

CITY OF PHOENIX, ARIZONA
OFFICE OF THE CITY ENGINEER
DESIGN AND CONSTRUCTION PROCUREMENT



PROJECT SPECIFICATIONS AND CONTRACT DOCUMENTS

AVIATION DEPARTMENT

PROJECT DESCRIPTION

PROJECT NO. AV06000026 FAA
AIP NO. 3-04-0029-106 and 3-04-0029-107

PROCUREPHX PRODUCT CATEGORY CODE 912000000
RFx 6000001413

AGREEMENT _____



Expires Sept. 2024

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PROJECT NO.: AV06000026
FEDERAL AID/AIP NO.: 3-04-0029-106 & 3-04-0029-107



Expires Sept. 2024

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CALL FOR BIDS

**CITY OF PHOENIX
PHOENIX SKY HARBOR INTERNATIONAL AIRPORT
WEST AIR CARGO RECONSTRUCTION
DESIGN-BID-BUILD**

PROJECT NO. AV06000026 FAA

**PROCUREPHX PRODUCT CATEGORY CODE 912000000
RFx 6000001413**

**BIDS WILL BE DUE: TUESDAY, MAY 23, 2023 AT 2:00 P.M.
SUBMITTED INTO THE DESIGN AND CONSTRUCTION PROCUREMENT BID BOX
LOCATED ON THE 1ST FLOOR LOBBY OF THE PHOENIX CITY HALL BUILDING,
200 W. WASHINGTON STREET, PHOENIX, ARIZONA, 85003**

**BIDS WILL BE READ: TUESDAY, MAY 23, 2023 AT 2:30 P.M.
IN PERSON, AT THE PHOENIX CITY HALL BUILDING, 5TH FLOOR WEST
CONFERENCE ROOM, LOCATED AT 200 W. WASHINGTON STREET, PHOENIX,
ARIZONA, 85003
AND VIA WEBEX VIDEO / PHONE ACCESS
*All times are local Phoenix time**

SCOPE OF WORK

The City of Phoenix is seeking a qualified contractor to provide construction services for the project listed below.

West Air Cargo Apron is located north and west of the center runway at Phoenix Sky Harbor International Airport (PHX). The purpose of this project is to deliver the reconstruction of the apron pavement within this area with new Portland Cement Concrete Pavement. Additional work will consist of drainage improvements, pavement markings, and utility adjustments as required. The ramp area is approximately 95,500 square yards of existing asphalt pavement located just west of the existing cargo building, east of the Aviation Facilities and Services building, in the northwest corner of the south airfield. The project will be constructed in an active airfield environment within the current boundaries of the PHX Operational Area. The project is located adjacent to the ongoing Taxiway U project and may require coordination in order to avoid conflicts.

This is a federal-aid project. The prevailing basic hourly wage rates and fringe benefit payments, as determined by the Secretary of Labor pursuant to the provisions of the Davis-Bacon Act, shall be the minimum wages paid to the described classes of laborers and mechanics employed or working on the site to perform the contract.

This project will utilize federal funds and is subject to the requirements of 49 Code of Federal Regulations Part 26 and the U.S. Department of Transportation DBE Program.

No goal has been established for this project.

The City of Phoenix, in accordance with the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252.42 U.S.C. §§ 2000d-4) and the Regulations, hereby notifies all bidders that it will affirmatively ensure that any contract entered into pursuant to this advertisement, disadvantaged business enterprises will be afforded full and fair opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, or national origin in consideration for an award.

PRE-BID MEETING

A pre-bid meeting will be held on Monday, May 8, 2023, at 10:00 a.m., at Phoenix Sky Harbor International Airport Facilities & Services Building, 2nd Floor Conference Rooms A & B, located at 2515 E. Buckeye Road, Phoenix, Arizona. At this meeting, staff will discuss the scope of work, general contract issues and respond to questions from the attendees. As City staff will not be available to respond to individual inquiries regarding the project scope outside of this pre-bid meeting, it is strongly recommended that interested firms send a representative to the pre-bid meeting.

REQUEST FOR BID PACKET

On Thursday, April 27, 2023, the bid packet may be downloaded from the City of Phoenix's eProcurement site at:

<https://eprocurement.phoenix.gov/irj/portal>

(OR)

the City of Phoenix's "Solicitations" web page as. The web address is:

<https://solicitations.phoenix.gov>

Firms receiving a copy of the bid packet through any other means are strongly encouraged to download the bid packet from the City webpage.

Firms must be registered in eProcurement <https://www.phoenix.gov/finance/vendorsreg> as a vendor.

Bid Opening MS Teams Meeting Instructions:

[Click here to join the meeting](#)

Meeting ID: 275 595 358 120

Passcode: Hbejdi

GENERAL INFORMATION

The City reserves the right to award the contract to the lowest responsible responsive bidder or all bids will be rejected, as soon as practicable after the date of opening bids.

The City of Phoenix will provide reasonable accommodations for alternate formats of the bid packet by calling Liz Blakley at (602) 495-3654 or calling TTY 711. Requests will only be honored if made within the first week of the advertising period. Please allow a minimum of seven calendar days for production.

Questions pertaining to process or contract issues should be directed to Liz Blakley at (602) 495-3654 or elizabeth.blakley@phoenix.gov.

Jeffrey Barton
City Manager

Eric J. Froberg, PE
City Engineer

Published: Arizona Business Gazette

Date: April 27, 2023

Date: May 4, 2023

District: 8

INFORMATION FOR BIDDERS

1. QUESTIONS ON PLANS AND SPECIFICATIONS

Neither the Engineer nor the City of Phoenix will be held responsible for any oral instructions. Any changes to the plans and specifications will be in the form of an addendum. All addenda will be posted online within the project folder at the following website:

<https://solicitations.phoenix.gov>

OR

<https://eprocurement.phoenix.gov/iri/portal>

For additional information prior to submitting your bid, contact:

Plans, Technical/Special Provisions, Proposal or Specifications:

NAME: Liz Blakley, Design and Construction Procurement

ADDRESS: 200 W. Washington Street, 5th Floor, Phoenix, AZ 85003-1611

PHONE: (602) 495-3654 E-MAIL: elizabeth.blakley@phoenix.gov

Federal Labor Standards/Davis-Bacon and related Acts contact:

Labor Compliance Office: (602) 261-8287

DBE Utilization contact:

Equal Opportunity Department: (602) 262-6790

All questions regarding the plans and specifications must be received (in writing) at a minimum seven calendar days prior to bid opening. Questions received after that time may not be given any consideration.

2. REQUEST FOR SUBSTITUTIONS

Paragraph A, B, and C of MAG Section 106.4 are deleted and the following paragraphs substituted:

- A. The Engineer will consider written request(s), by a prime bidder only, for substitution(s) which is/are considered equivalent to the item(s) specified in the Contract documents. The written request will be considered only if it is received at least twelve calendar days prior to the established bid date. Notification of acceptable substitutions will be made by addendum issued no fewer than seven calendar days prior to the established bid date. (A.R.S. 34-104)
- B. The prime bidder, at his own expense, will furnish the necessary data of substitution and validate that the physical, chemical, and operational qualities of each substitute item is such that this item will fulfill the originally specified required function.
- C. The substitution, if approved, will be authorized by a written addendum to the Contract documents and will be made available to all bidders. The bid date and the scheduled completion time will not be affected by any circumstances developing from this substitution.
- D. The request will be submitted to Design and Construction Procurement, Attention Liz Blakley, 5th Floor, Phoenix City Hall, 200 W. Washington Street, Phoenix, Arizona 85003-1611 or via email to elizabeth.blakley@phoenix.gov.

3. BID BOND

Bidders must submit a properly completed proposal guarantee in the form of certified check, cashier's check or on the surety bond provided, for an amount not less than ten percent of the total bid amount included in the proposal as a guarantee that the contractor will enter into a contract to perform the proposal in accordance with the plans and specifications. Surety bonds submitted for this project will be provided by a company which has been rated "A- or better for the prior four quarters" by the A.M. Best Company. ***A bid will be deemed non-responsive if not accompanied by this guarantee.***

The surety bond will be executed solely by a surety company or companies holding a certificate of authority to transact surety business in the State of Arizona, issued by the Director of the Department of Insurance pursuant to Title 20, Chapter 2, Article 1. The surety bond will not be executed by an individual surety or sureties even if the requirements of Section 7-101 are satisfied. The certified check, cashiers check, or surety bond will be returned to the contractors whose proposals are not accepted, and to the successful contractor upon the execution of a satisfactory bond and contract.

When providing a Surety Bond, ***failure to provide an "A- or better for the prior four quarters" bond will result in bid rejection.***

4. **LIST OF MAJOR SUBCONTRACTORS AND SUPPLIERS & LIST OF ALL SUBCONTRACTORS AND SUPPLIERS**

A bid will be deemed non-responsive if not accompanied by a properly completed and signed L.O.S.-1 "List of Major Subcontractors and Suppliers" form.

To assist in eliminating the practice of bid shopping on City construction projects, the Bidder shall list all Major Subcontractors and Suppliers to whom the Bidder intends to contract with that are equal to or greater than 5% of the base bid. The list of Major Subcontractors and Suppliers will be provided on the L.O.S.-1 "List of Major Subcontractors" form. Failure to properly complete and sign this form will result in bid rejection. This form is due with the bid.

If substantial evidence exists that bid shopping occurred on this project, the Bidder will be ineligible to bid on City or City-affiliated construction projects for a period of one year.

The list of All Subcontractors and Suppliers shall be provided on the L.O.S.-2 "List of All Subcontractors and Suppliers" form. This form is due five calendar days after bid opening by 5:00 p.m. All bidders will be required to submit the L.O.S.-1 form. The three lowest bidders will be required to submit the L.O.S.-2 form. If the L.O.S.-2 form is not submitted by the post-bid deadline, the Bidder will still be required to submit the document prior to award. If the Bidder fails to submit the required L.O.S.-2 form by the post-bid deadline, the Bidder's bid bond may be placed in jeopardy because the City may make a claim against the Bidder's bid bond for the cost difference between the lowest responsive and responsible Bidder's bid and the next lowest bid (and any additional costs involved in awarding the contract to the next lowest responsive and responsible bidder).

5. **BID SUBMITTAL**

The properly completed bid documents along with the ten percent bid guarantee will be submitted in a sealed envelope. The outside of the envelope will be marked as follows:

Bid of (Firm's Name, Address, and Phone Number)
For: West Air Cargo Apron Reconstruction
City of Phoenix Project Number: AV0600026 FAA

Sealed bids will be submitted to City Hall Building, 200 W. Washington Street, First Floor, Phoenix, AZ 85003, prior to the time and date specified for bid opening.

6. **BID WITHDRAWALS**

MAG Section 102-10, Withdrawal or Revision of Proposal, is hereby deleted and the following paragraph is substituted:

"No bidder may withdraw or revise a proposal after it has been deposited with the City, except as provided in Phoenix City Code Chapter 2, Section 188. Proposals, read or unread, will not be returned to the bidders until after determination of award has been made.

7. **ADDENDA**

Acknowledge all addenda; a bid will be deemed non-responsive if all issued addenda for this project are not acknowledged in writing on Page P. -1.

The City of Phoenix will not be responsible for any oral responses or instructions made by any employees or officers of the City of Phoenix in regard to the bidding instructions, plans, drawings, specifications, or contract documents. A verbal reply to an inquiry does not constitute a modification of the Invitation for Bid (IFB). Any changes to the plans, drawings and specifications will be in the form of an addendum.

It will be the responsibility of the prospective bidder to determine, prior to the submittal of its bid, if any addenda to the project have been issued by Design and Construction Procurement. All addenda issued, will be acknowledged by bidder on Page P.-1. All addenda (if any) will be available online within each project's folder at the following website:

<https://solicitations.phoenix.gov>

The contractors and/or consultants are responsible for ensuring they have all addenda and/or notifications for all projects they are submitting on. Prospective bidders are strongly encouraged to check the Solicitations website in order to ascertain if any addenda have been issued for this project.

8. **BID SUBMITTAL CHECK LIST**

All firms must be registered in the City's Vendor Management System prior to submitting a proposal. For new firms – the City will send an email to your firm with a vendor number within two days of submitting the request. The vendor number needs to be included on the cover of the bid proposal package/envelope. Information on how to register with the City is available at:

<https://www.phoenix.gov/finance/vendorsreg>

BID SUBMITTAL CHECKLIST

This checklist is provided to remind bidders of several of the required elements of the bid packages. It is not intended to be a comprehensive list of all of the contract documents. Bidders are encouraged to review all of the Bid Instructions to determine compliance therein.

- Acknowledge all addenda? (Page P.-1)
- Complete all the Bid Proposal forms? (Page P.-1 to P.-4 and P.S.-1)
- Include your Bid Bond (rated A- or better for the prior four quarters) or Guarantee Cashier's Check? (Page S.B.-1)

- Include the Buy American Requirement Certification form, Attachment 1? (AIP Pages 51-54)
- Include the Certification Regarding Lobbying and Influencing Federal Employees form, Attachment 2? (AIP Page 55)
- Include the Rights in Data and Rights in Inventions Certification form, Attachment 3? (AIP Page 56)
- Include the Rights Trade Restriction Clause form, Attachment 4? (AIP Page 58)
- Include the Restrictions on Federal Public Works Projects Certification form, Attachment 5? (AIP Page 60)
- Include the Certification on Previous Contracts Subject to Equal Opportunity Clause, Attachment 6 (AIP Page 62)
- Include the Certification of Non-Segregated Facilities Certification form, Attachment 7? (AIP Page 63)
- Include the Tax Delinquency and Felony Convictions, Attachment 8? (AIP Page 64)
- Include the Certification Regarding Debarment, Suspension, Proposed Debarment and Other Responsibility Matters form, Attachment 9? (AIP Page 65)
- Documentation of Small Business Outreach Efforts, Columns A through D – (Form E.O.2); Form E.O.2 instructions are found on pages DBEC-4 to 6
- Include the complete List of Major Subcontractors and Suppliers form? (Page L.O.S.-1)

PLEASE DO NOT SUBMIT THE ENTIRE SPECIFICATION BOOK WHEN SUBMITTING YOUR BID. INCLUDE ONLY THE REQUIRED BIDDING DOCUMENTS

POST-BID SUBMITTAL CHECKLIST

The three lowest bidders must submit completed contracts documents listed below, no later than five calendar days after bid opening by 5:00 p.m. The documents must be submitted to Design and Construction Procurement, 5th Floor, or can be sent by email to elizabeth.blakley@phoenix.gov.

- Submit completed List of **All** Subcontractors and Suppliers form (L.O.S.-2)
- Completed Documentation of Small Business Outreach Efforts with supporting documentation – Columns E and F (Form E.O.2) – Form E.O.2 instructions and supporting documentation requirements are found on pages DBEC-4 to 6
- Completed Small Business Utilization Commitment (Form E.O.3)
- Provide Certificate on Previous Contracts Subject to Equal Opportunity Clause form, Attachment 6 (AIP Page 54)
- Submit Bidders Disclosure Statement? (Page B.D.S.-1 to B.D.S.-4)
- Submit Affidavit of Identity (A.O.I.-1) if you are a sole proprietor

PRIOR TO CONTRACT EXECUTION

- Contractor must provide proof of license required to perform the work.

- Verification of Experience Modification Rate (EMR) – the awarded company will be required to provide an EMR verification letter from the insurance company prior to contract execution.

9. **PERMITS**

CITY RESPONSIBILITY – The City will be responsible for City of Phoenix review and permit(s) fees for building and demolition permits. The City will also pay review fees for grading and drainage, water, sewer, and landscaping. The City will also pay for utility design fees for permanent services.

CONTRACTOR RESPONSIBILITY – The Contractor will be responsible for all other permits and review fees not specifically listed above. The Contractor is responsible for the cost of water meters, water and sewer taps, fire lines and taps, and all water bills on the project meters until the project is accepted. Arrangements for construction water are the Contractor's responsibility.

The Contractor may elect to use a City fire hydrant for its source of construction water only if an existing water service connection is unavailable or inadequate. The Contractor will be required to comply with Phoenix City Code Section 37-13A.

The Contractor is specifically reminded of the need to obtain the necessary environmental permits or file the necessary environmental notices. Copies of these permits and notices must be provided to the City's Project Manager prior to starting the permitted activity. In the case of Fire Department permits, a copy of the application for permit will also be provided to the Project Manager. This provision does not constitute an assumption by the City of an obligation of any kind for violation of said permit or notice requirements.

10. **CONTRACT AWARD**

Contract award will be made to the responsive and responsible bidder based on the low total base bid. If unit pricing is required in the proposal, the extensions and additions will be verified to assure correctness. Award will be based on the revised total if any errors are found. Additionally, the Contractor will comply with the DBE requirements as detailed in the DBE Clause. The City expressly reserves the right to cancel this agreement without recourse or prejudice to Contractor until all parties have executed the agreement in full.

Any bidder that currently contracts with the City must be in good standing for its proposal to be considered responsive. For the purpose of this Invitation to Bid, good standing means compliance with all contractual provisions, including payment of financial obligations.

11. **CANCELLATION OF CONTRACT FOR CONFLICT OF INTEREST**

All parties hereto acknowledge that this Agreement is subject to cancellation by the City of Phoenix pursuant to the provisions of Section 38-511, Arizona Revised Statutes.

12. **TERMINATION FOR CONVENIENCE**

The Owner for its own convenience has the right for any reason and at any time to terminate the contract and require the Contractor to cease work hereunder. Such termination will be effective at the time and in the manner specified in the notification to the Contractor of the termination. Such termination will be without prejudice to any claims which the Owner may have against the Contractor. In the event of a termination for convenience, the Contractor will be paid only the direct value of its completed work and materials supplied as of the date of termination, and Contractor will not be entitled to anticipated profit or anticipated overhead or any other claimed damages from the Owner, Architect or the Engineer. If the City is found to have improperly terminated the Agreement for cause or default, the termination will be converted to a termination for convenience in accordance with the provisions of this Agreement.

13. **SURVEY**

The Contractor will set the construction stakes establishing lines, grades, and elevations to include necessary utilities and appurtenances and will be responsible for their conformance with plans and specifications. All construction survey is incidental to the Contractor's bid proposal. Construction staking will be done in accordance with the applicable provisions of the Public Works Design and Construction Management Division's "Standard Requirements for Staking, As-Builts, and Quantity Calculations", dated January 1, 1980. The Engineer will establish or designate a control line and benchmark of known location and elevation for use as a reference.

The Contractor will furnish the Engineer a certified set of calculations and measurements to fully support the derivation of all pay quantities. This information will be prepared by a registrant of the Arizona State Board of Technical Registration.

The Contractor will furnish the Engineer a set of "Record Drawings". Record drawings will be certified by a registrant of the Arizona State Board of Technical Registration.

14. **RECORD DRAWINGS**

The Contractor will maintain a record set of plans at the job site. These will be kept legible and current and will show all changes or work added in a contrasting, reproducible color. When the project is substantially complete, the Contractor will submit these plans to the Engineer for approval. When landscaping is included, the Contractor will submit, prior to final inspection, corrected landscape drawings showing the location of all utility services, controller, pipe, valves, and wiring. The Engineer will be the sole judge as to the acceptability of the record plans and receipt of an acceptable set is a pre-requisite for final payment.

15. **TESTINGS**

Soils backfill, pad, welding, roofing should be included in the contractor's proposal/price. Copies of all testing needed to be simultaneous sent via email or messenger to the developer.

16. **PRECONSTRUCTION CONFERENCE**

After the Contract documents are successfully completed, to include bonds, insurance, and signatures, and prior to the commencement of any work on the project, the Project Manager, will schedule a Pre-Construction Conference.

The purpose of this conference is to establish a working relationship between the Contractor, utility firms, and various City agencies. The agenda will include critical elements of the work schedule, submittal schedule, cost breakdown of major lump sum items, payment application and processing, coordination with the involved utility firms, emergency telephone numbers for all representatives involved in the course of construction, and establishment of the notice to proceed date.

Minimum attendance by the Contractor will be a responsible company/corporate official, who is authorized to execute and sign documents on behalf of the firm, the job superintendent, and the Contractor's safety officer.

17. **IMMIGRATION REFORM AND CONTROL ACT**

Compliance with Federal Laws Required. Contractor understands and acknowledges the applicability of the Immigration Reform and Control Act of 1986 and the Drug Free Workplace Act to him. Contractor agrees to comply with these Federal Laws in performing under this Agreement and to permit City inspection of his personnel records to verify such compliance.

18. **LEGAL WORKER REQUIREMENTS**

The City of Phoenix is prohibited by A.R.S. § 41-4401 from awarding a contract to any Contractor who fails, or whose subcontractors fail, to comply with A.R.S. § 23-214(A). Therefore, Contractor agrees that:

- A. Contractor and each subcontractor it uses warrants their compliance with all federal immigration laws and regulations that relate to their employees and their compliance with § 23-214, subsection A.
- B. A breach of a warranty under paragraph A will be deemed a material breach of the contract that is subject to penalties up to and including termination of the contract.
- C. The City of Phoenix retains the legal right to inspect the papers of any Contractor or subcontractor employee who works on the contract to ensure that the Contractor or subcontractor is complying with the warranty under paragraph A.

19. **CONTRACT WORKER BACKGROUND SCREENING**

Contractor agrees that all Contract Workers that Contractor allows to perform work under this Contract shall be subject to background and security checks and screening (Background Screening). Contractor must pay for the cost of all Background Screenings, unless otherwise provided in the Scope of Work. Contractor agrees that Background Screenings required by this Section is necessary to preserve and protect public health, safety, and welfare. The Background Screening requirements set forth in this Section are the minimum requirements for this Contract. The City does not warrant or represent that the minimum requirements are sufficient to protect Contractor from any liability that may arise out of Contractor's work under this Contract or Contractor's failure to comply with this Section. Therefore, in addition to the Background Screening measures set forth below, Contractor and its Contract Workers shall take such other reasonable, prudent, and necessary measures to further preserve and protect public health, safety, and welfare when providing work under this Contract.

As used in this Section, "Contract Worker" means a person performing work for the City, including (1) a person or entity that has a contract with the City, (2) a worker of a person or entity that has a contract with the City, (3) a worker of a subcontractor of a person or entity that has a contract with the City, and (4) a worker of a tenant of the City. (City of Phoenix A.R. 4.45)

Legal Worker Background Check

Pursuant to Arizona Revised Statutes (A.R.S.) § 41-4401, Contractor must verify the legal Arizona worker status of each Contract Worker. Contractor must conduct and all Contract Workers must pass a background check for their real identity and legal name prior to performing any work under this Contract.

City Rights Regarding Security Inquiries

In addition to a Legal Worker Background Check, the City reserves the right to require Contractor to:

- Have a Contract Worker provide fingerprints and execute any document that is necessary to obtain criminal justice information pursuant to A.R.S. § 41-1750(G)(4) or Phoenix City Code § 4-22 or both;
- Act on newly acquired information, whether or not the information should have been previously discovered;
- Unilaterally change its standards and criteria related to the acceptability of Contract Workers; and

- Object, at any time and for any reason, to a Contract Worker performing work under this Contract, including supervision and oversight services.

Contractor Certification

By entering into this Contract, Contractor certifies that Contractor has read the Background Screening requirements and criteria in this Section, understands them, and that all Background Screening information furnished to the City is accurate, complete, and current. A Contract Worker that is rejected for work under this Contract shall not perform any work under any other contract or engagement Contractor has with the City without the City's prior written approval.

Contractor's Contracts and Subcontracts

Contractor shall include the terms of this Section for Contract Worker Background Screening in all contracts and subcontracts for work performed under this Contract, including supervision and oversight services.

Materiality of Background Screening Requirements and Indemnity

The Background Screening requirements of this Section are material to the City's decision to enter into this Contract. Any breach of this Section by Contractor shall be deemed a material breach of this Contract. In addition to any other indemnification provision in this Contract, Contractor shall defend, indemnify, and hold harmless the City from and against any and all claims, actions, liabilities, damages, losses, and expenses (Claims) arising out of this Background Screening Section, including the Contractor's disqualification of any Contract Worker or the City's failure to enforce this Section.

Continuing Duty and Audit

Contractor's obligation to ensure that all Contract Workers pass a Background Screening pursuant to Section shall continue throughout the entire term of this Contract. Contractor shall immediately notify the City of any change to a Contract Worker's Background Screening. Contractor shall maintain all records and documents related to all Background Screenings and the City reserves the right to audit Contractor's compliance with this Section.

20. **CONTRACT WORKER ACCESS CONTROLS AND AIRPORT SECURITY BADGE REQUIREMENTS**

Contractor shall not allow a Contract Worker to begin work under this Contract until Contractor has completed the Background Screening required by the City and the City has issued the appropriate airport security badge to the Contract Worker. The airport security badge will grant the Contract Worker unescorted access authority only to the area or areas of the Airport that the Contract Worker must enter in order to perform work under this Contract. When a Contract Worker's work in any area ends, the Contract Worker's access authority to that area ends. Any Contract Worker that attempts to enter a restricted area or sterile area, as those terms are defined below, of the Airport without proper authority is an immediate breach of this Contract.

SECURITY IDENTIFICATION DISPLAY AREA (SIDA) BADGE PROCESS

Each Contract Worker that needs unescorted access authority to a restricted or sterile area of the Airport in order to perform work under this Contract must receive a security identification display area (SIDA) badge from the Aviation Department's Public Safety and Security Division's Badging Office. Contractor must make arrangements with the City to have each Contract Worker proceed to the Badging Office for processing. The Badging Office will not issue a SIDA badge until the Contract Worker passes a fingerprint-based criminal history background check (CHRC) required by federal law (49 C.F.R. § 1542.209) and § 4-22(C) of the Phoenix City Code and passes a security threat assessment as mandated by the TSA through a security directive (49 C.F.R. § 1542.303). The Contract Worker shall comply with all requirements of and furnish all information requested by the Badging Office. Contractor shall pay for all fees associated with SIDA badging process, unless otherwise provided in the Scope of Work. Fees will be assessed according to § 4-22(D) of the

Phoenix City Code. Current badging procedures and fees are available for review at <https://www.skyharbor.com/security/BadgingInformation>.

As used in this Section, “restricted area” means the secured area and SIDA area of the Airport. “Secured area” means the part of the Airport in which certain federal security measures are implemented and where airlines enplane and deplane passengers and load baggage. “SIDA area” means the secured area and other areas designated by the Aviation Department, which include air operation areas, ground transportation areas, and the Rental Car Center security doors. “Sterile area” means the part of the Airport that provides passengers access to board aircraft and is controlled by the TSA or the airline by screening of persons and property. See § 4-22 of the Phoenix City Code and Rules 05-01 and 05-09 of the Aviation Department Rules and Regulations for a complete definition of the foregoing terms

21. **RISK-BASED BACKGROUND CHECK PROCESS**

The City has established two levels of risk for Contract Worker background checks: standard risk and maximum risk. If the Scope of Work changes, the City may change the level of risk, which may require Contractor conduct additional investigations and incur additional costs in order to process a background check and obtain the required airport security badge. Contract Workers who receive a SIDA badge are exempt from a standard and maximum risk background check.

A MAXIMUM RISK BACKGROUND CHECK is required for all non-exempt Contract Workers performing work under this Contract.

As used in this Section, “background check” means the fact-gathering process described in City of Phoenix A.R. 4.45 that is conducted to obtain information regarding a Contract Worker’s legal Arizona eligibility, criminal history, driving history, certifications, and other matters that may affect the Contract Worker’s ability or fitness to perform work under this Contract.

Before any work is performed under this Contract, Contractor shall provide the City with a list of its Contract Workers.

If any dispute arises related to a background check process or criminal history check information, then Contractor and the affected Contract Worker will resolve the dispute. The City will not get involved in resolving any such dispute.

In making the determination whether information in a background check renders the Contract Worker disqualified, Contractor should be guided by the following principles and guidelines

- A. Disqualification should not be based solely on a criminal conviction, unless the conviction related to performance under this Contract.
- B. Arrests that did not result in a conviction being entered or charges being filed may not be considered.
- C. Not all criminal convictions or other negative information obtained in a background check will disqualify a Contract Worker from working under this Contract.
- D. Contractor must evaluate the relevance of the information to the work the Contract Worker will perform under this Contract.
- E. Contractor must consider the following factors in determining whether negative background information disqualifies a Contract Worker:
 - Duties of the position
 - Time, nature, and number of negative events and convictions
 - Attempts and extent of rehabilitation efforts
 - The relation between the duties of the position and the nature of the crime committed

The analysis of whether any information in a background check is a potentially disqualifying factor involves looking at the requirements of the Contract, the Scope of Work, where the work will be performed, the need for access to restricted areas, and the type of persons or places the Contract Worker will encounter. Contractor should review the background check results and determine whether the nature of the conviction or crime reported would create a risk to the City based on the Contract's requirements.

For a Contract Worker requiring a standard risk background check potentially disqualifying convictions include a record of theft, identity theft, computer fraud or abuse, burglary, arson, crimes against property, violent crimes, or other crimes involving dishonesty, or embezzlement. For a Contract Worker requiring a maximum risk background check, potentially disqualifying convictions include a record of child molestation, assault, sexual assault, crimes against a person, public indecency, drug offenses, forgery, theft, burglary, arson, crimes against property, violent crimes, crimes for financial gain, identity theft, computer fraud or abuse, and embezzlement.

If a background check shows that the disposition of an arrest is unknown, then Contractor must determine the disposition of the arrest.

Contractor will obtain a Contract Worker disclosure from each Contract Worker who will perform work under this Contract. Contractor will provide the Contract Worker disclosures to the City upon request. "Contract Worker disclosure" means an affidavit by a Contract Worker disclosing his or her prior criminal record. The Contract Worker disclosure must list all criminal convictions, including the nature of the crime, the date of the conviction, and the location where the crime and conviction occurred. The Contract Worker disclosure also grants to the City the right to review the background check results. (City of Phoenix A.R. 4.45)

In a standard risk background check, Contractor must review the results of the background check and decide if a Contract Worker should be disqualified for work under this Contract. Contractor must engage in whatever due diligence is necessary to make the decision on whether to disqualify a Contract Worker. After Contractor has made its decisions, a list of names of qualified Contract Workers will be provided to the City.

In a maximum risk background check, Contractor must conduct the same review as in a standard risk background check. However, when submitting its list of qualified Contract Workers, Contractor must also submit the results of the background checks to the City for review. After its review, the City will either approve or deny each Contract Worker.

If the City approves a Contract Worker, then the City will notify Contractor of that fact and the Aviation Department will issue the appropriate airport security badge to the Contract Worker.

If the City denies a Contract Worker, then the City will notify Contractor of that fact and Contractor will reevaluate the Contract Worker to determine whether the person should be disqualified. If Contractor believes there are extenuating circumstances that suggest that the Contract Worker should not be disqualified, then Contractor will discuss those circumstances with the City. The City will review the matter and its decision on disqualification is final.

The City may set up a secure folder or drop box for confidential materials related to maximum risk background checks. The City will not keep records related to maximum risk background checks after they are reviewed.

If Contractor is a sole proprietor, Contractor must submit to the City a copy of his or her own background check and a background check for all business partners, member, and employees that will work under this Contract and for whom the background check requirements of City of Phoenix A.R. 4.45 apply.

Contractor shall determine whether a Contract Worker is disqualified from performing work under this Contract.

MAXIMUM RISK BACKGROUND CHECK

A maximum risk background check must be conducted for the term of this Contract or five years, whichever is shorter. Contractor shall conduct a maximum risk background check on all Contract Workers whose work under this Contract requires:

- Working directly with a vulnerable adult or child under age 18,
- Any responsibility for the receipt of payment of City funds or control of inventories, assets, or records that are at risk of misappropriation,
- Unescorted access to City data centers, money rooms, high-value equipment rooms,
- Access to a private residence,
- Access to Homeland Defense Bureau-identified critical infrastructure sites or facilities, or
- Responsibility or access to City-identified critical infrastructure sites, City networks or data, cyber/IT/network assets, digital or cyber assets, workstations, or servers, by either remote or direct access.

Scope of the Maximum Risk Background Check

The maximum risk background check conducted by Contractor must include the search criteria conducted under a standard risk background check in addition to a search for all felony and misdemeanor convictions (not including traffic or parking violations), a sex offender check, and a search for all outstanding warrants. Based on the Scope of Work, Contractor shall also conduct a credit check (for cash handling, accounting, and compliance positions only), driving records check (for driving positions only), and fingerprint verification when the Contract Worker is working directly with a child under age 18 or a vulnerable adult or the work under the Contract will take the Contract Worker to a criminal justice information system (CJIS) location.

Maximum risk background checks are valid for the term of this Contract or three years, whichever is shorter.

Criminal Justice Information System (CJIS) Maximum Risk Background Check

If the Scope of Work of this Contract requires unescorted access to a CJIS location or if Contractor will have access to a CJIS infrastructure or information, then a CJIS maximum risk background check will be conducted, reviewed, and approved by the Phoenix Police Department or the Arizona Department of Public Safety.

22. **AIRPORT SECURITY BADGE HANDLING PROCEDURES**

Contractor will comply with the following airport security badge handling procedures:

Key Access Procedures. If a Contract Worker requires keyed access to enter a City facility, then a separate key will be issued and Contractor must complete a return form and submit it to the City for each key issued.

Stolen or Lost Badges or Keys. Contractor shall immediately report any lost or stolen airport security badge or key to the City. A new airport security badge application or key issue form must be completed and submitted along with payment of the applicable fee prior to issuance of a new airport security badge or key

Return of Badges or Keys. All airport security badges and keys are the property of the City and must be returned to the Badging Office within one business day after the Contract Worker's access to a City facility is no longer required under this Contract. Contractor shall collect a Contract Worker's airport security badge and all keys (1) when the Contract Worker's employment is terminated, (2) when the Contract Worker's services are no longer required at a City facility, or (3) when this Contract terminates, is cancelled, or expires, whichever occurs first.

Employee Identification and Access. Contract Workers must have an airport security badge and some form of verifiable company identification in their possession at all times while working under this Contract, unless otherwise provided in the Scope of Work. Contract Workers are strictly prohibited from entering any area of the Airport that is not authorized by the airport security badge or key issued to them by the Badging Office. The Aviation Department will determine who will have access to the Airport. Contract Workers access authority is only valid during their scheduled hours. Contractor shall provide the City with updates and changes in personnel as they occur.

Badge Fees. Contractor shall pay the airport security badge fees set forth in § 4-11(D) of the Phoenix City Code.

23. **CONTRACTOR'S BREACH**

Contractor agrees that the access control, airport security badge, and key requirements in this Section are necessary to preserve and protect public health, safety, and welfare. Therefore, Contractor shall be deemed in immediate breach of this Section upon the occurrence of any of the following:

- A Contract Worker gains access to a City facility or a restricted or secured area of the Airport without the proper airport security badge or key
- A Contract Worker uses another person's airport security badge or key to gain or attempt to gain access to a City facility or a restricted or secured area of the Airport
- A Contract Worker begins work under this Contract without passing the appropriate Background Screening and being issued the proper airport security badge or key
- A Contract Worker or Contractor submits false, incomplete, or misleading Background Screening information or submits any false, incomplete, or misleading information in an attempt to improperly obtain an airport security badge or key
- Contractor fails to collect and timely return a Contract Worker's airport security badge or key to the City within three days of the (1) date the Contract Worker's employment terminates, (2) the date the Contract Worker is assignment to another City facility, or (3) when this Contract terminates, is cancelled, or expires, whichever occurs first

24. **LIQUIDATED DAMAGES AND REMEDIES FOR BREACH**

In addition to any other remedy available to the City at law or in equity, including the right to terminate this Contract, Contractor shall be liable for and shall pay to the City a stipulated damage in the amount of \$1,000.00 for each breach of this Section and for each time a Contract Worker entered a restricted or secured area of the Airport without proper authority. Contractor agrees that the stipulated damage amount is not a penalty but is a reasonable estimate of the actual harm to the City caused by a breach and that the harm was very difficult to estimate at the time this Contract was entered into.

25. **CONTRACTOR CERTIFICATION**

Contractor certifies to the City that Contractor has read the foregoing Background Screening requirements and that all Background Screening information Contractor furnished to the City is accurate, complete, and current. Contractor further certifies to the City that Contractor has satisfied

all Background Screening requirements and verified the legal worker status of each Contract Worker as required under this Section.

26. **LAWFUL PRESENCE REQUIREMENT**

Pursuant to A.R.S. §§ 1-501 and 1-502, the City of Phoenix is prohibited from awarding a contract to any natural person who cannot establish that such person is lawfully present in the United States. To establish lawful presence, a person must produce qualifying identification and sign a City-provided affidavit affirming that the identification provided is genuine. This requirement will be imposed at the time of contract award. This requirement does not apply to business organizations such as corporations, partnerships or limited liability companies.

27. **BUSINESS AND OPERATION LICENSES, PERMITS AND CERTIFICATIONS REQUIRED**

On or before the submission of a bid for this project, bidder must possess all federal, state, county and City licenses, permits, certifications and any other legal authorizations required by law to transact business and to perform the services set forth in this Agreement (collectively "Business Licenses"). Bidder will submit a completed Bidder's Disclosure Statement as set forth in Pages B.D.S. - 1 to B.D.S. - 4, to be submitted within 3 days of bid opening by 5 p.m. and provide the following Business License information: (i) proper State of Arizona contractors license classification and number; (ii) City of Phoenix transaction privilege license number; (iii) federal tax identification number; and (iv) any special use or other zoning permits required for Bidder's operation and performance of the services under this Agreement. Unless provided otherwise in this solicitation, Bidder ***will be deemed non-responsive and the bid rejected if Bidder fails to possess the proper Business Licenses at the time of bid or fails to submit a substantially completed Bidder's Disclosure Statement*** as specified in this paragraph.

28. **TAX LIABILITIES; DISCLOSURE OF CONVICTIONS AND BREACH(S) OF CONTRACT**

On or before the award of the contract for this project, the successful bidder will: (i) file all applicable tax returns and will make payment for all applicable State of Arizona and Maricopa County Transaction Taxes (ARS Sec. 41-1305) and City of Phoenix Privilege License Taxes (Phoenix City Code Sec.14-415); (ii) disclose any civil fines, penalties or any criminal convictions, other than for traffic related offenses, for violation of federal, state, county or city laws, rules or regulations including, but not limited to, environmental, OSHA, or labor compliance laws (collectively "Laws") by Bidder, Bidder's directors, managing members, responsible corporate officers or party who will be responsible for overseeing and administering this project (collectively "Bidder"); and (iii) disclose any material breach(s) of an agreement with the City of Phoenix, any termination for cause or any litigation involving the City of Phoenix occurring within the past three calendar years. Unless provided otherwise in this solicitation, the successful bidder will be deemed non-responsive and the bid rejected for any of the following: (i) Bidder's civil or criminal conviction, other than for traffic related offenses, for a violation of Laws within the past three calendar years; (ii) liability or culpability resulting in payment of fines or penalties in the cumulative total amount of \$100,000 or greater for a violation of "Laws" within the past three calendar years; (iii) material breach of a City of Phoenix agreement, termination for cause or litigation with the City of Phoenix within the past three calendar years; and (iv) Bidder's failure to disclose the information as required by this provision. Further, after award of contract, in addition to any other remedy, Bidder's failure to remit proper taxes to the City of Phoenix may result in the City withholding payment pursuant to Phoenix City Charter Chapter XVIII, Section 14 until all delinquent taxes, interest, and penalties have been paid.

State and Local Transaction Privilege Taxes:

In accordance with applicable state and local law, transaction privilege taxes may be applicable to this transaction. The state and local transaction privilege (sales) tax burden is on the person who is

conducting business in Arizona and the City of Phoenix. The legal liability to remit the tax is on the person conducting business in Arizona. Any failure by the Contractor to collect applicable taxes from the City will not relieve the Contractor from its obligation to remit taxes.

It is the responsibility of the prospective bidder to determine any applicable taxes. The City will review the price or offer submitted and will not deduct, add or alter pricing based on taxes.

If you have questions regarding tax liability, seek advice from a tax professional prior to submitting bid. Once your bid is submitted, the Offer is valid for the time specified in this Solicitation, regardless of mistake or omission of tax liability.

If the City finds over payment of a project due to tax consideration that was not due, the Contractor will be liable to the City for that amount, and by contracting with the City agrees to remit any overpayments back to the City for miscalculations on taxes included in a bid price.

For purposes of A.R.S. 42-5075(P), this contract is subject to A.R.S. Title 34.

Tax Indemnification:

Contractor will, and require the same of all subcontractors, pay all federal, state and local taxes applicable to its operation and any persons employed by the Contractor. Contractor will, and require the same of all subcontractors, hold the City harmless from any responsibility for taxes, damages and interest, if applicable, contributions required under federal, and/or state and local laws and regulations and any other costs including transaction privilege taxes, unemployment compensation insurance, Social Security and Worker's Compensation.

Tax Responsibility Qualification:

Contractor may be required to establish, to the satisfaction of City, that any and all fees and taxes due to the City or the State of Arizona for any License or Transaction Privilege taxes, Use Taxes or similar excise taxes, are currently paid (except for matters under legal protest).

Contractor agrees to a waiver of the confidentiality provisions contained in the City Finance Code and any similar confidentiality provisions contained in Arizona statutes relative to State Transaction Privilege Taxes or Use Taxes.

Contractor agrees to provide written authorization to the City Finance Department and to the Arizona State Department of Revenue to release tax information relative to Arizona Transaction Privilege Taxes or Arizona Use Taxes in order to assist the Department in evaluating Contractor's qualifications for and compliance with contract for duration of the term of contract.

29. **LEADERSHIP IN ENERGY AND ENVIRONMENTAL DESIGN (LEED)**

The Contractor will provide an easily accessible area to serve the construction site that is dedicated to the separation, collection and storage of materials for recycling including (at a minimum) paper, glass, plastics, metals, and designate an area specifically for construction and demolition waste recycling. The contractor must provide documentation that the materials have been taken to a Maricopa County approved recycling facility.

30. **PROTEST PROCEDURES**

Any bidder who has any objections to the awarding of a contract to any bidder by the City of Phoenix, pursuant to competitive bidding procedures, will comply with Phoenix City Code Chapter 2, Section 187." A copy of the Protest Policy is also available online at:

<https://www.phoenix.gov/streets/procurement-opportunities>

31. **UTILITY-RELATED CONSTRUCTION DELAY DAMAGES CLAIM PROCEDURES**

The following procedure is intended to provide a fair and impartial process for the settlement of construction delay claims associated with unknown or improperly located utility facilities.

The Contractor will immediately notify, in writing, the Project Engineer of any potential utility-related delay claim.

The Contractor will immediately notify the appropriate liaison of the affected utility verbally, followed by a written notification.

The Contractor will coordinate an investigation of the situation with the affected utility and the City's Project Manager. After resolution, the Contractor will provide written notification of the settlement of the claim to all affected parties.

If the affected utility makes a decision to handle negotiations for a claim, their personnel will be responsible for monitoring the project and all negotiations with the Contractor regarding the claim.

The Contractor will determine to document requirements of the affected utility for their acceptance of responsibility for the claims. The Contractor will provide four (4) copies of the required documentation to the utility involved and two (2) copies of this documentation to the Project Engineer. The Contractor will obtain written confirmation from the utility company involved of their documentation requirements.

32. **PROMPT PAYMENT (DBE)**

The City adheres to the prompt payment provisions of ARS 34-221. A prompt payment clause will be included in every City Contract or subcontract on projects funded either in whole or in part by USDOT. The City's prompt payment clause reads as follows:

- A. **Contractor Payment to Subcontractor or Supplier.** Contractor will pay to its subcontractors or material suppliers and each subcontractor will pay to its subcontractor or material supplier, within seven (7) days of receipt of each progress payment, the amounts attributable to the Contractor, subcontractor, or material supplier for work performed or materials supplied. In addition, any reduction of retainage to the Contractor must also result in a like reduction to subcontractors for their work successfully completed within 14 days of the reduction of the retainage to the Contractor. No Contract between Contractor and its Contractors, subcontractors, and material suppliers may materially alter the rights of any Contractor, subcontractor, or material supplier to receive prompt and timely payment as provided herein. Any diversion by Contractor, or any subcontractor, of payments received for work performed on a Contract, or failure to reasonably account for the application or use of such payments, constitutes sufficient grounds for City to take any one or more of the following actions: 1) withhold future payments including retainage until proper disbursement has been made; 2) refusal of all future bids or offers from the Contractor for a period not to exceed one year or 3) cancellation of the Contract.
- B. **Alternate Dispute Resolution.** If entitlement to the payment is in dispute, the parties to the dispute will submit the matter to either: a) binding arbitration, b) to some other binding alternative dispute resolution (ADR), or c) a City of Phoenix facilitated mediation process within a reasonable period of time, not to exceed fourteen (14) calendar days. Once an ADR determination has been made on any disputed claim, the determination will be implemented by the disputing parties within seven (7) calendar days of that determination.
- C. **Inspection and Audit.** The provisions of A.R.S. Section 35-214 will apply to this Agreement. City will perform the inspection and audit function specified therein and such inspection and

audit may include, at City's option, sole and unfettered discretion, the prompt payment requirements contained in Paragraph 1, above.

- D. **Non-waiver.** Should City fail or delay in exercising or enforcing any right, power, privilege or remedy under this Section, such failure or delays will not be deemed a waiver, release or modification of the requirements of this Section or of any of the terms or provisions thereof.
- E. **Inclusion of this Provision in Subcontracts.** Contractor will include the provisions of these paragraphs in every subcontract, including procurement of materials and leases of equipment.
- F. **No Subcontractor Claim.** Nothing contained in this section will provide a basis for any subcontractor to assert any claim against the City of Phoenix for its administration, enforcement or waiver of the provisions of this Prompt Payment provision.

As this is a federally assisted project, it is subject to the requirements of Executive Order 11246 pertaining to Equal Employment Opportunity.

33. **CHANGE ORDERS**

Owner reserves the right to decrease adjustments made in any change order if, upon audit of Contractor's records, the audit discloses Contractor provided false or inaccurate cost and pricing data in negotiating the change order. In enforcing this provision, the parties will follow the procedure provided in the Federal Acquisition Regulation (FAR) clause 52.214-27, found in 48 CFR Part 52.

34. **ADA AND ANSI ACCESS OF PREMISES DURING CONSTRUCTION**

Contractor will maintain ADA and ANSI accessibility requirements during construction activities in an occupied building or facility. ADA and ANSI accessibility requirements will include, but not be limited to, parking, building access, entrances, exits, restrooms, areas of refuge, and emergency exit paths of travel. Contractor will be responsible for the coordination of all work to minimize disruption to building occupants and facilities.

35. **PROJECT MANAGEMENT INFORMATION SYSTEM (UNIFIER)**

The Aviation Department requires all project related documents to be uploaded to UNIFIER. The following information provides a guideline for utilization. Any questions related to the requirements of UNIFIER should be directed to the Aviation Department Project Manager.

- A. The Contractor will be required to maintain all project records in electronic format. The City provides an Application Service Provider (ASP) web-based project management database which the Contractor will be required to utilize in the fulfillment of the contract requirements. Although this electronic platform does not fulfill this requirement in its entirety, the Contractor will be required to utilize this platform as the basis for this work. The City will provide training to the Contractor's designated staff members and will provide online access to the UNIFIER software.
- B. The Contractor can expect to use this ASP to process all primary level tri-partite contract documents related to the construction phase of the Project including but not limited to: requests for interpretation/information, potential Change Orders, Change Orders, construction meeting minutes, Submittals, Design Professional's supplemental instructions and Payment Requests.
- C. The Contractor will be required to process information into electronic digital form. In order to fulfill this requirement, the Contractor will provide all necessary equipment to perform the functions necessary to generate, convert, store, maintain, connect to web-based ASP and transfer electronic data.

- D. The Contractor will provide a computerized networked office platform with broadband internet connectivity. Wired or wireless is acceptable. This platform will function well in a web-based environment utilizing an internet browser compatible with the Aviation Department UNIFIER ASP system.

36. **PAYMENT RETENTION**

At the start of construction, ten percent of all pay requests will be retained by the City to guarantee complete performance of the contract. When the work is fifty percent complete, this amount may be reduced to five percent providing that construction progress and quality of work is acceptable to the City. Any funds, which are withheld from the Contractor, will be paid no later than sixty days after completion of the Contract and settlement of all claims.

In lieu of retention, the Contractor may provide as a substitute, an assignment of money market accounts, demand deposit accounts, or time certificates of deposit (CDs) from a bank licensed by Arizona, securities guaranteed by the United States, securities of the United States, the state of Arizona, Arizona counties, Arizona municipalities, Arizona school districts, or shares of savings and loan institutions authorized to transact business in Arizona. These securities are referred to as "Qualified Securities."

CDs assigned to the City must be maintained at the City's single servicing bank, currently Chase Bank, Arizona, in the form of time deposit receipt accounts. CDs will be assigned exclusively for the benefit of the City of Phoenix pursuant to the City's form of escrow Agreement. Escrow Agreement forms may be obtained from the Finance Department by calling (602) 262-4918.

Qualified Securities deposited in lieu of retention must be deposited into a separate account with a bank having a branch located in the City of Phoenix and be assigned exclusively for the benefit of the City of Phoenix pursuant to the City's form of escrow and/or deposit Agreement. Escrow Agreement and Deposit Agreement forms may be obtained from the Contracts Specialist.

37. **FAIR TREATMENT OF WORKERS**

The Contractor will keep fully informed of all Federal and State laws, County and City ordinances, regulations, codes and all orders and decrees of bodies or tribunals having any jurisdiction or authority, which in any way affect the conduct of the work. He will at all times observe and comply with all such laws, ordinances, regulations, codes, orders and decrees; this includes, but is not limited to laws and regulations ensuring fair and equal treatment for all employees and against unfair employment practices, including OSHA and the Fair Labor Standards Act (FLSA). The contractor will protect and indemnify the Contracting Agency and its representatives against any claim or liability arising from or based on the violation of such, whether by himself or his employees.

38. **CITY OF PHOENIX EQUAL EMPLOYMENT OPPORTUNITY REQUIREMENT**

1. In order to do business with the City, Contractor must comply with Phoenix City Code, 1969, Chapter 18, Article V, as amended, Equal Employment Opportunity Requirements. Contractor will direct any questions in regard to these requirements to the Equal Opportunity Department, (602) 262-6790.
2. Any Contractor in performing under this contract will not discriminate against any worker, employee or applicant, or any member of the public, because of race, color, religion, sex, national origin, age, or disability nor otherwise commit an unfair employment practice. The Contractor will ensure that applicants are employed, and employees are dealt with during employment without regard to their race, color, religion, sex, national origin, age, or disability, and will adhere to a policy to pay equal compensation to men and women who perform jobs that require substantially equal skill, effort, and responsibility, and that are performed within the same establishment under similar working conditions. Such action will include but not be limited

to the following: Employment, promotion, demotion or transfer, recruitment or recruitment advertising, layoff or termination; rates of pay or other forms of compensation; and selection for training; including apprenticeship. The Contractor further agrees that this clause will be incorporated in all subcontracts with all labor organizations furnishing skilled, unskilled and union labor, or who may perform any such labor or services in connection with this contract.

If the Contractor employs more than thirty-five employees, the following language will apply as the last paragraph to the clause above:

The Contractor further agrees not to discriminate against any worker, employee or applicant, or any member of the public, because of sexual orientation or gender identity or expression and will ensure that applicants are employed, and employees are dealt with during employment without regard to their sexual orientation or gender identity or expression.

3. *Documentation.* Contractor may be required to provide additional documentation to the Equal Opportunity Department affirming that a nondiscriminatory policy is being utilized.
4. *Monitoring.* The Equal Opportunity Department will monitor the employment policies and practices of suppliers and lessees subject to this article as deemed necessary. The Equal Opportunity Department is authorized to conduct on-site compliance reviews of selected firms, which may include an audit of personnel and payroll records, if necessary.

39. **WAGE DETERMINATION**

In the event that a wage determination decision of the Secretary of Labor is required for a project, (attached hereto on pages G.W.D. – 1 to 10 and made a part hereof), and has been superseded by any subsequent wage determination decision(s) published up to and including ten (10) days prior to bid opening, the most recent applicable wage decision will be incorporated by reference, and the successful bidder agrees to be bound by it, regardless of what is contained in the specifications. State or local wage rates will not apply if the state or local wage rate exceeds the corresponding Federal Wage Determination rate.

40. **WORKFORCE REPORTING REQUIREMENTS**

The contractor will submit payrolls electronically through the internet to the City of Phoenix web-based certified payroll tracking system. The City of Phoenix uses the "LCP Tracker" web-site to track the certified payroll information. Additional information regarding the use of this system is available at <https://lcptracker.com>. This requirement will also apply to every lower-tier subcontractor that is required to provide weekly certified payroll reports.

41. **PAYMENT WITHHOLDING**

Payrolls, including subcontractor's payrolls, must be submitted weekly no later than seven (7) days after each pay period ending date. Payments may be withheld in part or in full until payrolls are received and reviewed to assure compliance of the Federal Labor Standards.

Failure to clarify, when requested, discrepancies between hourly wages paid individual workers and the minimum hourly wages required by the Federal Wage Decisions contained in the Contract documents may also affect the complete or timely release of payments.

42. **LABOR COMPLIANCE PRECONSTRUCTION CONFERENCE**

On all federally assisted projects, a Labor Compliance Conference must be held after project award and prior to the established Notice to Proceed. This meeting is separate from and in addition to the pre-construction conference.

The successful bidder will schedule the conference by calling the Labor Compliance Office, (602) 261-8287. Minimum attendance will be a corporate officer, who is authorized to execute and sign documents for the firm and the payroll representative of the prime, sub and lower-tier Contractors.

43. **DBE PARTICIPATION**

This project will utilize Federal funds provided by the Federal Aviation Administration (FAA) and is subject to the requirements of 49 Code of Federal Regulations (CFR) Part 26 and the U.S. Department of Transportation DBE Program. The Contractor is required to meet the DBE program requirements and agrees to provide opportunities for the fair and full utilization of DBEs. For this business opportunity, the City has not established a race- and gender-conscious DBE participation goal.

To participate in this business opportunity as a recognized DBE, only firms certified by the City or another AZUCP member and certified in the specified scopes of work will be considered in calculating DBE participation resulting from RGN measures on this contract.

The Contractor agrees that the following will be incorporated into all subcontracts of this Contract entered into by the General Contractor:

“The contractor, subrecipient, or subcontractor will not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor will carry out applicable requirements of 49 CFR Part 26, in the award and administration of USDOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract which may result in the termination of this contract and/or any other such remedy as the City deems appropriate.”

Refer to the attached Disadvantaged Business Enterprise Program Clause, pages D.B.E.C. - 1 to 11 and Disadvantaged Business Enterprise Program Reporting Forms D.B.E.F. - 1 to 2.

Failure to provide the following forms may be just cause for declaring your bid non-responsive.

- *Completed Documentation of Outreach Efforts Attachment A form (Page D.B.E.F. -1)*

44. **FEDERAL REQUIREMENTS COMPLIANCE**

This project will utilize federal funds provided by the Federal Aviation Administration. The Contractor will be required to meet all federal requirements as they pertain to this contract. Page A.I.P. - 1 contains a listing of the minimum requirements.

Buy American Preference

The Contractor is required to comply with Buy American preferences established under Title 49 U.S.C. Section 50101. Unless otherwise formally approved by the Federal Aviation Administration, all acquired steel and manufactured products installed must be produced in the United States. Be advised that the North American Free Trade Agreement does not apply to Aviation Improvement Projects.

As a condition of bid responsiveness, Bidders must submit the appropriate Buy American certification with their proposal. Installation of equipment/material that are manufactured in the United States and for which no formal waiver exists is ineligible. While the FAA does have the authority to waive the Buy American provisions if specific conditions exist, the Contractor will not assume such a waiver is valid unless written approval is granted by the FAA. The “Buy American Requirement” certification form (Attachment 1) is due with the bid. ***Failure to properly complete, sign and submit the form with bid will result in bid rejection.***

Non-Segregated Facilities

The Contractor and its subcontractors certifies that they do not maintain or provide for its employees any segregated facilities at any its establishments, and that it does not permit its employees to perform their services at any location, under its control where segregated facilities are maintained. The Contractor certifies further that it will not maintain or provide for its employees segregated facilities at any of its establishments, and that it will not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. The "Certification of Non-Segregated Facilities" certification form (Attachment 7) is due with the bid. ***Failure to properly complete, sign and submit the form with bid will result in bid rejection.***

Lobbying and Influencing Federal Employees

No Federal appropriated funds will be paid, by or on behalf of the Contractor, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the making of any Federal grant and the amendment or modification of any Federal grant.

If any funds other than Federal appropriated funds have been paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with any Federal grant, the Contractor will complete and submit Standard Form-LLL, "Disclosure of Lobby activities," in accordance with its instructions. The "Affidavit By Contractor That There was No Collusion in the Selection of the Contract" certification form (Attachment 2) is due with the bid. ***Failure to properly complete, sign and submit the form with bid will result in bid rejection.***

Rights to Inventions

All rights to inventions and materials generated under this contract are subject to regulations issued by the FAA and the Sponsor of the Federal grant under which the contract is executed. The "Rights in Data and Rights in Invention" certification form (Attachment 3) is due with the bid. ***Failure to properly complete, sign and submit the form with bid will result in bid rejection.***

Debarment, Suspension, Ineligibility and Voluntary Exclusion

The Contractor and its subconsultants/subcontractors, by submission of its bid proposal certifies that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency. It further agrees by submitting its bid proposal that it will include this clause without modification in all lower tier transactions, solicitations, proposals, contracts, and subcontracts. Where the Contractor or any lower tier participant is unable to certify this statement, it will attach an explanation to its bid. The "Certification Regarding Debarment, Suspension, Proposed Debarment, and other Responsibility Matters" form (Attachment 8) is due with the bid. ***Failure to properly complete, sign and submit the form with bid will result in bid rejection.***

Trade Restriction Clause

The "Trade Restriction Clause" form (Attachment 4) is due with the bid. ***Failure to properly complete, sign and submit the form with bid will result in bid rejection.***

Restrictions on Public Works Contracts

The "Restrictions on Federal Public Works Projects Certification" form (Attachment 5) is due with the bid. ***Failure to properly complete, sign and submit the form with bid will result in bid rejection.***

Equal Employment Opportunity

The Contractor agrees that it will undertake affirmative action in conformance with 14 CFR Part 152, Subpart E, to insure that no person will on the grounds of race, creed, color, national origin or sex be excluded from participating in any employment, contracting or leasing activities covered in

14 CFR Part 152, Subpart E. The Contractor assures that no person will be excluded on such grounds from participating in or receiving the services or benefits of any program or activity covered by Subpart E. The Contractor further agrees that it will require its covered suborganizations to provide assurances to the Contractor that they similarly will undertake affirmative action and that they will require like assurances from their suborganizations, as required by 14 CFR Part 152, Subpart E.

If the Contractor is a construction contractor on the Airport, the Contractor will submit to the City of Phoenix the reports required by paragraph (e) of 14 C.F.R. § 152.415, on the same basis as stated in paragraph (e) of 14 C.F.R. § 152.415, and the Contractor will require each subcontractor to submit the reports required by paragraph (f) of 14 C.F.R. § 152.415 through the Contractor to the City of Phoenix, for transmittal by the City of Phoenix to the FAA. The “Contractors Statement on Previous Contracts subject to EEO Clause” certification form (Attachment 6) **is due prior to contract award.**

Federal Affirmative Action Requirements

The Contractor will comply with the federal Affirmative Action requirements as provided by 14 C.F.R. Part 152, subpart E during the term of the Contract and the Contractor will require its subcontractors to also comply with the federal Affirmative Action requirements as set out above, and as may be amended. Failure of the Contractor and its subcontractors to maintain compliance during the term of the Contract, including renewal options, is a material breach and may result in termination of this Contract.

45. **RELEASE OF INFORMATION – ADVERTISING AND PROMOTION**

The Contractor and its subcontractors will not publish, release, disclose or announce to any member of the public, press, official body, or any other third party: (1) any information concerning this Agreement, the services, or any part thereof; or (2) any documentation or the contents thereof, without the prior written consent of the City, except as required by law. The name of any site on which services are performed will not be used in any advertising or other promotional context by Contractor and its subcontractors without the prior written consent of the City.

46. **OFF-DUTY POLICE OFFICER REQUIREMENTS**

Off-duty police officers are required for construction projects as defined in the most recent edition of the City of Phoenix Traffic Barricade Manual and TRACS permit. The Contractor must competitively procure off-duty police with vendors who are Authorized Traffic Coordinators with the City of Phoenix Police Department or Phoenix Police Department off-duty detail.

The following requirements must be included in the procurement:

1. Hourly fees charged
2. Administrative fees (administrative fees to be charged as a part of the hourly rate, not billed separately)
 - a. Pay applications requesting reimbursement for Off Duty Police hours worked will be accompanied with itemized documentation indicating officer name, date worked, hours worked, time of day worked and location.
 - b. For audit purposes, contractor’s files will contain documentation from the successful off duty vendor that the above items are accounted for in the vendor’s price proposal.
3. Off Duty Police needs at Phoenix Sky Harbor International Airport (boundaries include 24th Street to 143 and Air Lane Road to Old Tower Road) require that the Officers:
 - Must be City of Phoenix Police Officers with Phoenix Sky Harbor International

- Airport all areas badge – preference for Airport Bureau police officers
Have experience working in active airport environment

For all other areas at Phoenix Sky Harbor International Airport and Phoenix Deer Valley Airport, it is requested that Off Duty City of Phoenix Police be given preference over others due to their familiarity with City of Phoenix laws and procedures.

47. **PROJECT STAFFING**

- **Key Personnel:** Before starting work, Contractor must submit detailed résumés of key personnel involved in that work for City’s approval (which City will not unreasonably withhold). If Contractor later desires to change key personnel involved in that work, Contractor must submit detailed résumés of the new personnel for City’s approval (which City will not unreasonably withhold).
- **Qualified Staff:** Contractor must maintain an adequate and competent staff of qualified persons—as City may determine in its sole discretion—during performance of this Master Agreement. If City in its sole discretion determines that any of Contractor’s staff is objectionable, Contractor must take prompt corrective action or replace that staff with new personnel, subject to City’s approval.
- **Third-Party Employment Brokers:** Contractor and Subcontractors will not utilize a third party labor broker for any construction worker under this Agreement. The Contractor and Subcontractors must be the employers of record for its construction staff under this Agreement.

48. **NO ISRAEL BOYCOTT**

If this Contract is valued at \$100,000 or more and requires Contractor (a company engaging in for-profit activity and having ten or more full-time employees) to acquire or dispose of services, supplies, information technology, or construction, then Contractor must certify and agree that it does not and will not boycott goods or services from Israel, pursuant to Title 35, Chapter 2, Article 9 of the Arizona Revised Statutes. Provided that these statutory requirements are applicable, Contractor by entering this Contract now certifies that it is not currently engaged in, and agrees for the duration of the Contract to not engage in, a boycott of goods or services from Israel.

49. **NO FORCED LABOR OF ETHNIC UYGHURS**

If this Contract requires Contractor (a company engaging in for-profit activity and having ten or more full-time employees) to acquire or dispose of services, supplies, information technology, goods, or construction, then pursuant to Title 35, Chapter 2, Article 10 of the Arizona Revised Statutes Contractor must certify and agree that it and any contractors, subcontractors, or suppliers it utilizes do not and will not use the forced labor of ethnic Uyghurs in the People’s Republic of China or any goods or services produced by such forced labor. Provided these statutory requirements are applicable, Contractor, by entering this Contract, now certifies it is not currently engaged in, and agrees for the duration of the Contract to not engage in, (a) the use of forced labor of ethnic Uyghurs in the People’s Republic of China; (b) the use of any goods or services produced by the forced labor of ethnic Uyghurs in the People’s Republic of China; or (c) the use of any contractors, subcontractors, or suppliers that use the forced labor or any goods or services produced by the forced labor of ethnic Uyghurs in the People’s Republic of China.

50. **COMPLIANCE WITH LAWS**

Contractor must comply with all existing and subsequently enacted federal, state and local laws, ordinances and codes, all applicable ADA requirements, applicable FAA Advisory Circulars, and regulations that are, or become applicable to this Agreement. If a subsequently enacted law imposes substantial additional costs on Contractor, a request for an amendment may be submitted pursuant to this Agreement. Contractor is also required to certify its compliance with all applicable

laws and Contractor must pass along these requirements to its Subcontractors. If any of Contractor's certifications is found to be false, the City may terminate this Agreement or impose other remedies due to the false certification. See also: Supplemental Terms and Conditions Applicable to All Airport Agreements.



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Disadvantaged Business Enterprise Program

DBE –Design Bid Build (DBB) Contract Clause Race & Gender-Neutral – Non-Negotiated

PROJECT #: AV06000026 FAA

CONTRACT #:

PROJECT NAME: PSHIA WEST AIR CARGO RECONSTRUCTION

Phoenix is one of the fastest growing, multicultural cities in the country and has shown a historical commitment to business diversity. The City and its partners strive to advance the economic growth of small businesses through its Disadvantaged Business Enterprise (DBE) Program.

The City of Phoenix DBE Program is managed and administered by the City's Equal Opportunity Department, Contract Compliance Division. Through a coordinated effort among several city departments and partner agencies, the DBE Program provides certification and opportunities in construction, purchasing, management and technical assistance, educational services, and networking.

SECTION I. DEFINITIONS

Agency means the City of Phoenix for purposes of this Contract.

Arizona Unified Certification Program (AZUCP) means a consortium of government agencies organized to provide reciprocal DBE certification within Arizona pursuant to 49 Code of Federal Regulations (CFR) Part 26. The official DBE database containing eligible DBE firms certified by AZUCP can be accessed at: <https://utracs.azdot.gov>. The certification system is called the Arizona Unified Transportation Registration and Certification System (AZ UTRACS).

Business to Government Now (B2G) means the web-based certification and compliance system used to track and monitor DBE and Small Business Participation. The B2G system can be accessed at: <https://phoenix.diversitycompliance.com>

Contract means a legally binding relationship obligating a seller to furnish supplies or services (including construction and professional services) and the buyer to pay for them.

DBE Compliance Specialist means an Agency employee responsible for compliance with this DBE Contract Clause.

EOD means the City of Phoenix Equal Opportunity Department.

Joint Venture (JV) means an association between two or more persons, partnerships, corporations, or any combination thereof, formed to carry on a single business activity. The JV is limited in scope and duration to this Contract. The resources, asset, and labor of the participants must be combined in an effort to accrue profit.

Outreach Efforts means the diligent and good faith efforts demonstrated by a Bidder to solicit participation from interested and qualified DBEs and other Small Businesses. Bidder shall identify and document potential business opportunities for DBEs and other Small Businesses, describe what efforts were undertaken to solicit DBE and Small Business participation, disclose results of negotiations with Small Businesses, and communicate and record Bidder's selection decisions relating to DBE and Small Business participants.



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Disadvantaged Business Enterprise (DBE) means a Small Business Concern that has successfully completed the DBE certification process and has been granted DBE status by an AZUCP member pursuant to the criteria contained in 49 CFR Part 26.

Commercially Useful Function means that a DBE is responsible for executing the work of the contract and is carrying out its responsibilities by performing, managing, and supervising the work involved. If a DBE does not perform or exercise responsibility for at least 30% of the total cost of its contract with its own work force, or if the DBE subcontracts a greater portion of the work of a contract than would be expected on the basis of normal industry practice for the type of work involved, the DBE is presumed not to be performing a Commercially Useful Function.

Goods and Services Providers are firms that provide goods and services that represent a Commercially Useful Function directly to Transit as a DBE or Small Business.

Manufacturer means a firm that owns; operates or maintains a factory or establishment that produces on the premises the components, materials, or supplies obtained by the recipient, successful bidder, or Transit Vehicle Manufacturer.

Regular dealer/broker is a firm that owns, operates, or maintains a store, warehouse, or other establishment in which the materials, supplies, articles or equipment of the general character described by the specifications and required under the contract are bought, kept in stock, and regularly sold or released to the public in the usual course of business.

Supplier means a firm that engages in, as its principal business, the purchase and sale of material or supplies required for the performance of a contract. The firm must own, operate, and maintain a store, warehouse or other establishment where the supplies are bought, kept in stock, and regularly sold to the public in the usual course of business.

Small Business Concern (SBC) means, with respect to firms seeking to participate in contracts funded by the U.S. Department of Transportation (US DOT), a Small Business Concern as defined in section 3 of the Small Business Act and Small Business Administration regulations implementing the Act (13 CFR part 121), which Small Business Concern does not exceed the cap on average annual gross receipts specified in 49 CFR § 26.65(b). "Small Business" and "Small Business Concern" are used interchangeably in this DBE Contract Clause.

Small Business Enterprise (SBE) means a small business that has been determined to meet the requirements for SBE certification with the City of Phoenix and whose certification is in force at the time of the award of business by the City. A directory of currently certified SBE firms is located at <https://phoenix.diversitycompliance.com>.

Race- and Gender-Neutral (RGN) Measures means a measure or program that is or can be used to assist all Small Businesses.

Subcontract means a contract at any tier below the prime contract, including a purchase order.

Subcontractor means an individual, partnership, JV, corporation or firm that holds a contract at any tier below the prime contract, including a vendor under a purchase order.

Submitter means an individual, partnership, JV, contractor, corporation, or firm that tenders a submittal to the Agency to perform services requested by a solicitation or procurement. The submittal may be direct or through an authorized representative. (Submitter is inclusive of the terms: *Bidder, Offeror, Proposer, Respondent*, etc.).



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Responsive Submitter means a firm that has met the minimum program requirements as outlined in the solicitation and due at the time of submittal.

Successful Submitter means a firm that has been awarded the contract by the Agency to perform services or furnish supplies requested by a solicitation or procurement.

Responsible Submitter means a firm that has been selected to continue in the procurement process by the Agency.

Transit Vehicle Manufacturers (TVMs) means any manufacturer whose primary business purpose is to manufacture vehicles specifically built for public mass transportation. Such vehicles include, but are not limited to buses, rail cars, trolleys, ferries, and vehicles manufactured specifically for paratransit purposes. Producers of vehicles that receive post-production alterations or retrofitting to be used for public transportation purposes (e.g., so-called cutaway vehicles, vans customized for service to people with disabilities) are also considered transit vehicle manufacturers. Businesses that manufacture, mass-produce, or distribute vehicles solely for personal use and for sale “off the lot” are not considered transit vehicle manufacturers.

Transit Vehicle Manufacturers Goals for FTA recipients each transit vehicle manufacturer, as a condition of being authorized to bid or propose on FTA-assisted transit vehicle procurements, to certify that it has complied with the requirements of 49 CFR Part 26.49.

SECTION II. GENERAL REQUIREMENTS

A. Applicable Federal Regulations

This Contract is subject to DBE requirements issued by USDOT in 49 CFR Part 26. Despite the lack of a race- and gender-conscious DBE participation goal for this Contract, the Agency must track and report DBE participation that occurs as a result of any procurement, JV, goods/services, or other arrangement involving a DBE. For this reason, the Successful Bidder shall provide all relevant information to enable the required reporting.

B. DBE Participation

For this solicitation, the Agency has *not* established a race- or gender-conscious DBE participation goal. The Agency extends to each individual, firm, vendor, supplier, contractor, and subcontractor an equal economic opportunity to compete for business. The Agency uses race- and gender-neutral measures to facilitate participation by DBEs and Small Businesses. The Agency *encourages* each Bidder to voluntarily subcontract with DBEs and Small Businesses to perform part of the work—a Commercially Useful Function—that Bidder might otherwise perform with its own forces.

C. Small Business Participation

The Agency will track the participation of all approved businesses throughout the life of this contract. The Agency will count Small Business participation as authorized by federal regulations. A summary of these regulations can be found at www.ecfr.gov (49 CFR Part 26.39).

D. DBE Certification

Only firms (1) certified by the Agency or another AZUCP member, and (2) contracted to perform a Commercially Useful Function on scopes of work for which they are certified, may be considered to determine DBE participation resulting from RGN measures on this Contract. This DBE determination affects the Agency's tracking and reporting obligations to USDOT.



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E. Civil Rights Assurances.

As a recipient of USDOT funding, the Agency has agreed to abide by the assurances found in 49 CFR Parts 21 and 26. Each Contract signed by the Agency and the Successful Bidder, and each Subcontract signed by the Successful Bidder and a Subcontractor, must include the following assurance verbatim:

“The contractor, subrecipient, or subcontractor shall not discriminate on the basis of race, color, national origin, sex, or creed in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR Parts 21 and 26 in the award and administration of USDOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the City of Phoenix deems appropriate.”

Note: For purposes of the required Contract and Subcontract language above, Successful Bidder is the “contractor” awarded the contract.

SECTION III. REQUIRED OUTREACH EFFORTS

The Agency has implemented outreach requirements for this Contract. Specifically, Bidders shall: (1) identify small-business-participation opportunities, including Commercially Useful Functions; (2) actively solicit proposals from small businesses; (3) evaluate small-business proposals; and (4) communicate selection decisions to small businesses, including each rejection of a small-business proposal. If a Bidder fails to conduct these Outreach Efforts or fails to submit the required documentation of Bidder’s Outreach Efforts as indicated in Section IV, Parts A and B below, the Agency may determine that the Bidder is nonresponsive. A determination of non-responsiveness *disqualifies* Bidder from further consideration for the Contract award.

SECTION IV. BID REQUIREMENTS

A. Documentation due at time of bid:

All required Outreach Efforts documentation due with the bid must be submitted in a separate sealed envelope with the bid submittal.

1. Form EO2 (Outreach Efforts)

Each Bidder shall submit Form EO2 with Columns A through D completed to document their diligent and earnest Outreach Efforts.

Each Bidder shall list in Form EO2 all Small Businesses contacted by Bidder in preparing its bid. Each Bidder shall also provide the following minimum information to document its Outreach Efforts. The DBE Compliance Specialist will consider this information to determine whether Bidder has demonstrated the required Outreach Efforts:

a. Column A - Small Business Name and Contact Information

Must list each business’s full legal name and contact information. Successful Bidder shall inquire to obtain the following: the number of its employees, number of years in business and its estimated range of annual gross receipts.

b. Column B - Business Status

Indicate the business status. Check all that apply, if known.

- The official DBE database containing eligible DBE and SBC firms can be accessed at: <https://utracs.azdot.gov>



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- City of Phoenix SBE Certification Directory can be accessed at: <https://phoenix.diversitycompliance.com>

c. Column C - Scope(s) of Work Solicited

List the scope(s) of work solicited for which the small business was considered for participation in the proposal. The solicitation shall include a description of the scope(s) of work being requested.

d. Column D - Solicitation Method

Indicate the solicitation method by which each small business was contacted for your outreach efforts and provide supporting documentation. Supporting documentation must include a copy of the actual solicitation sent to Small Businesses. The solicitation may be in the form of letters or attachments to email, phone logs, newspapers and trade papers, outreach events, etc. If using a log as supporting documentation, it must include:

- List the Solicitation Method
- Name of Bidder's Representative
- Name of Company Contacted
- Name of Person Contacted
- Date and Time of Contact
- Details of the Communication

Each Bidder shall complete Columns A through D on Form EO2 in accordance with the following instructions:

1. Each Bidder shall actively contact Small Businesses for each scope of work or business opportunity selected for Outreach Efforts (**Columns A and C**).
2. Bidder's contacts with Small Businesses should occur well before the deadline for the bid to afford the firms contacted a reasonable opportunity to prepare a proposal and participate in the Contract.
3. Bidder shall ask each firm to indicate the number of its employees (**Column A**).
4. For each Small Business's annual gross receipts, Bidder shall ask the firm to indicate the gross-receipts bracket into which it fits (e.g., less than \$500,000; \$500,000 – \$1 million; \$1 – 2 million; \$2 – 5 million; etc.) rather than requesting an exact figure (**Column A**).

B. Documentation due within FIVE (5) CALENDAR DAYS of the Bid Deadline

All required Outreach Efforts documentation is due within the five (5) calendar days of the bid deadline must be submitted in a sealed envelope.

1. Form EO2 (Outreach Efforts)

Each Bidder shall submit **Form EO2 with Columns E and F** completed to document its diligent, earnest Outreach Efforts.

a. Column E - Selection Decision

Indicate the Successful Bidders selection decision for each small business that responded to the solicitation.

If selected, indicate the Dollar Value.

If not selected, provide an explanation why firm was NOT selected.



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b. **Column F - Method of Communication of Final Selection Outcome**

The Successful Bidder must notify the final selection outcome to all small businesses that responded. The supporting documentation for this notification may be in the form of an email, fax, letter, in person or a telephone log, etc. This documentation must show the following information regarding the final selection:

- List the Selection Outcome
- Name of Bidder's Representative
- Name of Company Contacted
- Name of Person Contacted
- Date and Time of Contact
- Details of the Communication

*Successful Bidder shall provide supporting documentation that shows Bidder has communicated its final selection decisions and outcomes to all Small Businesses, including those not chosen to participate in this Contract.

2. **Form EO2 Supporting Documentation**

Each Bidder shall complete and submit supporting documentation of its Outreach Efforts related to Form EO2 – as specifically related to Columns E & F.

- Within FIVE (5) Calendar Days of the Bid Deadline, Bidder shall submit all supporting documentation of Bidder's contacts with Small Businesses for each scope of work or business opportunity in regard to their Outreach Efforts.
- This documentation must include: (1) descriptions of scopes of work and business opportunities identified for Small Business participation, and (2) a copy of the actual solicitation sent to interested Small Businesses. The solicitation may be in the form of a letter, attachment to an e-mail, advertisements in newspapers and trade papers, or written communications with chambers of commerce.
- For all of the above documentation, if Bidder uses a blast e-mail or fax format, the documentation submitted must include a copy of the e-mail or fax, and Bidder must disclose all e-mail addresses and fax numbers to which the solicitation or outcome notification was sent and the date and time of the transmission. For telephone contacts, Bidder shall document the date and time of the call and the names of the respective persons representing Bidder and the Small Business.
- Bidder shall submit documentation that establishes how Bidder communicated its selection decisions and outcomes to each Small Businesses **SELECTED OR NOT SELECTED** for this Contract. This documentation may be in the form of a letter, e-mail, or a telephone log and must show the name of the person contacted and date.
- For all of the above documentation, if Bidder uses an email blast or fax format, the documentation submitted must include a copy of the e-mail or fax, and Bidder must disclose all e-mail addresses and fax numbers to which the solicitation or outcome notification was sent and the date and time of the transmission. For telephone contacts, Bidder shall document the date and time of the call and the names of the respective persons representing Bidder and the Small Business.



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3. Form EO3 (Small Business Utilization Commitment)

Due within FIVE (5) CALENDAR DAYS of the Bid Deadline. Bidder shall complete, sign, date and submit Form EO3 within the five (5) calendar days of the bid deadline, EO3 commits Bidder to the Agency as follows:

- a. The firms indicated as "Selected" on Form EO2 – Small Business Outreach Efforts will participate in the Contract;
- b. Bidder will comply with the Race- and Gender-Neutral post-award requirements as stated in the DBE contract clause;
- c. Any and all changes or substitutions will be authorized by the Compliance Specialist before implementation; and
- d. The proposed total Small Business participation percentage is true and correct.

Bidder shall ensure that the dollar amount or percentages proposed for Small Business participation on Form EO2 equal the total percentage proposed in Form EO3.

C. Failure to Meet Outreach Requirements

The DBE Compliance Specialist will determine, in writing, whether the Bidder has satisfied all outreach requirements. If the DBE Compliance Specialist determines the Bidder failed to satisfy the outreach requirements, then the DBE Compliance Specialist may determine the bid is nonresponsive. A determination of non-responsiveness *disqualifies* Bidder from further consideration for the Contract award. The Agency shall send written notice to Bidder stating the basis for the DBE Compliance Specialist's decision.

D. Administrative Reconsideration

In the event the City determines the Bidder failed to submit required documentation to meet the Small Business Outreach Requirements, an opportunity for reconsideration of this determination will be provided. This opportunity for reconsideration will seek to obtain clarification of documentation submitted with the bid.

Within three business days of being informed by the City that the Bidder is not responsive based on insufficient demonstration and/or documentation of Outreach Efforts, the Bidder may submit its written request to:

**City of Phoenix Equal Opportunity Department
Office of the Director
200 W. Washington St., 15th Floor
Phoenix, AZ 85003**

If the request for Administrative Reconsideration is not submitted within the allotted three business days, the non-responsive Bidder shall not utilize the DBE Program submittal requirements as the basis for its future protest.

As part of this reconsideration process, the Bidder will have an opportunity to provide written clarification or argument concerning the issue of whether it met the Outreach Requirements or

provided sufficient supporting documentation of this efforts at the time of bid. As the Disadvantaged Business Enterprise Liaison Officer (DBELO) for the City, The Equal Opportunity Director shall review solely the written clarification or argument, along with any document(s) originally submitted at the time of bid. No new or revised forms or supporting documentation will be reviewed for consideration.



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The DBELO or his designee will send the Bidder a written decision on the reconsideration, explaining the basis for finding that the Bidder did or did not meet the Small Business Outreach Requirements. The result of the DBE reconsideration process is not administratively appealable and cannot be escalated or included in any other protest not related to the DBE Program.

SECTION VI. POST-AWARD COMPLIANCE REQUIREMENTS

A. Subcontracting Commitment

The small business subcontractors identified and accepted in the Small Business Outreach documents must have an executed contract* in place prior to the performance of work.

Successful Bidder shall submit to Agency, through the B2G system, all executed contracts, purchase orders, subleases, JV agreements, and other arrangements formalizing agreements between Successful bidder and all subcontractors, upon execution throughout the life of this contract.

The Successful Bidder shall not terminate any approved DBE or Small Business Subcontracts, nor shall the Successful Bidder alter the scope of work or reduce the Subcontract amount, without the DBE Compliance Specialist's prior written approval. Any request to alter a DBE or Small Business Subcontract must be submitted in writing to the DBE Compliance Specialist before any change is made. If the Successful Bidder fails to do so, the Agency may declare Successful Bidder in breach of contract.

*Executed contracts and all lower tier contracts must contain the required Civil Rights Assurances and Prompt Payment provisions.

B. Post-Award Relief from Small Business Requirements

After Contract award, the Agency will not grant relief from the proposed Small Business utilization except in extraordinary circumstances. The Successful Bidder's request to modify Small Business participation must be in writing to the DBE Compliance Specialist, which has final discretion and authority to determine if the request should be granted.

The Successful Bidder's waiver request must contain the amount of relief being sought, evidence demonstrating why the relief is necessary, and any additional relevant information the DBE Compliance Specialist should consider. The Successful Bidder shall include with the request all documentation of its attempts to subcontract with the Small Business and any other action taken to locate and solicit a replacement Small Business.

If an approved DBE allows its DBE status to expire or its DBE certification is removed during the course of the subcontract, the Agency will consider all work performed by the DBE under the original contract to count as DBE participation. No increased scopes of work negotiated after expiration or revocation of the DBE's certification may be counted. Likewise, any work performed under a Contract extension granted by the Agency may not be counted as DBE participation.

C. Counting Small Business Participation

The prime contractor may only count expenditures to AZUCP certified DBE subcontractors that perform a commercially useful function on the contract. A DBE performs a commercially useful function when it is responsible for execution of the work of the contract and is carrying out its responsibilities by actually performing, managing, and supervising the work involved. A DBE subcontractor must perform a minimum of 30% of its subcontract value with its own



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workforce and equipment before its participation can be counted. DBEs must manage and control the performance of its contract and not be dependent on the prime's personnel and equipment to complete its work. Scope(s) of work not covered in the DBE firm's certification description **will not** be counted as DBE participation.

Commercially Useful Function & Counting of DBE Trucking/Hauling:

49 CFR Part 26.55 Section (d) defines Commercially Useful Function and the counting of DBE participation Trucking/Hauling as follows:

- The DBE must be responsible for **the management and supervision of the entire trucking operation for which it is responsible on a particular contract**, and there cannot be a contrived arrangement for the purpose achieving DBE participation.
- The DBE must itself own and operate at least one fully licensed, insured, and operational truck used on the contract.
- The DBE receives credit for the total value of the transportation services it provides on the contract using trucks it owns, insures, and operates using drivers it employs.
- The DBE may lease trucks from another DBE firm, including an owner-operator who is certified as a DBE. The DBE who leases trucks from another DBE receives credit for the total value of the transportation services the lessee DBE provides on the contract.
- The DBE may also lease trucks from a non-DBE firm, including from an owner-operator. The DBE who leases trucks from a non-DBE is entitled to credit for the total value of transportation services provided by non-DBE lessees not to exceed the value of transportation services provided by DBE-owned trucks on the contract. Additional participation by non-DBE lessees receives credit only for the fee or commission it receives as a result of the lease arrangement.
- Amounts paid for dump fees or materials being hauled/dumped cannot be counted as DBE participation.

Counting DBE certified Manufactures, Suppliers, and Brokers:

49 CFR Part 26.55 Section (e) permits the counting of expenditures with DBEs for materials or supplies toward DBE participation as provided in the following:

- If the materials or supplies are obtained from a **DBE manufacturer**, count 100 percent of the cost of the materials or supplies toward DBE participation,
- If the materials or supplies are purchased from a **DBE regular dealer (supplier)**, count 60 percent of the cost of the materials or supplies toward DBE participation.
- If materials or supplies purchased from a DBE which is neither a manufacturer nor a regular dealer, **(broker or manufacturer's rep.)** count the entire amount of fees or commissions charged for assistance in the procurement of the materials and supplies toward DBE participation.

If an approved DBE allows its DBE certification to expire, or the certification is revoked during the course of the Subcontract, the Agency will consider all work performed by the DBE under the original contract to count as DBE participation. No increased scope of work negotiated after expiration or revocation of the DBE's certification may be counted. Any work performed under a Contract extension granted by the Agency may not be counted as DBE participation.

D. Small Business Substitutions or Terminations

As set forth in 49 CFR Section 26.53 (f)(1)(2)(3) after Contract award, the Agency will not allow substitution or termination from the proposed Small Business utilization except in



City of Phoenix

Disadvantaged Business Enterprise Program

extraordinary circumstances. The Successful Bidder's request to modify Small Business participation must be in writing to the Phoenix DBE Compliance Specialist.

Successful Bidder's written request must set forth the amount of substitution or why termination is sought, evidence that demonstrates why it is necessary, and any additional relevant information that the Phoenix DBE Compliance Specialist should consider. The Successful Bidder shall include with the request all documentation of Bidder's attempts to subcontract with the Small Business and any other action taken to locate and solicit a replacement Small Business.

If the Small Business was approved by the Agency, the Phoenix DBE Compliance Specialist will consider whether or not the Successful Bidder has exercised diligent and good-faith efforts to find another Small Business as a replacement. The Successful Bidder shall notify the Phoenix DBE Compliance Specialist in writing of the necessity to substitute a Small Business and provide specific reason(s) for the substitution or replacement. Actual substitution or replacement of a Small Business may not occur before the Phoenix DBE Compliance Specialist's written approval has been obtained.

