow material shall be obtained from ~~areas designated by the Resident Project Representative (RPR) within the limits of the airport property but outside the normal limits of necessary grading, or from areas outside the airport boundaries.~~

Revise the following section 152-1.3 as noted:

152-1.3 Unsuitable excavation. Unsuitable material shall be disposed in designated waste areas as shown on the plans. Materials 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 RPR. *Undercutting of material unsatisfactory for subgrade foundation, roads, shoulders, or areas intended for turfing shall be considered unsuitable excavation and shall be excavated to the depth specified by the Engineer below the subgrade.*

Revise the following section 152-2.1 as noted:

152-2.1 General. ~~Before beginning excavation, grading, and embankment operations in any area, the area shall be cleared or 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 RPR. All unsuitable material shall be disposed of *off airport property, and clean soils free from debris may be disposed off on-site as permitted by airport operations at the location as specified in the plans in waste areas as shown on the plans.* All waste areas *to temporarily store unsuitable material before disposing off site* shall be graded to allow positive drainage of the area and adjacent areas. The surface elevation of waste areas shall be specified on the plans or approved by the RPR.

When the Contractor's excavating operations encounter artifacts of historical or archaeological significance, the operations shall be temporarily discontinued and the RPR notified per Section 70, paragraph 70-20. At the direction of the RPR, 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.

Areas outside the limits of the pavement areas where the top layer of soil has become compacted by hauling or other Contractor activities shall be scarified and disked to a depth of 4 inches, to loosen and pulverize the soil. Stones or rock fragments larger than 4 inches in their greatest dimension will not be permitted in the top 6 inches of the subgrade.

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 RPR, who shall arrange for their removal if necessary. The Contractor, at their own 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.

a. Blasting. Blasting shall not be allowed.

Revise the following section 152-2.2 as noted:

152-2.2 Excavation. No excavation shall be started until the work has been staked out by the Contractor and the RPR has obtained from the Contractor, the survey notes of the elevations and measurements of

the ground surface. The Contractor and RPR shall agree that the original ground lines shown on the original topographic mapping are accurate, or agree to any adjustments made to the original ground lines.

Digital terrain model (DTM) files of the existing surfaces, finished surfaces and other various surfaces were used to develop the design plans.

Volumetric quantities were calculated by comparing DTM files of the applicable design surfaces and generating Triangle Volume Reports. Electronic copies of DTM files and a paper copy of the original topographic map will be issued to the successful bidder.

Existing grades on the design cross sections or DTM's, where they do not match the locations of actual spot elevations shown on the topographic map, were developed by computer interpolation from those spot elevations. Prior to disturbing original grade, Contractor may verify the accuracy of the existing ground surface by verifying spot elevations at the same locations where original field survey data was obtained as indicated on the topographic map. Contractor shall recognize that, due to the interpolation process, the actual ground surface at any particular location may differ somewhat from the interpolated surface shown on the design cross sections or obtained from the DTM's. Contractor's verification of original ground surface, however, shall be limited to verification of spot elevations as indicated herein, and no adjustments will be made to the original ground surface unless the Contractor demonstrates that spot elevations shown are incorrect. For this purpose, spot elevations which are within 0.1 foot of the stated elevations for ground surfaces, or within 0.04 foot for hard surfaces (pavements, buildings, foundations, structures, etc.) shall be considered "no change". Only deviations in excess of these will be considered for adjustment of the original ground surface. If Contractor's verification identifies discrepancies in the topographic map, Contractor shall notify the RPR in writing at least two weeks before disturbance of existing grade to allow sufficient time to verify the submitted information and make adjustments to the design cross sections or DTM's. Disturbance of existing grade in any area shall constitute acceptance by the Contractor of the accuracy of the original elevations shown on the topographic map for that area.

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 RPR. All suitable excavated material shall be used in the formation of embankment, subgrade, or other purposes as shown on the plans. All unsuitable material shall be disposed of **as described in paragraph 152-1.3 shown on the plans**.

The grade shall be maintained so that the surface is well drained at all times.

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

a. Selective grading. When ~~the quality of material varies significantly~~ selective grading is indicated on the plans, the more suitable material designated by the RPR 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 until it can be placed. The more suitable material shall then be placed and compacted as specified. Selective grading shall be considered incidental to the work involved. The cost of stockpiling and placing the material shall be included in the various pay items of work involved.

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 below the subgrade or to the depth specified by the RPR. Muck, peat, matted roots, or other yielding material, unsatisfactory for subgrade foundation, shall be removed to the depth specified. Unsuitable materials shall be disposed off the airport. The cost is incidental to this item. This excavated material shall be paid for at the contract unit price per cubic yard for Unsuitable Excavation. 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 **necessary part of Unsuitable Excavation** 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. Undercutting will be paid as Unsuitable Excavation.

c. Over-break. Over-break, including slides, is that portion of any material displaced or loosened beyond the finished work as planned or authorized by the RPR. All over-break shall be graded or removed by the Contractor and disposed of as directed by the RPR. The RPR shall determine if the displacement of such material was unavoidable and their own decision shall be final. Payment will not be made for the removal and disposal of over-break that the RPR determines as avoidable. Unavoidable over-break 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 the Contractor as indicated on the plans. All existing foundations shall be excavated at least 2 feet below the top of subgrade or as indicated on the plans, and the material disposed of as directed by the RPR. All foundations thus excavated shall be backfilled with suitable material and compacted as specified for embankment or as shown on the plans. ***All work associated with the excavation, removal, backfill, disposal, and/or stockpiling of existing structures and culverts will not be measured for separate payment but will be considered subsidiary to SS-140.***

Revise the following section 152-2.3 as noted:

152-2.3 Borrow excavation.

There are no borrow sources within the boundaries of the airport property. The Contractor shall locate and obtain borrow sources, subject to the approval of the RPR. The Contractor shall notify the RPR at least 15 days prior to beginning the excavation so necessary measurements and tests can be made by the RPR. All borrow pits shall be opened to expose the various strata of acceptable material to allow obtaining a uniform product. Borrow areas shall be drained and left in a neat, presentable condition with all slopes dressed uniformly. Borrow areas shall not create a hazardous wildlife attractant.

Imported material for fill or backfill under pavements shall be of clayey sands and sandy clays free from organic materials with a plasticity index of 20 or less, a liquid limit of 40 or less, and between 15 and 30 percent passing a No. 200 sieve and compatible with lime treatment. Suitable fill material that is used should be moisture conditioned, placed in loose lifts not exceeding eight (8) inches, and compacted to a minimum of 96 percent of maximum dry density determined per ASTM D698. The moisture content of these soils shall be maintained within ± 2% of optimum moisture content until permanently covered.

Revise the following section 152-2.10 as noted:

152-2.10 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 96 percent of the maximum dry density as determined by **ASTM D698**. The subgrade in areas outside the limits of the pavement areas shall be compacted to a depth of 12 inches and to a density of not less than 95 percent of the maximum density as determined by ASTM D698.

The material to be compacted shall be within ±2% of optimum moisture content before being rolled to obtain the prescribed compaction (except for expansive soils). When the material has greater than 30 percent retained on the $\frac{3}{4}$ inch (19.0 mm) sieve, follow the methods in ASTM D698 procedures in AASHTO T180 Annex for correction of maximum dry density and optimum moisture for oversized particles. Tests for moisture content and compaction will be taken at a minimum of 2,500 S.Y. of subgrade. All quality assurance testing shall be done by the RPR.

The in-place field density shall be determined in accordance with ASTM D6938 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 within 12 months prior to its use on this contract. The gage shall be field standardized daily.

Maximum density refers to maximum dry density at optimum moisture content unless otherwise specified.

If the specified density is not attained, the entire lot shall be reworked and/or re-compacted and additional random tests made. This procedure shall be followed until the specified density is reached.

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 RPR and the finished subgrade shall be maintained.

Revise the following section 152-2.14 as noted:

152-2.14 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 be located as shown on the plans and the approved CSPP, and shall not be placed on areas that subsequently will require any excavation or embankment fill. If, in the judgment of the RPR, 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 re-handling.

Upon completion of grading operations, stockpiled topsoil shall be handled and placed as shown on the plans and as required in Item T-905. Topsoil shall be paid for as provided in Item T-905 ~~considered subsidiary to T-901~~. No direct payment will be made for topsoil under Item P-152.

Revise the following section Method of Measurement as noted:

METHOD OF MEASUREMENT

152-3.1 Measurement for payment specified by the cubic yard shall be computed by the comparison of digital terrain model (DTM) surfaces for computation of neat line design quantities. The end area is that bound by the original ground line established by ~~the design survey field cross-sections~~ and the final theoretical pay line established by cross-sections shown on the plans, subject to verification by the RPR.

In cut sections, the additional cut required to construct the topsoil layer to the plan grade has not been measured and will not be measured for separate payment but will be subsidiary to "Unclassified Excavation". In fill sections, the additional fill required to replace the stripped material has not been measured and will not be measured for payment but will be subsidiary to "Unclassified Excavation".

No allowance has been made in the measurement for shrink/swell. The Contractor shall make his own determination as to the amount of shrink/swell involved in the construction of the embankment.

The Contractor shall make his/her own determination as to the suitability of the excavated material to be placed in embankments and the resulting additional off-site material required for the construction of the embankment.

Measurement of unclassified borrow excavation shall be based on plan quantities. These quantities are believed to be correct and shall be utilized for final payment notwithstanding any adjustments to the project by written direction of the Engineer. Prior to disturbance of the existing ground the contractor shall provide the Engineer a topographic survey of the existing ground performed by a surveyor licensed in the State of Texas. The Contractor shall also submit a letter to the Engineer that states they agree to the plan quantities. Should the contractor find discrepancies and/or errors, he/she shall bring the discrepancy and/or error to the attention of the Engineer immediately and corrections shall be made to the quantity of excavation to be paid for by change order. It is expressly understood by the contractor that upon disturbance of the existing ground and no notification to the Engineer of possible errors, that the contractor accepts as final payment the quantities of excavation as detailed on the plans and laid out in the bid form.

No adjustment has been made to the plan quantities for the construction or demolition of existing drainage structures. The Contractor shall make his/her own determination as to the amount of unsuitable excavated material which may be encountered and the resulting additional borrow

material required for the construction of the embankment. There will be no adjustment for additional embankment required to construct the project if the excavated material is deemed unsuitable.

152-3.1 The quantity of unclassified excavation to be paid for shall be the number of cubic yards measured in its original position. Measurement shall not include the quantity of materials excavated without authorization beyond normal slope lines, or the quantity of material used for purposes other than those directed.

152-3.2 The quantity of embankment in place shall be the number of cubic yards measured in its final position.

152-3.3 Stockpiled material shall not be measured for payment in the stockpiled position ***and shall be subsidiary to Unclassified Excavation.***

152-3.4 Unsuitable excavation shall be measured from the surface of the ground, after stripping has been accomplished, or from the bottom of the planned excavation, to the depth of the excavation as directed by the Engineer. Measurements will be taken by the Engineer, and the volume of excavation will be calculated by the average end area method. The necessary refilling of unsuitable areas will not be measured for separate payment but will be subsidiary to "Unsuitable Excavation". Only that amount of excavation directed by the Engineer will be measured for payment.

Revise the following section Basis of Payment as noted:

BASIS OF PAYMENT

152-4.1 Unclassified excavation payment shall be made at the contract unit price per cubic yard. This price shall be full compensation for furnishing all materials, labor, equipment, tools, and incidentals necessary to complete the item.