E. Prompt Payment of Subcontractors

The prompt payment clause shall be included in every contract and subcontract.

Per A.R.S. § 32-1129.01 the Successful Bidder must promptly pay its subcontractors, subconsultants, or suppliers **within seven (7) calendar days**. If the Successful Bidder diverts any payment received for a DBE's,

Small Business's, or other Subcontractor's work performed on the Contract or fails to reasonably account for the application or use of the payment, the Agency may declare the Successful Bidder in breach of contract.

Under the prompt-payment provisions of 49 CFR Part 26, the Successful Bidder must ensure prompt and full release of retentions to Subcontractors and suppliers when their scope of work is complete, and the Agency has paid Successful Bidder for the work. The Successful Bidder shall pay each Subcontractor's and supplier's retention no later than 30 days after the Agency has paid for the scope(s) of work, regardless if there's outstanding retention held against the Successful Bidder. If the Agency reduces the Successful Bidder's retention, the Successful Bidder shall correspondingly reduce the retentions of Subcontractors and suppliers that have performed satisfactory work.

Nothing in this section prevents the Successful Bidder from enforcing its Subcontract with a Subcontractor or supplier for defective work, late performance, and other claims arising under the Subcontract.

F. Remedies

If the Successful Bidder fails to comply with these contract provisions and the requirements set forth in 49 CFR 26.101 and 26.103, the Agency may take any one or more of the following actions:

1. Withhold future payments, including retention, until the Successful Submitter is determined to be in compliance;
2. Cancel the Contract.



City of Phoenix

Disadvantaged Business Enterprise Program

SECTION VII. RECORDS & REPORTING REQUIREMENTS

A. Records

During performance of the Contract, the Successful Bidder shall keep all records necessary to document Small Business participation. The Successful Bidder shall provide the records to the Agency within 72 hours of the Agency's request and at final completion of the Contract. The Agency will prescribe the form, manner, and content of reports. The required records may include but not limited to:

1. A complete listing of all Subcontractors and suppliers on the project;
2. Each Subcontractor's and supplier's scope performed;
3. The dollar value of all subcontracting work, services, and procurement;
4. Copies of all executed Subcontracts, purchase orders, and invoices; and
5. Copies of all payment documentation and Change Orders.

B. Reports

Successful Bidder is required to file the following payment reports in the B2G system:

1. Progress Payments:

By the 15th of ***each*** month, the Successful Bidder must enter payment information and related supporting documentation into the Agency's web-based certification and compliance reporting system.

- a. The total of all payments received from the Agency during the previous month.
- b. All payments made to Subcontractors during the previous month.

The Successful Bidder is responsible for ensuring that subcontractors confirm receipt of payment in the B2G system by the end of each month.

2. Final Payment:

Before the Agency processes the Successful Bidder's final payment and/or outstanding retention held against the Successful Bidder, the Successful Bidder shall notate in the B2G system:

- a. The payment to each subcontractor is considered "Final".
- b. Every subcontractor must confirm they have received full and "Final" payment in the B2G system.
- c. For federal reporting purposes, Attachment E must be completed and signed by the Successful Bidder and DBE firm(s) prior to Successful Bidder receiving final payment.

The Successful Bidder is responsible for ensuring that subcontractors confirm the receipt of full and "Final" payment in the B2G system.

**Disadvantaged Business Enterprise (DBE) Program
DBE-Race & Gender Neutral (Non-Negotiated)
Form EO2 SMALL BUSINESS OUTREACH EFFORTS**

Bidder's Name:	Contract # / Project #: 2 F	Contract Name:
Email:	Phone #:	Point of Contact:

Each bidder must conduct outreach efforts and submit documentation of those outreach efforts as described in the Disadvantaged Business Enterprise (DBE) Program Race & Gender Neutral Contract Clause. Detailed instructions for this form are included in the Contract Clause. Supporting documentation is required for Columns D and F. Bidders should make additional copies of this form as needed for their submittal.

(A) Small Business Name and Contact Information	(B) Business Status	(C) Scope(s) of Work Solicited	(D) Solicitation Method	(E) Selection Decision*	(F) Communication Final Selection Outcome*										
<table border="1" style="width:100%; border-collapse: collapse;"> <tr><td colspan="2">Name:</td></tr> <tr><td colspan="2">Address:</td></tr> <tr> <td style="width:70%;">City, State, Zip:</td> <td style="width:30%;">Number of Employees:</td> </tr> <tr> <td>Phone Number:</td> <td>Email or Fax:</td> </tr> <tr> <td>Number of Years in Business:</td> <td>Range of Annual Gross Receipts:</td> </tr> </table>	Name:		Address:		City, State, Zip:	Number of Employees:	Phone Number:	Email or Fax:	Number of Years in Business:	Range of Annual Gross Receipts:	<input type="checkbox"/> DBE <input type="checkbox"/> SBC - Small Business Concern <input type="checkbox"/> SBE - City of Phoenix Certified <input type="checkbox"/> Unknown	List Scope(s) of Work Estimated percentage of total contract value: %	<input type="checkbox"/> E-mail Blast <input type="checkbox"/> Phone Call <input type="checkbox"/> In-Person <input type="checkbox"/> Newspaper <input type="checkbox"/> Website <input type="checkbox"/> Trade Listing <input type="checkbox"/> Outreach Event <input type="checkbox"/> Other	<input type="checkbox"/> Firm was selected Dollar Value: <input type="checkbox"/> Firm was not selected Provide explanation of why firm NOT selected _____ _____	Date Firm was Notified: _____ Method used to Communicate Selection: <input type="checkbox"/> Email <input type="checkbox"/> Phone <input type="checkbox"/> Fax <input type="checkbox"/> Letter <input type="checkbox"/> In person
Name:															
Address:															
City, State, Zip:	Number of Employees:														
Phone Number:	Email or Fax:														
Number of Years in Business:	Range of Annual Gross Receipts:														
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Name:															
Address:															
City, State, Zip:	Number of Employees:														
Phone Number:	Email or Fax:														
Number of Years in Business:	Range of Annual Gross Receipts:														



City of Phoenix

Disadvantaged Business Enterprise (DBE) Program

**FORM EO3 SMALL BUSINESS UTILIZATION COMMITMENT (RGN)
(Due within 5 calendar days of the bid deadline.)**

Project Number: 2 F	Project Title:
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On behalf of the Successful Bidder, I certify under the penalty of perjury that the information submitted herein is true and correct:

1. The firms indicated as "Selected" in **Form EO2 Small Business Outreach Efforts**, will participate in this contract;
2. The Successful Bidder will comply with the Race- and Gender-Neutral post-award compliance requirements as stated in the DBE contract clause;
3. Successful Bidder understands and agrees that any and all changes or substitutions to subcontracts with DBE's and Small Businesses must be authorized by the Phoenix DBE Compliance Specialist prior to implementation; and
4. The following statements are true and correct:

The Proposed Total Small Business percentage on this contract will be:

_____ %

Company Name: _____

Company Mailing Address: _____

Representative Name: _____

Title: _____

Email Address: _____

Phone Number: _____

Signature: _____ Date: _____

SUPPLEMENTARY CONDITIONS

1. STANDARD SPECIFICATIONS AND DETAILS

Except as otherwise required in these specifications, bid preparation and construction of this project will be in accordance with all applicable Maricopa Association of Governments' (MAG) Uniform Standard Specifications and Uniform Standard Details, latest revision, and the City of Phoenix Supplements, latest revision to the MAG Uniform Standard Specifications and Details.

2. PRECEDENCE OF CONTRACT DOCUMENTS

In case of a discrepancy or conflict, the precedence of contract documents is as follows:

1. Change Orders or Supplemental Agreements
2. Addenda
3. Contract Specifications/Special Provisions/Technical Provisions
4. The Plans
5. COP Supplement to MAG Standard Specifications and Details, latest revision
6. MAG Standard Specifications and Details, latest revision

The precedence of any Addenda falls within the category of which it represents.

3. PARTIAL PAYMENTS

The contracting agency will make a partial payment to the Contractor on the basis of an approved estimate prepared by the Engineer or the Contractor for work completed and accepted through the preceding month. The notice to proceed date, which is designated for the specific project involved, will be used as the closing date of each partial pay period. Payment will be made no later than fourteen (14) days after the work is certified and approved. City will review payment request and make recommendation of approval or denial within 7 calendar days. The contractor will attach to each monthly pay application the following documents:

- A. A completed and signed City of Phoenix Equal Opportunity Department DBE Utilization form.
- B. All current certified pay roll reports and statement of compliance (to be completed through the date of the pay application).
- C. Current record Drawings complete and current at the time of the monthly pay application. The contractor will review the most current Record Drawings with the Engineer at the time the payment application is submitted. If the Engineer determines that the Record Drawings are not complete, the Contractor will update the Record Drawings as directed, prior to re-submitting the monthly payment application.
- D. Certified quantity calculation to justify all pay quantities and amounts requested.
- E. A critical path method schedule monthly update report and compliance certificate.
- F. Failure to provide all of the completed documents as listed above will result in the Engineer returning the monthly pay application to the Contractor with no action.

4. MAG SUBSECTION 105.15(B) FINAL ACCEPTANCE

Delete this subsection and substitute the following:

B. Substantial Completion

The work may be judged substantially complete when all construction, including all applicable ADA requirements, has been completed with the possible exception of final inspection punch list work. The purpose of granting or acknowledging substantial completion is to stop Contract time. This is particularly important to the Contractor if Contract time is exhausted or nearly so and/or punch list work is anticipated to extend beyond the allotted time. Granting of substantial

completion will eliminate the possibility of incurring liquidated damages or additional liquidated damages beyond the substantial completion date, whichever case may apply.

In the event that the Engineer grants substantial completion, the Contractor will have thirty (30) days thereafter to complete punch list work, unless additional time is granted—in writing—by the Engineer. In no case will a Contractor be granted more than thirty (30) days to complete punch list work, unless there are extenuating circumstances such as delay in shipment of a specialized piece of equipment, labor strike, or other circumstances beyond the Contractor's control which would necessitate a further time extension.

C. Penalty for Failure to Complete Punch List Work Within Specified Time

In the event the Contractor fails to complete the punch list work within thirty (30) days following the Contract completion date, or in the case of specialized situations within the additional time allotted by the Engineer, the Contractor may be declared in default, and the Engineer may order the work completed by others.

In the event of default, as described herein, the Engineer will withhold from the Contractor's final payment, an amount equal to at least twice the estimated cost of the remaining work. In addition, the Engineer will withhold the retention deducted from Contract progress payments until all punch list work has been satisfactorily completed, whereupon twice the amount of the actual cost of completing the work will be deducted from the Contractor's final payment and the remaining funds, if any, including the Contract retention, will be released in accordance with the conditions set forth in Contract retention.

D. Contract Retention

This project will not be considered complete until all work has been completed, including punch list work. Under no circumstances will a Contractor receive any portion of the legally retained progress payments until the City has granted a final acceptance and/or acknowledged substantial completion. The following conditions will apply to each case:

1. Substantial Completion: The Engineer may reduce outstanding Contract retention to not less than one (1) percent of the total Contract amount, upon granting substantial completion, if the value of the punch list work is estimated to be less than one (1) percent of the total Contract.
2. Project Acceptance: Project acceptance implies that all punch list work is done and the improvements have been accepted by the City. Under these conditions, the retention will be fully released to the Contractor subject only to the signing of the standard claims affidavit and hold harmless clause required for all Contracts.
3. Final Release of Contract Retention and/or Release of More Than Ninety (90 Percent of the Contract Funds: Prior to final payment and release of monies retained and/or in the case of substantial completion where the Contractor has requested a reduction in Contract retention, the Contractor will be required to sign a claims affidavit agreeing to hold the City harmless from any and all claims arising out of the Contract.

5. DEFENSE AND INDEMNIFICATION

To the maximum extent allowed by law, including Title 34 A.R.S., Contractor ("Indemnitor") agrees to defend, indemnify, and hold harmless the City of Phoenix and its officers, officials (elected or appointed), agents and employees (and any jurisdiction or agency issuing permits for any work included in the project, and its officers, agents and employees) ("Indemnitee") from any and all claims, actions, liabilities, damages, losses or expenses, (including but not limited to court costs, attorney fees, expert fees, and costs of claim processing, investigation and litigation) of any nature or kind whatsoever ("Losses") caused or alleged to be caused, in whole or in part, by the wrongful, negligent or willful acts, or errors or omissions of Indemnitor or any of its owners, officers, directors, members, managers, agents, employees, or subcontractors (Indemnitor's Agents") arising out of or

in connection with this Contract. This defense and indemnity obligation includes holding Indemnitee harmless for any Losses or other amount arising out of or recovered under any state's workers' compensation law or arising out of the failure of Indemnitor or Indemnitor's Agents to conform to any federal, state or local law, statute, ordinance, rule, regulation, or court decree. Indemnitor's duty to defend Indemnitee accrues immediately at the time a claim is threatened or a claim is made against Indemnitee, whichever is first. Indemnitor's duty to defend exists regardless of whether Indemnitor is ultimately found liable. Indemnitor must indemnify Indemnitee from and against any and all Losses, except where it is proven that those Losses are solely as a result of Indemnitee's own negligent or willful acts or omissions. Indemnitor is responsible for primary loss investigation, defense and judgment costs where this indemnification applies. In consideration of the City's award of this Contract, Indemnitor agrees to waive all rights of subrogation against Indemnitee for losses arising from or related to any work performed by Indemnitor or Indemnitor's Agents for the City of Phoenix under this Contract. The obligations of Indemnitor under this provision survive the termination or expiration of this Contract.

6. CONTRACTOR'S INSURANCE

Contractor and Subcontractors must procure insurance against claims that may arise from or relate to performance of the work hereunder by Contractor and its agents, representatives, employees and Subcontractors. Contractor and Subcontractors must maintain that insurance until all of their obligations have been discharged, including any warranty periods under this Contract.

The City in no way warrants that the limits stated in this section are sufficient to protect the Contractor from liabilities that might arise out of the performance of the work under this Contract by the Contractor, its agents, representatives, employees, or Subcontractors and Contractor may purchase additional insurance as they determine necessary.

SCOPE AND LIMITS OF INSURANCE - Contractor must provide coverage with limits of liability not less than those stated below. An excess liability policy or umbrella liability policy may be used to meet the liability limits provided that (1) the coverage is written on a "following form" basis, and (2) all terms under each line of coverage below are met.

Commercial General Liability – Occurrence Form

General Aggregate	\$5,000,000
Products – Completed Operations Aggregate	\$5,000,000
Personal and Advertising Injury	\$5,000,000
Each Occurrence	\$5,000,000

- The policy must name the City of Phoenix as an additional insured with respect to liability for bodily injury, property damage and personal and advertising injury with respect to premises, ongoing operations, products and completed operations, and liability assumed under an insured contract arising out of the activities performed by, or on behalf of the Contractor, related to this Contract.
- Coverage must include XCU coverage.
- There must be no endorsement or modification which limits the scope of coverage or the policy limits available to the City of Phoenix as an additional insured.
- City of Phoenix is an additional insured to the full limits of liability purchased by the Contractor.
- The Contractor's insurance coverage must be primary and non-contributory with respect to any insurance or self-insurance carried by the City.
- Contractor's policies must be endorsed to provide an extension of the completed operations coverage for a period of nine years.
- Policy must not contain any restrictions of coverage with regard to operations on or near airport premises.

Automobile Liability

Bodily injury and property damage coverage for any owned, hired, and non-owned vehicles used in the performance of this Contract.

Combined Single Limit (CSL) \$5,000,000

- The policy must be endorsed to include The City of Phoenix as an additional insured with respect to liability arising out of the activities performed by, or on behalf of the Contractor, related to this contract.
- City of Phoenix is an additional insured to the full limits of liability purchased by the Contractor.
- The Contractor’s insurance coverage must be primary and non-contributory with respect to any insurance or self-insurance carried by the City.
- Policy must not contain any restrictions of coverage with regard to operations on or near airport premises.

Worker’s Compensation and Employers’ Liability

Workers’ Compensation Statutory

Employers’ Liability

Each Accident	\$100,000
Disease – Each Employee	\$100,000
Disease – Policy Limit	\$500,000

- Policy must contain a waiver of subrogation against the City of Phoenix.
- This requirement does not apply when a contractor or Subcontractor is exempt under A.R.S. §23-902(E), **AND** when such contractor or Subcontractor executes the appropriate sole proprietor waiver form.

Builders’ Risk Insurance

Policy provided, if determined necessary by the City, must be in an amount equal to the Job Order Agreement amount, plus additional coverage equal to JOA amount for all subsequent adjustments.

- The City of Phoenix, the Contractor and Subcontractors, must be named insureds on the policy.
- Special Causes of Loss coverage must be written on a replacement cost basis and must include coverage for soft costs, flood, and earth movement.
- Policy must be maintained until whichever of the following must first occur: (1) final payment has been made; or, (2) until no person or entity, other than the City of Phoenix, has an insurable interest in the property required to be covered.
- Policy must be endorsed such that the insurance must not be canceled or lapse because of any partial use or occupancy by the City.
- Policy must provide coverage from the time any covered property becomes the responsibility of the Contractor, and continue without interruption during construction, renovation, or installation, including any time during which the covered property is being transported to the construction installation site, or awaiting installation, whether on or off site.
- Policy must contain a waiver of subrogation against the City of Phoenix.

- Contractor is responsible for the payment of all policy deductibles.

Professional Liability (when required by Job Order Agreement)

Each Claim	\$1,000,000
Annual Aggregate	\$1,000,000

- The policy must cover liability arising from the failure to meet the professional standards required or expected in the delivery of those services as defined in the Scope of Services of this Contract.
- Contractor warrants that any retroactive date under the policy must precede the effective date of this Contract; and that either continuous coverage will be maintained, or an extended reporting period will be exercised for a period of two years beginning at the time work under this Contract is completed.
- Coverage must extend to job order types of contracts.

C. Notice of Cancellation

For each insurance policy required by the insurance provisions of this Contract, the Contractor must provide to the City, within five business days of receipt, a notice if a policy is suspended, voided or cancelled for any reason. Such notice must be mailed, emailed or hand delivered to City of Phoenix Design and Construction Procurement 200 W. Washington Street, 5th Floor, Phoenix, AZ 85003-1611.

D. Acceptability of Insurers

Insurance is to be placed with insurers duly licensed or authorized to do business in the state of Arizona and with an "A.M. Best" rating of not less than B+ VI. The City in no way warrants that the above-required minimum insurer rating is sufficient to protect the Contractor from potential insurer insolvency.

E. Verification of Coverage

Contractor must furnish the City with certificates of insurance (ACORD form or equivalent approved by the City) as required by this Contract. The certificates for each insurance policy are to be signed by a person authorized by that insurer to bind coverage on its behalf.

All certificates and any required endorsements are to be received and approved by the City before work commences. Each insurance policy required by this Contract must be in effect at or prior to commencement of work under this Contract and remain in effect for the duration of the project. Failure to maintain the insurance policies as required by this Contract or to provide evidence of renewal is a material breach of contract.

All certificates required by this Contract must be sent directly to Design and Construction Procurement via email at str.title34.procure@phoenix.gov. The City project number, contract number and project description must be noted on the certificate of insurance. The City reserves the right to require complete, certified copies of all insurance policies required by this Contract at any time. DO NOT SEND CERTIFICATES OF INSURANCE TO THE CITY'S RISK MANAGEMENT DIVISION.

F. Subcontractors

Contractor's certificates must include all Subcontractors as additional insureds under its policies **OR** Contractor must be responsible for ensuring and verifying that all Subcontractors have valid and collectable insurance. At any time throughout the life of the contract, the City of Phoenix reserves the right to require proof from the Contractor that its Subcontractors have insurance coverage. All Subcontractors providing services included under this Contract's Scope of

Services are subject to the insurance coverages identified above and must include the City of Phoenix as an additional insured. In certain circumstances, the Contractor may, on behalf of its Subcontractors, waive a specific type of coverage or limit of liability where appropriate to the type of work being performed under the subcontract. Contractor assumes liability for all Subcontractors with respect to this Contract.

G. Approval

Any modification or variation from the insurance requirements in this Contract must be made by the Law Department, whose decision is final. Such action will not require a formal Contract amendment, but may be made by administrative action.

7. **PERFORMANCE AND LABOR MATERIAL BOND**

Prior to the execution of the Contract, the successful bidder must provide a performance bond and a labor and materials bond, each in an amount equal to the full amount of the Contract. Each such bond will be executed by a surety company or companies holding a Certificate of Authority to transact surety business in the state of Arizona, issued by the Director of the Arizona Department of Insurance. A copy of the Certificate of Authority will accompany the bonds. The Certificate will have been issued or updated within two years prior to the execution of the Contract. The bonds will be made payable and acceptable to the City of Phoenix. The bonds will be written or countersigned by an authorized representative of the surety who is either a resident of the state of Arizona or whose principal office is maintained in this state, as by law required, and the bonds will have attached thereto a certified copy of Power of Attorney of the signing official. The Power of Attorney it will be for the total Contract amount. Personal or individual bonds are not acceptable. **Failure to comply with these provisions will be cause for rejection of the bidder's proposal.**

8. **BONDING COMPANIES**

Prior to execution of each individual Job Order Agreement, the Contractor must provide a performance bond and a payment bond, each in an amount equal to the full amount of the agreed upon cost for that Job Order.

Each such bond will be executed by a surety company or companies holding a Certificate of Authority to transact surety business in the State of Arizona, issued by the Director of the Arizona Department of Insurance. A copy of the Certificate of Authority will accompany the bonds. The Certificate will have been issued or updated within two years prior to the execution of this Contract.

The bonds will be made payable and acceptable to the City of Phoenix.

The bonds will be written or countersigned by an authorized representative of the surety who is either a resident of the State of Arizona or whose principal office is maintained in Arizona, as by law required, and the bonds will have attached thereto a certified copy of Power of Attorney of the signing official.

If one Power of Attorney is submitted, it will be for twice the total amount required.

If two Powers of Attorney are submitted, each will be for the total amount required. Personal or individual bonds are not acceptable.

Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract Documents, the Contractor will promptly furnish a copy of the bonds or will permit a copy to be made.

All bonds submitted for this Project will be provided by a company which has been rated "A- or better for the prior four quarters" by the A.M. Best Company.

9. **CONFIDENTIALITY OF PLANS & SPECIFICATIONS**

Any plans generated for this project must include the following statement in the Title Block on every page: "Per City of Phoenix City Code Chapter 2, Section 2-28, these plans are for official use only and may not be shared with others except as required to fulfill the obligations of Contractor's contract with the City of Phoenix."

10. **DATA CONFIDENTIALITY**

As used in the Contract, "data" means all information, whether written or verbal, including plans, photographs, studies, investigations, audits, analyses, samples, reports, calculations, internal memos, meeting minutes, data field notes, work product, proposals, correspondence and any other similar documents or information prepared by, obtained by, or transmitted to the Contractor or its subcontractors in the performance of this Contract.

The parties agree that all data, regardless of form, including originals, images, and reproductions, prepared by, obtained by, or transmitted to the Contractor or its subcontractors in connection with the Contractor's or its subcontractor's performance of this Contract is confidential and proprietary information belonging to the City.

Except as specifically provided in this Contract, the Contractor or its subcontractors will not divulge data to any third party without prior written consent of the City. The Contractor or its subcontractors will not use the data for any purposes except to perform the services required under this Contract. These prohibitions will not apply to the following data provided the Contractor or its subcontractors have first given the required notice to the City:

- A. Data which was known to the Contractor or its subcontractors prior to its performance under this Contract unless such data was acquired in connection with work performed for the City;
- B. Data which was acquired by the Contractor or its subcontractors in its performance under this Contract and which was disclosed to the Contractor or its subcontractors by a third party, who to the best of the Contractor's or its subcontractor's knowledge and belief, had the legal right to make such disclosure and the Contractor or its subcontractors are not otherwise required to hold such data in confidence; or
- C. Data which is required to be disclosed by virtue of law, regulation, or court order, to which the Contractor or its subcontractors are subject.

In the event the Contractor or its subcontractors are required or requested to disclose data to a third party, or any other information to which the Contractor or its subcontractors became privy as a result of any other contract with the City, the Contractor will first notify the City as set forth in this section of the request or demand for the data. The Contractor or its subcontractors will give the City sufficient facts so that the City can be given an opportunity to first give its consent or take such action that the City may deem appropriate to protect such data or other information from disclosure.

The Contractor, unless prohibited by law, within ten calendar days after completion of services for a third party on real or personal property owned or leased by the City, the Contractor or its subcontractors will promptly deliver, as set forth in this section, a copy of all data to the City. All data will continue to be subject to the confidentiality agreements of this Contract.

The Contractor or its subcontractors assume all liability for maintaining the confidentiality of the data in its possession and agrees to compensate the City if any of the provisions of this section are violated by the Contractor, its employees, agents or subcontractors. Solely for the purposes of seeking injunctive relief, it is agreed that a breach of this section will be deemed to cause irreparable harm that justifies injunctive relief in court. Contractor agrees that the requirements of this Section will be incorporated into all subcontracts entered into by Contractor. A violation of this Section may result in immediate termination of this Contract without notice.

Personal Identifying Information-Data Security. Personal identifying information, financial account information, or restricted City information, whether electronic format or hard copy, must be secured and protected at all times. At a minimum, Contractor must encrypt and/or password protects

electronic files. This includes data saved to laptop computers, computerized devices or removable storage devices.

When personal identifying information, financial account information, or restricted City information, regardless of its format, is no longer necessary, the information must be redacted or destroyed through appropriate and secure methods that ensure the information cannot be viewed, accessed, or reconstructed.

In the event that data collected or obtained by Contractor or its subcontractors in connection with this Contract is believed to have been compromised, Contractor or its subcontractors will immediately notify the Project Manager and City Engineer. Contractor agrees to reimburse the City for any costs incurred by the City to investigate potential breaches of this data and, where applicable, the cost of notifying individuals who may be impacted by the breach.

Contractor agrees that the requirements of this Section will be incorporated into all subcontracts entered into by Contractor. It is further agreed that a violation of this Section will be deemed to cause irreparable harm that justifies injunctive relief in court. A violation of this Section may result in immediate termination of this Contract without notice.

The obligations of Contractor or its subcontractors under this Section will survive the termination of this Contract.

11. MATERIALS CONTAINING ASBESTOS

Materials containing asbestos and/or lead in any form are unacceptable to incorporate into the project unless formally accepted in writing by the City of Phoenix. This written approval will take place prior to the material being incorporated into the project and/or brought to the site.

Repair kits or touch-up materials, materials that include asbestos and /or lead introduced into the product at the factory or applied at the assembly plant are all unacceptable. Any and all field-applied products that are comprised of asbestos and/or lead containing materials are also unacceptable.

If asbestos and/or lead are installed without written approval by City of Phoenix, the contractor will remove these materials at his expense and dispose of these materials in accordance with all state and federal laws and pay for the supervision and reporting costs in addition to the cost to properly remove them. The Contractor is required to submit MSDS documents for newly installed materials.

During construction, if the Contractor discovered or suspected any materials containing asbestos in the field, the Contractor will inform the City of Phoenix immediately, who will be in charge of removing and disposing off all asbestos containing materials.

12. DISPOSAL OF SURPLUS MATERIAL WHICH DOES NOT CONTAIN ASBESTOS

All surplus and/or waste material may be disposed of at the Contractor's discretion subject to the following conditions:

- A. If the City landfills are used, the Contractor will pay the normal dumping fee.
- B. If private property within the City limits is used, the Contractor will obtain written permission from the property Owner and deliver a copy of this Agreement to the Engineer prior to any hauling or dumping. All disposal and grading will be in strict conformance with the City of Phoenix Grading and Drainage Ordinance. The Contractor will obtain and pay for the necessary permit(s).
- C. If the surplus material is disposed of outside the City limits, the Contractor will comply with all applicable laws/ordinances of the agency concerned and be responsible for all cost incurred.

No measurement or direct payment will be made for the hauling and disposal of surplus and/or waste material, the cost will be incidental to the cost of the project.

13. HAUL PERMIT

On any project, when the quantity of fill or excavation to be hauled exceeds 10,000 C.Y. or when the duration of the haul is for more than twenty (20) working days, the Contractor will:

- A. Obtain a written (no fee) haul permit from the Planning and Development Department.
- B. Obtain approval of the proposed haul route, number of trucks, etc., by the Street Transportation Department.

NOTE: Obtaining the haul permit and the approval by the Street Transportation Department does not release the Contractor from strict compliance with MAG Subsection 108.5, Limitation of Operations.

14. DEFINITIONS – MAJOR ITEMS

Section 101, page 8 of MAG Specifications – the definition of major item is changed to read:
Major Item: A major item is any bid item for work having an original dollar value equal to or greater than the amount shown below.

<u>Contract Amount</u>	Major Item is defined as any item equal to or <u>greater than the following</u>
Up to \$1 million	\$15,000 or 3%, whichever is greater
\$1 million to \$3 million	3% of the original Contract amount to a maximum of \$75,000.00
\$3 million to \$5 million	2.5% of the original Contract amount to a maximum of \$90,000.00
Over \$5 million	1.5% of the original Contract amount to a maximum of \$125,000.00

Contingency Items: Contingency items, which fall under the definition of a major item, are subject to negotiation if decreased by more than twenty (20) percent.

Contingency items will not increase more than twenty (20) percent without being subject to re-negotiation, regardless of the percentage of that item relative to the total Contract amount.

15. UNDERGROUND FACILITIES

The Contractor will make whatever investigation it deems necessary to verify the location of underground utility facilities. If such facilities are not in the location shown in the drawings, then (regardless of whether this is discovered prior to or during construction) the Contractor’s remedies, if any, pursuant to Art. 6.3, Chapter 2, Title 40, A.R.S. (A.R.S. 40-360.21 through 40-360.32, “Underground Facilities”), will be the Contractor’s sole remedy for extra work, delays, and disruption of the job, or any other claim based on the location of utility facilities. Locations of utility facilities shown on drawings furnished by the City are to be regarded as preliminary information only, subject to further investigation by the Contractor. The City does not warrant the accuracy of these locations, and the Contractor, by entering into this Contract, expressly waives and disclaims any claim or action against the City under any theory for damage resulting from location of utility facilities.

The Contractor will be responsible for obtaining all Blue Stake utility location information, and for performing all requirements as prescribed in A.R.S. 40-360.21 through .29, for all underground facilities, including those that have been installed on the current project, until the project is accepted by the City.

At least two working days prior to commencing any excavation, the Contractor will call the Blue Stake Center, between the hours of 7:00 a.m. and 4:30 p.m., Monday through Friday, for information relative to the location of buried utilities. The number to be called is as follows: Maricopa County, (602) 263-1100.

16. AUDIT AND RECORDS

Records of the Contractor's direct personnel payroll, bond expenses, and reimbursable expenses pertaining to this Project, and records of accounts between the City and Contractor will be kept on the basis of generally accepted accounting principles and must be made available to the City and its auditors for up to five years following Final Acceptance of the Project.

The City, its authorized representative, and/or any federal agency, reserves the right to audit the Contractor's records to verify the accuracy and appropriateness of all cost and pricing data, including data used to negotiate the Contract Documents and any change orders.

The City reserves the right to decrease Contract price and/or payments made on this Contract and/or request reimbursement from the Contractor following final contract payment on this Contract if, upon audit of the Contractor's records, the audit discloses the Contractor has provided false, misleading, or inaccurate cost and pricing data.

The Contractor will include a similar provision in all of its contracts with subcontractors and suppliers providing services or supplying materials under the Contract Documents to ensure the City, its authorized representative, and/or the appropriate federal agency, has access to the subcontractors' and suppliers' records to verify the accuracy of cost and pricing data.

The City reserves the right to decrease Contract price and/or payments made on this Contract and/or request reimbursement from the Contractor following final contract payment on this Contract if the above provision is not included in subcontractor and Supplier contracts, and one or more subcontractors or suppliers refuse to allow the City to audit their records to verify the accuracy and appropriateness of cost and pricing data.

If, following an audit of this Agreement, the audit discloses the Contractor has provided false, misleading, or inaccurate cost and pricing data, and the cost discrepancies exceed 1% of the total Agreement billings, the Contractor will be liable for reimbursement of the reasonable, actual cost of the audit.

17. CHANGE ORDER REQUEST MARKUPS AND WORKSHEET

The General Contractor will conform to the following markups for change order work self-performed or performed by a subcontractor. The General Contractor will also utilize the Change Order Request Summary Worksheet (see page S.C. – 16) to summarize change order costs. The General Contractor will still submit all required backup and supplemental information, calculations, invoices, etc., required to justify and support General Contractor and subcontractor costs.

A. General Contractor Self-Performed Work and Subcontractor Work Markups

Overhead and Profit – The actual or approved costs for equipment, material, and labor will be marked up by 12%.

B. General Contractor Markups of Subcontractor Work

The General Contractor will be allowed to markup actual or approved subcontractor costs for equipment, material, and labor (excluding subcontractor overhead and profit) by 7.5%.

C. Bond

The General Contractor will be allowed to markup the cost for change order work for payment and performance bonds utilizing the same percentage used on the initial Contract and will

submit verification of this percentage, from the bonding company, with the initial change order request.

D. Insurance

The General Contractor will be allowed to markup the cost for change order work plus Bond costs for property damage/public liability insurance, utilizing the same percentage used on the initial contract. Verification, from insurance carriers, of this percentage will be submitted with the initial change order request.

E. Sales Tax

The General Contractor will be allowed to markup the cost for change order work plus Bond and Insurance costs by the current, approved sales tax multiplier.

18. CONTROL OF WORK

Add the following to Uniform Standard Specifications for Public Works Construction (MAG), Section 105.1 AUTHORIZATION OF THE ENGINEER:

The City may, at its discretion and without cause, order the Contractor in writing to stop and suspend the Work. Immediately after receiving such notice, the Contractor will discontinue advancing the work specified under this Agreement. Such suspension will not exceed one hundred and eighty (180) consecutive Days during the duration of the Project.

The Contractor may seek an adjustment of the Contract Price and Time, if its cost or time to perform the Work has been adversely impacted by any suspension or stoppage of work by City.

19. COMMENCEMENT, PROSECUTION AND PROGRESS

Add the following to Uniform Standard Specifications for Public Works Construction (MAG), Section 108.10 FORFEITURE AND DEFAULT OF CONTRACT:

City's Right to Perform and Terminate for Cause:

If the City provides the Contractor with a written order to provide adequate maintenance of traffic, adequate cleanup, adequate dust control or to correct deficiencies or damage resulting from abnormal weather conditions, and the Contractor fails to comply in a time frame specified, the City may have work accomplished by other sources at the Contractor's expense.

If Contractor persistently fails to (i) provide a sufficient number of skilled workers, (ii) supply the materials required by the Contract Documents, (iii) comply with applicable Legal Requirements, (iv) timely pay, without cause, Sub-consultants and/or Subcontractors, (v) prosecute the Contract Services with promptness and diligence to ensure that the Contract Services are completed by the Contract Time, as such times may be adjusted, or (vi) perform material obligations under the Contract Documents, then City, in addition to any other rights and remedies provided in the Contract Documents or by law, will have the rights set forth below.

Upon the occurrence of an event set forth above, City may provide written notice to Contractor that it intends to terminate the Agreement unless the problem cited is cured, or commenced to be cured, within seven (7) Days of Contractor's receipt of such notice.

If Contractor fails to cure, or reasonably commence to cure, such problem, then City may give a second written notice to Contractor of its intent to terminate within an additional seven (7) Day period.

If Contractor, within such second seven (7) Day period, fails to cure, or reasonably commence to cure, such problem, then City may declare the Agreement terminated for default by providing written notice to Contractor of such declaration.

Upon declaring the Agreement terminated pursuant to the above, City may enter upon the premises and take possession, for the purpose of completing the Work, of all materials, equipment, scaffolds, tools, appliances and other items thereon, which have been purchased or provided for the performance of the Work, all of which Contractor hereby transfers, assigns and sets over to City for such purpose, and to employ any person or persons to complete the Work and provide all of the required labor, services, materials, equipment and other items.

In the event of such termination, Contractor will not be entitled to receive any further payments under the Contract Documents until the Work will be finally completed in accordance with the Contract Documents. At such time, the Contractor will only be entitled to be paid for Work performed and accepted by the City prior to its default.

If City's cost and expense of completing the Work exceeds the unpaid balance of the Contract Price, then Contractor will be obligated to pay the difference to City. Such costs and expense will include not only the cost of completing the Work, but also losses, damages, costs and expense, including attorneys' fees and expenses, incurred by City in connection with the re-procurement and defense of claims arising from Contractor's default.

20. DUST CONTROL & PREVENTION

To facilitate and encourage strict compliance with the Maricopa County Air Pollution Control Regulations pertaining to fugitive dust control, Contractor will submit the following documentation to the Project Manager at the preconstruction meeting prior to conducting any earth moving or dust generating activities under the Contract.

- a. Copy of a valid Maricopa County Earth Moving [Dust Control] Permit applicable to the work or services under the Contract.
- b. Copy of the Dust Control Plan applicable to the work or services under the Contract.
- c. Documentation that all of Contractor's on-site project managers have received the Comprehensive or Basic dust control training as required by Maricopa County Rule 310 based on project disturbed acres

For construction sites where 5-acres or more are disturbed, Contractor will designate and identify to the City an individual who has completed the dust control training set forth in Section 2 above as the site Dust Control Coordinator. The Dust Control Coordinator will be present on-site all times that earth moving or dust generating activities are occurring and until all ground surfaces at the site have been stabilized.

For construction sites less than 1-acre, the Contractor will designate an individual who has completed Basic Training to be on site at all times that earth moving or dust generating activities are occurring.

Contractor will notify the City of Phoenix, Aviation Department Project Manager within twenty-four (24) hours of any inspection, Notice of Violation, or other contact by the Maricopa County Air Quality Department with it or any of its subcontractors regarding the work or services under the Contract. A copy of any written communications, notices or citations issued to Contractor or any of its subcontractors regarding the work or services under the Contract will likewise be transmitted to the Project Manager within twenty-four (24) hours.

The Contractor will prevent any dust nuisance due to construction operations in accordance with MAG Specifications, Section 104.1.3, Cleanup and Dust Control. The Contractor will use a power pick-up broom as part of the dust control effort. No separate measurement or payment will be made for cleanup or dust control, or for providing a power pick-up broom on the job.

The Contractor may be instructed by the Engineer to provide additional pavement cleaning (in parking lots, or other locations) above and beyond the normal expected cleanup and dust control required by MAG Section 104.1.3. If requested by the Engineer, the Contractor will clean the requested areas with a power pick-up broom.

Use of the power pick-up broom in the special requested areas only, will be measured and paid for on an hourly basis under the bid item, 'POWER BROOM'. The number of hours listed in the bid proposal is only an estimate. Actual hours requested for this project may vary.

Contractor agrees to indemnify and reimburse the City for any fine, penalty, fee or monetary sanction imposed on the City by Maricopa County arising out of or caused by the performance of work or services under the Contract. Contractor will remit payment of the reimbursable sum to the City within thirty (30) days of being presented with a demand for payment from the City.

21. ARCHAEOLOGICAL MONITORING AND DISCOVERIES

Archaeological monitoring may be required within the limits of the project during construction. The Contractor must coordinate all ground disturbing work with the archaeologist(s) and provide a current work schedule to facilitate the archaeologist's investigation and monitoring of all ground disturbing work within the area(s) of interest. When archaeological materials are discovered, the Contractor must stop work immediately within a 10-meter zone of the discovery, secure the area, and immediately notify the on-site archaeologist(s) who must then contact the City Archaeology Office (602-495-0901) or the Street Transportation Environmental Section at 602-534-3747, who will coordinate with the City Archaeology Office. The Contractor must not recommence work in the area of discovery until directed in writing by the City Archaeology Office.

If suspected archaeological materials are discovered during construction without an archaeologist present, the Contractor must stop work immediately within a 10-meter zone of the discovery, secure the area, and immediately notify the City Archaeology Office (602-495-0901). The Contractor must not recommence work in the area of discovery until directed in writing by the City Archaeology Office.

In 1990, the Arizona legislature amended two state laws (Arizona Antiquities Act & State Historic Preservation Act) that protect human burials and associated artifacts on both private and state land. As specified in these laws and rephrased below:

1) A person shall not knowingly excavate in or upon any historic or prehistoric archaeological site, except when acting as a duly authorized agent of an institution or corporation organized for scientific, research or land use planning purposes. [Arizona Revised Statute §41-841(A) - Archaeological Discoveries] Any person, institution or corporation violating any provision of this article is guilty of a class 2 misdemeanor. [A.R.S. §41-846 - Violation]

2) A person who knowingly excavates in violation of A.R.S. §41-841 is guilty of a class 5 felony pursuant to Arizona Criminal Code- Title 13. A second or subsequent violation under this subsection is a class 3 felony. [A.R.S. §13-1507 - Excavating Certain Sites].

A class 5 felony carries potential penalties of up to two years in prison. If a City of Phoenix (City) project may impact historic or pre-historic archaeological resources, the guidelines described above must be adhered to. Therefore, no subsurface disturbance activities related to this without having an archaeological consultant on-site prior to and during this project's ground disturbance activities.

The City of Phoenix Office of the City Engineer is requesting that the Project Archaeological Requirements Acknowledgment Form is completed for all City sponsored or managed projects involving ground subsurface disturbance activities in areas that may include archaeological resources, as determined by the City of Phoenix Archaeology Office (CAO). If archaeological monitoring is required on a project, a City Archaeological Monitoring Acknowledgment form will be provided for your review and signature. The guidelines and the provisions in the Terms and Conditions of the Archaeological Monitoring Form must be followed as prescribed on the form and referenced above in this section. Penalties for non-compliance are detailed on the Archaeological

Monitoring Form. Failure to comply with the requirements of this acknowledgment form and the City contract may constitute a breach of contract.

22. LABOR COMPLIANCE

Davis Bacon and Related Acts. The prevailing basic hourly wage rates and fringes benefit payments, as determined by the Secretary of Labor pursuant to the provisions of the Davis Bacon Act, will be the minimum wages paid to the described classes of laborers and mechanics employed, or working on the site, to perform the Contract.

A Labor Standards Conference must be held prior to the start of construction. The Contractor will schedule the conference by calling the Labor Compliance Office at (602) 261-8287. Minimum attendance will be a corporate officer, who is authorized to execute and sign documents for the firm, and the payroll representative(s) responsible for preparing, reviewing and certifying weekly payroll reports. This requirement applies to all prime, sub and lower-tiered contractors expected to perform work on the project.

Payrolls, including subcontractor's payrolls, must be submitted weekly no later than seven days after each pay period ending date. The Contractor will upon request, clarify discrepancies between hourly wages paid individual workers and the minimum hourly wages required by the applicable federal wage decision for the project. Failure to provide payrolls or clarification of discrepancies may affect the timely release of payments and cause the withholding payment to the Contractor in accordance with Title 29, CFR Part 5.

29 CFR Parts 3, 5 and Wage Decision included in Labor Compliance (pages A.I.P. 6 to 40 and G.W.D. – 1 to 10).

23. COMPLIANCE WITH FEDERAL LAWS

Contractor will comply with all existing and subsequently enacted federal, state and local laws, ordinances, codes, and regulations that are, or become applicable to this Agreement. If a subsequently enacted law imposes substantial additional costs on Contractor, a request for an amendment may be submitted. Contractor is also required to certify its compliance with specified laws and in some cases Contractor will pass along these requirements to its subcontractors. If any of Contractor's certifications is found to be false, the City may terminate this Contract or impose other remedies due to the false certification. If there is a conflict in interpretation between provisions in this Contract and stated Federal Provisions, the Federal Provisions will prevail.

CHANGE ORDER REQUEST SUMMARY WORKSHEET

Project: _____ COR# _____
 Project No. _____ Date: _____

1. Change Order Request Identification

2. Subcontractor Costs

<u>Company</u>	<u>Base Cost</u>	+	<u>12% OH & P</u>	=	<u>Total</u>
_____	_____		_____		_____
_____	_____		_____		_____
_____	_____		_____		_____
_____	_____		_____		_____
_____	_____		_____		_____
_____	_____		_____		_____
_____	_____		_____		_____
_____	_____		_____		_____
TOTAL	<input type="text"/>		(2A)		<input type="text"/> (2B)

3. GC Markup of Subcontractor Base Costs (excluding OH & P)

TOTAL _____ (2A) x 0.075 = **(3A)**

4. General Contractor Self-Performed Work

<u>Work Item</u>	<u>Base Cost</u>	+	<u>12% OH & P</u>	=	<u>Total</u>
_____	_____		_____		_____
_____	_____		_____		_____
_____	_____		_____		_____
_____	_____		_____		_____
_____	_____		_____		_____
_____	_____		_____		_____
_____	_____		_____		_____
_____	_____		_____		_____
TOTAL					<input type="text"/> (4A)

5. Bond, Insurance, Sales Tax

- (a) 2B + 3A + 4A = _____ **(5A)**
- (b) Bond Markup: (5A) x _____ = _____ **(5B)**
- (c) Insurance Markup: (5A + 5B) x _____ = _____ **(5C)**
- (d) Sales Tax Markup: (5A + 5B + 5C) x 0.05395 = _____ **(5D)**
- (e) Extended General Conditions (if applicable) = _____ **(5E)**

TOTAL CHANGE ORDER REQUEST (5A + 5B + 5C + 5D + 5E) =

*Approved bond markup. **Approved insurance markup

**SUPPLEMENTAL TERMS AND
CONDITIONS TO ALL AIRPORT
AGREEMENTS**

1. Definitions

1.1 "Airport" means Phoenix Sky Harbor International Airport, Phoenix Deer Valley Airport, and/or Phoenix Goodyear Airport, according to the context of the contract.

1.2 "Contract" means all City of Phoenix Aviation Department contracts, subcontracts, agreements, leases, subleases, licenses, permits, concessions, and other documents, however denominated, that grant or convey a right or privilege on an Airport and to which this Exhibit is attached.

1.3 "Contractor" means all lessees, sublessees, licensees, permittees, consultants, concessionaires and other persons, firms, or corporations exercising a right or privilege on an Airport pursuant to a Contract and includes Contractor's heirs, personal representatives, successors, and assigns.

1.4 "Premises" means the area of an Airport occupied or used by Contractor pursuant to a Contract.

2. Federal Aviation Administration (FAA) Grant Assurances

2.1 Title VI of the Civil Rights Act of 1964 – Compliance with Nondiscrimination Requirements - 49 U.S.C. § 47123 and FAA Order 1400.11

During the performance of this Contract, Contractor agrees as follows:

A. Compliance with Regulations. Contractor will comply with the Title VI List of Pertinent Nondiscrimination Acts and Authorities (as provided in Section 7 below), as it may be amended from time to time, which is incorporated herein by reference and made a part of this Contract.

B. Nondiscrimination. With regard to the work performed by it under this Contract, Contractor will not discriminate on the grounds of race, color, or national origin in the selection and retention of subcontractors, including procurements of materials and leases of equipment. Contractor will not participate, directly or indirectly, in the discrimination prohibited by the Title VI List of Pertinent Nondiscrimination Acts and Authorities, including employment practices when this Contract covers any activity, project, or program set forth in Appendix B of 49 C.F.R. Part 21.

C. Solicitations for Subcontracts, Including Procurements of

Materials and Equipment. In all solicitations, either by competitive bidding or negotiation, made by 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 Contractor of Contractor's obligations under this Contract and the Title VI List of Pertinent Nondiscrimination Acts and Authorities on the grounds of race, color, or national origin.

D. Information and Reports. The Contractor will provide all information and reports required by the Title VI List of Pertinent Nondiscrimination Acts and Authorities, and 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 City of Phoenix or the FAA to be pertinent to ascertain compliance with the Title VI List of Pertinent Nondiscrimination Acts and Authorities and instructions. Where any information required of Contractor is in the exclusive possession of another who fails or refuses to furnish the information, Contractor will so certify to the City of Phoenix or the FAA, as appropriate, and will set forth what efforts Contractor has made to obtain the information.

E. Sanctions for Noncompliance. In the event of Contractor's noncompliance with the nondiscrimination provisions of this Contract, the City of Phoenix will impose such Contract sanctions as it or the FAA may determine to be appropriate, including:

- (i) Withholding payments to Contractor under this Contract until Contractor complies, and/or
- (ii) Cancelling, terminating, or suspending this Contract, in whole or in part.

F. Covenant Running with the Land. Contractor for itself and its heirs, personal representatives, successors, and assigns, as a part of the consideration for this Contract, hereby covenants and agrees that, in the event facilities are constructed, maintained, or otherwise operated on the property described in this Contract for a purpose for which a FAA activity, facility, or program is extended or for another purpose involving the provision of similar services or benefits, Contractor will maintain and operate such facilities and services in compliance with all requirements imposed by the Nondiscrimination Acts and Regulations listed in the Title VI List of Pertinent Nondiscrimination Acts and Authorities (as may be amended) such that no person on the grounds of race, color, or national origin will be excluded from participation in, denied the benefits of, or be otherwise subjected to discrimination in the use of said facilities. In the event of a breach of any of the above Nondiscrimination covenants, the City of Phoenix will have the right to terminate this Contract and to enter, re-enter and repossess the property and facilities thereon and hold the same as if this Contract had never been made or issued.

G. Incorporation of Provisions. Contractor will include the provisions of paragraphs A through F in every subcontract, including procurements of materials

and leases of equipment, unless exempt by the Title VI List of Pertinent Nondiscrimination Acts and Authorities, the Regulations, and directives issued pursuant thereto. Contractor will take action with respect to any subcontract or procurement as the City of Phoenix or the FAA may direct as a means of enforcing such provisions, including sanctions for noncompliance, provided, however, that if Contractor becomes involved in, or is threatened with litigation by a subcontractor or supplier because of such direction, Contractor may request the City of Phoenix to enter into any litigation to protect the interests of the City of Phoenix. In addition, Contractor may request the United States to enter into the litigation to protect the interests of the United States.

2.2 General Civil Rights Provisions - 49 U.S.C. § 47123

A. Sponsor Contracts. Contractor 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 Contractor and subtier contractors from the bid solicitation period through the completion of this Contract. This provision is in addition to that required of Title VI of the Civil Rights Act of 1964.

B. Sponsor Lease Agreements and Transfer Agreements. Contractor 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, including Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990. If Contractor transfers its obligations to another, then the transferee is obligated in the same manner as Contractor. This provision obligates Contractor or its transferee for the period during which the property is owned, used, or possessed by Contractor and the City of Phoenix remains obligated to the FAA. This provision is in addition to that required by Title VI of the Civil Rights Act of 1964.

2.3 Economic Nondiscrimination - 49 U.S.C. § 47107

In any Contract under which a right or privilege on the Airport is granted to a Contractor to conduct or to engage in any aeronautical activity for furnishing services to the public, Contractor shall:

A. Furnish its services on a reasonable, and not unjustly discriminatory basis to all users of the Airport, and

B. Charge reasonable, and not unjustly discriminatory prices for each unit or services, provided that Contractor may be allowed to make reasonable and non-discriminatory discounts, rebates, or other similar types of price reductions to volume purchasers. Non-compliance with this requirement shall be a material breach of this Contract for which the City of Phoenix shall have the right to terminate this Contract and any estate created herewith without liability therefor or, at the election of the City of Phoenix or the United States shall have the right to judicially enforce said

requirement.

2.4 Disadvantaged Business Enterprise Requirements - 49 C.F.R. Part 26

A. Contract Assurance (§ 26.13). To the extent that this Contract is covered by 49 C.F.R. Part 26, Contractor agrees that this Contract is subject to the requirements of the U.S. Department of Transportation regulations at 49 C.F.R. Part 26. Contractor or its subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this Contract. Contractor shall carry out applicable requirements of 49 C.F.R. Part 26 in the award and administration of DOT-assisted contracts. Failure by Contractor to carry out these requirements is a material breach of this Contract, which may result in the termination of this Contract or such other remedy as the City of Phoenix deems appropriate, which may include (i) withholding monthly progress payments, (ii) assessing sanctions, (iii) liquidated damages, and/or (iv) disqualifying Contractor from future bidding as non-responsible. Contractor agrees to include the foregoing statement in any subsequent contract that it enters into and cause those businesses to similarly include the statement in further agreements.

B. Prompt Payment (§ 26.29). Contractor agrees to pay each subcontractor under this Contract for satisfactory performance of its contract not later than seven (7) days from the receipt of each payment Contractor receives from City of Phoenix. Contractor agrees further to return retainage payments to each subcontractor within seven (7) days after the subcontractor's work is satisfactorily completed. Any delay or postponement of payment from the above-referenced time frame may occur only for good cause following written approval of the City of Phoenix. This clause applies to both DBE and non-DBE subcontractors.

2.5 Airport Concessions Disadvantaged Business Enterprise Requirements - 49 C.F.R. Part 23

Contract Assurance (§ 23.9). To the extent that this Contract is a concession agreement covered by 49 C.F.R. Part 23, Contractor agrees that it will not discriminate against any business owner because of the owner's race, color, national origin, or sex in connection with the award or performance of any concession agreement, management contract, or subcontract, purchase or lease agreement, or other agreement covered by 49 C.F.R. Part 23. Contractor agrees to include the above statements in any subsequent concession agreement or contract covered by 49 C.F.R. Part 23 that it enters into and cause those businesses to similarly include the statements in further agreements.

2.6 Miscellaneous

A. Contractor agrees that it will undertake an affirmative action plan in conformance with 14 C.F.R. Part 152, Subpart E (Nondiscrimination in Airport Aid Program), to ensure that no person shall on the grounds of race, creed, color, national origin, or sex be excluded from participating in any employment, contracting, or leasing activities covered in 14 C.F.R. Part 152, Subpart E. Contractor assures that no person will be excluded on such grounds from participating in or receiving the services or

benefits of any program or activity covered by Subpart E. Contractor further agrees that it will require its covered suborganizations to provide assurances to Contractor that they similarly will undertake affirmative action programs and that they will require like assurances from their suborganizations as required by 14 C.F.R. Part 152, Subpart E.

B. City of Phoenix reserves the right to further develop, improve, repair, and alter the Airport and all roadways, parking areas, terminal facilities, landing areas, and taxiways, as it may reasonably see fit, free from any and all liability to Contractor for loss of business or damages of any nature whatsoever to Contractor occasioned during the making of such improvements, repairs, alterations, and additions.

C. The City of Phoenix reserves the right, but is not obligated to Contractor, to maintain and keep in repair the landing area of the Airport and all publicly-owned facilities of the Airport, together with the right to direct and control all activities of Contractor in this regard.

D. Contractor acknowledges that this Contract is subordinate to any existing or future agreement between the City of Phoenix and the United States concerning the development, operation, or maintenance of the Airport. If the FAA or its successors require modifications or changes in the Contract as a condition to obtaining funds for improvements at the Airport or as a requirement of any prior grants, Contractor hereby consents to any and all such modifications and changes as may be reasonably required and agrees that it will adopt any such modifications and changes as part of this Contract.

E. This Contract is subordinate to the reserved right of the City of Phoenix and its successors and assigns to occupy and use for the benefit of the public the airspace above the Premises for the right of flight for the passage of aircraft. This public right of flight includes the right to cause in the airspace any noise inherent in the operation of any aircraft through the airspace or in landing at, taking off from, or operating at an Airport.

F. Contractor agrees to comply with the notification and review requirements, as required by 14 C.F.R. Part 77 (Safe, Efficient Use, and Preservation of the Navigable Airspace), if future construction of a structure is planned for the Premises or a planned modification of a structure on the Premises. Contractor shall submit the required FAA Form 7460-1 (Notice of Proposed Construction or Alteration) and provide documentation showing compliance with the federal requirements. After the FAA has completed the aeronautical study, Contractor shall provide to the City of Phoenix the FAA determination letter on proposed construction and any impact to air navigation. Contractor covenants for itself and its successors and assigns that it will not erect or permit the erection of any structure or permit the growth of any tree on the Premises above the mean sea level elevation for (1) Phoenix Sky Harbor International Airport, 1,134 feet, (2) Phoenix Goodyear Airport, 968 feet, and (3) Phoenix Deer Valley Airport, 1,476 feet. As a remedy for the breach of the covenant, the City of Phoenix reserves the right to enter the Premises and remove the offending structure or cut the offending

tree at Contractor's expense.

G. Contractor, by accepting this Contract, covenants for itself and its successors and assigns, that no use will be made of the Premises that might in any manner interfere with the landing and taking off of aircraft from the Airport or otherwise constitute a hazard to air navigation. As a remedy for the breach of the covenant, the City of Phoenix reserves the right to enter the Premises and abate the interference at Contractor's expense.

H. Contractor agrees that nothing in this Contract may be construed to grant or authorize the granting of an exclusive right within the meaning of 49 U.S.C. § 40103(e) (No exclusive rights at certain facilities).

I. This Contract is subordinate to whatever rights the United States now has or in the future may acquire affecting the control, operation, regulation, and taking-over of the Airport or the exclusive or non-exclusive use of the Airport by the United States during a time of war or national emergency.

J. If this Contract involves construction, Contractor shall carry out the project in accordance with FAA airport design, construction, and equipment standards and specifications current on the date of project approval.

K. Contractor is encouraged to use fuel and energy conservation practices.

3. Immigration Reform and Control Act of 1986 (IRCA)

Contractor agrees that IRCA (Public Law 99-603) applies to it. Contractor shall comply with the provisions of IRCA as it applies to its activities under this Contract and to permit the City of Phoenix to inspect its personnel records to verify its compliance.

4. Conflict of Interest

See Section VII General Conditions, Item 17.

5. Legal Worker Requirements

See Section VII General Conditions, Item 3.

6. City of Phoenix Equal Employment Opportunity Requirement

See Section VII General Conditions, Item 26.

7. Title VI List of Pertinent Nondiscrimination Acts and Authorities

During the performance of this Contract, Contractor agrees to comply with all federal, state, and local nondiscrimination laws, rules, and regulation, including the

following:

- A.** Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d) (prohibits discrimination on the basis of race, color, or national origin).
- B.** 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).
- C.** The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, (42 U.S.C. §§ 4601, *et seq.*) (prohibits unfair treatment of persons displaced or whose property has been acquired because of federal or federal aid programs and projects).
- D.** Section 504 of the Rehabilitation Act of 1973 (29 U.S.C. §§ 701, *et seq.*), as amended (prohibits discrimination on the basis of disability), and 49 C.F.R. Part 27 (Nondiscrimination on the Basis of Disability in Programs or Activities Receiving Federal Financial Assistance).
- E.** 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 U.S.C. § 47123), as amended (prohibits discrimination based on race, creed, color, national origin, or sex).
- F.** The Civil Rights Restoration Act of 1987 (Public Law 100-209) (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 the programs or activities are federally funded or not).
- G.** Titles II and III of the Americans with Disabilities Act of 1990 (42 U.S.C. §§ 12101, *et seq.*), 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 as implemented by U.S. Department of Transportation regulations at 49 C.F.R. Part 37 (Transportation Services for Individual with Disabilities) and Part 38 (Americans with Disabilities Act Accessibility Specification for Transportation Vehicles).
- H.** Executive Order 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations), which ensures nondiscrimination 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.
- I.** Executive Order 13166 (Improving Access to Services for Persons with Limited English Proficiency) and resulting agency guidance and 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).

J. Title IX of the Education Amendments of 1972 (20 U.S.C. §§ 1681, *et seq.*), as amended, which prohibits you from discriminating because of sex in education programs or activities.

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Revised 2/1/19

COMPLIANCE WITH ENVIRONMENTAL LAWS

Contractor shall, at Contractor's expense, comply with all current and future Environmental Laws to the extent that they apply to Contractor's use or occupancy of the Premises or the Airport. If Contractor has any question about its obligations under this Exhibit, then Contractor may contact the City of Phoenix Aviation Department's Planning and Environmental Division for information, but not legal advice.

1. Definitions

1.1 *Airport* means Phoenix Sky Harbor International Airport, Phoenix Deer Valley Airport, or Phoenix Goodyear Airport according to the context of this Contract.

1.2 *Contract* means the lease, license, permit, or other agreement to which this Exhibit is attached.

1.3 *Contractor* means each person and entity that is a named party to this Contract.

1.4 *Contractor's Agents* means all persons under Contractor's direction or control, including Contractor's officers, managers, employees, heirs, personal representatives, invitees, volunteers, guests, successors, and assigns.

1.5 *Premises* means the area of the Airport or other City-owned property used or occupied by Contractor pursuant to this Contract or where Contractor causes or contributes to a Release of a Regulated Substance.

1.6 *Environmental Laws* means all current and future federal, state, and local laws, rules, regulations, and ordinances as clarified by advisory circulars or guidance documents, promulgated to protect the public health or the environment, including the following, as they may hereafter be amended or supplemented:

A. Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), 42 U.S.C. §§ 9601-9628, as amended by the Superfund Amendment and Reauthorization Act of 1986 (SARA), Pub. Law No. 99-499.

B. Solid Waste Disposal Act (SWDA), 42 U.S.C. §§ 6901-6992k, as amended by the Resource Conservation and Recovery Act of 1976 (RCRA), Pub. Law No. 94-580, including the Regulations of Underground Storage Tanks, 42 U.S.C. §§ 6991-6991m.

C. Toxic Substances Control Act of 1976 (TSCA), 15 U.S.C. §§ 2601-2629.

D. Public Health Service Act, 42 U.S.C., Chapter 6A, and Safe Drinking Water Act (SDWA), 42 U.S.C. §§ 300f-300j-27, and the amendments thereto.

- E. Federal Water Pollution Control Act of 1948 (FWPCA), as amended by the Clean Water Act, 33 U.S.C. §§ 1251-1388.
- F. Clean Air Act, 42 U.S.C. §§ 7401-7515.
- G. Title 49 of the Arizona Revised Statutes, A.R.S. §§ 49-101 to 49-1408, including the Arizona Environmental Quality Act, A.R.S. §§ 49-101 to 49-192.01.
- H. Arizona Comprehensive Air Quality Act, A.R.S. §§ 49-401 to 49-593.
- I. Arizona Solid Waste Management Act, A.R.S. §§ 49-701 to 49-881.
- J. Arizona Hazardous Waste Management Act, A.R.S. §§ 49-901 to 49-973.
- K. Arizona Underground Storage Tank Regulation Act, A.R.S. §§ 49-1001 to 49-1093.
- L. Occupational Safety and Health Act of 1970, Pub. Law No. 91-596, as amended by 29 U.S.C. §§ 651-678.
- M. Chapter 28 and Chapter 32C of the Phoenix City Code and City of Phoenix Aviation Department Rule and Regulations, including R&R 01-02 (Storm Water Enforcement).
- N. National Environmental Policy Act (NEPA), Pub. Law. No. 91-190, and all FAA-approved NEPA documents.
- O. Endangered Species Act, 16 U.S.C. §§ 1531-1544.
- P. Arizona Antiquities Act, A.R.S. §§ 41-841 to 41-847.
- Q. Migratory Bird Treaty Act, 16 U.S.C. §§ 703-712.
- R. AZPDES General Permit for Discharges from Construction Activities to Waters of the United States (AZG2013-001 and AZG2020-001) (AZPDES Construction General Permit); AZPDES General Permit for Point Source Discharges from the Application of Pesticides to Waters of the United States (AZG2011-0001) (AZPDES Pesticide General Permit); and AZPDES General Permit for Stormwater Discharges Associated with Industrial Activity to Waters of the United States (AZMSG2019-001) (AZPDES Multi-Sector General Permit).
- S. Interstate Conveyance Sanitation, 21 C.F.R. Part 1250.
- T. Maricopa County Air Quality Department Rule 310 (Fugitive Dust from Dust-Generating Operations) and Rule 310.01 (Fugitive Dust from Non-Traditional Sources of Fugitive Dust).

U. All current and future federal, state, and local laws, rules, regulations, and ordinances promulgated under the foregoing Environmental Laws that provide for the protection of the public health or the environment, including the ambient air, groundwater, surface water, land use, and substrata soils.

1.7 *Regulated Substances* means:

A. The substances identified or listed as a hazardous substance, pollutant, hazardous material, and petroleum in CERCLA; Hazardous Materials Transportation Act, 49 U.S.C. §§ 5101-5128; RCRA; Arizona Regulation of Underground Storage Tanks; Clean Air Act; and all rules and regulations promulgated to implement these Environmental Laws.

B. The substances identified or listed as a hazardous substance, pollutant, toxic pollutant, petroleum, or hazardous, special, or solid waste in the Arizona Environmental Quality Act, including the Water Quality Assurance Revolving Fund Act (WQARF), A.R.S. §§ 49-281 to 49-298; Arizona Comprehensive Air Quality Act; Arizona Solid Waste Management Act; Arizona Underground Storage Tank Regulation Act; Arizona Management of Special Waste Act; Arizona Hazardous Waste Management Act; and all rules and regulations promulgated to implement these Environmental Laws.

C. All substances, materials, and wastes that are or hereafter become regulated or that are classified as hazardous or toxic under any Environmental Law, including building materials that may contain any hazardous substance and its disturbance is subject to any Environmental Law. If a building material, including pavements and paint, will be disturbed by Contractor and the building material is not unpainted wood, metal, or glass, then Contractor shall employ an Asbestos Hazard Emergency Response Act (AHERA)-certified inspector, who shall comply with advance survey and testing requirements and the following rules, as applicable:

(i) 40 C.F.R. Part 61 (National Emission Standards for Hazardous Air Pollutants (NESHAP), Subpart M (National Emission Standards for Asbestos)).

(ii) Maricopa County Air Pollution Control Regulations: National Emission Standard for Asbestos Regulation III Maricopa County Air Quality Department (MCAQD) Rule 370, § 301.9 - subpart M

(iii) To the extent required by Environmental Law, NESHAP Notification Form and Delivery Requirement. A NESHAP Notification Form shall be completed and postmarked or delivered to the MCAQD Asbestos NESHAP Coordinator at least ten (10) days before disturbing any building material even if no asbestos is present.

(iv) 29 C.F.R. Part 1926 (OSHA Safety and Health Regulations for Construction).

(v) RCRA waste determination and proper handling, transport, and disposal.

1.8 *Release* means any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, disposing of a Regulated Substance.

2. Compliance

2.1 Contractor shall not cause or allow any Regulated Substance to be used, generated, manufactured, produced, stored, brought upon, Released on or under, or transported to or from the Premises by Contractor or Contractor's Agents in a manner that constitutes or would foreseeably result in a violation of any Environmental Law or that would give rise to liability under any Environmental Law.

2.2 Contractor may remediate any Release of a Regulated Substance under Chapter 28 of the Phoenix City Code (the City's pretreatment ordinances), under such other ordinances as may be promulgated by the City, and applicable Environmental Laws, including the Clean Water Act to the extent it applies.

2.3 Contractor (Indemnitor) must defend, indemnify, and hold harmless the City of Phoenix and its officers, officials, (elected and appointed), agents, and employees (Indemnitee) from and against any and all demands, claims, complaints, losses, damages, actions or causes of action, assessments, liabilities, costs or expenses, including interest, penalties, and reasonable attorney fees, expert witness fees, and reasonable expenses of investigation and remedial work, (including investigations and remediation by engineers, environmental consultants, and similar technical personnel) asserted against or imposed upon or incurred by Indemnitee arising in connection with, or resulting from, any violation of Environmental Law, including any use, generation, storage, spill, Release, discharge, or disposal of any Hazardous Substance that is now or comes to be located on, at, about, or under the Premises or because of, or in connection with, the violation of any Environmental Law (hereinafter collectively referred to as "Losses") to the extent that such Losses are caused by the fault of Indemnitor or its officers, officials, members, managers, agents, employees, contractors, volunteers, tenants, subtenants, invitees, or licensees (collectively, "Indemnitor's Parties"). Indemnitor's duty to defend Indemnitee accrues immediately at the time a claim is threatened or a claim is made against Indemnitee, whichever occurs first. Indemnitor's duty to defend exists whenever it is alleged that either the Indemnitor and/or one or more of the Indemnitor's Parties, or both, is/are liable, regardless of whether they are ultimately found liable. As used in the section, (a) Hazardous Substance are the Regulated Substances and other substances defined as toxic or hazardous substances, pollutants, or wastes by any Environmental Law and the following substances: gasoline, kerosene, or other petroleum products, toxic pesticides and herbicides, volatile solvents, materials containing asbestos or formaldehyde, and radioactive materials; (b) "Environmental Law" has the meaning prescribed above; (c) "Fault" means those nonculpable acts and omissions giving rise to strict liability under any Environmental Law pertaining to Hazardous Substances, as well as culpable conduct (negligence or willful misconduct). In consideration of the award of this Contract, Indemnitor agrees to waive all rights of subrogation against the City and its officers, officials, (elected and appointed), agents,

and employees for losses arising out of or related to this Contract. The obligations of Indemnitor under this provision shall survive the expiration or earlier termination of this Contract.

2.4 To the extent Contractor or Contractor's Agents Release any Regulated Substance in violation of Environmental Law on or under the Premises, or to the air, groundwater, or surface waters on or adjacent to the Premises, then Contractor shall, at its expense, promptly take all actions that are necessary or appropriate to remediate the Release and mitigate any threat to the public health or the environment consistent with Environmental Law. Subject to the City's prior written consent, Contractor shall undertake all remedial actions that are necessary to return the contaminated area to the condition that existed immediately prior to the Release or, if such prior condition is unknown, to such condition as is acceptable to the governmental agency with jurisdiction. Contractor shall undertake its remedial actions under this Section 2.4 without regard to the potential liability of Contractor or any other person. However, remedial actions undertaken by Contractor shall not impair Contractor's rights, if any, to seek contribution or indemnity from any other responsible party.

2.5 Contractor shall, at its expense, prepare all tests, reports, and studies and provide all information to any appropriate governmental agency that is required pursuant to any Environmental Law as a result of Contractor's use or occupancy of the Premises. Contractor's obligation includes any requirement under Environmental Law for a site characterization, site assessment, and/or remediation plan that may be necessary due to any actual or potential Releases of a Regulated Substances by Contractor or Contractor's Agents on, under, or from the Premises, or to the air, groundwater, or surface waters on or adjacent to the Premises during the Term of this Contract and during the time Contractor has possession of the Premises. Contractor shall, at its expense, promptly (A) provide all information requested by the City related to the applicability of the Environmental Laws to the Premises, (B) respond to any governmental investigation pursuant to Environmental Laws regarding the Premises, and (3) respond to any claim of liability by third parties that relate to any Release of a Regulated Substance by the Contractor or Contractor's Agents on the Premises or the Airport.

2.6 After giving Contractor at least thirty (30) days prior notice, the City may inspect and copy all of Contractor's records, test results, studies, and other documents, not protected by attorney-client privilege, regarding environmental conditions related to the use, storage, or treatment of any Regulated Substance on, under, or from the Premises.

2.7 Contractor shall promptly notify the City in writing upon the occurrence of any of the following:

A. Contractor receives any correspondence or communication from any governmental agency regarding the application or enforcement of any Environmental Law to the Premises or to Contractor's use or occupancy of the Premises.

B. There is any change in Contractor's activities on the Premises that changes or may change Contractor's or the City's obligations or liabilities under any Environmental Law.

C. Any person or entity asserts any claim or any other event occurs for which Contractor may incur an obligation under this Exhibit.

2.8 Contractor shall, at its expense, obtain and comply with all permits and approvals that are, or may become, required as result of Contractor's use or occupancy of the Premises.

2.9 Contractor shall include the provisions of this Exhibit in all agreements and contracts by which it grants a right or privilege to any person or entity under this Contract.

2.10 Contractor shall obtain and maintain compliance with all applicable financial responsibility requirements of all Environmental Laws regarding the ownership or operation of any underground storage tank or other device used to treat or store a Regulated Substance and upon request present evidence thereof to the City.

2.11 Contractor shall take reasonable precautions to prevent persons not acting under Contractor's or Airport's authority, direction, or control from conducting any activity on the Premises that may result in the Release of a Regulated Substance on, under, or from the Premises or to the air, groundwater, or surface waters on or adjacent to the Premises. Contractor shall exercise due care with respect to any Regulated Substance that is located on the Premises as a result of any action of any person who is not under Contractor's authority, direction, or control.

2.12 Contractor shall use its best efforts to minimize its production of a waste stream that includes Regulated Substances, and Contractor shall minimize the storage of Regulated Substances on, in, and around the Premises.

3. Breach and Termination

Subject to the terms and conditions of this Section, Contractor's failure to comply with any requirement or obligation of this Exhibit or any applicable Environmental Law is a default under this Contract. Contractor's failure to cure its default after being provided with notice thereof and a reasonable opportunity to cure, as provided in this Contract, shall constitute a material breach of this Contract. Upon a breach that is not timely cured as provided in this Contract, the City may pursue any and all remedies available under this Contract and all applicable federal, state, and local laws, including the following:

3.1 Without termination of this Contract, the City may enforce all its rights and remedies under this Contract, including, without limitation, any or all the following:

A. The right to file an action or proceeding seeking to recover rent, fees, and other amounts due and that become due under this Contract.

B. The right to recover interest at the rate of 18% per annum on all accrued, but unpaid, rents, fees, and other amounts due calculated from the date the amount was due pursuant to § 4-7 of the Phoenix City Code.

C. The right to file an action or proceeding seeking to recover possession of the Premises.

D. The right to make payments and to perform obligations required of Contractor under this Contract and to be reimbursed by Contractor for the costs thereof, including all attorney fees, expert fees, and other cost incurred by the City.

E. The City may terminate this Contract.

F. The City may exercise the right of “self-help” or similar remedy in order to minimize any damage, expense, penalty, and related fees or costs arising out of or related to the violation of any Environmental Law related to the Premises.

G. By exercising its rights under this Section, the City does not, and may not be construed as, releasing Contractor from any obligation it would otherwise have under this Exhibit or any applicable Environmental Law.

H. The covenants of this Exhibit shall survive the termination of this Contract.

If this Contract does not require Contractor to perform any activity on the Airport or other City-owned property, then the following stormwater provisions do not apply to Contractor or this Contract.

4. AZPDES Stormwater General Permit and Phoenix City Code Chapter 32C Compliance

4.1 Contractor shall comply with the City’s AZPDES Stormwater General Permit and Aviation Department R&R 01-02 (Storm Water Enforcement). Except for discharges on Indian land, stormwater discharges in Arizona are regulated by the Arizona Department of Environmental Quality (ADEQ) through the Arizona Pollutant Discharge Elimination System (AZPDES) program. An AZPDES permit is required for any point source discharge of pollutants to waters of the United States. Because stormwater runoff can transport pollutants to either a municipal separate storm sewer system (MS4) or to waters of the United States, AZPDES permits are required for stormwater discharges.

4.2 The City and Contractor are required to obtain AZPDES permit coverage as required by AZPDES regulations and to the extent that covered stormwater is discharged from the Premises. Coverage under the AZPDES General Permit for Discharges from Construction Activities to Waters of the United States (AZG2013-001 and AZG2020-001) (AZPDES Construction General Permit) is required for stormwater discharges generated by construction activities. Coverage under the AZPDES General Permit for Point Source Discharges from the Application of Pesticides to Waters of the United States (AZG2011-0001) (AZPDES Pesticide General Permit) is required for certain applications of

pesticides. Coverage under the AZPDES General Permit for Stormwater Discharges Associated with Industrial Activity to Waters of the United States (AZMSG2019-001) (AZPDES Multi-Sector General Permit) is required for stormwater discharges generated by facilities and operations engaged in certain industrial activities. Among these industries are those engaged in certain activities within the air transportation and associated activities.

4.3 The City has obtained coverage under the AZPDES Multi-Sector General Permit for its air transportation facilities at the Airports. The City has adopted Stormwater Quality Protection ordinances (Phoenix City Code §§ 32C-1 to 32C-111) and has in place an Aviation Department Stormwater Enforcement Procedures and Civil Penalty Policy (Aviation Stormwater Policy), both of which were developed to comply with Environmental Laws governing stormwater pollution.

4.4 The City adopted the Aviation Stormwater Policy to achieve compliance with the AZPDES program requirements by the Aviation Department and its contractors and permittees. Contractor is subject to the Aviation Stormwater Policy as a condition to its use or occupancy of the Premises or any part of the Airports. The City has the right to monitor Contractor's activities on the Premises and the Airport and enforce Contractor's compliance with the Aviation Stormwater Policy. The City will provide reasonable advance notice to the Contractor ahead of monitoring and audit activities.

4.5 Contractor shall comply with the Aviation Stormwater Policy and shall implement, at its expense, all requirements of the Airports' Stormwater Pollution Prevention Plans (SWPPP) and City ordinances that pertain to Contractor's operations and activities on the Premises and the Airports to the extent the operations and activities have a potential to release pollutants to stormwater. Contractor shall use its best efforts to meet all deadlines that are established by applicable Environmental Laws and the Aviation Stormwater Policy. Contractor agrees that time is of the essence in the implementation of all City permit requirements.

4.6 Contractor's compliance with the AZPDES Permit Program set forth in 18 A.A.C. Chapter 9, Article 9 (R18-9-A901 to R18-9-A909); Chapter 32C of the Phoenix City Code; and the Aviation Stormwater Policy is a material requirement and condition of this Contract. If Contractor fails to comply with the foregoing and the City is exposed to any civil or criminal fine, penalty, sanction, or remediation cost, then the City may, in addition to all other remedies available under this Contract and applicable law, terminate this Contract.

4.7 AZPDES Construction General Permit. If Contractor decides to perform construction activities at the Premises or the Airports, Contractor shall, prior to commencing any such construction activity, obtain stormwater discharge authorization from ADEQ under an AZPDES Construction General Permit. Contractor must obtain that authorization by preparing a SWPPP and filing for AZPDES Construction General Permit coverage in coordination with the City's manager assigned to the project. The City may consult with and assist Contractor with filing for AZPDES Construction General Permit coverage. Contractor shall work with the City's project manager to develop pollution

controls (e.g., best management practices, control measures, and schedules and procedures) for the SWPPP. Contractor is solely responsible for implementing the pollution controls and paying for all costs related to its compliance with its AZPDES Construction General Permit obligations.

4.8 AZPDES Multi-Sector General Permit.

A. If Contractor activities performed at the Premises are under AZDPES Multi-Sector General Permit, the Contractor shall, prior to using, occupying, or commencing any operation or activity on the Premises or the Airports, obtain stormwater discharge authorization from ADEQ under an AZPDES Multi-Sector General Permit. Contractor shall obtain that authorization as a “co-permittee” with the City. As a co-permittee, Contractor shall do all the following:

(i) Provide the City with a copy of Contractor’s written Authorization to Discharge that Contractor receives from ADEQ.

(ii) Implement the Airports’ SWPPP, including all best management practices, control measures, schedules, and procedures that apply to the Contractor’s use or occupancy of the Premises or the Airports.

B. In connection with its coverage under the AZPDES Multi-Sector General Permit, the City has developed a SWPPP for the Airports to minimize the contact of stormwater and other precipitation event water with Significant Materials (as that term is defined in the Section 32C-101 of the Phoenix City Code) generated, stored, handled, used, or otherwise located on the Premises or the Airports. The City shall provide a copy of the SWPPP, including best management practices, control measures, schedules, and procedures, to Contractor, who shall implement that portion of the SWPPP applicable to its use or occupancy of the Premises or the Airports.

C. To the extent allowed by applicable Environmental Laws, Contractor may ask to be removed as a co-permittee from coverage under the AZPDES Multi-Sector General Permit when this Contract expires or is terminated, Contractor vacates the Premises, Contractor fails to comply with the all AZPDES Multi-Sector General Permit requirements, or Contractor decides it does not want to be covered as a co-permittee. Contractor shall not be relieved of its obligation to comply with the requirements of the AZPDES Permit Program with regard to its use or occupancy of the Premises or the Airports, and Contractor shall not be excused from any obligation or indemnification incurred and owed to City prior to Contractor being removed as a co-permittee because Contractor failed to fulfill an obligation of a co-permittee.

4.9 Pollution Controls.

A. City reserves the right to impose upon Contractor any best management practices, control measures, schedules, procedures, and any other action reasonably necessary to ensure the City's ability to comply with its AZPDES Permit Program requirements or applicable City ordinances. However, except in Extreme Emergency Conditions (as that term is defined below), Contractor shall have thirty (30)

days from the City's notice imposing such pollution control measures and any other requirement to notify the City in writing if Contractor objects to any action Contractor is being directed by the City to undertake. If Contractor does not provide a timely objection, then Contractor will be deemed to have consented to the implementation of the pollution control measures or other requirements. If Contractor provides the City with timely notice of its objections, then the City and Contractor shall negotiate a prompt resolution of their differences. If a resolution is not reached within thirty (30) days, then the City's decision resolving the matter shall control. Contractor warrants that it will not serve a written notice of objections for purposes of delay or to avoid compliance with AZPDES Permit Program requirements or applicable City ordinances.

B. *Extreme Emergency Conditions* means all the following:

(i) Conditions that immediately impact the waters of the United States (e.g., Salt River) that result from an emergency, such as a fire, Release of a Regulated Substance, or explosion, that requires the responsible party or parties to immediately begin appropriate response activities independent of City's direction or oversight.

(ii) A catastrophic event that requires Contractor to close its business in the Premises. Contractor must implement pollution control measures before it reopens.

(iii) A collapse of the stormwater system or any other event that prevents the City from performing its obligations under the City's permit due to lack of capacity.

4.10 Covenant of Good Faith. City and Contractor shall act in good faith to implement any requirement imposed on them pursuant to the AZPDES Permit Program. The City and Contractor agree that close cooperation is necessary to ensure compliance with all AZPDES Multi-Sector General Permit requirements and to promote safety and minimize costs. The City and Contractor agree to a candid exchange of information necessary to coordinate a stormwater management and monitoring plan.

Revised May 2022
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SPECIAL PROVISIONS

SKY HARBOR INTERNATIONAL AIRPORT

1.1 Airfield Driver's License

1.1.1 All personnel operating a motor vehicle within the secured areas of Sky Harbor Airport will have a valid airfield driver's license issued by the Phoenix Aviation Department/Operations Division. To qualify for a license, personnel must possess a current valid state driver's license. Individuals must also complete an airfield driver's permit application form, attend an airfield driver's training seminar, and successfully pass a written exam. Applicants must pre-register to attend a class. Contact the Phoenix Aviation Department's Operations Division (602) 273-2036 to make the necessary arrangement.

1.1.2 Exception: Drivers in vehicles without an airfield driver's license may be escorted by a driver in a vehicle with an airfield driver's license. Example: Material supplier vehicle with drivers without an airfield driver's license will be escorted to and from the construction site within the secured area by the Contractor's supplied escort vehicle of which the driver has a valid airfield driver's license. Maximum convoy length will not exceed three vehicles plus the one escort vehicle (total of four). All escorted vehicles must be in the immediate control of the vehicle conducting the escort.

1.2 Security Badges

1.2.1 All construction personnel assigned to the project requiring access to the airport's restricted areas, except for escorted, in-transit material supplies, will apply for an airport security badge. The airport badge must be worn on their outermost garment above the waist at all times while in the restricted areas of the airport. The Contractor and the Subcontractor can apply for these items by contacting the Phoenix Aviation Department Operations Division at (602) 273-2036. A photo identification badge will be made for each employee. Employees will be subject to a federally mandated background check, Criminal History Records Check and Security Threat Assessment, and must pass the security training before a badge can be issued to the applicant. All companies must first establish and maintain at least one Authorized Signer to authorize the issuance of airport security badges for their respective employees. Construction companies need to take into consideration that there is a processing period from the time badge applications are submitted to when the airport security badge is issued. For example, it takes a minimum of seven (7) days for background checks to clear pending all requirements have been met. The total badge fee is \$89. This includes a \$27 fee per person for a criminal history records check, a \$7 fee for a Security Threat Assessment, a \$5 fee for the security badge itself and a \$50 badge control fee that will be returned to the individual or company that paid for it upon return of the badge to the Aviation Department. Fees may be subject to change.

As a general rule, employees working the project for more than seven (7) days may not be escorted and must process for their own airport security badge. All pertinent information regarding the airport's badging process (badge applications, fees, identification, documents, etc.) can be obtained at skyharbor.com/badging.

1.2.2 The Contractor is responsible for obtaining a written 10-year employment history from all employees applying for airport security badges. The Contractor must verify and document in writing the most recent 5 years of the employee's 10-year employment history. The contracting company must complete the employment verifications for an employee prior to signing the employee's badge application form. In addition, the Contractor must retain this past 10-year verification on file in the Contractor's office.

1.2.3 Attendance at a security-training seminar is mandatory prior to the issuance of security badges. All security badge applicants must attend a 2-hour SDA (Security Display Area) training class. Applicants must be pre-registered to attend a class. Contact the Phoenix Aviation Department's Operations Division at (602) 273-2036 to make the necessary arrangements.

1.3 Aircraft Safety

1.3.1 The Contractor will be required to coordinate his work so as to satisfy clearance requirements for arrival and departure of aircraft, and in compliance with FAA Advisory Circulars AC 150/5300-13, AC 150/5370-2, and the Special Safety Requirements concerning operational safety on airports during construction activity.

1.3.2 A high degree of care is necessary to control debris and dust so as not to collect onto aircraft or to accumulate on aprons, taxiways and runways, and not be a visual obstruction nuisance. The Contractor will take whatever steps, procedures, or measures required to prevent loose material from blowing onto aircraft or onto the airfield. The dust control measures will be maintained at all times during the construction of the Project, to the satisfaction of the Aviation Department. The Contractor’s Representative will be aware that the construction area is subject to jet blast that is equivalent to wind velocities of 75 to 90 miles per hour.

1.3.3 The Contractor will be charged the aggregate cost of any cleanup/repairs performed by others from the dust/debris leaving the work area.

1.4 Red Obstruction Lights

1.4.1 The Contractor will provide red obstruction lights and a 3 foot square flag with alternating 1 foot square orange and white checkers for all stationary cranes erected on the construction site. All movable cranes will be equipped with red obstruction lights and a 3 foot square flag with alternating 1 foot square orange and white checkers during working hours. This requirement may be waived when the boom is lowered and the crane is not in use. The Aviation Department will issue Local Notice to Airmen on obstruction lighting and the Contractor will notify the Project Architect/Engineer if any relocation takes place. The Aviation Department Airside Operations Division, (602) 273-2008, must be notified no later than 48 hours prior to erecting the crane, so that a Notice to Airmen (NOTAM) may be issued in a timely manner. Equipment may be required to be removed from the air operations area at night at the discretion of the Aviation Operations Division.

1.5 Yellow Warning Lights For Vehicles

1.5.1 The Contractor will provide yellow-warning lights at all times during work hours, and checkered flags during daylight hours for all vehicles on the construction site.