152-4.2 For embankment in place, payment shall be made at the contract unit price per cubic yard. This price shall be full compensation for furnishing all materials, labor, equipment, tools, and incidentals necessary to complete the item.

152-4.3 ~~Stockpiled material shall be paid for on the basis of the number of cubic yards measured in the stockpiled position.~~

152-4.4 *Unsuitable excavation shall be paid for at the contract unit price bid per cubic yard for "Unsuitable Excavation", which price shall be full compensation for all excavation; for disposal or placement of unsuitable material (in accordance with section 152-1.3), including loading, hauling, spreading, and compaction; for compaction and preparation of subgrade; for the refilling, rolling, and compaction of all undercut areas; and for all equipment, tools, labor, and incidentals necessary to complete the work.*

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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 and paid for under one of the following items.

b. Borrow excavation. Borrow excavation shall consist of approved material required for the construction of embankments or for other portions of the work in excess of the quantity of usable material available from required excavations. Borrow material shall be obtained from ~~areas designated by the Resident Project Representative (RPR) within the limits of the airport property but outside the normal limits of necessary grading, or from areas outside the airport boundaries.~~

152-1.3 Unsuitable excavation. Unsuitable material shall be disposed in designated waste areas as shown on the plans. Materials 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 RPR. *Undercutting of material unsatisfactory for subgrade foundation, roads, shoulders, or areas intended for turfing shall be considered unsuitable excavation and shall be excavated to the depth specified by the Engineer below the subgrade.*

CONSTRUCTION METHODS

152-2.1 General. ~~Before beginning excavation, grading, and embankment operations in any area, the area shall be cleared or 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 RPR. All unsuitable material shall be disposed of ~~off airport property, and clean soils free from debris may be disposed off on-site as permitted by airport operations at the location as specified in the plans in waste areas as shown on the plans. All waste areas to temporarily store unsuitable material before disposing off site~~ shall be graded to allow positive drainage of the area and adjacent areas. The surface elevation of waste areas shall be specified on the plans or approved by the RPR.

When the Contractor's excavating operations encounter artifacts of historical or archaeological significance, the operations shall be temporarily discontinued and the RPR notified per Section 70, paragraph 70-20. At the direction of the RPR, 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.

Areas outside the limits of the pavement areas where the top layer of soil has become compacted by hauling or other Contractor activities shall be scarified and disked to a depth of 4 inches, to loosen and pulverize the soil. Stones or rock fragments larger than 4 inches in their greatest dimension will not be permitted in the top 6 inches of the subgrade.

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 RPR, who shall arrange for their removal if necessary. The Contractor, at their own 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.

a. Blasting. Blasting shall not be allowed.

152-2.2 Excavation. No excavation shall be started until the work has been staked out by the Contractor and the RPR has obtained from the Contractor, the survey notes of the elevations and measurements of the ground surface. The Contractor and RPR shall agree that the original ground lines shown on the original topographic mapping are accurate, or agree to any adjustments made to the original ground lines.

Digital terrain model (DTM) files of the existing surfaces, finished surfaces and other various surfaces were used to develop the design plans.

Volumetric quantities were calculated by comparing DTM files of the applicable design surfaces and generating Triangle Volume Reports. Electronic copies of DTM files and a paper copy of the original topographic map will be issued to the successful bidder.

Existing grades on the design cross sections or DTM's, where they do not match the locations of actual spot elevations shown on the topographic map, were developed by computer interpolation from those spot elevations. Prior to disturbing original grade, Contractor may verify the accuracy of the existing ground surface by verifying spot elevations at the same locations where original field survey data was obtained as indicated on the topographic map. Contractor shall recognize that, due to the interpolation process, the actual ground surface at any particular location may differ somewhat from the interpolated surface shown on the design cross sections or obtained from the DTM's. Contractor's verification of original ground surface, however, shall be limited to verification of spot elevations as indicated herein, and no adjustments will be made to the original ground surface unless the Contractor demonstrates that spot elevations shown are incorrect. For this purpose, spot elevations which are within 0.1 foot of the stated elevations for ground surfaces, or within 0.04 foot for hard surfaces (pavements, buildings, foundations, structures, etc.) shall be considered "no change". Only deviations in excess of these will be considered for adjustment of the original ground surface. If Contractor's verification identifies discrepancies in the topographic map, Contractor shall notify the RPR in writing at least two weeks before disturbance of existing grade to allow sufficient time to verify the submitted information and make adjustments to the design cross sections or DTM's. Disturbance of existing grade in any area shall constitute acceptance by the Contractor of the accuracy of the original elevations shown on the topographic map for that area.

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 RPR. All suitable excavated material shall be used in the formation of embankment, subgrade, or other purposes as shown on the plans. All unsuitable material shall be disposed of **as described in paragraph 152-1.3 shown on the plans.**

The grade shall be maintained so that the surface is well drained at all times.

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

a. Selective grading. When **the quality of material varies significantly** selective grading is indicated on the plans, the more suitable material designated by the RPR 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 until it can be placed. The more suitable material shall then be placed and compacted as specified. Selective grading shall be considered incidental to the work involved. The cost of stockpiling and placing the material shall be included in the various pay items of work involved.