1.6 Safety & Security Non-Conformance Contract Adjustment (Deductions)

1.6.1 Due to the safety and security precautions necessary at Phoenix Sky Harbor International Airport, failure of the Contractor to adhere to the prescribed requirements has consequences that may jeopardize health, welfare and the lives of customers and employees at Sky Harbor. Therefore, if the Contractor is found to be in non-compliance with the security, airfield and badging/licensing requirements, the Aviation Department may issue Safety & Security Non-Conformance Contract Adjustment (Deductions). Appeals to the Safety & Security Non-Conformance Contract Adjustment (Deductions) can be made within four (4) days of the incident by writing to the Airports Civil Engineer (Project Manager) in charge of the Project. The appeal would need to state why the Safety & Security Non-Conformance Contract Adjustment (Deductions) circumstance is unwarranted. A final decision by the Project Manager will then be made.

1.6.2 Safety & Security Non-Conformance Contract Adjustment (Deductions) Schedule:

- 1. Runway Incursion \$15,000.00
- 2. Active Taxiway Incursion \$10,000.00
- 3. Runway/Taxiway Safety Area \$ 1,000.00
- 4. Security Non-Compliance

First Offense	\$ 1,000.00
Second Offense	\$ 5,000.00
Each Additional Offense	\$15,000.00

- 5. Badging/Licensing Non-Compliance
Fine same as 4
- 6. Aviation Department has the option to issue warnings on first offense, if the incident is justified.
- 7. Individuals involved in a non-compliance violation may be required to surrender their security badge and airfield driver's license pending investigation of the matter.

1.7 Disposal of Surplus Material

- 1.7.1 All surplus and/or waste material must be disposed of off the Airport property at the Contractor's discretion, subject to the following conditions:
- 1.7.2 If the City landfills are used, the Contractor will pay the normal dumping fee.
- 1.7.3 If private property within the City limits is used, the Contractor will obtain written permission from the property owner and deliver a copy of this agreement to the City prior to any hauling dumping. If the surplus material is disposed of outside City limits, the Contractor will comply with all applicable laws/ordinances of the agency concerned and be responsible for all costs incurred.

1.8 Contractor's Parking

- 1.8.1 The Contractor's employees will not be permitted to park their personal vehicles in the Airport parking garages or other parking areas intended for passenger and other airport users.
- 1.8.2 A limited number of parking cards will be made available for the Contractor to purchase and use. These parking cards will be paid for on a monthly basis and are available at the sole discretion of the Aviation Parking Coordinator.

1.9 Agreement Contingency and Allowance

- 1.9.1 A General Contingency Allowance is provided for the purpose of encumbering funds to cover possible additional work. The amount of the allowance item is determined by the Project Manager and is not subjected to individual bid pricing. All bidders will incorporate the amount pre-entered in the bid proposal and will reflect the same in the total amount bid for this Project. This allowance item provides estimated funding to cover unforeseen conditions that may be encountered and correspond to extra work needed to complete the project per plan. Unforeseen extra work, if any, will be approved by the Project Manager.
- 1.9.2 It will be understood that this allowance is an estimate only and is based on the history of similar projects. It will not be utilized without the Project Manager's approval. It is further understood that authorized extra work, if any, may be less than the allowance item.

1.10 Site Security

- 1.10.1 The Contractor will contact the Airport Security Coordinator (602) 273-2036 fifteen (15) calendar days before the start of construction to submit the necessary airport security information for all vehicles and personnel that will be required inside the airport security fence during construction. Vehicle logo requirements (including vehicles with magnetic company logos) and current registration vehicle tags also apply. The Contractor will also be required to submit a letter of verification received from the City, or the City sponsor, identifying the Contractor, its involvement in the project, and length of time of Agreement. New company information manual can be provided to the Contractor prior to submission of paperwork so that all paperwork is ready. This New Company Information Manual can be obtained in the Security Badging Office.

1.11 Vehicle Traffic Regulations (including vehicles with magnetic company logos)

- 1.11.1 The following will be considered major streets: AIR LANE (north of ARFF No. 29) and SKY HARBOR BLVD. (north of ARFF No. 19)
- 1.11.2 All traffic and/or traffic control devices on this project will be provided, maintained and/or controlled as specified in the City of Phoenix Traffic Barricade Manual MUTCD, latest revision.
- 1.11.3 Permission to restrict City streets will be requested as specified in Section III of the Traffic Barricade Manual.
- 1.11.4 Unless otherwise provided in the following “Aircraft Traffic Regulations,” all traffic on this Project will be regulated as specified in Section IV of the Traffic Barricade Manual. Non-peak hours at Phoenix Sky Harbor International Airport are 11:00 p.m. to 5:00 a.m. for lane restrictions. Contractor needs to coordinate closely with Aviation airside operation.
- 1.11.5 No deviation to the “Aircraft Traffic Regulations” will be allowed or implemented unless submitted to the City for review and approval two (2) weeks prior to proposed Work.
- 1.11.6 The Contractor will submit Traffic Control Plans to the Engineer for approval for all work affecting City Streets.

1.12 Aircraft Traffic Regulations

- 1.12.1 Special Regulations for Aircraft Traffic: Aircraft traffic will continue to use existing runways, aprons, and taxiways of the Airport during the times that work under this contract is being performed. The Contractor will at all times so conduct his work as to create no hindrance, hazard, or obstacle to aircraft using the airport, and must, at all times, conduct the work in conformance with the requirements of the Airport Director, and FAA Control Tower, or their authorized representative.
- 1.12.2 Proposed haul routes across aircraft movement areas will require controlled crossings with radio equipped flagmen at each side of the controlled crossing, in accordance with Aviation Department details and requirements.

1.13 Asbestos/Lead Based Paint Identification and Remediation

- 1.13.1 Asbestos and lead based paint identification and/or remediation will be performed by the City of Phoenix unless otherwise indicated by an authorized City of Phoenix representative. Prior to starting Work, the Contractor should obtain a copy of the asbestos and lead based paint survey of the affected area, and contact the City of Phoenix Aviation Environmental Division Manager prior to the disturbance of any building materials that contain or potentially contain asbestos or lead based paint. Building materials that could potentially contain asbestos include any materials that are not wood, metal or glass. Any building materials that will be disturbed during renovation or demolition projects that have not been previously inspected will be inspected by an Asbestos Hazard Emergency Response Act (AHERA) certified building inspector approved by the City of Phoenix. Any asbestos and lead based paint remediation activities will be conducted by contractors licensed to perform asbestos and lead based paint remedial activities and will be approved by the City of Phoenix. All asbestos and lead based paint inspection and remedial work will be performed in compliance with all applicable local, state and federal regulations regarding asbestos, lead based paint and general construction.

**FEDERAL CONTRACT PROVISIONS
FOR AIRPORT IMPROVEMENT PROGRAM CONSTRUCTION PROJECTS**

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III.	General Civil Rights Provisions – 49 U.S.C. § 47123	3	
IV.	Lobbying and Influencing Federal Employees – 31 U.S.C. § 1352; 49 C.F.R. Part 20, Appx. A; 2 C.F.R. Part 200, Appx. II(J)	3	Attachment 2
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Please Note: Attachments are located at end of this Exhibit.

ADDITIONAL FEDERAL CONTRACT PROVISIONS FOR AIRPORT IMPROVEMENT PROGRAM CONSTRUCTION PROJECTS

The Contractor is required to comply with all of the following federal contract provisions as applicable to this Contract.

I. BUY AMERICAN PREFERENCE, 49 U.S.C. § 50101

See [Attachment 1](#).

The contractor agrees to comply with 49 U.S.C. § 50101, which provides that federal funds may not be obligated unless all steel and manufactured goods used in AIP-funded projects are produced in the United States, unless the FAA has issued a waiver for the product; the product is listed as an Excepted Article, Material or Supply in Federal Acquisition Regulation subpart 25.108; or is included in the FAA Nationwide Buy American Waivers Issued list.

A bidder or offeror must complete and submit the appropriate Buy American certification included below with their bid or offer. The City will reject as nonresponsive any bid or offer that does not include a completed Certificate of Buy American Compliance.

Type of Certification is based on Type of Project

There are two types of Buy American certifications:

1. Projects for a facility (buildings, such as terminals, for snow removal equipment, for aircraft rescue and firefighting operations, etc.). The Certificate of Compliance Based on Total Facility must be submitted.
2. Projects for non-facility development (non-building construction projects, such as runway or roadway construction, equipment acquisition projects, etc.). The Certificate of Compliance Based on Equipment and Materials Used on the Project must be submitted.

II. TITLE VI OF THE CIVIL RIGHTS ACT OF 1964 – Compliance with Nondiscrimination Requirements – 49 U.S.C. § 47123 and FAA Order 1400.11

Title VI Solicitation Notice. The City, in accordance with the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252, 42 U.S.C. §§ 2000d to 2000d-4) and the Regulations, hereby notifies all bidders and offerors that it will affirmatively ensure that, in any contract entered into pursuant to this advertisement, disadvantaged business enterprises will be afforded full and fair opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, or national origin in consideration for an award.

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

1. **Compliance with Regulations.** The Contractor (hereinafter includes consultants) will comply with the Title VI List of Pertinent Nondiscrimination Acts and Authorities, as they may be amended from time to time, which are incorporated herein by reference and made a part of this Contract.
2. **Nondiscrimination.** The Contractor, with regard to the work performed by it during the Contract, shall not discriminate on the grounds of race, color, or national origin in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The Contractor shall not participate either directly or indirectly in the discrimination prohibited by the Nondiscrimination Acts and Authorities, including employment practices when the Contract covers any activity, project, or program set forth in Appendix B of 49 C.F.R. Part 21.
3. **Solicitations for Subcontracts, 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 shall be notified by the Contractor of the Contractor's obligations under this Contract and the Nondiscrimination Acts and Authorities on the grounds of race, color, or national origin.

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

5. **Sanctions for Noncompliance.** In the event of the Contractor's noncompliance with the nondiscrimination provisions of this Contract, the City will impose such Contract sanctions as it or the FAA may determine to be appropriate, including:

- (1) Withholding payments to the Contractor under the Contract until the Contractor complies and/or
- (2) Cancelling, terminating, or suspending the Contract, in whole or in part.

6. **Incorporation of Provisions.** The Contractor will include the provisions of paragraphs 1 through 6 in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Nondiscrimination Acts and Authorities, the Regulations, and directives issued pursuant thereto. The Contractor will take action with respect to any subcontract or procurement as the City or the FAA may direct as a means of enforcing such provisions, including sanctions for noncompliance. Provided, however, 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 City to enter into any litigation to protect the interests of the City. In addition, the Contractor may request the United States to enter into the litigation to protect the interests of the United States.

III. GENERAL CIVIL RIGHTS PROVISIONS -- 49 U.S.C. § 47123

1. **Sponsor Contracts.** The Contractor 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 Contractor and subtier contractors from the bid solicitation period through the completion of the Contract. This provision is in addition to that required of Title VI of the Civil Rights Act of 1964.

2. **Sponsor Lease Agreements and Transfer Agreements.** The Contractor, tenant, concessionaire, or lessee agree 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. If the Contractor, tenant, concessionaire, or lessee transfers its obligations to another, the transferee is obligated in the same manner as the Contractor, tenant, concessionaire, or lessee.

This provision obligates the Contractor, tenant, concessionaire, or lessee or its transferee for the period during which the property is owned, used, possessed by the Contractor, tenant, concessionaire, or lessee and the City remains obligated to the Federal Aviation Administration. This provision is in addition to that required by Title VI of the Civil Rights Act of 1964.

IV. LOBBYING AND INFLUENCING FEDERAL EMPLOYEES – 31 U.S.C. § 1352; 49 C.F.R. Part 20, Appx. A; 2 C.F.R. Part 200, Appx. II(J)

See [Attachment 2](#).

V. ACCESS TO RECORDS AND REPORTS – 2 C.F.R. §§ 200.333, 200.336 and FAA Order 5100.38

The Contractor shall maintain an acceptable cost accounting system. The Contractor agrees to provide the City, the FAA, and the Comptroller General of the United States or any of their duly authorized representatives, access to any books, documents, papers, and records of the Contractor that are directly pertinent to this Contract for the purpose of making audit, examination, excerpts, and transcriptions. The Contractor agrees to maintain all books, records, and reports required under this Contract for a period of not less than three years after final payment is made and all pending matters are closed.

VI. DISADVANTAGED BUSINESS ENTERPRISES – 49 C.F.R. Part 26

See Section D.B.E.C. – 1 to 6

VII. ENERGY CONSERVATION REQUIREMENTS – 2 C.F.R. Part 200, Appx. II(H)

The Contractor and its subcontractors shall comply with the mandatory standards and policies relating to energy efficiency as contained in the state energy conservation plan issued in compliance with the Energy Policy and Conservation Act, 42 U.S.C. §§ 6201-6422.

VIII. BREACH OF CONTRACT TERMS – 2 C.F.R. Part 200, Appx. II(A)

Any violation or breach of the terms of this Contract by the Contractor or its subcontractors may result in the suspension or termination of this Contract or such other action that may be necessary to enforce the rights of the parties of this Contract.

The City will provide the Contractor written notice that describes the nature of the breach and corrective actions the Contractor must undertake in order to avoid termination of this Contract. The City reserves the right to withhold payments to the Contractor until such time as the Contractor corrects the breach or the City elects to terminate this Contract. The City's notice will identify a specific date by which the Contractor must correct the breach. The City may proceed with termination of this Contract if the Contractor fails to correct the breach by the deadline indicated in the City's notice.

The duties and obligations imposed by this Contract and the rights and remedies available hereunder are in addition to, and not a limitation of, any duties, obligations, rights, and remedies otherwise imposed or available by law.

IX. RIGHT TO INVENTIONS – 2 C.F.R. Part 200, Appx. II(F) and 37 C.F.R. § 401

If this Contract includes the performance of experimental, developmental, or research work, then this Contract provides for the rights of the United States and the City in any resulting inventions, as established by 37 C.F.R. Part 401, Rights to Inventions Made by Non-profit Organizations and Small Business Firms under Government Grants, Contracts, and Cooperative Agreements. This Contract incorporates by this reference the patent and inventions rights as specified in 37 C.F.R. § 401.14. The Contractor shall include this requirement in all sub-tier contracts involving experimental, developmental, or research work.

See [Attachment 3](#).

X. TRADE RESTRICTION CERTIFICATION – 49 U.S.C. § 50104; 49 C.F.R. Part 30

See [Attachment 4](#).

XI. RESTRICTIONS ON FEDERAL PUBLIC WORK PROJECTS – 49 C.F.R. § 30.15

See [Attachment 5](#).

XII. VETERAN'S PREFERENCE – 49 U.S.C. § 47112

In the employment of labor (excluding executive, administrative, and supervisory positions), the Contractor and all sub-tier contractors must give preference to covered veterans as defined in 49 U.S.C. § 47112. Covered veterans include Vietnam-era veterans, Persian Gulf veterans, Afghanistan-Iraq war veterans,

disabled veterans, and small business concerns (as defined by 15 U.S.C. § 632) owned and controlled by disabled veterans. This preference only applies when there are covered veterans readily available and qualified to perform the work to which the employment relates.

XIII. DAVIS BACON ACT – EFFECTIVE FEDERAL WAGE SCHEDULE – 40 U.S.C. §§ 3142 - 3148

See Section G.W.D. – 1 to 10

XIV. XIV.DAVIS BACON LABOR STANDARDS PROVISIONS – 29 C.F.R. PART 3 and PART 5 AND 2 C.F.R. § 200, Appx. II(D)

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PART 3—CONTRACTORS AND SUBCONTRACTORS ON PUBLIC BUILDING OR PUBLIC WORK FINANCED IN WHOLE OR IN PART BY LOANS OR GRANTS FROM THE UNITED STATES

Contents

- §3.1 Purpose and scope.
 - §3.2 Definitions.
 - §3.3 Weekly statement with respect to payment of wages.
 - §3.4 Submission of weekly statements and the preservation and inspection of weekly payroll records.
 - §3.5 Payroll deductions permissible without application to or approval of the Secretary of Labor.
 - §3.6 Payroll deductions permissible with the approval of the Secretary of Labor.
 - §3.7 Applications for the approval of the Secretary of Labor.
 - §3.8 Action by the Secretary of Labor upon applications.
 - §3.9 Prohibited payroll deductions.
 - §3.10 Methods of payment of wages.
 - §3.11 Regulations part of contract.
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Authority: R.S. 161, sec. 2, 48 Stat. 848; Reorg. Plan No. 14 of 1950, 64 Stat. 1267; 5 U.S.C. 301; 40 U.S.C. 3145; Secretary's Order 01-2014 (Dec. 19, 2014), 79 FR 77527 (Dec. 24, 2014).

Source: 29 FR 97, Jan. 4, 1964, unless otherwise noted.

§3.1 Purpose and scope.

This part prescribes “anti-kickback” regulations under section 2 of the Act of June 13, 1934, as amended (40 U.S.C. 276c), popularly known as the Copeland Act. This part applies to any contract which is subject to Federal wage standards and which is for the construction, prosecution, completion, or repair of public buildings, public works or buildings or works financed in whole or in part by loans or grants from the United States. The part is intended to aid in the enforcement of the minimum wage provisions of the Davis- Bacon Act and the various statutes dealing with federally assisted construction that contain similar minimum wage provisions, including those provisions which are not subject to Reorganization Plan No. 14(e.g., the College Housing Act of 1950, the Federal Water Pollution Control Act, and the Housing Act of 1959), and in the enforcement of the overtime provisions of the Contract Work Hours Standards Act whenever they are applicable to construction work. The part details the obligation of contractors and subcontractors relative to the weekly submission of statements regarding the wages paid on work covered thereby; sets forth the circumstances and procedures governing the making of payroll deductions from the wages of those employed on such work; and delineates the methods of payment permissible on such work.

§3.2 Definitions.

As used in the regulations in this part:

(a) The terms *building* or *work* generally include construction activity as distinguished from manufacturing, furnishing of materials, or servicing and maintenance work. The terms include, without limitation, buildings, structures, and improvements of all types, such as bridges, dams, plants, highways, parkways, streets, subways, tunnels, sewers, mains, powerlines, pumping stations, railways, airports, terminals, docks, piers, wharves, ways, lighthouses, buoys, jetties, breakwaters, levees, and canals; dredging, shoring, scaffolding, drilling, blasting, excavating, clearing, and landscaping. Unless conducted in connection with and at the site of such a building or work as is described in the foregoing sentence, the manufacture or furnishing of materials, articles, supplies, or equipment (whether or not a Federal or State agency acquires title to such materials, articles, supplies,

or equipment during the course of the manufacture or furnishing, or owns the materials from which they are manufactured or furnished) is not a *building* or *work* within the meaning of the regulations in this part.

(b) The terms *construction*, *prosecution*, *completion*, or *repair* mean all types of work done on a particular building or work at the site thereof, including, without limitation, altering, remodeling, painting and decorating, the transporting of materials and supplies to or from the building or work by the employees of the construction contractor or construction subcontractor, and the manufacturing or furnishing of materials, articles, supplies, or equipment on the site of the building or work, by persons employed at the site by the contractor or subcontractor.

(c) The terms *public building* or *public work* include building or work for whose construction, prosecution, completion, or repair, as defined above, a Federal agency is a contracting party, regardless of whether title thereof is in a Federal agency.

(d) The term *building or work financed in whole or in part by loans or grants from the United States* includes building or work for whose construction, prosecution, completion, or repair, as defined above, payment or part payment is made directly or indirectly from funds provided by loans or grants by a Federal agency. The term includes building or work for which the Federal assistance granted is in the form of loan guarantees or insurance.

(e) Every person paid by a contractor or subcontractor in any manner for his labor in the construction, prosecution, completion, or repair of a public building or public work or building or work financed in whole or in part by loans or grants from the United States is *employed* and receiving *wages*, regardless of any contractual relationship alleged to exist between him and the real employer.

(f) The term *any affiliated person* includes a spouse, child, parent, or other close relative of the contractor or subcontractor; a partner or officer of the contractor or subcontractor; a corporation closely connected with the contractor or subcontractor as parent, subsidiary, or otherwise, and an officer or agent of such corporation.

(g) The term *Federal agency* means the United States, the District of Columbia, and all executive departments, independent establishments, administrative agencies, and instrumentalities of the United States and of the District of Columbia, including corporations, all or substantially all of the stock of which is beneficially owned by the United States, by the District of Columbia, or any of the foregoing departments, establishments, agencies, and instrumentalities.

[29 FR 97, Jan. 4, 1964, as amended at 38 FR 32575, Nov. 27, 1973]

§3.3 Weekly statement with respect to payment of wages.

(a) As used in this section, the term *employee* shall not apply to persons in classifications higher than that of laborer or mechanic and those who are the immediate supervisors of such employees.

(b) Each contractor or subcontractor engaged in the construction, prosecution, completion, or repair of any public building or public work, or building or work financed in whole or in part by loans or grants from the United States, shall furnish each week a statement with respect to the wages paid each of its employees engaged on work covered by this part 3 and part 5 of this title during the preceding weekly payroll period. This statement shall be executed by the contractor or subcontractor or by an authorized officer or employee of the contractor or subcontractor who supervises the payment of wages, and shall be on the back of Form WH 347, "Payroll (For Contractors Optional Use)" or on any form with identical wording. Copies of WH 347 may be obtained from the Government contracting or sponsoring agency or from the Wage and Hour Division Web site at <http://www.dol.gov/whd/forms/index.htm> or its successor site.

(c) The requirements of this section shall not apply to any contract of \$2,000 or less.

(d) Upon a written finding by the head of a Federal agency, the Secretary of Labor may provide reasonable limitations, variations, tolerances, and exemptions from the requirements of this section subject to such conditions as the Secretary of Labor may specify.

[29 FR 97, Jan. 4, 1964, as amended at 33 FR 10186, July 17, 1968; 47 FR 23679, May 28, 1982; 73 FR 77511, Dec. 19, 2008; 82 FR 2224, Jan. 9, 2017]

§3.4 Submission of weekly statements and the preservation and inspection of weekly payroll records.

(a) Each weekly statement required under §3.3 shall be delivered by the contractor or subcontractor, within seven days after the regular payment date of the payroll period, to a representative of a Federal or State agency in charge at the site of the building or work, or, if there is no representative of a Federal or State agency at the site of the building or work, the statement shall be mailed by the contractor or subcontractor, within such time, to a Federal or State agency contracting for or financing the building or work. After such examination and check as may be made, such statement, or a copy thereof, shall be kept available, or shall be transmitted together with a report of any violation, in accordance with applicable procedures prescribed by the United States Department of Labor.

(b) Each contractor or subcontractor shall preserve his weekly payroll records for a period of three years from date of completion of the contract. The payroll records shall set out accurately and completely the name and address of each laborer and mechanic, his correct classification, rate of pay, daily and weekly number of hours worked, deductions made, and actual wages paid. Such payroll records shall be made available at all times for inspection by the contracting officer or his authorized representative, and by authorized representatives of the Department of Labor.

(Reporting and recordkeeping requirements in paragraph (b) have been approved by the Office of Management and Budget under control number 1235-0008)

[29 FR 97, Jan. 4, 1964, as amended at 47 FR 145, Jan. 5, 1982; 82 FR 2224, Jan. 9, 2017]

§3.5 Payroll deductions permissible without application to or approval of the Secretary of Labor.

Deductions made under the circumstances or in the situations described in the paragraphs of this section may be made without application to and approval of the Secretary of Labor:

(a) Any deduction made in compliance with the requirements of Federal, State, or local law, such as Federal or State withholding income taxes and Federal social security taxes.

(b) Any deduction of sums previously paid to the employee as a bona fide prepayment of wages when such prepayment is made without discount or interest. A *bona fide prepayment of wages* is considered to have been made only when cash or its equivalent has been advanced to the person employed in such manner as to give him complete freedom of disposition of the advanced funds.

(c) Any deduction of amounts required by court process to be paid to another, unless the deduction is in favor of the contractor, subcontractor, or any affiliated person, or when collusion or collaboration exists.

(d) Any deduction constituting a contribution on behalf of the person employed to funds established by the employer or representatives of employees, or both, for the purpose of providing either from principal or income, or both, medical or hospital care, pensions or annuities on retirement, death benefits, compensation for injuries, illness, accidents, sickness, or disability, or for insurance to provide

any of the foregoing, or unemployment benefits, vacation pay, savings accounts, or similar payments for the benefit of employees, their families and dependents: *Provided, however,* That the following standards are met:

(1) The deduction is not otherwise prohibited by law;

(2) It is either:

(i) Voluntarily consented to by the employee in writing and in advance of the period in which the work is to be done and such consent is not a condition either for the obtaining of or for the continuation of employment, or

(ii) provided for in a bona fide collective bargaining agreement between the contractor or subcontractor and representatives of its employees;

(3) No profit or other benefit is otherwise obtained, directly or indirectly, by the contractor or subcontractor or any affiliated person in the form of commission, dividend, or otherwise; and

(4) The deductions shall serve the convenience and interest of the employee.

(e) Any deduction contributing toward the purchase of United States Defense Stamps and Bonds when voluntarily authorized by the employee.

(f) Any deduction requested by the employee to enable him to repay loans to or to purchase shares in credit unions organized and operated in accordance with Federal and State credit union statutes.

(g) Any deduction voluntarily authorized by the employee for the making of contributions to governmental or quasi-governmental agencies, such as the American Red Cross.

(h) Any deduction voluntarily authorized by the employee for the making of contributions to Community Chests, United Givers Funds, and similar charitable organizations.

(i) Any deductions to pay regular union initiation fees and membership dues, not including fines or special assessments: *Provided, however,* That a collective bargaining agreement between the contractor or subcontractor and representatives of its employees provides for such deductions and the deductions are not otherwise prohibited by law.

(j) Any deduction not more than for the "reasonable cost" of board, lodging, or other facilities meeting the requirements of section 3(m) of the Fair Labor Standards Act of 1938, as amended, and part 531 of this title. When such a deduction is made the additional records required under §516.25(a) of this title shall be kept.

(k) Any deduction for the cost of safety equipment of nominal value purchased by the employee as his own property for his personal protection in his work, such as safety shoes, safety glasses, safety gloves, and hardhats, if such equipment is not required by law to be furnished by the employer, if such deduction is not violative of the Fair Labor Standards Act or prohibited by other law, if the cost on which the deduction is based does not exceed the actual cost to the employer where the equipment is purchased from him and does not include any direct or indirect monetary return to the employer where the equipment is purchased from a third person, and if the deduction is either

(1) Voluntarily consented to by the employee in writing and in advance of the period in which the work is to be done and such consent is not a condition either for the obtaining of employment or its continuance; or

(2) Provided for in a bona fide collective bargaining agreement between the contractor or subcontractor

and representatives of its employees.

[29 FR 97, Jan. 4, 1964, as amended at 36 FR 9770, May 28, 1971]

§3.6 Payroll deductions permissible with the approval of the Secretary of Labor.

Any contractor or subcontractor may apply to the Secretary of Labor for permission to make any deduction not permitted under §3.5. The Secretary may grant permission whenever he finds that:

- (a) The contractor, subcontractor, or any affiliated person does not make a profit or benefit directly or indirectly from the deduction either in the form of a commission, dividend, or otherwise;
- (b) The deduction is not otherwise prohibited by law;
- (c) The deduction is either (1) voluntarily consented to by the employee in writing and in advance of the period in which the work is to be done and such consent is not a condition either for the obtaining of employment or its continuance, or (2) provided for in a bona fide collective bargaining agreement between the contractor or subcontractor and representatives of its employees; and
- (d) The deduction serves the convenience and interest of the employee.

§3.7 Applications for the approval of the Secretary of Labor.

Any application for the making of payroll deductions under §3.6 shall comply with the requirements prescribed in the following paragraphs of this section:

- (a) The application shall be in writing and shall be addressed to the Secretary of Labor.
- (b) The application need not identify the contract or contracts under which the work in question is to be performed. Permission will be given for deductions on all current and future contracts of the applicant for a period of 1 year. A renewal of permission to make such payroll deduction will be granted upon the submission of an application which makes reference to the original application, recites the date of the Secretary of Labor's approval of such deductions, states affirmatively that there is continued compliance with the standards set forth in the provisions of §3.6, and specifies any conditions which have changed in regard to the payroll deductions.
- (c) The application shall state affirmatively that there is compliance with the standards set forth in the provisions of §3.6. The affirmation shall be accompanied by a full statement of the facts indicating such compliance.
- (d) The application shall include a description of the proposed deduction, the purpose to be served thereby, and the classes of laborers or mechanics from whose wages the proposed deduction would be made.
- (e) The application shall state the name and business of any third person to whom any funds obtained from the proposed deductions are to be transmitted and the affiliation of such person, if any, with the applicant.

[29 FR 97, Jan. 4, 1964, as amended at 36 FR 9771, May 28, 1971]

§3.8 Action by the Secretary of Labor upon applications.

The Secretary of Labor shall decide whether or not the requested deduction is permissible under provisions of §3.6; and shall notify the applicant in writing of his decision.

§3.9 Prohibited payroll deductions.

Deductions not elsewhere provided for by this part and which are not found to be permissible under §3.6 are prohibited.

§3.10 Methods of payment of wages.

The payment of wages shall be by cash, negotiable instruments payable on demand, or the additional forms of compensation for which deductions are permissible under this part. No other methods of payment shall be recognized on work subject to the Copeland Act.

§3.11 Regulations part of contract.

All contracts made with respect to the construction, prosecution, completion, or repair of any public building or public work or building or work financed in whole or in part by loans or grants from the United States covered by the regulations in this part shall expressly bind the contractor or subcontractor to comply with such of the regulations in this part as may be applicable. In this regard, see §5.5(a) of this subtitle.

Title 29: Labor

PART 5—LABOR STANDARDS PROVISIONS APPLICABLE TO CONTRACTS COVERING FEDERALLY FINANCED AND ASSISTED CONSTRUCTION (ALSO LABOR STANDARDS PROVISIONS APPLICABLE TO NONCONSTRUCTION CONTRACTS SUBJECT TO THE CONTRACT WORK HOURS AND SAFETY STANDARDS ACT)

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Authority: 5 U.S.C. 301; R.S. 161, 64 Stat. 1267; Reorganization Plan No. 14 of 1950, 5 U.S.C. appendix; 40 U.S.C. 3141 et seq.; 40 U.S.C. 3145; 40 U.S.C. 3148; 40 U.S.C. 3701 et seq.; and the laws listed in 5.1(a) of this part; Secretary's Order No. 01-2014 (Dec. 19, 2014), 79 FR 77527 (Dec. 24, 2014); 28 U.S.C. 2461 note (Federal Civil Penalties Inflation Adjustment Act of 1990); Pub. L. 114-74 at §701, 129 Stat 584.

Source: 48 FR 19541, Apr. 29, 1983, unless otherwise noted.

Subpart A—Davis-Bacon and Related Acts Provisions and

ProceduresSource: 48 FR 19540, Apr. 29, 1983, unless

otherwise noted.

Editorial Note: Nomenclature changes to subpart A of part 5 appear at 61 FR 19984, May 3, 1996.

§5.1 Purpose and scope.

(a) The regulations contained in this part are promulgated under the authority conferred upon the Secretary of Labor by Reorganization Plan No. 14 of 1950 and the Copeland Act in order to coordinate the administration and enforcement of the labor standards provisions of each of the following acts by the Federal agencies responsible for their administration and of such additional statutes as may from time to time confer upon the Secretary of Labor additional duties and responsibilities similar to those conferred upon the Secretary of Labor under Reorganization Plan No. 14 of 1950:

1. The Davis-Bacon Act (sec. 1-7, 46 Stat. 1949, as amended; Pub. L. 74-403, 40 U.S.C. 276a-276a-7).
2. Copeland Act (40 U.S.C. 276c).
3. The Contract Work Hours and Safety Standards Act (40 U.S.C. 327-332).
4. National Housing Act (sec. 212 added to c. 847, 48 Stat. 1246, by sec. 14, 53 Stat. 807; 12 U.S.C. 1715c and repeatedly amended).
5. Housing Act of 1950 (college housing) (amended by Housing Act of 1959 to add labor provisions, 73 Stat. 681; 12 U.S.C. 1749a(f)).
6. Housing Act of 1959 (sec. 401(f) of the Housing Act of 1950 as amended by Pub. L. 86-372, 73 Stat. 681; 12 U.S.C. 1701q(c)(3)).
7. Commercial Fisheries Research and Development Act of 1964 (sec. 7, 78 Stat. 199; 16 U.S.C. 779e(b)).
8. Library Services and Construction Act (sec. 7(a), 78 Stat. 13; 20 U.S.C. 355c(a)(4), as amended).
9. National Technical Institute for the Deaf Act (sec. 5(b)(5), 79 Stat. 126; 20 U.S.C. 684(b)(5)).
10. National Foundation on the Arts and Humanities Act of 1965 (sec. 5(k), 79 Stat. 846 as amended; 20 U.S.C. 954(j)).
11. Elementary and Secondary Education Act of 1965 as amended by Elementary and Secondary and other Education Amendments of 1969 (sec. 423 as added by Pub. L. 91-230, title IV, sec. 401(a)(10), 84 Stat. 169, and renumbered sec. 433, by Pub. L. 92-318; title III, sec. 301(a)(1), 86 Stat. 326; 20 U.S.C. 1232(b)). Under the amendment coverage is extended to all programs administered by the Commissioner of Education.
12. The Federal-Aid Highway Acts (72 Stat. 895, as amended by 82 Stat. 821; 23 U.S.C. 113, as amended by the Surface Transportation Assistance Act of 1982, Pub. L. 97-424).
13. Indian Self-Determination and Education Assistance Act (sec. 7, 88 Stat. 2205; 25 U.S.C. 450e).

14. Indian Health Care Improvement Act (sec. 303(b), 90 Stat. 1407; 25 U.S.C. 1633(b)).
15. Rehabilitation Act of 1973 (sec. 306(b)(5) 87 Stat. 384, 29 U.S.C. 776(b)(5)).
16. Comprehensive Employment and Training Act of 1973 (sec. 606, 87 Stat. 880, renumbered sec. 706 by 88 Stat. 1845; 29 U.S.C. 986; also sec. 604, 88 Stat. 1846; 29 U.S.C. 964(b)(3)).
17. State and Local Fiscal Assistance Act of 1972 (sec. 123(a)(6), 86 Stat. 933; 31 U.S.C. 1246(a)(6)).
18. Federal Water Pollution Control Act (sec. 513 of sec. 2, 86 Stat. 894; 33 U.S.C. 1372).
19. Veterans Nursing Home Care Act of 1964 (78 Stat. 502, as amended; 38 U.S.C. 5035(a)(8)).
20. Postal Reorganization Act (sec. 410(b)(4)(C); 84 Stat. 726 as amended; 39 U.S.C. 410(b)(4)(C)).
21. National Visitors Center Facilities Act of 1966 (sec. 110, 32 Stat. 45; 40 U.S.C. 808).
22. Appalachian Regional Development Act of 1965 (sec. 402, 79 Stat. 21; 40 U.S.C. App. 402).
23. Health Services Research, Health Statistics, and Medical Libraries Act of 1974 (sec. 107, see sec. 308(h)(2) thereof, 88 Stat. 370, as amended by 90 Stat. 378; 42 U.S.C. 242m(h)(2)).
24. Hospital Survey and Construction Act, as amended by the Hospital and Medical Facilities Amendments of 1964 (sec. 605(a)(5), 78 Stat. 453; 42 U.S.C. 291e(a)(5)).
25. Health Professions Educational Assistance Act (sec. 303(b), 90 Stat. 2254; 42 U.S.C. 293a(g)(1)(C); also sec. 308a, 90 Stat. 2258, 42 U.S.C. 293a(c)(7)).
26. Nurse Training Act of 1964 (sec. 941(a)(1)(C), 89 Stat. 384; 42 U.S.C. 296a(b)(5)).
27. Heart Disease, Cancer, and Stroke Amendments of 1965 (sec. 904, as added by sec. 2, 79 Stat. 928; 42 U.S.C. 299d(b)(4)).
28. Safe Drinking Water Act (sec. 2(a) see sec. 1450e thereof, 88 Stat. 1691; 42 U.S.C. 300j-9(e)).
29. National Health Planning and Resources Act (sec. 4, see sec. 1604(b)(1)(H), 88 Stat. 2261, 42 U.S.C. 300o-3(b)(1)(H)).
30. U.S. Housing Act of 1937, as amended and recodified (88 Stat. 667; 42 U.S.C. 1437j).
31. Demonstration Cities and Metropolitan Development Act of 1966 (secs. 110, 311, 503, 1003, 80 Stat. 1259, 1270, 1277, 1284; 42 U.S.C. 3310; 12 U.S.C. 1715c; 42 U.S.C. 1437j).
32. Slum clearance program: Housing Act of 1949 (sec. 109, 63 Stat. 419, as amended; 42 U.S.C. 1459).
33. Farm housing: Housing Act of 1964 (adds sec. 516(f) to Housing Act of 1949 by sec. 503, 78 Stat. 797; 42 U.S.C. 1486(f)).
34. Housing Act of 1961 (sec. 707, added by sec. 907, 79 Stat. 496, as amended; 42 U.S.C. 1500c-3).
35. Defense Housing and Community Facilities and Services Act of 1951 (sec. 310, 65 Stat.

307; 42 U.S.C.1592i).

36. Special Health Revenue Sharing Act of 1975 (sec. 303, see sec. 222(a)(5) thereof, 89 Stat. 324; 42 U.S.C. 2689j(a)(5)).

37. Economic Opportunity Act of 1964 (sec. 607, 78 Stat. 532; 42 U.S.C. 2947).

38. Headstart, Economic Opportunity, and Community Partnership Act of 1974 (sec. 11, see sec. 811thereof, 88 Stat. 2327; 42 U.S.C. 2992a).

39. Housing and Urban Development Act of 1965 (sec. 707, 79 Stat. 492 as amended; 42 U.S.C. 3107).

40. Older Americans Act of 1965 (sec. 502, Pub. L. 89-73, as amended by sec. 501, Pub. L. 93-29; 87 Stat.50; 42 U.S.C. 3041a(a)(4)).

41. Public Works and Economic Development Act of 1965 (sec. 712; 79 Stat. 575 as amended; 42 U.S.C.3222).

42. Juvenile Delinquency Prevention Act (sec. 1, 86 Stat. 536; 42 U.S.C. 3884).

43. New Communities Act of 1968 (sec. 410, 82 Stat. 516; 42 U.S.C. 3909).

44. Urban Growth and New Community Development Act of 1970 (sec. 727(f), 84 Stat. 1803; 42 U.S.C.4529).

45. Domestic Volunteer Service Act of 1973 (sec. 406, 87 Stat. 410; 42 U.S.C. 5046).

46. Housing and Community Development Act of 1974 (secs. 110, 802(g), 88 Stat. 649, 724; 42 U.S.C.5310, 1440(g)).

47. Developmentally Disabled Assistance and Bill of Rights Act (sec. 126(4), 89 Stat. 488; 42 U.S.C.6042(4); title I, sec. 111, 89 Stat. 491; 42 U.S.C. 6063(b)(19)).

48. National Energy Conservation Policy Act (sec. 312, 92 Stat. 3254; 42 U.S.C. 6371j).

49. Public Works Employment Act of 1976 (sec. 109, 90 Stat. 1001; 42 U.S.C. 6708; also sec. 208, 90 Stat.1008; 42 U.S.C. 6728).

50. Energy Conservation and Production Act (sec. 451(h), 90 Stat. 1168; 42 U.S.C. 6881(h)).

51. Solid Waste Disposal Act (sec. 2, 90 Stat. 2823; 42 U.S.C. 6979).

52. Rail Passenger Service Act of 1970 (sec. 405d, 84 Stat. 1337; 45 U.S.C. 565(d)).

53. Urban Mass Transportation Act of 1964 (sec. 10, 78 Stat. 307; renumbered sec. 13 by 88 Stat. 715;
49
U.S.C. 1609).

54. Highway Speed Ground Transportation Study (sec. 6(b), 79 Stat. 893; 49 U.S.C. 1636(b)).

55. Airport and Airway Development Act of 1970 (sec. 22(b), 84 Stat. 231; 49 U.S.C. 1722(b)).

56. Federal Civil Defense Act of 1950 (50 U.S.C. App. 2281i).

57. National Capital Transportation Act of 1965 (sec. 3(b)(4), 79 Stat. 644; 40 U.S.C. 682(b)(4)).

Note. Repealed December 9, 1969, and labor standards incorporated in sec. 1-1431 of the District of Columbia Code).

58. Model Secondary School for the Deaf Act (sec. 4, 80 Stat. 1027, Pub. L. 89-694, but not in the United States Code).

59. Delaware River Basin Compact (sec. 15.1, 75 Stat. 714, Pub. L. 87-328) (considered a statute for purposes of the plan but not in the United States Code).

60. Energy Security Act (sec. 175(c), Pub. L. 96-294, 94 Stat. 611; 42 U.S.C. 8701 note).

(b) Part 1 of this subtitle contains the Department's procedural rules governing requests for wage determinations and the issuance and use of such wage determinations under the Davis-Bacon Act and its related statutes as listed in that part.

§5.2 Definitions.

(a) The term Secretary includes the Secretary of Labor, the Deputy Under Secretary for Employment Standards, and their authorized representatives.

(b) The term Administrator means the Administrator of the Wage and Hour Division, U.S. Department of Labor, or authorized representative.

(c) The term Federal agency means the agency or instrumentality of the United States which enters into the contract or provides assistance through loan, grant, loan guarantee or insurance, or otherwise, to the project subject to a statute listed in §5.1.

(d) The term Agency Head means the principal official of the Federal agency and includes those persons duly authorized to act in the behalf of the Agency Head.

(e) The term Contracting Officer means the individual, a duly appointed successor, or authorized representative who is designated and authorized to enter into contracts on behalf of the Federal agency.

(f) The term labor standards as used in this part means the requirements of the Davis-Bacon Act, the Contract Work Hours and Safety Standards Act (other than those relating to safety and health), the Copeland Act, and the prevailing wage provisions of the other statutes listed in §5.1, and the regulations in parts 1 and 3 of this subtitle and this part.

(g) The term United States or the District of Columbia means the United States, the District of Columbia, and all executive departments, independent establishments, administrative agencies, and instrumentalities of the United States and of the District of Columbia, including corporations, all or substantially all of the stock of which is beneficially owned by the United States, by the foregoing departments, establishments, agencies, instrumentalities, and including non-appropriated fund instrumentalities.

(h) The term contract means any prime contract which is subject wholly or in part to the labor standards provisions of any of the acts listed in §5.1 and any subcontract of any tier thereunder, let under the prime contract. A State or local Government is not regarded as a contractor under statutes providing loans, grants, or other Federal assistance in situations where construction is performed by its own employees. However, under statutes requiring payment of prevailing wages to all laborers and mechanics employed on the assisted project, such as the U.S. Housing Act of 1937, State and local recipients of Federal-aid must pay these employees according to Davis-Bacon labor standards.

(i) The terms building or work generally include construction activity as distinguished from manufacturing, furnishing of materials, or servicing and maintenance work. The terms include without limitation, buildings, structures, and improvements of all types, such as bridges, dams, plants, highways,

parkways, streets, subways, tunnels, sewers, mains, power lines, pumping stations, heavy generators, railways, airports, terminals, docks, piers, wharves, ways, lighthouses, buoys, jetties, breakwaters, levees, canals, dredging, shoring, rehabilitation and reactivation of plants, scaffolding, drilling, blasting, excavating, clearing, and landscaping. The manufacture or furnishing of materials, articles, supplies or equipment (whether or not a Federal or State agency acquires title to such materials, articles, supplies, or equipment during the course of the manufacture or furnishing, or owns the materials from which they are manufactured or furnished) is not a building or work within the meaning of the regulations in this part unless conducted in connection with and at the site of such a building or work as is described in the foregoing sentence, or under the United States Housing Act of 1937 and the Housing Act of 1949 in the construction or development of the project.

(j) The terms construction, prosecution, completion, or repair mean the following:

(1) All types of work done on a particular building or work at the site thereof, including work at a facility which is deemed a part of the site of the work within the meaning of (paragraph (l)) of this section by laborers and mechanics employed by a construction contractor or construction subcontractor (or, under the United States Housing Act of 1937; the Housing Act of 1949; and the Native American Housing Assistance and Self-Determination Act of 1996, all work done in the construction or development of the project), including without limitation—

(i) Altering, remodeling, installation (where appropriate) on the site of the work of items fabricated off-site;

(ii) Painting and decorating;

(iii) Manufacturing or furnishing of materials, articles, supplies or equipment on the site of the building or work (or, under the United States Housing Act of 1937; the Housing Act of 1949; and the Native American Housing Assistance and Self-Determination Act of 1996 in the construction or development of the project);

(iv)(A) Transportation between the site of the work within the meaning of paragraph (l)(1) of this section and a facility which is dedicated to the construction of the building or work and deemed a part of the site of the work within the meaning of paragraph (l)(2) of this section; and

(B) Transportation of portion(s) of the building or work between a site where a significant portion of such building or work is constructed, which is a part of the site of the work within the meaning of paragraph (l)(1) of this section, and the physical place or places where the building or work will remain.

(2) Except for laborers and mechanics employed in the construction or development of the project under the United States Housing Act of 1937; the Housing Act of 1949; and the Native American Housing Assistance and Self-Determination Act of 1996, and except as provided in paragraph (j)(1)(iv)(A) of this section, the transportation of materials or supplies to or from the site of the work by employees of the construction contractor or a construction subcontractor is not “construction, prosecution, completion, or repair” (see Building and Construction Trades Department, AFL-CIO v. United States Department of Labor Wage Appeals Board (Midway Excavators, Inc.), 932 F.2d 985 (D.C. Cir. 1991)).

(k) The term public building or public work includes building or work, the construction, prosecution, completion, or repair of which, as defined above, is carried on directly by authority of or with funds of a Federal agency to serve the interest of the general public regardless of whether title thereof is in a Federal agency.

(l) The term site of the work is defined as follows:

(1) The site of the work is the physical place or places where the building or work called for in the contract will remain; and any other site where a significant portion of the building or work is constructed, provided that such site is established specifically for the performance of the contract or project;

(2) Except as provided in paragraph (l)(3) of this section, job headquarters, tool yards, batch plants, borrowpits, etc., are part of the site of the work, provided they are dedicated exclusively, or nearly so, to performance of the contract or project, and provided they are adjacent or virtually adjacent to the site of the work as defined in paragraph (l)(1) of this section;

(3) Not included in the site of the work are permanent home offices, branch plant establishments, fabrication plants, tool yards, etc., of a contractor or subcontractor whose location and continuance in operation are determined wholly without regard to a particular Federal or federally assisted contract or project. In addition, fabrication plants, batch plants, borrow pits, job headquarters, tool yards, etc., of a commercial or material supplier, which are established by a supplier of materials for the project before opening of bids and not on the site of the work as stated in paragraph (l)(1) of this section, are not included in the site of the work. Such permanent, previously established facilities are not part of the site of the work, even where the operations for a period of time may be dedicated exclusively, or nearly so, to the performance of a contract.

(m) The term laborer or mechanic includes at least those workers whose duties are manual or physical in nature (including those workers who use tools or who are performing the work of a trade), as distinguished from mental or managerial. The term laborer or mechanic includes apprentices, trainees, helpers, and, in the case of contracts subject to the Contract Work Hours and Safety Standards Act, watchmen or guards. The term does not apply to workers whose duties are primarily administrative, executive, or clerical, rather than manual. Persons employed in a bona fide executive, administrative, or professional capacity as defined in part 541 of this title are not deemed to be laborers or mechanics. Working foremen who devote more than 20 percent of their time during a workweek to mechanic or laborer duties, and who do not meet the criteria of part 541, are laborers and mechanics for the time so spent.

(n) The terms apprentice, trainee, and helper are defined as follows:

(1) Apprentice means (i) a person employed and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Bureau, or (ii) a person in the first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice;

(2) Trainee means a person registered and receiving on-the-job training in a construction occupation under a program which has been approved in advance by the U.S. Department of Labor, Employment and Training Administration, as meeting its standards for on-the-job training programs and which has been so certified by that Administration.

(3) These provisions do not apply to apprentices and trainees employed on projects subject to 23 U.S.C. 113 who are enrolled in programs which have been certified by the Secretary of Transportation in accordance with 23 U.S.C. 113(c).

(4) A distinct classification of "helper" will be issued in wage determinations applicable to work performed on construction projects covered by the labor standards provisions of the Davis-Bacon and Related Acts only where:

(i) The duties of the helper are clearly defined and distinct from those of any other classification on the wage determination;

(ii) The use of such helpers is an established prevailing practice in the area; and

(iii) The helper is not employed as a trainee in an informal training program. A "helper" classification will be added to wage determinations pursuant to §5.5(a)(1)(ii)(A) only where, in addition, the work to be performed by the helper is not performed by a classification in the wage determination.

(o) Every person performing the duties of a laborer or mechanic in the construction, prosecution, completion, or repair of a public building or public work, or building or work financed in whole or in part by loans, grants, or guarantees from the United States is employed regardless of any contractual relationship alleged to exist between the contractor and such person.

(p) The term wages means the basic hourly rate of pay; any contribution irrevocably made by a contractor or subcontractor to a trustee or to a third person pursuant to a bona fide fringe benefit fund, plan, or program; and the rate of costs to the contractor or subcontractor which may be reasonably anticipated in providing bona fide fringe benefits to laborers and mechanics pursuant to an enforceable commitment to carry out a financially responsible plan of program, which was communicated in writing to the laborers and mechanics affected. The fringe benefits enumerated in the Davis-Bacon Act include medical or hospital care, pensions on retirement or death, compensation for injuries or illness resulting from occupational activity, or insurance to provide any of the foregoing; unemployment benefits; life insurance, disability insurance, sickness insurance, or accident insurance; vacation or holiday pay; defraying costs of apprenticeship or other similar programs; or other bona fide fringe benefits. Fringe benefits do not include benefits required by other Federal, State, or local law.

(q) The term wage determination includes the original decision and any subsequent decisions modifying, superseding, correcting, or otherwise changing the provisions of the original decision. The application of the wage determination shall be in accordance with the provisions of §1.6 of this title.

[48 FR 19541, Apr. 29, 1983, as amended at 48 FR 50313, Nov. 1, 1983; 55 FR 50149, Dec. 4, 1990; 57 FR 19206, May 4, 1992; 65 FR 69693, Nov. 20, 2000; 65 FR 80278, Dec. 20, 2000; 82 FR 2225, Jan. 9, 2017]

§§5.3-5.4 [Reserved]

§5.5 Contract provisions and related matters.

(a) The Agency head shall cause or require the contracting officer to insert in full in any contract in excess of \$2,000 which is entered into for the actual construction, alteration and/or repair, including painting and decorating, of a public building or public work, or building or work financed in whole or in part from Federal funds or in accordance with guarantees of a Federal agency or financed from funds obtained by pledge of any contract of a Federal agency to make a loan, grant or annual contribution (except where a different meaning is expressly indicated), and which is subject to the labor standards provisions of any of the acts listed in §5.1, the following clauses (or any modifications thereof to meet the particular needs of the agency, Provided, That such modifications are first approved by the Department of Labor):

(1) Minimum wages. (i) All laborers and mechanics employed or working upon the site of the work (or under the United States Housing Act of 1937 or under the Housing Act of 1949 in the construction or development of the project), will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or

mechanics, subject to the provisions of paragraph (a)(1)(iv) of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in §5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph (a)(1)(ii) of this section) and the Davis-Bacon poster (WH- 1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

(ii)(A) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(1) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(2) The classification is utilized in the area by the construction industry; and

(3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(B) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(C) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(D) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs (a)(1)(ii) (B) or (C) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(iii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefits stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(iv) If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account

assets for the meeting of obligations under the plan or program.

(2) Withholding. The (write in name of Federal Agency or the loan or grant recipient) shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld from the contractor under this contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work (or under the United States Housing Act of 1937 or under the Housing Act of 1949 in the construction or development of the project), all or part of the wages required by the contract, the (Agency) may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

(3) Payrolls and basic records. (i) Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work (or under the United States Housing Act of 1937, or under the Housing Act of 1949, in the construction or development of the project). Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

(ii)(A) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the (write in name of appropriate federal agency) if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit the payrolls to the applicant, sponsor, or owner, as the case may be, for transmission to the (write in name of agency). The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at <http://www.dol.gov/esa/whd/forms/wh347instr.htm> or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the (write in name of appropriate federal agency) if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit them to the applicant, sponsor, or owner, as the case may be, for transmission to the (write in name of agency), the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the sponsoring government agency (or the applicant, sponsor, or owner).

(B) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(1) That the payroll for the payroll period contains the information required to be provided under §5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under §5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;

(2) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;

(3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(C) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph (a)(3)(ii)(B) of this section.

(D) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

(iii) The contractor or subcontractor shall make the records required under paragraph (a)(3)(i) of this section available for inspection, copying, or transcription by authorized representatives of the (write the name of the agency) or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the Federal agency may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

(4) Apprentices and trainees—(i) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in

accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(ii) Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(iii) Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

(5) Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.

(6) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses contained in 29 CFR 5.5(a)(1) through (10) and such other clauses as the (write in the name of the Federal agency) may by appropriate instructions require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

(7) Contract termination: debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

(8) Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.

(9) Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their

representatives.

(10) Certification of eligibility. (i) By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

(b) Contract Work Hours and Safety Standards Act. The Agency Head shall cause or require the contracting officer to insert the following clauses set forth in paragraphs (b)(1), (2), (3), and (4) of this section in full in any contract in an amount in excess of \$100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by §5.5(a) or §4.6 of part 4 of this title. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

(1) Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

(2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (b)(1) of this section the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (b)(1) of this section, in the sum of \$26 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (b)(1) of this section.

(3) Withholding for unpaid wages and liquidated damages. The (write in the name of the Federal agency or the loan or grant recipient) shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (b)(2) of this section.

(4) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (b)(1) through (4) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (b)(1) through (4) of this section.

(c) In addition to the clauses contained in paragraph (b), in any contract subject only to the Contract Work Hours and Safety Standards Act and not to any of the other statutes cited in §5.1, the Agency Head shall cause or require the contracting officer to insert a clause requiring that the contractor or subcontractor

shall maintain payrolls and basic payroll records during the course of the work and shall preserve them for a period of three years from the completion of the contract for all laborers and mechanics, including guards and watchmen, working on the contract. Such records shall contain the name and address of each such employee, social security number, correct classifications, hourly rates of wages paid, daily and weekly number of hours worked, deductions made, and actual wages paid. Further, the Agency Head shall cause or require the contracting officer to insert in any such contract a clause providing that the records to be maintained under this paragraph shall be made available by the contractor or subcontractor for inspection, copying, or transcription by authorized representatives of the (write the name of agency) and the Department of Labor, and the contractor or subcontractor will permit such representatives to interview employees during working hours on the job.

(The information collection, recordkeeping, and reporting requirements contained in the following paragraphs of this section were approved by the Office of Management and Budget:

Paragraph	OMB Control No.
(a)(1)(ii)(B)	1235-0023
(a)(1)(ii)(C)	1235-0023
(a)(1)(iv)	1235-0023
(a)(3)(i)	1235-0023
(a)(3)(ii)(A)	1235-0023
	1235-0008
(c)	1235-0023

[48 FR 19540, Apr. 29, 1983, as amended at 51 FR 12265, Apr. 9, 1986; 55 FR 50150, Dec. 4, 1990; 57 FR 28776, June 26, 1992; 58 FR 58955, Nov. 5, 1993; 61 FR 40716, Aug. 5, 1996; 65 FR 69693, Nov. 20, 2000; 73 FR 77511, Dec. 19, 2008; 81 FR 43450, July 1, 2016; 82 FR 2225, 2226, Jan. 9, 2017; 83 FR 12, Jan 2, 2018]

§5.6 Enforcement.

(a)(1) It shall be the responsibility of the Federal agency to ascertain whether the clauses required by §5.5 have been inserted in the contracts subject to the labor standards provisions of the Acts contained in §5.1. Agencies which do not directly enter into such contracts shall promulgate the necessary regulations or procedures to require the recipient of the Federal assistance to insert in its contracts the provisions of §5.5. No payment, advance, grant, loan, or guarantee of funds shall be approved by the Federal agency unless the agency ensures that the clauses required by §5.5 and the appropriate wage determination of the Secretary of Labor are contained in such contracts. Furthermore, no payment, advance, grant, loan, or guarantee of funds shall be approved by the Federal agency after the beginning of construction unless there is on file with the agency a certification by the contractor that the contractor and its subcontractors have complied with the provisions of §5.5 or unless there is on file with the agency a certification by the contractor that there is a substantial dispute with respect to the required provisions.

(2) Payrolls and Statements of Compliance submitted pursuant to §5.5(a)(3)(ii) shall be preserved by the Federal agency for a period of 3 years from the date of completion of the contract and shall be produced at the request of the Department of Labor at any time during the 3-year period.

(3) The Federal agency shall cause such investigations to be made as may be necessary to assure compliance with the labor standards clauses required by §5.5 and the applicable statutes listed in §5.1. Investigations shall be made of all contracts with such frequency as may be necessary to assure

compliance. Such investigations shall include interviews with employees, which shall be taken in confidence, and examinations of payroll data and evidence of registration and certification with respect to apprenticeship and training plans. In making such examinations, particular care shall be taken to determine the correctness of classifications and to determine whether there is a disproportionate employment of laborers and of apprentices or trainees registered in approved programs. Such investigations shall also include evidence of fringe benefit plans and payments thereunder. Complaints of alleged violations shall be given priority.

(4) In accordance with normal operating procedures, the contracting agency may be furnished various investigatory material from the investigation files of the Department of Labor. None of the material, other than computations of back wages and liquidated damages and the summary of back wages due, may be disclosed in any manner to anyone other than Federal officials charged with administering the contract or program providing Federal assistance to the contract, without requesting the permission and views of the Department of Labor.

(5) It is the policy of the Department of Labor to protect the identity of its confidential sources and to prevent an unwarranted invasion of personal privacy. Accordingly, the identity of an employee who makes a written or oral statement as a complaint or in the course of an investigation, as well as portions of the statement which would reveal the employee's identity, shall not be disclosed in any manner to anyone other than Federal officials without the prior consent of the employee. Disclosure of employee statements shall be governed by the provisions of the "Freedom of Information Act" (5 U.S.C. 552, see 29 CFR part 70) and the "Privacy Act of 1974" (5 U.S.C. 552a).

(b) The Administrator shall cause to be made such investigations as deemed necessary, in order to obtain compliance with the labor standards provisions of the applicable statutes listed in §5.1, or to affirm or reject the recommendations by the Agency Head with respect to labor standards matters arising under the statutes listed in §5.1. Federal agencies, contractors, subcontractors, sponsors, applicants, or owners shall cooperate with any authorized representative of the Department of Labor in the inspection of records, in interviews with workers, and in all other aspects of the investigations. The findings of such an investigation, including amounts found due, may not be altered or reduced without the approval of the Department of Labor. Where the underpayments disclosed by such an investigation total \$1,000 or more, where there is reason to believe that the violations are aggravated or willful (or, in the case of the Davis-Bacon Act, that the contractor has disregarded its obligations to employees and subcontractors), or where liquidated damages may be assessed under the Contract Work Hours and Safety Standards Act, the Department of Labor will furnish the Federal agency an enforcement report detailing the labor standards violations disclosed by the investigation and any action taken by the contractor to correct the violative practices, including any payment of back wages. In other circumstances, the Federal agency will be furnished a letter of notification summarizing the findings of the investigation.

§5.7 Reports to the Secretary of Labor.

(a) Enforcement reports. (1) Where underpayments by a contractor or subcontractor total less than \$1,000, and where there is no reason to believe that the violations are aggravated or willful (or, in the case of the Davis-Bacon Act that the contractor has disregarded its obligations to employees and subcontractors), and where restitution has been effected and future compliance assured, the Federal agency need not submit its investigative findings and recommendations to the Administrator, unless the investigation was made at the request of the Department of Labor. In the latter case, the Federal agency shall submit a factual summary report detailing any violations including any data on the amount of restitution paid, the number of workers who received restitution, liquidated damages assessed under the Contract Work Hours and Safety Standards Act, corrective measures taken (such as "letters of notice"), and any information that may be necessary to review any recommendations for an appropriate adjustment in liquidated damages under §5.8.

(2) Where underpayments by a contractor or subcontractor total \$1,000 or more, or where there is reason to believe that the violations are aggravated or willful (or, in the case of the Davis-Bacon Act, that the

contractor has disregarded its obligations to employees and subcontractors), the Federal agency shall furnish within 60 days after completion of its investigation, a detailed enforcement report to the Administrator.

(b) Semi-annual enforcement reports. To assist the Secretary in fulfilling the responsibilities under Reorganization Plan No. 14 of 1950, Federal agencies shall furnish to the Administrator by April 30 and October 31 of each calendar year semi-annual reports on compliance with and enforcement of the labor standards provisions of the Davis-Bacon Act and its related acts covering the periods of October 1 through March 31 and April 1 through September 30, respectively. Such reports shall be prepared in the manner prescribed in memoranda issued to Federal agencies by the Administrator. This report has been cleared in accordance with FPMR 101-11.11 and assigned interagency report control number 1482-DOL-SA.

(c) Additional information. Upon request, the Agency Head shall transmit to the Administrator such information available to the Agency with respect to contractors and subcontractors, their contracts, and the nature of the contract work as the Administrator may find necessary for the performance of his or her duties with respect to the labor standards provisions referred to in this part.

(d) Contract termination. Where a contract is terminated by reason of violations of the labor standards provisions of the statutes listed in §5.1, a report shall be submitted promptly to the Administrator and to the Comptroller General (if the contract is subject to the Davis-Bacon Act), giving the name and address of the contractor or subcontractor whose right to proceed has been terminated, and the name and address of the contractor or subcontractor, if any, who is to complete the work, the amount and number of the contract, and the description of the work to be performed.

§5.8 Liquidated damages under the Contract Work Hours and Safety Standards Act.

(a) The Contract Work Hours and Safety Standards Act requires that laborers or mechanics shall be paid wages at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in any workweek. In the event of violation of this provision, the contractor and any subcontractor shall be liable for the unpaid wages and in addition for liquidated damages, computed with respect to each laborer or mechanic employed in violation of the Act in the amount of \$26 for each calendar day in the workweek on which such individual was required or permitted to work in excess of forty hours without payment of required overtime wages. Any contractor or subcontractor aggrieved by the withholding of liquidated damages shall have the right to appeal to the head of the agency of the United States (or the territory of District of Columbia, as appropriate) for which the contract work was performed or for which financial assistance was provided.

(b) Findings and recommendations of the Agency Head. The Agency Head has the authority to review the administrative determination of liquidated damages and to issue a final order affirming the determination. It is not necessary to seek the concurrence of the Administrator, but the Administrator shall be advised of the action taken. Whenever the Agency Head finds that a sum of liquidated damages administratively determined to be due is incorrect or that the contractor or subcontractor violated inadvertently the provisions of the Act notwithstanding the exercise of due care upon the part of the contractor or subcontractor involved, and the amount of the liquidated damages computed for the contract is in excess of \$500, the Agency Head may make recommendations to the Secretary that an appropriate adjustment in liquidated damages be made or that the contractor or subcontractor be relieved of liability for such liquidated damages. Such findings with respect to liquidated damages shall include findings with respect to any wage underpayments for which the liquidated damages are determined.

(c) The recommendations of the Agency Head for adjustment or relief from liquidated damages under paragraph (a) of this section shall be reviewed by the Administrator or an authorized representative who shall issue an order concurring in the recommendations, partially concurring in the recommendations, or rejecting the recommendations, and the reasons therefor. The order shall be the final decision of the Department of Labor, unless a petition for review is filed pursuant to part 7 of this title, and the Administrative Review Board in its discretion reviews such decision and order; or, with respect to

contracts subject to the Service Contract Act, unless petition for review is filed pursuant to part 8 of this title, and the Administrative Review Board in its discretion reviews such decision and order.

(d) Whenever the Agency Head finds that a sum of liquidated damages administratively determined to be due under section 104(a) of the Contract Work Hours and Safety Standards Act for a contract is \$500 or less and the Agency Head finds that the sum of liquidated damages is incorrect or that the contractor or subcontractor violated inadvertently the provisions of the Contract Work Hours and Safety Standards Act notwithstanding the exercise of due care upon the part of the contractor or subcontractor involved, an appropriate adjustment may be made in such liquidated damages or the contractor or subcontractor may be relieved of liability for such liquidated damages without submitting recommendations to this effect or a report to the Department of Labor. This delegation of authority is made under section 105 of the Contract Work Hours and Safety Standards Act and has been found to be necessary and proper in the public interest to prevent undue hardship and to avoid serious impairment of the conduct of Government business.

[48 FR 19541, Apr. 29, 1983, as amended at 51 FR 12265, Apr. 9, 1986; 51 FR 13496, Apr. 21, 1986; 81 FR 43450, July 1, 2016; 83 FR 12, Jan. 2, 2018]

§5.9 Suspension of funds.

In the event of failure or refusal of the contractor or any subcontractor to comply with the labor standards clauses contained in §5.5 and the applicable statutes listed in §5.1, the Federal agency, upon its own action or upon written request of an authorized representative of the Department of Labor, shall take such action as may be necessary to cause the suspension of the payment, advance or guarantee of funds until such time as the violations are discontinued or until sufficient funds are withheld to compensate employees for the wages to which they are entitled and to cover any liquidated damages which may be due.

§5.10 Restitution, criminal action.

(a) In cases other than those forwarded to the Attorney General of the United States under paragraph (b), of this section, where violations of the labor standards clauses contained in §5.5 and the applicable statutes listed in §5.1 result in underpayment of wages to employees, the Federal agency or an authorized representative of the Department of Labor shall request that restitution be made to such employees or on their behalf to plans, funds, or programs for any type of bona fide fringe benefits within the meaning of section 1(b)(2) of the Davis-Bacon Act.

(b) In cases where the Agency Head or the Administrator finds substantial evidence that such violations are willful and in violation of a criminal statute, the matter shall be forwarded to the Attorney General of the United States for prosecution if the facts warrant. In all such cases the Administrator shall be informed simultaneously of the action taken.

§5.11 Disputes concerning payment of wages.

(a) This section sets forth the procedure for resolution of disputes of fact or law concerning payment of prevailing wage rates, overtime pay, or proper classification. The procedures in this section may be initiated upon the Administrator's own motion, upon referral of the dispute by a Federal agency pursuant to §5.5(a)(9), or upon request of the contractor or subcontractor(s).

(b)(1) In the event of a dispute described in paragraph (a) of this section in which it appears that relevant facts are at issue, the Administrator will notify the affected contractor and subcontractor(s) (if any), by registered or certified mail to the last known address, of the investigation findings. If the Administrator determines that there is reasonable cause to believe that the contractor and/or subcontractor(s) should also be subject to debarment under the Davis-Bacon Act or §5.12(a)(1), the letter will so indicate.

(2) A contractor and/or subcontractor desiring a hearing concerning the Administrator's investigative findings shall request such a hearing by letter postmarked within 30 days of the date of the Administrator's letter. The request shall set forth those findings which are in dispute and the reasons therefor, including any affirmative defenses, with respect to the violations and/or debarment, as appropriate.

(3) Upon receipt of a timely request for a hearing, the Administrator shall refer the case to the Chief Administrative Law Judge by Order of Reference, to which shall be attached a copy of the letter from the Administrator and response thereto, for designation of an Administrative Law Judge to conduct such hearings as may be necessary to resolve the disputed matters. The hearing shall be conducted in accordance with the procedures set forth in 29 CFR part 6.

(c)(1) In the event of a dispute described in paragraph (a) of this section in which it appears that there are no relevant facts at issue, and where there is not at that time reasonable cause to institute debarment proceedings under §5.12, the Administrator shall notify the contractor and subcontractor(s) (if any), by registered or certified mail to the last known address, of the investigation findings, and shall issue a ruling on any issues of law known to be in dispute.

(2)(i) If the contractor and/or subcontractor(s) disagree with the factual findings of the Administrator or believe that there are relevant facts in dispute, the contractor or subcontractor(s) shall so advise the Administrator by letter postmarked within 30 days of the date of the Administrator's letter. In the response, the contractor and/or subcontractor(s) shall explain in detail the facts alleged to be in dispute and attach any supporting documentation.

(ii) Upon receipt of a response under paragraph (c)(2)(i) of this section alleging the existence of a factual dispute, the Administrator shall examine the information submitted. If the Administrator determines that there is a relevant issue of fact, the Administrator shall refer the case to the Chief Administrative Law Judge in accordance with paragraph (b)(3) of this section. If the Administrator determines that there is no relevant issue of fact, the Administrator shall so rule and advise the contractor and subcontractor(s) (if any) accordingly.

(3) If the contractor and/or subcontractor(s) desire review of the ruling issued by the Administrator under paragraph (c)(1) or (2) of this section, the contractor and/or subcontractor(s) shall file a petition for review thereof with the Administrative Review Board within 30 days of the date of the ruling, with a copy thereof to the Administrator. The petition for review shall be filed in accordance with part 7 of this title.

(d) If a timely response to the Administrator's findings or ruling is not made or a timely petition for review is not filed, the Administrator's findings and/or ruling shall be final, except that with respect to debarment under the Davis-Bacon Act, the Administrator shall advise the Comptroller General of the Administrator's recommendation in accordance with §5.12(a)(1). If a timely response or petition for review is filed, the findings and/or ruling of the Administrator shall be inoperative unless and until the decision is upheld by the Administrative Law Judge or the Administrative Review Board.

§5.12 Debarment proceedings.

(a)(1) Whenever any contractor or subcontractor is found by the Secretary of Labor to be in aggravated or willful violation of the labor standards provisions of any of the applicable statutes listed in §5.1 other than the Davis-Bacon Act, such contractor or subcontractor or any firm, corporation, partnership, or association in which such contractor or subcontractor has a substantial interest shall be ineligible for a period not to exceed 3 years (from the date of publication by the Comptroller General of the name or names of said contractor or subcontractor on the ineligible list as provided below) to receive any contracts or subcontract subject to any of the statutes listed in §5.1.

(2) In cases arising under contracts covered by the Davis-Bacon Act, the Administrator shall transmit to the Comptroller General the names of the contractors or subcontractors and their responsible officers, if any (and any firms in which the contractors or subcontractors are known to have an interest), who have been found to have disregarded their obligations to employees, and the recommendation of the Secretary

of Labor or authorized representative regarding debarment. The Comptroller General will distribute a list to all Federal agencies giving the names of such ineligible person or firms, who shall be ineligible to be awarded any contract or subcontract of the United States or the District of Columbia and any contract or subcontract subject to the labor standards provisions of the statutes listed in §5.1.

(b)(1) In addition to cases under which debarment action is initiated pursuant to §5.11, whenever as a result of an investigation conducted by the Federal agency or the Department of Labor, and where the Administrator finds reasonable cause to believe that a contractor or subcontractor has committed willful or aggravated violations of the labor standards provisions of any of the statutes listed in §5.1 (other than the Davis-Bacon Act), or has committed violations of the Davis-Bacon Act which constitute a disregard of its obligations to employees or subcontractors under section 3(a) thereof, the Administrator shall notify by registered or certified mail to the last known address, the contractor or subcontractor and its responsible officers, if any (and any firms in which the contractor or subcontractor are known to have a substantial interest), of the finding. The Administrator shall afford such contractor or subcontractor and any other parties notified an opportunity for a hearing as to whether debarment action should be taken under paragraph (a)(1) of this section or section 3(a) of the Davis-Bacon Act. The Administrator shall furnish to those notified a summary of the investigative findings. If the contractor or subcontractor or any other parties notified wish to request a hearing as to whether debarment action should be taken, such a request shall be made by letter postmarked within 30 days of the date of the letter from the Administrator, and shall set forth any findings which are in dispute and the reasons therefor, including any affirmative defenses to be raised. Upon receipt of such request for a hearing, the Administrator shall refer the case to the Chief Administrative Law Judge by Order of Reference, to which shall be attached a copy of the letter from the Administrator and the response thereto, for designation of an Administrative Law Judge to conduct such hearings as may be necessary to determine the matters in dispute. In considering debarment under any of the statutes listed in §5.1 other than the Davis-Bacon Act, the Administrative Law Judge shall issue an order concerning whether the contractor or subcontractor is to be debarred in accordance with paragraph (a)(1) of this section. In considering debarment under the Davis-Bacon Act, the Administrative Law Judge shall issue a recommendation as to whether the contractor or subcontractor should be debarred under section 3(a) of the Act.

(2) Hearings under this section shall be conducted in accordance with 29 CFR part 6. If no hearing is requested within 30 days of receipt of the letter from the Administrator, the Administrator's findings shall be final, except with respect to recommendations regarding debarment under the Davis-Bacon Act, as set forth in paragraph (a)(2) of this section.

(c) Any person or firm debarred under paragraph (a)(1) of this section may in writing request removal from the debarment list after six months from the date of publication by the Comptroller General of such person or firm's name on the ineligible list. Such a request should be directed to the Administrator of the Wage and Hour Division, U.S. Department of Labor, Washington, DC 20210, and shall contain a full explanation of the reasons why such person or firm should be removed from the ineligible list. In cases where the contractor or subcontractor failed to make full restitution to all underpaid employees, a request for removal will not be considered until such underpayments are made. In all other cases, the Administrator will examine the facts and circumstances surrounding the violative practices which caused the debarment, and issue a decision as to whether or not such person or firm has demonstrated a current responsibility to comply with the labor standards provisions of the statutes listed in §5.1, and therefore should be removed from the ineligible list. Among the factors to be considered in reaching such a decision are the severity of the violations, the contractor or subcontractor's attitude towards compliance, and the past compliance history of the firm. In no case will such removal be effected unless the Administrator determines after an investigation that such person or firm is in compliance with the labor standards provisions applicable to Federal contracts and Federally assisted construction work subject to any of the applicable statutes listed in §5.1 and other labor statutes providing wage protection, such as the Service Contract Act, the Walsh-Healey Public Contracts Act, and the Fair Labor Standards Act. If the request for removal is denied, the person or firm may petition for review by the Administrative Review Board pursuant to 29 CFR part 7.

(d)(1) Section 3(a) of the Davis-Bacon Act provides that for a period of three years from date of

publication on the ineligible list, no contract shall be awarded to any persons or firms placed on the list as a result of a finding by the Comptroller General that such persons or firms have disregarded obligations to employees and subcontractors under that Act, and further, that no contract shall be awarded to "any firm, corporation, partnership, or association in which such persons or firms have an interest." Paragraph (a)(1) of this section similarly provides that for a period not to exceed three years from date of publication on the ineligible list, no contract subject to any of the statutes listed in §5.1 shall be awarded to any contractor or subcontractor on the ineligible list pursuant to that paragraph, or to "any firm, corporation, partnership, or association" in which such contractor or subcontractor has a "substantial interest." A finding as to whether persons or firms whose names appear on the ineligible list have an interest (or a substantial interest, as appropriate) in any other firm, corporation, partnership, or association, may be made through investigation, hearing, or otherwise.

(2)(i) The Administrator, on his/her own motion or after receipt of a request for a determination pursuant to paragraph (d)(3) of this section may make a finding on the issue of interest (or substantial interest, as appropriate).

(ii) If the Administrator determines that there may be an interest (or substantial interest, as appropriate), but finds that there is insufficient evidence to render a final ruling thereon, the Administrator may refer the issue to the Chief Administrative Law Judge in accordance with paragraph (d)(4) of this section.

(iii) If the Administrator finds that no interest (or substantial interest, as appropriate) exists, or that there is not sufficient information to warrant the initiation of an investigation, the requesting party, if any, will be so notified and no further action taken.

(iv)(A) If the Administrator finds that an interest (or substantial interest, as appropriate) exists, the person or firm affected will be notified of the Administrator's finding (by certified mail to the last known address), which shall include the reasons therefor, and such person or firm shall be afforded an opportunity to request that a hearing be held to render a decision on the issue.

(B) Such person or firm shall have 20 days from the date of the Administrator's ruling to request a hearing. A detailed statement of the reasons why the Administrator's ruling is in error, including facts alleged to be in dispute, if any, shall be submitted with the request for a hearing.

(C) If no hearing is requested within the time mentioned in paragraph (d)(2)(iv)(B) of this section, the Administrator's finding shall be final and the Administrator shall so notify the Comptroller General. If a hearing is requested, the ruling of the Administrator shall be inoperative unless and until the administrative law judge or the Administrative Review Board issues an order that there is an interest (or substantial interest, as appropriate).

(3)(i) A request for a determination of interest (or substantial interest, as appropriate), may be made by any interested party, including contractors or prospective contractors and associations of contractor's representatives of employees, and interested Government agencies. Such a request shall be submitted in writing to the Administrator, Wage and Hour Division, U.S. Department of Labor, Washington, DC 20210.

(ii) The request shall include a statement setting forth in detail why the petitioner believes that a person or firm whose name appears on the debarred bidders list has an interest (or a substantial interest, as appropriate) in any firm, corporation, partnership, or association which is seeking or has been awarded a contract of the United States or the District of Columbia, or which is subject to any of the statutes listed in §5.1. No particular form is prescribed for the submission of a request under this section.

(4) Referral to the Chief Administrative Law Judge. The Administrator, on his/her own motion under paragraph (d)(2)(ii) of this section or upon a request for hearing where the Administrator determines that relevant facts are in dispute, will by order refer the issue to the Chief Administrative Law Judge, for designation of an Administrative Law Judge who shall conduct such hearings as may be necessary to render a decision solely on the issue of interest (or substantial interest, as appropriate). Such proceedings

shall be conducted in accordance with the procedures set forth at 29 CFR part 6.

(5) Referral to the Administrative Review Board. If the person or firm affected requests a hearing and the Administrator determines that relevant facts are not in dispute, the Administrator will refer the issue and therecord compiled thereon to the Administrative Review Board to render a decision solely on the issue of interest (or substantial interest, as appropriate). Such proceeding shall be conducted in accordance with the procedures set forth at 29 CFR part 7.

[48 FR 19541, Apr. 29, 1983, as amended at 48 FR 50313, Nov. 1, 1983; 82 FR 2226, Jan. 9, 2017]

§5.13 Rulings and interpretations.

All questions relating to the application and interpretation of wage determinations (including the classifications therein) issued pursuant to part 1 of this subtitle, of the rules contained in this part and in parts 1 and 3, and of the labor standards provisions of any of the statutes listed in §5.1 shall be referred to the Administrator for appropriate ruling or interpretation. The rulings and interpretations shall be authoritative and those under the Davis-Bacon Act may be relied upon as provided for in section 10 of the Portal-to-Portal Act of 1947 (29 U.S.C. 259). Requests for such rulings and interpretations should be addressed to the Administrator, Wage and Hour Division, U.S. Department of Labor, Washington, DC 20210.

[82 FR 2226, Jan. 9, 2017]

§5.14 Variations, tolerances, and exemptions from parts 1 and 3 of this subtitle and this part.

The Secretary of Labor may make variations, tolerances, and exemptions from the regulatory requirements of this part and those of parts 1 and 3 of this subtitle whenever the Secretary finds that such action is necessary and proper in the public interest or to prevent injustice and undue hardship. Variations, tolerances, and exemptions may not be made from the statutory requirements of any of the statutes listed in §5.1 unless the statute specifically provides such authority.

§5.15 Limitations, variations, tolerances, and exemptions under the Contract Work Hours and Safety Standards Act.

(a) General. Upon his or her own initiative or upon the request of any Federal agency, the Secretary of Labor may provide under section 105 of the Contract Work Hours and Safety Standards Act reasonable limitations and allow variations, tolerances, and exemptions to and from any or all provisions of that Act whenever the Secretary finds such action to be necessary and proper in the public interest to prevent injustice, or undue hardship, or to avoid serious impairment of the conduct of Government business. Any request for such action by the Secretary shall be submitted in writing, and shall set forth the reasons for which the request is made.

(b) Exemptions. Pursuant to section 105 of the Contract Work Hours and Safety Standards Act, the following classes of contracts are found exempt from all provisions of that Act in order to prevent injustice, undue hardship, or serious impairment of Government business:

(1) Contract work performed in a workplace within a foreign country or within territory under the jurisdiction of the United States other than the following: A State of the United States; the District of Columbia; Puerto Rico; the Virgin Islands; Outer Continental Shelf lands defined in the Outer Continental Shelf Lands Act (ch. 345, 67 Stat. 462); American Samoa; Guam; Wake Island; Eniwetok Atoll; Kwajalein Atoll; and Johnston Island.

(2) Agreements entered into by or on behalf of the Commodity Credit Corporation providing for the storing in or handling by commercial warehouses of wheat, corn, oats, barley, rye, grain sorghums, soybeans,

flaxseed, rice, naval stores, tobacco, peanuts, dry beans, seeds, cotton, and wool.

(3) Sales of surplus power by the Tennessee Valley Authority to States, counties, municipalities, cooperative organization of citizens or farmers, corporations and other individuals pursuant to section 10 of the Tennessee Valley Authority Act of 1933 (16 U.S.C. 8311).

(c) Tolerances. (1) The "basic rate of pay" under section 102 of the Contract Work Hours and Safety Standards Act may be computed as an hourly equivalent to the rate on which time-and-one-half overtime compensation may be computed and paid under section 7 of the Fair Labor Standards Act of 1938, as amended (29 U.S.C. 207), as interpreted in part 778 of this title. This tolerance is found to be necessary and proper in the public interest in order to prevent undue hardship.

(2) Concerning the tolerance provided in paragraph (c)(1) of this section, the provisions of section 7(d)(2) of the Fair Labor Standards Act and §778.7 of this title should be noted. Under these provisions, payments for occasional periods when no work is performed, due to vacations, and similar causes are excludable from the "regular rate" under the Fair Labor Standards Act. Such payments, therefore, are also excludable from the "basic rate" under the Contract Work Hours and Safety Standards Act.

(3) See §5.8(c) providing a tolerance subdelegating authority to the heads of agencies to make appropriate adjustments in the assessment of liquidated damages totaling \$500 or less under specified circumstances.

(4)(i) Time spent in an organized program of related, supplemental instruction by laborers or mechanics employed under bona fide apprenticeship or training programs may be excluded from working time if the criteria prescribed in paragraphs (c)(4)(ii) and (iii) of this section are met.

(ii) The apprentice or trainee comes within the definition contained in §5.2(n).

(iii) The time in question does not involve productive work or performance of the apprentice's or trainee's regular duties.

(d) Variations. (1) In the event of failure or refusal of the contractor or any subcontractor to comply with overtime pay requirements of the Contract Work Hours and Safety Standards Act, if the funds withheld by Federal agencies for the violations are not sufficient to pay fully both the unpaid wages due laborers and mechanics and the liquidated damages due the United States, the available funds shall be used first to compensate the laborers and mechanics for the wages to which they are entitled (or an equitable portion thereof when the funds are not adequate for this purpose); and the balance, if any, shall be used for the payment of liquidated damages.

(2) In the performance of any contract entered into pursuant to the provisions of 38 U.S.C. 620 to provide nursing home care of veterans, no contractor or subcontractor under such contract shall be deemed in violation of section 102 of the Contract Work Hours and Safety Standards Act by virtue of failure to pay the overtime wages required by such section for work in excess of 40 hours in the workweek to any individual employed by an establishment which is an institution primarily engaged in the care of the sick, the aged, or the mentally ill or defective who reside on the premises if, pursuant to an agreement or understanding arrived at between the employer and the employee before performance of the work, a work period of 14 consecutive days is accepted in lieu of the workweek of 7 consecutive days for the purpose of overtime compensation and if such individual receives compensation for employment in excess of 8 hours in any workday and in excess of 80 hours in such 14-day period at a rate not less than 1 1/2 times the regular rate at which the individual is employed, computed in accordance with the requirements of the Fair Labor Standards Act of 1938, as amended.

(3) Any contractor or subcontractor performing on a government contract the principal purpose of which is the furnishing of firefighting or suppression and related services, shall not be deemed to be in violation of section 102 of the Contract Work Hour and Safety Standards Act for failing to pay the overtime compensation required by section 102 of the Act in accordance with the basic rate of pay as defined in

paragraph (c)(1) of this section, to any pilot or copilot of a fixed-wing or rotary-wing aircraft employed on such contract if:

(i) Pursuant to a written employment agreement between the contractor and the employee which is arrived at before performance of the work.

(A) The employee receives gross wages of not less than \$300 per week regardless of the total number of hours worked in any workweek, and

(B) Within any workweek the total wages which an employee receives are not less than the wages to which the employee would have been entitled in that workweek if the employee were paid the minimum hourly wage required under the contract pursuant to the provisions of the Service Contract Act of 1965 and any applicable wage determination issued thereunder for all hours worked, plus an additional premium payment of one-half times such minimum hourly wage for all hours worked in excess of 40 hours in the workweek;

(ii) The contractor maintains accurate records of the total daily and weekly hours of work performed by such employee on the government contract. In the event these conditions for the exemption are not met, the requirements of section 102 of the Contract Work Hours and Safety Standards Act shall be applicable to the contract from the date the contractor or subcontractor fails to satisfy the conditions until completion of the contract.

(Reporting and recordkeeping requirements in paragraph (d)(2) have been approved by the Office of Management and Budget under control numbers 1235-0023 and 1235-0018. Reporting and recordkeeping requirements in paragraph (d)(3)(ii) have been approved by the Office of Management and Budget under control number 1235-0018)

[48 FR 19541, Apr. 29, 1983, as amended at 51 FR 12265, Apr. 9, 1986; 61 FR 40716, Aug. 5, 1996; 82 FR 2226, Jan. 9, 2017]

§5.16 Training plans approved or recognized by the Department of Labor prior to August 20, 1975.

(a) Notwithstanding the provisions of §5.5(a)(4)(ii) relating to the utilization of trainees on Federal and federally assisted construction, no contractor shall be required to obtain approval of a training program which, prior to August 20, 1975, was approved by the Department of Labor for purposes of the Davis-Bacon and Related Acts, was established by agreement of organized labor and management and therefore recognized by the Department, and/or was recognized by the Department under Executive Order 11246, as amended. A copy of the program and evidence of its prior approval, if applicable shall be submitted to the Employment and Training Administration, which shall certify such prior approval or recognition of the program. In every other respect, the provisions of §5.5(a)(4)(ii)—including those relating to registration of trainees, permissible ratios, and wage rates to be paid—shall apply to these programs.

(b) Every trainee employed on a contract executed on and after August 20, 1975, in one of the above training programs must be individually registered in the program in accordance with Employment and Training Administration procedures, and must be paid at the rate specified in the program for the level of progress. Any such employee listed on the payroll at a trainee rate who is not registered and participating in a program certified by ETA pursuant to this section, or approved and certified by ETA pursuant to §5.5(a)(4)(ii), must be paid the wage rate determined by the Secretary of Labor for the classification of work actually performed. The ratio of trainees to journeymen shall not be greater than permitted by the terms of the program.

(c) In the event a program which was recognized or approved prior to August 20, 1975, is modified, revised, extended, or renewed, the changes in the program or its renewal must be approved by the Employment and Training Administration before they may be placed into effect.

§5.17 Withdrawal of approval of a training program.