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 below the subgrade or to the depth specified by the RPR. Muck, peat, matted roots, or other yielding material, unsatisfactory for subgrade foundation, shall be removed to the depth specified. Unsuitable materials shall be disposed off the airport. The cost is incidental to this item. This excavated material shall be paid for at the contract unit price per cubic yard for Unsuitable Excavation. 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 **necessary part of Unsuitable Excavation** 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. Undercutting will be paid as Unsuitable Excavation.

c. Over-break. Over-break, including slides, is that portion of any material displaced or loosened beyond the finished work as planned or authorized by the RPR. All over-break shall be graded or removed by the Contractor and disposed of as directed by the RPR. The RPR shall determine if the displacement of such material was unavoidable and their own decision shall be final. Payment will not be made for the removal and disposal of over-break that the RPR determines as avoidable. Unavoidable over-break 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 the Contractor as indicated on the plans. All existing foundations shall be excavated at least 2 feet below the top of subgrade or as indicated on the plans, and the material disposed of as directed by the RPR. All foundations thus excavated shall be backfilled with suitable material and compacted as specified for embankment or as shown on the plans. **All work associated with the excavation, removal, backfill, disposal, and/or stockpiling of existing structures and culverts will not be measured for separate payment but will be considered subsidiary to SS-140.**

152-2.3 Borrow excavation.

There are no borrow sources within the boundaries of the airport property. The Contractor shall locate and obtain borrow sources, subject to the approval of the RPR. The Contractor shall notify the RPR at least 15 days prior to beginning the excavation so necessary measurements and tests can be made by the RPR. All borrow pits shall be opened to expose the various strata of acceptable material to allow obtaining a uniform product. Borrow areas shall be drained and left in a neat, presentable condition with all slopes dressed uniformly. Borrow areas shall not create a hazardous wildlife attractant.

Imported material for fill or backfill under pavements shall be of clayey sands and sandy clays free from organic materials with a plasticity index of 20 or less, a liquid limit of 40 or less, and between 15 and 30 percent passing a No. 200 sieve and compatible with lime treatment. Suitable fill material that is used should be moisture conditioned, placed in loose lifts not exceeding eight (8) inches, and compacted to a minimum of 96 percent of maximum dry density determined per ASTM D698. The moisture content of these soils shall be maintained within \pm 2% of optimum moisture content until permanently covered.

152-2.4 Drainage excavation. Drainage excavation shall consist of excavating drainage ditches including intercepting, inlet, or outlet ditches; or other types as shown on the plans. The work shall be performed in sequence with the other construction. 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 RPR. 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 cut areas or areas where existing pavement has been removed. In those areas on which a subbase or base course is to be placed, the top 12 inches of subgrade shall be compacted to not less than 100 % of maximum density for non-cohesive soils, and 96% of maximum density for cohesive soils as determined by ASTM D698. As used in this specification, "non-cohesive" shall mean those soils having a plasticity index (PI) of less than 3 as determined by ASTM D4318.

152-2.6 Preparation of embankment area. 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 and shall then be compacted per paragraph 152-2.10.

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 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.

152-2.7 Control Strip. The first half-day of construction of subgrade and/or embankment shall be considered as a control strip for the Contractor to demonstrate, in the presence of the RPR, that the materials, equipment, and construction processes meet the requirements of this specification. The sequence and manner of rolling necessary to obtain specified density requirements shall be determined. The maximum compacted thickness may be increased to a maximum of 12 inches upon the Contractor's demonstration that approved equipment and operations will uniformly compact the lift to the specified density. The RPR must witness this demonstration and approve the lift thickness prior to full production.

Control strips that do not meet specification requirements shall be reworked, re-compact, or removed and replaced at the Contractor's expense. Full operations shall not begin until the control strip has been accepted by the RPR. The Contractor shall use the same equipment, materials, and construction methods for the remainder of construction, unless adjustments made by the Contractor are approved in advance by the RPR.

152-2.8 Formation of embankments. The material shall be constructed in lifts as established in the control strip, but not less than 6 inches nor more than 12 inches of compacted thickness.

When more than one lift is required to establish the layer thickness shown on the plans, the construction procedure described here shall apply to each lift. No lift shall be covered by subsequent lifts until tests verify that compaction requirements have been met. The Contractor shall rework, re-compact and retest any material placed which does not meet the specifications.

The lifts shall be placed, to produce a soil structure as shown on the typical cross-section or as directed by the RPR. 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 due to 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 lift shall be within $\pm 2\%$ of optimum moisture content before rolling to obtain the prescribed compaction. The material shall be moistened or aerated as necessary to achieve a uniform moisture content throughout the lift. Natural drying may be accelerated by blending in dry material or manipulation alone to increase the rate of evaporation.

The Contractor shall make the necessary corrections and adjustments in methods, materials or moisture content to achieve the specified embankment density.

The RPR will take samples of excavated materials which will be used in embankment for testing and develop a Moisture-Density Relations of Soils Report (Proctor) in accordance with D698. A new Proctor shall be developed for each soil type based on visual classification.

Density tests will be taken by the RPR for every 2,500 square yards of compacted embankment for each lift which is required to be compacted, or other appropriate frequencies as determined by the RPR.

If the material has greater than 30% retained on the 3/4-inch (19.0 mm) sieve, follow AASHTO T-180 Annex Correction of maximum dry density and optimum moisture for oversized particles.

Rolling operations shall be continued until the embankment is compacted to not less than 100% of maximum density for non-cohesive soils, and 96% of maximum density for cohesive soils as determined by ASTM D698. Under all areas to be paved, the embankments shall be compacted to a depth of 12 inches

and to a density of not less than 96% percent of the maximum density as determined by *ASTM D698*. As used in this specification, "non-cohesive" shall mean those soils having a plasticity index (PI) of less than 3 as determined by *ASTM D4318*.

On all areas outside of the pavement areas, no compaction will be required on the top 4 inches which shall be prepared for a seedbed in accordance with Item T-901.

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 RPR shall perform all density tests. If the specified density is not attained, the area represented by the test or as designated by the RPR shall be reworked and/or re-compact and additional random tests made. This procedure shall be followed until the specified density is reached.

Compaction areas shall be kept separate, and no lift shall be covered by another lift 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 lift is placed. Lift placement shall begin in the deepest portion of the embankment fill. As placement progresses, the lifts shall be constructed approximately parallel to the finished pavement grade line.

When rock, concrete pavement, asphalt pavement, and other embankment material are excavated at approximately the same time as the subgrade, the material shall be incorporated into the outer portion of the embankment and the subgrade material shall be incorporated under the future paved areas. Stones, fragmentary rock, and recycled pavement larger than 4 inches in their greatest dimensions will not be allowed in the top 12 inches of the subgrade. Rockfill shall be brought up in lifts as specified or as directed by the RPR and the finer material shall be used to fill the voids forming a dense, compact mass. Rock, cement concrete pavement, asphalt pavement, and other embankment material shall not be disposed of except at places and in the manner designated on the plans or by the RPR.

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

Payment for compacted embankment will be made under embankment in-place and no payment will be made for excavation, borrow, or other items.

152-2.9 Proof rolling. The purpose of proof rolling the subgrade is to identify any weak areas in the subgrade and not for compaction of the subgrade. Before start of embankment, and after compaction is completed, the subgrade area shall be proof rolled with a 20 ton Tandem axle Dual Wheel Dump Truck loaded to the legal limit with tires inflated to 150 psi in the presence of the RPR. Apply a minimum of 25% coverage, or as specified by the RPR, under pavement 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 or show permanent deformation greater than 1 inch shall be removed and replaced with suitable material or reworked to conform to the moisture content and compaction requirements in accordance with these specifications. Removal and replacement of soft areas is incidental to this item.

152-2.10 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 96 percent of the maximum dry density as determined by *ASTM D698*. The subgrade in areas outside the limits of the pavement areas shall be compacted to a depth of 12 inches and to a density of not less than 95 percent of the maximum density as determined by *ASTM D698*.

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). When the material has greater than 30 percent

retained on the $\frac{3}{4}$ inch (19.0 mm) sieve, follow the methods in ASTM D698 procedures in AASHTO T180 Annex for correction of maximum dry density and optimum moisture for oversized particles. Tests for moisture content and compaction will be taken at a minimum of 2,500 S.Y. of subgrade. All quality assurance testing shall be done by the RPR.

The in-place field density shall be determined in accordance with ASTM D6938 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 within 12 months prior to its use on this contract. The gage shall be field standardized daily.

Maximum density refers to maximum dry density at optimum moisture content unless otherwise specified.

If the specified density is not attained, the entire lot shall be reworked and/or re-compact and additional random tests made. This procedure shall be followed until the specified density is reached.

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 RPR and the finished subgrade shall be maintained.

152-2.11 Finishing and protection of subgrade. Finishing and protection of the subgrade is incidental to this item. Grading and compacting of the subgrade shall be performed so that it will drain readily. All low areas, holes or depressions in the subgrade shall be brought to grade. 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. All ruts or rough places that develop in the completed subgrade shall be graded, re-compact, and retested. The Contractor shall protect the subgrade from damage and limit hauling over the finished subgrade to only traffic essential for construction purposes.

The Contractor shall maintain the completed course in satisfactory condition throughout placement of subsequent layers. No subbase, base, or surface course shall be placed on the subgrade until the subgrade has been accepted by the RPR.

152-2.12 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.

The Contractor's equipment shall not cause damage to any excavated surface, compacted lift or to the subgrade as a result of hauling operations. Any damage caused as a result of the Contractor's hauling operations shall be repaired at the Contractor's expense.

The Contractor shall be responsible for providing, maintaining and removing any haul roads or routes within or outside of the work area, and shall return the affected areas to their former condition, unless otherwise authorized in writing by the Owner. No separate payment will be made for any work or materials associated with providing, maintaining and removing haul roads or routes.

152-2.13 Surface Tolerances. In those areas on which a subbase or base course is to be placed, the surface shall be tested for smoothness and accuracy of grade and crown. Any portion lacking the required smoothness or failing in accuracy of grade or crown shall be scarified to a depth of at least 3 inches, reshaped and re-compact to grade until the required smoothness and accuracy are obtained and approved by the RPR. The Contractor shall perform all final smoothness and grade checks in the presence of the RPR. Any deviation in surface tolerances shall be corrected by the Contractor at the Contractor's expense.

- a. **Smoothness.** The finished surface shall not vary more than $+\text{-} \frac{1}{2}$ inch when tested with a 12-foot straightedge applied parallel with and at right angles to the centerline. The straightedge shall be moved continuously forward at half the length of the 12-foot straightedge for the full length of each line on a 50-foot grid.
- b. **Grade.** The grade and crown shall be measured on a 50-foot grid and shall be within $+\text{-}0.05$ feet of the specified grade.

On safety areas, turfed areas and other designated areas within the grading limits where no subbase or base is to be placed, grade shall not vary more than 0.10 feet from specified grade. Any deviation in excess of this amount shall be corrected by loosening, adding or removing materials, and reshaping.

152-2.14 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 be located as shown on the plans and the approved CSPP, and shall not be placed on areas that subsequently will require any excavation or embankment fill. If, in the judgment of the RPR, 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 re-handling.

Upon completion of grading operations, stockpiled topsoil shall be handled and placed as shown on the plans and as required in Item T-905. Topsoil shall be ~~paid for as provided in Item T-905~~ considered subsidiary to T-901. No direct payment will be made for topsoil under Item P-152.

METHOD OF MEASUREMENT

152-3.1 Measurement for payment specified by the cubic yard shall be computed by the comparison of digital terrain model (DTM) surfaces for computation of neat line design quantities. The end area is that bound by the original ground line established by *the design survey field cross-sections* and the final theoretical pay line established by cross-sections shown on the plans, subject to verification by the RPR.