If at any time the Employment and Training Administration determines, after opportunity for a hearing, that the standards of any program, whether it is one recognized or approved prior to August 20, 1975, or a program subsequently approved, have not been complied with, or that such a program fails to provide adequate training for participants, a contractor will no longer be permitted to utilize trainees at less than the predetermined rate for the classification of work actually performed until an acceptable program is approved.

Subpart B—Interpretation of the Fringe Benefits Provisions of the Davis-Bacon Act Source: 29 FR

13465, Sept. 30, 1964, unless otherwise noted.

§5.20 Scope and significance of this subpart.

The 1964 amendments (Pub. L. 88-349) to the Davis-Bacon Act require, among other things, that the prevailing wage determined for Federal and federally-assisted construction include: (a) The basic hourly rate of pay; and (b) the amount contributed by the contractor or subcontractor for certain fringe benefits (or the cost to them of such benefits). The purpose of this subpart is to explain the provisions of these amendments. This subpart makes available in one place official interpretations of the fringe benefits provisions of the Davis-Bacon Act. These interpretations will guide the Department of Labor in carrying out its responsibilities under these provisions. These interpretations are intended also for the guidance of contractors, their associations, laborers and mechanics and their organizations, and local, State and Federal agencies, who may be concerned with these provisions of the law. The interpretations contained in this subpart are authoritative and may be relied upon as provided for in section 10 of the Portal-to-Portal Act of 1947 (29 U.S.C. 359). The omission to discuss a particular problem in this subpart or in interpretations supplementing it should not be taken to indicate the adoption of any position by the Secretary of Labor with respect to such problem or to constitute an administrative interpretation, practice, or enforcement policy.

Questions on matters not fully covered by this subpart may be referred to the Secretary for interpretation as provided in §5.12.

§5.21 [Reserved]

§5.22 Effect of the Davis-Bacon fringe benefits provisions.

The Davis-Bacon Act and the prevailing wage provisions of the related statutes listed in §1.1 of this subtitle confer upon the Secretary of Labor the authority to predetermine, as minimum wages, those wage rates found to be prevailing for corresponding classes of laborers and mechanics employed on projects of a character similar to the contract work in the area in which the work is to be performed. See paragraphs (a) and (b) of §1.2 of this subtitle. The fringe benefits amendments enlarge the scope of this authority by including certain bona fide fringe benefits within the meaning of the terms "wages", "scale of wages", "wage rates", "minimum wages" and "prevailing wages", as used in the Davis-Bacon Act.

§5.23 The statutory provisions.

The fringe benefits provisions of the 1964 amendments to the Davis-Bacon Act are, in part, as follows:

(b) As used in this Act the term "wages", "scale of wages", "wage rates", "minimum wages", and "prevailing wages" shall include—

(1) The basic hourly rate of pay; and

(2) The amount of—

(A) The rate of contribution irrevocably made by a contractor or subcontractor to a trustee or to a third

person pursuant to a fund, plan, or program; and

(B) The rate of costs to the contractor or subcontractor which may be reasonably anticipated in providing benefits to laborers and mechanics pursuant to an enforceable commitment to carry out a financially responsible plan or program which was communicated in writing to the laborers and mechanics affected,

for medical or hospital care, pensions on retirement or death, compensation for injuries or illness resulting from occupational activity, or insurance to provide any of the foregoing, for unemployment benefits, life insurance, disability and sickness insurance, or accident insurance, for vacation and holiday pay, for defraying costs of apprenticeship or other similar programs, or for other bona fide fringe benefits, but only where the contractor or subcontractor is not required by other Federal, State, or local law to provide any of such benefits * * *.

§5.24 The basic hourly rate of pay.

“The basic hourly rate of pay” is that part of a laborer's or mechanic's wages which the Secretary of Labor would have found and included in wage determinations prior to the 1964 amendments. The Secretary of Labor is required to continue to make a separate finding of this portion of the wage. In general, this portion of the wage is the cash payment made directly to the laborer or mechanic. It does not include fringe benefits.

§5.25 Rate of contribution or cost for fringe benefits.

(a) Under the amendments, the Secretary is obligated to make a separate finding of the rate of contribution or cost of fringe benefits. Only the amount of contributions or costs for fringe benefits which meet the requirements of the act will be considered by the Secretary. These requirements are discussed in this subpart.

(b) The rate of contribution or cost is ordinarily an hourly rate, and will be reflected in the wage determination as such. In some cases, however, the contribution or cost for certain fringe benefits may be expressed in a formula or method of payment other than an hourly rate. In such cases, the Secretary may in his discretion express in the wage determination the rate of contribution or cost used in the formula or method or may convert it to an hourly rate of pay whenever he finds that such action would facilitate the administration of the Act. See §5.5(a)(1)(i) and (iii).

§5.26 “* * * contribution irrevocably made * * * to a trustee or to a third person”.

Under the fringe benefits provisions (section 1(b)(2) of the Act) the amount of contributions for fringe benefits must be made to a trustee or to a third person irrevocably. The “third person” must be one who is not affiliated with the contractor or subcontractor. The trustee must assume the usual fiduciary responsibilities imposed upon trustees by applicable law. The trust or fund must be set up in such a way that in no event will the contractor or subcontractor be able to recapture any of the contributions paid in or any way divert the funds to his own use or benefit. Although contributions made to a trustee or third person pursuant to a benefit plan must be irrevocably made, this does not prevent return to the contractor or subcontractor of sums which he had paid in excess of the contributions actually called for by the plan, as where such excess payments result from error or from the necessity of making payments to cover the estimated cost of contributions at a time when the exact amount of the necessary contributions under the plan is not yet ascertained. For example, a benefit plan may provide for definite insurance benefits for employees in the event of the happening of a specified contingency such as death, sickness, accident, etc., and may provide that the cost of such definite benefits, either in full or any balance in excess of specified employee contributions, will be borne by the contractor or subcontractor. In such a case the return by the insurance company to the contractor or subcontractor of sums paid by him in excess of the amount required to provide the benefits which, under the plan, are to be provided through contributions by the contractor or subcontractor, will not be deemed a recapture or diversion by the employer of contributions made pursuant to the plan. (See Report of the Senate Committee on Labor and Public

Welfare, S. Rep. No. 963, 88th Cong., 2d Sess., p. 5.)

§5.27 “* * * fund, plan, or program”.

The contributions for fringe benefits must be made pursuant to a fund, plan or program (sec. 1(b)(2)(A) of the act). The phrase “fund, plan, or program” is merely intended to recognize the various types of arrangements commonly used to provide fringe benefits through employer contributions. The phrase is identical with language contained in section 3(1) of the Welfare and Pension Plans Disclosure Act. In interpreting this phrase, the Secretary will be guided by the experience of the Department in administering the latter statute. (See Report of Senate Committee on Labor and Public Welfare, S. Rep. No. 963, 88th Cong., 2d Sess., p. 5.)

§5.28 Unfunded plans.

(a) The costs to a contractor or subcontractor which may be reasonably anticipated in providing benefits of the types described in the act pursuant to an enforceable commitment to carry out a financially responsible plan or program, are considered fringe benefits within the meaning of the act (see 1(b)(2)(B) of the act). The legislative history suggests that these provisions were intended to permit the consideration of fringe benefits meeting, among others, these requirements and which are provided from the general assets of a contractor or subcontractor. (Report of the House Committee on Education and Labor, H. Rep. No. 308, 88th Cong., 1st Sess., p. 4.)

(b) No type of fringe benefit is eligible for consideration as a so-called unfunded plan unless:

(1) It could be reasonably anticipated to provide benefits described in the act;

(2) It represents a commitment that can be legally enforced;

(3) It is carried out under a financially responsible plan or program; and

(4) The plan or program providing the benefits has been communicated in writing to the laborers and mechanics affected. (See S. Rep. No. 963, p. 6.)

(c) It is in this manner that the act provides for the consideration of unfunded plans or programs in finding prevailing wages and in ascertaining compliance with the Act. At the same time, however, there is protection against the use of this provision as a means of avoiding the act's requirements. The words “reasonably anticipated” are intended to require that any unfunded plan or program be able to withstand a test which can perhaps be best described as one of actuarial soundness. Moreover, as in the case of other fringe benefits payable under the act, an unfunded plan or program must be “bona fide” and not a mere simulation or sham for avoiding compliance with the act. (See S. Rep. No. 963, p. 6.) The legislative history suggests that in order to insure against the possibility that these provisions might be used to avoid compliance with the act, the committee contemplates that the Secretary of Labor in carrying out his responsibilities under Reorganization Plan No. 14 of 1950, may direct a contractor or subcontractor to set aside in an account assets which, under sound actuarial principles, will be sufficient to meet the future obligation under the plan. The preservation of this account for the purpose intended would, of course, also be essential. (S. Rep. No. 963, p. 6.) This is implemented by the contractual provisions required by §5.5(a)(1)(iv).

§5.29 Specific fringe benefits.

(a) The act lists all types of fringe benefits which the Congress considered to be common in the construction industry as a whole. These include the following: Medical or hospital care, pensions on retirement or death, compensation for injuries or illness resulting from occupational activity, or insurance to provide any of the foregoing, unemployment benefits, life insurance, disability and sickness insurance, or accident insurance, vacation and holiday pay, defrayment of costs of apprenticeship or other similar

programs, or other bona fide fringe benefits, but only where the contractor or subcontractor is not required by other Federal, State, or local law to provide any of such benefits.

(b) The legislative history indicates that it was not the intent of the Congress to impose specific standards relating to administration of fringe benefits. It was assumed that the majority of fringe benefits arrangements of this nature will be those which are administered in accordance with requirements of section 302(c)(5) of the National Labor Relations Act, as amended (S. Rep. No. 963, p. 5).

(c) The term "other bona fide fringe benefits" is the so-called "open end" provision. This was included so that new fringe benefits may be recognized by the Secretary as they become prevailing. It was pointed out that a particular fringe benefit need not be recognized beyond a particular area in order for the Secretary to find that it is prevailing in that area. (S. Rep. No. 963, p. 6).

(d) The legislative reports indicate that, to insure against considering and giving credit to any and all fringe benefits, some of which might be illusory or not genuine, the qualification was included that such fringe benefits must be "bona fide" (H. Rep. No. 308, p. 4; S. Rep. No. 963, p. 6). No difficulty is anticipated in determining whether a particular fringe benefit is "bona fide" in the ordinary case where the benefits are those common in the construction industry and which are established under a usual fund, plan, or program. This would be typically the case of those fringe benefits listed in paragraph (a) of this section which are funded under a trust or insurance program. Contractors may take credit for contributions made under such conventional plans without requesting the approval of the Secretary of Labor under §5.5(a)(1)(iv).

(e) Where the plan is not of the conventional type described in the preceding paragraph, it will be necessary for the Secretary to examine the facts and circumstances to determine whether they are "bona fide" in accordance with requirements of the act. This is particularly true with respect to unfunded plans. Contractors or subcontractors seeking credit under the act for costs incurred for such plans must request specific permission from the Secretary under §5.5(a)(1)(iv).

(f) The act excludes fringe benefits which a contractor or subcontractor is obligated to provide under other Federal, State, or local law. No credit may be taken under the act for the payments made for such benefits. For example, payment for workmen's compensation insurance under either a compulsory or elective State statute are not considered payments for fringe benefits under the Act. While each situation must be separately considered on its own merits, payments made for travel, subsistence or to industry promotion funds are not normally payments for fringe benefits under the Act. The omission in the Act of any express reference to these payments, which are common in the construction industry, suggests that these payments should not normally be regarded as bona fide fringe benefits under the Act.

§5.30 Types of wage determinations.

(a) When fringe benefits are prevailing for various classes of laborers and mechanics in the area of proposed construction, such benefits are includable in any Davis-Bacon wage determination. Illustrations, contained in paragraph (c) of this section, demonstrate some of the different types of wage determinations which may be made in such cases.

(b) Wage determinations of the Secretary of Labor under the act do not include fringe benefits for various classes of laborers and mechanics whenever such benefits do not prevail in the area of proposed construction. When this occurs the wage determination will contain only the basic hourly rates of pay, that is only the cash wages which are prevailing for the various classes of laborers and mechanics. An illustration of this situation is contained in paragraph (c) of this section.

(c) Illustrations:

Classes	Basic hourly rates	Health and welfare	Pensions	Vacations	Apprenticeship program	Others
Laborers	\$3.25					
Carpenters	4.00	\$0.15				
Painters	3.90	.15	\$0.10	\$0.20		
Electricians	4.85	.10	.15			
Plumbers	4.95	.15	.20		\$0.05	
Ironworkers	4.60			.10		

(It should be noted this format is not necessarily in the exact form in which determinations will issue; it is for illustration only.)

§5.31 Meeting wage determination obligations.

(a) A contractor or subcontractor performing work subject to a Davis-Bacon wage determination may discharge his minimum wage obligations for the payment of both straight time wages and fringe benefits by paying in cash, making payments or incurring costs for “bona fide” fringe benefits of the types listed in the applicable wage determination or otherwise found prevailing by the Secretary of Labor, or by a combination thereof.

(b) A contractor or subcontractor may discharge his obligations for the payment of the basic hourly rates and the fringe benefits where both are contained in a wage determination applicable to his laborers or mechanics in the following ways:

(1) By paying not less than the basic hourly rate to the laborers or mechanics and by making the contributions for the fringe benefits in the wage determinations, as specified therein. For example, in the illustration contained in paragraph (c) of §5.30, the obligations for “painters” will be met by the payment of a straight time hourly rate of not less than \$3.90 and by contributing not less than at the rate of 15 cents an hour for health and welfare benefits, 10 cents an hour for pensions, and 20 cents an hour for vacations; or

(2) By paying not less than the basic hourly rate to the laborers or mechanics and by making contributions for “bona fide” fringe benefits in a total amount not less than the total of the fringe benefits required by the wage determination. For example, the obligations for “painters” in the illustration in paragraph (c) of §5.30 will be met by the payment of a straight time hourly rate of not less than \$3.90 and by contributions of not less than a total of 45 cents an hour for “bona fide” fringe benefits; or

(3) By paying in cash directly to laborers or mechanics for the basic hourly rate and by making an additional cash payment in lieu of the required benefits. For example, where an employer does not make payments or incur costs for fringe benefits, he would meet his obligations for “painters” in the illustration in paragraph (c) of §5.30, by paying directly to the painters a straight time hourly rate of not less than \$4.35 (\$3.90 basic hourly rate plus 45 cents for fringe benefits); or

(4) As stated in paragraph (a) of this section, the contractor or subcontractor may discharge his minimum wage obligations for the payment of straight time wages and fringe benefits by a combination of the methods illustrated in paragraphs (b)(1) thru (3) of this section. Thus, for example, his obligations for “painters” may be met by an hourly rate, partly in cash and partly in payments or costs for fringe benefits which total not less than \$4.35 (\$3.90 basic hourly rate plus 45 cents for fringe benefits). The payments in such case may be \$4.10 in cash and 25 cents in payments or costs in fringe benefits. Or, they may be \$3.75 in cash and 60 cents in payments or costs for fringe benefits.

[30 FR 13136, Oct. 15, 1965]

§5.32 Overtime payments.

(a) The act excludes amounts paid by a contractor or subcontractor for fringe benefits in the computation of overtime under the Fair Labor Standards Act, the Contract Work Hours and Safety Standards Act, and the Walsh-Healey Public Contracts Act whenever the overtime provisions of any of these statutes apply concurrently with the Davis-Bacon Act or its related prevailing wage statutes. It is clear from the legislative history that in no event can the regular or basic rate upon which premium pay for overtime is calculated under the aforementioned Federal statutes be less than the amount determined by the Secretary of Labor as the basic hourly rate (i.e. cash rate) under section 1(b)(1) of the Davis-Bacon Act. (See S. Rep. No. 963, p. 7.) Contributions by employees are not excluded from the regular or basic rate upon which overtime is computed under these statutes; that is, an employee's regular or basic straight-time rate is computed on his earnings before any deductions are made for the employee's contributions to fringe benefits. The contractor's contributions or costs for fringe benefits may be excluded in computing such rate so long as the exclusions do not reduce the regular or basic rate below the basic hourly rate contained in the wage determination.

(b) The legislative report notes that the phrase "contributions irrevocably made by a contractor or subcontractor to a trustee or to a third person pursuant to a fund, plan, or program" was added to the bill in Committee. This language in essence conforms to the overtime provisions of section 7(d)(4) of the Fair Labor Standards Act, as amended. The intent of the committee was to prevent any avoidance of overtime requirements under existing law. See H. Rep. No. 308, p. 5.

(c)(1) The act permits a contractor or subcontractor to pay a cash equivalent of any fringe benefits found prevailing by the Secretary of Labor. Such a cash equivalent would also be excludable in computing the regular or basic rate under the Federal overtime laws mentioned in paragraph (a). For example, the W construction contractor pays his laborers or mechanics \$3.50 in cash under a wage determination of the Secretary of Labor which requires a basic hourly rate of \$3 and a fringe benefit contribution of 50 cents. The contractor pays the 50 cents in cash because he made no payments and incurred no costs for fringe benefits. Overtime compensation in this case would be computed on a regular or basic rate of \$3.00 an hour. However, in some cases a question of fact may be presented in ascertaining whether or not a cash payment made to laborers or mechanics is actually in lieu of a fringe benefit or is simply part of their straight time cash wage. In the latter situation, the cash payment is not excludable in computing overtime compensation. Consider the examples set forth in paragraphs (c)(2) and (3) of this section.

(2) The X construction contractor has for some time been paying \$3.25 an hour to a mechanic as his basic cash wage plus 50 cents an hour as a contribution to a welfare and pension plan. The Secretary of Labor determines that a basic hourly rate of \$3 an hour and a fringe benefit contribution of 50 cents are prevailing. The basic hourly rate or regular rate for overtime purposes would be \$3.25, the rate actually paid as a basic cash wage for the employee of X, rather than the \$3 rate determined as prevailing by the Secretary of Labor.

(3) Under the same prevailing wage determination, discussed in paragraph (c)(2) of this section, the Y construction contractor who has been paying \$3 an hour as his basic cash wage on which he has been computing overtime compensation reduces the cash wage to \$2.75 an hour but computes his costs of benefits under section 1(b)(2)(B) as \$1 an hour. In this example the regular or basic hourly rate would continue to be \$3 an hour. See S. Rep. No. 963, p. 7.

XV. EQUAL OPPORTUNITY CLAUSE – 41 C.F.R. §§ 60-1.4 and 60-4.3

During the performance of this Contract, the Contractor agrees as follows:

1. The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.
2. The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive considerations for employment without regard to race, color, religion, sex, or national origin.
3. The Contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the Contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
4. The Contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.
5. The Contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
6. In the event of the Contractor's noncompliance with the nondiscrimination clauses of this Contract or with any of the said rules, regulations, or orders, this Contract may be canceled, terminated, or suspended in whole or in part and the Contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedure authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.
7. The Contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (7) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each sub contractor or vendor. The Contractor will take such action with respect to any subcontract or purchase order as the City may direct as a means of enforcing such provision, including sanctions for noncompliance: *Provided, however,* that in the event a Contractor becomes involved in, or is threatened with, litigation with a sub contractor or vendor as a result of such direction by the City the Contractor may request the United States to enter into such litigation to protect the interests of the United States.

**STANDARD FEDERAL EQUAL EMPLOYMENT OPPORTUNITY CONSTRUCTION
CONTRACT SPECIFICATIONS**

1. As used in these specifications:
 - a. "Covered area" means the geographical area described in the solicitation from which this Contract resulted;
 - b. "Director" means Director, Office of Federal Contract Compliance Programs (OFCCP), U.S. Department of Labor, or any person to whom the Director delegates authority;

c. "Employer identification number" means the federal social security number used on the Employer's Quarterly Federal Tax Return, U.S. Treasury Department Form 941;

d. "Minority" includes:

(1) Black (all) persons having origins in any of the Black African racial groups not of Hispanic origin);

(2) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin regardless of race);

(3) Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands); and

(4) American Indian or Alaskan native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).

2. Whenever the Contractor, or any subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of \$10,000 the provisions of these specifications and the Notice which contains the applicable goals for minority and female participation and which is set forth in the solicitations from which this contract resulted.

3. If the Contractor is participating (pursuant to 41 C.F.R. § 60-4.5) in a Hometown Plan approved by the U.S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals and timetables) shall be in accordance with that Plan for those trades which have unions participating in the Plan. Contractors shall be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each contractor or subcontractor participating in an approved plan is individually required to comply with its obligations under the EEO clause and to make a good faith effort to achieve each goal under the Plan in each trade in which it has employees. The overall good faith performance by other contractors or subcontractors toward a goal in an approved Plan does not excuse any covered contractor's or subcontractor's failure to take good faith efforts to achieve the Plan goals and timetables.

4. The Contractor shall implement the specific affirmative action standards provided in paragraphs 7a through 7p of these specifications. The goals set forth in the solicitation from which this Contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. Covered construction contractors performing construction work in a geographical area where they do not have a federal or federally assisted construction contract shall apply the minority and female goals established for the geographical area where the work is being performed. Goals are published periodically in the Federal Register in notice form, and such notices may be obtained from any Office of Federal Contract Compliance Programs office or from federal procurement contracting officers. The Contractor is expected to make substantially uniform progress in meeting its goals in each craft during the period specified.

5. Neither the provisions of any collective bargaining agreement nor the failure by a union with whom the Contractor has a collective bargaining agreement to refer either minorities or women shall excuse the Contractor's obligations under these specifications, Executive Order 11246, or the regulations promulgated pursuant thereto.

6. In order for the non-working training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees shall be employed by the Contractor during the training period and the Contractor shall have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees shall be trained pursuant to training programs approved by the U.S. Department of Labor.

7. The Contractor shall take specific affirmative actions to ensure equal employment opportunity. The

evaluation of the Contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully and shall implement affirmative action steps at least as extensive as the following:

a. Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and in all facilities at which the Contractor's employees are assigned to work. The Contractor, where possible, will assign two or more women to each construction project. The Contractor shall specifically ensure that all foremen, superintendents, and other onsite supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.

b. Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the Contractor or its unions have employment opportunities available, and maintain a record of the organizations' responses.

c. Maintain a current file of the names, addresses, and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment source, or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the Contractor by the union or, if referred, not employed by the Contractor, this shall be documented in the file with the reason therefore along with whatever additional actions the contractor may have taken.

d. Provide immediate written notification to the Director when the union or unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or female sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.

e. Develop on-the-job training opportunities and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the Department of Labor. The Contractor shall provide notice of these programs to the sources compiled under 7b above.

f. Disseminate the Contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc.; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.

g. Review, at least annually, the company's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff, termination, or other employment decisions including specific review of these items with onsite supervisory personnel such as superintendents, general foremen, etc., prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.

h. Disseminate the Contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the Contractor's EEO policy with other contractors and subcontractors with whom the Contractor does or anticipates doing business.

i. Direct its recruitment efforts, both oral and written, to minority, female, and community organizations, to schools with minority and female students; and to minority and female recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the Contractor shall send written notification to organizations, such as the above, describing the openings, screening procedures, and tests to be used in the selection process.

j. Encourage present minority and female employees to recruit other minority persons and women and, where reasonable provide after school, summer, and vacation employment to minority and female youth both on the site and in other areas of a contractor's workforce.

k. Validate all tests and other selection requirements where there is an obligation to do so under 41 C.F.R. Part 60-3.

l. Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel, for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc., such opportunities.

m. Ensure that seniority practices, job classifications, work assignments, and other personnel practices do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the Contractor's obligations under these specifications are being carried out.

n. Ensure that all facilities and company activities are non-segregated except that separate or single user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.

o. Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.

p. Conduct a review, at least annually, of all supervisors' adherence to and performance under the Contractor's EEO policies and affirmative action obligations.

8. Contractors are encouraged to participate in voluntary associations, which assist in fulfilling one or more of their affirmative action obligations (7a through 7p). The efforts of a contractor association, joint contractor union, contractor community, or other similar groups of which the Contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under 7a through 7p of these specifications provided that the Contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the Contractor's minority and female workforce participation, makes a good faith effort to meet its individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's noncompliance.

9. A single goal for minorities and a separate single goal for women have been established. The Contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, if the particular group is employed in a substantially disparate manner (for example, even though the Contractor has achieved its goals for women generally,) the Contractor may be in violation of the Executive Order if a specific minority group of women is underutilized.

10. The Contractor shall not use the goals and timetables or affirmative action standards to discriminate against any person because of race, color, religion, sex, or national origin.

11. The Contractor shall not enter into any subcontract with any person or firm debarred from Government contracts pursuant to Executive Order 11246.

12. The Contractor shall carry out such sanctions and penalties for violation of these specifications and of the Equal Opportunity Clause, including suspension, termination, and cancellation of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations, by the Office of Federal Contract Compliance Programs. Any contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Executive Order 11246, as amended.

13. The Contractor, in fulfilling its obligations under these specifications, shall implement specific affirmative action steps, at least as extensive as those standards prescribed in paragraph 7 of these specifications, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of the Executive Order, the implementing regulations, or these specifications, the Director shall proceed in accordance with 41 C.F.R. § 60-4.8.

14. The Contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the Government, and to keep records. Records shall at least include for each employee, the name, address, telephone number, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records.

15. Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

See [Attachment 6](#).

XVI. PROHIBITION OF SEGREGATED FACILITIES – 41 C.F.R. § 60-1.8

1. The Contractor agrees that it does not and will not maintain or provide for its employees any segregated facilities at any of its establishments, and that it does not and will not permit its employees to perform their services at any location under its control where segregated facilities are maintained. The Contractor agrees that a breach of this provision is a violation of the Equal Opportunity provision in this Contract.

2. "Segregated facilities," as used in this provision, means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees, that are segregated by explicit directive or are in fact segregated on the basis of race, color, religion, sex, or national origin because of written or oral policies or employee custom. The term does not include separate or single-user rest rooms or necessary dressing or sleeping areas provided to assure privacy between the sexes.

3. The Contractor shall include this provision in every subcontract and purchase order that is subject to the Equal Opportunity provision of this Contract.

See [Attachment 7](#).

XVII. NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION – 41 C.F.R. § 60-4.2 and Executive Order 11246

1. The offeror's or bidder's attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Opportunity Construction Contract Specifications" set forth herein.

2. The goals and timetables for minority and female participation, expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work in the covered area, are as follows:

Timetables

Goals for minority participation for each trade: 0.0%

Goals for female participation in each trade: 0.0%

These goals are applicable to all of the Contractor's construction work (whether or not it is federal or federally-assisted) performed in the covered area. If the Contractor performs construction work in a

geographical area located outside of the covered area, it shall apply the goals established for such geographical area where the work is actually performed. With regard to this second area, the Contractor also is subject to the goals for both its federally involved and non-federally involved construction.

The Contractor's compliance with the Executive Order and the regulations in 41 C.F.R. Part 60-4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications set forth in 41 C.F.R. 60-4.3(a), and its efforts to meet the goals. The hours of minority and female employment and training shall be substantially uniform throughout the length of the Contract, and in each trade, and the Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from contractor to contractor or from project to project, for the sole purpose of meeting the Contractor's goals, shall be a violation of the Contract, the Executive Order, and the regulations in 41 C.F.R. Part 60-4. Compliance with the goals will be measured against the total work hours performed.

3. The Contractor shall provide written notification to the Director of the Office of Federal Contract Compliance Programs (OFCCP) within 10 working days of award of any construction subcontract in excess of \$10,000 at any tier for construction work under the Contract resulting from this solicitation. The notification shall list the name, address, and telephone number of the sub contractor; employer identification number of the subcontractor; estimated dollar amount of the subcontract; estimated starting and completion dates of subcontract; and the geographical area in which the subcontract is to be performed.

4. As used in this notice and in the Contract resulting from this solicitation, the "covered area" is Arizona, Maricopa County, and City of Phoenix.

XVIII. TAX DELINQUENCY AND FELONY CONVICTIONS

The sponsor must ensure that no funding goes to any contractor who:

- Has been convicted of a Federal felony within the last 24 months; or
- Has any outstanding tax liability for which all judicial and administrative remedies have lapsed or been exhausted.

See [Attachment 8](#).

XIX. TERMINATION OF CONTRACT – 2 C.F.R. § 200, Appendix II(B) and FAA Circular 150/5370-10, § 80-09

Termination for Convenience (Construction and Equipment Contracts)

The City may terminate this Contract in whole or in part at any time by providing written notice to the Contractor. Such action may be without cause and without prejudice to any other right or remedy of the City. Upon receipt of a written notice of termination, except as explicitly directed by the City, the Contractor shall immediately proceed with the following obligations regardless of any delay in determining or adjusting amounts due under this clause:

1. Contractor must immediately discontinue work as specified the written notice.
2. Terminate all subcontracts to the extent they relate to the work terminated under the notice.
3. Discontinue orders for materials and services, except as directed by the written notice.
4. Deliver to the City all fabricated and partially fabricated parts, completed and partially completed work, supplies, equipment, and materials acquired prior to termination of the work and as directed in the written notice.
5. Complete performance of the work not terminated by the notice.
6. Take action, as directed by the City, to protect and preserve property and work related to this Contract that the City will take possession of.

The City agrees to pay Contractor for:

1. Completed and acceptable work executed in accordance with the Contract documents prior to the effective date of termination;
2. Documented expenses sustained prior to the effective date of termination in performing work and furnishing labor, materials, or equipment as required by the Contract documents in connection with uncompleted work;
3. Reasonable and substantiated claims, costs, and damages incurred in settlement of terminated contracts with subcontractors and suppliers; and
4. Reasonable and substantiated expenses to the Contractor directly attributable to the City's termination action.

The City will not pay Contractor for loss of anticipated profits or revenue or other economic loss arising out of or resulting from the City's termination action.

The rights and remedies this clause provides are in addition to any other rights and remedies provided by law or under this Contract.

Termination for Default (Construction)

Section 80-09 of FAA Advisory Circular 150/5370-10 establishes conditions, rights, and remedies associated with the City's termination of this Contract due to the default of the Contractor.

XX. DEBARMENT AND SUSPENSION – 2 C.F.R. Parts 180 and 1200 and DOT Order 4200.5

Certification of Bidder or Offeror Regarding Debarment

By submitting a bid or proposal under this solicitation, the bidder or offeror certifies that neither it nor its principals are presently debarred or suspended by any federal department or agency from participation in this transaction.

Certification of Lower Tier Contractors Regarding Debarment

The successful bidder, by administering each lower tier subcontract that exceeds \$25,000 as a "covered transaction", must verify each lower tier participant of a "covered transaction" under the project is not presently debarred or otherwise disqualified from participation in this federally assisted project. The successful bidder will accomplish this by:

1. Checking the System for Award Management at website: <http://www.sam.gov>.
2. Collecting a certification statement similar to the Certificate Regarding Debarment and Suspension (Bidder or Offeror), above.
3. Inserting a clause or condition in the covered transaction with the lower tier contract.

If the FAA later determines that a lower tier participant failed to disclose to a higher tier participant that it was excluded or disqualified at the time it entered the covered transaction, the FAA may pursue any available remedies, including suspension and debarment of the non-compliant participant.

See [Attachment 9](#).

XXI. CONTRACT WORKHOURS AND SAFETY STANDARDS ACT REQUIREMENTS – 2 C.F.R. § 200, Appx. II(E)

1. Overtime Requirements.

No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic, including watchmen and guards, in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

2. Violation; Liability for Unpaid Wages; Liquidated Damages.

In the event of any violation of the clause set forth in paragraph (1) of this clause, the Contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such Contractor and subcontractor shall be liable to the U.S. (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1) of this clause, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1) of this clause.

3. Withholding for Unpaid Wages and Liquidated Damages.

The FAA or the City shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the Contractor or subcontractor under any such Contract or any other federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such Contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph 2 of this clause.

4. Subcontractors.

The Contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraphs (1) through (4) and also a clause requiring the subcontractor to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1) through (4) of this clause.

XXII. CLEAN AIR AND WATER POLLUTION CONTROL – 2 C.F.R. § 200, Appendix II(G)

Contractor agrees to comply with all applicable standards, orders, and regulations issued pursuant to the Clean Air Act (42 U.S.C. § 740-7671q) and the Federal Water Pollution Control Act, as amended (33 U.S.C. § 1251-1387). The Contractor agrees to report any violation to the City immediately upon discovery. The City assumes responsibility for notifying the Environmental Protection Agency (EPA) and the FAA.

Contractor must include this requirement in all subcontracts that exceeds \$150,000.

XXIII. TRAFFICKING VICTIMS PROTECTION – 2 C.F.R. Part 175

The City may be unilaterally terminate this Contract without penalty, if the Contractor or a subcontractor is a private entity and:

1. Engages in severe forms of trafficking in persons during the period of time that this Contract is in effect:
2. Procures a commercial sex act during the period of time that this Contract is in effect; or
3. Uses forced labor in the performance of the Contract or subcontracts under this Contract.

If Contractor, an employee of the Contractor, or an employee of a subcontractor is determined by the City to have committed any prohibited act listed above through conduct that is either:

1. Associated with performance of this Contract or
2. Imputed to the Contractor using the standards and due process for imputing the conduct of an individual to an organization as provided in 2 C.F.R. Part 180, "OMB Guidelines to Agencies on Governmentwide Debarment and Suspension (Nonprocurement)," as implemented by the federal awarding agency at 2 C.F.R. Part 376.

The Contractor must inform the City immediately of any information received from any source alleging a violation of any prohibited act listed above during the term of this Contract.

For purposes of this Section:

1. "Employee" means either:
 - a. An individual employed by the Contractor or subcontractor who is engaged in the performance of this Contract or a subcontract under this Contract; or
 - b. Another person engaged in the performance of this Contract and not compensated by the Contractor or a subcontractor, including a volunteer or individual whose services are contributed by a third party as an in-kind contribution toward cost sharing or matching requirements.
2. "Forced labor" means labor obtained by any of the following methods: the recruitment, harboring, transportation, provision, or obtaining of a person for labor or services, through the use of force, fraud, or coercion for the purpose of subjection to involuntary servitude, peonage, debt bondage, or slavery.
3. "Private entity" means any entity, other than a state, local government, Indian tribe, or foreign public entity, as those terms are defined in 2 C.F.R. § 175.25, and includes:
 - a. A nonprofit organization, including any nonprofit institution of higher education, hospital, or tribal organization other than one included in the definition of Indian tribe at 2 C.F.R. § 175.25(b).
 - b. A for-profit organization.
4. "Severe forms of trafficking in persons," "commercial sex act," and "coercion" have the meanings given at section 103 of the Trafficking Victims Protection Act, as amended (22 U.S.C. § 7102).

XXIV. Distracted Driving and Texting While Driving – Executive Order 13513 and DOT Order 3902.10

In accordance with Executive Order 13513, "Federal Leadership on Reducing Text Messaging While Driving" (October 1, 2009), and DOT Order 3902.10, "Text Messaging While Driving" (December 30, 2009), the FAA encourages the City and Contractor, as recipients of federal funds, to adopt and enforce safety policies that decrease crashes caused by distracted drivers, including policies to ban text messaging while driving when performing any work related to this Contract, a grant, or a sub-grant.

In support of this initiative, the City encourages the Contractor to promote policies and initiatives for its employees and other work personnel that decrease crashes by distracted drivers, including policies that ban text messaging while driving motor vehicles while performing work activities associated with this Contract. The Contractor must include the substance of this clause in all sub-tier contracts exceeding \$3,500 and involve driving a motor vehicle in the performance of work activities associated with this Contract.

XXV. Occupational Safety and Health Act of 1970 – 29 C.F.R. Part 1910

All contracts and subcontracts that result from this solicitation incorporate by reference the requirements of 29 C.F.R. Part 1910 with the same force and effect as if given in full text. Contractor must provide a work environment that is free from recognized hazards that may cause death or serious physical harm to the employee. The Contractor retains full responsibility to monitor its compliance and their subcontractor's compliance with the applicable requirements of the Occupational Safety and Health Act of 1970 (20 C.F.R.

Part 1910). Contractor 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.

XXVI. Copeland “Anti-kickback” Act – 2 C.F.R. § 200, Appendix II(D) and 29 C.F.R. Parts 3 and 5

Contractor must comply with the requirements of the Copeland “Anti-Kickback” Act (18 U.S.C. § 874 and 40 U.S.C. § 3145), as supplemented by Department of Labor regulation 29 C.F.R. Part 3. Contractor and subcontractors are prohibited from inducing, by any means, any person employed on the project to give up any part of the compensation to which the employee is entitled. The Contractor and each subcontractor must submit to the City a weekly statement on the wages paid to each employee performing on covered work during the prior week. The City must report any violations of the Act to the FAA.

See also Section XIV.

XXVII. Federal Fair Labor Standards Act (Federal Minimum Wage) – 29 U.S.C. §§ 201, et seq.

All contracts and subcontracts that result from this solicitation incorporate 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.

The Contractor has full responsibility to monitor compliance to the referenced statute or regulation. The Contractor must address any claims or disputes that arise from this requirement directly with the U.S. Department of Labor – Wage and Hour Division.

XXVIII. Procurement of Recovered Materials – 2 C.F.R. § 200.322 and 40 C.F.R. Part 247

Contractor and subcontractor agree to comply with Section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act, and the regulatory provisions of 40 C.F.R. Part 247. In the performance of this Contract and to the extent practicable, the Contractor and subcontractors are to use of products containing the highest percentage of recovered materials for items designated by the Environmental Protection Agency (EPA) under 40 C.F.R. Part 247 whenever:

1. The Contract requires procurement of \$10,000 or more of a designated item during the fiscal year or,
2. The Contractor has procured \$10,000 or more of a designated item using federal funding during the previous fiscal year.

The list of EPA-designated items is available at www.epa.gov/smm/comprehensive-procurement-guidelines-construction-products. Section 6002(c) establishes exceptions to the preference for recovery of EPA-designated products if the Contractor can demonstrate the item is:

1. Not reasonably available within a timeframe providing for compliance with the Contract performance schedule;
2. Fails to meet reasonable contract performance requirements; or
3. Is only available at an unreasonable price.

XXIX. Seismic Activity – 49 C.F.R. Part 41

The Contractor agrees to ensure that all work performed under this Contract, including work performed by subcontractors, conforms to a building code standard that provides a level of seismic safety substantially equivalent to standards established by the National Earthquake Hazards Reduction Program (NEHRP). Local building codes that model their code after the current version of the International Building Code (IBC) meet the NEHRP equivalency level for seismic safety. At the conclusion of the design services, the Contractor agrees to furnish the City a “certification of compliance” that attest conformance of the building design and the construction specifications with the seismic standards of NEHRP or an equivalent building code.

ATTACHMENT 1 - BUY AMERICAN CERTIFICATION

Certificate of Buy American Compliance for Total Facility

(Buildings, such as terminals, for snow removal equipment,
for aircraft rescue and firefighting operations, etc.)

As a matter of bid responsiveness, the bidder or offeror must complete, sign, date, and submit this certification statement with their proposal. The bidder or offeror must indicate how they intend to comply with 49 U.S.C. § 50101 by selecting one of the following certification statements. These statements are mutually exclusive. Bidder must select one or the other (i.e. not both) by inserting a checkmark (✓) or the letter "X".

- Bidder or offeror hereby certifies that it will comply with 49 U.S.C. § 50101 by:
- Only installing steel and manufactured products produced in the United States; or
 - Installing manufactured products for which the FAA has issued a waiver as indicated by inclusion on the current FAA Nationwide Buy American Waivers Issued listing; or
 - Installing products listed as an Excepted Article, Material or Supply in Federal Acquisition Regulation Subpart 25.108.

By selecting this certification statement, the bidder or offeror agrees:

- To provide to the City evidence that documents the source and origin of the steel and manufactured product.
- To faithfully comply with providing U.S. domestic products.
- To refrain from seeking a waiver request after establishment of the contract, unless extenuating circumstances emerge that the FAA determines justified.

- The bidder or offeror hereby certifies it cannot comply with the 100% Buy American Preferences of 49 U.S.C. § 50101(a) but may qualify for either a Type 3 or Type 4 waiver under 49 U.S.C. § 50101(b). By selecting this certification statement, the apparent bidder or offeror with the apparent low bid agrees:

- To submit to the City within 15 calendar days of the bid opening, a formal waiver request and required documentation that support the type of waiver being requested.
- That failure to submit the required documentation within the specified timeframe is cause for a non-responsive determination may result in rejection of the proposal.
- To faithfully comply with providing US domestic products at or above the approved U.S. domestic content percentage as approved by the FAA.
- To furnish U.S. domestic product for any waiver request that the FAA rejects.
- To refrain from seeking a waiver request after establishment of the contract, unless extenuating circumstances emerge that the FAA determines justified.

Required Documentation

Type 3 Waiver - The cost of components and subcomponents produced in the United States is more than 60% of the cost of all components and subcomponents of the "facility". The required documentation for a type 3 waiver is:

- Listing of all manufactured products that are not comprised of 100% U.S. domestic content (excludes products listed on the FAA Nationwide Buy American Waivers Issued listing and products excluded by Federal Acquisition Regulation Subpart 25.108; products of unknown origin must be considered as non-domestic products in their entirety).
- Cost of non-domestic components and subcomponents, excluding labor costs associated with final assembly and installation at project location.
- Percentage of non-domestic component and subcomponent cost as compared to total "facility" component and subcomponent costs, excluding labor costs associated with final assembly and installation at project location.

Type 4 Waiver — Total cost of project using U.S. domestic source product exceeds the total project cost using non-domestic product by 25%. The required documentation for a type 4 of waiver is:

- a) Detailed cost information for total project using U.S. domestic product.
- b) Detailed cost information for total project using non-domestic product.

False Statements: Per 49 U.S.C. § 47126, this certification concerns a matter within the jurisdiction of the FAA and the making of a false, fictitious, or fraudulent certification may render the maker subject to prosecution under Title 18, United States Code.

Date

Signature

Company Name

Title

Certificate of Buy American Compliance for Manufactured Products

(Non-building construction projects, such as runway or roadway construction, equipment acquisition projects, etc.).

As a matter of bid responsiveness, the bidder or offeror must complete, sign, date, and submit this certification statement with their proposal. The bidder or offeror must indicate how they intend to comply with 49 U.S.C. § 50101 by selecting one on the following certification statements. These statements are mutually exclusive. Bidder must select one or the other (not both) by inserting a checkmark (✓) or the letter "X".

- Bidder or offeror hereby certifies that it will comply with 49 U.S.C. § 50101 by:
- Only installing steel and manufactured products produced in the United States, or;
 - Installing manufactured products for which the FAA has issued a waiver as indicated by inclusion on the current FAA Nationwide Buy American Waivers Issued listing, or;
 - Installing products listed as an Excepted Article, Material or Supply in Federal Acquisition Regulation Subpart 25.108.

By selecting this certification statement, the bidder or offeror agrees:

- To provide to the City evidence that documents the source and origin of the steel and manufactured product.
- To faithfully comply with providing U.S. domestic product.
- To furnish U.S. domestic product for any waiver request that the FAA rejects
- To refrain from seeking a waiver request after establishment of the contract, unless extenuating circumstances emerge that the FAA determines justified.

- The bidder or offeror hereby certifies it cannot comply with the 100% Buy American Preferences of 49 U.S.C. § 50101(a), but may qualify for either a Type 3 or Type 4 waiver under 49 U.S.C. § 50101(b). By selecting this certification statement, the apparent bidder or offeror with the apparent low bid agrees:

- To submit to the City within 15 calendar days of the bid opening, a formal waiver request and required documentation that support the type of waiver being requested.
- That failure to submit the required documentation within the specified timeframe is cause for a non-responsive determination may result in rejection of the proposal.
- To faithfully comply with providing U.S. domestic products at or above the approved U.S. domestic content percentage as approved by the FAA.
- To refrain from seeking a waiver request after establishment of the contract, unless extenuating circumstances emerge that the FAA determines justified.

Required Documentation

Type 3 Waiver - The cost of the item components and subcomponents produced in the United States is more than 60% of the cost of all components and subcomponents of the "item". The required documentation for a type 3 waiver is:

- Listing of all product components and subcomponents that are not comprised of 100% U.S. domestic content (excludes products listed on the FAA Nationwide Buy American Waivers Issued listing and products excluded by Federal Acquisition Regulation Subpart 25.108; products of unknown origin must be considered as non-domestic products in their entirety).
- Cost of non-domestic components and subcomponents, excluding labor costs associated with final assembly at place of manufacture.
- Percentage of non-domestic component and subcomponent cost as compared to total "item" component and subcomponent costs, excluding labor costs associated with final assembly at place of manufacture.

Type 4 Waiver – Total cost of project using U.S. domestic source product exceeds the total project cost

using non-domestic product by 25%. The required documentation for a type 4 of waiver is:

- a) Detailed cost information for total project using U.S. domestic product.
- b) Detailed cost information for total project using non-domestic product.

False Statements: Per 49 U.S.C. § 47126, this certification concerns a matter within the jurisdiction of the FAA and the making of a false, fictitious, or fraudulent certification may render the maker subject to prosecution under Title 18, United States Code.

Date

Signature

Company Name

Title

ATTACHMENT 2 – CERTIFICATION REGARDING LOBBYING

As a condition of responsiveness, this Certification must be submitted with each bid or offer exceeding \$100,000.

The bidder or offeror certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

- 1. No federally appropriated funds have been paid or will be paid, by or on behalf of the bidder or offeror, to any person for influencing or attempting to influence an officer or employee of an agency, a member of Congress, an officer or employee of Congress, or an employee of a member of Congress in connection with the awarding of any federal contract, the making of any federal grant, the making of any federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any federal contract, grant, loan, or cooperative agreement.
- 2. If any funds other than federally appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a member of Congress, an officer or employee of Congress, or an employee of a member of Congress in connection with this federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form - LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
- 3. The undersigned shall require that the language of this certification be included in the award documents for all sub-awards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all sub-recipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. § 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

The bidder or offeror, _____, certifies the truthfulness and accuracy of each statement of this certification. In addition, the bidder or offeror understands and agrees that the provisions of 31 U.S.C. §§ 3801-3812, Administrative Remedies for False Claims and Statements, apply to this certification.

Signature of Bidder's/Offeror's Authorized Official

Name and Title of Bidder's/Offeror's Authorized Official

Bidder's/Contractor's Firm Name

Date

ATTACHMENT 3 - RIGHTS IN DATA AND RIGHTS IN INVENTIONS

Contractor by entering into this Contract with the City to perform services associated with or in requirement of the conditions stated in this Contract does, by affixing its authorized signature on the lines provided below, agrees to the following:

1. That no sole rights to data provided in the submission or in fulfillment of contract requirements exist within the domain of the Contractor.
2. That all data provided in the submission or in the documents provided in fulfillment of this Contract become the property of the City for its use and benefit.
3. That no data submitted in documents required for Contract fulfillment will be regarded by the City as proprietary to the Contractor.
4. "Intellectual Property Rights" or "IPR" means all intellectual property rights, including any rights in any invention, patent, discovery, improvement, know-how, utility model, trade-mark, copyright, industrial design, mask work, integrated circuit topography, and trade secret, and all rights of whatsoever nature in computer software and data, confidential information, and all intangible rights or privileges of any nature similar to any of the foregoing, including in every case in any part of the world and whether or not registered, and shall include all rights in any applications and granted registrations for any of the foregoing.
5. "Joint IPR" means the Intellectual Property Rights conceived, created, developed, or reduced to practice in a Project pursuant to this Contract.
6. Intellectual Property Ownership. The City shall own all right, title, and interest in any Intellectual Property conceived, developed, created, or reduced to practice pursuant to this Contract, and Contractor shall have no ownership interest therein. Contractor hereby irrevocably transfers, conveys, and assigns to the City all of its right, title, and interest therein and in any property owned or to be owned by the City under this Contract. Contractor shall execute such documents, render such assistance, and take such other action as the City may reasonably request, at the City's reasonable expense, to apply for, register, perfect, confirm, and protect City's Intellectual Property Rights and ownership interests. The City has the exclusive right to apply for or register any patents, mask work rights, copyrights, and such other proprietary protections with respect thereto.
7. All documents, including artwork, copy, posters, billboards, photographs, video tapes, audio tapes, systems designs, drawings, estimates, field notes, investigations, software, reports, diagrams, surveys, analysis, studies, or any other original works of authorship created by Contractor in the performance of this Contract are to be and remain "works for hire" under Title 17, United States Code, and the property of the City and all copyright ownership and authorship rights in the works shall belong to the City pursuant to 17 U.S.C. § 201(b). If the works that are the subject matter of this Contract are deemed to not be works for hire, then Contractor hereby assigns to the City all of its right, title, and interest for the entire world in and to the works and the copyright therein. Contractor agrees to cooperate and execute additional documents reasonably necessary to conform with its obligations under this paragraph.
8. All Joint IPR will be the exclusive property of the City, and Contractor hereby assigns all its right, title, and interest in the same to the City. Any and all intellectual property conceived by the Contractor prior to the term of this Contract and utilized by it in rendering duties to the City are hereby licensed to the City for use in its operations and for an infinite duration. This license is non-exclusive and may be assigned without the Contractor's prior written approval by the City. Contractor agrees to provide all reasonable assistance requested by the City for the registration and protection of such intellectual property rights free of charge.

Signature of Contractor's Authorized Official

Name and Title of Contractor's Authorized Official

Bidder's/Contractor's Firm Name

Date

ATTACHMENT 4 – TRADE RESTRICTION CERTIFICATION

By submission of a bid or offer, the bidder or offeror certifies that with respect to this solicitation and any resulting contract, the bidder or offeror:

1. Is not owned or controlled by one or more citizens of a foreign country included in the list of countries that discriminate against U.S. firms as published by the Office of the United States Trade Representative (U.S.T.R.);

2. Has not knowingly entered into any contract or subcontract for this project with a person that is a citizen or national of a foreign country included on the list of countries that discriminate against U.S. firms as published by the U.S.T.R.;

3. Has not entered into any subcontract for any product to be used on the federal project that is produced in a foreign country included on the list of countries that discriminate against U.S. firms as published by the U.S.T.R.

This certification concerns a matter within the jurisdiction of an agency of the United States and the making of a false, fictitious, or fraudulent certification may render the maker subject to prosecution under 18 U.S.C. § 1001.

The bidder or offeror must provide immediate written notice to the City if the bidder or offeror learns that its certification or that of a subcontractor was erroneous when submitted or has become erroneous by reason of changed circumstances. The Contractor must require that subcontractors provide immediate written notice to the Contractor if at any time it learns that its certification was erroneous by reason of changed circumstances.

Unless the restrictions of this clause are waived by the Secretary of Transportation in accordance with 49 C.F.R. 30.17, no contract shall be awarded to a bidder or offeror or subcontractor:

1. Who is owned or controlled by one or more citizens or national of a foreign country included on the list of countries that discriminate against U.S. firms as published by the U.S.T.R. or

2. Whose subcontractors are owned or controlled by one or more citizens or national of a foreign country on the U.S.T.R. list, or

3. Who incorporates in the public works project any product of a foreign country on the U.S.T.R. list.

Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render, in good faith, the certification required by this provision. The knowledge and information of the Contractor is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

The bidder or offeror agrees that, if awarded a contract resulting from this solicitation, it will incorporate this provision for certification without modification in all lower tier subcontracts. The Contractor may rely on the certification of a prospective subcontractor that is not a firm from a foreign country included on the list of countries that discriminate against U.S. firms as published by the U.S.T.R., unless the bidder or offeror has knowledge that the certification is erroneous.

This certification is a material representation of fact upon which reliance was placed when making an award. If it is later determined that the Contractor or subcontractor knowingly rendered an erroneous certification, the FAA may direct through the City cancellation of the Contract or subcontract for default at no cost to the City of the FAA.

TRADE RESTRICTION CERTIFICATION (continued)

Signature of Bidder's/Offeror's Authorized Official

Name and Title of Bidder's/Offeror's Authorized Official

Bidder's/Offeror's Firm Name

Date

ATTACHMENT 5 – RESTRICTIONS ON FEDERAL PUBLIC WORKS PROJECTS CERTIFICATION

1. Definitions. The definitions pertaining to this clause are those that are set forth in 49 C.F.R. 30.7-30.9.
2. General. This clause implements the procurement provisions contained in the Continuing Resolution on the Fiscal Year 1988 Budget, Public Law No. 100-202, and the Airport and Airway Safety and Capacity Expansion Act of 1987, Public Law No. 100-223.
3. Restrictions. The Contractor shall not knowingly enter into any subcontract under this Contract:
 - a. With a subcontractor of a foreign country included on the list of countries that discriminate against U.S. firms published by the United States Trade Representative (U.S.T.R.); or
 - b. For the supply of any product for use on the Federal Public works project under this Contract that is produced or manufactured in a foreign country included on the list of countries that discriminate against U.S. firms published by the U.S.T.R.
4. Certification. The Contractor may rely upon the certification of a prospective sub contractor that it is not a subcontractor of a foreign country included on the list of countries that discriminates against U.S. firms published by the U.S.T.R. and that products supplied by such sub contractor for use on the federal public works project under this Contract are not products of a foreign country included on the list of countries that discriminate against U.S. firms published by the U.S.T.R., unless the Contractor has knowledge that the certification is erroneous.
5. Erroneous certification. The certification in paragraph (2) of the provision entitled "Restriction on Federal Public Works Projects-Certification," is a material representation of fact upon which reliance was placed when making the award. If it is later determined that the Contractor knowingly rendered an erroneous certification, in addition to other remedies available to the Government, the Contracting Officer may cancel this Contract for default at no cost to the Government.
6. Cancellation. Unless the restrictions of this clause are waived as provided in paragraph (5) of the provision entitled "Restriction on Federal Public Works Projects-Certification," if the Contractor knowingly enters into a subcontract with a subcontractor that is a subcontractor of a foreign country included on the list of countries that discriminate against U.S. firms published by the U.S.T.R. or that supplies any product for use on the federal public works project under this Contract of a foreign country included on the list of countries that discriminate against U.S. firms published by the U.S.T.R., the Contracting Officer may cancel this Contract for default, at no cost to the Government.
7. Subcontracts. The Contractor shall incorporate this clause, without modification, including this paragraph (7) in all solicitations and subcontracts under this Contract:

Certification Regarding Restrictions on Federal Public Works Projects - Subcontractors

- a. The Bidder/Contractor, by submission of an offer and/or execution of a contract certifies that the Offeror/Contractor is:
 - (1) Not a Bidder/Contractor owned or controlled by one or more citizens or nationals of a foreign country included on the list of countries that discriminate against U.S. firms published by the United States Trade Representative (U.S.T.R.) or
 - (2) Not supplying any product for use on the federal public works project that is produced or manufactured in a foreign country included on the list of foreign countries that discriminate against U.S. firms published by the U.S.T.R.

THIS CERTIFICATION CONCERNS A MATTER WITHIN THE JURISDICTION OF AN AGENCY OF THE UNITED STATES AND THE MAKING OF A FALSE, FICTITIOUS, OR FRAUDULENT CERTIFICATION MAY RENDER THE MAKER SUBJECT TO PROSECUTION UNDER TITLE 18, U.S.C SECTION 1001.

b. The Bidder shall provide immediate written notice to the Contractor if, at any time, the Bidder learns that its certification was erroneous by reason of changed circumstances.

c. The Contractor shall not knowingly enter into any subcontract under this Contract:

(1) With a subcontractor of a foreign country included on the list of countries that discriminate against U.S. firms published by the U.S.T.R.; or

(2) For the supply of any product for use on the federal public works project under this Contract that is produced or manufactured in a foreign country included on the list of countries that discriminate against U.S. firms published by the U.S.T.R. The Contractor may rely upon the certification in paragraph (7)(a) of this clause unless it has knowledge that the certification is erroneous.

d. Unless the restrictions of this clause have been waived under the Contract for the federal public works project, if Contractor knowingly enters into a subcontract with a subcontractor that is a subcontractor of a foreign country included on the list of countries that discriminate against U.S. firms published by the U.S.T.R. or that supplies any product for use on the federal public works project under this Contract that is produced or manufactured in a foreign country included on the list of countries that discriminate against U.S. firms published by the U.S.T.R., the Government Contracting Officer may direct, through higher-tier Contractors, cancellation of this Contract at no cost to the Government.

e. Definitions. The definitions pertaining to this clause are those that are set forth in 49 C.F.R. 30.7-30.9.

f. The certification in paragraph (7)(a) of this clause is a material representation of fact upon which reliance was placed when making the award. If it is later determined that the Contractor knowingly rendered an erroneous certification, in addition to other remedies available to the Government, the Government Contracting Officer may direct, through higher-tier Contractors, cancellation of this subcontract at no cost to the Government.

g. The Contractor agrees to insert this clause, without modification, including this paragraph, in all solicitations and subcontracts under this clause.

Signature of Bidder's/Contractor's Authorized Official

Name and Title of Bidder's/Contractor's Authorized Official

Bidder's/Contractor's Firm Name

Date

**ATTACHMENT 6 - CERTIFICATION ON PREVIOUS CONTRACTS
SUBJECT TO EQUAL OPPORTUNITY CLAUSE**

Each Contractor and proposed subcontractors must complete the following form by checking the appropriate blanks.

The Contractor or subcontractor has _____ has not _____ participated in a previous contract subject to the Equal Opportunity Clause prescribed by Executive Order 11246, as amended, of September 24, 1965.

The Contractor or subcontractor has _____ has not _____ submitted all compliance reports in connection with any such contract due under the applicable filing requirements; and that representations indicating submission of required compliance reports signed by proposed subcontractors will be obtained prior to award of subcontractors.

If the Contractor or subcontractor has participated in a previous contract subject to the Equal Opportunity Clause and has not submitted compliance reports due under applicable filing requirements, the Contractor shall submit a compliance report on Standard Form 100, "Employee Information Report EEP-1" prior to the award of this Contract.

Signature of Contractor's Authorized Official

Name and Title of Contractor's Authorized Official

Contractor's Firm Name

Contractor's Business Address

Date

ATTACHMENT 7 - CERTIFICATION OF NON-SEGREGATED FACILITIES

This Certification of Non-Segregated Facilities must be submitted prior to the award of a contract or subcontract exceeding \$10,000 which is not exempt from the provisions of the Equal Opportunity Clause.

Contractors receiving federally-assisted construction contract awards exceeding \$10,000 which are not exempt from the provisions of the Equal Opportunity Clause will be required to provide for the forwarding of the following notice to prospective subcontractors for supplies and construction contracts where the subcontracts exceed \$10,000 and are not exempt from the provisions of the Equal Opportunity Clause. NOTE: The penalty for making false statements in offers is prescribed in 18 U.S.C. 1001.

Notice to Prospective Subcontractors of Requirements for Certification of Non-Segregated Facilities

1. A Certification of Non-Segregated Facilities shall be submitted prior to the award of a subcontract exceeding \$10,000, which is not exempt from the provisions of the Equal Opportunity Clause.

2. Contractors receiving subcontract awards exceeding \$10,000 which are not exempt from the provisions of the Equal Opportunity Clause will be required to provide for the forwarding of this notice to prospective subcontractors for supplies and construction contracts where the subcontracts exceed \$10,000 and are not exempt from the provisions of the Equal Opportunity Clause. NOTE: The penalty for making false statements in offers is prescribed in 18 U.S.C. 1001.

The Federally assisted Contractor certifies that he does not maintain or provide, for his employees any segregated facilities at any of his establishment, and that he does not permit his employees to perform their services at any location, under his control where segregated facilities are maintained. The Federally assisted Construction Contractor certifies further that he will not maintain or provide for his employees segregated facilities at any of his establishments, and that will not permit his employees to perform their services at any location, under this control, where segregated facilities are maintained. The Federally assisted Construction Contractor agrees that a breach of this certification is a violation of the Equal Opportunity Clause in this Contract.

As used in this certification, the term "segregated facilities" means any waiting room, work areas, and washrooms, restaurants and other eating area, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directives or are, in fact, segregated on the basis of race, color, religion, sex or national origin, because of habit, local custom, or any other reason. The Federally assisted Contractor agrees that (except where he has obtained identical certifications from proposed subcontractors for special time periods) he will obtain identical certifications from proposed subcontractors prior to the award of subcontracts exceeding \$10,000 which are not exempt from the provisions of the Equal Opportunity Clause and that he will retain such certifications in his files.

Certification: The above information is true and complete to the best of my knowledge and belief.

Name of Contractor or subcontractor: _____

Signature and Title: _____

Business Address: _____

ATTACHMENT 8 – TAX DELINQUENCY AND FELONY CONVICTIONS

The applicant must complete the following two certification statements. The applicant must indicate its current status as it relates to tax delinquency and felony conviction by inserting a checkmark (✓) in the space following the applicable response. The applicant agrees that, if awarded a contract resulting from this solicitation, it will incorporate this provision for certification in all lower tier subcontracts.

Certifications

- a) The applicant represents that it is () is not () a corporation that has any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability.
- b) The applicant represents that it is () is not () is not a corporation that was convicted of a criminal violation under any Federal law within the preceding 24 months.

Note

If an applicant responds in the affirmative to either of the above representations, the applicant is ineligible to receive an award unless the sponsor has received notification from the agency suspension and debarment official (SDO) that the SDO has considered suspension or debarment and determined that further action is not required to protect the Government's interests. The applicant therefore must provide information to the owner about its tax liability or conviction to the Owner, who will then notify the FAA Airports District Office, which will then notify the agency's SDO to facilitate completion of the required considerations before award decisions are made.

Term Definitions

Felony conviction: Felony conviction means a conviction within the preceding twentyfour (24) months of a felony criminal violation under any Federal law and includes conviction of an offense defined in a section of the U.S. code that specifically classifies the offense as a felony and conviction of an offense that is classified as a felony under 18 U.S.C. § 3559.

Tax Delinquency: A tax delinquency is any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted, or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability.

ATTACHMENT 9 - CERTIFICATION REGARDING DEBARMENT, SUSPENSION, PROPOSED DEBARMENT, AND OTHER RESPONSIBILITY MATTERS

A. The Bidder/Contractor certifies to the best of its knowledge and belief that the Bidder/Contractor and/or any of its Principals:

1. Are not presently debarred, suspended, proposed for debarment, or declared ineligible for the award of contracts by any Federal agency;
2. Have not within a three-year period preceding this bid, been convicted of or had a civil judgment rendered against them for: commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, state, or local) contract or subcontract; violation of Federal or state antitrust statutes relating to the submission of offers; or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, tax evasion, violating Federal criminal tax laws or receiving stolen property; and
3. Are not presently indicted for, or otherwise criminally or civilly charged by a governmental entity with, commission of any of the offenses enumerated in paragraph (A) (2) of this provision.
4. Have not within a three-year period preceding this bid been notified of any delinquent Federal taxes in an amount that exceeds \$3,000 for which the liability remains unsatisfied.
5. Have not within a three-year period preceding this bid had one or more contracts terminated for default by any Federal agency.

B. For the purpose of this Certification, "Principals" means officers; directors; owners; partners; and, persons having primary management or supervisory responsibilities within a business entity (e.g., general manager; plant manager; head of a subsidiary, division, or business segment, and similar positions). THIS CERTIFICATION CONCERNS A MATTER WITHIN THE JURISDICTION OF AN AGENCY OF THE U.S. AND THE MAKING OF A FALSE, FICTITIOUS, OR FRAUDULENT CERTIFICATION MAY RENDER THE MAKER SUBJECT TO PROSECUTION UNDER 5 U.S.C. SECTION 1001.

1. The Bidder/Contractor must provide immediate written notice to the Contracting Officer if, at any time prior to contract award, the Bidder/Contractor learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.
2. A certification that any of the items in paragraph (A) of this provision exists will not necessarily result in withholding of an award. However, the certification will be considered in connection with a determination of the Bidder's/Contractor's responsibility. Failure of the Bidder/Contractor to furnish a certification or provide such additional information as requested by the Contracting Officer may render the Bidder/Contractor nonresponsible.
3. Nothing contained in the foregoing will be construed to require establishment of a system of records in order to render, in good faith, the certification required by paragraph (A) of this provision. The knowledge and information of a Bidder/Contractor is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.
4. The certification in paragraph (A) of this provision is a material representation of fact upon which reliance was placed when making award. If it is later determined that the Bidder/Contractor knowingly rendered an erroneous certification, in addition to other remedies available to the Government, the Contracting Officer may terminate the Contract for default.

CERTIFICATION REGARDING DEBARMENT, SUSPENSION, PROPOSED DEBARMENT, AND
OTHER RESPONSIBILITY MATTERS (continued)

_____ Signature of Bidder's/Contractor's Authorized Official

_____ Name and Title of Bidder's/Contractor's Authorized Official

_____ Bidder's/Contractor's Firm Name

_____ Date
(FAA/Date)

"General Decision Number: AZ20230008 01/06/2023

Superseded General Decision Number: AZ20220008

State: Arizona

Construction Type: Highway

Counties: Coconino, Maricopa, Mohave, Pima, Pinal, Yavapai and Yuma Counties in Arizona.

HIGHWAY CONSTRUCTION PROJECTS

Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658. Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60).

If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022: 	. Executive Order 14026 generally applies to the contract. . The contractor must pay all covered workers at least \$16.20 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2023.
If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022: 	. Executive Order 13658 generally applies to the contract. . The contractor must pay all covered workers at least \$12.15 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2023.

The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the

Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must still submit a conformance request.

Additional information on contractor requirements and worker protections under the Executive Orders is available at <http://www.dol.gov/whd/govcontracts>.

Modification Number	Publication Date
0	01/06/2023

CARP0408-005 07/01/2022

	Rates	Fringes
CARPENTER (Including Cement Form Work).....	\$ 32.90	13.62

ENGI0428-001 06/01/2022

	Rates	Fringes
POWER EQUIPMENT OPERATOR		
Group 1.....	\$ 30.14	12.57
Group 2.....	\$ 33.41	12.57
Group 3.....	\$ 34.49	12.57
Group 4.....	\$ 35.52	12.57

POWER EQUIPMENT OPERATORS CLASSIFICATIONS:

GROUP 1: A-frame boom truck, air compressor, Beltcrete, boring bridge and texture, brakeman, concrete mixer (skip type), conductor, conveyor, cross timing and pipe float, curing machine, dinky (under 20 tons), elevator hoist (Husky and similar), firemen, forklift, generator (all), handler, highline cableway signalman, hydrographic mulcher, joint inserter, jumbo finishing machine, Kolman belt loader, machine conveyor, multiple power concrete saw, pavement breaker, power grizzly, pressure grout machine, pump, self-propelled chip spreading machine, slurry seal machine (Moto paver driver), small self-propelled compactor (with blade-backfill, ditch operation), straw blower, tractor (wheel type), tripper, tugger (single drum), welding machine, winch truck

GROUP 2:
 ALL COUNTIES INCLUDING MARICOPA: Aggregate Plant, Asphalt plant Mixer, Bee Gee, Boring Machine, Concrete Pump, Concrete Mechanical Tamping-Spreading Finishing Machine, Concrete Batch Plant, Concrete Mixer (paving & mobile),

Elevating Grader (except as otherwise classified), Field Equipment Serviceman, Locomotive Engineer (including Dinky 20 tons & over), Moto-Paver, Oiler-Driver, Operating Engineer Rigger, Power Jumbo Form Setter, Road Oil Mixing Machine, Self-Propelled Compactor (with blade-grade operation), Slip Form (power driven lifting device for concrete forms), Soil Cement Road Mixing Machine, Pipe-Wrapping & Cleaning Machine (stationary or traveling), Surface Heater & Planer, Trenching Machine, Tugger (2 or more drums).

MARICOPA COUNTY ONLY: Backhoe < 1 cu yd, Motor Grader (rough), Scraper (pneumatic tired), Roller (all types asphalt), Screed, Skip Loader (all types 3<6 cu yd), Tractor (dozer, pusher-all).

GROUP 3:

ALL COUNTIES INCLUDING MARICOPA: Auto Grade Machine, Barge, Boring Machine (including Mole, Badger & similar type directional/horizontal), Crane (crawler & pneumatic 15>100 tons), Crawler type Tractor with boom attachment & slope bar, Derrick, Gradall, Heavy Duty Mechanic-Welder, Helicopter Hoist or Pilot, Highline Cableway, Mechanical Hoist, Mucking Machine, Overhead Crane, Pile Driver Engineer (portable, stationary or skid), Power Driven Ditch Lining or Ditch Trimming Machine, Remote Control Earth Moving Machine, Slip Form Paving Machine (including Gunnert, Zimmerman & similar types), Tower Crane or similar type.

MARICOPA COUNTY ONLY: Backhoe<10 cu yd, Clamshell < 10 cu yd, Concrete Pump (truck mounted with boom only), Dragline <10 cu yd, Grade Checker, Motor Grader (finish-any type power blade), Shovel < 10 cu yd.

GROUP 4: Backhoe 10 cu yd and over, Clamshell 10 cu yd and over, Crane (pneumatic or crawler 100 tons & over), Dragline 10 cu yd and over, Shovel 10 cu yd and over.

All Operators, Oilers, and Motor Crane Drivers on equipment with Booms, except concrete pumping truck booms, including Jibs, shall receive \$0.01 per hour per foot over 80 ft in addition to regular rate of pay

Premium pay for performing hazardous waste removal \$0.50 per hour over base rate.

IRON0075-004 08/01/2022

COCONINO, MARICOPA, MOHAVE, YAVAPAI & YUMA COUNTIES

	Rates	Fringes
Ironworker, Rebar.....	\$ 28.50	18.16
Zone 1: 0 to 50 miles from City Hall in Phoenix or Tucson		
Zone 2: 050 to 100 miles - Add \$4.00		
Zone 3: 100 to 150 miles - Add \$5.00		
Zone 4: 150 miles & over - Add \$6.50		

LABO1184-008 06/01/2021

	Rates	Fringes
Laborers:		
Group 1.....	\$ 21.93	6.27
Group 2.....	\$ 23.57	6.27
Group 3.....	\$ 24.43	6.27
Group 4.....	\$ 25.40	6.27
Group 5.....	\$ 26.50	6.27

LABORERS CLASSIFICATIONS:

GROUP 1: All Counties: Chipper, Rip Rap Stoneman. Pinal County Only: General/Cleanup Laborer. Maricopa County Only: Flagger.

GROUP 2: Asphalt Laborer (Shoveling-excluding Asphalt Raker or Ironer), Bander, Cement Mason Tender, Concrete Mucker, Cutting Torch Operator, Fine Grader, Guinea Chaser, Power Type Concrete Buggy

GROUP 3: Chain Saw, Concrete Small Tools, Concrete Vibrating Machine, Cribber & Shorer (except tunnel), Hydraulic Jacks and similar tools, Operator and Tender of Pneumatic and Electric Tools (not herein separately classified), Pipe Caulker and Back-Up Man-Pipeline, Pipe Wrapper, Pneumatic Gopher, Pre-Cast Manhole Erector, Rigger and Signal Man-Pipeline

GROUP 4: Air and Water Washout Nozzleman; Bio-Filter, Pressman, Installer, Operator; Scaffold Laborer; Chuck Tender; Concrete Cutting Torch; Gunite; Hand-Guided Trencher; Jackhammer and/or Pavement Breaker; Scaler (using boson's chair or safety belt); Tamper (mechanical all types).

GROUP 5: AC Dumpman, Asbestos Abatement, Asphalt Raker II, Drill Doctor/Air Tool Repairman, Hazardous Waste Removal, Lead Abatement, Lead Pipeman, Process Piping Installer, Scaler (Driller), Pest Technician/Weed Control, Scissor Lift, Hydro Mobile Scaffold Builder.

PAIN0086-001 04/01/2017

	Rates	Fringes
PAINTER		
PAINTER (Yavapai County only), SAND BLASTER/WATER BLASTER (all Counties).....	\$ 19.58	6.40
ZONE PAY: More than 100 miles from Old Phoenix Courthouse \$3.50 additional per hour.		

SUAZ2009-001 04/20/2009

	Rates	Fringes
CEMENT MASON.....	\$ 19.28	3.99
ELECTRICIAN.....	\$ 22.84	6.48
IRONWORKER (Rebar)		
Pima County.....	\$ 23.17	14.83
Pinal County.....	\$ 20.27	8.35
LABORER		
Asphalt Raker.....	\$ 15.49 **	3.49
Compaction Tool Operator....	\$ 14.59 **	2.91
Concrete Worker.....	\$ 13.55 **	3.20
Concrete/Asphalt Saw.....	\$ 13.95 **	2.58
Driller-Core, diamond, wagon, air track.....	\$ 16.94	3.12
Dumpman Spotter.....	\$ 14.99 **	3.16
Fence Builder.....	\$ 13.28 **	2.99
Flagger		
Coconino, Mohave, Pima, Pinal, Yavapai & Yuma.....	\$ 12.35 **	1.59
Formsetter.....	\$ 16.09 **	3.97
General/Cleanup Laborer		
Coconino, Maricopa, Mohave, Pima, Yavapai & Yuma.....	\$ 14.54 **	3.49
Grade Setter (Pipeline).....	\$ 17.83	5.45
Guard Rail Installer.....	\$ 13.28 **	2.99
Landscape Laborer.....	\$ 11.39 **	
Landscape Sprinkler Installer.....	\$ 15.27 **	
Pipelayer.....	\$ 14.81 **	2.96
Powderman, Hydrasonic.....	\$ 16.39	2.58

OPERATOR: Power Equipment		
Asphalt Laydown Machine.....	\$ 21.19	6.05
Backhoe < 1 cu yd		
Coconino, Mohave, Pima,		
Pinal, Yavapai & Yuma.....	\$ 17.37	3.85
Backhoe < 10 cu yd		
Coconino, Mohave, Pima,		
Pinal, Yavapai & Yuma.....	\$ 18.72	3.59
Clamshell < 10 cu yd		
Coconino, Mohave, Pima,		
Pinal, Yavapai & Yuma.....	\$ 18.72	3.59
Concrete Pump (Truck		
Mounted with boom only)		
Coconino, Mohave, Pima,		
Pinal, Yavapai & Yuma.....	\$ 19.92	7.10
Crane (under 15 tons).....	\$ 21.35	7.36
Dragline (up to 10 cu yd)		
Coconino, Mohave, Pima,		
Pinal, Yavapai & Yuma.....	\$ 18.72	3.59
Drilling Machine		
(including Water Wells).....	\$ 20.58	5.65
Grade Checker		
Coconino, Mohave, Pima,		
Pinal, Yavapai & Yuma.....	\$ 16.04 **	3.68
Hydrographic Seeder.....	\$ 15.88 **	7.67
Mass Excavator.....	\$ 20.97	4.28
Milling Machine/Rotomill.....	\$ 21.42	7.45
Motor Grader (Finish-any		
type power blade)		
Coconino, Mohave, Pima,		
Pinal, Yavapai & Yuma.....	\$ 21.92	4.66
Motor Grader (Rough)		
Coconino, Mohave, Pima,		
Pinal, Yavapai & Yuma.....	\$ 20.07	4.13
Oiler.....	\$ 18.15	8.24
Power Sweeper.....	\$ 16.76	4.44
Roller (all types Asphalt)		
Coconino, Mohave, Pima,		
Pinal, Yavapai & Yuma.....	\$ 18.27	3.99
Roller (excluding asphalt)..<	\$ 15.65 **	3.32
Scraper (pneumatic tired)		
Coconino, Mohave, Pima,		
Pinal, Yavapai & Yuma.....	\$ 17.69	3.45
Screed		
Coconino, Mohave, Pima,		
Pinal, Yavapai & Yuma.....	\$ 17.54	3.72
Shovel < 10 cu yd		
Coconino, Mohave, Pima,		
Pinal, Yavapai & Yuma.....	\$ 18.72	3.59
Skip Loader (all types <3		
cu yd).....	\$ 18.28	5.30
Skip Loader (all types 3 <		

6 cu yd) Coconino, Mohave, Pima, Pinal, Yavapai & Yuma.....\$ 18.64	4.86
Skip Loader (all types 6 < 10 cu yd).....\$ 20.15	4.52
Tractor (dozer, pusher - all) Coconino, Mohave, Pima, Pinal, Yavapai & Yuma.....\$ 17.26	2.65

PAINTER

Coconino, Maricopa, Mohave, Pima, Pinal & Yuma..\$ 15.57 **	3.92
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TRUCK DRIVER

2 or 3 Axle Dump or Flatrack.....\$ 16.27	3.30
5 Axle Dump or Flatrack.....\$ 13.97 **	2.89
6 Axle Dump or Flatrack (< 16 cu yd).....\$ 17.79	6.42
Belly Dump.....\$ 14.67 **	
Oil Tanker Bootman.....\$ 22.03	
Self-Propelled Street Sweeper.....\$ 13.11 **	5.48
Water Truck 2500 < 3900 gallons.....\$ 18.14	4.55
Water Truck 3900 gallons and over.....\$ 15.92 **	3.33
Water Truck under 2500 gallons.....\$ 15.94 **	4.16

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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** Workers in this classification may be entitled to a higher minimum wage under Executive Order 14026 (\$16.20) or 13658 (\$12.15). Please see the Note at the top of the wage determination for more information.

Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is

like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at <https://www.dol.gov/agencies/whd/government-contracts>.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of ""identifiers"" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than ""SU"" or ""UAVG"" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the ""SU"" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average

rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour National Office because National Office has responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described

in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

=====

END OF GENERAL DECISIO"

BID PROPOSAL
CITY OF PHOENIX, ARIZONA
OFFICE OF THE CITY ENGINEER
PROJECT TITLE:
PROJECT NO(s):
ADOT TRACS NUMBER:
BOND ISSUE OR BUDGET PROJECT

PROPOSAL to the City Engineer of the City of Phoenix.

In compliance with the Advertisement for Bids, by the City Engineer, the undersigned bidder:

(Print or type contractor name)

Having examined the contract documents, site of work and being familiar with the conditions to be met, hereby submits the following proposal for furnishing the material, equipment, labor and everything necessary for the completion of the work listed and agrees to execute the contract documents and furnish the required bonds and certificates of insurance for the completion of said work, at the locations and for the prices set forth on the inside pages of this form.

Understands that construction of this project will be in accordance with all applicable Maricopa Association of Governments' (MAG) Uniform Standard Specifications and Uniform Standard Details, latest revision, and the City of Phoenix Supplements, latest revision to the MAG Uniform Standard Specifications and Details, except as otherwise required by the project plans and specifications.

No proposal may be withdrawn for a period of 50 days after opening without consent of the Contracting Agency through the body or agent duly authorized to accept or reject the proposal except in the case of federally-assisted projects.

Understands that his proposal will be submitted with a proposal guarantee of certified check, cashier's check or surety bond for an amount not less than ten (10) percent of the amount bid, as referenced in the Call for Bids.

Agrees that upon receipt of Notice of Award, from the City of Phoenix, he will execute the contract documents within 10 calendar days.

Work will be completed within **266 calendar days**, beginning with the day following the starting date specified in the Notice to Proceed. The time allowed for completion of the work includes lead time for obtaining the necessary materials and/or equipment and approvals.

The bidder will acknowledge all addenda in writing. By writing the addenda number(s) below, the bidder agrees that this proposal is computed with consideration of the specification book(s) plus any and all addenda.

<u>ADDENDA NO.</u>	<u>DATE</u>	<u>ADDENDA NO.</u>	<u>DATE</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

LINE NO.	ITEM NO.	DESCRIPTION	UNIT	APPROX. QUANTITY	UNIT PRICE	AMOUNT
1	C-100	CONTRACTOR QUALITY CONTROL PROGRAM (CQCP)	LS	1		\$ -
2	C-102	TEMPORARY AIR AND WATER POLLUTION, SOIL EROSION, AND SILTATION CONTROL	LS	1		\$ -
3	C-105	MOBILIZATION (4% MAXIMUM)	LS	1		\$ -
4	SP-XX	UNFORESEEN UTILITY LOCATING (ALLOWANCE)	ALLOW	1	\$5,000.00	\$ 5,000.00
5	SP-XX	OVEREXCAVATION OF UNSUITABLE MATERIALS AND BACKFILL WITH SELECT MATERIAL (ALLOWANCE)	ALLOW	1	\$75,000.00	\$ 75,000.00
6	SP-XX	UNFORESEEN SOIL CONDITIONS (ALLOWANCE)	ALLOW	1	\$50,000.00	\$ 50,000.00
7	SP-XX	AIRFIELD SAFETY AND SECURITY	LS	1		\$ -
8	SP-XX	CONSTRUCTION SURVEY LAYOUT	LS	1		\$ -
9	SP-XX	ENGINEER/RPR FIELD OFFICE	LS	1		\$ -
10	SP-XX	REMOVE EXISING STORM DRAIN MANHOLE FRAME, COVER AND REINFORCED CONCRETE APRON	EA	2		\$ -
11	SP-XX	CONSTRUCT NEW CONCRETE STORM DRAIN MANHOLE APRON	EA	2		\$ -
12	SP-XX	REMOVE EXISTING UILITY HANDHOLE FRAME, COVER AND REINFORCED CONCRETE APRON	EA	1		\$ -
13	SP-XX	CONSTRUCT NEW CONCRETE HANDHOLE APRON	EA	1		\$ -
14	SP-XX	REMOVE EXISTING FAA COMMUNICATION MANHOLE FRAME, COVER AND REINFORCED CONCRETE APRON	EA	1		\$ -
15	SP-XX	CONSTRUCT NEW FAA COMMUNICATION MANHOLE APRON	EA	1		\$ -
16	SP-XX	SAWCUT EXISTING ASPHALT PAVEMENT, FULL DEPTH (9.5" DEPTH)	LF	2,399		\$ -
17	SP-XX	REMOVE EXISTING INLET FRAME, GRATE AND REINFORCED CONCRETE APRON	EA	8		\$ -
18	SP-XX	CONSTRUCT NEW INLET FRAME, GRATE AND APRON	EA	8		\$ -
19	SP-XX	REMOVE EXISTING CONCRETE TIE DOWN	EA	33		\$ -
20	SP-XX	CONSTRUCT TEMPORARY ASPHALT PAVEMENT TRANSITION	SY	497		\$ -
21	P-101	REMOVE EXISTING ASPHALT PAVEMENT, FULL DEPTH (9.5" DEPTH)	SY	93,572		\$ -
22	P-101	REMOVE EXISTING CONCRETE PAVEMENT	SY	722		\$ -
23	P-151	CLEARING AND GRUBBING	LS	1		\$ -
24	P-152	UNCLASSIFIED EXCAVATION	CY	64,158		\$ -
25	P-209	CRUSHED AGGREGATE BASE COURSE (10" THICK)	SY	87,653		\$ -
26	P-209	CRUSHED AGGREGATE BASE COURSE (6" THICK)	SY	6,424		\$ -
27	P-401	ASPHALT CONCRETE SURFACE COURSE (5" THICK)	TON	1,807		\$ -
28	P-401	ASPHALT CONCRETE BASE COURSE (5" THICK)	TON	1,807		\$ -
29	P-501	PORTLAND CEMENT CONCRETE PAVEMENT (19" THICK)	SY	87,654		\$ -

LINE NO.	ITEM NO.	DESCRIPTION	UNIT	APPROX. QUANTITY	UNIT PRICE	AMOUNT
30	P-603	BITUMINOUS TACK COAT	TON	50		\$ -
31	P-604	COMPRESSION JOINT SEALS FOR CONCRETE PAVEMENT	LF	77,117		\$ -
32	P-605	JOINT SEALING FILLER	LF	6,440		\$ -
33	P-620	SURFACE PREPARATION OF PAVEMENT TO REMOVE EXISTING MARKINGS	SF	12,874		\$ -
34	P-620	SURFACE PREPARATION OF NEW PAVEMENT SURFACES	SF	54,132		\$ -
35	P-620	REFLECTIVE MEDIA	LB	7,848		\$ -
36	P-620	YELLOW PAVEMENT MARKING	SF	16,128		\$ -
37	P-620	WHITE PAVEMENT MARKING	SF	2,051		\$ -
38	P-620	BLACK PAVEMENT MARKING	SF	35,479		\$ -
39	P-620	RED PAVEMENT MARKING	SF	474		\$ -
40	P-620	TEMPORARY MARKINGS	LS	1		\$ -
41	L-100	REMOVE AND SALVAGE EXISTING TAXIWAY EDGE LIGHT AND ISOLATION TRANSFORMER, DEMO BASE CAN	EA	9		\$ -
42	L-100	EXCAVATE AND REMOVE EXISTING HANDHOLE	EA	3		\$ -
43	L-100	EXCAVATE AND REMOVE EXISTING CONDUIT AND CONDUCTOR	LF	1,125		\$ -
44	L-100	EXCAVATE AND REMOVE EXISTING CONDUCTOR. CONDUIT TO REMAIN	LF	127		\$ -
45	L-100	TEMPORARY AIRFIELD LIGHTING CIRCUIT JUMPERS	LS	1		\$ -
46	L-100	NEW 25A 2-POLE 480V CIRCUIT BREAKER INSTALLED (APRON LIGHTING CIRCUITS)	EA	4		\$ -
47	L-100	NEW 100' STEEL POLE WITH 12, 1200 WATT LED FIXTURES AND LED OBSTRUCTION LIGHT ON NEW CONCRETE FOUNDATION WITH GROUNDING COMPLETE	EA	2		\$ -
48	L-100	APRON LIGHTING CONTROL/CONTACTOR CABINET, WITH PHOTOCELL, NEMA 3R, OUTDOOR RATED COMPLETE	EA	1		\$ -
49	L-108	L-824, TYPE C, 2/C #8 AWG, 5KV CABLE, #6 BARE COPPER GROUND	LF	855		\$ -
50	L-108	2-#4, #4 NEUTRAL, #4 GROUND THWN, 600V CABLE (APRON LIGHTING)	LF	3,050		\$ -
51	L-110	SINGLE-WAY, (1) - 2" CONDUIT, SLURRY ENCASED RETROFIT IN EXISTING ASPHALT	LF	85		\$ -
52	L-110	SINGLE-WAY (1) - 2" CONDUIT, CONCRETE ENCASED	LF	675		\$ -
53	L-110	MULTIPLE-WAY, (2) - 2" CONDUIT, CONCRETE ENCASED	LF	460		\$ -
54	L-110	MULTIPLE-WAY, (4) - 2" CONDUIT, CONCRETE ENCASED	LF	423		\$ -
55	L-110	MULTIPLE-WAY (8) - 2" CONDUIT, SLURRY ENCASED, RETROFIT IN EXISTING ASPHALT	LF	85		\$ -
56	L-110	MULTIPLE-WAY (9) - 2" CONDUIT, CONCRETE ENCASED, RETROFIT IN EXISTING CONCRETE	LF	60		\$ -
57	L-110	MULTIPLE-WAY, (8) - 2" CONDUIT, CONCRETE ENCASED	LF	975		\$ -
58	L-110	MULTIPLE-WAY, (12) - 2" CONDUIT, CONCRETE ENCASED	LF	10		\$ -

LINE NO.	ITEM NO.	DESCRIPTION	UNIT	APPROX. QUANTITY	UNIT PRICE	AMOUNT
59	L-110	MULTIPLE-WAY, (3) - 4" CONDUIT (COMMUNICATIONS), CONCRETE ENCASED, RETROFIT IN EXISTING CONCRETE	LF	60		\$ -
60	L-115	NEW HANDHOLE, PREFABRICATED CONCRETE 4' X 4' X 4' WITH AIRCRAFT RATED LID	EA	4		\$ -
61	L-115	NEW L-867D 16" DIAMETER JUNCTION CAN WITH BLANK COVER	EA	1		\$ -
62	L-115	NEW SIZE 5 TRAFFIC RATED PULLBOX	EA	2		\$ -
63	L-125	NEW ELEVATED L-861T(L) LED TAXIWAY EDGE LIGHT AND ISOLATION TRANSFORMER ON NEW L-868 BASE CAN WITH CONVERSION RING	EA	9		\$ -
BASE BID TOTAL (ITEMS 1 - 63)						
_____ & _____/100 DOLLARS						
WRITTEN WORDS						

PROPOSAL SUBMITTAL

PROJECT TITLE: PSHIA WEST AIR CARGO APRON RECONSTRUCTION
PROJECT NO: AV06000026 FAA

THIS PROPOSAL IS SUBMITTED BY _____

a corporation organized under the laws of the state of _____

partnership consisting of _____

a joint venture of _____

or individual trading as _____

of the City of _____

FIRM _____

ADDRESS _____

CITY _____ STATE _____ ZIP CODE _____

PHONE _____ FAX _____

EMAIL ADDRESS: _____

BY _____

Officer and Title (signature)

Date

WITNESS: If Contractor is an individual
(signature)

ATTEST: If Contractor is Corporation or Partnership
(signature and title)

SURETY BOND

PROJECT NO: AV06000026 FAA

That we, _____, as Principal, (hereinafter called the Principal) and the _____, a corporation duly organized under the laws of the state of _____, a Surety, (hereinafter called Surety) are held and firmly bound unto the City of Phoenix as Obligee, in the sum of ten (10) percent of the total amount of the bid of Principal, submitted by him to the City of Phoenix for the work described below, for the payment of which sum, well and truly to be made, the said Principal and the said Surety, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents and in conformance with A.R.S. 34-201.