In cut sections, the additional cut required to construct the topsoil layer to the plan grade has not been measured and will not be measured for separate payment but will be subsidiary to "Unclassified Excavation". In fill sections, the additional fill required to replace the stripped material has not been measured and will not be measured for payment but will be subsidiary to "Unclassified Excavation".

No allowance has been made in the measurement for shrink/swell. The Contractor shall make his own determination as to the amount of shrink/swell involved in the construction of the embankment.

The Contractor shall make his/her own determination as to the suitability of the excavated material to be placed in embankments and the resulting additional off-site material required for the construction of the embankment.

Measurement of unclassified borrow excavation shall be based on plan quantities. These quantities are believed to be correct and shall be utilized for final payment notwithstanding any adjustments to the project by written direction of the Engineer. Prior to disturbance of the existing ground the contractor shall provide the Engineer a topographic survey of the existing ground performed by a surveyor licensed in the State of Texas. The Contractor shall also submit a letter to the Engineer that states they agree to the plan quantities. Should the contractor find discrepancies and/or errors, he/she shall bring the discrepancy and/or error to the attention of the Engineer immediately and corrections shall be made to the quantity of excavation to be paid for by change order. It is expressly understood by the contractor that upon disturbance of the existing ground and no notification to the Engineer of possible errors, that the contractor accepts as final payment the quantities of excavation as detailed on the plans and laid out in the bid form.

No adjustment has been made to the plan quantities for the construction or demolition of existing drainage structures. The Contractor shall make his/her own determination as to the amount of unsuitable excavated material which may be encountered and the resulting additional borrow material required for the construction of the embankment. There will be no adjustment for additional embankment required to construct the project if the excavated material is deemed unsuitable.

152-3.1 The quantity of unclassified excavation to be paid for shall be the number of cubic yards measured in its original position. Measurement shall not include the quantity of materials excavated without

authorization beyond normal slope lines, or the quantity of material used for purposes other than those directed.

152-3.2 The quantity of embankment in place shall be the number of cubic yards measured in its final position.

152-3.3 Stockpiled material shall not be measured for payment in the stockpiled position ***and shall be subsidiary to Unclassified Excavation.***

152-3.4 *Unsuitable excavation shall be measured from the surface of the ground, after stripping has been accomplished, or from the bottom of the planned excavation, to the depth of the excavation as directed by the Engineer. Measurements will be taken by the Engineer, and the volume of excavation will be calculated by the average end area method. The necessary refilling of unsuitable areas will not be measured for separate payment but will be subsidiary to "Unsuitable Excavation". Only that amount of excavation directed by the Engineer will be measured for payment.*

BASIS OF PAYMENT

152-4.1 Unclassified excavation payment shall be made at the contract unit price per cubic yard. This price shall be full compensation for furnishing all materials, labor, equipment, tools, and incidentals necessary to complete the item.

152-4.2 For embankment in place, payment shall be made at the contract unit price per cubic yard. This price shall be full compensation for furnishing all materials, labor, equipment, tools, and incidentals necessary to complete the item.

152-4.3 ~~Stockpiled material shall be paid for on the basis of the number of cubic yards measured in the stockpiled position.~~

152-4.4 *Unsuitable excavation shall be paid for at the contract unit price bid per cubic yard for "Unsuitable Excavation", which price shall be full compensation for all excavation; for disposal or placement of unsuitable material (in accordance with section 152-1.3), including loading, hauling, spreading, and compaction; for compaction and preparation of subgrade; for the refilling, rolling, and compaction of all undercut areas; and for all equipment, tools, labor, and incidentals necessary to complete the work.*

Payment will be made under:

Item P-152-4.1	Unclassified Excavation - per cubic yard
Item P-152-4.2	Embankment in Place - per cubic yard
Item P-152-4.3	Unsuitable Excavation - per cubic yard

REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

American Association of State Highway and Transportation Officials (AASHTO)

AASHTO T-180 Standard Method of Test for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop

ASTM International (ASTM)

ASTM D698 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN·m/m³))

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/ft³ (2700 kN-m/m³))

ASTM D6938 Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

Advisory Circulars (AC)

AC 150/5370-2 Operational Safety on Airports During Construction Software

Software

FAARFIELD – FAA Rigid and Flexible Iterative Elastic Layered Design

U.S. Department of Transportation

FAA RD-76-66 Design and Construction of Airport Pavements on Expansive Soils

END OF ITEM P-152

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CONSTRUCTION SAFETY AND PHASING PLAN (CSPP) - PAGE 2 OF 2

13. SPECIAL CONDITIONS

THE GENERAL CONTRACTOR SHALL REMAIN ON SITE AT ALL TIMES WHEN A SUBCONTRACTOR IS PERFORMING WORK.

14. RUNWAY AND TAXIWAY VISUAL AIDS

- A. GENERAL - ALL AIRPORT MARKINGS, LIGHTING, SIGNS, AND VISUAL NAVAIDS THAT ARE IN OPERATION MUST BE CLEAR FROM ALL OBSTRUCTIONS. ALL TEMPORARY MARKINGS, SIGNS, LIGHTS, OR OTHER VISUAL AIDS MUST BE SECURED IN PLACE TO PREVENT DAMAGE OR DISPLACEMENT BY PROP WASH, JET BLAST, WING VORTICES, OR OTHER WIND CURRENTS.
- B. MARKINGS - ALL TEMPORARY OR PERMANENT RUNWAY AND TAXIWAY VISUAL AIDS SHALL CONFORM TO THE REQUIREMENTS OF THE MOST RECENT EDITION OF FAA AC 150/5340-1 (www.faa.gov). MARKINGS FOR THIS PROJECT INCLUDE THE FOLLOWING:
 - TEMPORARILY PARTIALLY CLOSED TAXIWAYS - THE CONTRACTOR SHALL FURNISH AND INSTALL LOW PROFILE BARRICADES AT THE ENTRANCE TO THE PARTIALLY CLOSED TAXIWAY FROM AN ADJACENT TAXIWAY. BARRICADES SHALL BE INSTALLED OUTSIDE ALL ACTIVE TAXIWAY SAFETY AREAS. SEE DETAILS ON CONSTRUCTION SAFETY DRAWINGS FOR LOW-PROFILE AIRCRAFT BARRICADE DETAILS.
- C. LIGHTING AND VISUAL NAVAIDS - ALL TEMPORARY LIGHTING FOR RUNWAY AND TAXIWAY SYSTEMS SHALL CONFORM TO THE REQUIREMENTS OF THE MOST RECENT EDITION OF FAA AC 150/5340-30 AND 150/5345-50 (www.faa.gov). THE CONTRACTOR SHALL BE RESPONSIBLE FOR DISCONNECTING ISOLATION TRANSFORMERS ASSOCIATED WITH ANY RUNWAY OR TAXIWAY LIGHT FIXTURES THAT ARE BEING DISCONNECTED.