WHEREAS, the said Principal is herewith submitting its proposal for AV06000026 FAA – PSHIA West Air Cargo Reconstruction.

NOW, THEREFORE, if the City of Phoenix will accept the proposal of the Principal and the Principal will enter into a Contract with the City of Phoenix in accordance with the terms of such proposal and give such Bonds and Certificates of Insurance as specified in the Standard Specifications with good and sufficient Surety for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof, or in the event of the failure of the Principal to enter into such Contract and give such Bonds and Certificates of Insurance, if the Principal will pay to the City of Phoenix the difference not to exceed the penalty of the bond between the amount specified in the proposal and such larger amount for which the Obligee may in good faith Contract with another party to perform the work covered by the proposal, then this obligation will be null and void, otherwise to remain in full force and effect.

Signed and sealed the _____ day of _____ A.D., 20__

Principal

TITLE

Surety

WITNESS

A.M. BEST RATING:

CITY OF PHOENIX
LIST OF MAJOR SUBCONTRACTORS AND SUPPLIERS

PROJECT NO.: AV06000026 F

PROJECT TITLE: PSHIA WEST AIR CARGO APRON RECONSTRUCTION

DESCRIPTION OF WORK OR MATERIALS (CONTRACTOR TO ENTER TRADE/SUPPLIER AREAS)	SELF-PERFORMED BY PRIME CONTRACTOR	SUBCONTRACTOR/SUPPLIER COMPANY NAME (IF NOT SELF-PERFORMED)	CONTACT PERSON	PHONE NUMBER	DOLLAR VALUE OF WORK OR MATERIALS IN BID
	<input type="checkbox"/> YES <input type="checkbox"/> NO				
	<input type="checkbox"/> YES <input type="checkbox"/> NO				
	<input type="checkbox"/> YES <input type="checkbox"/> NO				
	<input type="checkbox"/> YES <input type="checkbox"/> NO				
	<input type="checkbox"/> YES <input type="checkbox"/> NO				
	<input type="checkbox"/> YES <input type="checkbox"/> NO				

I hereby certify by signing below that the above listed companies will be utilized to perform work on this project for an **equal to or greater than 5% of the base bid**. These companies will not be removed or replaced without prior written approval by the City of Phoenix Project Manager. The City requires that ALL vendors providing work equal to or greater than 5% of the base bid are listed or you will be disqualified. If you are self-performing work, you must still list any suppliers for materials or list any subcontractors with whom you will directly contract.

COMPANY NAME _____ SIGNATURE _____

NAME & TITLE _____ PHONE NUMBER _____ DATE _____

EMAIL ADDRESS _____

**CITY OF PHOENIX
LIST OF ALL SUBCONTRACTORS AND SUPPLIERS**

PROJECT NO.: AV06000026 F

PROJECT TITLE: PSHIA WEST AIR CARGO APRON RECONSTRUCTION

DESCRIPTION OF WORK OR MATERIALS (CONTRACTOR TO ENTER TRADE/SUPPLIER AREAS)	SELF-PERFORMED BY PRIME CONTRACTOR	SUBCONTRACTOR/SUPPLIER COMPANY NAME (IF NOT SELF-PERFORMED)	CONTACT PERSON	PHONE NUMBER	DOLLAR VALUE OF WORK OR MATERIALS IN BID
	<input type="checkbox"/> YES <input type="checkbox"/> NO				
	<input type="checkbox"/> YES <input type="checkbox"/> NO				
	<input type="checkbox"/> YES <input type="checkbox"/> NO				
	<input type="checkbox"/> YES <input type="checkbox"/> NO				
	<input type="checkbox"/> YES <input type="checkbox"/> NO				
	<input type="checkbox"/> YES <input type="checkbox"/> NO				
	<input type="checkbox"/> YES <input type="checkbox"/> NO				

I hereby certify by signing below that the above listed companies will be utilized to perform work on this project. These companies will not be removed or replaced on the project without prior written approval by the City of Phoenix Project Manager. The City requires that ALL vendors providing work are listed or you will be disqualified. If you are self-performing work, you must still list any suppliers for materials or list any subcontractors with whom you will directly contract.

COMPANY NAME _____ SIGNATURE _____

NAME & TITLE _____ PHONE NUMBER _____ DATE _____

EMAIL ADDRESS _____

BIDDER'S DISCLOSURE STATEMENT

Authorized Contact for this Disclosure Statement

Name: _____

Title: _____

E-mail: _____

Phone number: _____

List any EIN, DBA, trade name, or other identity used in the last five years, the state or country where filed, and the status (active or inactive): (if applicable): _____

Business Characteristics

Business entity type – Please check appropriate box and provide additional information:

- | | | |
|--------------------------|-------------------------------|------------------------------------|
| <input type="checkbox"/> | Corporation | Date of incorporation: _____ |
| <input type="checkbox"/> | Limited Liability Company | Date organized: _____ |
| <input type="checkbox"/> | Limited Liability Partnership | Date of registration: _____ |
| <input type="checkbox"/> | Limited Partnership | Date established: _____ |
| <input type="checkbox"/> | General Partnership | Date established: _____ |
| <input type="checkbox"/> | Sole Proprietor | How many years in business?: _____ |
| <input type="checkbox"/> | Other (explain) | date established: _____ |

Was the business entity formed in the State of Arizona? Yes _____ No _____

If no, indicate jurisdiction where Business Entity was formed: _____

Business License Number and Classification: _____

Business Transaction Privilege License Number: _____

Special Use or other zoning permits required for Bidder's operation and performance of the services under this Agreement:

Is the Business Entity currently registered to do business in Arizona with the Arizona Corporation Commission? Yes _____ No _____ Not required _____ (if sole proprietor or general partnership)

Does the Business Entity have a City of Phoenix business privilege license? Yes _____ No _____ If "no" explain and provide detail such as "not required" or "application in progress" or other reason.

Is the Business Entity publicly traded? Yes _____ No _____

Is the responding Business Entity a Joint Venture? Note: If the Submitting Business entity is a Joint Venture, also submit a questionnaire for each Business Entity comprising the Joint Venture. Yes _____ No _____

Is the Business Entity's Principal Place of Business/Executive office in Phoenix? If "no" does the Business Entity maintain an office in Phoenix? Yes _____ No _____

Provide the address and phone number for the Phoenix office. _____

Is the business certified by Phoenix as a Small Business Enterprise? Yes _____ No _____

Identify Business Entity Officials and principal Owners:

Name(s) _____ Title _____ Percentage ownership ____%(Enter 0% if not applicable).

Name(s) _____ Title _____ Percentage ownership ____%(Enter 0% if not applicable).

Name(s) _____ Title _____ Percentage ownership ____%(Enter 0% if not applicable).

Name(s) _____ Title _____ Percentage ownership ____%(Enter 0% if not applicable).

Affiliates and Joint Venture Relationships

Does the Business entity have any Affiliates? Yes _____ No _____ Attach additional pages if necessary.

Affiliate name: _____

Affiliate EIN (if available): _____.

Affiliate's primary Business Activity: _____

Explain relationship with Affiliate and indicate percent ownership, if applicable. _____

Are there any Business Entity Officials or Principal Owners that the Business Entity has un common with this Affiliate? _____

Individual's name: _____

Position/Title with Affiliate: _____

Has the Business Entity participated in any joint Ventures within the past three years? Yes _____ No _____
(Attach additional pages if necessary)

Joint Venture Name: _____

Joint venture EIN (if applicable): _____

Identify parties to the Joint Venture: _____

Contract History

Has the Business Entity held any contracts with the city of Phoenix in the last three (3) years? Yes_____ No_____ If "yes" attach a list.

Integrity – Contract Bidding

Within the past three (3) years, has the Business Entity or any Affiliate been suspended or debarred from any government contracting process or been disqualified on any government procurement? Yes_____ No_____

Been subject to a denial or revocation of a government prequalification? Yes_____ No_____

Been denied a contract award or had a bid rejected based upon a finding of a non-responsibility by a government entity? Yes_____ No_____

Agreed to a voluntary exclusion from bidding/contracting with a government entity? Yes_____ No_____

Initiated a request to withdraw a bid submitted to a government entity or made any claim of an error on a bid submitted to a government entity? Yes_____ No_____

Initiated a request to withdraw a bid submitted to a government entity or made any claim of an error on a bid submitted to a government entity? Yes_____ No_____

For each "Yes" answer above, provide an explanation of the issues.

Integrity – Contract Award

Within the past three (3) years has the Business Entity or any Affiliate been suspended, cancelled, or terminated for cause on any government contract? Yes_____ No_____

Been subject to an administrative proceeding or civil action seeking specific performance or restitution in connection with any government contract? Yes_____ No_____

For each "yes" answer, provide an explanation. (Attach explanation on a separate sheet of paper).

Certifications/Licenses

Within the past three (3) years, has the Business Entity or Affiliate had a revocation, suspension, or disbarment of any business or professional permit and/or license? Yes_____ No_____

If "yes" provide an explanation of the issue(s), the Business Entity involved, the relationship to the submitting Business Entity, relevant dates, the government entity involved, and any remedial or corrective action(s) taken and the current status of the issues.

Legal Proceedings

Within the past three (3) years, has the Business Entity of any Affiliate:

Been the subject of an investigation, whether open or closed, by any government entity for a civil or criminal violation? Yes_____ No_____

Been the subject of an indictment, grant of immunity, judgment or conviction, (including entering into a plea bargain for conduct constituting a crime)?
Yes_____ No_____

Received any OSHA citation and Notification of Penalty containing a violation classified as serious or willful? Yes_____ No_____

Had a government entity find a willful prevailing wage or supplemental payment violation? Yes_____ No_____

Been involved in litigation as either a plaintiff or a defendant involving a copyright or patent infringement violation or an anti-trust violation? Yes_____ No_____

Other than previously disclosed, for the past three (3) years:

(i) Been subject to the imposition of a fine or penalty in excess of \$1000 imposed by any government as a result of the issuance of citation, summons or notice of violation, or pursuant to any administrative, regulatory, or judicial determination? Yes_____ No_____

(ii) Been charged or convicted of a criminal offense pursuant to any administrative and/or regulatory action taken by any government entity? Yes_____ No_____

If “yes” provide an explanation of the issue(s), the Business Entity involved, the relationship to the submitting Business Entity, relevant dates, the government entity involved, and any remedial or corrective action(s) taken and the current status of the issues.

Leadership Integrity

If the Business Entity is a joint Venture Entity, answer “N/A – Not Applicable” to questions below:

Within the past three (3) years has any individual previously identified, or any other Business Entity Leader not previously identified, or any individual having the authority to sign, execute, or approve bids, proposals, contracts or supporting documentation with the city of Phoenix been subject to:

A sanction imposed relative to any business or professional permit and/or license? Yes_____ No_____

An investigation, whether open or closed, by any government entity for a civil or criminal violation for any business related conduct? Yes_____ No_____

Home

Search

Data Bank

Data Services

Help



Official U.S. Government Website
100% Free

The Official U.S. Government System for:

Contract Opportunities

(was fbo.gov)

Contract Data

(Reports ONLY from fpds.gov)

Wage Determinations

(was wdol.gov)

Federal Hierarchy

Departments and Subtiers

Assistance Listings

(was cfda.gov)

Entity Information

Entities, Disaster Response Registry,
Exclusions, and Responsibility/
Qualification (was fapiis.gov) **NEW**

Entity Reporting

SCR and Bio-Preferred Reporting

Register Your Entity or Get a Unique Entity ID

Register your entity or get a Unique Entity ID to get started doing business with the federal government.

[Get Started](#)

[Renew Entity](#)



[Check Entity Status](#)

ACTIVE EXCLUSIONS

There are no active exclusion records associated to this entity by its Unique Entity ID.



City of Phoenix

AFFIDAVIT OF IDENTITY

Your completion of this form is required by Arizona state law. A.R.S. §§ 1-501 and -50 only if you are a sole proprietor.

I, _____ (print full name exactly as on document), hereby affirm, upon penalty of perjury, that I presented the document marked below to the City of Phoenix, that I am lawfully present in the United States, and that I am the person stated on the document. (select one category only)

Arizona driver license issued after 1996.
Print first four numbers/letters from license:

--	--	--	--

Arizona non-operating identification license.
Print first four numbers/letters:

--	--	--	--

Birth certificate or delayed birth certificate issued in any state, territory or possession of the U.S.
Year of birth: _____; Place of birth: _____

United States Certificate of Birth Abroad.
Year of birth: _____; Place of birth: _____

United States Passport.
Print first four numbers/letters on Passport:

--	--	--	--

Foreign Passport with United States Visa.
Print first four numbers/letters on Passport:

--	--	--	--

Print first four numbers/letters on Visa:

--	--	--	--

I-94 Form with a photograph.
Print first four numbers on I-94:

--	--	--	--

USCIS Employment Authorization Document (EAD).
Print first four numbers/letters on EAD:

--	--	--	--

or Perm. Resident Card (acceptable alternative):

--	--	--	--

Refugee Travel Document.
Date of issuance: _____; Refugee country: _____

U.S. Certificate of Naturalization.
Print first four digits of CIS Reg. No.:

--	--	--	--

U.S. Certificate of Citizenship.
Date of issuance: _____; Place of issuance: _____

Tribal Certificate of Indian Blood.
Date of issuance: _____; Name of tribe: _____

Tribal or Bureau of Indian Affairs Affidavit of Birth.
Year of birth: _____; Place of birth: _____

Signed: _____ Dated: _____

SECTION III-A
GENERAL PROVISION SPECIFICATIONS

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Section 10 Definition of Terms

When the following terms are used in these specifications, in the contract, or in any documents or other instruments pertaining to construction where these specifications govern, the intent and meaning shall be defined as follows:

Paragraph Number	Term	Definition
10-01	AASHTO	The American Association of State Highway and Transportation Officials.
10-02	Access Road	The right-of-way, the roadway and all improvements constructed thereon connecting the airport to a public roadway.
10-03	Advertisement	A public announcement, as required by local law, inviting bids for work to be performed and materials to be furnished.
10-04	Airport	Airport means an area of land or water which is used or intended to be used for the landing and takeoff of aircraft; an appurtenant area used or intended to be used for airport buildings or other airport facilities or rights of way; airport buildings and facilities located in any of these areas, and a heliport.
10-05	Airport Improvement Program (AIP)	A grant-in-aid program, administered by the Federal Aviation Administration (FAA).
10-06	Air Operations Area (AOA)	The term air operations area (AOA) shall mean any area of the airport used or intended to be used for the landing, takeoff, or surface maneuvering of aircraft. An air operation area shall include such paved or unpaved areas that are used or intended to be used for the unobstructed movement of aircraft in addition to its associated runway, taxiway, or apron.
10-07	Apron	Area where aircraft are parked, unloaded or loaded, fueled and/or serviced.
10-08	ASTM International (ASTM)	Formerly known as the American Society for Testing and Materials (ASTM).
10-09	Award	The Owner's notice to the successful bidder of the acceptance of the submitted bid.

Paragraph Number	Term	Definition
10-10	Bidder	Any individual, partnership, firm, or corporation, acting directly or through a duly authorized representative, who submits a proposal for the work contemplated.
10-11	Building Area	An area on the airport to be used, considered, or intended to be used for airport buildings or other airport facilities or rights-of-way together with all airport buildings and facilities located thereon.
10-12	Calendar Day	Every day shown on the calendar.
10-13	Certificate of Analysis (COA)	The COA is the manufacturer's Certificate of Compliance (COC) including all applicable test results required by the specifications.
10-14	Certificate of Compliance (COC)	The manufacturer's certification stating that materials or assemblies furnished fully comply with the requirements of the contract. The certificate shall be signed by the manufacturer's authorized representative.
10-15	Change Order	A written order to the Contractor covering changes in the plans, specifications, or proposal quantities and establishing the basis of payment and contract time adjustment, if any, for work within the scope of the contract and necessary to complete the project.
10-16	Contract	<p>A written agreement between the Owner and the Contractor that establishes the obligations of the parties including but not limited to performance of work, furnishing of labor, equipment and materials and the basis of payment.</p> <p>The awarded contract includes but may not be limited to: Advertisement, Contract form, Proposal, Performance bond, payment bond, General provisions, certifications and representations, Technical Specifications, Plans, Supplemental Provisions, standards incorporated by reference and issued addenda.</p>
10-17	Contract Item (Pay Item)	A specific unit of work for which a price is provided in the contract.
10-18	Contract Time	The number of calendar days or working days, stated in the proposal, allowed for completion of the contract, including authorized time extensions. If a calendar date of completion is stated in the proposal,

Paragraph Number	Term	Definition
		in lieu of a number of calendar or working days, the contract shall be completed by that date.
10-19	Contractor	The individual, partnership, firm, or corporation primarily liable for the acceptable performance of the work contracted and for the payment of all legal debts pertaining to the work who acts directly or through lawful agents or employees to complete the contract work.
10-20	Contractors Quality Control (QC) Facilities	The Contractor's QC facilities in accordance with the Contractor Quality Control Program (CQCP).
10-21	Contractor Quality Control Program (CQCP)	Details the methods and procedures that will be taken to assure that all materials and completed construction required by the contract conform to contract plans, technical specifications and other requirements, whether manufactured by the Contractor, or procured from subcontractors or vendors.
10-22	Control Strip	A demonstration by the Contractor that the materials, equipment, and construction processes results in a product meeting the requirements of the specification.
10-23	Construction Safety and Phasing Plan (CSPP)	The overall plan for safety and phasing of a construction project developed by the airport operator, or developed by the airport operator's consultant and approved by the airport operator. It is included in the invitation for bids and becomes part of the project specifications.
10-24	Drainage System	The system of pipes, ditches, and structures by which surface or subsurface waters are collected and conducted from the airport area.
10-25	Engineer	The individual, partnership, firm, or corporation duly authorized by the Owner to be responsible for engineering, inspection, and/or observation of the contract work and acting directly or through an authorized representative.
10-26	Equipment	All machinery, together with the necessary supplies for upkeep and maintenance; and all tools and apparatus necessary for the proper construction and acceptable completion of the work.

Paragraph Number	Term	Definition
10-27	Extra Work	An item of work not provided for in the awarded contract as previously modified by change order or supplemental agreement, but which is found by the Owner's Engineer or Resident Project Representative (RPR) to be necessary to complete the work within the intended scope of the contract as previously modified.
10-28	FAA	The Federal Aviation Administration. When used to designate a person, FAA shall mean the Administrator or their duly authorized representative.
10-29	Federal Specifications	The federal specifications and standards, commercial item descriptions, and supplements, amendments, and indices prepared and issued by the General Services Administration.
10-30	Force Account	<p>a. Contract Force Account - A method of payment that addresses extra work performed by the Contractor on a time and material basis.</p> <p>b. Owner Force Account - Work performed for the project by the Owner's employees.</p>
10-31	Intention of Terms	<p>Whenever, in these specifications or on the plans, the words "directed," "required," "permitted," "ordered," "designated," "prescribed," or words of like import are used, it shall be understood that the direction, requirement, permission, order, designation, or prescription of the Engineer and/or Resident Project Representative (RPR) is intended; and similarly, the words "approved," "acceptable," "satisfactory," or words of like import, shall mean approved by, or acceptable to, or satisfactory to the Engineer and/or RPR, subject in each case to the final determination of the Owner.</p> <p>Any reference to a specific requirement of a numbered paragraph of the contract specifications or a cited standard shall be interpreted to include all general requirements of the entire section, specification item, or cited standard that may be pertinent to such specific reference.</p>
10-32	Lighting	A system of fixtures providing or controlling the light sources used on or near the airport or within the airport buildings. The field lighting includes all luminous signals, markers, floodlights, and illuminating devices used on or near the airport or to

Paragraph Number	Term	Definition
		aid in the operation of aircraft landing at, taking off from, or taxiing on the airport surface.
10-33	Major and Minor Contract Items	A major contract item shall be any item that is listed in the proposal, the total cost of which is equal to or greater than 20% of the total amount of the award contract. All other items shall be considered minor contract items.
10-34	Materials	Any substance specified for use in the construction of the contract work.
10-35	Modification of Standards (MOS)	Any deviation from standard specifications applicable to material and construction methods in accordance with FAA Order 5300.1.
10-36	Notice to Proceed (NTP)	A written notice to the Contractor to begin the actual contract work on a previously agreed to date. If applicable, the Notice to Proceed shall state the date on which the contract time begins.
10-37	Owner	The term "Owner" shall mean the party of the first part or the contracting agency signatory to the contract. Where the term "Owner" is capitalized in this document, it shall mean airport Sponsor only. The Owner for this project is the City of Phoenix.
10-38	Passenger Facility Charge (PFC)	Per 14 Code of Federal Regulations (CFR) Part 158 and 49 United States Code (USC) § 40117, a PFC is a charge imposed by a public agency on passengers enplaned at a commercial service airport it controls.
10-39	Pavement Structure	The combined surface course, base course(s), and subbase course(s), if any, considered as a single unit.
10-40	Payment bond	The approved form of security furnished by the Contractor and their own surety as a guaranty that the Contractor will pay in full all bills and accounts for materials and labor used in the construction of the work.
10-41	Performance bond	The approved form of security furnished by the Contractor and their own surety as a guaranty that the Contractor will complete the work in accordance with the terms of the contract.
10-42	Plans	The official drawings or exact reproductions which show the location, character, dimensions and details

Paragraph Number	Term	Definition
		of the airport and the work to be done and which are to be considered as a part of the contract, supplementary to the specifications. Plans may also be referred to as 'contract drawings.'
10-43	Project	The agreed scope of work for accomplishing specific airport development with respect to a particular airport.
10-44	Proposal	The written offer of the bidder (when submitted on the approved proposal form) to perform the contemplated work and furnish the necessary materials in accordance with the provisions of the plans and specifications.
10-45	Proposal guaranty	The security furnished with a proposal to guarantee that the bidder will enter into a contract if their own proposal is accepted by the Owner.
10-46	Quality Assurance (QA)	Owner's responsibility to assure that construction work completed complies with specifications for payment.
10-47	Quality Control (QC)	Contractor's responsibility to control material(s) and construction processes to complete construction in accordance with project specifications.
10-48	Quality Assurance (QA) Inspector	An authorized representative of the Engineer and/or Resident Project Representative (RPR) assigned to make all necessary inspections, observations, tests, and/or observation of tests of the work performed or being performed, or of the materials furnished or being furnished by the Contractor.
10-49	Quality Assurance (QA) Laboratory	The official quality assurance testing laboratories of the Owner or such other laboratories as may be designated by the Engineer or RPR. May also be referred to as Engineer's, Owner's, or QA Laboratory.
10-50	Resident Project Representative (RPR)	The individual, partnership, firm, or corporation duly authorized by the Owner to be responsible for all necessary inspections, observations, tests, and/or observations of tests of the contract work performed or being performed, or of the materials furnished or being furnished by the Contractor, and acting directly or through an authorized representative.

Paragraph Number	Term	Definition
10-51	Runway	The area on the airport prepared for the landing and takeoff of aircraft.
10-52	Runway Safety Area (RSA)	A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to aircraft. See the construction safety and phasing plan (CSPP) for limits of the RSA.
10-53	Safety Plan Compliance Document (SPCD)	Details how the Contractor will comply with the CSPP.
10-54	Specifications	A part of the contract containing the written directions and requirements for completing the contract work. Standards for specifying materials or testing which are cited in the contract specifications by reference shall have the same force and effect as if included in the contract physically.
10-55	Sponsor	A Sponsor is defined in 49 USC § 47102(24) as a public agency that submits to the FAA for an AIP grant; or a private Owner of a public-use airport that submits to the FAA an application for an AIP grant for the airport.
10-56	Structures	Airport facilities such as bridges; culverts; catch basins, inlets, retaining walls, cribbing; storm and sanitary sewer lines; water lines; underdrains; electrical ducts, manholes, handholes, lighting fixtures and bases; transformers; navigational aids; buildings; vaults; and, other manmade features of the airport that may be encountered in the work and not otherwise classified herein.
10-57	Subgrade	The soil that forms the pavement foundation.
10-58	Superintendent	The Contractor's executive representative who is present on the work during progress, authorized to receive and fulfill instructions from the RPR, and who shall supervise and direct the construction.
10-59	Supplemental Agreement	A written agreement between the Contractor and the Owner that establishes the basis of payment and contract time adjustment, if any, for the work affected by the supplemental agreement. A supplemental agreement is required if: (1) in scope work would increase or decrease the total amount of the awarded contract by more than 25%; (2) in scope work would

Paragraph Number	Term	Definition
		increase or decrease the total of any major contract item by more than 25%; (3) work that is not within the scope of the originally awarded contract; or (4) adding or deleting of a major contract item.
10-60	Surety	The corporation, partnership, or individual, other than the Contractor, executing payment or performance bonds that are furnished to the Owner by the Contractor.
10-61	Taxilane	A taxiway designed for low speed movement of aircraft between aircraft parking areas and terminal areas.
10-62	Taxiway	The portion of the air operations area of an airport that has been designated by competent airport authority for movement of aircraft to and from the airport's runways, aircraft parking areas, and terminal areas.
10-63	Taxiway/Taxilane Safety Area (TSA)	A defined surface alongside the taxiway prepared or suitable for reducing the risk of damage to an aircraft. See the construction safety and phasing plan (CSPP) for limits of the TSA.
10-64	Work	The furnishing of all labor, materials, tools, equipment, and incidentals necessary or convenient to the Contractor's performance of all duties and obligations imposed by the contract, plans, and specifications.
10-65	Working day	A working day shall be any day other than a legal holiday, Saturday, or Sunday on which the normal working forces of the Contractor may proceed with regular work for at least six (6) hours toward completion of the contract. When work is suspended for causes beyond the Contractor's control, it will not be counted as a working day. Saturdays, Sundays and holidays on which the Contractor's forces engage in regular work will be considered as working days.
10-66	Owner Defined terms	None

END OF SECTION 10

Section 20 Not Used

END OF SECTION 20

Section 30 Not Used

END OF SECTION 30

Section 40 Scope of Work

40-01 Intent of contract. The intent of the contract is to provide for construction and completion, in every detail, of the work described. It is further intended that the Contractor shall furnish all labor, materials, equipment, tools, transportation, and supplies required to complete the work in accordance with the plans, specifications, and terms of the contract.

40-02 Alteration of work and quantities. The Owner reserves the right to make such changes in quantities and work as may be necessary or desirable to complete, in a satisfactory manner, the original intended work. Unless otherwise specified in the Contract, the Owner's Engineer or RPR shall be and is hereby authorized to make, in writing, such in-scope alterations in the work and variation of quantities as may be necessary to complete the work, provided such action does not represent a significant change in the character of the work.

For purpose of this section, a significant change in character of work means: any change that is outside the current contract scope of work; any change (increase or decrease) in the total contract cost by more than 25%; or any change in the total cost of a major contract item by more than 25%.

Work alterations and quantity variances that do not meet the definition of significant change in character of work shall not invalidate the contract nor release the surety. Contractor agrees to accept payment for such work alterations and quantity variances in accordance with Section 90, paragraph 90-03, *Compensation for Altered Quantities*.

Should the value of altered work or quantity variance meet the criteria for significant change in character of work, such altered work and quantity variance shall be covered by a supplemental agreement. Supplemental agreements shall also require consent of the Contractor's surety and separate performance and payment bonds. If the Owner and the Contractor are unable to agree on a unit adjustment for any contract item that requires a supplemental agreement, the Owner reserves the right to terminate the contract with respect to the item and make other arrangements for its completion.

40-03 Omitted items. The Owner, the Owner's Engineer or the RPR may provide written notice to the Contractor to omit from the work any contract item that does not meet the definition of major contract item. Major contract items may be omitted by a supplemental agreement. Such omission of contract items shall not invalidate any other contract provision or requirement.

Should a contract item be omitted or otherwise ordered to be non-performed, the Contractor shall be paid for all work performed toward completion of such item prior to the date of the order to omit such item. Payment for work performed shall be in accordance with Section 90, paragraph 90-04, *Payment for Omitted Items*.

40-04 Extra work. Should acceptable completion of the contract require the Contractor to perform an item of work not provided for in the awarded contract as previously modified by change order or supplemental agreement, Owner may issue a Change Order to cover the necessary extra work. Change orders for extra work shall contain agreed unit prices for performing the change order work in accordance with the requirements specified in the order, and shall contain any adjustment to the contract time that, in the RPR's opinion, is necessary for completion of the extra work.

When determined by the RPR to be in the Owner's best interest, the RPR may order the Contractor to proceed with extra work as provided in Section 90, paragraph 90-05, *Payment for*

Extra Work. Extra work that is necessary for acceptable completion of the project, but is not within the general scope of the work covered by the original contract shall be covered by a supplemental agreement as defined in Section 10, paragraph 10-59, *Supplemental Agreement*.

If extra work is essential to maintaining the project critical path, RPR may order the Contractor to commence the extra work under a Time and Material contract method. Once sufficient detail is available to establish the level of effort necessary for the extra work, the Owner shall initiate a change order or supplemental agreement to cover the extra work.

Any claim for payment of extra work that is not covered by written agreement (change order or supplemental agreement) shall be rejected by the Owner.

40-05 Maintenance of traffic. It is the explicit intention of the contract that the safety of aircraft, as well as the Contractor's equipment and personnel, is the most important consideration. The Contractor shall maintain traffic in the manner detailed in the Construction Safety and Phasing Plan (CSPP).

a. It is understood and agreed that the Contractor shall provide for the free and unobstructed movement of aircraft in the air operations areas (AOAs) of the airport with respect to their own operations and the operations of all subcontractors as specified in Section 80, paragraph 80-04, *Limitation of Operations*. It is further understood and agreed that the Contractor shall provide for the uninterrupted operation of visual and electronic signals (including power supplies thereto) used in the guidance of aircraft while operating to, from, and upon the airport as specified in Section 70, paragraph 70-15, *Contractor's Responsibility for Utility Service and Facilities of Others*.

b. With respect to their own operations and the operations of all subcontractors, the Contractor shall provide marking, lighting, and other acceptable means of identifying personnel, equipment, vehicles, storage areas, and any work area or condition that may be hazardous to the operation of aircraft, fire-rescue equipment, or maintenance vehicles at the airport in accordance with the construction safety and phasing plan (CSPP) and the safety plan compliance document (SPCD).

c. When the contract requires the maintenance of an existing road, street, or highway during the Contractor's performance of work that is otherwise provided for in the contract, plans, and specifications, the Contractor shall keep the road, street, or highway open to all traffic and shall provide maintenance as may be required to accommodate traffic. The Contractor, at their expense, shall be responsible for the repair to equal or better than preconstruction conditions of any damage caused by the Contractor's equipment and personnel. The Contractor shall furnish, erect, and maintain barricades, warning signs, flag person, and other traffic control devices in reasonable conformity with the Manual on Uniform Traffic Control Devices (MUTCD) (<http://mutcd.fhwa.dot.gov/>), unless otherwise specified. The Contractor shall also construct and maintain in a safe condition any temporary connections necessary for ingress to and egress from abutting property or intersecting roads, streets or highways.

40-06 Removal of existing structures. All existing structures encountered within the established lines, grades, or grading sections shall be removed by the Contractor, unless such existing structures are otherwise specified to be relocated, adjusted up or down, salvaged, abandoned in place, reused in the work or to remain in place. The cost of removing such existing structures shall not be measured or paid for directly, but shall be included in the various contract items.

Should the Contractor encounter an existing structure (above or below ground) in the work for which the disposition is not indicated on the plans, the Resident Project Representative (RPR) shall be notified prior to disturbing such structure. The disposition of existing structures so

encountered shall be immediately determined by the RPR in accordance with the provisions of the contract.

Except as provided in Section 40, paragraph 40-07, *Rights in and Use of Materials Found in the Work*, it is intended that all existing materials or structures that may be encountered (within the lines, grades, or grading sections established for completion of the work) shall be used in the work as otherwise provided for in the contract and shall remain the property of the Owner when so used in the work.

40-07 Rights in and use of materials found in the work. Should the Contractor encounter any material such as (but not restricted to) sand, stone, gravel, slag, or concrete slabs within the established lines, grades, or grading sections, the use of which is intended by the terms of the contract to be embankment, the Contractor may at their own option either:

- a. Use such material in another contract item, providing such use is approved by the RPR and is in conformance with the contract specifications applicable to such use; or,
- b. Remove such material from the site, upon written approval of the RPR; or
- c. Use such material for the Contractor's own temporary construction on site; or,
- d. Use such material as intended by the terms of the contract.

Should the Contractor wish to exercise option a., b., or c., the Contractor shall request the RPR's approval in advance of such use.

Should the RPR approve the Contractor's request to exercise option a., b., or c., the Contractor shall be paid for the excavation or removal of such material at the applicable contract price. The Contractor shall replace, at their expense, such removed or excavated material with an agreed equal volume of material that is acceptable for use in constructing embankment, backfills, or otherwise to the extent that such replacement material is needed to complete the contract work. The Contractor shall not be charged for use of such material used in the work or removed from the site.

Should the RPR approve the Contractor's exercise of option a., the Contractor shall be paid, at the applicable contract price, for furnishing and installing such material in accordance with requirements of the contract item in which the material is used.

It is understood and agreed that the Contractor shall make no claim for delays by reason of their own exercise of option a., b., or c.

The Contractor shall not excavate, remove, or otherwise disturb any material, structure, or part of a structure which is located outside the lines, grades, or grading sections established for the work, except where such excavation or removal is provided for in the contract, plans, or specifications.

40-08 Final cleanup. Upon completion of the work and before acceptance and final payment will be made, the Contractor shall remove from the site all machinery, equipment, surplus and discarded materials, rubbish, temporary structures, and stumps or portions of trees. The Contractor shall cut all brush and woods within the limits indicated and shall leave the site in a neat and presentable condition. Material cleared from the site and deposited on adjacent property will not be considered as having been disposed of satisfactorily, unless the Contractor has obtained the written permission of the property Owner.

END OF SECTION 40

Section 50 Control of Work

50-01 Authority of the Resident Project Representative (RPR). The RPR has final authority regarding the interpretation of project specification requirements. The RPR shall determine acceptability of the quality of materials furnished, method of performance of work performed, and the manner and rate of performance of the work. The RPR does not have the authority to accept work that does not conform to specification requirements.

50-02 Conformity with plans and specifications. All work and all materials furnished shall be in reasonably close conformity with the lines, grades, grading sections, cross-sections, dimensions, material requirements, and testing requirements that are specified (including specified tolerances) in the contract, plans, or specifications.

If the RPR finds the materials furnished, work performed, or the finished product not within reasonably close conformity with the plans and specifications, but that the portion of the work affected will, in their opinion, result in a finished product having a level of safety, economy, durability, and workmanship acceptable to the Owner, the RPR will advise the Owner of their determination that the affected work be accepted and remain in place. The RPR will document the determination and recommend to the Owner a basis of acceptance that will provide for an adjustment in the contract price for the affected portion of the work. Changes in the contract price must be covered by contract change order or supplemental agreement as applicable.

If the RPR finds the materials furnished, work performed, or the finished product are not in reasonably close conformity with the plans and specifications and have resulted in an unacceptable finished product, the affected work or materials shall be removed and replaced or otherwise corrected by and at the expense of the Contractor in accordance with the RPR's written orders.

The term "reasonably close conformity" shall not be construed as waiving the Contractor's responsibility to complete the work in accordance with the contract, plans, and specifications. The term shall not be construed as waiving the RPR's responsibility to insist on strict compliance with the requirements of the contract, plans, and specifications during the Contractor's execution of the work, when, in the RPR's opinion, such compliance is essential to provide an acceptable finished portion of the work.

The term "reasonably close conformity" is also intended to provide the RPR with the authority, after consultation with the Sponsor and FAA, to use sound engineering judgment in their determinations to accept work that is not in strict conformity, but will provide a finished product equal to or better than that required by the requirements of the contract, plans and specifications.

The RPR will not be responsible for the Contractor's means, methods, techniques, sequences, or procedures of construction or the safety precautions incident thereto.

50-03 Coordination of contract, plans, and specifications. The contract, plans, specifications, and all referenced standards cited are essential parts of the contract requirements. If electronic files are provided and used on the project and there is a conflict between the electronic files and hard copy plans, the hard copy plans shall govern. A requirement occurring in one is as binding as though occurring in all. They are intended to be complementary and to describe and provide for a complete work. In case of discrepancy, calculated dimensions will govern over scaled dimensions; contract technical specifications shall govern over contract general provisions, plans, cited standards for materials or testing, and

cited advisory circulars (ACs); contract general provisions shall govern over plans, cited standards for materials or testing, and cited ACs; plans shall govern over cited standards for materials or testing and cited ACs. If any paragraphs contained in the Special Provisions conflict with General Provisions or Technical Specifications, the Special Provisions shall govern.

From time to time, discrepancies within cited testing standards occur due to the timing of the change, edits, and/or replacement of the standards. If the Contractor discovers any apparent discrepancy within standard test methods, the Contractor shall immediately ask the RPR for an interpretation and decision, and such decision shall be final.

The Contractor shall not take advantage of any apparent error or omission on the plans or specifications. In the event the Contractor discovers any apparent error or discrepancy, Contractor shall immediately notify the Owner or the designated representative in writing requesting their written interpretation and decision.

50-04 List of Special Provisions. Refer to Section III B for the Project Technical Special Provisions.

50-05 Cooperation of Contractor. The Contractor shall be supplied with five hard copies or an electronic PDF of the plans and specifications. The Contractor shall have available on the construction site at all times one hardcopy each of the plans and specifications. Additional hard copies of plans and specifications may be obtained by the Contractor for the cost of reproduction.

The Contractor shall give constant attention to the work to facilitate the progress thereof, and shall cooperate with the RPR and their inspectors and with other Contractors in every way possible. The Contractor shall have a competent superintendent on the work at all times who is fully authorized as their agent on the work. The superintendent shall be capable of reading and thoroughly understanding the plans and specifications and shall receive and fulfill instructions from the RPR or their authorized representative.

50-06 Cooperation between Contractors. The Owner reserves the right to contract for and perform other or additional work on or near the work covered by this contract.

When separate contracts are let within the limits of any one project, each Contractor shall conduct the work not to interfere with or hinder the progress of completion of the work being performed by other Contractors. Contractors working on the same project shall cooperate with each other as directed.

Each Contractor involved shall assume all liability, financial or otherwise, in connection with their own contract and shall protect and hold harmless the Owner from any and all damages or claims that may arise because of inconvenience, delays, or loss experienced because of the presence and operations of other Contractors working within the limits of the same project.

The Contractor shall arrange their work and shall place and dispose of the materials being used to not interfere with the operations of the other Contractors within the limits of the same project. The Contractor shall join their work with that of the others in an acceptable manner and shall perform it in proper sequence to that of the others.

50-07 Construction layout and stakes. The Engineer/RPR shall establish necessary horizontal and vertical control. The establishment of Survey Control and/or reestablishment of survey control shall be by a State Licensed Land Surveyor. Contractor is responsible for preserving integrity of horizontal and vertical controls established by Engineer/RPR. In case of negligence on the part of the Contractor or their employees, resulting in the destruction of any horizontal and vertical control, the resulting costs will be deducted as a liquidated damage against the Contractor.

Prior to the start of construction, the Contractor will check all control points for horizontal and vertical accuracy and certify in writing to the RPR that the Contractor concurs with survey control established for the project. All lines, grades and measurements from control points necessary for the proper execution and control of the work on this project will be provided to the RPR. The Contractor is responsible to establish all layout required for the construction of the project.

Copies of survey notes will be provided to the RPR for each area of construction and for each placement of material as specified to allow the RPR to make periodic checks for conformance with plan grades, alignments and grade tolerances required by the applicable material specifications. Surveys will be provided to the RPR prior to commencing work items that cover or disturb the survey staking. Survey(s) and notes shall be provided in the following format(s): .pdf, .xml, .dtm, .txt (PNEZD), .csv (PNEZD).

Laser, GPS, String line, or other automatic control shall be checked with temporary control as necessary. In the case of error, on the part of the Contractor, their surveyor, employees or subcontractors, resulting in established grades, alignment or grade tolerances that do not concur with those specified or shown on the plans, the Contractor is solely responsible for correction, removal, replacement and all associated costs at no additional cost to the Owner.

No direct payment will be made, unless otherwise specified in contract documents, for this labor, materials, or other expenses. The cost shall be included in the price of the bid for the various items of the Contract.

50-08 Authority and duties of Quality Assurance (QA) inspectors. QA inspectors shall be authorized to inspect all work done and all material furnished. Such QA inspection may extend to all or any part of the work and to the preparation, fabrication, or manufacture of the materials to be used. QA inspectors are not authorized to revoke, alter, or waive any provision of the contract. QA inspectors are not authorized to issue instructions contrary to the plans and specifications or to act as foreman for the Contractor.

QA Inspectors are authorized to notify the Contractor or their representatives of any failure of the work or materials to conform to the requirements of the contract, plans, or specifications and to reject such nonconforming materials in question until such issues can be referred to the RPR for a decision.

50-09 Inspection of the work. All materials and each part or detail of the work shall be subject to inspection. The RPR shall be allowed access to all parts of the work and shall be furnished with such information and assistance by the Contractor as is required to make a complete and detailed inspection.

If the RPR requests it, the Contractor, at any time before acceptance of the work, shall remove or uncover such portions of the finished work as may be directed. After examination, the Contractor shall restore said portions of the work to the standard required by the specifications. Should the work thus exposed or examined prove acceptable, the uncovering, or removing, and the replacing of the covering or making good of the parts removed will be paid for as extra work; but should the work so exposed or examined prove unacceptable, the uncovering, or removing, and the replacing of the covering or making good of the parts removed will be at the Contractor's expense.

Provide advance written notice to the RPR of work the Contractor plans to perform each week and each day. Any work done or materials used without written notice and allowing opportunity for inspection by the RPR may be ordered removed and replaced at the Contractor's expense.

Should the contract work include relocation, adjustment, or any other modification to existing facilities, not the property of the (contract) Owner, authorized representatives of the Owners of such facilities shall have the right to inspect such work. Such inspection shall in no sense make any facility owner a party to the contract, and shall in no way interfere with the rights of the parties to this contract.

50-10 Removal of unacceptable and unauthorized work. All work that does not conform to the requirements of the contract, plans, and specifications will be considered unacceptable, unless otherwise determined acceptable by the RPR as provided in paragraph 50-02, *Conformity with Plans and Specifications*.

Unacceptable work, whether the result of poor workmanship, use of defective materials, damage through carelessness, or any other cause found to exist prior to the final acceptance of the work, shall be removed immediately and replaced in an acceptable manner in accordance with the provisions of Section 70, paragraph 70-14, *Contractor's Responsibility for Work*.

No removal work made under provision of this paragraph shall be done without lines and grades having been established by the RPR. Work done contrary to the instructions of the RPR, work done beyond the lines shown on the plans or as established by the RPR, except as herein specified, or any extra work done without authority, will be considered as unauthorized and will not be paid for under the provisions of the contract. Work so done may be ordered removed or replaced at the Contractor's expense.

Upon failure on the part of the Contractor to comply with any order of the RPR made under the provisions of this subsection, the RPR will have authority to cause unacceptable work to be remedied or removed and replaced; and unauthorized work to be removed and recover the resulting costs as a liquidated damage against the Contractor.

50-11 Load restrictions. The Contractor shall comply with all legal load restrictions in the hauling of materials on public roads beyond the limits of the work. A special permit will not relieve the Contractor of liability for damage that may result from the moving of material or equipment.

The operation of equipment of such weight or so loaded as to cause damage to structures or to any other type of construction will not be permitted. Hauling of materials over the base course or surface course under construction shall be limited as directed. No loads will be permitted on a concrete pavement, base, or structure before the expiration of the curing period. The Contractor, at their own expense, shall be responsible for the repair to equal or better than preconstruction conditions of any damage caused by the Contractor's equipment and personnel.

50-12 Maintenance during construction. The Contractor shall maintain the work during construction and until the work is accepted. Maintenance shall constitute continuous and effective work prosecuted day by day, with adequate equipment and forces so that the work is maintained in satisfactory condition at all times.

In the case of a contract for the placing of a course upon a course or subgrade previously constructed, the Contractor shall maintain the previous course or subgrade during all construction operations.

All costs of maintenance work during construction and before the project is accepted shall be included in the unit prices bid on the various contract items, and the Contractor will not be paid an additional amount for such work.

50-13 Failure to maintain the work. Should the Contractor at any time fail to maintain the work as provided in paragraph 50-12, *Maintenance during Construction*, the RPR shall immediately notify the Contractor of such noncompliance. Such notification shall specify a reasonable time

within which the Contractor shall be required to remedy such unsatisfactory maintenance condition. The time specified will give due consideration to the exigency that exists.

Should the Contractor fail to respond to the RPR's notification, the Owner may suspend any work necessary for the Owner to correct such unsatisfactory maintenance condition, depending on the exigency that exists. Any maintenance cost incurred by the Owner, shall be recovered as a liquidated damage against the Contractor.

50-14 Partial acceptance. If at any time during the execution of the project the Contractor substantially completes a usable unit or portion of the work, the occupancy of which will benefit the Owner, the Contractor may request the RPR to make final inspection of that unit. If the RPR finds upon inspection that the unit has been satisfactorily completed in compliance with the contract, the RPR may accept it as being complete, and the Contractor may be relieved of further responsibility for that unit. Such partial acceptance and beneficial occupancy by the Owner shall not void or alter any provision of the contract.

50-15 Final acceptance. Upon due notice from the Contractor of presumptive completion of the entire project, the RPR and Owner will make an inspection. If all construction provided for and contemplated by the contract is found to be complete in accordance with the contract, plans, and specifications, such inspection shall constitute the final inspection. The RPR shall notify the Contractor in writing of final acceptance as of the date of the final inspection.

If, however, the inspection discloses any work, in whole or in part, as being unsatisfactory, the RPR will notify the Contractor and the Contractor shall correct the unsatisfactory work. Upon correction of the work, another inspection will be made which shall constitute the final inspection, provided the work has been satisfactorily completed. In such event, the RPR will make the final acceptance and notify the Contractor in writing of this acceptance as of the date of final inspection.

50-16 Claims for adjustment and disputes. If for any reason the Contractor deems that additional compensation is due for work or materials not clearly provided for in the contract, plans, or specifications or previously authorized as extra work, the Contractor shall notify the RPR in writing of their intention to claim such additional compensation before the Contractor begins the work on which the Contractor bases the claim. If such notification is not given or the RPR is not afforded proper opportunity by the Contractor for keeping strict account of actual cost as required, then the Contractor hereby agrees to waive any claim for such additional compensation. Such notice by the Contractor and the fact that the RPR has kept account of the cost of the work shall not in any way be construed as proving or substantiating the validity of the claim. When the work on which the claim for additional compensation is based has been completed, the Contractor shall, within 10 calendar days, submit a written claim to the RPR who will present it to the Owner for consideration in accordance with local laws or ordinances.

Nothing in this subsection shall be construed as a waiver of the Contractor's right to dispute final payment based on differences in measurements or computations.

END OF SECTION 50

Section 60 Control of Materials

60-01 Source of supply and quality requirements. The materials used in the work shall conform to the requirements of the contract, plans, and specifications. Unless otherwise specified, such materials that are manufactured or processed shall be new (as compared to used or reprocessed).

In order to expedite the inspection and testing of materials, the Contractor shall furnish documentation to the RPR as to the origin, composition, and manufacture of all materials to be used in the work. Documentation shall be furnished promptly after execution of the contract but, in all cases, prior to delivery of such materials.

At the RPR's option, materials may be approved at the source of supply before delivery. If it is found after trial that sources of supply for previously approved materials do not produce specified products, the Contractor shall furnish materials from other sources.

The Contractor shall furnish airport lighting equipment that meets the requirements of the specifications; and is listed in AC 150/5345-53, *Airport Lighting Equipment Certification Program* and *Addendum*, that is in effect on the date of advertisement.

60-02 Samples, tests, and cited specifications. All materials used in the work shall be inspected, tested, and approved by the RPR before incorporation in the work unless otherwise designated. Any work in which untested materials are used without approval or written permission of the RPR shall be performed at the Contractor's risk. Materials found to be unacceptable and unauthorized will not be paid for and, if directed by the RPR, shall be removed at the Contractor's expense.

Unless otherwise designated, quality assurance tests will be made by and at the expense of the Owner in accordance with the cited standard methods of ASTM, American Association of State Highway and Transportation Officials (AASHTO), federal specifications, Commercial Item Descriptions, and all other cited methods, which are current on the date of advertisement for bids.

The testing organizations performing on-site quality assurance field tests shall have copies of all referenced standards on the construction site for use by all technicians and other personnel. Unless otherwise designated, samples for quality assurance will be taken by a qualified representative of the RPR. All materials being used are subject to inspection, test, or rejection at any time prior to or during incorporation into the work. Copies of all tests will be furnished to the Contractor's representative at their request after review and approval of the RPR.

A copy of all Contractor QC test data shall be provided to the RPR daily, along with printed reports, in an approved format, on a weekly basis. After completion of the project, and prior to final payment, the Contractor shall submit a final report to the RPR showing all test data reports, plus an analysis of all results showing ranges, averages, and corrective action taken on all failing tests.

The Contractor shall employ a Quality Control (QC) testing organization to perform all Contractor required QC tests in accordance with Item C-100 Contractor Quality Control Program (CQCP).

60-03 Certification of compliance/analysis (COC/COA). The RPR may permit the use, prior to sampling and testing, of certain materials or assemblies when accompanied by manufacturer's COC stating that such materials or assemblies fully comply with the

requirements of the contract. The certificate shall be signed by the manufacturer. Each lot of such materials or assemblies delivered to the work must be accompanied by a certificate of compliance in which the lot is clearly identified. The COA is the manufacturer's COC and includes all applicable test results.

Materials or assemblies used on the basis of certificates of compliance may be sampled and tested at any time and if found not to be in conformity with contract requirements will be subject to rejection whether in place or not.

The form and distribution of certificates of compliance shall be as approved by the RPR.

When a material or assembly is specified by "brand name or equal" and the Contractor elects to furnish the specified "or equal," the Contractor shall be required to furnish the manufacturer's certificate of compliance for each lot of such material or assembly delivered to the work. Such certificate of compliance shall clearly identify each lot delivered and shall certify as to:

a. Conformance to the specified performance, testing, quality or dimensional requirements; and,

b. Suitability of the material or assembly for the use intended in the contract work.

The RPR shall be the sole judge as to whether the proposed "or equal" is suitable for use in the work.

The RPR reserves the right to refuse permission for use of materials or assemblies on the basis of certificates of compliance.

60-04 Plant inspection. The RPR or their authorized representative may inspect, at its source, any specified material or assembly to be used in the work. Manufacturing plants may be inspected from time to time for the purpose of determining compliance with specified manufacturing methods or materials to be used in the work and to obtain samples required for acceptance of the material or assembly.

Should the RPR conduct plant inspections, the following conditions shall exist:

a. The RPR shall have the cooperation and assistance of the Contractor and the producer with whom the Contractor has contracted for materials.

b. The RPR shall have full entry at all reasonable times to such parts of the plant that concern the manufacture or production of the materials being furnished.

c. If required by the RPR, the Contractor shall arrange for adequate office or working space that may be reasonably needed for conducting plant inspections. Place office or working space in a convenient location with respect to the plant.

It is understood and agreed that the Owner shall have the right to retest any material that has been tested and approved at the source of supply after it has been delivered to the site. The RPR shall have the right to reject only material which, when retested, does not meet the requirements of the contract, plans, or specifications.

60-05 Engineer/ Resident Project Representative (RPR) field office. The Contractor shall provide dedicated space for the use of the engineer, RPR, and inspectors, as a field office for the duration of the project. This space shall be located conveniently near the construction and shall be separate from any space used by the Contractor. The Contractor shall furnish water, sanitary facilities, heat, air conditioning, and electricity.

60-06 Storage of materials. Materials shall be stored to assure the preservation of their quality and fitness for the work. Stored materials, even though approved before storage, may again be inspected prior to their use in the work. Stored materials shall be located to facilitate their

prompt inspection. The Contractor shall coordinate the storage of all materials with the RPR. Materials to be stored on airport property shall not create an obstruction to air navigation nor shall they interfere with the free and unobstructed movement of aircraft. Unless otherwise shown on the plans and/or CSPP, the storage of materials and the location of the Contractor's plant and parked equipment or vehicles shall be as directed by the RPR. Private property shall not be used for storage purposes without written permission of the Owner or lessee of such property. The Contractor shall make all arrangements and bear all expenses for the storage of materials on private property. Upon request, the Contractor shall furnish the RPR a copy of the property Owner's permission.

All storage sites on private or airport property shall be restored to their original condition by the Contractor at their expense, except as otherwise agreed to (in writing) by the Owner or lessee of the property.

60-07 Unacceptable materials. Any material or assembly that does not conform to the requirements of the contract, plans, or specifications shall be considered unacceptable and shall be rejected. The Contractor shall remove any rejected material or assembly from the site of the work, unless otherwise instructed by the RPR.

Rejected material or assembly, the defects of which have been corrected by the Contractor, shall not be returned to the site of the work until such time as the RPR has approved its use in the work.

60-08 Owner furnished materials. The Contractor shall furnish all materials required to complete the work, except those specified, if any, to be furnished by the Owner. Owner-furnished materials shall be made available to the Contractor at the location specified.

All costs of handling, transportation from the specified location to the site of work, storage, and installing Owner-furnished materials shall be included in the unit price bid for the contract item in which such Owner-furnished material is used.

After any Owner-furnished material has been delivered to the location specified, the Contractor shall be responsible for any demurrage, damage, loss, or other deficiencies that may occur during the Contractor's handling, storage, or use of such Owner-furnished material. The Owner will deduct from any monies due or to become due the Contractor any cost incurred by the Owner in making good such loss due to the Contractor's handling, storage, or use of Owner-furnished materials.

END OF SECTION 60

Section 70 Legal Regulations and Responsibility to Public

70-01 Laws to be observed. The Contractor shall keep fully informed of all federal and state laws, all local laws, ordinances, and regulations and all orders and decrees of bodies or tribunals having any jurisdiction or authority, which in any manner affect those engaged or employed on the work, or which in any way affect the conduct of the work. The Contractor shall at all times observe and comply with all such laws, ordinances, regulations, orders, and decrees; and shall protect and indemnify the Owner and all their officers, agents, or servants against any claim or liability arising from or based on the violation of any such law, ordinance, regulation, order, or decree, whether by the Contractor or the Contractor's employees.

70-02 Permits, licenses, and taxes. The Contractor shall procure all permits and licenses, pay all charges, fees, and taxes, and give all notices necessary and incidental to the due and lawful execution of the work.

70-03 Patented devices, materials, and processes. If the Contractor is required or desires to use any design, device, material, or process covered by letters of patent or copyright, the Contractor shall provide for such use by suitable legal agreement with the Patentee or Owner. The Contractor and the surety shall indemnify and hold harmless the Owner, any third party, or political subdivision from any and all claims for infringement by reason of the use of any such patented design, device, material or process, or any trademark or copyright, and shall indemnify the Owner for any costs, expenses, and damages which it may be obliged to pay by reason of an infringement, at any time during the execution or after the completion of the work.

70-04 Restoration of surfaces disturbed by others. The Owner reserves the right to authorize the construction, reconstruction, or maintenance of any public or private utility service, FAA or National Oceanic and Atmospheric Administration (NOAA) facility, or a utility service of another government agency at any time during the progress of the work. To the extent that such construction, reconstruction, or maintenance has been coordinated with the Owner, such authorized work (by others) must be shown on the plans and is indicated as follows:

Except as listed above, the Contractor shall not permit any individual, firm, or corporation to excavate or otherwise disturb such utility services or facilities located within the limits of the work without the written permission of the RPR.

Should the Owner of public or private utility service, FAA, or NOAA facility, or a utility service of another government agency be authorized to construct, reconstruct, or maintain such utility service or facility during the progress of the work, the Contractor shall cooperate with such Owners by arranging and performing the work in this contract to facilitate such construction, reconstruction or maintenance by others whether or not such work by others is listed above. When ordered as extra work by the RPR, the Contractor shall make all necessary repairs to the work which are due to such authorized work by others, unless otherwise provided for in the contract, plans, or specifications. It is understood and agreed that the Contractor shall not be entitled to make any claim for damages due to such authorized work by others or for any delay to the work resulting from such authorized work.

70-05 Federal Participation. The United States Government has agreed to reimburse the Owner for some portion of the contract costs. The contract work is subject to the inspection and approval of duly authorized representatives of the FAA Administrator. No requirement of this contract shall be construed as making the United States a party to the contract nor will any such requirement interfere, in any way, with the rights of either party to the contract.

70-06 Sanitary, health, and safety provisions. The Contractor's worksite and facilities shall comply with applicable federal, state, and local requirements for health, safety and sanitary provisions.

70-07 Public convenience and safety. The Contractor shall control their operations and those of their subcontractors and all suppliers, to assure the least inconvenience to the traveling public. Under all circumstances, safety shall be the most important consideration.

The Contractor shall maintain the free and unobstructed movement of aircraft and vehicular traffic with respect to their own operations and those of their own subcontractors and all suppliers in accordance with Section 40, paragraph 40-05, *Maintenance of Traffic*, and shall limit such operations for the convenience and safety of the traveling public as specified in Section 80, paragraph 80-04, *Limitation of Operations*.

The Contractor shall remove or control debris and rubbish resulting from its work operations at frequent intervals, and upon the order of the RPR. If the RPR determines the existence of Contractor debris in the work site represents a hazard to airport operations and the Contractor is unable to respond in a prompt and reasonable manner, the RPR reserves the right to assign the task of debris removal to a third party and recover the resulting costs as a liquidated damage against the Contractor.

70-08 Construction Safety and Phasing Plan (CSPP). The Contractor shall complete the work in accordance with the approved Construction Safety and Phasing Plan (CSPP) developed in accordance with AC 150/5370-2, Operational Safety on Airports During Construction. The CSPP is included in the Contract Documents. Construction Safety and Phasing Plan sheets are included as sheets GC-100 through GC-104 and GC-501 of the project plans.

70-09 Use of explosives. The use of explosives is not permitted on this project.

70-10 Protection and restoration of property and landscape. The Contractor shall be responsible for the preservation of all public and private property, and shall protect carefully from disturbance or damage all land monuments and property markers until the Engineer/RPR has witnessed or otherwise referenced their location and shall not move them until directed.

The Contractor shall be responsible for all damage or injury to property of any character, during the execution of the work, resulting from any act, omission, neglect, or misconduct in manner or method of executing the work, or at any time due to defective work or materials, and said responsibility shall not be released until the project has been completed and accepted.

When or where any direct or indirect damage or injury is done to public or private property by or on account of any act, omission, neglect, or misconduct in the execution of the work, or in consequence of the non-execution thereof by the Contractor, the Contractor shall restore, at their expense, such property to a condition similar or equal to that existing before such damage or injury was done, by repairing, or otherwise restoring as may be directed, or the Contractor shall make good such damage or injury in an acceptable manner.

70-11 Responsibility for damage claims. The Contractor shall indemnify and hold harmless the Engineer/RPR and the Owner and their officers, agents, and employees from all suits, actions, or claims, of any character, brought because of any injuries or damage received or sustained by any person, persons, or property on account of the operations of the Contractor; or on account of or in consequence of any neglect in safeguarding the work; or through use of unacceptable materials in constructing the work; or because of any act or omission, neglect, or misconduct of said Contractor; or because of any claims or amounts recovered from any infringements of patent, trademark, or copyright; or from any claims or amounts arising or recovered under the "Workmen's Compensation Act," or any other law, ordinance, order, or

decree. Money due the Contractor under and by virtue of their own contract considered necessary by the Owner for such purpose may be retained for the use of the Owner or, in case no money is due, their own surety may be held until such suits, actions, or claims for injuries or damages shall have been settled and suitable evidence to that effect furnished to the Owner, except that money due the Contractor will not be withheld when the Contractor produces satisfactory evidence that he or she is adequately protected by public liability and property damage insurance.

70-12 Third party beneficiary clause. It is specifically agreed between the parties executing the contract that it is not intended by any of the provisions of any part of the contract to create for the public or any member thereof, a third-party beneficiary or to authorize anyone not a party to the contract to maintain a suit for personal injuries or property damage pursuant to the terms or provisions of the contract.

70-13 Opening sections of the work to traffic. If it is necessary for the Contractor to complete portions of the contract work for the beneficial occupancy of the Owner prior to completion of the entire contract, such "phasing" of the work must be specified below and indicated on the approved Construction Safety and Phasing Plan (CSPP) and the project plans. When so specified, the Contractor shall complete such portions of the work on or before the date specified or as otherwise specified.

- Phase 1 shall be completed and usable for aircraft operations within 110 calendar days. The limits and scope of Phase 1 are shown on sheet GC-101 of the construction plans.
- Phase 2 shall be completed and usable for aircraft operations within 70 calendar days. The limits and scope of Phase 2 are shown on sheet GC-102 of the construction plans.
- Phase 3 shall be completed and usable for aircraft operations within 65 calendar days. The limits and scope of Phase 3 are shown on sheet GC-103 of the construction plans.
- Phase 4 shall be completed and usable for aircraft operations within 21 calendar days. The limits and scope of Phase 4 are shown on sheet GC-104 of the construction plans.

Upon completion of any portion of work listed above, such portion shall be accepted by the Owner in accordance with Section 50, paragraph 50-14, *Partial Acceptance*.

No portion of the work may be opened by the Contractor until directed by the Owner in writing. Should it become necessary to open a portion of the work to traffic on a temporary or intermittent basis, such openings shall be made when, in the opinion of the RPR, such portion of the work is in an acceptable condition to support the intended traffic. Temporary or intermittent openings are considered to be inherent in the work and shall not constitute either acceptance of the portion of the work so opened or a waiver of any provision of the contract. Any damage to the portion of the work so opened that is not attributable to traffic which is permitted by the Owner shall be repaired by the Contractor at their expense.

The Contractor shall make their own estimate of the inherent difficulties involved in completing the work under the conditions herein described and shall not claim any added compensation by reason of delay or increased cost due to opening a portion of the contract work.

The Contractor must conform to safety standards contained AC 150/5370-2 and the approved CSPP.

Contractor shall refer to the plans, specifications, and the approved CSPP to identify barricade requirements, temporary and/or permanent markings, airfield lighting, guidance signs and other safety requirements prior to opening up sections of work to traffic.

70-14 Contractor's responsibility for work. Until the RPR's final written acceptance of the entire completed work, excepting only those portions of the work accepted in accordance with Section 50, paragraph 50-14, *Partial Acceptance*, the Contractor shall have the charge and care thereof and shall take every precaution against injury or damage to any part due to the action of the elements or from any other cause, whether arising from the execution or from the non-execution of the work. The Contractor shall rebuild, repair, restore, and make good all injuries or damages to any portion of the work occasioned by any of the above causes before final acceptance and shall bear the expense thereof except damage to the work due to unforeseeable causes beyond the control of and without the fault or negligence of the Contractor, including but not restricted to acts of God such as earthquake, tidal wave, tornado, hurricane or other cataclysmic phenomenon of nature, or acts of the public enemy or of government authorities.

If the work is suspended for any cause whatever, the Contractor shall be responsible for the work and shall take such precautions necessary to prevent damage to the work. The Contractor shall provide for normal drainage and shall erect necessary temporary structures, signs, or other facilities at their own expense. During such period of suspension of work, the Contractor shall properly and continuously maintain in an acceptable growing condition all living material in newly established planting, seeding, and sodding furnished under the contract, and shall take adequate precautions to protect new tree growth and other important vegetative growth against injury.

70-15 Contractor's responsibility for utility service and facilities of others. As provided in paragraph 70-04, *Restoration of Surfaces Disturbed by Others*, the Contractor shall cooperate with the owner of any public or private utility service, FAA or NOAA, or a utility service of another government agency that may be authorized by the Owner to construct, reconstruct or maintain such utility services or facilities during the progress of the work. In addition, the Contractor shall control their operations to prevent the unscheduled interruption of such utility services and facilities.

To the extent that such public or private utility services, FAA, or NOAA facilities, or utility services of another governmental agency are known to exist within the limits of the contract work, the approximate locations have been indicated on the plans and/or in the contract documents.

Arizona Public Service (APS):	David McCasland	(602) 371-6451
FAA Facilities:	Roger Gusfason	(602) 305-2532
Communication (Lumen):	John O'Dell	(602) 530-0496
Gas (Southwest Gas):	Norma Jardin	(602) 484-5344
Water/Sewer (City):	Jami Erickson	(602) 261-8229
Environmental (City):	Rebecca Godley	(602) 273-3396
Electrical (City)	David Thornton	(602) 540-7667
Communication (City):	Chad Blotkamp	(602) 708-0244
All Emergency, Fire, Police, Medical	Operator	(602) 273-3311

It is understood and agreed that the Owner does not guarantee the accuracy or the completeness of the location information relating to existing utility services, facilities, or

structures that may be shown on the plans or encountered in the work. Any inaccuracy or omission in such information shall not relieve the Contractor of the responsibility to protect such existing features from damage or unscheduled interruption of service.

It is further understood and agreed that the Contractor shall, upon execution of the contract, notify the Owners of all utility services or other facilities of their plan of operations. Such notification shall be in writing addressed to "The Person to Contact" as provided in this paragraph and paragraph 70-04, *Restoration of Surfaces Disturbed By Others*. A copy of each notification shall be given to the RPR.

In addition to the general written notification provided, it shall be the responsibility of the Contractor to keep such individual Owners advised of changes in their plan of operations that would affect such Owners.

Prior to beginning the work in the general vicinity of an existing utility service or facility, the Contractor shall again notify each such Owner of their plan of operation. If, in the Contractor's opinion, the Owner's assistance is needed to locate the utility service or facility or the presence of a representative of the Owner is desirable to observe the work, such advice should be included in the notification. Such notification shall be given by the most expeditious means to reach the utility owner's "Person to Contact" no later than two normal business days prior to the Contractor's commencement of operations in such general vicinity. The Contractor shall furnish a written summary of the notification to the RPR.

The Contractor's failure to give the two days' notice shall be cause for the Owner to suspend the Contractor's operations in the general vicinity of a utility service or facility.

Where the outside limits of an underground utility service have been located and staked on the ground, the Contractor shall be required to use hand excavation methods within 3 feet (1 m) of such outside limits at such points as may be required to ensure protection from damage due to the Contractor's operations.

Should the Contractor damage or interrupt the operation of a utility service or facility by accident or otherwise, the Contractor shall immediately notify the proper authority and the RPR and shall take all reasonable measures to prevent further damage or interruption of service. The Contractor, in such events, shall cooperate with the utility service or facility owner and the RPR continuously until such damage has been repaired and service restored to the satisfaction of the utility or facility owner.

The Contractor shall bear all costs of damage and restoration of service to any utility service or facility due to their operations whether due to negligence or accident. The Owner reserves the right to deduct such costs from any monies due or which may become due the Contractor, or their own surety.

70-15.1 FAA facilities and cable runs. The Contractor is hereby advised that the construction limits of the project include existing facilities and buried cable runs that are owned, operated and maintained by the FAA. The Contractor, during the execution of the project work, shall comply with the following:

a. The Contractor shall permit FAA maintenance personnel the right of access to the project work site for purposes of inspecting and maintaining all existing FAA owned facilities.

b. The Contractor shall provide notice to the FAA Air Traffic Organization (ATO)/Technical Operations/System Support Center (SSC) Point-of-Contact through the airport Owner a minimum of seven (7) calendar days prior to commencement of construction activities in order to permit sufficient time to locate and mark existing buried cables and to schedule any required facility outages.

c. If execution of the project work requires a facility outage, the Contractor shall contact the FAA Point-of-Contact a minimum of 72 hours prior to the time of the required outage.

d. Any damage to FAA cables, access roads, or FAA facilities during construction caused by the Contractor's equipment or personnel whether by negligence or accident will require the Contractor to repair or replace the damaged cables, access road, or FAA facilities to FAA requirements. The Contractor shall not bear the cost to repair damage to underground facilities or utilities improperly located by the FAA.

e. If the project work requires the cutting or splicing of FAA owned cables, the FAA Point-of-Contact shall be contacted a minimum of 72 hours prior to the time the cable work commences. The FAA reserves the right to have a FAA representative on site to observe the splicing of the cables as a condition of acceptance. All cable splices are to be accomplished in accordance with FAA specifications and require approval by the FAA Point-of-Contact as a condition of acceptance by the Owner. The Contractor is hereby advised that FAA restricts the location of where splices may be installed. If a cable splice is required in a location that is not permitted by FAA, the Contractor shall furnish and install a sufficient length of new cable that eliminates the need for any splice.

70-16 Furnishing rights-of-way. The Owner will be responsible for furnishing all rights-of-way upon which the work is to be constructed in advance of the Contractor's operations.

70-17 Personal liability of public officials. In carrying out any of the contract provisions or in exercising any power or authority granted by this contract, there shall be no liability upon the Engineer, RPR, their authorized representatives, or any officials of the Owner either personally or as an official of the Owner. It is understood that in such matters they act solely as agents and representatives of the Owner.

70-18 No waiver of legal rights. Upon completion of the work, the Owner will expeditiously make final inspection and notify the Contractor of final acceptance. Such final acceptance, however, shall not preclude or stop the Owner from correcting any measurement, estimate, or certificate made before or after completion of the work, nor shall the Owner be precluded or stopped from recovering from the Contractor or their surety, or both, such overpayment as may be sustained, or by failure on the part of the Contractor to fulfill their obligations under the contract. A waiver on the part of the Owner of any breach of any part of the contract shall not be held to be a waiver of any other or subsequent breach.

The Contractor, without prejudice to the terms of the contract, shall be liable to the Owner for latent defects, fraud, or such gross mistakes as may amount to fraud, or as regards the Owner's rights under any warranty or guaranty.

70-19 Environmental protection. The Contractor shall comply with all federal, state, and local laws and regulations controlling pollution of the environment. The Contractor shall take necessary precautions to prevent pollution of streams, lakes, ponds, and reservoirs with fuels, oils, asphalts, chemicals, or other harmful materials and to prevent pollution of the atmosphere from particulate and gaseous matter.

70-20 Archaeological and historical findings. Unless otherwise specified in this subsection, the Contractor is advised that the site of the work is not within any property, district, or site, and does not contain any building, structure, or object listed in the current National Register of Historic Places published by the United States Department of Interior.

Should the Contractor encounter, during their operations, any building, part of a building, structure, or object that is incongruous with its surroundings, the Contractor shall immediately cease operations in that location and notify the RPR. The RPR will immediately investigate the

Contractor's finding and the Owner will direct the Contractor to either resume operations or to suspend operations as directed.

Should the Owner order suspension of the Contractor's operations in order to protect an archaeological or historical finding, or order the Contractor to perform extra work, such shall be covered by an appropriate contract change order or supplemental agreement as provided in Section 40, paragraph 40-04, *Extra Work*, and Section 90, paragraph 90-05, *Payment for Extra Work*. If appropriate, the contract change order or supplemental agreement shall include an extension of contract time in accordance with Section 80, paragraph 80-07, *Determination and Extension of Contract Time*.

70-21 Not Used.

END OF SECTION 70

Section 80 Not Used

END OF SECTION 80

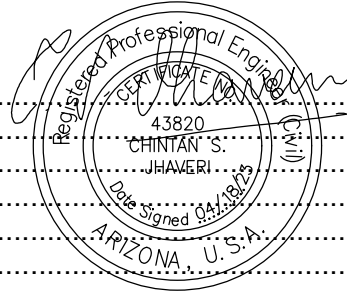
Section 90 Not Used

END OF SECTION 90

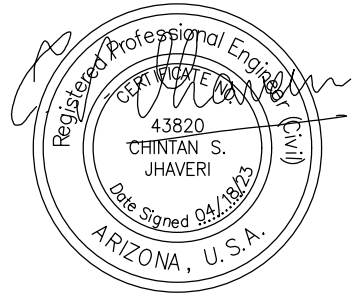
SECTION III-B
TECHNICAL SPECIAL PROVISION SPECIFICATIONS

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TECHNICAL SPECIAL PROVISION SPECIFICATIONS

1. TRAFFIC CONTROL AND REGULATIONS. All traffic and/or traffic control devices on this project shall be provided, maintained and/or controlled by the Contractor, as specified in the City of Phoenix *Traffic Barricade Manual*, latest edition, with revisions as shown below:

- a. The following shall be considered major streets:
 - 24th Street;
 - Air Lane;
 - 48th Street;
 - 44th Street;
 - Buckeye Road, and;
 - Sky Harbor Boulevard;
 - Old Tower Road.
- b. Permission to restrict City streets, sidewalks and alleys (street closure permits) shall be requested as specified in the *Traffic Barricade Manual*, latest edition.
- c. Unless otherwise provided in Special Provision Item 36, "Airport Safety and Security (M-003)", all traffic on this project shall be regulated as specified in the *Traffic Barricade Manual*, latest edition.
- d. No deviation to Special Provision Item 36, "Airport Safety and Security (M-003)" will be allowed or implemented unless submitted to the City for review and approval one (1) week prior to the proposed work.
- e. Off-peak hours at Phoenix Sky Harbor International Airport are from 11:00PM to 5:00AM for lane restrictions.
- f. No complete road closures are allowed.
- g. Sky Harbor Boulevard during peak hours shall have no less than two (2) lanes operational in each direction unless noted otherwise.
- h. The Contractor shall submit for each construction phase, a Landside Traffic Control Plan containing traffic control drawings with barricade layouts to the City for approval. This submittal must be transmitted to the City a minimum of one (1) week prior to instituting the particular Traffic Control Plan.
- i. Hauling equipment, either full or empty, or any other construction traffic will not be allowed on Sky Harbor Boulevard, the exceptions to this will be either shown on the plans, or otherwise directed by the City of Phoenix Aviation Department. Any damage by the Contractor to major streets, including Sky Harbor Boulevard, shall have full repairs performed the same day that the damage occurred at no cost to the City.

2. PLANS AND SPECIFICATIONS. The Contractor shall keep at least one (1) copy of the contract documents constantly accessible on the work site.

The City of Phoenix Supplements will govern over the MAG Standard Specifications and Details. In case of a discrepancy or conflict between these Contract Documents and the City of Phoenix Supplements or the MAG Standard Specifications and Details, the Plans will govern over both the City of Phoenix Supplements and MAG Standard Specifications and Details. Technical Special Provisions will govern over the City of Phoenix Supplements and the MAG Standard Specifications and Details.

The following is the precedence of the Contract Documents:

- a. Technical Special Provision Specifications
- b. Civil Technical Specifications
- c. Cited Standards for Materials and Testing
- d. Cited Federal Aviation Administration (FAA) Advisory Circulars
- e. General Provision Specifications
- f. Plans
- g. City of Phoenix Supplement to MAG Standard Specifications and Details
- h. MAG Uniform Standard Specifications and Details for Public Works Construction

Calculated dimensions will govern over scaled dimensions. The Contractor shall not take advantage of any apparent error or omission on the Plans or Specifications. In the event the Contractor discovers any apparent error or discrepancy, he shall immediately call upon the RPR for his/her interpretation and decision, and such decision shall be final.

Electronic files (CAD files) are not a part of the contract documents. Information contained on CAD files may not be compatible with the coordinates, elevations, details, and dimensions shown on the Project Plans. The Contractor may be provided with CAD files; however, the Contractor shall survey and construct the project from the information shown on the Project Plans, and as specified in the Project Specifications and Contract Documents.

3. WATER. All water required for and in conjunction with the work to be performed shall be provided by the Contractor and at the Contractor's expense. The Contractor shall arrange for the installation of an appropriate meter and bear the cost of such installation and the cost of the water.

When the Contractor needs a temporary waterline to the staging area, he shall coordinate the temporary waterline installation with the City of Phoenix Aviation Department Inspection Staff. There shall be no separate pay item for the construction of temporary water lines. These costs shall be included in items for which direct payment is made.

Prior to the actual water line shut down, the Contractor shall follow the following sequence of events:

- a. Construct all new waterlines, except for connections to existing water lines.
- b. Test the new water line in accordance with MAG and the City of Phoenix Supplemental specifications.
- c. Demonstrate that all fittings and waterlines are on site available to connect the new waterline to the existing waterline.
- d. Notify all customers in writing who will be experience water service interruption.
- e. Notify the Fire Department of possible low pressures to firelines and satisfy Fire Department requirements.
- f. Complete the connection of new temporary waterline under this Contract, to existing, with minimum disruption to the waterline system.

4. SECURITY FENCES AND GATES. All existing security fences and gates affected by the work shall be maintained by the Contractor until final completion and acceptance of the work. Existing security fence and gates that interfere with construction operations shall not be relocated or dismantled until permission is obtained from the City of Phoenix Airside Operations, through the RPR. The duration that the security fence or gate may be left relocated or dismantled shall be approved by the City of Phoenix.

The Contractor shall submit to the City, a Security Gate Access Plan for review prior to the work, and prior to relocation or removal of any security gates or fence. The Contractor shall restore all security fences and gates that are affected by the work, to their original or to a better condition.

5. POWER. All power for lighting, operation of Contractor's plant or equipment, or for any other use as may be required in the execution of the work to be performed under the provisions of these contract documents shall be provided by the Contractor at his/her expense. Subject to the approval of the City, he/she may be permitted to connect to existing facilities where available, but he/she shall meter and bear the cost of such power.

Should electrical power not be immediately available for the Contractor's field offices, batch plant or the RPR's field offices and testing laboratories, the Contractor shall provide a generator(s) until such electrical power is available.

6. OPERATIONAL SAFETY AND MARKING. This project is within the limits of the Phoenix Sky Harbor International Airport Air Operations Area, and as such, strict safety and security requirements are in effect. The Contractor's attention is directed to the City of Phoenix, *Airport Construction Safety Manual* and the following FAA Advisory Circulars:

a. Federal Aviation Advisory Circulars.

1. Advisory Circular AC 150/5340-1M, "Standards for Airport Markings" which is incorporated into these Contract Documents by reference. The requirements of Section 5 of the Advisory Circular regarding marking of closed or hazardous areas shall also be adhered to.
2. Advisory Circular AC 150/5210-5D, "Painting, Marking, and Lighting of Vehicles Used on an Airport", which is incorporated into these contract documents by reference. All Contractor vehicles and equipment shall be provided with orange and white checkered flags during hours with sufficient daylight. Fully functional amber rotating beacons shall be provided during all hours of work, as described in Special Provision Item 36.
3. Advisory Circular AC 150/5370-2G, "Operational Safety on Airports During Construction", which is incorporated into these Contract Documents by reference. The Special Safety requirements during construction shall be strictly observed.

b. Portable Light Plants.

1. The height, placement and orientation of light plants used during night construction will be subject to the review and approval of the City of Phoenix Aviation Department. Special care must be made to light plant position, orientation and use in order to avoid impairing both aircraft movements and the Air Traffic Control Tower (ATCT) operations.
2. A minimum of seven (7) days prior to the start of night construction the Contractor shall submit a Construction Lighting Plan for review and approval by the RPR. This lighting plan

shall be updated and re-submitted for approval, as and when dictated by changes to the Plan during the progression of the work, or if a revised Plan is requested by the RPR.

c. Contractor Operational Assistance.

1. The Contractor shall provide trained personnel with vehicles, to escort the Contractor employees, subcontractors, vendors, truckers and any other person who are required to perform work that allows them to have access to the secured areas of the Airport.

2. The Contractor provided Operational Assistance shall hold security badges and attend escort training/airfield drivers training that will be conducted by Airside Operations.

3. These Contractor Operational Assistance personnel shall be under the direction of the City of Phoenix Airside Operations.

d. Open Trenching Limitations.

Open storm drain trenches, electrical duct or conduit trenches, utility trenches or any other trench shall be limited to 500-feet accumulative in length at any time. Open trenches in the runway safety area (RSA) shall be properly and completely backfilled and compacted in sufficient time before the end of the work shift.

e. Availability of Water Trucks and Vacuum Sweepers.

Vacuum sweepers and highway 4M water trucks shall be available and in operating condition to control dust and remove foreign object debris seven (7) days per week and twenty-four (24) hours per day, including Holidays. A minimum of one (1) vacuum sweeper and one (1) 4M highway water trucks shall be operating continuously at all times the Contractor or any subcontractor is working on the project.

f. Paint Striping and Obliteration. Asbestos and lead based paint identification and/or remediation shall be performed by the City of Phoenix unless otherwise indicated by an authorized City of Phoenix representative.

Prior to starting Work:

1. Paint marking trucks and obliteration by water blasting shall be on call and available to respond to the project site within twelve (12) hours.

2. The Contractor shall fabricate aluminum stencils/templates for all surface painted numbers and letters. Upon project completion, the Contractor shall deliver to the City of Phoenix, all stencils/templates for surface painted numbers and letters. The gauge of the aluminum stencil/template shall match the gauge of the City's existing stencils/templates.

g. Measurement and Payment.

1. Operational Safety and Marking shall not be measured for payment under this Special Provision. All costs in relation herewith will be considered incidental to the item of work to which it pertains.

7. RECORDS. The City of Phoenix, ADOT, the FAA, the Comptroller General of the United States, or any of their authorized representatives, shall be allowed access to any books, documents, papers, and records of the Contractor which are directly pertinent to the Airport Improvement Program project for the purpose of making audit, examination, excerpts, and

transcriptions for a period of three (3) years following completion of the work.

8. NOT USED.

9. SHOP DRAWINGS AND SUBMITTALS. The Contractor shall submit all submittals including shop drawings, working drawings or supplementary drawings to the RPR for review for general conformance in accordance with MAG 105.2 and as modified herein. Contractor submittals shall be uploaded to the City's Oracle® Unifier system as necessary in PDF format. Each submittal shall be numbered sequentially and shall be submitted as to cause no delay in the work.

A partial list of submittals has been provided below, and it is intended to provide the Contractor with the minimum of required submittals. This list may not be complete, and it may be revised from time to time as the project progresses. Additional submittals may be required throughout the duration of the project at the discretion of the RPR.

The date when the Contractor provides the submittal(s) to the RPR shall be included in the Contractor's schedule using a distinct schedule activity ID number for each submittal. All submittals shall have assigned due dates. Due dates shall correspond with the approved Critical Path Method (CPM) schedule start dates for related activities allowing a minimum of fifteen (15) calendar days, or otherwise specified in the Technical Specifications, for the RPR's review as well as adequate time for fabrication and delivery of the material. The RPR and the City of Phoenix shall not be held responsible for late or inadequate submittals provided by the Contractor. Failure to submit by the submittal date may result in withholding of payment either in part or in full until the submittals are received. Materials shall not be incorporated into the work without the submittal reviewed, or the material certification reviewed by the City of Phoenix Materials Laboratory.

<u>Submittal Number</u>	<u>Submittal Description</u>
1.	Dust control plan (Civil Technical Specification Item C-102).*
2.	Preliminary CPM Contractor's construction schedule.
3.	A schedule of values.
4.	Revisions to the critical path method construction schedule and monthly report.
5.	A detailed lighting plan for night work (Special Provision Item 36) *
6.	Contractor's emergency names and phone number list (Special Provision Item 36). *
7.	Request for taxiway closing, 72-hours advance written notice (Special Provision Item 36).
8.	A detailed work plan for each phase and sub-phase of construction (Special Provision Item 36).
9.	An airside barricade plan and traffic control plan (Special Provision Item 36).
10.	A security badge control plan (Special Provision Item 36).*
11.	A list designating those portions of the work to be performed by subcontractor's and the Contractor's own forces (City of Phoenix Requirement).
12.	Video tape and written report of the conditions of existing facilities, documenting the results of the inspection performed prior to the start of the work (Special Provision Specification 10).
13.	A list of subcontractors and material suppliers with an experience statement (City of Phoenix Requirement).
14.	Written safety and security program for the work (City of Phoenix Requirement).
15.	Copy of all executed subcontracts, including material suppliers (to be submitted before any subcontractor or material supplier begins work).
16.	A list of proposed construction equipment with specification details for the following: the

- concrete paver(s) including cure application equipment; structural concrete vibration equipment, the asphaltic concrete paver, compaction equipment, and the concrete batch plants (FAA Requirement).
17. Certification from the Contractor's registered Land Surveyor or professional Engineer that the primary control established is acceptable and adequate to allow the Contractor's construction staking to meet the accuracy requirements of the specifications. (Special Provision Specification 30).
 18. Duplicate original certified payroll reports and statement of compliance, with sworn affidavits from the Contractor (Special Provision Specification, and to be submitted weekly).
 19. Three (3) week look ahead project schedule at weekly construction meetings (Special Provision Specifications).
 20. A landside barricade plan and traffic control plan for each phase of construction (Special Provision Specifications).
 21. Security gate access plan (Special Provision Specifications).
 22. Contractor's Quality Control Plan, to be submitted five (5) business days prior to the pre-construction conference (Civil Technical Specification Item C-100).
 23. Contractor's quality control records, including daily inspection reports and daily test reports, to be submitted daily (Civil Technical Specification Item C-100).
 24. Temporary fencing plan for Contractor's staging area (Civil Technical Specification Item P-101).
 25. Controlled low strength material (CLSM) mix design with test data (Civil Technical Specification P-153).
 26. Storm water pollution prevention plan, including certification of compliance Form* (Civil Technical Specification Item C-102).
 27. Storm water pollution prevention plan notice of intent.* (Civil Technical Specification Item C-102).
 28. Storm water pollution prevention plan inspection and maintenance reports, monthly submission required, or when precipitation exceeds 0.5-inches (Civil Technical Specification Item C-102).
 29. Storm water pollution prevention plan notice of termination (Civil Technical Specification Item C-102).
 30. Material gradation, fractured face(s), percentage of wear, Atterberg Limits, and sodium sulfate soundness loss for crushed aggregate base course (Civil Technical Specification Items P-209 and P-219).
 31. Structural Portland cement concrete mix design(s) (Civil Technical Specification Item P-610).
 32. A letter of certification for any admixture used in structural Portland cement concrete (Civil technical specification Item P-610).
 33. Manufacturer's certified test reports for all paint shipped to the project (Civil Technical Specification Item P-620).
 34. A letter of compliance for the rubber gasket reinforced concrete D-load pipe (Civil Technical Specification Item D-701).
 35. Gradation and physical requirements for the pipe bedding (Civil Technical Specification Item D-701).
 36. Shop drawings for junction structures, manholes and catch basins (Civil Technical Specification Item D-751).
 37. MAG concrete mix design(s) (MAG Standard Specifications).
 38. A new copy of the sealed and certified weighing and metering devices used for the purpose of proportioning Portland cement, sealed and certified as to accuracy and tolerance prescribed by the weights and measures division of the state of Arizona.
 39. Shop drawings and material lists of manufacturers' brochures containing complete

- dimensional and performance characteristics, installation and operation instructions, etc. for each item; the FAA specification number, the manufacturers' name, the manufacturers' catalog number; and the size, type and/or rating of each item used on the project.
40. Manufacturers' statement of warranty for each item used on the project.
 41. Materials list shall be submitted listing each specification paragraph number and stating whether the materials proposed are as specified or are substitutions.
 42. Contractor's affidavit regarding settlement of claims (Project Close out Requirement).
 43. Submit a disadvantaged business enterprise (DBE) utilization percent obtained for the project (Project Close out Requirement).
 44. Original affidavit acknowledging that all subcontractors, material suppliers, payrolls, bills for materials and equipment, and other indebtedness connected with the work have been paid or otherwise satisfied (Project Close out Requirement).
 45. A written consent of the surety to final payment (Project Close out Requirement).
 46. Record drawings with a written certification that the drawings are accurate and complete, due at substantial completion (Project Close out Requirement).
 47. An Original, with Notary Signature, Full and Final Release and Waiver on Liens from the Contractor and for each subcontractor and material supplier that documents that they have been paid in full (Project Close out Requirement).
 48. A lien release documenting that all subcontractors and material suppliers have been paid for the previous months work (Project Close out Requirement).
 49. Certificate of final completion (Project Close out Requirement)
 50. Written warranty, due at final completion (Project Close out Requirement).
 51. Compact disk containing all the information contained in the submittals. The information shall be submitted in PDF format. Cut sheets, shop drawings, and pages from suppliers catalogs must also be furnished in electronic format as indicated above (Special Provision Specification 9).

* Indicates that the submittal or shop drawing is due at the pre-construction conference.

The Contractor shall submit a detailed listing of all submittals (e.g. mix designs, material certifications) and shop drawings as required by the Civil and Electrical Technical Specifications and elsewhere in these contract documents. The listing can be developed in a spreadsheet format and shall include:

- a. Specification item number
- b. Item description
- c. Description of submittal
- d. Specification paragraph requiring submittal, and
- e. Scheduled date of submittal to be returned to Contractor

The Contractor shall certify each submittal and shop drawing by providing an original signed and dated letter to the City, that he has reviewed and approved the submittal and that it conforms to the requirements of the contract documents.

If this original certification is not included, the submittal and/or shop drawing will be returned without any action by the City. At the time of each submittal, the Contractor shall define and delineate in writing on the certification, any deviations from the contract documents.

The City's review will be only for general conformance with the design concept of the work and for compliance with the information contained in the contract documents. The review of a specified item, as such, will not indicate review of the assembly in which the item functions. Review by the

City will not relieve the Contractor from responsibility for any errors or omissions in the submittal or shop drawings, nor from his responsibility for complying with the contract documents.

After all submittals and shop drawings are reviewed, the Contractor shall furnish a compact disk read only memory (CD ROM) containing all the information contained in the submittal. The information shall be submitted in Acrobat Reader PDF format. Cut sheets, shop drawings, and pages from suppliers catalogs must also be furnished in electronic format as indicated above, or otherwise approved by the City.

10. PROTECTION OF EXISTING FACILITIES. Prior to the start of the construction, periodically as requested, and at the completion of the project, a representative of the Aviation Department and the Contractor's authorized representative will inspect the excavation and embankment areas, staging area, haul roads and job site to evaluate the condition of existing facilities. The City may videotape these inspections. The Contractor will be held responsible for any damage to existing facilities in accordance with MAG Uniform Standard Specifications Section 107.9. The Quality Control Program Administrator and the Contractor shall video tape and inspect the condition of existing facilities. The video tape and the written report shall be submitted to the RPR, documenting the results of the inspection performed prior to the start of the work.

There may be existing ground monitoring wells throughout the Airport owned by the City of Phoenix and Arizona Department of Environmental Quality (ADEQ). The Contractor shall provide lighted barricades around the existing ground monitoring wells that are within the construction limits, prior to the start of construction.

Existing ground monitoring wells shall be protected in-place by the Contractor. The environmental division of the Aviation Department will complete the grade adjustments to the ground monitoring wells as necessary, unless noted otherwise on plans. However, the cost of repairs due to damage caused by the Contractor shall be borne solely by the Contractor. The Contractor shall coordinate all adjustments or repairs to the ground monitoring wells with the Environmental Division.

11. PROJECT FIELD OFFICES. During the performance of this Contract, the Contractor shall maintain suitable offices, laboratories and testing facilities at the Airport project site (specific site is shown on the plans) that shall be the headquarters of his representative authorized to receive drawings, instructions or other communication or articles.

The Contractor shall be responsible for maintaining the offices and all facilities and equipment therein in good working condition for the full duration of the project. All utility costs shall be the responsibility of the Contractor as well as any fees for permits, cleaning services, sanitary, water, electrical and gas hookups, installation charges, etc.

Any communication given to the said representative or delivered at Contractor's office at the site of the work in his absence shall be deemed to have been delivered to the Contractor. Copies of the drawings, specifications and other Contract Documents shall be kept at Contractor's office at the site of the work and available for use at all times. Refer to Special Provision Item 34 for project requirements for the RPR's field offices and concrete testing facilities for additional project requirements.

12. TELEPHONE SERVICE. Contractor shall make all necessary arrangements with the telephone utility for telephones in his offices at the site and separate telephones in the office of the RPR. The Contractor shall pay all monthly charges therefore, including long-distance calls

from the office of the RPR, not to exceed \$250.00 per month.

13. SANITARY FACILITIES. The Contractor shall furnish temporary sanitary facilities at the site, as provided herein, for the needs of all construction workers and others performing work or furnishing services on the project. Sanitary facilities shall be of reasonable capacity, properly maintained throughout the construction period, and obscured from public view to the greatest practical extent. If toilets of the chemically treated type are used, at least one (1) or more toilets will be furnished at each secured site, as required by the Arizona State Department of Health Services. The Contractor shall enforce the use of such sanitary facilities by all personnel at the site.

For construction phases or sub-phases where the work hours are limited and the area is to be re-opened at the end of the work shift, the Contractor shall provide mobile chemically treated facilities to be mobilized and demobilized to the work area daily.

14. PARKING. The Contractor shall provide and maintain suitable off-site parking areas outside of the Air Operations Area for the use of all construction workers and others performing work or furnishing services in connection with the project, as required to avoid any need for parking personal vehicles where they may interfere with public traffic, aircraft and Owner's operations, or construction activities. A preliminary parking location is shown in the plans; however, the Contractor's parking area will be determined in the pre-construction conference. The Contractor shall restore all parking areas to original (pre-construction) condition, including fence, gates and ground surfaces following all construction activities.

15. CONSTRUCTION SCHEDULE. Refer to City of Phoenix specifications for project schedule requirements. There will be no work (with exception to vacuum sweeping for the cleanup of foreign object debris) as described in the following:

- a. The night shift on New Year's Eve, all day on New Year's day, the night shift on New Year's day
- b. The night shift prior to Labor day, all day on Labor day, the night shift on Labor day
- c. The night shift prior to Memorial day, all day on Memorial day, the night shift on Memorial day
- d. The night shift prior to the 4th of July, all day on the 4th of July, the night shift on the 4th of July
- e. The night shift prior to Thanksgiving day, all day on Thanksgiving day, the night shift on Thanksgiving day, the Sunday day shift and the Sunday night shift following Thanksgiving
- f. The night shift on Christmas Eve, all day on Christmas day, the night shift on Christmas day
- g. Any dates described in the current City of Phoenix Aviation Department's moratorium calendar.

The Contractor shall develop his schedule, plan his work, and provide sufficient manpower materials and equipment to complete all work within the allotted contract time utilizing five (5) day work weeks and multiple shift operations as needed.

16. DELAYS AND EXTENSIONS OF TIME. Delete MAG Section 110 and substitute the following:

a. Notice of Claim for Additional Time. Claims for additional time must be made by the Contractor per Article 6. Notice of any Contractor claims of time extension entitlement due to extra work must be included in the Contractors change order request regarding the extra work. Failure to provide the notice required by this section shall constitute a waiver of any entitlement the

Contractor may otherwise have. Notices shall include: (1) the nature of the delay; (2) the critical path activities being affected; (3) the probably effect of the delay on progress of the work; (4) a description of efforts the Contractor intends to make to mitigate the delay, and; (5) a cost estimate. If the notice includes adverse weather delays, the notice shall also include data substantiating the adverse weather.

b. Notice of Claim for Additional Cost. If the Contractor wishes to make a claim for an increase in the contract sum, written notice shall be given before proceeding to execute the work. The written notice shall be given to the City within five (5) calendar days after the occurrence of the event giving rise to the claim. Prior notice is not required for claims relating to an emergency endangering life or property. The Contractor shall provide notice of claims relating to emergencies within five (5) days after the occurrence of the emergency. Failure to strictly comply with this notice requirement shall constitute waiver of such claims.

c. Out-of-Sequence Work. The Contractor and Owner contemplate that changes in the Contractor's schedule and the performance of out-of-sequence work may be necessary for the beneficial and timely completion of the project, safety of the flying public or convenience of the Owner. The Contractor expressly waives any claim for additional costs resulting from out-of-sequence work beneficial to the overall project.

d. Continuing Contract Performance. Pending final resolution of a claim, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract other than amounts in dispute.

e. Claim Documentation. Within thirty (30) calendar days after the Contractor submits a notice of claim, the Contractor shall submit a "Claim," which shall include the following documentation:

1. The date of the occurrence and the nature and circumstances of the issue for which the notice of claim was given.
2. The identity of any documents and the substance of any oral communication related to the issue.
3. The basis for an assertion that the work required is a change from the original Contractor work or schedule.
4. The identity of particular elements of contract performance for which a change in compensation and/or time may be sought including:
5. A previously submitted project schedule demonstrating that any affected activities were identified as on the project's critical path or were made critical by the delay.
 - a) Pay item(s) that have been or may be affected by the issue and any adjustments to unit price(s) that are required;
 - b) Labor and/or materials that will be added, deleted or wasted by the problem and what equipment will be idled or required.
 - c) Delay and disruption in the manner and sequence of performance that has been or will be required.
 - d) Adjustments to delivery schedule(s), staging, and contract time due to the dispute and
 - e) An estimate of time within which the Owner must respond to the notice to minimize cost, delay, or disruption of issue.
6. Any other items or information germane to the dispute.
7. "I, _____, being the _____ (must be an officer) of _____ (Contractor), declare under penalty of perjury under the laws of the State of Arizona, and do personally certify and attest that: I have thoroughly reviewed the attached Claim for additional compensation and/or extension of time, and know it's contents, and said claim is made in good faith; the supporting data is truthful and accurate; that the amount requested accurately reflects the contract

adjustment for which the Contractor believes the City of Phoenix is liable; and, further, that I am familiar with Federal Acquisition Regulation (FAR) clause 52.214-27, found in 48 CFR Part 52; and further know and understand that submission or certification of a false claim may lead to fines, imprisonment, and/or other severe legal consequences.”

By: _____
Title: _____
Date: _____

The Contractor’s written certification, under oath: If any subcontractor or any lower tier subcontractor wishes to make a Claim, the subcontractor shall also provide the certification (in addition to the General Contractor).

f. Claims for Consequential Damages. The Contractor waives claims against the Owner for consequential damages arising out of or relating to this contract. This waiver includes the Contractor’s principal office expenses including the compensation of personnel stationed there, financing losses, business and reputation and lost profits.

g. Claim Review. Claims shall be submitted to the RPR, who will review the Claim and provide a recommendation to the Owner. The RPR’s recommendation shall not be binding on the Owner. The Owner may meet with the Contractor review the claim.

h. Owner’s Audit Rights. The submission of a Claim by the Contractor shall entitle the Owner to audit all Contractor records and documents relating to the project, including but not limited to the Contractor’s bid documents, job cost records and ledgers, payrolls, schedules, communications with its subcontractor and material suppliers and subcontract agreements. The Contractor’s failure to timely provide these documents shall constitute a material breach of the Contract.

17. COORDINATION BETWEEN CONTRACTORS. There may be work on airport projects by other contractors that could affect this project. The Contractor on this project shall work with airport personnel to coordinate his/her activities and access to the project.

18. SEQUENCE OF CONSTRUCTION. The following scheduling requirements are being provided to serve as supplemental information in preparation of the sequencing of construction. It is not the intent of these Special Provisions or the construction plans to dictate to the Contractor his/her method of construction for this project. The Contractor shall review these specifications and submit to the RPR prior to construction, his/her construction plan on how he/she will meet the project schedule for review.

a. Limitations of Operations. The Contractor shall conduct all his operations in such a manner so as to maintain a smooth, safe, uninterrupted flow of aircraft and vehicular traffic adjacent to the work site. He shall conduct all his earthwork construction in such a manner so as to minimize any potential differential settlement between the edges of existing pavements. Unless noted otherwise on the plans, no work shall be performed within active runway or taxiway safety areas. The Contractor shall remove all equipment from the Runway and Taxiway safety areas including the infields prior to re-opening the Taxiway.

Limits of the various phases of work shall be clearly delineated with barricades, barricade lights, mandatory signs, taxiway signs (temporary and permanent) and paint markings as shown on the plans and specified herein, in order to deter aircraft and vehicles from entering the construction areas. The Contractor shall work closely with Airport Operations personnel, City of Phoenix Inspectors and the RPR to ensure that the work is accomplished with minimal interference with aircraft movements.

Aircraft always have the "right-of-way". When the Contractor is working adjacent to an active apron, runway or taxiway and an aircraft approaches the work area, the Contractor may be required to "pull back" his operations, i.e., move workers, materials and equipment away from the taxiway or runway, outside of object free area, or as directed by City of Phoenix Operations or Inspection personnel.

The Contractor shall maintain all active runway and taxiway lighting systems at all times, unless otherwise specified. When temporary bypasses of active circuits are to be constructed in order to work on portions of the circuits, the circuits shall be de-energized and re-energized in conformance with the procedures specified by the City of Phoenix Aviation Department.

b. Opening Inspections. When the Contractor requests in writing to open an individual phase of work, or areas that are scheduled to be reopened to aircraft traffic, the RPR will conduct an observation of the construction area before opening to aircraft traffic. The conditions which observations will consider potentially hazardous and which must be corrected prior to reopening the taxiway prior to the end of a work shift (day shift or night shift as the case may be) include but are not limited to, the following:

1. Trenches, holes, or excavations on, or adjacent to any open taxiway, runway, apron or related safety area.
2. Un-marked or un-lighted holes, trenches or excavations near any runway, apron, taxiway, or related safety area.
3. Mounds or piles of earth, temporary stockpiles, construction materials, temporary structures, or other objects on or in the vicinity of any open runway, apron, taxiway object free area, or in a related safety, approach or departure area.
4. Vehicles or equipment (whether operating or idle) on any open apron, taxiway, or in any related safety, approach or departure area.
5. Vehicles, equipment, excavations, stockpiles, or other materials which could impinge upon Navigational Aid (NAVAID) critical areas and degrade or otherwise interfere with electronic signals from radios or electronic NAVAIDs or interfere with visual NAVAID facilities.
6. Objects (whether marked/flagged or not) or activities anywhere on or in the vicinity of the airport which could be distracting, confusing, or alarming to pilots during aircraft operations.
7. Un-flagged or un-lighted low visibility vehicles and equipment including cranes in the vicinity of an active runway, taxiway or apron or near any approach or departure surface.
8. Misleading or malfunctioning obstruction lights or barricade lights.
9. Inadequate approach/departure surfaces (needed to assure adequate landing/takeoff clearance over obstructions or work or storage areas).
10. Inadequate, confusing, or misleading (to user pilots) marking/lighting of any open apron, runway, taxiway, or in any related safety, approach or departure area.
11. Water, dirt, debris, or other transient accumulation that temporarily obscures pavement marking, pavement edges, or derogates the visibility of runway/taxiways marking, lighting or of construction and maintenance areas. There is zero tolerance for foreign object debris (FOD).
12. Inadequate or improper methods of marking, barricading, or lighting of temporarily closed

portions of airport operation areas including unlighted or missing construction and barricade lights.

13. Construction materials, trash or other materials with FOD potential, whether on aprons, runways, taxiways, service road, public streets or related safety areas. Inspectors will be watchful for debris that can be ingested into aircraft engines creating a potential for FOD. Such items include rock, aggregate, soil, loose polyethylene and other light materials capable of being blown onto aircraft movement areas by wind.
14. Construction/maintenance activities or materials that could hamper airport rescue and fire-fighting (ARFF) vehicle access from ARFF stations to all parts of the runway/taxiway system, runway approach and departure areas, or aircraft parking locations.
15. The time allowances for all work is inclusive of the Contractor moving onto the site, performing work activities, performing all clean-up, having the work area and haul routes inspected and approved by the RPR, and moving off the site. The Contractor shall provide adequate lighting for the needs of the inspection personnel.
16. Any Aircraft Operating Areas (AOA), open apron, runway, taxiway, or in any related safety, approach or departure area that does not pass inspection must remain closed until such time cleanup is performed and approved.

c. Construction Phasing. Typical work to be done during each construction phase is given as supplemental information and is not intended to be a complete listing of all work to be accomplished. All work called for on the plans and all items necessary to construct a complete, operational section of a concrete taxiway within the limits of the work area shall be completed in the individual phase and/or sub-phases, prior to proceeding with the next phase or sub-phase.

19. **ARCHAEOLOGICAL FEATURES.** Although the City of Phoenix Aviation Department has made every effort prior to construction to identify all cultural resources in the project area, previously unidentified archaeological materials may be found during the construction of this project.

If human remains are encountered during any phase of the construction, the Contractor shall suspend all work in the vicinity of the find and shall take steps to secure the protection of the remains. The Archaeological Consultant and the City of Phoenix Archaeologist shall be contacted immediately to determine an appropriate course of action. In the event of suspension of work pursuant to this Special Provision, the Contractor may be entitled to an adjustment of contract time.

If satisfactory fulfillment of the Contract involves alterations to the contract time that affect the Contractor's completion time, the Contractor may request a supplemental agreement that extends that Contract time. The supplemental agreement shall be in the form of a Request for Extension of Contract time and shall include the Contractor's revised schedule and all other pertinent data. The request shall show why an increase of Contract time is warranted.

An extension of contract time will not be considered unless the work affected by the Archaeological investigation and suspension of a construction activity becomes a critical item on the Contractor's CPM schedule.

20. **RED OBSTRUCTION LIGHTS.** Red obstruction lights shall be 100-watt fixtures, with 360-degree beam spread, and in compliance with the Federal Aviation Administration (FAA) specification found in Advisory Circular AC150/5345-43J "Specification for Obstruction

Lighting Equipment", L-810. The Contractor shall provide a minimum of two (2) red obstruction lights each, for all stationary cranes, batch plants, pug mills or other equipment erected on the Airport, and erected at the other sites that are near the Airport. The red obstruction lights shall be supplemented with additional red obstruction lights as directed by the City of Phoenix Airside Operations or the RPR. All movable cranes shall be provided with red obstruction lights at their highest point, and the boom shall be lowered during the hours of darkness or periods of low visibility.

The City of Phoenix Aviation Department will issue local Notice to Airmen (NOTAM) for obstruction lighting and the Contractor shall notify the RPR a minimum of five (5) working days in advance, if any relocation of the obstruction lights is necessary. The Contractor shall not relocate any red obstruction lights(s) without prior approval from the RPR. All such equipment is to be erected and removed from the Air Operations Area (AOA) during the off peak hours.

21. YELLOW WARNING LIGHTS FOR VEHICLES. The Contractor will provide flashing yellow warning lights at all times during construction, including periods of low visibility, as well as orange and white checkered flags during daylight, for all vehicles and all mobile construction equipment on the construction site, per Advisory Circular 150/5210-5D, "Painting, Marking, and Lighting of Vehicles Used on an Airport" as included in the Appendix. Yellow warning lights and orange and white checkered flags must be displayed in a prominent visible position and kept operational at all times. The Contractor must rectify the condition of any lights or flags not found to be acceptable to the City of Phoenix Operations immediately. If not rectified within six (6) hours, or a lesser time, at the discretion of the City of Phoenix, or if a clearly unsafe condition exists, work may be suspended at no cost to the City of Phoenix, until the situation is addressed.

All construction motor vehicles must display adequate company identification logos on both sides of the vehicle and at all times while within the AOA. Failure to comply will result in the issuing of a Notice of Violation (NOV) and the appropriate fine.

There will be no separate pay item for yellow warning lights, checkered flags or company identification logos. The cost will be included in other bid items. Refer to Special Provision Item 36, "Airport Safety and Security (M-003)" and Compliance with Airport Construction Safety Phasing Plan" for additional requirements.

22. AIRCRAFT TRAFFIC REGULATIONS. Aircraft traffic will continue to use existing runways, aprons, and taxiways of the airport during the time that work under this contract is being performed. The Contractor shall at all times so conduct his work as to create no hindrance, hazard, or obstacle to aircraft using the airport and must, at all times, conduct the work in conformance with requirements of the Airport Director and FAA Control Tower or their authorized representative.

Any proposed haul routes across aircraft movement areas will require controlled crossings with flagmen at each side of the controlled crossing, in accordance with Aviation Department details and requirements. Nighttime crossings shall be equipped with light plants on both sides of the crossing. The Contractor shall provide traffic control, crossing guards, barricades, and temporary fencing plan(s) to the RPR for approval five (5) days prior to instituting operations in the Air Operations Area.

When absolutely essential, in order to permit construction under this contract, taxiways may

be closed at the Aviation Department's discretion to aircraft operations upon advance written application by the Contractor to the RPR. The Contractor will schedule and organize his work so that a minimum of crossings or crossings of taxiways will be required during the performance of the entire project.

23. DISPOSAL OF SURPLUS MATERIAL WHICH DOES NOT CONTAIN ASBESTOS. No measurement or direct payment will be made for the hauling and disposal of surplus and/or waste material; the cost shall be incidental to the cost of the project. All surplus and/or waste material shall be disposed of by Contractor at and off-site location such as a landfill, subject to the following conditions:

a. If the City landfills are used, the Contractor shall pay the normal dumping fee. The Estes Landfill will not be available to dispose of surplus materials.

b. If private property within the City limits is used, the Contractor shall obtain written permission from the property Owner and deliver a copy of this Agreement to the RPR prior to any hauling or dumping. All disposal and grading shall be in strict conformance with the City of Phoenix Grading and Drainage Ordinance. The Contractor shall obtain and pay for the necessary permit(s).

c. If the surplus material is disposed of outside the City limits, the Contractor shall comply with all applicable laws/ordinances of the agency concerned and be responsible for all cost incurred.

24. HAUL PERMIT. Obtaining the haul permit and the approval by Street Transportation does not release the Contractor from strict compliance with MAG Subsection 108.5, Limitation of Operations. On any project, when the quantity of fill or excavation to be hauled exceeds 10,000 cubic yards, or when the duration of the haul is for more than twenty (20) working days, the Contractor shall:

a. Obtain and pay for a written haul permit from the Development Services Department.

b. Obtain approval of the proposed haul route, number of trucks, etc., by the Street Transportation Department.

25. UNDERGROUND FACILITIES. The Contractor will make whatever investigation it deems necessary to verify the location of underground utility facilities, by providing a private utility locating company to verify the location of all on-site utilities prior to construction. The utility locator company shall mark all utilities that may or may not conflict with construction. The Contractor shall field survey these utilities and plot this information on the Record Drawings that the Contractor will be preparing. If such facilities are not in the location shown in the drawings, then (regardless of whether this is discovered prior to or during construction) the Contractor's remedies, if any, pursuant to Article 6.3, Chapter 2, Title 40, A.R.S. (A.R.S. § 40-360.21 through A.R.S. § 40-360.32, "Underground Facilities"), shall be the Contractor's sole remedy for extra work, delays, and disruption of the job, or any other claim based on the location of utility facilities. Locations of utility facilities are shown on drawings and were furnished by the City, are to be regarded as preliminary information only, subject to further investigation by the Contractor. The City does not warrant the accuracy of these locations, and the Contractor, by entering into this Contract, expressly waives and disclaims any claim

or action against the City under any theory for damage resulting from location of utility facilities.

The Contractor shall be responsible for obtaining all utility location information, and for performing all requirements as prescribed in A.R.S. § 40-360.21 through A.R.S. § 40-360.29, for all underground facilities, including those that have been installed on the current project, until the project is accepted by the City.

At least two (2) working days prior to commencing any excavation, the Contractor shall contact Arizona 811, the Blue Stake Center, between the hours of 6:00 a.m. and 5:00 p.m., Monday through Friday, for information relative to the location of buried utilities that are located on landside. The number to be called is as follows: Maricopa County: (602) 659-7500.

Several utility owners, including the City of Phoenix, the Federal Aviation Administration, and others have utilities in the proposed work area. These utilities shall be located and potholed by the Contractor prior to starting construction. The Contractor is advised that several underground environmental monitoring facilities exist within the project work limits. These facilities are to be protected by the Contractor and left in an undisturbed condition, unless noted on plans. Any inadvertent damage must be reported immediately to the Aviation Department Environmental Section. The Contractor will be responsible for returning any damaged environmental monitoring facility to a pre-construction condition. Refer to Special Provision Item 33 for method of measurement and basis of payment.

26. CHANGE ORDER REQUEST MARKUPS. The Contractor shall conform to the following markups for change order work, or for the allowance work that is self-performed by the Contractor and/or performed by a subcontractor. The Contractor shall also utilize the Change Order Request Summary Worksheet. The Contractor shall submit all required backup and supplemental information, calculations, invoices, etc., that are required to justify and support all Contractor and subcontractor costs.

a. General Contractor Self-Performed Work and Subcontractor Work Markups. For overhead and profit, the actual or approved costs for equipment, material, and labor shall be marked up by twelve percent (12%) for profit and overhead.

b. General Contractor Markups of Subcontractor Work and Subcontractor Markups of Lower Tier Subcontractors. The Contractor shall be allowed to markup actual or approved subcontractor costs for equipment, material, and labor (excluding subcontractor overhead and profit) by seven and one half percent (7.5%). Subcontractors shall be allowed to markup actual or approved lower tier subcontractor costs for equipment, material, and labor (excluding lower tier subcontractor overhead and profit) by seven and one half percent (7.5%).

c. Bond. No markups for bond will be permitted until the contract monetary amount has been exceeded for which the bond has been issued. No bond markups will be permitted for work performed by subcontractors and lower tier subcontractors.

d. Insurance. The Contractor shall be allowed to markup the cost for change order work plus bond costs for property damage/public liability insurance, utilizing the same percentage used on the initial contract. Verification, from insurance carriers, of this percentage shall be submitted with the initial change order request.

e. Sales Tax. The Contractor shall be allowed to markup the cost for change order work plus bond and insurance costs by the current, approved sales tax multiplier.

27. EXTENSIONS OF CONTRACT TIME. MAG General Condition Specification 108.7, DETERMINATION AND EXTENSION OF CONTRACT TIME, is deleted in its entirety and substitute the following:

a. Weather Delay. “Extensions of time due to adverse weather conditions not reasonably anticipated will be granted only if such inclement weather prevents the execution of critical path items of work at the time of the inclement weather. Extensions of time for weather delays will be considered only if such actual monthly inclement weather exceeds the monthly average for that month as shown in the Table below. The extension would be considered on the day after the rainfall exceeds the monthly average listed in the Table. The Contractor shall base his CPM Schedule using at least three (3) weather delay days per month between January and March, and at least one (1) weather delay day per month between April and December. These weather days will not be considered for an extension of contract time.

The Contractor shall request an extension of time in writing within forty-eight (48) hours after the event that caused the delay. This written notification is required regardless if the request is based on inclement weather or based on other factors. No extension of time will granted if the written request is not received within forty-eight (48) hours.

TABLE – City of Phoenix Average Monthly Precipitation Data.

<i>Month</i>	<i>Average Monthly Precipitation</i>
January	0.94-inches
February	1.05-inches
March	1.13-inches
April	0.32-inches
May	0.11-inches
June	0.05-inches
July	0.88-inches
August	0.98-inches
September	0.75-inches
October	0.65-inches
November	0.67-inches
December	0.94-inches

b. Notice of Claim for Additional Time. If the Contractor wishes to make a claim for an increase in the Contract Time, written notice shall be given. The notice shall be made in writing to the RPR within five (5) days of the delay causing occurrence except for notice of adverse weather caused delays, which shall be made within forty-eight (48) hours. The notice shall set forth (a) the cause of the delay, (b) a description of the portion or portions of Work affected by the delay, (c) the specific number of days of delay for which an extension of time is requested, (d) all actions the Contractor is taking to mitigate the delay (e) any actions the Owner or others could take to mitigate the delay (f) the latest schedule showing the delayed activity’s relationship to the project’s critical path and (g) all details pertaining thereto. In the case of a continuing delay, the Contractor shall weekly submit an updated notice. Failure to give notice of a claim for extension of time in strict compliance with this provision shall constitute a waiver of such claim.

c. Critical Path. No extension of time shall be granted to the Contractor for a delay caused by the Owner, RPR, other contractors or any other party, or other causes beyond the Contractor's control, unless the delay affects the critical path of the Project as defined on a critical path method schedule or monthly update provided to the Owner before the delaying occurrence and then only to the extent that the delay affects the critical path. If the delay event forces a previously non-critical path activity onto the project critical path, this change must be shown on the next monthly update and expressly identified in the narrative report. Failure to so identify critical path changes shall be deemed to waive the Contractor's right to recover any costs associated with the delay event's impact on the activity. Delays not identified on the Contractor's next monthly update shall be waived. No extension of time shall be granted to the Contractor to the extent that, notwithstanding the existence of any such circumstance beyond the Contractor's control, delay would have resulted in any event due to a concurrent unexcused delay.

d. Changes in the Work. For changes in the work that significantly affect the time and progress of the work, any time extensions shall be requested no later than when the change in the work is requested. Any change order negotiated and signed by the Contractor and Owner that does not include an express time extension shall be deemed conclusive evidence that no time extensions related to the changed work is warranted and the Contractor shall forever waive its right to claim entitlement to such a time extension.

Change order requests shall include all costs necessary to perform the extra work within the contract period unless a time extension is granted. This shall include but not be limited to necessary acceleration costs. The Contractor may reserve the right to request a time extension at a later date. However, if the Contractor elects to do so, the City will withhold ten (10) percent of the change order amount until the Contractor submits a critical path method schedule analysis that complies with all Contract requirements and identifies the resultant delay. If the Contractor fails to timely do so, the Owner may use the withheld amount to perform a schedule analysis to identify the resulting delay.

e. Overhead Costs During Time Extensions. The Contractor and Owner contemplate that the entire contract period may be reasonably necessary to complete this Contract's scope of work. It is the contemplation of the parties that any home office or field overhead or supervision costs necessary to perform work during the entire contract period is incorporated into the Contractor's overall Bid. The Contractor shall not be entitled to recover home office or field overhead and supervision costs during the performance period, even if the Contractor originally planned to complete the work before the contract period expired. Acceptance by the Owner of schedules showing early completion by the Contractor shall not constitute a waiver of this provision.

28. STOCKPILED MATERIAL. Stockpiled materials shall not be allowed in the air operations area, unless permitted by the City of Phoenix. Material shall not be stored near aircraft turning areas or movement areas.

The maximum stockpile height, if permitted by the City of Phoenix, shall not exceed 3-feet above the adjacent pavement elevation. Therefore, the Contractor shall prepare his bid on the basis of hauling the material off-site of the Airport, and importing the material at a later date when the work area on site is available to receive the material.

All unsuitable materials, as defined in Civil Technical Specification Item P-152, shall be

disposed of at an offsite legal location, such as a landfill, at the time the material is excavated, and shall not be temporarily stockpiled on the Airport.

When asphalt pavement is milled, the material shall be hauled off site of the airport at the time the pavement is milled. Any asphalt millings that are not used in the formation of subbase shall become property of the Contractor and exported from the site.

Storm drain pipe shall not be stockpiled in the Air Operations Area.

Open trenches shall be limited to no more than 500 linear feet. Open trenches in the RSA shall be properly and completely backfilled and compacted in sufficient time before the end of the work shift.

29. MAG SPECIFICATION MODIFICATIONS. In addition to any other modifications to the MAG specifications contained elsewhere in this Contract, the following changes are made:

a. MAG Section 104.2.4 is deleted and replaced with:

“104.2.4 At the Contractor’s Request: Changes in the plans or specifications, which do not materially affect and are not detrimental to the work or to the interests of the Contracting Agency, may be granted to facilitate the work. Requests shall be in writing and submitted to the RPR for approval. The Contracting Agency shall be entitled to a reduction in cost equal to one-hundred percent of any cost reductions to the Contractor caused by the change. In no event shall a Contractor requested change result in any additional cost to the Contracting Agency. The Contractor assumes sole responsibility and liability for changes it requests and the Contracting Agency’s approval of a proposed change shall not create any liability on the part of the Contracting Agency.

b. MAG Section 105.11 is deleted and replaced with:

“105.11 REMOVAL OF UNACCEPTABLE AND UNAUTHORIZED WORK:

(A) *Duty to Uncover Work:* If a portion of the work is covered contrary to the RPR’s request or to requirements specifically expressed in the Contract, the RPR may order in writing that it either be uncovered for observation and/or replaced. The cost of uncovering or replacing the work shall be solely at the Contractor’s expense. The Contractor shall not be entitled to any associated time extensions or impact costs associated with such a request.

(B) *Cost of Uncovering Work:* If a portion of the work has been covered that the RPR has not specifically requested to observe prior to it’s being covered or the Contract does not provide for inspection, the RPR may request the Contractor to uncover the work. If the uncovered work is in compliance with Contract requirements, the Contracting Agency shall bear the cost of uncovering and replacing the work. If the uncovered work is not in compliance with Contract requirements, the Contractor shall bear such costs.

(C) *Duty to Correct Rejected Work:* Work done contrary to the instruction of the RPR, work done beyond the lines shown on the plans, or as given, any extra work done without authority, unacceptable work, poor workmanship, work done with defective materials, work damaged through carelessness or found unacceptable by the RPR, whether observed

before or after substantial completion of the work and whether or not fabricated, installed or completed shall be promptly corrected by the Contractor. The Contractor shall bear all costs of correcting such work, including the replacement or repair of other work affected, additional testing and inspection costs, and additional RPR costs. The Contractor shall not be entitled to recover any impact costs or delay damages and shall not be entitled to any time extensions in any way relating to correcting the work. Work rejected by the RPR shall be promptly corrected. All work rejected before final acceptance shall be corrected prior to final payment.

- (D) *One Year Duty to Correct Work:* Without limiting the Owner's statutory, common law, or other contractual rights, if within one (1) year after the date of final acceptance, or within such longer period of time as may be prescribed by law or by the terms of any applicable special warranty or guarantee required by the Contract, any defective work or work not in accordance with the Contract shall be promptly corrected by the Contractor after written notice by the RPR or Owner to do so. The Contractor shall bear all costs of correcting such work, including replacement or repair of other work affected by the defect and any other damages resulting from such defect. This obligation shall survive Final Payment to the Contractor.
- (E) *Owner's Right to Correct Non-Conforming Work:* If the Contractor fails to correct nonconforming or defective work within a reasonable time, the Owner may correct it with its own forces. If the Contractor does not correct the work within a reasonable time, the Owner may provide written notice to the Contractor and then remove and store the salvable materials or equipment at the Contractor's expense. If the Contractor does not pay the Owner's expenses within ten (10) days thereafter, the Owner may sell such materials and equipment and shall deduct its expenses, including additional services by the RPR.
- (F) *Acceptance of Non-Conforming Work:* If the Owner prefers to accept defective or non-conforming work rather than require its removal and correction, the Owner shall be entitled to recover one-hundred and fifty (150) percent of the cost of removing and correcting the work. Such adjustment shall be effected whether or not final payment has been made."

c. Delete MAG Section 108.4 and substitute the following:

"The Contractor shall furnish the RPR a construction schedule and monthly updates to the schedule. The RPR's review of the Contractor's schedule is for purposes of: (1) determining the Contracting Agency's staffing requirements; (2) to ensure general compliance with the contract documents as it relates to the completion of all work; (3) to monitor and evaluate the construction status for purposes of approving progress payments; (4) to evaluate project delays and claims for additional time and compensation; and (5) to identify methods for mitigating delay impacts. In the event the schedule does not contain sufficient information to meet the above purpose, or does not comply with the Contract's schedule and monthly update requirements, the Contractor shall resubmit a new schedule or update with the required information. The Contractor shall not change an accepted construction schedule without the written consent of the RPR. The orderly procedure of all work to be performed shall be the full responsibility of the Contractor.

Review of a submitted schedule by the RPR shall in no way be construed as an affirmation or admission that the schedule is reasonable or workable, which responsibility remains the Contractor's obligation. When the schedule shows a completion prior to the completion date, this extra time between the contract completion date and the scheduled completion date (float), may be used by the Contracting Agency without additional compensation to the Contractor, including extended field and home office overhead and supervision costs. The Contracting Agency shall not be liable to the Contractor for any damages for delay if the Contractor complete the work prior to expiration of the original Contract completion date or as modified by approved change orders, if any."

d. Delete MAG section 108.11 and substitute the following:

"A. *Termination for Convenience:* The Owner may, without cause, terminate the Contract for its convenience, even if the Contractor has not failed to perform any part of the Contract. Termination of the Contract shall be affected by written notice to the Contractor. Upon receipt of such notice, the Contractor shall, unless the notice directs otherwise:

1. Immediately discontinue the work and the placing of all orders and subcontracts in connection with this Contract;
2. Immediately cancel all of the existing orders and subcontracts made hereunder;
3. Immediately transfer to the Owner all materials, supplies, work in progress, appliances, facilities, machinery and tools acquired by the Contractor in connection with the performance of the Contract, and take such action as may be necessary or as the Owner may direct for protection and preservation of the Work relating to this Contract;
4. Deliver all plans, Drawings, Specifications and other necessary information to the Owner;
5. Take all necessary steps to secure the project site and work.

B. *Contractor's Exclusive Remedy:* If the Owner terminates the Contract for convenience, the following shall be the Contractor's exclusive remedy.

1. Reimbursement of all actual expenditures and costs approved by the Owner as having been made or incurred in performing the work;
2. Reimbursement of expenditures made and costs incurred with the Owner's prior written approval in settling or discharging outstanding commitments entered into by the Contractor in performing the Contract; and
3. Payment of profit, in so far as profits is realized hereunder, of an amount equal to the actual profit on the entire Contract at the time of termination multiplied by the percentage of the completed work. In no event shall the Contractor be entitled to anticipated fees or profits on Work not required to be performed.

C. *Warranties, Guarantees and Indemnities to Remain in Effect.* All obligations of the Contractor under the Contract with respect to completion of the work, including but

not limited to all warranties, guarantees and indemnities, shall apply to all work completed or substantially completed by the Contractor prior to a convenience or for cause termination by the Owner. Notwithstanding the above, any termination by the Owner or payments to the Contractor shall be without prejudice to any claims or legal remedies that the Owner may have against the Contractor for any cause.

- D. *Conversion of Termination for Cause to Termination for Convenience.* If a termination for convenience by the Owner is determined to be wrongful or improper for any reason, such termination shall automatically be converted to a convenience termination and the Contractor's remedy for such wrongful termination shall be limited to the recoveries for a convenience termination.
- E. *Remedy Limited to Damages:* In the event that the Contractor is terminated, whether for cause or convenience, the Contractor's sole remedy shall be for damages. In no event shall the Contractor be entitled to reinstatement or other equitable relief from a court or other forum.
- F. *Termination For Cause:* The Owner may terminate the Contract if the Contractor:
1. fails or refuses to supply enough properly skilled workers or proper materials to ensure compliance with approved schedules or as directed by the RPR;
 2. fails to make payment to subcontractors for labor or materials in accordance with the respective agreements between the Contractor and subcontractors or A.R.S. § 34-221.
 3. disregards laws, ordinances, rules, regulations or orders of a public authority having jurisdiction;
 4. breaches any provision of the Contract;
 5. fails to furnish the Owner with satisfactory assurances evidencing the Contractor's ability to complete the work in compliance with all Contract requirements.;
 6. fails to comply with approved schedules or fails to comply with Contract schedule requirements; or
 7. fails after commencement of the work to proceed diligently and continuously with the construction and completion of the work for more than seven (7) days, except as permitted under the Contract.
- G. *Contractor Right to Receive Payment:* When the Owner terminates the Contract for cause; the Contractor shall not be entitled to receive further payment until the work is finished. If it appears the Contractor would have sustained a loss on the entire Contract had it been completed, the Contractor shall not be entitled to any profit and an appropriate adjustment shall be made reducing the Contractor's payment to reflect the Contractor's anticipated rate of loss for the entire Contract.
- H. *Cost of Finishing Work.* If the unpaid balance of the Contract exceeds costs of finishing the work, including compensation to the RPR and other Owner representatives, such excess shall be paid to the Contractor. If such costs exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner shall be certified by the RPR and

this obligation for payment shall survive the Contract's termination.

30. CONSTRUCTION SURVEYING LAYOUT. The Contractor shall set all construction stakes, establishing lines, grades and elevations to construct the Project, including necessary utilities, appurtenances and shall be responsible for their conformance with plans and specifications. The Engineer has established survey control points and benchmarks for the project. Refer to the Survey Control Plan.

- a. Initial Verification.** Prior to setting any construction stakes, the Contractor shall first verify the accuracy of the control points established by the Engineer. If errors are discovered during this verification process, and the control points do not agree with the geometry shown in the plans, the Contractor shall immediately notify the Engineer in writing, explaining the issue in detail. Upon completion of this verification process, the Contractor shall employ an Arizona registered Land Surveyor to certify in writing that all control points established by the Engineer are acceptable and adequate to allow the Contractor's construction staking to meet the accuracy requirements of the specifications.
- b. General Description.** After the Contractor's registered land surveyor has submitted his written certification verifying the accuracy of the control points established by the Engineer, the Contractor shall set all stakes including, but not necessarily limited to: centerline stakes; offset stakes; reference point stakes; slope stakes; pavement lines; grade stakes; blue tops for subgrade and subbase course; stakes for utilities; drainage; pipe; base and pavement courses; paint striping layouts; supplemental bench marks and permanent record drawing elevations; as well as all other horizontal and vertical controls necessary for complete and accurate layout of the construction work.
- c. Materials, Personnel and Equipment.** All work shall be done under the direction of a registered land surveyor employed by the Contractor. All survey crew chiefs shall be a registered civil engineer, a registered land surveyor, an engineer in training or a NICET level III (or a higher level NICET level) certified technician. The Contractor shall furnish all materials, personnel and equipment necessary to perform all surveying, staking and verification of the accuracy of all existing control points, which have been provided by the Engineer and/or the City. Included in this work shall be all calculations required for the satisfactory completion of the project in conformance with the plans and specifications.

Materials and equipment shall include, but shall not necessarily be limited to: vehicles for transporting personnel and equipment; properly adjusted and accurate survey equipment; stakes; flagging and all other devices necessary for checking; marking, establishing and maintaining lines, grades and layout to perform the work called for in the contract. The Contractor shall furnish a sufficient quantity of competent personnel to perform the survey work and layout.
- d. Light Bases.** The Contractor shall stake all airfield light bases.
- e. Discrepancies.** Any discrepancies in the grade, alignment, quantities, locations or dimensions detected by the Contractor shall immediately be brought to the attention of the RPR. Changes to the project plans will not be allowed without the written approval of the RPR.
- f. Record Drawings.** The work shall include establishing and marking the "Record Drawings" with coordinates, elevations and changes to the design, as well as locating

existing utilities with coordinates and elevations. Refer to A.R.S. § 32-152.

- g. Measurement and Payment.** Survey will be measured for payment by the lump sum. Travel time shall not be measured for payment. Survey work for quality control surveys shall not be measured for payment, but shall be considered incidental to the Contractor Quality Control program.

Payment will be made under:

Item SP-30.1 Construction Survey Layout – per Lump Sum

- 31. UNFORESEEN UTILITY LOCATING (ALLOWANCE)** This Item shall govern the field location of all underground existing utilities in areas to be improved, to avoid conflicts with proposed surface or underground improvements. Work under this section shall include designation and potholing as required on existing underground utilities. This shall include, but not be limited to, the location of electrical and communication ducts, airfield lighting and control cables, FAA NAVAID cables and environmental infrastructure (Honeywell, City of Phoenix, etc.). It is the intent of this specification to provide for the location of existing utilities and, by hand digging, particularly of direct burial cables for NAVAIDS.

The contractor is hereby advised that the location of all utilities, as shown on the Plans, may not be complete or exact. The Contractor shall satisfy himself/herself as to the exact location of the utilities by contacting all utility companies before proceeding with the work and by having a private utility locating firm locate and identify all utilities at the work site prior to any construction. The Contractor shall be responsible for any and all costs as a result of damage caused by construction activities to public/private property and utilities.

- a.** Utilities, utility appurtenances and cables encountered by the Contractor during the construction of this project shall be protected by the Contractor as needed to permit construction and to conform to the finished grades on the project. Use of mechanical equipment of any kind to verify a utility location is expressly prohibited. The Contractor shall immediately repair any damaged utilities at his own expense.
- b.** Coordinate all contacts with companies maintaining utilities at the Airport through the Engineer prior to any excavation/digging. Provide the Engineer with written documentation of how utility locations were verified.
- c.** Continuously maintain utilities for facilities and/or systems which are or may be affected by work associated with the project. Prepare and maintain a contingency plan, approved by the Engineer, to restore to service all utilities and/or control/signal cables which may be placed out of service or damaged during performance of the work. The Contractor shall provide the Engineer, PHX Operations and FAA Sector Manager with written reports on all cable cuts.
- d.** Take all measures necessary to accurately locate all the routing of underground cable and utilities within project areas to be excavated, trenched or drilled. Contractor shall locate underground cables and utilities by designation, and where necessary, potholing and/or hand digging. Once located, place highly visible and durable markers along all such cable and utility route at intervals of not greater than 25 feet. The Contractor shall maintain these

markers in their original location throughout the project. The Contractor shall also be responsible for providing and maintaining a field survey and plan of the marker locations and shall replace any disturbed markers at his own expense. Do not use power equipment with teeth when excavating where cables are marked. Obtain Engineer approval of proposed marking devices. Use semi-permanent markers which are low profile, frangible and non-metallic within runway/taxiway safety areas and navigational and restricted zones.

- e. Utilities located by potholing and/or had digging shall be surveyed by the Contractor. Coordinates and elevations shall be submitted to the Engineer and marked on the Contractor maintained record drawings.

Measurement for "Location of Underground Utilities" shall be by the actual cost of the work. Cost for work for subcontractors (i.e., Utility Designation/Potholing contractor) will be based upon invoiced cost from the subcontractor. Cost shall be calculated in accordance with the City of Phoenix Supplement to the MAG Uniform Specifications, Section 109, as modified by the provisions of Special Provision Specification for "Underground Facilities". Underground Utility Location costs will be subject to daily monitoring and approval by the RPR.

Payment will be made under:

Item SP-31.1 Unforeseen Utility Locating (Allowance) – per Allowance

- 32. OVER EXCAVATION OF UNSUITABLE MATERIALS AND BACKFILL WITH SELECT MATERIAL (ALLOWANCE)** Work under this item consists of the Over excavation of unsuitable material, or undercut excavation, and shall consist of the removal of material that is unsuitable and unsatisfactory for use as subgrade to a depth of one foot below existing grade, or an additional depth as directed by the RPR and as defined in Civil Technical Specification Item P-152. The Contractor shall protect existing utilities while excavating unsuitable material. This material may be made up of rock, hardpan, loose rock, boulders, muck, clay, wet clay and silt or other unsuitable materials.

Method of Measurement. The quantity of Over Excavation of Unsuitable Materials and Backfill with Select Material shall be the number of cubic yards measured in its original position and authorized to be removed and replaced with the material as ordered by the RPR. Measurement for P-152 material, if any used to replace the unsuitable/unstable material will also be measured by computed cubic yard volume of the in-place material placed and compacted. Measurement of Over Excavation of Unsuitable Materials and Backfill with Select Material for payment shall be by the cubic yard of in-place volume of unsuitable material removed.

The quantity shown for bid purposes is a projected amount that could have to be replaced; the actual amount may vary based on actual field conditions at the time of construction.

Method of Payment. For Over Excavation of Unsuitable Material and Backfill with Select Materials, payment shall be made at the unit price per cubic yard. This price shall be full compensation for furnishing all materials (including geotextile fabric), labor, equipment, tools, and incidentals necessary to complete the item. It shall be understood that this allowance is an estimate only. It is further understood that authorized work, if any, may be less than the allowance item. The Over Excavation of Unsuitable Material and Backfill with Select Materials item will be measured and paid for based on the actual costs billed to the project by the

contractors used to complete the work that is deemed necessary by the Owner.

For removal and haul off of unsuitable/unstable subgrade, payment will be measured at the unit price per cubic yard volume of the in-place material removed. This price shall be full compensation for furnishing all materials, labor, equipment, tools, and incidentals necessary to complete the item. If P-152 material is also directed to be used for replacement backfill of the unsuitable/unstable subgrade removed, payment will also be based on the Contractor's unit bid price for Item P-152 multiplied by the computed volume of material replaced. If P-209 material is used for replacement backfill, the payment will be in accordance with either Section P-209. If a material other than P-152, or P-209 is directed by the RPR for replacement backfill the work will be paid on a time and material basis

Payment will be made under:

Item SP-32.1 Over Excavation of Unsuitable Materials and Backfill with Select Material (Allowance) – per Allowance

33. EXISTING UTILITY RELOCATIONS (ALLOWANCE)

General. The Existing Utility Relocation item is provided for the purpose of encumbering funds to cover the costs of utility relocations or modifications needed to complete the utility work. This item will be used to relocate any existing utility that is in conflict with the proposed pavement section, including subgrade preparation. This item may also be used to address unknown utility issues. The amount of the allowance is determined by the Owner and is not subject to individual bid pricing. All bidders shall incorporate the amount pre-entered in the bid proposal and shall reflect the same in the total amount bid for this project. It shall be understood that this allowance is an estimate only. It is further understood that authorized work, if any, may be less than the allowance item.

Measurement and Payment. The Existing Utility Relocation item will be measured and paid for based on the actual costs billed to the project by the utility agency or contractors used to complete the work as is deemed necessary by the Owner.

Payment will be made under:

Item SP-33.1 Existing Utility Relocations (Allowance) – per Allowance

34. RPR FIELD OFFICE. This item shall consist of furnishing, maintaining and providing a weekly cleaning of a new RPR's field office for the exclusive use of the RPR, in a weatherproof building hereafter described, at a location approved by the RPR. Unless otherwise approved, the building shall be independent of any buildings used by the Contractor and all keys to the building shall be turned over to the RPR.

The Contractor shall furnish one (1) building for the exclusive use of the RPR as a field office. The building shall be furnished and maintained by the Contractor as specified herein.

The offices shall be durable, waterproof, dust tight and securable.

The field office shall have ceiling heights of not less than eight (8) feet and a floor space of not less than 1,440 square feet. The field office shall have at least four (4) office rooms with

one (1) room being large enough to accommodate twenty (20) people for meetings and conferences. The offices shall be provided with sufficient heat, natural and artificial light and air conditioning to maintain thermostatically controlled temperatures between sixty (60) and eighty (80) degrees Fahrenheit. Doors and windows shall be equipped with locks approved by the RPR, and windows shall contain wrought iron security coverings and blinds. Suitable sanitary facilities separate from those for the Contractor's personnel meeting Federal, state and local health department requirements shall be provided and maintained and cleaned daily. Bathrooms shall be stocked with lavatory and sanitary supplies at all times during the period of the Contract.

An eight (8) feet high chain link fenced area to accommodate at least ten (10) parked vehicles on pavement or aggregate base materials with a double twelve (12) feet lockable gate shall be provided by the Contractor. The RPR will approve the location of the office(s).

Field offices that are provided by the Contractor must have the layout approved by the City of Phoenix, and they shall be securely blocked and tied down per the manufacturer's recommendations.

In addition, the following equipment and furniture meeting the approval of the RPR shall be furnished for the RPRs Field Office:

TABLE 1 – RPR’s Field Office Equipment and Furniture.

Quantity	Description
3	Desks (2.5-feet by 5-feet) with armed swivel desk chairs
1	Three shelf bookcases (each shelf to accommodate at least 12” high binders)
1	Four-drawer legal file cabinets
6	Folding padded chairs
1	Folding tables (2.5-feet by 5-feet)
1	Equipment cabinet with lock (36-inch by 72-inch by 15-inch minimum)
1	Carbon dioxide fire extinguisher (as required by code for office and computers)
1	First aid kit (as required by code)
1	Smoke detector (as required by code)
1	Electric water cooler hot and cold dispenser with water and cups supplied as needed
1	Trash cans (1.2 cubic feet minimum capacity)
1	Multi-function copy/print/scanner.

1	Dry erase board, 4-feet by 6-feet (with one set of four markers, eraser, and cleaner)
1	Refrigerator/freezer, 14 cubic foot
1	Wall-mounted electric clock
1	Identifying exterior sign, 24-inch by 36-inch minimum, professional lettered with wording acceptable to the RPR for Field Office
1	High Speed Internet Connection
1	Microwave Oven
1	Uninterruptible Power Supply (Battery Backup Units for Computers)

The field office building(s), equipment, materials and furnishings, shall remain fully operational and maintained on the job site until forty-five (45) calendar days after substantial completion, unless released at an earlier date by the RPR.

The Contractor shall provide continuous maintenance and refuse removal. Weekly cleaning and janitorial services shall be provided, except that sanitary facilities shall be cleaned daily. In addition to office supplies stated herein, the Contractor shall provide soap, paper towels, cleansers, and sanitary supplies to maintain a functional field office for the duration of the contract.

Measurement and Payment. The measurement and payment for RPR Field Office shall be by the lump sum.

Item SP-34.1 RPR Field Office – per Lump Sum

35. WORK DONE BY CITY FORCES There are items of work that are to be performed by the City that the Contractor will have to build into his schedule. This includes paint removal of any paint containing lead, prior to pavement removal, and asbestos testing of the concrete. It is anticipated that the paint removal will take approximately twelve working days and will need to be completed prior to the asphalt removal and after the area is barricaded. There shall be no separate payment for coordination between the Contractor and City related to this item.

36. AIRPORT SAFETY AND SECURITY (M-003)

36-1.1 GENERAL. The Contractor shall carry out his operations in a manner that will cause a minimum of interference with air traffic, and shall cooperate with the FAA, the City (Owner), City of Phoenix, tenants, flight schools and Fixed Base Operators, and other contractors working in the area.

All work shall be completed in accordance with the Construction Safety and Phasing Plan (CSPP) adopted for the project, the Contractor prepared Safety Plan Compliance Document (SPCD), FAA Advisory Circular 150/5370-2G or current series, and the City of Phoenix Department of Aviation's Airport Construction Safety Manual and the Supplementary Conditions, Special Provisions and Technical Specifications of these Contract Documents.

Phasing of the work will be necessary to minimize impacts on airport operations during construction. The priorities for phasing of the work are shown in the CSPP.

All work within the Runway Safety Area will require that the runway be closed.

The preparation of a Safety Plan Compliance Document (SPCD) by the Contractor to indicate how it will comply with the CSPP, the project Supplementary Conditions, Special Provisions and Special Provision Item 36 Airport Safety and Security (M-003) is included in the Contractor's scope of work.

Any conflicts between the CSPP, the Contract Documents and Special Provision Item 36 Airport Safety and Security (M-003) shall be reported to the Aviation Department Project Manager, PHX Aviation Supervisor and the Engineer of Record for resolution. Until resolved, the Contractor shall comply with the most stringent requirement.

The Contractor shall hold weekly airfield coordination meetings with PHX Airport Operations. Additionally, the Contractor shall meet with Airport Operations prior to the start of each shift to discuss the day's anticipated work activities.

All vehicles shall have flashing amber lights in accordance with the CSPP and Special Provision Item 36. All vehicles shall be required to have the headlights and flashing amber lights on at all times while on the airfield.

The Contractor shall be required to supply, place, maintain, move and store the items listed herein, as appropriate, to facilitate construction and protect air traffic. The Contractor shall keep on site an adequate extra supply of these items.

MATERIALS

36-2.1 RED WARNING LIGHTS. Red warning lights shall meet the requirements of the "Manual on Uniform Traffic Control Devices for Streets and Highways" for Type A and Type B flashers or as shown in the *Airport Construction Safety Manual*. All warning lights used on the airfield shall be RED only.

36-2.2 WARNING MARKERS. (For use on roadways and service roads only) Warning markers shall be the type and size detailed on the plans or shown in the CSPP. Markers shall be equipped with a red warning light per paragraph 36-2.1.

36-2.3 TEMPORARY RUNWAY/TAXIWAY CLOSED DEVICES AND SYMBOL. The airport operations personnel will provide "Lighted X's" to mark all runway closures. The closed devices

shall be portable lighted "X", SWEEPSTER Model LX Runway Closure Marker conforming to FAA AC 150/5345-55A *Specification for L-893 Lighted Visual Aid to Indicate Temporary Runway Closure* or approved equal.

All other temporary closure symbols, including vinyl "X's", shall be painted or applied on the pavement surface in accordance with the CSPP, plans and Civil Technical Specification Item P-620.

36-2.4 LOW AND MEDIUM LEVEL BARRIER SYSTEMS. Medium and low-level barriers shall be the Airport Runway Safety Barricade Model AR-1 and AR-2 Multi-Barrier as manufactured by Off The Wall Products, LLC, or approved equal. The AR-1 barrier medium level sections shall be eight (8) feet long and two (2) feet high and the AR-2 low level barrier sections shall be eight (8) feet long and ten (10) inches high and shall have reflective sheeting on the side facing the active airfield. Both sections shall be interlocking and shall be ballasted with water to prevent damage from jet blast. Each barricade section shall be equipped with a Model: SL-H867R Solar Powered Safety lights as manufactured by Leotek Electronics USA Corp., or approved equal. The barriers shall be furnished, maintained and relocated during each phase by the Contractor, and at the completion of the Contract they shall become property of the City.

36-2.5 VACUUM SWEEPER. Vacuum Sweeper shall be Tymco, Model HSP-600 or Elgin Model Crosswind, or approved equal. A sweeper and operator shall be available at all times during construction activities.

36-2.6 SAFETY AREA SUPPORT. Reinforced structural steel plates, precast slabs or other approved material necessary to cover open excavation in the Runway Safety Area shall conform to Paragraph 36-5.1(1)(c)(i). Excavations that cannot be covered to provide the required protection shall be backfilled.

36-2.7 SECURITY CHECK POINTS AND CONTROLLED CROSSINGS. Provide as shown on the plans, in the CSPP, in Appendix A of the SPCD, and as detailed within this specification, the items necessary to control access to the Air Operations Area (AOA) through Entry Gate #___ and control crossings at active taxiways. These items include, but are not limited to the following:

- 1) Flaggers equipped for day time and nighttime operations.
- 2) Marking, symbols, barrier systems and warning markers in accordance with the CSPP and this specification.

RESPONSIBILITIES

36-3.1 CONTROL REQUIREMENTS. The Contractor's responsibilities for work areas are as follows:

- 1) The Contractor shall be held responsible for controlling his employees, subcontractors, and their employees with regard to traffic movement. The Contractor is required to submit a Safety Plan Compliance Document (SPCD) to indicate how he/she will comply with the Construction Safety and Phasing Plan (CSPP) and how he/she will safely operate within the AOA. This SPCD shall conform to Chapter 2, *Safety Plans, Operational Safety on Airports During Construction*, AC 150/5370-2F and the Aviation Department Airport Construction Safety Manual, June 2006. It shall be submitted and approved by the Airside Operations Manager before the commencement of any construction. Information needed for preparation of the SPCD is located in AC 150/5370-2F, the CSPP and at the end of this section.

- 2) The Contractor shall rebuild, repair, restore, and make good at his own expense all injuries or damages to any portion of the work occasioned by his use of these facilities before completion and acceptance of his work.
- 3) The Contractor shall submit to the Engineer in writing a detailed work plan for each construction phase. The work plan shall include, but not be limited to, paving sequence, marking sequence, maintenance of airfield electrical and NAVAID power and control circuits. This plan shall be submitted 14 calendar days prior to the start of each construction phase. No work within the construction phase may commence until the phase work plan is approved.
- 4) The Contractor shall submit to the Engineer in writing a plan, by construction phase, for controlling construction equipment and vehicular movements, including material haul roads, in the Air Operations Area (AOA). This plan shall be submitted at the Pre-Construction Meeting and prior to each construction phase. No work may commence until this plan is approved by PHX Airport Operations. The plan must include material haul roads.
- 5) **Paved surfaces shall be kept clear at all times and specifically must be kept free from all Foreign Object Debris (FOD) which might damage aircraft.**
- 6) The Contractor shall prepare a security badge control plan for review by Airport Operations. The plan shall be submitted prior to or at the Pre-Construction Meeting. No work may commence until this plan is approved. The plan shall be prepared on the Contractor's company letterhead and signed by the company representative who is authorized to sign the badge applications. The plan shall describe in detail the Contractor's and/or subcontractor's plan to control badges.
- 7) The Contractor shall ensure that no personnel or equipment enters the active movement areas or their associated Object Free Areas without the appropriate Airport Operations escort. **Access into movement areas or Object Free Areas without an Airport Operations escort is prohibited!**
- 8) The Contractor will be required to coordinate his work so as to satisfy clearance requirements for arrival and departure of aircraft in compliance with the CSPP and in compliance with FAA Advisory Circular 150/5370-2G concerning Operational Safety on Airports during Construction.

36-3.2 VEHICLE AND PEDESTRIAN CONTROL. Vehicle and access routes for airport construction shall be controlled as necessary to prevent inadvertent or unauthorized entry of persons, vehicles or animals onto Air Operation areas. No vehicle shall enter the AOA except at predetermined locations. The amount of construction traffic will require a flag person to control traffic crossing taxiways and other aircraft movement areas. Contractor personnel who operate vehicles in the AOA shall comply with the Airport Operations rules and regulations for vehicle marking, lighting, and operation. Failure to comply may result in contract non-compliance costs and Notice of Violation assessments, per paragraph 36-3.10.

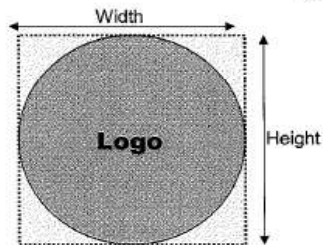
36-3.3 CONTROL AND WARNING DEVICES. During construction operations near active taxiways or runways the Contractor shall furnish and maintain medium and low-level barricades equipped with red warning lights along the edges of the runway and taxiway safety areas to warn construction equipment to stay clear of the active airfield pavement as well as warn pilots of areas having construction hazards. Per paragraph 36-2.4 barricades shall be equipped with red lights

acceptable to the Airport Operations. The Contractor shall furnish and maintain warning markers with red warning lights along the edges of the runway safety area as designated and detailed on the plans. The Contractor shall maintain red warning lights and warning flags around all equipment, stockpiles, or other areas as directed by the Engineer and Airport Operations.

The Contractor shall provide the phone numbers of five (5) of its responsible personnel, including the project superintendent, and three (3) each responsible personnel, from the paving and safety subcontractors, each of whom may be contacted in an emergency. Personnel shall be on call 24 hours per day for maintaining construction hazard lighting and barricades. The Contractor shall employ watchmen to maintain and service all traffic control equipment. The project superintendent, foreman and on-site manager for the Contractor and all subcontractors shall have cell phones with a "602", "480" or "623" area code.

36-3.4 VEHICLE MARKING AND IDENTIFICATION. All permitted vehicles operating in the AOA shall display in full view above the vehicle a 3' x 3' or larger, orange and white checkerboard flag, each checkerboard color being 1' square. Any vehicle operating on the AOA shall be equipped with a flashing amber dome-type light, mounted on top of the vehicle and of such intensity to conform to local codes for maintenance and emergency vehicles. All vehicles operating within the airfield boundary which are approved for unescorted access shall be identified with a painted or magnetic sign on each side of the vehicle bearing the name and logo of the company. The sign shall conform to the requirements below:

City of Phoenix – Aviation Department
*Company Identification for Vehicles
entering the Restricted Area*



Logo Only

If using a logo only on each side of the vehicle it must be greater than 12 inches in diameter or the 'width' multiplied by the 'height' must be greater than 144 square inches.

or

Logo and Letters

The width of the logo plus the letters

(measured from one side of the logo to the opposite end of the letters)

multiplied by

the height of the highest point

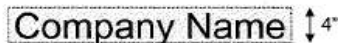
(measured from the bottom of the lowest point of the logo plus company name to the highest point of the logo and company name)

must be greater than 144 square inches

or

Lettering Only

The letters must be 4" or greater



Rented or leased vehicles cannot be granted unescorted access unless the above signage is placed on it. All vehicles with unescorted access must have available for inspection, when entering the Restricted area or while in the Restricted area, the current registration and proof of insurance for the vehicle.

Vehicles making only occasional visits to the job site are exempt from the identification requirements contained above provided that the Airside Operations Manager is notified and a properly identified vehicle escorts them into, through, and out of the airport secured area. These and other vehicles needing intermittent identification may be marked with tape or with magnetically attached markers that are commercially available to meet identification size and content requirements.

36-3.5 VEHICLE TRAFFIC AND OPERATIONS. When any vehicle other than those approved for use in the AOA is required to travel to or from the work area or over any portion of the work area, shall be escorted by a vehicle properly identified to operate in the area and be provided with a flag on a staff attached to the vehicle. All construction vehicles/equipment shall have automatic signaling devices to sound an alarm when moving in reverse. All equipment shall be operated within the approved speed limits.

All vehicles and/or construction equipment operating inside the active AOA, but outside of the designated haul roads, shall be escorted by Airport Operations, who will maintain radio contact with the ATCT. Crossing the active runway shall not be permitted. Vehicular traffic routes which need to cross an active taxiway shall be coordinated in advance (at least 72 hours) with Airport Operations to ensure that proper Notices to Airmen (NOTAMs) are in place. These prearranged traffic routes must be controlled by flag-persons as detailed on the plans. Aircraft **always** have the right-of-way. Construction equipment shall **always** yield to aircraft. Construction vehicle traffic shall **never** cross an active taxiway unless escorted by Airport Operations or at the pre-approved crossing points while crossing guards are stationed.

At such a pre-approved taxiway crossing point, the Contractor shall have a flag-person stationed on each side of the crossing point to monitor aircraft movement and to direct construction traffic. The flag-person shall be equipped with handheld signs or flags to assist in directing construction traffic. For nighttime construction operations, the flag-person shall also be equipped with lighted wands and light plants on each side of the taxiway. In addition, one vacuum sweeper and one water truck shall be dedicated to and stationed full time at each active taxiway crossing to maintain the surface of the taxiway free from construction traffic debris. Mud and other material tracked onto taxiway surfaces shall be removed by hand if necessary to achieve its complete removal.

Prior to entering any work site within the AOA, the Contractor will physically meet with Airport Operations to brief each other on the intended activities. The Contractor must also arrange a physical inspection of the work area with Airport Operations prior to leaving any area that has been closed for work, or that has been used for a crossing point or haul route by the Contractor.

36-3.6 VEHICLE PARKING. All vehicles shall be parked and serviced in the designated staging and employee parking areas shown on the plans. The Contractor is responsible for transporting his/her employees from these areas to the jobsite.

36-3.7 RADIO COMMUNICATIONS. The control of vehicular activity on the AOA is of the highest importance. This requires coordination with airport users and Air Traffic Control Tower (ATCT). The Contractor shall have no direct contact with the ATCT. All communications with the ATCT shall be coordinated through Airport Operations. However, the Contractor shall properly train his/her personnel, particularly flag-persons, on the proper procedures for monitoring radio frequencies.

36-3.8 AIRPORT SECURITY REQUIREMENTS. The Contractor will be required to coordinate his work so as to satisfy clearance requirements for arrival and departure of scheduled aircraft, and in compliance with FAA Advisory Circular 150/5370-2G concerning operational safety on airports during construction activity.

The airport is operated in strict compliance with Federal, State and local rules and regulations, which prohibits unauthorized persons or vehicles in the AOA. Equipment and personnel will be restricted to the work areas defined on the plans. Any violations by Contractor's personnel will subject the Contractor to the contract non-compliance assessments imposed by FAA and the Aviation Department.

Airport restricted areas are fenced and must remain fenced at all times. No temporary airport perimeter security fencing is required for this project. If, as the project progress, any temporary security fences and/or gates are required they shall be constructed by the Contractor according to specifications set by Airport Operations. The temporary fence and gate must be approved by Airport Operations before any of the regulated perimeter security fence may be altered. If needed, temporary fencing shall be constructed in accordance with FAA Specification F-162. The gates will remain closed and locked, or if used continuously for ingress and egress, the Contractor will provide approved guards trained by Airport Operations to monitor access to the Airport. The Contractor shall provide guards with a roster of his personnel and ensure that each individual has adequate identification. Contractor locks are not permitted on any airport gate. Gates will be staffed during shift working hours and will be secured when there is no activity at that location. The Contractor will be responsible for a 24-hour advance notification to Airport Operations regarding the scheduling of the use of the various security check point gates. There will be a communications system for emergency responses, security breaches, etc.

Entrance to the airfield is subject to strict security regulations. All personnel entering the airfield must obtain and display Airport security identification badges and all vehicles must meet minimum identification requirements and have proof of insurance on file with the Airport Security Office. All vehicles will be searched upon entering the AOA. All vehicles will be searched each time prior to passing the security check points and may be subject to random searches while operating in the AOA. Due to these TSA mandatory searches, throughput of vehicles entering the AOA at these check points may be severely reduced, thereby possibly affecting the execution of some construction activity. The Contractor must account for the possible loss of time associated with these vehicle searches in his/her bid. No additional time or compensation will be permitted for actions resulting from these vehicle searches.

The Contractor shall maintain the security integrity between the public and AOA. All barrier designs and their phasing shall be submitted to the Aviation Department and approved by them in writing prior to erection.

All construction personnel assigned to the project, except for escorted in-transit material suppliers, shall make application for and wear security badges. The term of the badge will be no more than six months. If the prime contract is for more than six months, a renewal badge application will be required at no cost to the company making the application. The Contractor and the subcontractor can make application for these items by contacting Phoenix Sky Harbor International Airport. A "Fingerprint Criminal History Records Check Application" form must be completed prior to fingerprinting. Photo identification badges will be made for each employee. Each employee shall be responsible for paying the current fee schedule, which is approximately \$10.00 for each badge and \$53.00 for federal fingerprinting. Badges must be surrendered upon termination of the employee or contract. The Contractor must notify the Phoenix Sky Harbor International Airport immediately to report any badges that are lost or stolen. The Contractor's employees, the

subcontractor's employees and others taking the Airfield Drivers Training class and the Security class should anticipate that the duration to wait in line, and submit to fingerprinting, may take one to two hours per person. Required classes will be scheduled upon completion of the federal background check, and may take two to five days to schedule and two to three hours to complete.

Each employee is required to submit the following:

- A completed "Fingerprint Criminal History Records Check" form. All questions must be answered "yes" or "no". Applicants may be subject to a criminal history records check and fingerprinting check. Any disqualifying crimes committed within the past ten years will eliminate an applicant from the badging process and they are not permitted to be escorted. The completed form must be submitted to the Security Badging office along with the employee's Security Badge Application Form (form available in Security Badging Office).
- Two forms of current identification. At least one form of a government issued pictured ID (state driver's license, ID card, military ID, etc). The second form does not have to be a picture ID (social security card, bank card, etc).

Contractor company officials/officials who wish to become authorized signers on the "Company Application for Air Operations Area Access" form must also be fingerprinted. Once their prints are cleared they will be designated an 'Authorized Signer' for that company and are authorized to sign badge applications for other company employees.

The Contractor shall maintain an up-to-date record of all badge holders showing name, address, social security number and Immigration form I-9 (eligibility to work in the United States). The Contractor will be required to furnish this information to the Airport upon request.

The Contractor shall restrict passage into the Security Area to badged persons, vehicles and equipment displaying his identification or that of the Airport. Should the Contractor wish to allow visitors, vendors or delivery through his access point, he shall provide an escort in accordance with escort procedures.

The Contractor shall be responsible for providing at his own cost a badged escort for all vehicles that do not operate on a daily basis within the AOA. Escorted vehicles shall not be left unattended. The badged escort shall remain with the escorted vehicle at all times while on the AOA and shall be escorted back and forth to the point of entry. One badged escort vehicle shall be required for EACH unbadged vehicle. There will be no exceptions to this requirement.

The Contractor is required to submit a plan on how he/she will safely operate within the AOA. This plan shall be submitted and approved by the Airside Operations Manager before the commencement of any construction. The Contractor is required to prepare, submit for approval and maintain during construction a plan for managing Airport Security Badges of his/her employees, subcontractors or any other party recommended by the Contractor for badging. This plan shall be submitted to Airport Operations prior to the Pre-Construction Meeting.

The Contractor will contact the Airside Operations Manager, telephone (602) 273-3490 ten (10) days prior to start of construction to submit the necessary airport security information for all vehicles and personnel required inside the restricted area during construction.

36-3.9 VIOLATION OF RESPONSIBILITIES. Any violation of 36-3.1 - 36-3.8 shall be considered a violation of the Contract itself and shall be sufficient cause for halting the work without extending the time limit of the job.

36-3.10 CONTRACT NON-COMPLIANCE. Due to both the safety and security precautions necessary at Phoenix Sky Harbor International Airport, failure of the Contractor to adhere to the prescribed requirements/regulations has consequences that may jeopardize the health, welfare

and lives of the customers and employees at Phoenix Sky Harbor International Airport, as well as the Contractor's own employees. Therefore, if the Contractor is found to be in non-compliance with the security, airfield badging/licensing and airfield safety requirements by either Airside Operation's Personnel or the Engineer or his representatives, the Airside Operations Division will issue Notices of Violation (NOV). The Contractor may appeal the NOV, however appeals must be made in writing, and within four (4) calendar days of the offending incident, to the City of Phoenix's Project Manager. The appeal would need to state, in sufficient detail, why the NOV/circumstances is unwarranted. A final and binding decision on the appeal will be made by the City of Phoenix's Project Management Team within ten (10) working days of receipt of the appeal, the Contractor will then be notified of this decision in writing. No further appeals to the specific NOV will be considered or accepted.

The City of Phoenix Airside Operations has the option to issue warnings on the first offense if the incident justifies it. Individuals involved in a non-compliance violation may be required to surrender their security badge and airfield driver's license pending investigations of the matter and the outcome of the possible appeal.

- 1) Should any violation caused by the Contractor result in an expense to the City of Phoenix, the City shall recover the total of those expenses from the Contractor. The expenses will be determined by the Aviation Department and will consist of the following:
 - a) Labor hours of City staff or consultants which were devoted to investigate and resolve the violation, including overhead and labor burden mark-ups.
 - b) Expenses for materials or equipment necessary to make the situation temporarily or permanently safe.
 - c) Work by others, either contracts, or services, or by airlines, which were performed in order to rectify the situation.
 - d) Any monetary sanctions assessed by the FAA, TSA or others

Incursions are defined as "any entrance onto an active runway, taxiway, taxilane or apron that may or may not subject any aircraft or crash fire rescue vehicle to yield, stop or change direction to avoid the sudden entrance."

The Airport's Notice of Violation (NOV) program also applies to all security badge holders and the companies they work for. Airport NOVs can result in the suspension or revocation of a companies or individual's privilege to do work at the airport. Responsibilities for security badge holders and their companies are communicated through the badge application process.

COORDINATION OF CONSTRUCTION ACTIVITIES

36-4.1 WORK SCHEDULING AND ACCOMPLISHMENT. The Contractor shall contact PHX Airport Operations each day before beginning work to coordinate the status and nature of work to be done that day. Access to work sites within the AOA will require daily coordination with Airport Operations prior to gaining access. The Contractor shall also report to Airport Operations at the end of each day to schedule the work he plans to do on the following day.

Violations of any coordination requirements shall be considered a violation of the Contract itself and shall be sufficient cause for halting the work without extending the time limit of the job.

SAFETY REQUIREMENTS

36-5.1 GENERAL. Before entering upon or crossing any runway or taxiway, or aircraft movement area, the Contractor shall receive proper clearance from PHX Airport Operations. Emergencies and operating conditions may necessitate sudden changes, both in airport operations and in the operations of the Contractor. Aircraft operations shall always have priority over any and all of the Contractor's operations. Should runways or taxiways be required for the use of aircraft, and should Airport Operations deem the Contractor to be too close to active runways or taxiways the Contractor shall suspend his operations, remove his personnel, plant, equipment, and materials to a safe distance and stand by until the runways and taxiways are no longer required for use by aircraft. There will be no compensation for delays or inefficiencies due to these changes.

The Contractor shall ensure that no personnel or equipment enters into the active movement areas or their associated Object Free Area without the appropriate Airport Operations escort. **Access into movement areas or Object Free Areas without an Airport Operations escort is prohibited!**

Throughout the duration of the job, any practice or situation that Airport Operations or the Engineer determines to be unsafe or a hindrance to regular airport operations shall be immediately rectified.

Any violation of these or the following safety requirements shall be considered a violation of the Contract itself and shall be sufficient cause for halting the work without extending the time limit of the job.

- (1) The following publications contain definitions/descriptions of critical airport operating areas. The areas defined below pertain to airfield safety requirements and are referenced throughout the Contract Documents. Copies of Advisory Circulars may be found at the FAA website:

[http://www.faa.gov/airports airtraffic/airports/resources/advisory circulars/](http://www.faa.gov/airports_airtraffic/airports/resources/advisory_circulars/)

and, Federal Aviation Regulations (FARs) can be found at:

[http://www.faa.gov/regulations policies/faa regulations.](http://www.faa.gov/regulations_policies/faa_regulations.)

The Contractor is always to use the latest version of each AC or regulation.

- (a) Advisory Circular 150/5370-2G, "Operational Safety on Airports During Construction" sets forth guidelines to assist airport operators in with the requirements of federally funded construction projects.
- (b) FAR Part 77, "Objects Affecting Navigable Airspace," Current Edition: Establishes standards for determining obstructions to navigable airspace. Civil airport imaginary surfaces are defined in the publication. It also sets forth requirements for notice of certain proposed construction or alteration. Notice of construction provides a basis for recommendations for identifying the construction or alteration in accordance with AC 70/7460-1, "Obstruction Marking and Lighting," Current Edition.
- (c) AC 150/5300-13B, "Airport Design" Current Edition: Establishes design, operational and maintenance standards for airports. Standard terms used in the contract plans and specifications are defined below:

- (i) Runway Safety Area (RSA) - The defined surface surrounding the runway over which aircraft should, in dry weather, be able to cross at normal operating speeds without incurring significant damage. A safety area is graded, drained and compacted. It is free of any holes, trenches, humps or other significant surface variations or objects, other than those which must be there because of their essential aeronautical function. The safety area requires the capability of supporting maintenance, firefighting, and rescue vehicles under normal (dry) conditions.

Prior to re-opening the runway each morning, the RSA must comply with the following:

- 1) The area(s) shall be able to support an aircraft at normal operating speeds without the aircraft incurring significant damage.
- 2) For the first 200 feet beyond the runway ends, the longitudinal grade of the RSA is between 0 and 3 percent, with any slope being downward from the runway ends. For the remainder of the RSA, the maximum allowable downward grade is 5 percent and the maximum allowable upward grade shall not penetrate the 20:1 approach surface from the end of the runway, as defined in FAR Part 77. However, limitations on longitudinal grade changes are plus or minus 2 percent per 100 feet.
- 3) For the RSA during construction (200 feet from runway centerline and up to 200 feet from the runway ends), the transverse grade from the edge of the runway pavement is 1.5 to 5 percent downward. For areas beyond 200 feet from the runway ends, the maximum allowable transverse grade shall be 5%, upward or downward. Transverse grade changes should be warped smoothly.
- 4) The maximum permissible drop-off at the edge of the runway pavement is 3 inches.
 - (ii) Object Free Area (OFA) – An area on the ground centered on a runway, taxiway, or taxilane centerline provided to enhance the safety of aircraft operations by having the area free of objects, except for objects that need to be located in the OFA for air navigations or aircraft ground maneuvering purposes.
 - (iii) Obstacle Free Zone (OFZ) – The OFZ is the airspace below 150 feet above the established airport elevation and along the runway and extended runway centerline that is required to be clear of all objects, except for frangible visual NAVAIDs that need to be located in the OFZ because of their function, in order to provide clearance protection for aircraft landing or taking off from the runway, and for missed approaches. The OFZ is subdivided as follows:
 - 1) Runway OFZ. The airspace above a surface centered on the runway centerline.
 - 2) Inner-approach OFZ. The airspace above a surface centered on the extended runway centerline. It applies to runways with an approach lighting system.
 - 3) Inner-transitional OFZ. The airspace above the surfaces located on the outer edges of the runway OFZ and the inner-approach OFZ. It applies to runways with approach visibility minimums lower than $\frac{3}{4}$ -statute mile.

(iv) Taxiway Safety Area (TSA) – A defined surface alongside the taxiway prepared or suitable for reducing the risk of damage to an airplane unintentionally departing the taxiway.

(iv) The dimensioning of RSA's, OFA's and OFZ's are determined by the type of aircraft utilizing the runways and taxiways. AC 150/5300-13A provides detailed information for determining the required dimensioning for various safety areas. For the Phoenix Sky Harbor International Airport, the following are the locations of Runway and Taxiway Safety Areas, Object Free Areas and Obstacle Free Zones.

(1) Group V aircraft is the Design Aircraft for Phoenix Sky Harbor International Airport. Workers and equipment are to provide 36' wingtip clearance during taxiing operations if Taxiways remain open to traffic.

Group V – 214' Wingspan

(a) TSA 107' from Taxiway Centerline

(b) OFA 142.5' from Taxiway Centerline

- (5) The Contractor shall acquaint his supervisors and employees with the airport and operations that are inherent to Phoenix Sky Harbor International Airport and shall conduct his/her construction activities to conform to all routine and emergency air traffic requirements and guidelines for safety specified herein. **The Contractor shall be responsible for providing all safety devices as required for the protection of his personnel.**
- (6) Protection of all persons shall be provided throughout the progress of the work. The work shall proceed in such a manner as to provide safe conditions for all workers and personnel. The sequence of operations shall be such that maximum protection is afforded to ensure that personnel and workers in the work area are not subject to any dangerous conditions. The Contractor must provide safety measures to guard against injury.
- (7) During the performance of this contract, the airport facility shall remain in use to the maximum extent possible. Use of areas near the Contractor's work will be controlled to minimize disturbance to the Airport's operation. The Contractor shall not allow employees, subcontractors, suppliers, or any other unauthorized person to enter or remain in any airport area which would be hazardous to persons.
- (8) All work to be performed which is too close to an active runway, taxiway or apron under operational conditions shall be performed when the runway, taxiway or apron is not in use. Such work shall not be accomplished without prior permission from Airport Operations. Requested closings shall be directed to the Airport Operations in writing at least 72 hours in advance so that the proper Notice-to-Airmen (NOTAM) may be issued. Only Airport Operations have the authority to open or close runways or taxiways.
- (9) The Contractor shall be aware of the following types of safety problems and/or hazards. These problems or hazards shall not be permitted. Should any of these problems or hazards arise during construction, the Contractor shall immediately rectify/correct the problem or hazard to the satisfaction of the Engineer and Airport Operations Personnel:

- (a) Trenches, holes, or excavations on or adjacent to any open runway or in safety areas.
- (b) Unmarked/unlighted holes or excavation in any apron, open taxiway, open taxilane, or related safety area.
- (c) Mounds or piles of earth, construction materials, temporary structures, or other objects in the vicinity of any open runway, taxiway, taxilane, or in a related safety, approach, or departure area.
- (d) Vehicles or equipment (whether operating or idle) on any open runway, taxiway, taxilane, or in any related safety, approach, or departure area.
- (e) Vehicles, equipment, excavations, stockpiles, or other materials which could degrade or otherwise interfere with electronic signals from radios or electronic navigational aids (NAVAIDS).
- (f) Runway surfacing projects resulting in excessive lips greater than 1 inch for runways and exceeding 3 inches for edges between the old shoulder and new surfaces at runway edges and ends.
- (g) Unmarked utility, NAVAID, weather service, runway lighting, or other power or signal cables that could be damaged during construction.
- (h) Objects (whether or not marked or flagged) or activities anywhere on or in the vicinity of the airport which could be distracting, confusing, or alarming to pilots during aircraft operations.
- (i) Unflagged/unlighted low visibility items (such as tall cranes, drills, and the like) anywhere in the vicinity of active runways, or in any approach or departure area.
- (j) Misleading or malfunctioning obstruction lights or unlighted/unmarked obstructions in an approach to any open runway.
- (k) Inadequate approach/departure surfaces needed to assure adequate landing/takeoff clearance over obstructions or work or storage areas.
- (l) Inadequate, confusing or misleading (to user pilots) marking/lighting of runways, taxiways, or taxilanes, including displaced or relocated thresholds.
- (m) Water, dirt, debris, or other transient accumulation which temporarily obscures pavement marking, pavement edges, or derogates visibility of runway/taxiway marking or lighting.
- (n) Inadequate or improper methods of marking, barricading, and lighting of temporarily closed portions of AOA.
- (o) Trash or other materials with foreign object damage (FOD) potential, whether on runways, taxiways, or aprons, or in related safety areas.
- (p) Inadequate barricading or other marking which is placed to separate construction or maintenance areas from open aircraft operating areas.
- (q) Failure to control vehicle and human access to open aircraft operating areas.
- (r) Construction/maintenance activities or materials which could hamper the response of aircraft rescue and firefighting (ARFF) equipment from reaching all aircraft

or any part of the runway/taxiway system, runway approach and departure areas, and aircraft parking locations.