IF APPLICABLE, ALL CONSTRUCTION, ALTERATION, OR REMOVAL OF FAA OWNED EQUIPMENT SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS SET FORTH IN THE APPROVED FAA REIMBURSABLE AGREEMENT. NO WORK SHALL BE COMPLETED ON FAA OWNED EQUIPMENT PRIOR TO COMPLETION OF THE FAA REIMBURSABLE AGREEMENT.

D. SIGNS - THE CONTRACTOR SHALL INSTALL ALL SIGNS IN ACCORDANCE WITH THE MOST RECENT EDITION OF FAA AC 150/5345-44 AND 150/5340-18. ANY SIGN THAT IS NOT PERFORMING ITS NORMAL FUNCTION MUST BE COVERED OR REMOVED TO PREVENT MISLEADING PILOTS.

15. MARKING AND SIGNS FOR ACCESS ROUTES

THE CONTRACTOR SHALL BE RESPONSIBLE FOR SUPPLYING AND INSTALLING ALL NECESSARY MARKINGS AND SIGNAGE FOR ALL ACCESS ROUTES TO AND FROM THE SITE TO BE USED BY CONTRACTOR PERSONNEL, SUBCONTRACTOR PERSONNEL, OR DELIVERY OPERATIONS. ALL SIGNAGE IN THE AIR OPERATIONS AREA SHALL BE FRANGIBLY MOUNTED.

16 HAZARD MARKING AND LIGHTING

- A. PURPOSE - HAZARD MARKING AND LIGHTING PREVENTS PILOTS FROM ENTERING AREAS CLOSED TO AIRCRAFT AND PREVENTS CONTRACTOR PERSONNEL FROM ENTERING AREAS OPEN TO AIRCRAFT.
- B. EQUIPMENT - THE CONTRACTOR SHALL FURNISH, INSTALL, AND MAINTAIN LOW-PROFILE BARRICADES IN HAZARDOUS AREAS INSIDE MOVEMENT AREAS. BARRICADES SHALL RESTRICT ACCESS AND MAKE HAZARDS OBVIOUS TO AIRCRAFT, PERSONNEL, AND VEHICLES. DURING PERIODS OF LOW VISIBILITY AND AT NIGHT, BARRICADES SHALL BE EQUIPPED WITH RED FLASHING OR STEADY BURNING LIGHTS. THE SPACING OF BARRICADES SHALL BE SUCH THAT A BREACH IS PHYSICALLY PREVENTED BARRING A DELIBERATE ACT. IF BARRICADES ARE INTENDED TO PREVENT PEDESTRIANS, THEN THEY SHALL BE LINKED. SEE DETAILS ON CONSTRUCTION SAFETY DRAWINGS FOR LOW-PROFILE AIRCRAFT BARRICADE DETAIL.

17. WORK ZONE LIGHTING FOR NIGHTTIME CONSTRUCTION

ALL WORK CONDUCTED AT NIGHT SHALL BE ACCCOMPANIED BY ADEQUATE LIGHT FACILITIES TO COMPLETE THE WORK. ALL LIGHT FACILITIES SHALL BE AIMED OR SHIELDED AS NECESSARY TO AVOID IMPACTING AIRCRAFT OR ATCT OPERATIONS. THE CONTRACTOR SHALL BE REQUIRED TO SUBMIT A LIGHTING PLAN SHOWING THE LOCATION AND AIMING DIRECTION OF ALL LIGHT FACILITIES PRIOR TO THE COMPLETION OF ANY NIGHT WORK