- (s) Bird attractants on airport, such as edibles (food scraps, etc.), miscellaneous trash, or ponded water.
- (10) The Contractor shall conduct activities so as not to violate any safety standards contained herein. The Contractor shall inspect all construction and storage areas as often as necessary and promptly take all steps needed to prevent/remedy any unsafe or potentially unsafe conditions/activities discovered.
- (11) Before actual commencement of construction activity, the Contractor shall notify Airport Operations and the Engineer in writing of his intentions to begin construction, stating the proposed time, date, and work area in order for the appropriate Notice-to-Airmen (NOTAM) to be issued. Only PHX Airport Operations have the authority to open or close runways or taxiways and to issue NOTAMs. In order to properly communicate these closures Airport Operation must receive these requests 72 hours prior to the scheduled closure. Upon completion of work and return of all related areas to standard conditions, the Contractor shall again notify Airport Operations and the Engineer in writing, and describe the area that is complete and available for normal airport operations.
- (12) Debris. Debris, waste and loose material or any other FOD (including dust and dirt) capable of causing damage to aircraft landing gear, propellers or being ingested in jet engines shall not be allowed on active aircraft movement areas or adjacent infield areas. Materials observed to be within these areas shall be removed immediately and/or continuously by the Contractor. The Contractor shall be required to have a sweeping machine and operator on site, ready at all times during construction activity. Where travel on or across runways, ramp areas, taxiways, or aircraft aprons is required, the Contractor shall provide adequate personnel and equipment to keep such surfaces clear of debris at the discretion of the Engineer. Closed pavements shall be swept clean prior to reopening to aircraft traffic. Exposed earth in excavation areas within 75 feet of the centerline immediately adjacent to active taxiways shall be covered to prevent dust from jet blast. Cover material shall be weighted to prevent movement from jet blast.
- (13) Flagpersons. In accordance with the specifications, the Contractor shall furnish, at his own expense, flagpersons as necessary to control his traffic unless otherwise directed by the Engineer.
- (14) Trenches, Excavations and Stockpiled Material. Open trenches or excavations exceeding 3" in depth and 3" in width or stockpiled material will not be permitted within the limits of restricted areas of operational runways or taxiways. Covering for open trenches or excavations shall be of sufficient strength to support the weight of the heaviest aircraft operating on the runway or taxiway. Trenches and excavations that cannot be protected by covering shall be backfilled, and re-excavated if necessary at the end of each day or before opening the restricted area to operational use of the runway or taxiway. Open storm drain trenches, electrical duct or conduit trenches, utility trenches or any other trench shall be limited to 500-feet accumulative in length at any time. Open trenches in the runway safety area shall be properly and completely backfilled and compacted in sufficient time before the end of the work shift.

(15) Construction in Proximity to Active Runways and Taxiways.

Runway Sides: If appropriate construction/maintenance NOTAM has been issued, construction is permissible as close as 250 feet from the centerline of the active runway provided that all Airport Operations and FAA criteria are met. The 250 feet shall be clearly marked in the infield areas with approved barricades at 10-foot intervals. Runway Ends: No work will be permitted within 1,000 feet of the active runway threshold.

Taxiway Sides: If appropriate construction/maintenance NOTAM has been issued, construction is permissible as close as the dimensions shown on the Construction Safety and Phasing Plan (CSPP) provided that all Airport Operations and FAA criteria are met. This dimension(s) shall be clearly marked in the infield areas using approved barricades at 10-foot intervals. Personnel and equipment working within taxiway Object Free Areas (OFA) must at all times be able to give way to taxiing aircraft.

(16) Equipment Height Restrictions.

Maximum permissible equipment height varies by location and by construction phase. Maximum equipment height requirements are shown in the CSPP and shall not be exceeded unless prior approval is obtained from the Engineer and Airport Operations. Atop all equipment booms shall be mounted the white and orange checkered flag described in Paragraph 36-3.4. The top ten feet (10') of these booms shall be painted fluorescent orange and they shall be equipped with a red obstruction light. Any crane erections shall be coordinated with Airport Operations and the Engineer during every shift.

(17) Miscellaneous.

- (a) Open flame, welding or torch cutting are prohibited unless adequate fire and safety precautions have been taken and the procedure has been approved by the Engineer.
- (b) All materials and equipment when not in use shall be placed in approved areas where they will not constitute a hazard to aircraft and not penetrate clearance height restrictions as shown in the CSPP. All equipment shall be parked in the appropriate area(s) when not in use.
- (c) The Contractor shall provide the Safety/Security Manager with a current list of all employees working on the airport. The list shall be maintained current by the Contractor and Subcontractors.
- (d) For emergencies involving life safety (injuries, fires, security breaches, etc.), the Contractor shall immediately call 602-273-3311, the Sky Harbor Emergency number, and simultaneously or as soon as possible contact PHX Airport Operations followed by notification to the Project Manager.

36-5.2 CLOSED RUNWAY AND TAXIWAY MARKING AND LIGHTING. Closed runway and taxiway markings shall be as shown in the CSPP. Closed runway and taxiway marking and lighting materials shall be approved for use by the Engineer prior to placement. Construction activities shall not begin until the layout of such marking and lighting has been approved by the Engineer.

36-5.3 HAZARD MARKING. Hazard-marking barricades, flashers, etc. should be used: to identify and define the limits of construction making them visible to aircraft, personnel, or vehicles; to identify hazards such as open manholes, small areas under repair, stockpiled material, waste areas, etc.; to prevent aircraft from taxiing onto a closed runway for takeoff; and to identify FAA,

airport, and National Weather Service facilities, cables, power lines and other sensitive areas to prevent damage, interference, and facility shutdown.

Traffic Cones shall not be used at any time on the Air Operations Area.

Hazardous areas, in which no part of an aircraft may enter, should be indicated by the use of barricades marked with diagonal, alternating orange and white reflective stripes. During reduced visibility or night hours, the barricades should be supplemented with flashing red lights. The intensity of the lights and spacing for barricades, flags, and lights should be adequate to delineate the hazardous area without ambiguity. The Contractor shall have a designated person on call 24 hours a day for emergency maintenance of airport hazard lighting and barricades.

36-5.4 CONSTRUCTION AREA MARKING AND LIGHTING. Low profile lights, retroreflective taxiway edge markers, low level barriers, and warning flags shall be provided and erected by the Contractor as shown in the CSPP or as directed by the Engineer. All construction areas, including closed runways and taxiways, should be clearly and visibly separated from active air operation areas. Hazard areas, facilities, cables, and power lines should also be clearly identified by the Contractor. The Contractor is responsible for maintaining the condition and visibility of all markers identifying above-mentioned areas and that marking and lighting aids remain in place. Appropriate barriers, lights and signs should be used as necessary to clearly separate all construction/maintenance areas from other parts of the AOA. All barricades, temporary markers, flag line supports, and other objects placed and left in safety areas on any open runway, taxiway, or taxilane should be: as low as possible to the ground; of low mass; easily collapsible upon contact with an aircraft or any of its components; weighted down or sturdily attached to the surface to prevent displacement from prop wash, jet blast, wing vortex, or other surface wind currents; and if affixed to the surface, frangible at ground level.

36-5.5 CONSTRUCTION NEAR NAVIGATIONAL AIDS. Construction materials and equipment shall not be placed or parked where they may interfere with the line-of-sight of the ATCT and navigational aids in operation. PHX Operations shall determine if any materials or equipment will cause any type of interference.

36-5.6 CONSTRUCTION SITE ACCESS AND HAUL ROADS. The Contractor will not be permitted to use any access or haul roads other than those designated on the contract drawings. The Contractor should submit specific proposed ingress and egress routes associated with specific construction activities to the Engineer for evaluation and approval prior to commencing construction activities. Aircraft Rescue and Firefighting (ARFF) right-of-way on access roads, haul roads, taxiways, and runways shall not be impeded at any time.

36-5.7 TRENCHES AND EXCAVATIONS. Gaps or holes between paving lanes, open trenches or excavations are not permitted within an operational runway safety area. Coverings for open trenches or excavations such as reinforced structural steel plates, precast slabs or other methods should be of sufficient strength to meet the requirements of the RSA found in Paragraph 36-5.1(1)(c). Open trenches and excavations at the construction site outside of the RSA should be prominently marked with red or orange flags, as approved by the Engineer, and lighted with red light units during hours of restricted visibility or darkness.

Excavations and open trenches may be permitted up to the edge of structural taxiways provided the drop-off is adequately signed, marked, and lighted and the appropriate NOTAM is issued.

36-5.8 CONSTRUCTION MATERIALS STOCKPILING AND EQUIPMENT STORAGE. There shall not be any equipment storage in the active runway and active taxiway safety areas or in the infield areas. The Contractor shall remove pavers and other equipment from the active Runway and Taxiway Object Free Areas (OFA) including the infields (staging on apron areas will be

allowed with prior approval) before re-opening the runway or taxiway. Stockpiled material or equipment should not be stored near aircraft turning areas or operational movement areas, aprons, or excavations and trenches. Stockpiled materials shall not be stored near NAVAIDs, visual or approach aids, nor shall they obstruct the ATCT's line of sight to any runway or taxiway. The Contractor shall ensure that stockpiled construction materials and equipment do not cause degraded or hazardous conditions to airport operations safety. This includes determining and verifying that stockpiled materials and equipment are stored or parked at an approved location, that they are properly stowed to prevent foreign object debris (FOD), attraction by wildlife, or obstruction of air operations either by their proximity to NAVAIDs or to aircraft movement areas.

36-5.9 OTHER LIMITATIONS ON CONSTRUCTION. Open flame welding or torch cutting operations are prohibited unless adequate fire and safety precautions are provided and have been approved for use by the Engineer. Under no circumstances should flare pots be used near aircraft turning areas.

36-5.10 FOREIGN OBJECT DEBRIS (FOD) MANAGEMENT. Waste and loose materials capable of causing damage to aircraft landing gear or propellers or capable of being ingested in jet engines should not be left or placed on or near active aircraft movement areas. Materials tracked onto these areas should be continuously removed during the construction project. It is also recommended that waste or loose materials which would attract wildlife be carefully controlled and removed on a continuous basis.

36-5.11 RUNWAYS AND TAXIWAYS. Nothing shall be placed upon runways, taxiways, taxilanes, or aprons without authorization from Airport Operations.

36-6.1 CONTRACTOR QUALITY CONTROL. The Contractor shall be responsible for developing and implementing a Safety Plan Compliance Document including inspections necessary to assure compliance with the requirements of this section and the approved Construction Safety and Phasing Plan.

METHOD OF MEASUREMENT

36-7.1 All items specified in this section will be measured as one lump sum.

36-7.2 Measurement and payment for "Landside Traffic Control" and for Uniform Off-Duty Officer as specified in the Technical Special Provisions (if included) is incidental to Special Provision Item 36 Airport Safety and Security (M-003).

BASIS OF PAYMENT

36-8.1 Airport Safety and Security (M-003) shall be paid for at the contract lump sum price in a proportionate manner, on the basis of current estimates. This price shall constitute full compensation for furnishing material and equipment, including but not limited to flagpersons, temporary gates, warning markers, temporary drainage items, low level barriers, other traffic control devices and necessary equipment, safety area support material, and other material and equipment list herein, and the maintenance thereof and all other labor, materials, equipment, tools and incidentals including Landside Traffic Control and Uniform off-duty Officers necessary to accomplish this item.

Payment will be made under:

Item M-36-8.1 Airport Safety and Security (M-003) – per lump sum

37. AIRPORT SAFETY REQUIREMENTS

37.1 CONTRACTOR GENERAL AIRPORT SAFETY REQUIREMENTS. PHX is committed to providing a safe work environment and requires contractors ensure the health and safety of its employees and the employees of its subcontractors. Hazards include but are not limited to harmful dusts, fumes, and vapors, strong acids, molten or hot metal, metal with sharp or jagged edges, electrical hazards, overhead hazards and moving vehicles. PHX requires contractors comply with all federal, state and local laws, codes and regulations as applicable to the area and type of work conducted on the airport.

37.2 SAFETY COORDINATOR All Contracts will require the Contractor to designate a Safety Coordinator(s) as the point of contact for the Project regarding Safety. Contractor shall work with the Airport's Safety section in meeting the pre-requisites to establish the Safety Coordinator. The Safety Coordinator(s) will represent the company having oversight of the project activities and the person(s) with a direct relationship with the Airport's Safety section. The Safety Coordinator(s) should at minimum be responsible for planning, implementing and overseeing company's employee safety at work. Their main duty is to ensure that the company complies and adheres to Occupational Health and Safety (OHSA) guidelines to reduce work-related injuries and provide a direct point of contact for the Airport's Safety section.

The Safety Coordinator(s) is responsible for implementing and maintaining the safety program for areas pertaining to the project. Responsibilities may include administration and coordination of the following activities:

- Thoroughly reviewing accident investigations and initiating corrective action.
- In the event of an accident, preparing and submitting a written report, and assisting in the investigation according to requirements.
- Holding safety meetings.
- Reviewing safety performance and taking action as necessary within the areas of responsibility.
- Maintaining effective and prompt communication of safety matters.
- Monitoring compliance with established safety standards and regulations.
- Assigning duties to subcontractors, checking work areas, making housekeeping inspections, and keeping records of conditions found and corrective actions taken.
- Requiring employees to use personal protective equipment such as safety glasses, body harnesses, respiratory protection equipment and head and eyewear protection.
- Maintaining effective communication of safety matters to employees.
- Assisting in the development and communication of safe work procedures for unusual or hazardous operations.
- Maintaining compliance with the requirements of federal, state, local, and other agencies, and with the requirements of the Contractor's safety programs.

37-3.1 HAZARD IDENTIFICATION AND JOB HAZARD ANALYSIS (JHA) To ensure that safety risks are assessed, understood and controlled to reduce operational risks and exposures Contractor shall develop and maintain a procedure for the identification of hazards and effective management of risk for activities and tasks conducted within the scope of project activity. There shall be a system, based on hazard identification and risk assessment, which ensures effective controls are in place to minimize exposure to hazards.

Contractor risk assessment process will use risk matrix and include at minimum the following elements:

- hazard identification;
- credible worst-case consequence;
- risk ranking;
- risk control treatments; and
- monitoring and review of controls.

A JHA shall be undertaken for each activity and shall at minimum:

- consider the tasks to be performed;
- identify and document the hazards;
- identify control measures;
- develop and implement hazard controls and regulatory compliance;
- perform the work and monitor the effectiveness of the hazard controls;
- consider emergency response procedures;
- provide feedback to improve the process (e.g. routine workplace inspections, auditing compliance during work performance, job briefing postings, lessons learned, etc); and
- provide for hazard assessments on new equipment or equipment where conditions change.

37-4.1 SAFETY VIOLATIONS Safety violations by Contractor employees constitute non-compliance with provisions of the contract and may result in immediate removal of the employee from airport premises. The Contractor's manager, supervisor, or other person in charge who directs or allows employees to perform unsafe acts or to work in or around unsafe conditions will be immediately removed from the airport premises.

37-5.1 SAFETY TRAINING Contractor are responsible for ensuring that employees under their supervision, direct and/or indirect, are competent, trained, understand, and comply with the requirements of OSHA and applicable ADOSH standards. Upon request and/or as applicable, contractors must show proof of training for their employees prior to commencing any work activities associated with OSHA/ADOSH regulations.

Contractor are to train their employees on the safety, health, environmental, and fire prevention requirements for the work they are to perform and enforce adherence to safe work practices and procedures.

37-6.1 SAFETY EQUIPMENT Contractor is responsible for providing their employees with the proper tools and equipment to perform the job safely, including any required personal protective equipment. Contractor must ensure that their subcontractors do the same.

Personal protective equipment shall be worn according to the hazards associated with various types of exposure (e.g. Safety glasses, ear plugs, gloves, chemical gloves, respirators, aprons, harnesses, etc.)

Contractor must supply their own equipment necessary for their employees to perform the work safely and in compliance with rules, regulations. Contractor are to arrange for the proper use, maintenance, and repair of work equipment.

37-7.1 REGULATORY COMPLIANCE Contractor shall perform all work in a manner that complies with all applicable federal, state, and local laws, rules, and regulations and complies with safety best practices (e.g., 29 CFR 1900 through 1999, Federal Aviation Administration, Transportation Security Administration, National Fire Protection Association, Arizona Department of Environmental Quality) while performing work and/or in support, direct or indirect, of the airport project,

In addition, contractors are obligated to:

- obtain/provide information on OSHA/ADOSH safety plans/procedures when affecting airport employees;
- coordinate operations with the appropriate PHX supervisor(s) should both PHX employees and Contractor personnel be working in a work area simultaneously;
- inform the Aviation Project Manager and/or Aviation Safety of any hazards encountered or created either through a debriefing or during the operation;
- the requirements are in addition to any other requirements or obligations set forth herein the Contract documents or applicable federal, state, and local laws, rules, regulations, and permits;

37-8.1 WORK PERMITS Contractor shall obtain, at their expense, all applicable work permits required to perform their work to ensure that any potential hazard takes into consideration the reduction of risk and includes safety precaution measures in place.

Work Permits shall:

- be approved for use prior to commencing the task;
- clearly define the work to be completed under the Work Permit;
- show on the permit the duration of the work.

Examples of where Work Permits are required (but not limited to):

- electrical or equipment isolations;
- confined space work;
- surface excavations;
- working at heights;
- work performed near x-ray or radioactive sources;
- high voltage work or working in proximity to high voltage;
- hot work (excluding hot work conducted in workshops).

37-9.1 SAFETY PROGRAM Contractor are responsible for establishing and implementing a safety program. This program will include maintaining and auditing safety performance for compliance with applicable federal, state, local regulations and with established safety and environmental requirements.

Contractors are responsible for planning and executing work according to the stated objectives of their safety program.

At minimum, such programs are to provide employees with information on the following topics (as applicable to the type of work required and/or exposed to):

- Construction Safety Phasing Plan
- Site Specific Safety Plan
- Hazards present in their work assignment and surrounding area.
- Personnel protective equipment requirements.
- Proper procedures for safe work and reporting unsafe job conditions.
- Hazardous Energy control (lockout/tagout).
- Confined space and powered industrial trucks.
- Fire prevention and fire extinguishers.
- Waste disposal and environmental release requirements.
- Respiratory Protection
- Hot Work
- Fall protection / Working at Heights
- Electrical safety
- Hazardous Materials / Hazard Communication
- Evacuation
- Traffic Control
- Emergency Procedures and Contacts
- Lifting and Crane Works
- Machine and Equipment Guarding
- Extreme Weather
- Work Permits
- Personal Protective Equipment (PPE)
- Hearing Conservation
- Scaffolding
- Bloodborne Pathogens
- Spill Prevention Control, and Countermeasures
- Trenching and Excavation

The Contractor shall provide, when applicable or upon request, a written safety program(s)/plan(s) to the Aviation Project Manager and/or Aviation Safety.

As it pertains to their work responsibility, the Contractor's written safety program(s)/plan(s) must meet the requirements set forth in federal (e.g., of OSHA 29 CFR 1900 through 1999, Federal Aviation Administration), state, and local regulatory entities.

Procedures used by the Contractor for intended/proposed work in a controlled area must be discussed with the Aviation Project Manager and/or Aviation Safety prior to commencement of work.

37-10.1 SAFETY INSPECTIONS Contractor are to conduct regularly scheduled safety inspections of the work being conducted by the contract and/or subcontract personnel. The scope or duration of work may regulate the frequency of these inspections.

The inspection program may include but not be limited to:

- Housekeeping;
- correct use of work permits, JHAs;
- appropriate workplace behaviors;
- equipment condition;
- hazard identification;
- task observations; and
- work and environmental conditions.

Inspections must be carried out by line management to verify that employees are competent, trained, equipped and if required, certified to carry out their work in accordance with statutory and company requirements.

All inspection findings must be actioned using a formal corrective action plan that addresses identified issues.

Contractor must take immediate corrective action when a violation of job safety, fire, or environmental safety hazard is observed. Contractor are to regularly review their safety performance. Agreed corrective and preventative actions must be tracked to completion, closed out and verified as being effective. Failure to correct a problem may result in work stoppage in the related area, and work will not be permitted to resume until the problem is corrected.

Work stoppages need to be communicated to the Aviation Project Manager immediately and/or the Airport Duty Manager. Contractor are required to administer their own safety activities and are responsible for the safety of their employees.

If required by the project, Contractor and their Safety Coordinator or designee must attend a pre-work safety conference with the Aviation Project Manager and Aviation Safety (et.al as required) prior to beginning work. The conference is to review procedures, forms, record keeping and reporting, and to ensure a clear understanding of the safety program relevant to the work to be performed.

37-11.1 SAFETY RIGHTS Contractor agrees that, in addition to any other right under the Contract, the Aviation Project Manager, shall have the right to take any or all of the following actions:

- Review and approve all Contractor work plans and work specific safety requirements;
- Designate safety precautions in addition to those in use or proposed by Contractor;
- Verify Contractor have effectively planned for eliminating or controlling work hazards that may impact the safety or health of the Airports and Contractor personnel or the general public;
- Require Contractor to provide additional safeguards beyond what Contractor plans to utilize;

- Conduct and document field safety observations and inspections to verify Contractor compliance with the Contractor Safety Program, the Contract requirements, applicable federal, state, and local laws, rules, regulations, and permits;
- Stop work to ensure compliance with safe work practices and applicable federal, state and local laws, rules, and regulations;
- Suspend, terminate, or place on probationary status Contractor in the event of a safety incident or failure to comply with these program requirements; and Evaluate Contractor safety performance at periodically during performance of the work and at conclusion of the work.

37-12.1 SAFETY INCIDENT REPORTING Contractor shall have a formal process implemented to report, investigate, record and follow-up incidents, injuries and occupational illnesses. This must include the determination of underlying causes and to minimize the potential for the future occurrence of similar events.

All incidents including, safety, environmental, process loss, property damage, injuries, near misses and occupational illnesses that occur within the project scope must be reported by Contractor's employees to their immediate supervisor as soon as possible and recorded on Contractor's Incident Report form.

All incidents, injuries, near misses and occupational illnesses shall be assessed within 24 hours for actual consequence and potential risk and corrective and preventative actions planned to reduce the likelihood and potential consequence of the event.

All high potential incidents and incidents that result in recordable injuries shall be formally investigated to determine causal and contributing factors and the appropriate corrective and preventative actions.

Incident investigations shall be led by an appropriately trained person and reviewed by Contractor, Aviation Project Manager, and Aviation Safety to verify the thoroughness of the investigations, completeness of findings and suitability of the recommended actions.

Contractor shall maintain records of all project related incidents, including all investigations and associated corrective and preventative actions.

Contractor is to immediately provide such information with complete copies of all documents, photographs, witness statements, another evidence related to any of the above to the Aviation Project Manager and Aviation Safety during the course of the incident, investigation, and/or upon request.

37-13.1 SAFETY MEETINGS Contractor should hold regularly scheduled safety meetings and require attendance by employees. Accident prevention should have a prominent place on the agenda, and the meeting records should state the specific items discussed. Each supervisor should hold safety and training meetings in their work area with their on-site staff and review specific procedures pertinent to the work activity.

Safety meetings provide an opportunity to point out hazardous conditions or unsafe work practices, and discuss safety and environmental rules and regulations, safe working procedures, analysis of accidents, and potential hazards.

Records and minutes of safety meetings are encouraged, including recording attendees and subjects covered.

37-14.1 GENERAL HOUSEKEEPING Good housekeeping shall be maintained during all operations and clean up should occur at the end of work each day.

Maintaining a clean work environment is the responsibility of the contractor. The Contractor is responsible for properly managing all waste generated in the course of the project in accordance with federal, state, and local regulations. Passageways, exits, and firefighting equipment must not be blocked or obstructed.

37-15.1 INDEMINIFICATION Contractor shall indemnify and hold harmless PHX from and against any and all losses, liabilities, damages, costs, fines, expenses, deficiencies, taxes and reasonable fees and expenses of counsel and agents, including any costs incurred in enforcing this contract, that PHX may sustain, suffer or incur arising from

- (i) Contractor's failure or alleged failure to comply, in whole or in part, with any of its obligations hereunder the contract;
- (ii) any loss of or damage to Contractor's equipment throughout the course of construction activity(ies);
- (iii) any violation of laws;
- (iv) any damage to any property of PHX caused by the maintenance or operation of any Contractor employees, direct or indirect;
- (v) any claims by any third person with respect to death, injury or property damage caused, in whole or in part, by the maintenance or operation of any Contractor employee, direct or indirect; and
- (vi) any claims resulting from or arising out of injury or death of any employee, agent of Contractor, direct or indirect, including claims alleging that PHX failed to provide a safe place to work.

METHOD OF MEASUREMENT

37-16.1 All items specified in this section are considered incidental to the project.

BASIS OF PAYMENT

37-17.1 All items specified in this section are to be considered as incidental to the Contract. No additional payment will be made for conformance to the specifications

38. ENVIRONMENTAL COMPLIANCE.

38-1.1 GENERAL. Contractor shall, at Contractor's own expense, comply with all present and subsequently enacted Environmental Laws, and any amendments thereto, affecting Contractor's occupation and use of the Premises.

38-2.1 DEFINITIONS

1. “*Environmental Laws*” means those laws promulgated for the protection of human health or the environment, including but not limited to, the following as the same are amended from time to time: the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 [CERCLA], 42 U.S.C. Sections 9601 et seq., as amended by the Superfund Amendment and Reauthorization Act [SARA]; the Solid Waste Disposal Act [SWDA], 42 U.S.C. Sections 6901 et seq., as amended by the Resource Conservation and Recovery Act [RCRA] including Subtitle I, Underground Storage Tanks; the Toxic Substances Control Act [TSCA], 15 U.S.C. Sections 2601 et seq.; the Public Health Service Act (Title XIV) [PHSA] a.k.a. the Safe Drinking Water Act [SDWA] and SDWA Amendments of 1996, 42 U.S.C. Sections 300f et seq.; the Federal Water Pollution Control Act [FWPCA], as amended by the Clean Water Act, 33 U.S.C. Sections 1251 et seq.; the Clean Air Act, 42 U.S.C. Sections 7401 et seq.; Title 49 of the Arizona Revised Statutes, including the Arizona Environmental Quality Act, A.R.S. Sections 49-101 et seq.; the Arizona Comprehensive Air Quality Act, A.R.S. Sections 49-401 et seq.; the Arizona Solid Waste Management Act, A.R.S. Section 49-701 et seq.; the Arizona Hazardous Waste Management Act, A.R.S. Sections 49-901 et seq.; the Arizona Underground Storage Tank Regulation Act, A.R.S. Sections 49-1001 et seq.; the Occupational Safety and Health Act of 1970 as amended, 29 U.S.C. Sections 651-678 and the regulations promulgated thereunder, and, any other laws, regulations and ordinances (whether enacted by local, state or federal government) now in effect or hereafter enacted, that provide for the regulation or protection of human health or the environment, including the ambient air, ground water, surface water, and land use, including substrata soils.
2. In this Contract, the term “*regulated substances*” means:
 - a. Those substances identified or listed as a hazardous substance, pollutant, hazardous material, and, petroleum, in CERCLA/SARA; the Hazardous Materials Transportation Act, 49 U.S.C. Sections 5101 et seq.; RCRA, Subtitle I, Regulation of Underground Storage Tanks, 42 U.S.C. Sections 6991 through 6991i; Clean Air Act, 42 U.S.C. Section 7412 et seq.; and in any rule or regulation adopted to implement said statutes.
 - b. Those substances identified or listed as a hazardous substance, pollutant, toxic pollutant, petroleum, or as a hazardous, special, or solid waste in the Arizona Environmental Quality Act, A.R.S. Sections 49-101 et seq., including but not limited to, the Water Quality Assurance Revolving Fund Act [WQARF], A.R.S. Sections 49-281 et seq.; the Arizona Comprehensive Air Quality Act, A.R.S. Sections 49-401 et seq.; the Arizona Solid Waste Management Act, A.R.S. Sections 49-701 et seq.; the Arizona Underground Storage Tank Regulation Act, A.R.S. Sections 49-1001 et seq.; A.R.S. Sections 49-851 through 49-868 pertaining to Management of Special Waste; the Arizona Hazardous Waste Management Act, A.R.S. Sections 49-921 et seq.; and in any rule or regulation adopted to implement said statutes.
 - c. All substances, materials and wastes that are, or that become, regulated, or that otherwise are classified as hazardous or toxic, under any Environmental Law during the term of this Contract.
3. The term “*release*” means any releasing, spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, disposing or dumping.
4. As used herein, the term “*Premises*” means Contractor’s leasehold and/or any part or portion of Phoenix Sky Harbor International Airport (PSHIA), Phoenix Deer Valley Airport (DVT), Phoenix Goodyear Airport (GYR) or City owned property where Contractor or its employees or agents causes to occur a release of a regulated substance.

5. As used herein, the term “*Contractor*” means every consultant, lessee, sublessee, licensee, permittee, concessionaire, tenant or other person, firm or corporation occupying or using the Premises pursuant to an agreement and includes Contractor’s heirs, personal representatives, successors-in-interest and assigns.

38-3.1. COMPLIANCE Contractor shall not cause or permit any regulated substance to be used, generated, manufactured, produced, stored, brought upon, or released on, or under the Premises, or transported to or from the Premises, by Contractor, its agents, employees, Contractor’s invitees or a third party in a manner that would constitute or result in a violation of any Environmental Law or that would give rise to liability under an Environmental Law.

38-3.1.1 Contractor may provide for the treatment of certain discharges regulated under the City of Phoenix pretreatment ordinances pursuant to Chapter 28 of the Phoenix City Code or such other ordinances as may be promulgated and the Federal Clean Water Act, 33 U.S.C. Section 1251 et seq.

Contractor shall indemnify, defend and hold harmless, on demand, City of Phoenix (“City”), its successors and assigns, its elected and appointed officials, employees, agents, boards, commissions, representatives, and attorneys, for, from and against any and all liabilities, obligations, damages, charges and expenses, penalties, suits, fines, claims, legal and investigation fees or costs, arising from or related to any claim or action for injury, liability, breach of warranty or representation, or damage to persons, the environment or Premises and any and all claims or actions brought by any person, entity or governmental body, alleging or arising in connection with contamination of, or adverse effects on, human health or the environment pursuant to any Environmental Law, the common law, or other statute, ordinance, rule, regulation, judgment or order of any governmental agency or judicial entity, which are incurred or assessed as a result, whether in part or in whole, of Contractor’s occupancy or use of the Premises during the term of this Contract or any previous contract or uses of the Premises by Contractor or its owners or affiliated entities, agents, employees, invitees, visitors or licensees. Regardless of the date of termination of this Contract, Contractor’s obligations and liabilities under this Section shall continue so long as City bears any liability or responsibility under the Environmental Laws arising from Contractor’s occupancy or use of the Premises during the term of this Contract. This indemnification of City by Contractor includes, without limitation, costs incurred in connection with any investigation of site conditions or any cleanup, remedial actions, removal or restoration work required or conducted by any federal, state or local governmental agency or political subdivision because of regulated substances caused by Contractor to be present on or under the Premises or present in the soil or ground water on or under the Premises or present in surface waters on or adjacent to the Premises.

38-3.1.2 Without limiting the foregoing, if the release by Contractor of any regulated substance on or under the Premises, or to the air, groundwater or surface waters on or adjacent to the Premises results in any contamination of the Premises, air, groundwater or surface waters, Contractor shall promptly take all actions at its sole cost and expense that are necessary to mitigate any immediate threat to human health or the environment. Contractor shall then undertake any further action necessary to return the contaminated site to the condition existing prior to the introduction by Contractor of any regulated substance; provided that City’s approval of such actions shall first be obtained. Contractor shall undertake such actions without regard to the potential legal liability of any other person; however, any remedial

activities by Contractor shall not be construed to impair Contractor's rights, if any, to seek contribution or indemnity from another person.

38-3.1.3 Contractor shall, at Contractor's own cost and expense, make all tests, reports, studies and provide all information to any appropriate governmental agency as may be required pursuant to the Environmental Laws pertaining to Contractor's occupancy or use of the Premises. This obligation includes but is not limited to any requirements for a site characterization, site assessment and/or remediation plan that may be necessary due to any actual or potential spills or discharges of regulated substances on, under or from the Premises, or to the air, groundwater or surface waters on or adjacent to the Premises during the term of this Contract. At no cost or expense to City, Contractor shall promptly provide all information requested by City pertaining to the applicability of the Environmental Laws to the Premises, to respond to any governmental investigation, or to respond to any claim of liability by third parties which is related to environmental contamination.

In addition, City shall have the right to inspect, within ten (10) days of Contractor's receipt of written request, and copy any and all records, test results, studies and/or other documentation, other than trade secrets and legally privileged documents, regarding environmental conditions relating to the use, storage, or treatment of regulated substances by Contractor on, under or from the Premises or to the air, groundwater or surface waters on or adjacent to the Premises.

38-3.1.4 Contractor shall notify the Aviation Director within twenty-four (24) hours upon learning of the following:

- a) Any correspondence or communication from any governmental agency regarding the application of Environmental Laws to the Premises or Contractor's occupancy or use of the Premises;
- b) Any change in Contractor's activities on the Premises that will change or have the potential to change Contractor's or City's obligations or liabilities under Environmental Laws;
- c) Any assertion of a claim or other occurrence for which Contractor may incur an obligation under this Section.

38-3.1.5 Contractor shall at its own expense obtain and comply with any permits or approvals that are required or may become required as result of any occupancy or use of the Premises by Contractor, its agents, employees, invitees and assigns.

38-3.1.6 Contractor shall insert the provisions of this Exhibit in any agreement or contract by which it grants a right or privilege to any person, firm or corporation under this Contract.

38-3.1.7 Contractor shall obtain and maintain compliance with any applicable financial responsibility requirements of federal, state and/or local law regarding the ownership or operation of any underground storage tank(s) or any device used for the treatment or storage of a regulated substance and present evidence thereof to the City, as may be applicable.

38-3.1.8 Contractor shall take reasonable precautions to prevent other persons not acting under Contractor's authority from conducting any activity that would result in the release of a regulated substance on, under or from the Premises or to the air, groundwater or surface waters on or adjacent to the Premises. Contractor shall also exercise due care with respect

to any regulated substance that may come to be located on the Premises as a result of the actions of third parties who are not under Contractor's authority.

38-3.1.9 Contractor shall make its best efforts to minimize its production of a waste stream that includes regulated substances, and shall minimize the storage of regulated substances on, in and around the Premises.

38-4.1. TERMINATION OF AGREEMENT Contractor's failure or the failure of its agents, employees, contractors, invitees or of a third party to comply with any of the requirements and obligations of this Exhibit or applicable Environmental Law shall constitute a material breach of this Contract and shall permit the City to pursue the following remedies, in addition to all other rights and remedies provided by law or otherwise provided for in this Contract, to which the City may resort cumulatively, or in the alternative.

38-4.1.1 The City of Phoenix may, at the City's election, keep this Contract in effect and enforce all of its rights and remedies under the Contract, including (1) the right to recover rent and other sums as they become due by appropriate legal action and/or (2) the right, upon ten (10) day's written notice to Contractor, to make payments required of Contractor or perform Contractor's obligations and be reimbursed by Contractor for the cost thereof, unless such payment is made or obligation performed by Contractor within such ten (10) day period.

38-4.1.2 The City of Phoenix may, at the City's election, terminate this Contract upon written notice to Contractor. Upon the City's termination, Contractor shall immediately pay to the City an amount equal to all accrued but unpaid rents plus interest thereon calculated from the date the rent is past due at a rate equal to: (1) eighteen percent (18%) per annum or (2) the maximum interest rate permitted by state law, whichever is greater.

38-4.1.3 Notwithstanding any other provision in this Contract to the contrary, the City shall have the right of "self-help" or similar remedy in order to minimize any damages, expenses, penalties and related fees or costs, arising from or related to a violation of Environmental Laws on, under or from the Premises or in surface waters on or adjacent to the Premises, without waiving any of its rights under this Contract.

38-4.1.4 The exercise by the City of any of its rights under Section C of this Exhibit shall not release Contractor from any obligation it would otherwise have under this Exhibit.

38-4.1.5 The covenants of this Exhibit shall survive the termination of this Contract.

38-5.1 AZPDES STORMWATER GENERAL PERMIT COMPLIANCE SUPPLEMENT Contractor shall also comply with the AZPDES Stormwater General Permit Compliance Supplement to this Exhibit as if the Supplement is fully set forth herein.

With the exception of discharges on Indian Country, stormwater discharges in Arizona are regulated by the Arizona Department of Environmental Quality through the Arizona Pollutant Discharge Elimination System (AZPDES) program. An AZPDES permit is required for any point source discharge of pollutants to waters of the United States. Because stormwater runoff can transport pollutants to either a municipal separate storm sewer system (MS4) or to waters of the United States, AZPDES permits are required for stormwater discharges.

The City of Phoenix (the “City”) and its Contractors are required to obtain AZPDES permit coverage to the extent that stormwater is discharged from the Premises. Coverage under the AZPDES General Permit for Discharges from Construction Activities to Waters of the United States (AZG2008-001) (“AZPDES Construction General Permit”) is required for stormwater discharges generated by construction activities. Coverage under the AZPDES General Permit for Stormwater Discharges Associated with Industrial Activity from Non-Mining Facilities to Waters of the United States (AZMSG2010-38) (“AZPDES Multi-Sector General Permit”) is required for stormwater discharges generated by facilities and operations engaged in certain industrial activities. Among these industries are those engaged in “air transportation” and associated activities.

The City has obtained coverage under the AZPDES Multi-Sector General Permit for its “air transportation” facilities at Phoenix Sky Harbor International Airport, Phoenix Deer Valley Airport and Phoenix Goodyear Airport (collectively hereinafter referred to as the “Airports”). The City has adopted a Stormwater Quality Protection ordinance, Phoenix City Code Ch. 32C, and has in place an “Aviation Department Stormwater Enforcement Procedures and Civil Penalty Policy” (“Aviation Stormwater Policy”), both of which were developed to comply with federal and local laws governing stormwater pollution.

38-5.1.2 COMPLIANCE GENERALLY The City adopted the Aviation Stormwater Policy to achieve compliance with the AZPDES program requirements by the Aviation Department, its contractors and permittees. Contractor is subject to the policy as a condition of its activities, operations, and location at the Airports. The City shall have the right to monitor and require compliance with the Aviation Stormwater Policy.

Contractor agrees to comply with the Aviation Stormwater Policy and to implement at its sole expense, unless otherwise agreed to in writing between City and Contractor, those requirements of the Airports’ Stormwater Pollution Prevention Plans (SWPPP) and City ordinances that pertain to its operations and activities on the Premises at the Airports. Contractor warrants that it will use its best efforts to meet all deadlines that are established by statute, regulation, ordinance, and the Aviation Stormwater Policy, or that are agreed to by the parties. Contractor acknowledges that time is of the essence in the implementation of all City Permit requirements.

Full compliance with the AZPDES Permit Program as contained in 18 A.A.C. 9, Art. 9; Chapter 32(C) of the Phoenix City Code; and the Aviation Stormwater Policy is a material condition of this Contract, and for any breach thereof which exposes City to civil or criminal fine, penalty, sanction or remediation cost by any governmental entity, City may terminate this Contract. This remedy is in addition to any other remedies available to the City.

38-5.1.3 AZPDES CONSTRUCTION GENERAL PERMIT If Contractor elects to perform construction activities at the Airports, Contractor is required, prior to commencing those construction activities, to obtain stormwater discharge authorization from ADEQ under an AZPDES Construction General Permit. Contractor will obtain that authorization by preparing a SWPPP and filing for AZPDES Construction General Permit coverage in coordination with the City’s project manager. The City will consult with and assist Contractor with regard to the filing for AZPDES Construction General Permit coverage as time and personnel allow. Contractor will also work with the City’s project manager to develop pollution controls (e.g., Best Management Practices, Control Measures, schedules and procedures) for the SWPPP. Contractor is solely responsible for implementation of the pollution controls, all related costs

and compliance with its AZPDES Construction General Permit obligations.

38-5.1.4 AZPDES MULTI-SECTOR GENERAL PERMIT Contractor is required, prior to commencing its operations and activities at the Airports, to obtain stormwater discharge authorization from the ADEQ under an AZPDES Multi-Sector General Permit. Contractor will obtain that authorization as a "Co-Permittee" with the City. As a Co-Permittee, the Contractor agrees to:

- Provide the City with a copy of Contractor's written Authorization to Discharge to the extent Contractor has received such from the Arizona Department of Environmental Quality; and
- Implement the Airports' SWPPP, including Best Management Practices, Control Measures, schedules, and procedures, as applicable to the Contractor's operations.

In connection with its coverage under the AZPDES Multi-Sector General Permit, the City has developed a SWPPP for the Airports to minimize the contact of storm and other precipitation event water with "significant materials" (as defined in the Regulations and City Ordinances) generated, stored, handled or otherwise used on Airport facilities. The City shall provide a copy of the SWPPP, including Best Management Practices, Control Measures, schedules, and procedures to Contractor, and Contractor shall implement that portion of the SWPPP applicable to its activities.

The City agrees that, to the extent allowed by law, Contractor shall have the right to be removed as a Co-Permittee from coverage under the AZPDES Multi-Sector General Permit should its Contract be canceled or terminated for other reasons, or due to Contractor's relocation, noncompliance with the AZPDES Multi-Sector General Permit requirements or Contractor's exercise of choice. In no event shall Contractor be relieved of its obligation to comply with the requirements of the AZPDES permit program with regard to its occupation and use of the Premises at the Airports, nor shall Contractor be excused from any obligations or indemnifications incurred and owed to City prior to Contractor's removal as a Co-Permittee that result from a failure of Contractor to fulfill an obligation of a Co-Permittee.

38-5.1.5 POLLUTION CONTROLS City reserves the right to impose upon Contractor any Best Management Practices, Control Measures, schedules, and procedures, other action necessary to ensure City's ability to comply with its AZPDES program requirements or applicable City ordinances; however, except in "extreme emergency" conditions, Contractor shall have ten (10) days from date of receipt of written notice imposing such pollution control measures or other requirements to notify City in writing if it objects to any action it is being directed to undertake. If Contractor does not provide the specified timely notice, it will be deemed to have assented to implementation of the pollution control measures or other requirements. If Contractor provides City with timely written notice of its objections, the parties agree to negotiate a prompt resolution of their differences. Contractor warrants that it will not serve a written notice of objections for purposes of delay or avoiding compliance.

As used herein, "*extreme emergency conditions*" means:

- a) Conditions that impose an immediate impact on waters of the United States (e.g., Salt River) resulting from an emergency situation such as fire, spill, release or explosion, such that the facility responsible for the release must immediately begin appropriate response activities independently of City's direction or oversight;

- b) An emergency such that a facility has to close because of a catastrophic event, where the facility can extend the ten (10) day notice period, but must implement pollution control measures before it reopens;
- c) A collapse of the storm sewer system or other event which forecloses the Airports and/or City from performing its obligations under the City Permit due to lack of capacity.

38-5.1.5 COVENANT OF GOOD FAITH City and Contractor covenant to act in good faith to implement any AZPDES program requirements imposed on them pursuant to 18 A.A.C. 9, Art. 9. City and Contractor acknowledge that close cooperation will be necessary to ensure compliance with any AZPDES Multi-Sector General Permit requirements to promote safety and minimize costs, and each party agrees to a candid exchange of information necessary to coordinate a stormwater management and monitoring plan.

38-5.1.6 INDEMNIFICATION The covenants of insurance and indemnification in favor of City imposed by other provisions of the Contract shall extend to, and are incorporated into, the provisions of this Supplement to Exhibit 3.

38-5.1.5 COVENANT OF GOOD FAITH City and Contractor covenant to act in good faith to implement any AZPDES program requirements imposed on them pursuant to 18 A.A.C. 9, Art. 9. City and Contractor acknowledge that close cooperation will be necessary to ensure compliance with any AZPDES Multi-Sector General Permit requirements to promote safety and minimize costs, and each party agrees to a candid exchange of information necessary to coordinate a stormwater management and monitoring plan.

38-6.1 DISPOSAL OF SURPLUS MATERIAL All surplus and/or waste material must be disposed of off the Airport property at the Contractor's discretion, subject to the following conditions:

If the City landfills are used, the Contractor will pay the normal dumping fee.

If private property within the City limits is used, the Contractor will obtain written permission from the property owner and deliver a copy of this agreement to the City prior to any hauling dumping. If the surplus material is disposed of outside City limits, the Contractor will comply with all applicable laws/ordinances of the agency concerned and be responsible for all costs incurred.

38-7.1 ASBESTOS/LEAD BASED PAINT IDENTIFICATION AND REMEDIATION Asbestos and lead based paint identification and/or remediation will be performed by the City of Phoenix unless otherwise indicated by an authorized City of Phoenix representative. Prior to starting Work, the Contractor should obtain a copy of the asbestos and lead based paint survey of the affected area, and contact the City of Phoenix Aviation Environmental Division Manager prior to the disturbance of any building materials that contain or potentially contain asbestos or lead based paint. Building materials that could potentially contain asbestos include any materials that are not wood, metal or glass. Any building materials that will be disturbed during renovation or demolition projects that have not been previously inspected will be inspected by an Asbestos Hazard Emergency Response Act (AHERA) certified building inspector approved by the City of Phoenix. Any asbestos and lead based paint remediation activities will be conducted by contractors licensed to perform asbestos and lead based paint remedial

activities and will be approved by the City of Phoenix. All asbestos and lead based paint inspection and remedial work will be performed in compliance with all applicable local, state and federal regulations regarding asbestos, lead based paint and general construction.

METHOD OF MEASUREMENT

38-8.1 All items specified in this section are considered incidental to the project.

BASIS OF PAYMENT

38-9.1 All items specified in this section are to be considered as incidental to the Contract. No additional payment will be made for conformance to the specifications

- 39. TEMPORARY PAVEMENT MARKINGS** This item shall consist of the preparation and painting of temporary numbers, markings, and stripes on the surface of runways, taxiways, and aprons, in accordance with these specifications and at the locations shown on the plans, or as directed by PHX Operations Staff.

Temporary pavement markings shall be applied following procedures and rates for permanent pavement marking application. Temporary paint shall include reflective media.

Measurement and payment for Temporary Pavement Markings shall be made as described in Civil Technical Specification Item P-620 in accordance with the specifications and accepted by the RPR. This price shall be full compensation for all labor, materials, and equipment necessary to complete the item.

- 40. CONSTRUCT TEMPORARY ASPHALT PAVEMENT TRANSITION** This item shall consist of the construction of temporary asphalt pavement sections necessary to maintain continuous service road access throughout the duration of construction of the project.

The thicknesses of the various pavement courses for the temporary asphalt pavement transition shall be per Structural Section No. 2 on Sheet CS-301 of the construction plans. The materials for the temporary asphalt pavement sections may be constructed using Asphaltic Concrete per MAG 336 and City Supplements. The aggregate base course may be constructed per MAG 310.

Measurement and payment for this item shall be by the square yard, based on actual field measurement of the area covered. This price shall be full compensation for the item complete, including all incidentals.

Payment will be made under:

Item SP-40.1 Construct Temporary Asphalt Pavement Transition – per square yard

- 41. CUT AND CAP EXISTING MONITORING WELL** This item shall consist of the removal of concrete ring and valve box frame and cover and cutting and capping PVC pipe associated with existing monitoring well infrastructure no longer in use. The contractor performing this work shall meet the qualification requirements established by Arizona Department of Water Resources as stated in Form 55-38 (<http://www.azwater.gov>) and all other required

stipulations.

The Contractor shall remove and properly dispose of the existing frame cover and concrete ring. The existing PVC pipe shall be cut down to two (2) feet below the top of the subgrade and capped with an appropriate permanent cap and seal. The excavated area necessary to expose and cut the pipe shall be backfilled and compacted in accordance with these specifications.

Measurement and payment for this item shall be per each; removal of frame, cover and concrete ring, cut and cap of existing PVC pipe below subgrade, and backfill. This price shall be full compensation for the item complete, including all labor, parts, equipment, and incidentals.

Payment will be made under:

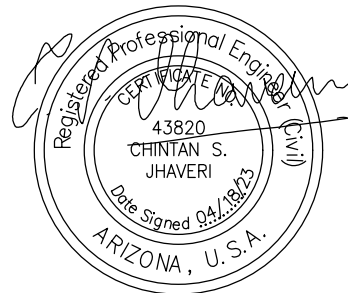
Item SP-41.1 Cut and Cap Existing Monitoring Well – per each

END OF TECHNICAL SPECIAL PROVISION SPECIFICATIONS

SECTION III-C
CIVIL TECHNICAL SPECIFICATIONS

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Item C-100 Contractor Quality Control Program (CQCP)

100-1 General. Quality is more than test results. Quality is the combination of proper materials, testing, workmanship, equipment, inspection, and documentation of the project. Establishing and maintaining a culture of quality is key to achieving a quality project. The Contractor shall establish, provide, and maintain an effective Contractor Quality Control Program (CQCP) that details the methods and procedures that will be taken to assure that all materials and completed construction required by this contract conform to contract plans, technical specifications and other requirements, whether manufactured by the Contractor, or procured from subcontractors or vendors. Although guidelines are established and certain minimum requirements are specified here and elsewhere in the contract technical specifications, the Contractor shall assume full responsibility for accomplishing the stated purpose.

The Contractor shall establish a CQCP that will:

- a. Provide qualified personnel to develop and implement the CQCP.
- b. Provide for the production of acceptable quality materials.
- c. Provide sufficient information to assure that the specification requirements can be met.
- d. Document the CQCP process.

The Contractor shall not begin any construction or production of materials to be incorporated into the completed work until the CQCP has been reviewed and approved by the Resident Project Representative (RPR). No partial payment will be made for materials subject to specific quality control (QC) requirements until the CQCP has been reviewed and approved.

The QC requirements contained in this section and elsewhere in the contract technical specifications are in addition to and separate from the quality assurance (QA) testing requirements. QA testing requirements are the responsibility of the RPR or Contractor as specified in the specifications.

A Quality Control (QC)/Quality Assurance (QA) workshop with the Engineer, Resident Project Representative (RPR), Contractor, subcontractors, testing laboratories, and Owner's representative must be held prior to start of construction. The QC/QA workshop will be facilitated by the Contractor. The Contractor shall coordinate with the Airport and the RPR on time and location of the QC/QA workshop. Items to be addressed, at a minimum, will include:

- a. Review of the CQCP including submittals, QC Testing, Action & Suspension Limits for Production, Corrective Action Plans, Distribution of QC reports, and Control Charts.
- b. Discussion of the QA program.
- c. Discussion of the QC and QA Organization and authority including coordination and information exchange between QC and QA.
- d. Establish regular meetings to discuss control of materials, methods and testing.
- e. Establishment of the overall QC culture.

100-2 Description of program.

a. General description. The Contractor shall establish a CQCP to perform QC inspection and testing of all items of work required by the technical specifications, including those performed by subcontractors. The CQCP shall ensure conformance to applicable specifications and plans with respect to materials, off-site fabrication, workmanship, construction, finish, and functional performance. The CQCP shall be effective for control of all construction work performed under this Contract and shall specifically include surveillance and tests required by the technical specifications, in addition to other requirements of this section and any other activities deemed necessary by the Contractor to establish an effective level of QC.

b. Contractor Quality Control Program (CQCP). The Contractor shall describe the CQCP in a written document that shall be reviewed and approved by the RPR prior to the start of any production, construction, or off-site fabrication. The written CQCP shall be submitted to the RPR for review and approval at least 21 calendar days before the CQCP Workshop. The Contractor's CQCP and QC testing laboratory must be approved in writing by the RPR prior to the Notice to Proceed (NTP).

The CQCP shall be organized to address, as a minimum, the following:

1. QC organization and resumes of key staff
2. Project progress schedule
3. Submittals schedule
4. Inspection requirements
5. QC testing plan
6. Documentation of QC activities and distribution of QC reports
7. Requirements for corrective action when QC and/or QA acceptance criteria are not met
8. Material quality and construction means and methods. Address all elements applicable to the project that affect the quality of the pavement structure including subgrade, subbase, base, and surface course. Some elements that must be addressed include, but is not limited to mix design, aggregate grading, stockpile management, mixing and transporting, placing and finishing, quality control testing and inspection, smoothness, laydown plan, equipment, and temperature management plan.

The Contractor must add any additional elements to the CQCP that is necessary to adequately control all production and/or construction processes required by this contract.

100-3 CQCP organization. The CQCP shall be implemented by the establishment of a QC organization. An organizational chart shall be developed to show all QC personnel, their authority, and how these personnel integrate with other management/production and construction functions and personnel.

The organizational chart shall identify all QC staff by name and function, and shall indicate the total staff required to implement all elements of the CQCP, including inspection and testing for each item of work. If necessary, different technicians can be used for specific inspection and testing functions for different items of work. If an outside organization or independent testing laboratory is used for implementation of all or part of the CQCP, the personnel assigned shall be subject to the qualification requirements of paragraphs 100-03a and 100-03b. The

organizational chart shall indicate which personnel are Contractor employees and which are provided by an outside organization.

The QC organization shall, as a minimum, consist of the following personnel:

a. Program Administrator. The Contractor Quality Control Program Administrator (CQCPA) must be a full-time employee of the Contractor, or a consultant engaged by the Contractor. The CQCPA must have a minimum of five (5) years of experience in QC pavement construction with prior QC experience on a project of comparable size and scope as the contract.

Included in the five (5) years of paving/QC experience, the CQCPA must meet at least one of the following requirements:

- (1) Professional Engineer with one (1) year of airport paving experience.
- (2) Engineer-in-training with two (2) years of airport paving experience.
- (3) National Institute for Certification in Engineering Technologies (NICET) Civil Engineering Technology Level IV with three (3) years of airport paving experience.
- (4) An individual with four (4) years of airport paving experience, with a Bachelor of Science Degree in Civil Engineering, Civil Engineering Technology or Construction.

The CQCPA must have full authority to institute any and all actions necessary for the successful implementation of the CQCP to ensure compliance with the contract plans and technical specifications. The CQCPA authority must include the ability to immediately stop production until materials and/or processes are in compliance with contract specifications. The CQCPA must report directly to a principal officer of the construction firm. The CQCPA may supervise the Quality Control Program on more than one project provided that person can be at the job site within two (2) hours after being notified of a problem.

b. QC technicians. A sufficient number of QC technicians necessary to adequately implement the CQCP must be provided. These personnel must be either Engineers, engineering technicians, or experienced craftsman with qualifications in the appropriate field equivalent to NICET Level II in Civil Engineering Technology or higher, and shall have a minimum of two (2) years of experience in their area of expertise.

The QC technicians must report directly to the CQCPA and shall perform the following functions:

- (1) Inspection of all materials, construction, plant, and equipment for conformance to the technical specifications, and as required by paragraph 100-6.
- (2) Performance of all QC tests as required by the technical specifications and paragraph 100-8.
- (3) Performance of tests for the RPR when required by the technical specifications.

Certification at an equivalent level of qualification and experience by a state or nationally recognized organization will be acceptable in lieu of NICET certification.

c. Staffing levels. The Contractor shall provide sufficient qualified QC personnel to monitor each work activity at all times. Where material is being produced in a plant for incorporation into the work, separate plant and field technicians shall be provided at each plant and field placement location. The scheduling and coordinating of all inspection and testing must match the type and pace of work activity. The CQCP shall state where different technicians will be required for different work elements.

100-4 Project progress schedule. Critical QC activities must be shown on the project schedule as required by Section 80, paragraph 80-03, *Execution and Progress*.

100-5 Submittals schedule. The Contractor shall submit a detailed listing of all submittals (for example, mix designs, material certifications) and shop drawings required by the technical specifications. The listing can be developed in a spreadsheet format and shall include as a minimum:

- a. Specification item number
- b. Item description
- c. Description of submittal
- d. Specification paragraph requiring submittal
- e. Scheduled date of submittal

100-6 Inspection requirements. QC inspection functions shall be organized to provide inspections for all definable features of work, as detailed below. All inspections shall be documented by the Contractor as specified by paragraph 100-9.

Inspections shall be performed as needed to ensure continuing compliance with contract requirements until completion of the particular feature of work. Inspections shall include the following minimum requirements:

a. During plant operation for material production, QC test results and periodic inspections shall be used to ensure the quality of aggregates and other mix components, and to adjust and control mix proportioning to meet the approved mix design and other requirements of the technical specifications. All equipment used in proportioning and mixing shall be inspected to ensure its proper operating condition. The CQCP shall detail how these and other QC functions will be accomplished and used.

b. During field operations, QC test results and periodic inspections shall be used to ensure the quality of all materials and workmanship. All equipment used in placing, finishing, and compacting shall be inspected to ensure its proper operating condition and to ensure that all such operations are in conformance to the technical specifications and are within the plan dimensions, lines, grades, and tolerances specified. The CQCP shall document how these and other QC functions will be accomplished and used.

100-7 Contractor QC testing facility.

a. For projects that include Item P-401, Item P-403, and Item P-404, the Contractor shall ensure facilities, including all necessary equipment, materials, and current reference standards, are provided that meet requirements in the following paragraphs of ASTM D3666, *Standard Specification for Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials*:

- 8.1.3 Equipment Calibration and Checks;
- 8.1.9 Equipment Calibration, Standardization, and Check Records;
- 8.1.12 Test Methods and Procedures

b. For projects that include P-501, the Contractor shall ensure facilities, including all necessary equipment, materials, and current reference standards, are provided that meet requirements in the following paragraphs of ASTM C1077, *Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation*:

- 7 Test Methods and Procedures
- 8 Facilities, Equipment, and Supplemental Procedures

100-8 QC testing plan. As a part of the overall CQCP, the Contractor shall implement a QC testing plan, as required by the technical specifications. The testing plan shall include the minimum tests and test frequencies required by each technical specification Item, as well as any additional QC tests that the Contractor deems necessary to adequately control production and/or construction processes.

The QC testing plan can be developed in a spreadsheet fashion and shall, as a minimum, include the following:

- a. Specification item number (e.g., P-401)
- b. Item description (e.g., Hot Mix Asphalt Pavements)
- c. Test type (e.g., gradation, grade, asphalt content)
- d. Test standard (e.g., ASTM or American Association of State Highway and Transportation Officials (AASHTO) test number, as applicable)
- e. Test frequency (e.g., as required by technical specifications or minimum frequency when requirements are not stated)
- f. Responsibility (e.g., plant technician)
- g. Control requirements (e.g., target, permissible deviations)

The QC testing plan shall contain a statistically-based procedure of random sampling for acquiring test samples in accordance with ASTM D3665. The RPR shall be provided the opportunity to witness QC sampling and testing.

All QC test results shall be documented by the Contractor as required by paragraph 100-9.

100-9 Documentation. The Contractor shall maintain current QC records of all inspections and tests performed. These records shall include factual evidence that the required QC inspections or tests have been performed, including type and number of inspections or tests involved; results of inspections or tests; nature of defects, deviations, causes for rejection, etc.; proposed remedial action; and corrective actions taken.

These records must cover both conforming and defective or deficient features, and must include a statement that all supplies and materials incorporated in the work are in full compliance with the terms of the contract. Legible copies of these records shall be furnished to the RPR daily. The records shall cover all work placed subsequent to the previously furnished records and shall be verified and signed by the CQCPA.

Contractor QC records required for the contract shall include, but are not necessarily limited to, the following records:

a. Daily inspection reports. Each Contractor QC technician shall maintain a daily log of all inspections performed for both Contractor and subcontractor operations. These technician's daily reports shall provide factual evidence that continuous QC inspections have been performed and shall, as a minimum, include the following:

- (1) Technical specification item number and description
- (2) Compliance with approved submittals
- (3) Proper storage of materials and equipment
- (4) Proper operation of all equipment

- (5) Adherence to plans and technical specifications
- (6) Summary of any necessary corrective actions
- (7) Safety inspection.
- (8) Photographs and/or video

The daily inspection reports shall identify all QC inspections and QC tests conducted, results of inspections, location and nature of defects found, causes for rejection, and remedial or corrective actions taken or proposed.

The daily inspection reports shall be signed by the responsible QC technician and the CQCPA. The RPR shall be provided at least one copy of each daily inspection report on the work day following the day of record. When QC inspection and test results are recorded and transmitted electronically, the results must be archived.

b. Daily test reports. The Contractor shall be responsible for establishing a system that will record all QC test results. Daily test reports shall document the following information:

- (1) Technical specification item number and description
- (2) Test designation
- (3) Location
- (4) Date of test
- (5) Control requirements
- (6) Test results
- (7) Causes for rejection
- (8) Recommended remedial actions
- (9) Retests

Test results from each day's work period shall be submitted to the RPR prior to the start of the next day's work period. When required by the technical specifications, the Contractor shall maintain statistical QC charts. When QC daily test results are recorded and transmitted electronically, the results must be archived.

100-10 Corrective action requirements. The CQCP shall indicate the appropriate action to be taken when a process is deemed, or believed, to be out of control (out of tolerance) and detail what action will be taken to bring the process into control. The requirements for corrective action shall include both general requirements for operation of the CQCP as a whole, and for individual items of work contained in the technical specifications.

The CQCP shall detail how the results of QC inspections and tests will be used for determining the need for corrective action and shall contain clear rules to gauge when a process is out of control and the type of correction to be taken to regain process control.

When applicable or required by the technical specifications, the Contractor shall establish and use statistical QC charts for individual QC tests. The requirements for corrective action shall be linked to the control charts.

100-11 Inspection and/or observations by the RPR. All items of material and equipment are subject to inspection and/or observation by the RPR at the point of production, manufacture or shipment to determine if the Contractor, producer, manufacturer or shipper maintains an adequate QC system in conformance with the requirements detailed here and the applicable technical specifications and plans. In addition, all items of materials, equipment and work in place shall be subject to inspection and/or observation by the RPR at the site for the same purpose.

Inspection and/or observations by the RPR does not relieve the Contractor of performing QC inspections of either on-site or off-site Contractor's or subcontractor's work.

100-12 Noncompliance.

a. The Resident Project Representative (RPR) will provide written notice to the Contractor of any noncompliance with their CQCP. After receipt of such notice, the Contractor must take corrective action.

b. When QC activities do not comply with either the CQCP or the contract provisions or when the Contractor fails to properly operate and maintain an effective CQCP, and no effective corrective actions have been taken after notification of non-compliance, the RPR will recommend the Owner take the following actions:

(1) Order the Contractor to replace ineffective or unqualified QC personnel or subcontractors and/or

(2) Order the Contractor to stop operations until appropriate corrective actions are taken.

METHOD OF MEASUREMENT

100-13 Basis of measurement and payment. Contractor Quality Control Program (CQCP) is for the personnel, tests, facilities and documentation required to implement the CQCP. The CQCP will be paid as a lump sum with the following schedule of partial payments:

- a. With first pay request, 25% with approval of CQCP and completion of the Quality Control (QC)/Quality Assurance (QA) workshop.
- b. When 25% or more of the original contract is earned, an additional 25%.
- c. When 50% or more of the original contract is earned, an additional 20%.
- d. When 75% or more of the original contract is earned, an additional 20%
- e. After final inspection and acceptance of project, the final 10%.

BASIS OF PAYMENT

100-14 Payment will be made under:

Item C-100 Contractor Quality Control Program (CQCP)

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.

National Institute for Certification in Engineering Technologies (NICET)

ASTM International (ASTM)

ASTM C1077	Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation
ASTM D3665	Standard Practice for Random Sampling of Construction Materials
ASTM D3666	Standard Specification for Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials

END OF ITEM C-100

Item C-102 Temporary Air and Water Pollution, Soil Erosion, and Siltation Control

DESCRIPTION

102-1. This item shall consist of temporary control measures as shown on the plans or as ordered by the Resident Project Representative (RPR) during the life of a contract to control pollution of air and water, soil erosion, and siltation through the use of silt fences, berms, dikes, dams, sediment basins, fiber mats, gravel, mulches, grasses, slope drains, and other erosion control devices or methods.

Temporary erosion control shall be in accordance with the approved erosion control plan; the approved Construction Safety and Phasing Plan (CSPP) and AC 150/5370-2, *Operational Safety on Airports During Construction*. The temporary erosion control measures contained herein shall be coordinated with the permanent erosion control measures specified as part of this contract to the extent practical to assure economical, effective, and continuous erosion control throughout the construction period.

Temporary control may include work outside the construction limits such as borrow pit operations, equipment and material storage sites, waste areas, and temporary plant sites.

Temporary control measures shall be designed, installed and maintained to minimize the creation of wildlife attractants that have the potential to attract hazardous wildlife on or near public-use airports.

MATERIALS

102-2.1 Grass. Grass that will not compete with the grasses sown later for permanent cover per Item T-901 shall be a quick-growing species (such as ryegrass, Italian ryegrass, or cereal grasses) suitable to the area providing a temporary cover. Selected grass species shall not create a wildlife attractant.

102-2.2 Mulches. Mulches may be hay, straw, fiber mats, netting, bark, wood chips, or other suitable material reasonably clean and free of noxious weeds and deleterious materials per Item T-908. Mulches shall not create a wildlife attractant.

102-2.3 Fertilizer. Fertilizer shall be a standard commercial grade and shall conform to all federal and state regulations and to the standards of the Association of Official Agricultural Chemists.

102-2.4 Slope drains. Slope drains may be constructed of pipe, fiber mats, rubble, concrete, asphalt, or other materials that will adequately control erosion.

102-2.5 Silt fence. Silt fence shall consist of polymeric filaments which are formed into a stable network such that filaments retain their relative positions. Synthetic filter fabric shall contain ultraviolet ray inhibitors and stabilizers to provide a minimum of six months of expected usable construction life. Silt fence shall meet the requirements of ASTM D6461.

102-2.6 Other. All other materials shall meet commercial grade standards and shall be approved by the RPR before being incorporated into the project.

CONSTRUCTION REQUIREMENTS

102-3.1 General. In the event of conflict between these requirements and pollution control laws, rules, or regulations of other federal, state, or local agencies, the more restrictive laws, rules, or regulations shall apply.

The RPR shall be responsible for assuring compliance to the extent that construction practices, construction operations, and construction work are involved.

102-3.2 Schedule. Prior to the start of construction, the Contractor shall submit schedules in accordance with the approved Construction Safety and Phasing Plan (CSPP) and the plans for accomplishment of temporary and permanent erosion control work for clearing and grubbing; grading; construction; paving; and structures at watercourses. The Contractor shall also submit a proposed method of erosion and dust control on haul roads and borrow pits and a plan for disposal of waste materials. Work shall not be started until the erosion control schedules and methods of operation for the applicable construction have been accepted by the RPR.

102-3.3 Construction details. The Contractor will be required to incorporate all permanent erosion control features into the project at the earliest practicable time as outlined in the plans and approved CSPP. Except where future construction operations will damage slopes, the Contractor shall perform the permanent seeding and mulching and other specified slope protection work in stages, as soon as substantial areas of exposed slopes can be made available. Temporary erosion and pollution control measures will be used to correct conditions that develop during construction that were not foreseen during the design stage; that are needed prior to installation of permanent control features; or that are needed temporarily to control erosion that develops during normal construction practices, but are not associated with permanent control features on the project.

Where erosion may be a problem, schedule and perform clearing and grubbing operations so that grading operations and permanent erosion control features can follow immediately if project conditions permit. Temporary erosion control measures are required if permanent measures cannot immediately follow grading operations. The RPR shall limit the area of clearing and grubbing, excavation, borrow, and embankment operations in progress, commensurate with the Contractor's capability and progress in keeping the finish grading, mulching, seeding, and other such permanent control measures current with the accepted schedule. If seasonal limitations make such coordination unrealistic, temporary erosion control measures shall be taken immediately to the extent feasible and justified as directed by the RPR.

The Contractor shall provide immediate permanent or temporary pollution control measures to minimize contamination of adjacent streams or other watercourses, lakes, ponds, or other areas of water impoundment as directed by the RPR. If temporary erosion and pollution control measures are required due to the Contractor's negligence, carelessness, or failure to install permanent controls as a part of the work as scheduled or directed by the RPR, the work shall be performed by the Contractor and the cost shall be incidental to this item.

The RPR may increase or decrease the area of erodible earth material that can be exposed at any time based on an analysis of project conditions.

The erosion control features installed by the Contractor shall be maintained by the Contractor during the construction period.

Provide temporary structures whenever construction equipment must cross watercourses at frequent intervals. Pollutants such as fuels, lubricants, bitumen, raw sewage, wash water from concrete mixing operations, and other harmful materials shall not be discharged into any waterways, impoundments or into natural or manmade channels.

102-3.4 Installation, maintenance and removal of silt fence. Silt fences shall extend a minimum of 16 inches and a maximum of 34 inches above the ground surface. Posts shall be set no more than 10 feet on center. Filter fabric shall be cut from a continuous roll to the length required minimizing joints where possible. When joints are necessary, the fabric shall be spliced at a support post with a minimum 12-inch overlap and securely sealed. A trench shall be excavated approximately 4 inches deep by 4 inches wide on the upslope side of the silt fence. The trench shall be backfilled and the soil compacted over the silt fence fabric. The Contractor shall remove and dispose of silt that accumulates during construction and prior to establishment of permanent erosion control. The fence shall be maintained in good working condition until permanent erosion control is established. Silt fence shall be removed upon approval of the RPR.

BASIS OF PAYMENT

102-4.1 The Contractor's participation in the preparation of the Storm Water Pollution Prevention Plan (SWPPP), the implementation of the SWPPP, and the modification of the SWPPP as necessary for compliance with AZPDES General Permit No. AZG2019-001 for the duration of this construction project is included in these contract documents. Payment shall be made monthly with equal payment during the entire construction period with any retention required by the terms and conditions of the construction contract to be paid after filing of the Notice of Termination (NOT).

No separate measurement or direct payment will be made for preparing the Notice of Intent (NOI), the Notice of Termination (NOT), Inspection and Maintenance Reports, or other documentation required to perform the work, the cost being considered as included in the allowance.

Payment will be made under:

Item C-102-4.1	Stormwater Pollution Prevention Plan – per lump sum
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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.

Advisory Circulars (AC)

AC 150/5200-33 *Hazardous Wildlife Attractants on or Near Airports*

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

ASTM International (ASTM)

ASTM D6461 *Standard Specification for Silt Fence Materials*

United States Department of Agriculture (USDA)

FAA/USDA Wildlife Hazard Management at Airports, A Manual for Airport Personnel

END OF ITEM C-102

Item C-105 Mobilization

105-1 Description. This item of work shall consist of, but is not limited to, work and operations necessary for the movement of personnel, equipment, material and supplies to and from the project site for work on the project except as provided in the contract as separate pay items.

105-2 Mobilization limit. Mobilization shall be limited to 4 percent of the total project cost.

105-3 Posted notices. Prior to commencement of construction activities, the Contractor must post the following documents in a prominent and accessible place where they may be easily viewed by all employees of the prime Contractor and by all employees of subcontractors engaged by the prime Contractor: Equal Employment Opportunity (EEO) Poster "Equal Employment Opportunity is the Law" in accordance with the Office of Federal Contract Compliance Programs Executive Order 11246, as amended; Davis Bacon Wage Poster (WH 1321) - DOL "Notice to All Employees" Poster; and Applicable Davis-Bacon Wage Rate Determination. These notices must remain posted until final acceptance of the work by the Owner.

105-4 Engineer/RPR field office. The Contractor shall provide dedicated space for the use of the field RPR and inspectors, as a field office for the duration of the project. This space shall be located conveniently near the construction and shall be separate from any space used by the Contractor. The Contractor shall furnish water, sanitary facilities, heat, air conditioning, and electricity in accordance with local building codes.

Requirements for specifying the Engineer/RPR field office should be coordinated with the Owner and the Engineer/RPR since such facilities are not needed for all airport construction projects. If a field office is required for the project, a separate line item for payment may be established. Other equipment may be appropriate with approval of the owner based on the size and duration of the project.

METHOD OF MEASUREMENT

105-5 Basis of measurement and payment. Based upon the contract lump sum price for "Mobilization" partial payments will be allowed as follows:

- a. With first pay request, 25%.
- b. When 25% or more of the original contract is earned, an additional 25%.
- c. When 50% or more of the original contract is earned, an additional 40%.
- d. After Final Inspection, Staging area clean-up and delivery of all Project Closeout materials as required by Section 90, paragraph 90-11, *Contractor Final Project Documentation*, the final 10%.

BASIS OF PAYMENT

105-6 Payment will be made under:

Item C-105 Mobilization

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.

Office of Federal Contract Compliance Programs (OFCCP)

Executive Order 11246, as amended

EEOC-P/E-1 – Equal Employment Opportunity is the Law Poster

United States Department of Labor, Wage and Hour Division (WHD)

WH 1321 – Employee Rights under the Davis-Bacon Act Poster

END OF ITEM C-105

Item C-110 Method of Estimating Percentage of Material Within Specification Limits (PWL)

110-1 General. When the specifications provide for acceptance of material based on the method of estimating percentage of material within specification limits (PWL), the PWL will be determined in accordance with this section. All test results for a lot will be analyzed statistically to determine the total estimated percent of the lot that is within specification limits. The PWL is computed using the sample average (\bar{X}) and sample standard deviation (S_n) of the specified number (n) of sublots for the lot and the specification tolerance limits, L for lower and U for upper, for the particular acceptance parameter. From these values, the respective Quality index, Q_L for Lower Quality Index and/or Q_U for Upper Quality Index, is computed and the PWL for the lot for the specified n is determined from Table 1. All specification limits specified in the technical sections shall be absolute values. Test results used in the calculations shall be to the significant figure given in the test procedure.

There is some degree of uncertainty (risk) in the measurement for acceptance because only a small fraction of production material (the population) is sampled and tested. This uncertainty exists because all portions of the production material have the same probability to be randomly sampled. The Contractor's risk is the probability that material produced at the acceptable quality level is rejected or subjected to a pay adjustment. The Owner's risk is the probability that material produced at the rejectable quality level is accepted.

It is the intent of this section to inform the Contractor that, in order to consistently offset the Contractor's risk for material evaluated, production quality (using population average and population standard deviation) must be maintained at the acceptable quality specified or higher. In all cases, it is the responsibility of the Contractor to produce at quality levels that will meet the specified acceptance criteria when sampled and tested at the frequencies specified.

110-2 Method for computing PWL. The computational sequence for computing PWL is as follows:

- a. Divide the lot into n sublots in accordance with the acceptance requirements of the specification.
- b. Locate the random sampling position within the subplot in accordance with the requirements of the specification.
- c. Make a measurement at each location, or take a test portion and make the measurement on the test portion in accordance with the testing requirements of the specification.
- d. Find the sample average (\bar{X}) for all subplot test values within the lot by using the following formula:

$$\bar{X} = (x_1 + x_2 + x_3 + \dots + x_n) / n$$

Where: \bar{X} = Sample average of all subplot test values within a lot

x_1, x_2, \dots, x_n = Individual subplot test values

n = Number of subplot test values

e. Find the sample standard deviation (S_n) by use of the following formula:

$$S_n = [(d_1^2 + d_2^2 + d_3^2 + \dots + d_n^2)/(n-1)]^{1/2}$$

Where: S_n = Sample standard deviation of the number of subplot test values in the set

d_1, d_2, \dots, d_n = Deviations of the individual subplot test values x_1, x_2, \dots from the average value X

that is: $d_1 = (x_1 - X), d_2 = (x_2 - X) \dots d_n = (x_n - X)$

n = Number of subplot test values

f. For single sided specification limits (i.e., L only), compute the Lower Quality Index Q_L by use of the following formula:

$$Q_L = (X - L) / S_n$$

Where: L = specification lower tolerance limit

Estimate the percentage of material within limits (PWL) by entering Table 1 with Q_L , using the column appropriate to the total number (n) of measurements. If the value of Q_L falls between values shown on the table, use the next higher value of PWL.

g. For double-sided specification limits (i.e., L and U), compute the Quality Indexes Q_L and Q_U by use of the following formulas:

$$Q_L = (X - L) / S_n$$

and

$$Q_U = (U - X) / S_n$$

Where: L and U = specification lower and upper tolerance limits

Estimate the percentage of material between the lower (L) and upper (U) tolerance limits (PWL) by entering Table 1 separately with Q_L and Q_U , using the column appropriate to the total number (n) of measurements, and determining the percent of material above P_L and percent of material below P_U for each tolerance limit. If the values of Q_L fall between values shown on the table, use the next higher value of P_L or P_U . Determine the PWL by use of the following formula:

$$PWL = (P_U + P_L) - 100$$

Where: P_L = percent within lower specification limit

P_U = percent within upper specification limit

EXAMPLE OF PWL CALCULATION

Project: Example Project

Test Item: Item P-401, Lot A.

A. PWL Determination for Mat Density.

1. Density of four random cores taken from Lot A.

A-1 = 96.60

$$A-2 = 97.55$$

$$A-3 = 99.30$$

$$A-4 = 98.35$$

$$n = 4$$

2. Calculate average density for the lot.

$$X = (x_1 + x_2 + x_3 + \dots + x_n) / n$$

$$X = (96.60 + 97.55 + 99.30 + 98.35) / 4$$

$$X = 97.95\% \text{ density}$$

3. Calculate the standard deviation for the lot.

$$S_n = [((96.60 - 97.95)^2 + (97.55 - 97.95)^2 + (99.30 - 97.95)^2 + (98.35 - 97.95)^2) / (4 - 1)]^{1/2}$$

$$S_n = [(1.82 + 0.16 + 1.82 + 0.16) / 3]^{1/2}$$

$$S_n = 1.15$$

4. Calculate the Lower Quality Index Q_L for the lot. ($L=96.3$)

$$Q_L = (X - L) / S_n$$

$$Q_L = (97.95 - 96.30) / 1.15$$

$$Q_L = 1.4348$$

5. Determine PWL by entering Table 1 with $Q_L= 1.44$ and $n= 4$.

$$PWL = 98$$

B. PWL Determination for Air Voids.

1. Air Voids of four random samples taken from Lot A.

$$A-1 = 5.00$$

$$A-2 = 3.74$$

$$A-3 = 2.30$$

$$A-4 = 3.25$$

2. Calculate the average air voids for the lot.

$$X = (x_1 + x_2 + x_3 + \dots + x_n) / n$$

$$X = (5.00 + 3.74 + 2.30 + 3.25) / 4$$

$$X = 3.57\%$$

3. Calculate the standard deviation S_n for the lot.

$$S_n = [((3.57 - 5.00)^2 + (3.57 - 3.74)^2 + (3.57 - 2.30)^2 + (3.57 - 3.25)^2) / (4 - 1)]^{1/2}$$

$$S_n = [(2.04 + 0.03 + 1.62 + 0.10) / 3]^{1/2}$$

$$S_n = 1.12$$

4. Calculate the Lower Quality Index Q_L for the lot. ($L= 2.0$)

$$Q_L = (X - L) / S_n$$

$$Q_L = (3.57 - 2.00) / 1.12$$

$$Q_L = 1.3992$$

5. Determine P_L by entering Table 1 with $Q_L = 1.41$ and $n = 4$.

$$P_L = 97$$

6. Calculate the Upper Quality Index Q_U for the lot. ($U = 5.0$)

$$Q_U = (U - X) / S_n$$

$$Q_U = (5.00 - 3.57) / 1.12$$

$$Q_U = 1.2702$$

7. Determine P_U by entering Table 1 with $Q_U = 1.29$ and $n = 4$.

$$P_U = 93$$

8. Calculate Air Voids PWL

$$PWL = (P_L + P_U) - 100$$

$$PWL = (97 + 93) - 100 = 90$$

EXAMPLE OF OUTLIER CALCULATION (REFERENCE ASTM E178)

Project: Example Project

Test Item: Item P-401, Lot A.

A. Outlier Determination for Mat Density.

1. Density of four random cores taken from Lot A arranged in descending order.

$$A-3 = 99.30$$

$$A-4 = 98.35$$

$$A-2 = 97.55$$

$$A-1 = 96.60$$

2. From ASTM E178, Table 1, for $n=4$ an upper 5% significance level, the critical value for test criterion = 1.463.

3. Use average density, standard deviation, and test criterion value to evaluate density measurements.

- a. For measurements greater than the average:

If $(\text{measurement} - \text{average}) / (\text{standard deviation})$ is less than test criterion, then the measurement is not considered an outlier.

For A-3, check if $(99.30 - 97.95) / 1.15$ is greater than 1.463.

Since 1.174 is less than 1.463, the value is not an outlier.

- b. For measurements less than the average:

If $(\text{average} - \text{measurement}) / (\text{standard deviation})$ is less than test criterion, then the measurement is not considered an outlier.

For A-1, check if $(97.95 - 96.60) / 1.15$ is greater than 1.463.

Since 1.135 is less than 1.463, the value is not an outlier.

Note: In this example, a measurement would be considered an outlier if the density were:

$$\text{Greater than } (97.95 + 1.463 \times 1.15) = 99.63\%$$

OR

$$\text{less than } (97.95 - 1.463 \times 1.15) = 96.27\%.$$

Table 1. Table for Estimating Percent of Lot Within Limits (PWL)

Percent Within Limits (P _L and P _U)	Positive Values of Q (Q _L and Q _U)							
	n=3	n=4	n=5	n=6	n=7	n=8	n=9	n=10
99	1.1541	1.4700	1.6714	1.8008	1.8888	1.9520	1.9994	2.0362
98	1.1524	1.4400	1.6016	1.6982	1.7612	1.8053	1.8379	1.8630
97	1.1496	1.4100	1.5427	1.6181	1.6661	1.6993	1.7235	1.7420
96	1.1456	1.3800	1.4897	1.5497	1.5871	1.6127	1.6313	1.6454
95	1.1405	1.3500	1.4407	1.4887	1.5181	1.5381	1.5525	1.5635
94	1.1342	1.3200	1.3946	1.4329	1.4561	1.4717	1.4829	1.4914
93	1.1269	1.2900	1.3508	1.3810	1.3991	1.4112	1.4199	1.4265
92	1.1184	1.2600	1.3088	1.3323	1.3461	1.3554	1.3620	1.3670
91	1.1089	1.2300	1.2683	1.2860	1.2964	1.3032	1.3081	1.3118
90	1.0982	1.2000	1.2290	1.2419	1.2492	1.2541	1.2576	1.2602
89	1.0864	1.1700	1.1909	1.1995	1.2043	1.2075	1.2098	1.2115
88	1.0736	1.1400	1.1537	1.1587	1.1613	1.1630	1.1643	1.1653
87	1.0597	1.1100	1.1173	1.1192	1.1199	1.1204	1.1208	1.1212
86	1.0448	1.0800	1.0817	1.0808	1.0800	1.0794	1.0791	1.0789
85	1.0288	1.0500	1.0467	1.0435	1.0413	1.0399	1.0389	1.0382
84	1.0119	1.0200	1.0124	1.0071	1.0037	1.0015	1.0000	0.9990
83	0.9939	0.9900	0.9785	0.9715	0.9671	0.9643	0.9624	0.9610
82	0.9749	0.9600	0.9452	0.9367	0.9315	0.9281	0.9258	0.9241
81	0.9550	0.9300	0.9123	0.9025	0.8966	0.8928	0.8901	0.8882
80	0.9342	0.9000	0.8799	0.8690	0.8625	0.8583	0.8554	0.8533
79	0.9124	0.8700	0.8478	0.8360	0.8291	0.8245	0.8214	0.8192
78	0.8897	0.8400	0.8160	0.8036	0.7962	0.7915	0.7882	0.7858
77	0.8662	0.8100	0.7846	0.7716	0.7640	0.7590	0.7556	0.7531
76	0.8417	0.7800	0.7535	0.7401	0.7322	0.7271	0.7236	0.7211
75	0.8165	0.7500	0.7226	0.7089	0.7009	0.6958	0.6922	0.6896
74	0.7904	0.7200	0.6921	0.6781	0.6701	0.6649	0.6613	0.6587
73	0.7636	0.6900	0.6617	0.6477	0.6396	0.6344	0.6308	0.6282
72	0.7360	0.6600	0.6316	0.6176	0.6095	0.6044	0.6008	0.5982
71	0.7077	0.6300	0.6016	0.5878	0.5798	0.5747	0.5712	0.5686
70	0.6787	0.6000	0.5719	0.5582	0.5504	0.5454	0.5419	0.5394
69	0.6490	0.5700	0.5423	0.5290	0.5213	0.5164	0.5130	0.5105
68	0.6187	0.5400	0.5129	0.4999	0.4924	0.4877	0.4844	0.4820
67	0.5878	0.5100	0.4836	0.4710	0.4638	0.4592	0.4560	0.4537
66	0.5563	0.4800	0.4545	0.4424	0.4355	0.4310	0.4280	0.4257
65	0.5242	0.4500	0.4255	0.4139	0.4073	0.4030	0.4001	0.3980
64	0.4916	0.4200	0.3967	0.3856	0.3793	0.3753	0.3725	0.3705
63	0.4586	0.3900	0.3679	0.3575	0.3515	0.3477	0.3451	0.3432
62	0.4251	0.3600	0.3392	0.3295	0.3239	0.3203	0.3179	0.3161
61	0.3911	0.3300	0.3107	0.3016	0.2964	0.2931	0.2908	0.2892
60	0.3568	0.3000	0.2822	0.2738	0.2691	0.2660	0.2639	0.2624
59	0.3222	0.2700	0.2537	0.2461	0.2418	0.2391	0.2372	0.2358
58	0.2872	0.2400	0.2254	0.2186	0.2147	0.2122	0.2105	0.2093
57	0.2519	0.2100	0.1971	0.1911	0.1877	0.1855	0.1840	0.1829
56	0.2164	0.1800	0.1688	0.1636	0.1607	0.1588	0.1575	0.1566
55	0.1806	0.1500	0.1406	0.1363	0.1338	0.1322	0.1312	0.1304
54	0.1447	0.1200	0.1125	0.1090	0.1070	0.1057	0.1049	0.1042
53	0.1087	0.0900	0.0843	0.0817	0.0802	0.0793	0.0786	0.0781
52	0.0725	0.0600	0.0562	0.0544	0.0534	0.0528	0.0524	0.0521
51	0.0363	0.0300	0.0281	0.0272	0.0267	0.0264	0.0262	0.0260
50	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Percent Within Limits (P_L and P_U)	Negative Values of Q (Q_L and Q_U)							
	n=3	n=4	n=5	n=6	n=7	n=8	n=9	n=10
49	-0.0363	-0.0300	-0.0281	-0.0272	-0.0267	-0.0264	-0.0262	-0.0260
48	-0.0725	-0.0600	-0.0562	-0.0544	-0.0534	-0.0528	-0.0524	-0.0521
47	-0.1087	-0.0900	-0.0843	-0.0817	-0.0802	-0.0793	-0.0786	-0.0781
46	-0.1447	-0.1200	-0.1125	-0.1090	-0.1070	-0.1057	-0.1049	-0.1042
45	-0.1806	-0.1500	-0.1406	-0.1363	-0.1338	-0.1322	-0.1312	-0.1304
44	-0.2164	-0.1800	-0.1688	-0.1636	-0.1607	-0.1588	-0.1575	-0.1566
43	-0.2519	-0.2100	-0.1971	-0.1911	-0.1877	-0.1855	-0.1840	-0.1829
42	-0.2872	-0.2400	-0.2254	-0.2186	-0.2147	-0.2122	-0.2105	-0.2093
41	-0.3222	-0.2700	-0.2537	-0.2461	-0.2418	-0.2391	-0.2372	-0.2358
40	-0.3568	-0.3000	-0.2822	-0.2738	-0.2691	-0.2660	-0.2639	-0.2624
39	-0.3911	-0.3300	-0.3107	-0.3016	-0.2964	-0.2931	-0.2908	-0.2892
38	-0.4251	-0.3600	-0.3392	-0.3295	-0.3239	-0.3203	-0.3179	-0.3161
37	-0.4586	-0.3900	-0.3679	-0.3575	-0.3515	-0.3477	-0.3451	-0.3432
36	-0.4916	-0.4200	-0.3967	-0.3856	-0.3793	-0.3753	-0.3725	-0.3705
35	-0.5242	-0.4500	-0.4255	-0.4139	-0.4073	-0.4030	-0.4001	-0.3980
34	-0.5563	-0.4800	-0.4545	-0.4424	-0.4355	-0.4310	-0.4280	-0.4257
33	-0.5878	-0.5100	-0.4836	-0.4710	-0.4638	-0.4592	-0.4560	-0.4537
32	-0.6187	-0.5400	-0.5129	-0.4999	-0.4924	-0.4877	-0.4844	-0.4820
31	-0.6490	-0.5700	-0.5423	-0.5290	-0.5213	-0.5164	-0.5130	-0.5105
30	-0.6787	-0.6000	-0.5719	-0.5582	-0.5504	-0.5454	-0.5419	-0.5394
29	-0.7077	-0.6300	-0.6016	-0.5878	-0.5798	-0.5747	-0.5712	-0.5686
28	-0.7360	-0.6600	-0.6316	-0.6176	-0.6095	-0.6044	-0.6008	-0.5982
27	-0.7636	-0.6900	-0.6617	-0.6477	-0.6396	-0.6344	-0.6308	-0.6282
26	-0.7904	-0.7200	-0.6921	-0.6781	-0.6701	-0.6649	-0.6613	-0.6587
25	-0.8165	-0.7500	-0.7226	-0.7089	-0.7009	-0.6958	-0.6922	-0.6896
24	-0.8417	-0.7800	-0.7535	-0.7401	-0.7322	-0.7271	-0.7236	-0.7211
23	-0.8662	-0.8100	-0.7846	-0.7716	-0.7640	-0.7590	-0.7556	-0.7531
22	-0.8897	-0.8400	-0.8160	-0.8036	-0.7962	-0.7915	-0.7882	-0.7858
21	-0.9124	-0.8700	-0.8478	-0.8360	-0.8291	-0.8245	-0.8214	-0.8192
20	-0.9342	-0.9000	-0.8799	-0.8690	-0.8625	-0.8583	-0.8554	-0.8533
19	-0.9550	-0.9300	-0.9123	-0.9025	-0.8966	-0.8928	-0.8901	-0.8882
18	-0.9749	-0.9600	-0.9452	-0.9367	-0.9315	-0.9281	-0.9258	-0.9241
17	-0.9939	-0.9900	-0.9785	-0.9715	-0.9671	-0.9643	-0.9624	-0.9610
16	-1.0119	-1.0200	-1.0124	-1.0071	-1.0037	-1.0015	-1.0000	-0.9990
15	-1.0288	-1.0500	-1.0467	-1.0435	-1.0413	-1.0399	-1.0389	-1.0382
14	-1.0448	-1.0800	-1.0817	-1.0808	-1.0800	-1.0794	-1.0791	-1.0789
13	-1.0597	-1.1100	-1.1173	-1.1192	-1.1199	-1.1204	-1.1208	-1.1212
12	-1.0736	-1.1400	-1.1537	-1.1587	-1.1613	-1.1630	-1.1643	-1.1653
11	-1.0864	-1.1700	-1.1909	-1.1995	-1.2043	-1.2075	-1.2098	-1.2115
10	-1.0982	-1.2000	-1.2290	-1.2419	-1.2492	-1.2541	-1.2576	-1.2602
9	-1.1089	-1.2300	-1.2683	-1.2860	-1.2964	-1.3032	-1.3081	-1.3118
8	-1.1184	-1.2600	-1.3088	-1.3323	-1.3461	-1.3554	-1.3620	-1.3670
7	-1.1269	-1.2900	-1.3508	-1.3810	-1.3991	-1.4112	-1.4199	-1.4265
6	-1.1342	-1.3200	-1.3946	-1.4329	-1.4561	-1.4717	-1.4829	-1.4914
5	-1.1405	-1.3500	-1.4407	-1.4887	-1.5181	-1.5381	-1.5525	-1.5635
4	-1.1456	-1.3800	-1.4897	-1.5497	-1.5871	-1.6127	-1.6313	-1.6454
3	-1.1496	-1.4100	-1.5427	-1.6181	-1.6661	-1.6993	-1.7235	-1.7420
2	-1.1524	-1.4400	-1.6016	-1.6982	-1.7612	-1.8053	-1.8379	-1.8630
1	-1.1541	-1.4700	-1.6714	-1.8008	-1.8888	-1.9520	-1.9994	-2.0362

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.