18 PROTECTION OF SAFETY AREAS, OBJECT FREE AREAS, OBJECT FREE ZONES, AND APPROACH/DEPARTURE SURFACES

- A. RUNWAY SAFETY AREAS (RSA) - NO WORK SHALL BE PERMITTED WITHIN AN ACTIVE RUNWAY SAFETY AREA. IF REQUIRED, ADJUSTMENTS TO THE RSA DIMENSIONS THROUGH RESTRICTED OPERATIONS SHALL BE COORDINATED WITH THE FAA AIRPORTS REGIONAL OR DISTRICT OFFICE PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL ENSURE ADEQUATE DISTANCE PROTECTION FOR BLAST PROJECTION, AS NEEDED. ALL OPEN TRENCHES OR EXCAVATIONS WITHIN THE LIMITS OF THE RSA SHALL BE BACK FILLED OR COVERED PRIOR TO OPENING THE RUNWAY TO OPERATIONS. IN ADDITION, EROSION CONTROL MEASURES SHALL BE PROVIDED IN THE RSA TO PREVENT RUTS, HUMPS, OR DEPRESSIONS INSIDE THE LIMITS OF THE RSA.
- B. RUNWAY OBJECT FREE AREAS (ROFA) - NO MATERIAL SHALL BE STOCKPILED INSIDE THE LIMITS OF THE ACTIVE ROFA UNLESS APPROVED BY AIR SPACING THROUGH THE APPROPRIATE FAA AIRPORTS REGIONAL OR DISTRICT OFFICE.
- C. TAXIWAY SAFETY AREAS (TSA) - NO WORK SHALL BE PERMITTED WITHIN AN ACTIVE TSA. IF REQUIRED, ADJUSTMENTS TO THE TAXIWAY TSA DIMENSIONS THROUGH RESTRICTED OPERATIONS SHALL BE COORDINATED WITH THE FAA AIRPORTS REGIONAL OR DISTRICT OFFICE PRIOR TO CONSTRUCTION. ALL OPEN TRENCHES OR EXCAVATIONS WITHIN THE LIMITS OF THE TSA SHALL BE BACK FILLED OR COVERED PRIOR TO OPENING THE TAXIWAY TO OPERATIONS. IN ADDITION, EROSION CONTROL MEASURES SHALL BE PROVIDED IN THE TSA TO PREVENT RUTS, HUMPS, OR DEPRESSIONS INSIDE THE LIMITS OF THE TSA.
- D. TAXIWAY OBJECT FREE AREAS (TOFA) - NO CONSTRUCTION SHALL BE PERMITTED INSIDE AN ACTIVE TOFA UNLESS THE TAXIWAY HAS BEEN RESTRICTED TO OPERATIONS REQUIRING A TOFA EQUAL TO THAT OF THE TOFA AVAILABLE. IF REQUIRED, CONSTRUCTION MAY BE PERMITTED INSIDE THE TOFA IF THE TAXIWAY CENTERLINE MARKINGS ARE OFFSET WITH CENTERLINE REFLECTORS OR LIGHTING, OR APPROPRIATE NOTAMS ARE ISSUED. CONSTRUCTION MAY ALSO BE PERMITTED INSIDE THE TOFA IF A FIVE FOOT WING TIP CLEARANCE IS MAINTAINED FOR ALL CONSTRUCTION EQUIPMENT AND VEHICLES. IN THIS SCENARIO, FLAGGERS AND WING WALKERS MUST BE USED TO DIRECT TRAFFIC THROUGH THE CONSTRUCTION SITE.
- E. OBSTACLE FREE ZONE (OFZ) - NO PERSONNEL, MATERIAL, OR EQUIPMENT SHALL PENETRATE THE OFZ WHILE THE RUNWAY IS OPEN TO OPERATIONS. THE DIMENSIONS OF THE OFZ ARE AS DEFINED IN FAA AC 150/5300-13 (www.faa.gov).

19. OTHER LIMITATIONS ON CONSTRUCTION

- A. PROHIBITIONS - THE USE OF TALL EQUIPMENT (I.E. CRANES, CONCRETE PUMPS) SHALL NOT BE PERMITTED UNLESS APPROVED BY THE ENGINEER. OPEN FLAME WELDING AND TORCH CUTTING OPERATIONS ARE NOT PERMITTED UNLESS ADEQUATE FIRE SAFETY PRECAUTIONS ARE PROVIDED AND THESE OPERATIONS ARE AUTHORIZED BY THE AIRPORT OPERATOR AND THE ENGINEER. ELECTRICAL BLASTING CAPS SHALL NOT BE PERMITTED WITHIN 1,000-FT OF THE AIRPORT PROPERTY. FLARE POTS ARE NOT PERMITTED WITHIN THE AIR OPERATIONS AREA.
- B. CONTRACTOR MUST BE PRESENT AT RECEIVE ALL DELIVERIES. OWNER WILL NOT ACCEPT DELIVERIES ON BEHALF OF THE CONTRACTOR AND HAS THE RIGHT TO REJECT DELIVERIES IF CONTRACTOR IS NOT PRESENT TO RECEIVE THEM

AIRFIELD AREAS AFFECTED BY CONSTRUCTION

OPERATIONAL REQUIREMENTS	EXISTING (NORMAL)	PHASE 1	PHASE 2	ULTIMATE
RUNWAY 18R-36L	C-II	OPEN	OPEN	C-II
RUNWAY 18L-36R	A-1	OPEN	OPEN	A-1
TAXIWAY M	ADG III	CLOSED SOUTH OF TW K	OPEN	ADG III
TAXIWAY K*	ADG I	OPEN	PARTIALLY CLOSED	ADG I
TAXILANE M1	ADG I	CLOSED	OPEN	ADG I
TAXILANE M2	ADG I	CLOSED	OPEN	ADG I
TAXILANE M3	ADG I	CLOSED	OPEN	ADG I
TAXILANE M4	-	UNDER CONSTRUCTION	OPEN	ADG I
TAXILANE M5	-	UNDER CONSTRUCTION	OPEN	ADG I
TAXILANE M6**	-	UNDER CONSTRUCTION	OPEN	ADG I

*TAXILANE K WILL ONLY BE CLOSED FOR CONSTRUCTION IF ADDITIVE ALTERNATE 2 IS AWARDED.

**EARTHWORK AND TAXILANE M6 CONSTRUCTION WILL ONLY BE CONSTRUCTED IF ADDITIVE ALTERNATE 1 IS AWARDED.

RUNWAY DATA

JNWAY END NUMBER	AIRPLANE DESIGN GROUP	AIRCRAFT APPROACH CATEGORY	MINIMUM SAFETY AREA PRIOR TO THE THRESHOLD	MINIMUM UNOBSTRUCTED APPROACH SLOPE	RSA WIDTH DIVIDED BY
RUNWAY 18R	II	C	1,000-FT	20:1	250-FT
RUNWAY 36L	II	C	1,000-FT	34:1	250-FT
RUNWAY 18L	I	B	240-FT	20:1	60-FT
RUNWAY 36R	I	B	240-FT	20:1	60-FT