ASTM International (ASTM)

ASTM E178

Standard Practice for Dealing with Outlying Observations

END OF ITEM C-110

Item P-101 Preparation/Removal of Existing Pavements

DESCRIPTION

101-1 This item shall consist of preparation of existing pavement surfaces for overlay, surface treatments, removal of existing pavement, and other miscellaneous items. The work shall be accomplished in accordance with these specifications and the applicable plans.

EQUIPMENT AND MATERIALS

101-2 All equipment and materials shall be specified here and in the following paragraphs or approved by the Resident Project Representative (RPR). The equipment shall not cause damage to the pavement to remain in place.

CONSTRUCTION

101-3.1 Removal of existing pavement.

The Contractor's removal operation shall be controlled to not damage adjacent pavement structure, and base material, cables, utility ducts, pipelines, or drainage structures which are to remain under the pavement.

a. Concrete pavement removal. Full depth saw cuts shall be made perpendicular to the slab surface. The Contractor shall saw through the full depth of the slab including any dowels at the joint, removing the pavement and installing new dowels as shown on the plans and per the specifications. Where the perimeter of the removal limits is not located on the joint and there are no dowels present, the perimeter shall be saw cut the full depth of the pavement. The pavement inside the saw cut shall be removed by methods which will not cause distress in the pavement which is to remain in place. If the material is to be wasted on the airport site, it shall be reduced to a maximum size of 2 inches. Concrete slabs that are damaged by under breaking shall be repaired or removed and replaced as directed by the RPR.

The edge of existing concrete pavement against which new pavement abuts shall be protected from damage at all times. Spall and underbreak repair shall be in accordance with the plans. Any underlying material that is to remain in place, shall be recompacted and/or replaced as shown on the plans. Adjacent areas damaged during repair shall be repaired or replaced at the Contractor's expense.

b. Asphalt pavement removal. Asphalt pavement to be removed shall be cut to the full depth of the asphalt pavement around the perimeter of the area to be removed.

c. Repair or removal of Base, Subbase, and/or Subgrade. All failed material including surface, base course, subbase course, and subgrade shall be removed and repaired as shown on the plans or as directed by the RPR. Materials and methods of construction shall comply with the applicable sections of these specifications. Any damage caused by Contractor's removal process shall be repaired at the Contractor's expense.

101-3.2 Preparation of joints and cracks prior to overlay/surface treatment. Remove all vegetation and debris from cracks to a minimum depth of 1 inch. If extensive vegetation exists,

treat the specific area with a concentrated solution of a water-based herbicide approved by the RPR. Fill all cracks greater than 1/4 inch wide with a crack sealant per ASTM D6690. The crack sealant, preparation, and application shall be compatible with the surface treatment/overlay to be used. To minimize contamination of the asphalt with the crack sealant, underfill the crack sealant a minimum of 1/8 inch, not to exceed 1/4 inch. Any excess joint or crack sealer shall be removed from the pavement surface.

Wider cracks (over 1-1/2 inch wide), along with soft or sunken spots, indicate that the pavement or the pavement base should be repaired or replaced as stated below.

Cracks and joints may be filled with a mixture of emulsified asphalt and aggregate. The aggregate shall consist of limestone, volcanic ash, sand, or other material that will cure to form a hard substance. The combined gradation shall be as shown in the following table.

Gradation

Sieve Size	Percent Passing
No. 4	100
No. 8	90-100
No. 16	65-90
No. 30	40-60
No. 50	25-42
No. 10	15-30
No. 200	10-20

Up to 3% cement can be added to accelerate the set time. The mixture shall not contain more than 20% natural sand without approval in writing from the RPR.

The proportions of asphalt emulsion and aggregate shall be determined in the field and may be varied to facilitate construction requirements. Normally, these proportions will be approximately one part asphalt emulsion to five parts aggregate by volume. The material shall be poured or placed into the joints or cracks and compacted to form a voidless mass. The joint or crack shall be filled to within +0 to -1/8 inches of the surface. Any material spilled outside the width of the joint shall be removed from the pavement surface prior to constructing the overlay. Where concrete overlays are to be constructed, only the excess joint material on the pavement surface and vegetation in the joints need to be removed.

101-3.3 Removal of Foreign Substances/contaminates prior to overlay, seal-coat, or remarking. Removal of foreign substances/contaminates from existing pavement that will affect the bond of the new treatment shall consist of removal of rubber, fuel spills, oil, crack sealer, at least 90% of paint, and other foreign substances from the surface of the pavement. Areas that require removal are designated on the plans and as directed by the RPR in the field during construction.

High-pressure water may be used. If chemicals are used, they shall comply with the state's environmental protection regulations. Removal methods used shall not cause major damage to the pavement, or to any structure or utility within or adjacent to the work area. Major damage is defined as changing the properties of the pavement, removal of asphalt causing the aggregate to ravel, or removing pavement over 1/8 inch deep. If it is deemed by the RPR that damage to the existing pavement is caused by operational error, such as permitting the application method

to dwell in one location for too long, the Contractor shall repair the damaged area without compensation and as directed by the RPR.

Removal of foreign substances shall not proceed until approved by the RPR. Water used for high-pressure water equipment shall be provided by the Contractor at the Contractor's expense. No material shall be deposited on the pavement shoulders. All wastes shall be disposed of in areas indicated in this specification or shown on the plans.

101-3.4 Concrete spall or failed asphaltic concrete pavement repair.

a. Repair of concrete spalls in areas to be overlaid with asphalt. The Contractor shall repair all spalled concrete as shown on the plans or as directed by the RPR. The perimeter of the repair shall be saw cut a minimum of 2 inches outside the affected area and 2 inches deep. The deteriorated material shall be removed to a depth where the existing material is firm or cannot be easily removed with a geologist pick. The removed area shall be filled with asphalt mixture with aggregate sized appropriately for the depth of the patch. The material shall be compacted with equipment approved by the RPR until the material is dense and no movement or marks are visible. The material shall not be placed in lifts over 4 inches in depth. This method of repair applies only to pavement to be overlaid.

b. Asphalt pavement repair. The Contractor shall repair all spalled concrete as shown on the plans or as directed by the RPR. The failed areas shall be removed as specified in paragraph 101-3.1b. All failed material including surface, base course, subbase course, and subgrade shall be removed. Materials and methods of construction shall comply with the applicable sections of these specifications.

101-3.5 Cold milling. Milling shall be performed with a power-operated milling machine or grinder, capable of producing a uniform finished surface. The milling machine or grinder shall operate without tearing or gouging the underlying surface. The milling machine or grinder shall be equipped with grade and slope controls, and a positive means of dust control. All millings shall be removed and disposed off Airport property. If the Contractor mills or grinds deeper or wider than the plans specify, the Contractor shall replace the material removed with new material at the Contractor's Expense.

a. Patching. The milling machine shall be capable of cutting a vertical edge without chipping or spalling the edges of the remaining pavement and it shall have a positive method of controlling the depth of cut. The RPR shall layout the area to be milled with a straightedge in increments of 1-foot widths. The area to be milled shall cover only the failed area. Any excessive area that is milled because the Contractor doesn't have the appropriate milling machine, or areas that are damaged because of his negligence, shall be repaired by the Contractor at the Contractor's Expense.

b. Profiling, grade correction, or surface correction. The milling machine shall have a minimum width of 7 feet and it shall be equipped with electronic grade control devices that will cut the surface to the grade specified. The tolerances shall be maintained within +0 inch and - 1/4 inch of the specified grade. The machine must cut vertical edges and have a positive method of dust control. The machine must have the ability to remove the millings or cuttings from the pavement and load them into a truck. All millings shall be removed and disposed of off the airport.

c. Clean-up. The Contractor shall sweep the milled surface daily and immediately after the milling until all residual materials are removed from the pavement surface. Prior to paving, the Contractor shall wet down the milled pavement and thoroughly sweep and/or blow the surface to remove loose residual material. Waste materials shall be collected and removed from the

pavement surface and adjacent areas by sweeping or vacuuming. Waste materials shall be removed and disposed off Airport property.

101-3.6. Preparation of asphalt pavement surfaces prior to surface treatment. Existing asphalt pavements to be treated with a surface treatment shall be prepared as follows:

a. Patch asphalt pavement surfaces that have been softened by petroleum derivatives or have failed due to any other cause. Remove damaged pavement to the full depth of the damage and replace with new asphalt pavement similar to that of the existing pavement in accordance with paragraph 101-3.4b.

b. Repair joints and cracks in accordance with paragraph 101-3.2.

c. Remove oil or grease that has not penetrated the asphalt pavement by scrubbing with a detergent and washing thoroughly with clean water. After cleaning, treat these areas with an oil spot primer.

d. Clean pavement surface immediately prior to placing the surface treatment so that it is free of dust, dirt, grease, vegetation, oil or any type of objectionable surface film.

101-3.7 Maintenance. The Contractor shall perform all maintenance work necessary to keep the pavement in a satisfactory condition until the full section is complete and accepted by the RPR. The surface shall be kept clean and free from foreign material. The pavement shall be properly drained at all times. If cleaning is necessary or if the pavement becomes disturbed, any work repairs necessary shall be performed at the Contractor's expense.

101-3.8 Preparation of Joints in Rigid Pavement prior to resealing. Prior to application of sealant material, clean and dry the joints of all scale, dirt, dust, old sealant, curing compound, moisture and other foreign matter. The Contractor shall demonstrate, in the presence of the RPR, that the method used cleans the joint and does not damage the joint.

101-3.8.1 Removal of Existing Joint Sealant. All existing joint sealants will be removed by plowing or use of hand tools. Any remaining sealant and or debris will be removed by use of wire brushes or other tools as necessary. Resaw joints removing no more than 1/16 inch from each joint face. Immediately after sawing, flush out joint with water and other tools as necessary to completely remove the slurry.

101-3.8.2 Cleaning prior to sealing. Immediately before sealing, joints shall be cleaned by removing any remaining laitance and other foreign material. Allow sufficient time to dry out joints prior to sealing. Joint surfaces will be surface-dry prior to installation of sealant.

101-3.8.3 Joint sealant. Joint material and installation will be in accordance with Item P-604 or P-605.

101-3.9 Preparation of Cracks in Flexible Pavement prior to sealing. Prior to application of sealant material, clean and dry the joints of all scale, dirt, dust, old sealant, curing compound, moisture and other foreign matter. The Contractor shall demonstrate, in the presence of the RPR, that the method used cleans the cracks and does not damage the pavement.

101-3.9.1 Preparation of Crack. Widen crack with router or random crack saw by removing a minimum of 1/16 inch from each side of crack. Immediately before sealing, cracks will be blown out with a hot air lance combined with oil and water-free compressed air.

101-3.9.2 Removal of Existing Crack Sealant. Existing sealants will be removed by routing or random crack saw. Following routing or sawing any remaining debris will be removed by use of a hot lance combined with oil and water-free compressed air.

101-3.9.3 Crack Sealant. Crack sealant material and installation will be in accordance with Item P-605.

101-3.9.4 Removal of Pipe and other Buried Structures.

a. Removal of Existing Pipe Material. Not used.

b. Removal of Inlets/Manholes. Where indicated on the plans or as directed by the RPR, inlets and/or manholes shall be removed and legally disposed of off-site in a timely fashion after removal. Excavations after removal shall be backfilled with material equal or better in quality than adjacent embankment. When under paved areas must be compacted to 95% of ASTM D1557, when outside of paved areas must be compacted to 95% of ASTM D698.

c. Not Used.

METHOD OF MEASUREMENT

101-4.1 Pavement removal. The unit of measurement for pavement removal shall be the number of square yards removed by the Contractor. Any pavement removed outside the limits of removal because the pavement was damaged by negligence on the part of the Contractor shall not be included in the measurement for payment. No direct measurement or payment shall be made for saw cutting. Saw cutting shall be incidental to pavement removal. Dowel bar installation shall be incidental to pavement removal.

101-4.2 Joint and crack repair. The unit of measurement for joint and crack repair shall be the linear foot of joint.

101-4.3 Removal of Foreign Substances/contaminates. The unit of measurement for foreign Substances/contaminates removal shall be the square foot.

101-4.4 Spalled and failed asphalt pavement repair. The unit of measure for failed asphalt pavement repair shall be square foot.

101-4.5 Concrete Spall Repair. The unit of measure for concrete spall repair shall be the number of square feet. The location and average depth of the patch shall be determined and agreed upon by the RPR and the Contractor.

101-4.6 Cold milling. The unit of measure for cold milling shall be 9.5 inches of milling per square yard. The location and average depth of the cold milling shall be as shown on the plans. If the initial cut does not correct the condition, the Contractor shall re-mill the area and will be paid for the total depth of milling.

101-4.7 Removal of Pipe and other Buried Structures. The unit of measurement for removal of pipe and other buried structures will be made at the contract unit price for each completed and accepted item. This price shall be full compensation for all labor, equipment, tools, and incidentals necessary to complete this item in accordance with paragraph 101-3.9.4.

BASIS OF PAYMENT

101-5.1 Payment. Payment shall be made at contract unit price for the unit of measurement as specified above. This price shall be full compensation for furnishing all materials and for all preparation, hauling, and placing of the material and for all labor, equipment, tools, and incidentals necessary to complete this item.

Item P 101-5.1 Remove Existing Asphalt Pavement, Full Depth (Up to 10" Depth)
 – per square yard

Item P 101-5.2 Joint and Crack Repair – per linear foot

Item P 101-5.3	Removal of Foreign Substances/contaminates – per square foot
Item P-101-5.4	Spalled and Failed Asphalt Pavement Repair – per square foot
Item P-101-5.5	Concrete Spall Repair - per square foot
Item P-101-5.6	Cold Milling – per square yard
Item P-101-5.7	Remove Existing Concrete Pavement – per square yard
Item P-101-5.8	Remove Existing Storm Drain Manhole Frame, Cover, and Reinforced Concrete Apron – per each
Item P-101-5.9	Remove Existing Utility Handhole Frame, Cover, and Reinforced Concrete Apron – per each
Item P-101-5.10	Remove Existing FAA Communication Manhole Frame, Cover, and Reinforced Concrete Apron – per each
Item P-101-5.11	Remove Existing Inlet Frame, Grate, and Reinforced Concrete Apron – per each
Item P-101-5.12	Remove Existing Concrete Tie Down – per each

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.

Advisory Circulars (AC)

AC 150/5380-6 Guidelines and Procedures for Maintenance of Airport Pavements.

ASTM International (ASTM)

ASTM D6690 Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements

END OF ITEM P-101

Item P-151 Clearing and Grubbing

DESCRIPTION

151-1.1 This item shall consist of clearing and grubbing, including the disposal of materials, for all areas within the limits designated on the plans or as required by the Resident Project Representative (RPR).

a. 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 RPR 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 and grubbed shall be staked on the ground by the Contractor as indicated on the plans.

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

151-2.1.1 Disposal. All 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 RPR. As far as practicable, waste concrete and masonry shall be placed on slopes of embankments or channels. When embankments are constructed of such material, this material shall be placed in accordance with requirements for formation of embankments. Any broken concrete or masonry that cannot be used in construction and all other materials not considered suitable for use elsewhere, shall be disposed of by the Contractor. In no case, shall any discarded materials be left in windrows or piles adjacent to or within the airport limits. The manner and location of disposal of materials shall be subject to the approval of the RPR and shall not create an unsightly or objectionable view. When the Contractor is required to locate a disposal area outside the airport property limits, the Contractor shall obtain and file with the RPR permission in writing from the property owner for the use of private property for this purpose.

151-2.1.2 Blasting. Blasting shall not be allowed.

151-2.2 Clearing. The Contractor shall clear the staked or indicated area of all materials as indicated on the plans. 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 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 RPR. 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 location designated by the RPR 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 as indicated on the plans, 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 in 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.

METHOD OF MEASUREMENT

151-3.1 The quantities of clearing and grubbing as shown by the limits on the plans shall be per lump sum of land specifically cleared and grubbed.

BASIS OF PAYMENT

151-4.1 Payment shall be made at the contract unit price per lump sum for clearing and grubbing. This price shall be full compensation for furnishing all materials and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item P-151-4.1 Clearing and grubbing – per lump sum

END OF ITEM P-151

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.

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.

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 in waste areas as shown on the plans. All waste areas 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 shall 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 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 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 unclassified 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 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 unclassified 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 someone other than the Contractor or 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.

152-2.3 Borrow excavation. Borrow areas are not required.

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 95% of maximum density for cohesive soils as determined by ASTM D1557. 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-compacted, 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 Contractor 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 D 1557. A new Proctor shall be developed for each soil type based on visual classification.

Density tests will be taken by the Contractor for every 3,000 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 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 95% 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 100 percent of the maximum density as determined by ASTM D1557. 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 D1556 or 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 RPR's presence and provide the test results upon completion to the RPR for acceptance. 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-compacted 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.

There will be no separate measurement of payment for compacted embankment. All costs incidental to placing in lifts, 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.

152-2.9 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. 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 80/100/150 psi in the presence of the RPR. Apply a minimum of one (1) 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 12 inches and to a density of not less than 95 percent of the maximum dry density as determined by ASTM D1557. 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 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). When the material has greater than 30 percent retained on the $\frac{3}{4}$ inch sieve, follow the methods in ASTM D1557. Tests for moisture content and compaction will be taken at a minimum of 1000 S.Y. of subgrade. All quality assurance testing shall be done by the Contractor's laboratory in the presence of the RPR, and density test results shall be furnished upon completion to the RPR for acceptance determination.

The in-place field density shall be determined in accordance with ASTM D1556 or 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.

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-compacted, 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-compacted 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 +/- ½ 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 +/- 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. 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 field cross-sections and the final theoretical pay line established by cross-sections shown on the plans, subject to verification by the RPR.

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.

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.

Payment will be made under:

Item P-152-4.1 Unclassified 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 10-lb Rammer and an 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

Item P-153 Controlled Low-Strength Material (CLSM)

DESCRIPTION

153-1.1 This item shall consist of furnishing, transporting, and placing a controlled low-strength material (CLSM) as flowable backfill in trenches or at other locations shown on the plans or as directed by the Resident Project Representative (RPR).

MATERIALS

153-2.1 Materials.

a. Cement. Cement shall conform to the requirements of ASTM C150 Type I, II, or V.

b. Fly ash. Fly ash shall conform to ASTM C618, Class C or F.

c. Fine aggregate (sand). Fine aggregate shall conform to the requirements of ASTM C33 except for aggregate gradation. Any aggregate gradation which produces the specified performance characteristics of the CLSM and meets the following requirements, will be accepted.

Sieve Size	Percent Passing by weight
3/4 inch	100
No. 200	0 - 12

d. Water. Water used in mixing or curing shall be from potable water sources. Other sources shall be tested in accordance with ASTM C1602 prior to use.

MIX DESIGN

153-3.1 Proportions. The Contractor shall submit, to the RPR, a mix design including the proportions and source of aggregate, fly ash, cement, water, and approved admixtures. No CLSM mixture shall be produced for payment until the RPR has given written approval of the proportions. The proportions shall be prepared by a laboratory and shall remain in effect for the duration of the project. The proportions shall establish a single percentage or weight for aggregate, fly ash, cement, water, and any admixtures proposed. Laboratory costs are incidental to this item.

a. Compressive strength. CLSM shall be designed to achieve a 28-day compressive strength of 100 to 200 psi when tested in accordance with ASTM D4832, with no significant strength gain after 28 days.

b. Consistency. Design CLSM to achieve a consistency that will produce an approximate 8-inch diameter circular-type spread without segregation. CLSM consistency shall be determined per ASTM D6103.

CONSTRUCTION METHODS

153-4.1 Placement.

a. Placement. CLSM may be placed by any reasonable means from the mixing unit into the space to be filled. Agitation is required during transportation and waiting time. Placement shall be performed so structures or pipes are not displaced from their final position and intrusion of CLSM into unwanted areas is avoided. The material shall be brought up uniformly to the fill line shown on the plans or as directed by the RPR. Each placement of CLSM shall be as continuous an operation as possible. If CLSM is placed in more than one lift, the base lift shall be free of surface water and loose foreign material prior to placement of the next lift.

b. Contractor Quality Control. The Contractor shall collect all batch tickets to verify the CLSM delivered to the project conforms to the mix design. The Contractor shall verify daily that the CLSM is consistent with 153-3.1a and 153-3.1b. Adjustments shall be made as necessary to the proportions and materials as needed. The Contractor shall provide all batch tickets to the RPR.

c. Limitations of placement. CLSM shall not be placed on frozen ground. Mixing and placing may begin when the air or ground temperature is at least 35°F and rising. Mixing and placement shall stop when the air temperature is 40°F and falling or when the anticipated air or ground temperature will be 35°F or less in the 24-hour period following proposed placement. At the time of placement, CLSM shall have a temperature of at least 40°F.

153-4.2 Curing and protection

a. Curing. The air in contact with the CLSM shall be maintained at temperatures above freezing for a minimum of 72 hours. If the CLSM is subjected to temperatures below 32°F, the material may be rejected by the RPR if damage to the material is observed.

b. Protection. The CLSM shall not be subject to loads and shall remain undisturbed by construction activities for a period of 48 hours or until a compressive strength of 15 psi is obtained. The Contractor shall be responsible for providing evidence to the RPR that the material has reached the desired strength. Acceptable evidence shall be based upon compressive tests made in accordance with paragraph 153-3.1a.

153-4.3 Quality Assurance (QA) Acceptance. CLSM QA acceptance shall be based upon batch tickets provided by the Contractor to the RPR to confirm that the delivered material conforms to the mix design.

METHOD OF MEASUREMENT

153-5.1 Measurement.

No separate measurement for payment shall be made for controlled low strength material (CLSM). CLSM shall be considered necessary and incidental to the work of this Contract.

BASIS OF PAYMENT

153-6.1 Payment.

No payment will be made separately or directly for controlled low strength material (CLSM). CLSM shall be considered necessary and incidental to the work of this Contract.

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.

ASTM International (ASTM)

ASTM C33	Standard Specification for Concrete Aggregates
ASTM C150	Standard Specification for Portland Cement
ASTM C618	Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
ASTM C595	Standard Specification for Blended Hydraulic Cements
ASTM C1602	Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete
ASTM D4832	Standard Test Method for Preparation and Testing of Controlled Low-Strength Material (CLSM) Test Cylinders
ASTM D6103	Flow Consistency of Controlled Low Strength Material (CLSM)

END OF ITEM P-153

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Item P-209 Crushed Aggregate Base Course

DESCRIPTION

209-1.1 This item consists of a base course composed of crushed aggregate base constructed on a prepared course in accordance with these specifications and in conformity to the dimensions and typical cross-sections shown on the plans.

MATERIALS

209-2.1 Crushed aggregate base. Crushed aggregate shall consist of clean, sound, durable particles of crushed stone, crushed gravel, and shall be free from coatings of clay, silt, organic material, clay lumps or balls or other deleterious materials or coatings. The method used to produce the crushed gravel shall result in the fractured particles in the finished product as consistent and uniform as practicable. Fine aggregate portion, defined as the portion passing the No. 4 sieve shall consist of fines from the coarse aggregate crushing operation. The fine aggregate shall be produced by crushing stone, gravel, that meet the coarse aggregate requirements for wear and soundness. Aggregate base material requirements are listed in the following table.

Crushed Aggregate Base Material Requirements

Material Test	Requirement	Standard
Coarse Aggregate		
Resistance to Degradation	Loss: 45% maximum	ASTM C131
Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate	Loss after 5 cycles: 12% maximum using Sodium sulfate - or - 18% maximum using magnesium sulfate	ASTM C88
Percentage of Fractured Particles	Minimum 90% by weight of particles with at least two fractured faces and 98% with at least one fractured face ¹	ASTM D5821
Flat Particles, Elongated Particles, or Flat and Elongated Particles	10% maximum, by weight, of flat, elongated, or flat and elongated particles ²	ASTM D4791
Fine Aggregate		
Liquid limit	Less than or equal to 25	ASTM D4318
Plasticity Index	Not more than five (5)	ASTM D4318

¹ The area of each face shall be equal to at least 75% of the smallest mid-sectional area of the piece. When two fractured faces are contiguous, the angle between the planes of fractures shall be at least 30 degrees to count as two fractured faces.

² A flat particle is one having a ratio of width to thickness greater than five (5); an elongated particle is one having a ratio of length to width greater than five (5).

209-2.2 Gradation requirements. The gradation of the aggregate base material shall meet the requirements of the gradation given in the following table when tested per ASTM C117 and ASTM C136. The gradation shall be well graded from coarse to fine and shall not vary from the lower limit on one sieve to the high limit on an adjacent sieve or vice versa.

Gradation of Aggregate Base

Sieve Size	Design Range Percentage by Weight passing	Contractor's Final Gradation	Job Control Grading Band Tolerances ¹ (Percent)
2 inch	100		0
1-1/2 inch	95-100		±5
1 inch	70-95		±8
3/4 inch	55-85		±8
No. 4	30-60		±8
No. 40 ²	10-30		±5
No. 200 ²	0-5		±3

¹ The "Job Control Grading Band Tolerances for Contractor's Final Gradation" in the table shall be applied to "Contractor's Final Gradation" to establish a job control grading band.

The full tolerance still applies if application of the tolerances results in a job control grading band outside the design range.

² The fraction of material passing the No 200 sieve shall not exceed two-thirds the fraction passing the No 40 sieve.

209-2.3 Sampling and Testing.

a. Aggregate base materials. The Contractor shall take samples of the aggregate base in accordance with ASTM D75 to verify initial aggregate base requirements and gradation. Material shall meet the requirements in paragraph 209-2.1. This sampling and testing will be the basis for approval of the aggregate base quality requirements.

b. Gradation requirements. The Contractor shall take at least two aggregate base samples per day in the presence of the Resident Project Representative (RPR) to check the final gradation. Sampling shall be per ASTM D75. Material shall meet the requirements in paragraph 209-2.2. The samples shall be taken from the in-place, un-compacted material at sampling points and intervals designated by the RPR.

209-2.4 Separation Geotextile. Not used.

CONSTRUCTION METHODS

209-3.1 Control strip. The first half-day of construction shall be considered the control strip. The Contractor shall demonstrate, in the presence of the RPR, that the materials, equipment, and construction processes meet the requirements of the 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-compacted or removed and replaced at the Contractor's expense. Full operations shall not continue 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 by the RPR.

209-3.2 Preparing underlying subgrade and/or subbase. The underlying subgrade and/or subbase shall be checked and accepted by the RPR before base course placing and spreading operations begin. Re-proof rolling of the subgrade or proof rolling of the subbase in accordance with Item P-152, at the Contractor's expense, may be required by the RPR if the Contractor fails to ensure proper drainage or protect the subgrade and/or subbase. Any ruts or soft, yielding areas due to improper drainage conditions, hauling, or any other cause, shall be corrected before the base course is placed. To ensure proper drainage, the spreading of the base shall begin along the centerline of the pavement on a crowned section or on the high side of the pavement with a one-way slope.

209-3.3 Production. The aggregate shall be uniformly blended and, when at a satisfactory moisture content per paragraph 209-3.5, the approved material may be transported directly to the placement.

209-3.4 Placement. The aggregate shall be placed and spread on the prepared underlying layer by spreader boxes or other devices as approved by the RPR, to a uniform thickness and width. The equipment shall have positive thickness controls to minimize the need for additional

manipulation of the material. Dumping from vehicles that require re-handling shall not be permitted. Hauling over the uncompacted base course shall not be permitted.

The aggregate shall meet gradation and moisture requirements prior to compaction. The base course shall be constructed in lifts as established in the control strip, but not less than 4 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 at the Contractor's expense.

209-3.5 Compaction. Immediately after completion of the spreading operations, compact each layer of the base course, as specified, with approved compaction equipment. The number, type, and weight of rollers shall be sufficient to compact the material to the required density within the same day that the aggregate is placed on the subgrade.

The field density of each compacted lift of material shall be at least 100% of the maximum density of laboratory specimens prepared from samples of the base material delivered to the jobsite. The laboratory specimens shall be compacted and tested in accordance with ASTM D1557. The moisture content of the material during placing operations shall be within ± 2 percentage points of the optimum moisture content as determined by ASTM D1557. Maximum density refers to maximum dry density at optimum moisture content unless otherwise specified.

209-3.6 Weather limitations. Material shall not be placed unless the ambient air temperature is at least 40°F and rising. Work on base course shall not be conducted when the subgrade or subbase is wet or frozen or the base material contains frozen material.

209-3.7 Maintenance. The base course shall be maintained in a condition that will meet all specification requirements. When material has been exposed to excessive rain, snow, or freeze-thaw conditions, prior to placement of additional material, the Contractor shall verify that materials still meet all specification requirements. Equipment may be routed over completed sections of base course, provided that no damage results and the equipment is routed over the full width of the completed base course. Any damage resulting to the base course from routing equipment over the base course shall be repaired by the Contractor at the Contractor's expense.

209-3.8 Surface tolerances. After the course has been compacted, 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 recompact to grade until the required smoothness and accuracy are obtained and approved by the RPR. Any deviation in surface tolerances shall be corrected by the Contractor at the Contractor's expense. The smoothness and accuracy requirements specified here apply only to the top layer when base course is constructed in more than one layer.

a. Smoothness. The finished surface shall not vary more than 3/8-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 +0 and -1/2 inch of the specified grade.

209-3.9 Acceptance sampling and testing. Crushed aggregate base course shall be accepted for density and thickness on an area basis. Two tests shall be made for density and thickness

for each 1200 square yds. Sampling locations will be determined on a random basis per ASTM D3665

a. Density. The Contractor's laboratory shall perform all density tests in the RPR's presence and provide the test results upon completion to the RPR for acceptance.

Each area shall be accepted for density when the field density is at least 100% of the maximum density of laboratory specimens compacted and tested per ASTM D1557. The in-place field density shall be determined per ASTM D1556 or 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. If the specified density is not attained, the area represented by the failed test must be reworked and/or recompacted and two additional random tests made. This procedure shall be followed until the specified density is reached. Maximum density refers to maximum dry density at optimum moisture content unless otherwise specified.

b. Thickness. Depth tests shall be made by test holes at least 3 inches in diameter that extend through the base. The thickness of the base course shall be within +0 and -1/2 inch of the specified thickness as determined by depth tests taken by the Contractor in the presence of the RPR for each area. Where the thickness is deficient by more than 1/2-inch, the Contractor shall correct such areas at no additional cost by scarifying to a depth of at least 3 inches, adding new material of proper gradation, and the material shall be blended and recompacted to grade. The Contractor shall replace, at his expense, base material where depth tests have been taken.

METHOD OF MEASUREMENT

209-4.1 The quantity of crushed aggregate base course will be determined by measurement of the number of square yards of material actually constructed and accepted by the RPR as complying with the plans and specifications. Base materials shall not be included in any other excavation quantities.

BASIS OF PAYMENT

209-5.1 Payment shall be made at the contract unit price per square yard for crushed aggregate base course. This price shall be full compensation for furnishing all materials, for preparing and placing these materials, and for all labor, equipment tools, and incidentals necessary to complete the item.

Payment will be made under:

Item P-209-5.1	Crushed Aggregate Base Course (6" Thick) – per square yard
Item P-209-5.2	Crushed Aggregate Base Course (10" Thick) – per square 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.

ASTM International (ASTM)

ASTM C29	Standard Test Method for Bulk Density ("Unit Weight") and Voids in Aggregate
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ASTM C88	Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
ASTM C117	Standard Test Method for Materials Finer than 75- μm (No. 200) Sieve in Mineral Aggregates by Washing
ASTM C131	Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
ASTM C136	Standard Test Method for Sieve or Screen Analysis of Fine and Coarse Aggregates
ASTM C142	Standard Test Method for Clay Lumps and Friable Particles in Aggregates
ASTM D75	Standard Practice for Sampling Aggregates
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 D2419	Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate
ASTM D3665	Standard Practice for Random Sampling of Construction Materials
ASTM D4318	Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D4491	Standard Test Methods for Water Permeability of Geotextiles by Permittivity
ASTM D4643	Standard Test Method for Determination of Water Content of Soil and Rock by Microwave Oven Heating
ASTM D4751	Standard Test Methods for Determining Apparent Opening Size of a Geotextile
ASTM D4791	Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate
ASTM D5821	Standard Test Method for Determining the Percentage of Fractured Particles in Coarse Aggregate
ASTM D6938	Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)
ASTM D7928	Standard Test Method for Particle-Size Distribution (Gradation) of Fine-Grained Soils Using the Sedimentation (Hydrometer) Analysis

American Association of State Highway and Transportation Officials (AASHTO)

M288

Standard Specification for Geosynthetic Specification for Highway
Applications

END OF ITEM P-209

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Item P-401 Asphalt Mix Pavement

DESCRIPTION

401-1.1 This item shall consist of pavement courses composed of mineral aggregate and asphalt binder mixed in a central mixing plant and placed on a prepared base or stabilized course in accordance with these specifications and shall conform to the lines, grades, thicknesses, and typical cross-sections shown on the plans. Each course shall be constructed to the depth, typical section, and elevation required by the plans and shall be rolled, finished, and approved before the placement of the next course.

MATERIALS

401-2.1 Aggregate. Aggregates shall consist of crushed stone, crushed gravel, crushed slag, screenings, natural sand, and mineral filler, as required. The aggregates should have no known history of detrimental pavement staining due to ferrous sulfides, such as pyrite. Coarse aggregate is the material retained on the No. 4 sieve. Fine aggregate is the material passing the No. 4 sieve.

a. Coarse aggregate. Coarse aggregate shall consist of sound, tough, durable particles, free from films of matter that would prevent thorough coating and bonding with the asphalt material and free from organic matter and other deleterious substances. Coarse aggregate material requirements are given in the table below.

Coarse Aggregate Material Requirements

Material Test	Requirement	Standard
Resistance to Degradation	Loss: 40% maximum	ASTM C131
Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate	Loss after 5 cycles: 12% maximum using Sodium sulfate - or - 18% maximum using magnesium sulfate	ASTM C88
Clay lumps and friable particles	1.0 % maximum	ASTM C142
Percentage of Fractured Particles	For pavements designed for aircraft gross weights of 60,000 pounds or more: Minimum 75% by weight of particles with at least two fractured faces and 85% with at least one fractured face ¹	ASTM D5821
	For pavements designed for aircraft gross weights less than 60,000 pounds: Minimum 50% by weight of particles with at least two fractured faces and 65% with at least one fractured face ¹	
Flat, Elongated, or Flat and Elongated Particles	8% maximum, by weight, of flat, elongated, or flat and elongated particles at 5:1 ²	ASTM D4791
Bulk density of slag ³	Weigh not less than 70 pounds per cubic foot	ASTM C29.

¹ The area of each face shall be equal to at least 75% of the smallest mid-sectional area of the piece. When two fractured faces are contiguous, the angle between the planes of fractures shall be at least 30 degrees to count as two fractured faces.

² A flat particle is one having a ratio of width to thickness greater than five (5); an elongated particle is one having a ratio of length to width greater than five (5).

³ Only required if slag is specified.

b. Fine aggregate. Fine aggregate shall consist of clean, sound, tough, durable, angular shaped particles produced by crushing stone, slag, or gravel and shall be free from coatings of clay, silt, or other objectionable matter. Natural (non-manufactured) sand may be used to obtain the gradation of the fine aggregate blend or to improve the workability of the mix. Fine aggregate material requirements are listed in the table below.

Fine Aggregate Material Requirements

Material Test	Requirement	Standard
Liquid limit	25 maximum	ASTM D4318
Plasticity Index	4 maximum	ASTM D4318
Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate	Loss after 5 cycles: 10% maximum using Sodium sulfate - or - 15% maximum using magnesium sulfate	ASTM C88
Clay lumps and friable particles	1.0% maximum	ASTM C142
Sand equivalent	45 minimum	ASTM D2419

c. Sampling. ASTM D75 shall be used in sampling coarse and fine aggregate.

401-2.2 Mineral filler. Mineral filler (baghouse fines) may be added in addition to material naturally present in the aggregate. Mineral filler shall meet the requirements of ASTM D242.

Mineral Filler Requirements

Material Test	Requirement	Standard
Plasticity Index	4 maximum	ASTM D4318

401-2.3 Asphalt binder. Asphalt binder shall conform to ASTM D6373 Performance Grade (PG) 70-16.

Asphalt Binder PG Plus Test Requirements

Material Test	Requirement	Standard
Elastic Recovery	75% minimum	ASTM D6084 ¹

¹ Follow procedure B on RTFO aged binder.

401-2.4 Anti-stripping agent. Any anti-stripping agent or additive (anti-strip) shall be heat stable and shall not change the asphalt binder grade beyond specifications. Anti-strip shall be an approved material of the Department of Transportation of the State in which the project is located.

COMPOSITION

401-3.1 Composition of mixture(s). The asphalt mix shall be composed of a mixture of aggregates, filler and anti-strip agent if required, and asphalt binder. The aggregate fractions shall be sized, handled in separate size groups, and combined in such proportions that the resulting mixture meets the grading requirements of the job mix formula (JMF).

401-3.2 Job mix formula (JMF) laboratory. The laboratory used to develop the JMF shall possess a current certificate of accreditation, listing D3666 from a national accrediting authority and all test methods required for developing the JMF; and be listed on the accrediting authority's website. A copy of the laboratory's current accreditation and accredited test methods shall be submitted to the Resident Project Representative (RPR) prior to start of construction.

401-3.3 Job mix formula (JMF). No asphalt mixture shall be placed until an acceptable mix design has been submitted to the RPR for review and accepted in writing. The RPR's review shall not relieve the Contractor of the responsibility to select and proportion the materials to comply with this section.

When the project requires asphalt mixtures of differing aggregate gradations and/or binders, a separate JMF shall be submitted for each mix. Add anti-stripping agent to meet tensile strength requirements.

The JMF shall be prepared by an accredited laboratory that meets the requirements of paragraph 401-3.2. The asphalt mixture shall be designed using procedures contained in Asphalt Institute MS-2 Mix Design Manual, 7th Edition. Samples shall be prepared and compacted using a Marshall compactor in accordance with ASTM D6926.

Should a change in sources of materials be made, a new JMF must be submitted to the RPR for review and accepted in writing before the new material is used. After the initial production JMF has been approved by the RPR and a new or modified JMF is required for whatever reason, the subsequent cost of the new or modified JMF, including a new control strip when required by the RPR, will be borne by the Contractor.

The RPR may request samples at any time for testing, prior to and during production, to verify the quality of the materials and to ensure conformance with the applicable specifications.

The JMF shall be submitted in writing by the Contractor at least 30 days prior to the start of paving operations. The JMF shall be developed within the same construction season using aggregates proposed for project use.

The JMF shall be dated, and stamped or sealed by the responsible professional Engineer of the laboratory and shall include the following items as a minimum:

- Manufacturer's Certificate of Analysis (COA) for the asphalt binder used in the JMF in accordance with paragraph 401-2.3. Certificate of asphalt performance grade is with modifier already added, if used and must indicate compliance with ASTM D6373. For plant modified asphalt binder, certified test report indicating grade certification of modified asphalt binder.
- Manufacturer's Certificate of Analysis (COA) for the anti-stripping agent if used in the JMF in accordance with paragraph 401-2.4.
- Certified material test reports for the course and fine aggregate and mineral filler in accordance with paragraphs 401-2.1.
- Percent passing each sieve size for individual gradation of each aggregate cold feed and/or hot bin; percent by weight of each cold feed and/or hot bin used; and the total combined gradation in the JMF.
- Specific Gravity and absorption of each coarse and fine aggregate.
- Percent natural sand.
- Percent fractured faces.
- Percent by weight of flat particles, elongated particles, and flat and elongated particles (and criteria).
- Percent of asphalt.
- Number of blows or gyrations

- Laboratory mixing and compaction temperatures.
- Supplier-recommended field mixing and compaction temperatures.
- Plot of the combined gradation on a 0.45 power gradation curve.
- Graphical plots of air voids, voids in the mineral aggregate (VMA), and unit weight versus asphalt content. To achieve minimum VMA during production, the mix design needs to account for material breakdown during production.
- Tensile Strength Ratio (TSR).
- Type and amount of Anti-strip agent when used.
- Asphalt Pavement Analyzer (APA) results.
- Date the JMF was developed. Mix designs that are not dated or which are from a prior construction season shall not be accepted.

Table 1. Asphalt Design Criteria

Test Property	Value	Test Method
Number of blows or gyrations	75	
Air voids (%)	3.5	ASTM D3203
Percent voids in mineral aggregate (VMA), minimum	See Table 2	ASTM D6995
Tensile Strength Ratio (TSR) ¹	not less than 80 at a saturation of 70-80%	ASTM D4867
Asphalt Pavement Analyzer (APA) ^{2,3}	Less than 10 mm @ 4000 passes	AASHTO T340 at 250 psi hose pressure at 64°C test temperature

¹ Test specimens for TSR shall be compacted at 7 ± 1.0 % air voids. In areas subject to freeze-thaw, use freeze-thaw conditioning in lieu of moisture conditioning per ASTM D4867.

² AASHTO T340 at 100 psi hose pressure at 64°C test temperature may be used in the interim. If this method is used the required Value shall be less than 5 mm @ 8000 passes

³ Where APA not available, use Hamburg Wheel test (AASHTO T-324) 10mm @ 20,000 passes at 50°C.

The mineral aggregate shall be of such size that the percentage composition by weight, as determined by laboratory sieves, will conform to the gradation or gradations specified in Table 2 when tested in accordance with ASTM C136 and ASTM C117.

The gradations in Table 2 represent the limits that shall determine the suitability of aggregate for use from the sources of supply; be well graded from coarse to fine and shall not vary from the low limit on one sieve to the high limit on the adjacent sieve, or vice versa.

Table 2. Aggregate - Asphalt Pavements

Sieve Size	Percentage by Weight Passing Sieve
1 inch	--
3/4 inch	100
1/2 inch	90-100
3/8 inch	72-88
No. 4	53-73
No. 8	38-60
No. 16	26-48
No. 30	18-38
No. 50	11-27
No. 100	6-18
No. 200	3-6
Minimum Voids in Mineral Aggregate (VMA)¹	15.0
Asphalt Percent:	
Stone or gravel	5.0-7.5
Slag	6.5-9.5
Recommended Minimum Construction Lift Thickness	2 inch

¹To achieve minimum VMA during production, the mix design needs to account for material breakdown during production.

The aggregate gradations shown are based on aggregates of uniform specific gravity. The percentages passing the various sieves shall be corrected when aggregates of varying specific gravities are used, as indicated in the Asphalt Institute MS-2 Mix Design Manual, 7th Edition.

401-3.4 Reclaimed asphalt pavement (RAP). RAP shall not be used.

401-3.5 Control Strip. Full production shall not begin until an acceptable control strip has been constructed and accepted in writing by the RPR. The Contractor shall prepare and place a quantity of asphalt according to the JMF. The underlying grade or pavement structure upon which the control strip is to be constructed shall be the same as the remainder of the course represented by the control strip.

The Contractor will not be allowed to place the control strip until the Contractor quality control program (CQCP), showing conformance with the requirements of paragraph 401-5.1, has been accepted, in writing, by the RPR.

The control strip will consist of at least 250 tons or 1/2 subplot, whichever is greater. The control strip shall be placed in two lanes of the same width and depth to be used in production with a longitudinal cold joint. The cold joint must be cut back in accordance with paragraph 401-4.14 using the same procedure that will be used during production. The cold joint for the control strip will be an exposed construction joint at least four (4) hours old or when the mat has cooled to

less than 160°F. The equipment used in construction of the control strip shall be the same type, configuration and weight to be used on the project.

The control strip will be considered acceptable by the RPR if the gradation, asphalt content, and VMA are within the action limits specified in paragraph 401-5.5a; and Mat density greater than or equal to 94.5%, air voids 3.5% +/- 1%, and joint density greater than or equal to 92.5%.

If the control strip is unacceptable, necessary adjustments to the JMF, plant operation, placing procedures, and/or rolling procedures shall be made and another control strip shall be placed. Unacceptable control strips shall be removed at the Contractor's expense.

The control strip will be considered one lot for payment based upon the average of a minimum of 3 samples (no sublots required for control strip). Payment will only be made for an acceptable control strip in accordance with paragraph 401-8.1 using a lot pay factor equal to 100.

CONSTRUCTION METHODS

401-4.1 Weather limitations. The asphalt shall not be placed upon a wet surface or when the surface temperature of the underlying course is less than specified in Table 4. The temperature requirements may be waived by the RPR, if requested; however, all other requirements including compaction shall be met.

Table 4. Surface Temperature Limitations of Underlying Course

Mat Thickness	Base Temperature (Minimum)	
	°F	°C
3 inches or greater	40 ¹	4
Greater than 2 inches but less than 3 inches	45	7

401-4.2 Asphalt plant. Plants used for the preparation of asphalt shall conform to the requirements of American Association of State Highway and Transportation Officials (AASHTO) M156 including the following items.

a. Inspection of plant. The RPR, or RPR's authorized representative, shall have access, at all times, to all areas of the plant for checking adequacy of equipment; inspecting operation of the plant: verifying weights, proportions, and material properties; and checking the temperatures maintained in the preparation of the mixtures.

b. Storage bins and surge bins. The asphalt mixture stored in storage and/or surge bins shall meet the same requirements as asphalt mixture loaded directly into trucks. Asphalt mixture shall not be stored in storage and/or surge bins for a period greater than twelve (12) hours. If the RPR determines there is an excessive heat loss, segregation, or oxidation of the asphalt mixture due to temporary storage, temporary storage shall not be allowed.

401-4.3 Aggregate stockpile management. Aggregate stockpiles shall be constructed in a manner that prevents segregation and intermixing of deleterious materials. Aggregates from different sources shall be stockpiled, weighed and batched separately at the asphalt batch plant. Aggregates that have become segregated or mixed with earth or foreign material shall not be used.

A continuous supply of materials shall be provided to the work to ensure continuous placement.

401-4.4 Hauling equipment. Trucks used for hauling asphalt shall have tight, clean, and smooth metal beds. To prevent the asphalt from sticking to the truck beds, the truck beds shall be lightly coated with a minimum amount of paraffin oil, lime solution, or other material approved by the RPR. Petroleum products shall not be used for coating truck beds. Each truck shall have a suitable cover to protect the mixture from adverse weather. When necessary, to ensure that the mixture will be delivered to the site at the specified temperature, truck beds shall be insulated or heated and covers shall be securely fastened.

401-4.4.1 Material transfer vehicle (MTV). Material transfer vehicles used to transfer the material from the hauling equipment to the paver, shall use a self-propelled, material transfer vehicle with a swing conveyor that can deliver material to the paver without making contact with the paver. The MTV shall be able to move back and forth between the hauling equipment and the paver providing material transfer to the paver, while allowing the paver to operate at a constant speed. The Material Transfer Vehicle will have remixing and storage capability to prevent physical and thermal segregation.

401-4.5 Asphalt pavers. Asphalt pavers shall be self-propelled with an activated heated screed, capable of spreading and finishing courses of asphalt that will meet the specified thickness, smoothness, and grade. The paver shall have sufficient power to propel itself and the hauling equipment without adversely affecting the finished surface. The asphalt paver shall be equipped with a control system capable of automatically maintaining the specified screed grade and elevation.

If the spreading and finishing equipment in use leaves tracks or indented areas, or produces other blemishes in the pavement that are not satisfactorily corrected by the scheduled operations, the use of such equipment shall be discontinued.

The paver shall be capable of paving to a minimum width specified in paragraph 401-4.12.

401-4.6 Rollers. The number, type, and weight of rollers shall be sufficient to compact the asphalt to the required density while it is still in a workable condition without crushing of the aggregate, depressions or other damage to the pavement surface. Rollers shall be in good condition, clean, and capable of operating at slow speeds to avoid displacement of the asphalt. All rollers shall be specifically designed and suitable for compacting asphalt concrete and shall be properly used. Rollers that impair the stability of any layer of a pavement structure or underlying soils shall not be used.

401-4.7 Density device. The Contractor shall have on site a density gauge during all paving operations in order to assist in the determination of the optimum rolling pattern, type of roller and frequencies, as well as to monitor the effect of the rolling operations during production paving. The Contractor shall supply a qualified technician during all paving operations to calibrate the gauge and obtain accurate density readings for all new asphalt. These densities shall be supplied to the RPR upon request at any time during construction. No separate payment will be made for supplying the density gauge and technician.

401-4.8 Preparation of asphalt binder. The asphalt binder shall be heated in a manner that will avoid local overheating and provide a continuous supply of the asphalt binder to the mixer at a uniform temperature. The temperature of unmodified asphalt binder delivered to the mixer shall be sufficient to provide a suitable viscosity for adequate coating of the aggregate particles, but shall not exceed 325°F when added to the aggregate. The temperature of modified asphalt binder shall be no more than 350°F when added to the aggregate.

401-4.9 Preparation of mineral aggregate. The aggregate for the asphalt shall be heated and dried. The maximum temperature and rate of heating shall be such that no damage occurs to the aggregates. The temperature of the aggregate and mineral filler shall not exceed 350°F

when the asphalt binder is added. Particular care shall be taken that aggregates high in calcium or magnesium content are not damaged by overheating. The temperature shall not be lower than is required to obtain complete coating and uniform distribution on the aggregate particles and to provide a mixture of satisfactory workability.

401-4.10 Preparation of Asphalt mixture. The aggregates and the asphalt binder shall be weighed or metered and mixed in the amount specified by the JMF. The combined materials shall be mixed until the aggregate obtains a uniform coating of asphalt binder and is thoroughly distributed throughout the mixture. Wet mixing time shall be the shortest time that will produce a satisfactory mixture, but not less than 25 seconds for batch plants. The wet mixing time for all plants shall be established by the Contractor, based on the procedure for determining the percentage of coated particles described in ASTM D2489, for each individual plant and for each type of aggregate used. The wet mixing time will be set to achieve 95% of coated particles. For continuous mix plants, the minimum mixing time shall be determined by dividing the weight of its contents at operating level by the weight of the mixture delivered per second by the mixer. The moisture content of all asphalt upon discharge shall not exceed 0.5%.

401-4.11 Application of Prime and Tack Coat. Immediately before placing the asphalt mixture, the underlying course shall be cleaned of all dust and debris.

A tack coat shall be applied in accordance with Item P-603 to all vertical and horizontal asphalt and concrete surfaces prior to placement of the first and each subsequent lift of asphalt mixture.

401-4.12 Laydown plan, transporting, placing, and finishing. Prior to the placement of the asphalt, the Contractor shall prepare a laydown plan with the sequence of paving lanes and width to minimize the number of cold joints; the location of any temporary ramps; laydown temperature; and estimated time of completion for each portion of the work (milling, paving, rolling, cooling, etc.). The laydown plan and any modifications shall be approved by the RPR.

Deliveries shall be scheduled so that placing and compacting of asphalt is uniform with minimum stopping and starting of the paver. Hauling over freshly placed material shall not be permitted until the material has been compacted, as specified, and allowed to cool to approximately ambient temperature. The Contractor, at their expense, shall be responsible for repair of any damage to the pavement caused by hauling operations.

Contractor shall survey each lift of asphalt surface course and certify to RPR that every lot of each lift meets the grade tolerances of paragraph 401-6.2d before the next lift can be placed.

Edges of existing asphalt pavement abutting the new work shall be saw cut and the cut off material and laitance removed. Apply a tack coat in accordance with P-603 before new asphalt material is placed against it.

The speed of the paver shall be regulated to eliminate pulling and tearing of the asphalt mat. Placement of the asphalt mix shall begin along the centerline of a crowned section or on the high side of areas with a one way slope unless shown otherwise on the laydown plan as accepted by the RPR. The asphalt mix shall be placed in consecutive adjacent lanes having a minimum width of 10 feet except where edge lanes require less width to complete the area. Additional screed sections attached to widen the paver to meet the minimum lane width requirements must include additional auger sections to move the asphalt mixture uniformly along the screed extension.

The longitudinal joint in one course shall offset the longitudinal joint in the course immediately below by at least one foot; however, the joint in the surface top course shall be at the centerline of crowned pavements. Transverse joints in one course shall be offset by at least 10 feet from transverse joints in the previous course. Transverse joints in adjacent lanes shall be offset a

minimum of 10 feet. On areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impractical, the asphalt may be spread and luted by hand tools.

The RPR may at any time, reject any batch of asphalt, on the truck or placed in the mat, which is rendered unfit for use due to contamination, segregation, incomplete coating of aggregate, or overheated asphalt mixture. Such rejection may be based on only visual inspection or temperature measurements. In the event of such rejection, the Contractor may take a representative sample of the rejected material in the presence of the RPR, and if it can be demonstrated in the laboratory, in the presence of the RPR, that such material was erroneously rejected, payment will be made for the material at the contract unit price.

Areas of segregation in the surface course, as determined by the RPR, shall be removed and replaced at the Contractor's expense. The area shall be removed by saw cutting and milling a minimum of the construction lift thickness as specified in paragraph 401-3.3, Table 2 for the approved mix design. The area to be removed and replaced shall be a minimum width of the paver and a minimum of 10 feet long.

401-4.13 Compaction of asphalt mixture. After placing, the asphalt mixture shall be thoroughly and uniformly compacted by self-propelled rollers. The surface shall be compacted as soon as possible when the asphalt has attained sufficient stability so that the rolling does not cause undue displacement, cracking or shoving. The sequence of rolling operations and the type of rollers used shall be at the discretion of the Contractor. The speed of the roller shall, at all times, be sufficiently slow to avoid displacement of the hot mixture and be effective in compaction. Any surface defects and/or displacement occurring as a result of the roller, or from any other cause, shall be corrected at the Contractor's expense.

Sufficient rollers shall be furnished to handle the output of the plant. Rolling shall continue until the surface is of uniform texture, true to grade and cross-section, and the required field density is obtained. To prevent adhesion of the asphalt to the roller, the wheels shall be equipped with a scraper and kept moistened with water as necessary.

In areas not accessible to the roller, the mixture shall be thoroughly compacted with approved power tampers.

Any asphalt that becomes loose and broken, mixed with dirt, contains check-cracking, or in any way defective shall be removed and replaced with fresh hot mixture and immediately compacted to conform to the surrounding area. This work shall be done at the Contractor's expense. Skin patching shall not be allowed.

401-4.14 Joints. The formation of all joints shall be made to ensure a continuous bond between the courses and obtain the required density. All joints shall have the same texture as other sections of the course and meet the requirements for smoothness and grade.

The roller shall not pass over the unprotected end of the freshly laid asphalt except when necessary to form a transverse joint. When necessary to form a transverse joint, it shall be made by means of placing a bulkhead or by tapering the course. The tapered edge shall be cut back to its full depth and width on a straight line to expose a vertical face prior to placing the adjacent lane. In both methods, all contact surfaces shall be coated with an asphalt tack coat before placing any fresh asphalt against the joint.

Longitudinal joints which have been left exposed for more than four (4) hours; the surface temperature has cooled to less than 175°F; or are irregular, damaged, uncompacted or otherwise defective shall be cut back with a cutting wheel or pavement saw a maximum of 3 inches to expose a clean, sound, uniform vertical surface for the full depth of the course. All

cutback material and any laitance produced from cutting joints shall be removed from the project. Asphalt tack coat in accordance with P-603 shall be applied to the clean, dry joint prior to placing any additional fresh asphalt against the joint. The cost of this work shall be considered incidental to the cost of the asphalt.

401-4.15 Saw-cut grooving. Saw-cut grooves shall be provided as specified in Item P-621. Saw-cut grooving is not required.

401-4.16 Diamond grinding. Diamond grinding shall be completed prior to pavement grooving. Diamond grinding shall be accomplished by sawing with saw blades impregnated with industrial diamond abrasive.

Diamond grinding shall be performed with a machine designed specifically for diamond grinding capable of cutting a path at least 3 feet wide. The saw blades shall be 1/8-inch wide with a sufficient number of blades to create grooves between 0.090 and 0.130 inches wide; and peaks and ridges approximately 1/32 inch higher than the bottom of the grinding cut. The actual number of blades will be determined by the Contractor and depend on the hardness of the aggregate. Equipment or grinding procedures that cause raveling, aggregate fractures, spalls or disturbance to the pavement will not be permitted. Contractor shall demonstrate to the RPR that the grinding equipment will produce satisfactory results prior to making corrections to surfaces. Grinding will be tapered in all directions to provide smooth transitions to areas not requiring grinding. The slurry resulting from the grinding operation shall be continuously removed and the pavement left in a clean condition. The Contractor shall apply a surface treatment per P-608 to all areas that have been subject to grinding.

401-4.17 Nighttime paving requirements. The Contractor shall provide adequate lighting during any nighttime construction. A lighting plan shall be submitted by the Contractor and approved by the RPR prior to the start of any nighttime work. All work shall be in accordance with the approved CSPP and lighting plan.

CONTRACTOR QUALITY CONTROL (CQC)

401-5.1 General. The Contractor shall develop a Contractor Quality Control Program (CQCP) in accordance with Item C-100. No partial payment will be made for materials without an approved CQCP.

401-5.2 Contractor quality control (QC) facilities. The Contractor shall provide or contract for testing facilities in accordance with Item C-100. The RPR shall be permitted unrestricted access to inspect the Contractor's QC facilities and witness QC activities. The RPR will advise the Contractor in writing of any noted deficiencies concerning the QC facility, equipment, supplies, or testing personnel and procedures. When the deficiencies are serious enough to be adversely affecting the test results, the incorporation of the materials into the work shall be suspended immediately and will not be permitted to resume until the deficiencies are satisfactorily corrected.

401-5.3 Contractor QC testing. The Contractor shall perform all QC tests necessary to control the production and construction processes applicable to these specifications and as set forth in the approved CQCP. The testing program shall include, but not necessarily be limited to, tests for the control of asphalt content, aggregate gradation, temperatures, aggregate moisture, field compaction, and surface smoothness. A QC Testing Plan shall be developed as part of the CQCP.

a. Asphalt content. A minimum of two tests shall be performed per day in accordance with ASTM D6307 or ASTM D2172 for determination of asphalt content. When using ASTM D6307, the correction factor shall be determined as part of the first test performed at the beginning of plant production; and as part of every tenth test performed thereafter. The asphalt content for the day will be determined by averaging the test results.

b. Gradation. Aggregate gradations shall be determined a minimum of twice per day from mechanical analysis of extracted aggregate in accordance with ASTM D5444, ASTM C136, and ASTM C117.

c. Moisture content of aggregate. The moisture content of aggregate used for production shall be determined a minimum of once per day in accordance with ASTM C566.

d. Moisture content of asphalt. The moisture content shall be determined once per day in accordance with AASHTO T329 or ASTM D1461.

e. Temperatures. Temperatures shall be checked, at least four times per day, at necessary locations to determine the temperatures of the dryer, the asphalt binder in the storage tank, the asphalt at the plant, and the asphalt at the job site.

f. In-place density monitoring. The Contractor shall conduct any necessary testing to ensure that the specified density is being achieved. A nuclear gauge may be used to monitor the pavement density in accordance with ASTM D2950.

g. Smoothness for Contractor Quality Control.

The Contractor shall perform smoothness testing in transverse and longitudinal directions daily to verify that the construction processes are producing pavement with variances less than ¼ inch in 12 feet, identifying areas that may pond water which could lead to hydroplaning of aircraft. If the smoothness criteria is not met, appropriate changes and corrections to the construction process shall be made by the Contractor before construction continues

The Contractor may use a 12-foot "straightedge, a rolling inclinometer meeting the requirements of ASTM E2133 or rolling external reference device that can simulate a 12-foot straightedge approved by the RPR. Straight-edge testing shall start with one-half the length of the straightedge at the edge of pavement section being tested and then moved ahead one-half the length of the straightedge for each successive measurement. Testing shall be continuous across all joints. The surface irregularity shall be determined by placing the freestanding (unleveled) straightedge on the pavement surface and allowing it to rest upon the two highest spots covered by its length, and measuring the maximum gap between the straightedge and the pavement surface in the area between the two high points. If the rolling inclinometer or external reference device is used, the data may be evaluated using either the FAA profile program, ProFAA, or FHWA ProVal, using the 12-foot straightedge simulation function.

Smoothness readings shall not be made across grade changes or cross slope transitions. The transition between new and existing pavement shall be evaluated separately for conformance with the plans.

(1) Transverse measurements. Transverse measurements shall be taken for each day's production placed. Transverse measurements shall be taken perpendicular to the pavement centerline each 50 feet or more often as determined by the RPR. The joint between lanes shall be tested separately to facilitate smoothness between lanes.

(2) Longitudinal measurements. Longitudinal measurements shall be taken for each day's production placed. Longitudinal tests shall be parallel to the centerline of paving; at the center of paving lanes when widths of paving lanes are less than 20 feet; and at the third points of paving lanes when widths of paving lanes are 20 ft or greater. When placement abuts

previously placed material the first measurement shall start with one half the length of the straight edge on the previously placed material.

Deviations on the final surface course in either the transverse or longitudinal direction that will trap water greater than 1/4 inch shall be corrected with diamond grinding per paragraph 401-4.16 or by removing and replacing the surface course to full depth. Grinding shall be tapered in all directions to provide smooth transitions to areas not requiring grinding. All areas in which diamond grinding has been performed shall be subject to the final pavement thickness tolerances specified in paragraph 401-6.1d(3). Areas that have been ground shall be sealed with a surface treatment in accordance with Item P-608. To avoid the surface treatment creating any conflict with runway or taxiway markings, it may be necessary to seal a larger area.

Control charts shall be kept to show area of each day's placement and the percentage of corrective grinding required. Corrections to production and placement shall be initiated when corrective grinding is required. If the Contractor's machines and/or methods produce significant areas that need corrective actions in excess of 10 percent of a day's production, production shall be stopped until corrective measures are implemented by the Contractor.

h. Grade. Grade shall be evaluated daily to allow adjustments to paving operations when grade measurements do not meet specifications. As a minimum, grade shall be evaluated prior to and after the placement of the first lift and after placement of the surface lift.

Measurements will be taken at appropriate gradelines (as a minimum at center and edges of paving lane) and longitudinal spacing as shown on cross-sections and plans. The final surface of the pavement will not vary from the gradeline elevations and cross-sections shown on the plans by more than 1/2 inch vertically and 0.1 feet laterally. The documentation will be provided by the Contractor to the RPR within 24 hours.

Areas with humps or depressions that exceed grade or smoothness criteria and that retain water on the surface must be ground off provided the course thickness after grinding is not more than 1/2 inch less than the thickness specified on the plans. Grinding shall be in accordance with paragraph 401-4.16.

The Contractor shall repair low areas or areas that cannot be corrected by grinding by removal of deficient areas to the depth of the final course plus 1/2 inch and replacing with new material. Skin patching is not allowed.

401-5.4 Sampling. When directed by the RPR, the Contractor shall sample and test any material that appears inconsistent with similar material being sampled, unless such material is voluntarily removed and replaced or deficiencies corrected by the Contractor. All sampling shall be in accordance with standard procedures specified.

401-5.5 Control charts. The Contractor shall maintain linear control charts for both individual measurements and range (i.e. difference between highest and lowest measurements) for aggregate gradation, asphalt content, and VMA. The VMA for each day will be calculated and monitored by the QC laboratory.

Control charts shall be posted in a location satisfactory to the RPR and kept current. As a minimum, the control charts shall identify the project number, the contract item number, the test number, each test parameter, the Action and Suspension Limits applicable to each test parameter, and the Contractor's test results. The Contractor shall use the control charts as part of a process control system for identifying potential problems and assignable causes before they occur. If the Contractor's projected data during production indicates a problem and the Contractor is not taking satisfactory corrective action, the RPR may suspend production or acceptance of the material.

a. Individual measurements. Control charts for individual measurements shall be established to maintain process control within tolerance for aggregate gradation, asphalt content, and VMA. The control charts shall use the job mix formula target values as indicators of central tendency for the following test parameters with associated Action and Suspension Limits:

Control Chart Limits for Individual Measurements

Sieve	Action Limit	Suspension Limit
3/4 inch	±6%	±9%
1/2 inch	±6%	±9%
3/8 inch	±6%	±9%
No. 4	±6%	±9%
No. 16	±5%	±7.5%
No. 50	±3%	±4.5%
No. 200	±2%	±3%
Asphalt Content	±0.45%	±0.70%
Minimum VMA	-0.5%	-1.0%

b. Range. Control charts shall be established to control gradation process variability. The range shall be plotted as the difference between the two test results for each control parameter. The Suspension Limits specified below are based on a sample size of n = 2. Should the Contractor elect to perform more than two tests per lot, the Suspension Limits shall be adjusted by multiplying the Suspension Limit by 1.18 for n = 3 and by 1.27 for n = 4.

Control Chart Limits Based on Range

Sieve	Suspension Limit
1/2 inch	11%
3/8 inch	11%
No. 4	11%
No. 16	9%
No. 50	6%
No. 200	3.5%
Asphalt Content	0.8%

c. Corrective Action. The CQCP shall indicate that appropriate action shall be taken when the process is believed to be out of tolerance. The Plan shall contain rules to gauge when a process is out of control and detail what action will be taken to bring the process into control. As a minimum, a process shall be deemed out of control and production stopped and corrective action taken, if:

- (1) One point falls outside the Suspension Limit line for individual measurements or range; or
- (2) Two points in a row fall outside the Action Limit line for individual measurements.

401-5.6 QC reports. The Contractor shall maintain records and shall submit reports of QC activities daily, in accordance with Item C-100.

MATERIAL ACCEPTANCE

401-6.1 Acceptance sampling and testing. Unless otherwise specified, all acceptance sampling and testing necessary to determine conformance with the requirements specified in this section will be performed by the RPR at no cost to the Contractor except that coring as required in this section shall be completed and paid for by the Contractor.

a. Quality assurance (QA) testing laboratory. The QA testing laboratory performing these acceptance tests will be accredited in accordance with ASTM D3666. The QA laboratory accreditation will be current and listed on the accrediting authority's website. All test methods required for acceptance sampling and testing will be listed on the lab accreditation.

b. Lot size. A standard lot will be equal to one day's production divided into approximately equal sublots of between 400 to 600 tons. When only one or two sublots are produced in a day's production, the sublots will be combined with the production lot from the previous or next day.

Where more than one plant is simultaneously producing asphalt for the job, the lot sizes will apply separately for each plant.

c. Asphalt air voids. Plant-produced asphalt will be tested for air voids on a subplot basis.

(1) Sampling. Material from each subplot shall be sampled in accordance with ASTM D3665. Samples shall be taken from material deposited into trucks at the plant or at the job site in accordance with ASTM D979. The sample of asphalt may be put in a covered metal tin and placed in an oven for not less than 30 minutes nor more than 60 minutes, or not less than 60 minutes nor more than 90 minutes when absorptive aggregates are used, to maintain the material at or above the compaction temperature as specified in the JMF.

(2) Testing. Air voids will be determined for each subplot in accordance with ASTM D3203 for a set of three compacted specimens prepared in accordance with ASTM D6926.

d. In-place asphalt mat and joint density. Each subplot will be tested for in-place mat and joint density as a percentage of the theoretical maximum density (TMD).

(1) Sampling. The Contractor will cut minimum 5 inch diameter samples in accordance with ASTM D5361. The Contractor shall furnish all tools, labor, and materials for cleaning, and filling the cored pavement. Laitance produced by the coring operation shall be removed immediately after coring, and core holes shall be filled within one day after sampling in a manner acceptable to the RPR.

(2) Bond. Each lift of asphalt shall be bonded to the underlying layer. If cores reveal that the surface is not bonded, additional cores shall be taken as directed by the RPR to determine the extent of unbonded areas. Unbonded areas shall be removed by milling and replaced at no additional cost as directed by the RPR.

(3) Thickness. Thickness of each lift of surface course will be evaluated by the RPR for compliance to the requirements shown on the plans after any necessary corrections for grade. Measurements of thickness will be made using the cores extracted for each subplot for density measurement. The maximum allowable deficiency at any point will not be more than 1/4 inch less than the thickness indicated for the lift. Average thickness of lift, or combined lifts, will not be less than the indicated thickness. Where the thickness tolerances are not met, the lot or subplot shall be corrected by the Contractor at his expense by removing the deficient area and

replacing with new pavement. The Contractor, at his expense, may take additional cores as approved by the RPR to circumscribe the deficient area.

(4) Mat density. One core shall be taken from each subplot. Core locations will be determined by the RPR in accordance with ASTM D3665. Cores for mat density shall not be taken closer than one foot from a transverse or longitudinal joint. The bulk specific gravity of each cored sample will be determined in accordance with ASTM D2726. The percent compaction (density) of each sample will be determined by dividing the bulk specific gravity of each subplot sample by the TMD for that subplot.

(5) Joint density. One core centered over the longitudinal joint shall be taken for each subplot that has a longitudinal joint. Core locations will be determined by the RPR in accordance with ASTM D3665. The bulk specific gravity of each core sample will be determined in accordance with ASTM D2726. The percent compaction (density) of each sample will be determined by dividing the bulk specific gravity of each joint density sample by the average TMD for the lot. The TMD used to determine the joint density at joints formed between lots will be the lower of the average TMD values from the adjacent lots.

401-6.2 Acceptance criteria.

a. General. Acceptance will be based on the implementation of the Contractor Quality Control Program (CQCP) and the following characteristics of the asphalt and completed pavements: air voids, mat density, joint density, grade.

b. Air Voids and Mat density. Acceptance of each lot of plant produced material for mat density and air voids will be based on the percentage of material within specification limits (PWL). If the PWL of the lot equals or exceeds 90%, the lot will be acceptable. Acceptance and payment will be determined in accordance with paragraph 401-8.1.

c. Joint density. Acceptance of each lot of plant produced asphalt for joint density will be based on the PWL. If the PWL of the lot is equal to or exceeds 90%, the lot will be considered acceptable. If the PWL is less than 90%, the Contractor shall evaluate the reason and act accordingly. If the PWL is less than 80%, the Contractor shall cease operations and until the reason for poor compaction has been determined. If the PWL is less than 71%, the pay factor for the lot used to complete the joint will be reduced by five (5) percentage points. This lot pay factor reduction will be incorporated and evaluated in accordance with paragraph 401-8.1.

d. Grade. The final finished surface of the pavement shall be surveyed to verify that the grade elevations and cross-sections shown on the plans do not deviate more than 1/2 inch vertically or 0.1 feet laterally.

Cross-sections of the pavement shall be taken at a minimum 50-foot longitudinal spacing, at all longitudinal grade breaks, and at start and end of each lane placed. Minimum cross-section grade points shall include grade at centerline, \pm 10 feet of centerline, and edge of taxiway pavement.

The survey and documentation shall be stamped and signed by a licensed surveyor. Payment for sublots that do not meet grade for over 25% of the subplot shall not be more than 95%.

e. Profilograph roughness for QA Acceptance. Not used.

401-6.3 Percentage of material within specification limits (PWL). The PWL will be determined in accordance with procedures specified in Item C-110. The specification tolerance limits (L) for lower and (U) for upper are contained in Table 5.

Table 5. Acceptance Limits for Air Voids and Density

Test Property	Pavements Specification Tolerance Limits	
	L	U
Air Voids Total Mix (%)	2.0	5.0
Surface Course Mat Density (%)	92.8	-
Base Course Mat Density (%)	92.0	-
Joint density (%)	90.5	--

a. Outliers. All individual tests for mat density and air voids will be checked for outliers (test criterion) in accordance with ASTM E178, at a significance level of 5%. Outliers will be discarded, and the PWL will be determined using the remaining test values. The criteria in Table 5 is based on production processes which have a variability with the following standard deviations: Surface Course Mat Density (%), 1.30; Base Course Mat Density (%), 1.55; Joint Density (%), 1.55.

The Contractor should note that (1) 90 PWL is achieved when consistently producing a surface course with an average mat density of at least 94.5% with 1.30% or less variability, (2) 90 PWL is achieved when consistently producing a base course with an average mat density of at least 94.0% with 1.55% or less variability, and (3) 90 PWL is achieved when consistently producing joints with an average joint density of at least 92.5% with 1.55% or less variability.

401-6.4 Resampling pavement for mat density.

a. General. Resampling of a lot of pavement will only be allowed for mat density, and then, only if the Contractor requests same, in writing, within 48 hours after receiving the written test results from the RPR. A retest will consist of all the sampling and testing procedures contained in paragraphs 401-6.1d and 401-6.2b. Only one resampling per lot will be permitted.

(1) A redefined PWL will be calculated for the resampled lot. The number of tests used to calculate the redefined PWL will include the initial tests made for that lot plus the retests.

(2) The cost for resampling and retesting shall be borne by the Contractor.

b. Payment for resampled lots. The redefined PWL for a resampled lot will be used to calculate the payment for that lot in accordance with Table 6.

c. Outliers. Check for outliers in accordance with ASTM E178, at a significance level of 5%.

METHOD OF MEASUREMENT

401-7.1 Measurement. Asphalt shall be measured by the number of tons of asphalt used in the accepted work. Batch weights or truck scale weights will be used to determine the basis for the tonnage.

BASIS OF PAYMENT

401-8.1 Payment. Payment for a lot of asphalt meeting all acceptance criteria as specified in paragraph 401-6.2 shall be made based on results of tests for mat density and air voids.

Payment for acceptable lots shall be adjusted according to paragraph 401-8.1c for mat density and air voids; and paragraph 401-6.2c for joint density, subject to the limitation that:

a. The total project payment for plant mix asphalt pavement shall not exceed 100 percent of the product of the contract unit price and the total number of tons of asphalt used in the accepted work.

b. The price shall be compensation for furnishing all materials, for all preparation, mixing, and placing of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

c. Basis of adjusted payment. The pay factor for each individual lot shall be calculated in accordance with Table 6. A pay factor shall be calculated for both mat density and air voids. The lot pay factor shall be the higher of the two values when calculations for both mat density and air voids are 100% or higher. The lot pay factor shall be the product of the two values when only one of the calculations for either mat density or air voids is 100% or higher. The lot pay factor shall be the lower of the two values when calculations for both mat density and air voids are less than 100%. If PWL for joint density is less than 71% then the lot pay factor shall be reduced by 5% but be no higher than 95%.

For each lot accepted, the adjusted contract unit price shall be the product of the lot pay factor for the lot and the contract unit price. Payment shall be subject to the total project payment limitation specified in paragraph 401-8.1a. Payment in excess of 100% for accepted lots of asphalt shall be used to offset payment for accepted lots of asphalt pavement that achieve a lot pay factor less than 100%.

Payment for sublots which do not meet grade in accordance with paragraph 401-6.2d after correction for over 25% of the subplot shall be reduced by 5%.

Table 6. Price adjustment schedule¹

Percentage of material within specification limits (PWL)	Lot pay factor (percent of contract unit price)
96 – 100	106
90 – 95	PWL + 10
75 – 89	0.5 PWL + 55
55 – 74	1.4 PWL – 12
Below 55	Reject ²

¹ Although it is theoretically possible to achieve a pay factor of 106% for each lot, actual payment above 100% shall be subject to the total project payment limitation specified in paragraph 401-8.1a.

² The lot shall be removed and replaced. However, the RPR may decide to allow the rejected lot to remain. In that case, if the RPR and Contractor agree in writing that the lot shall not be removed, it shall be paid for at 50% of the contract unit price and the total project payment shall be reduced by the amount withheld for the rejected lot.

d. Profilograph Roughness Not used.

401-8.1 Payment.

Payment will be made under:

- | | |
|----------------|----------------------------------|
| Item P-401-8.1 | Asphalt Surface Course - per ton |
| Item P-401-8.2 | Asphalt Base Course - per ton |

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.

ASTM International (ASTM)

- | | |
|------------|---|
| ASTM C29 | Standard Test Method for Bulk Density ("Unit Weight") and Voids in Aggregate |
| ASTM C88 | Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate |
| ASTM C117 | Standard Test Method for Materials Finer than 75- μ m (No. 200) Sieve in Mineral Aggregates by Washing |
| ASTM C127 | Standard Test Method for Density, Relative Density (Specific Gravity) and Absorption of Coarse Aggregate |
| ASTM C131 | Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine |
| ASTM C136 | Standard Test Method for Sieve or Screen Analysis of Fine and Coarse Aggregates |
| ASTM C142 | Standard Test Method for Clay Lumps and Friable Particles in Aggregates |
| ASTM C566 | Standard Test Method for Total Evaporable Moisture Content of Aggregate by Drying |
| ASTM D75 | Standard Practice for Sampling Aggregates |
| ASTM D242 | Standard Specification for Mineral Filler for Bituminous Paving Mixtures |
| ASTM D946 | Standard Specification for Penetration-Graded Asphalt Cement for Use in Pavement Construction |
| ASTM D979 | Standard Practice for Sampling Asphalt Paving Mixtures |
| ASTM D1073 | Standard Specification for Fine Aggregate for Asphalt Paving Mixtures |
| ASTM D1188 | Standard Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Coated Samples |
| ASTM D2172 | Standard Test Method for Quantitative Extraction of Bitumen from Asphalt Paving Mixtures |
| ASTM D1461 | Standard Test Method for Moisture or Volatile Distillates in Asphalt Paving Mixtures |

ASTM D2041	Standard Test Method for Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures
ASTM D2419	Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate
ASTM D2489	Standard Practice for Estimating Degree of Particle Coating of Bituminous-Aggregate Mixtures
ASTM D2726	Standard Test Method for Bulk Specific Gravity and Density of Non-Absorptive Compacted Bituminous Mixtures
ASTM D2950	Standard Test Method for Density of Bituminous Concrete in Place by Nuclear Methods
ASTM D3203	Standard Test Method for Percent Air Voids in Compacted Dense and Open Bituminous Paving Mixtures
ASTM D3381	Standard Specification for Viscosity-Graded Asphalt Cement for Use in Pavement Construction
ASTM D3665	Standard Practice for Random Sampling of Construction Materials
ASTM D3666	Standard Specification for Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials
ASTM D4318	Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D4552	Standard Practice for Classifying Hot-Mix Recycling Agents
ASTM D4791	Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate
ASTM D4867	Standard Test Method for Effect of Moisture on Asphalt Concrete Paving Mixtures
ASTM D5361	Standard Practice for Sampling Compacted Asphalt Mixtures for Laboratory Testing
ASTM D5444	Standard Test Method for Mechanical Size Analysis of Extracted Aggregate
ASTM D5821	Standard Test Method for Determining the Percentage of Fractured Particles in Coarse Aggregate
ASTM D6084	Standard Test Method for Elastic Recovery of Bituminous Materials by Ductilometer
ASTM D6307	Standard Test Method for Asphalt Content of Hot Mix Asphalt by Ignition Method
ASTM D6373	Standard Specification for Performance Graded Asphalt Binder
ASTM D6752	Standard Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Automatic Vacuum Sealing Method
ASTM D6925	Standard Test Method for Preparation and Determination of the Relative Density of Hot Mix Asphalt (HMA) Specimens by Means of the SuperPave Gyrotory Compactor.

ASTM D6926	Standard Practice for Preparation of Bituminous Specimens Using Marshall Apparatus
ASTM D6927	Standard Test Method for Marshall Stability and Flow of Bituminous Mixtures
ASTM D6995	Standard Test Method for Determining Field VMA based on the Maximum Specific Gravity of the Mix (Gmm)
ASTM E11	Standard Specification for Woven Wire Test Sieve Cloth and Test Sieves
ASTM E178	Standard Practice for Dealing with Outlying Observations
ASTM E1274	Standard Test Method for Measuring Pavement Roughness Using a Profilograph
ASTM E950	Standard Test Method for Measuring the Longitudinal Profile of Traveled Surfaces with an Accelerometer Established Inertial Profiling Reference
ASTM E2133	Standard Test Method for Using a Rolling Inclinator to Measure Longitudinal and Transverse Profiles of a Traveled Surface
American Association of State Highway and Transportation Officials (AASHTO)	
AASHTO M156	Standard Specification for Requirements for Mixing Plants for Hot-Mixed, Hot-Laid Bituminous Paving Mixtures.
AASHTO T329	Standard Method of Test for Moisture Content of Hot Mix Asphalt (HMA) by Oven Method
AASHTO T324	Standard Method of Test for Hamburg Wheel-Track Testing of Compacted Asphalt Mixtures
AASHTO T 340	Standard Method of Test for Determining the Rutting Susceptibility of Hot Mix Asphalt (APA) Using the Asphalt Pavement Analyzer (APA)
Asphalt Institute (AI)	
Asphalt Institute Handbook MS-26, Asphalt Binder	
Asphalt Institute MS-2Mix Design Manual, 7th Edition	
AI State Binder Specification Database	
Federal Highway Administration (FHWA)	
Long Term Pavement Performance Binder Program	
Advisory Circulars (AC)	
AC 150/5320-6	Airport Pavement Design and Evaluation
FAA Orders	
5300.1	Modifications to Agency Airport Design, Construction, and Equipment Standards
Software	
FAARFIELD	

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Item P-501 Cement Concrete Pavement

DESCRIPTION

501-1.1 This work shall consist of pavement composed of cement concrete with and without reinforcement constructed on a prepared underlying surface in accordance with these specifications and shall conform to the lines, grades, thickness, and typical cross-sections shown on the plans. The terms cement concrete, hydraulic cement concrete, and concrete are interchangeable in this specification.

MATERIALS

501-2.1 Aggregates.

a. Reactivity. Fine and Coarse aggregates to be used in PCC on this project shall be tested and evaluated by the Contractor for alkali-aggregate reactivity in accordance with both ASTM C1260 and ASTM C1567. Tests must be representative of aggregate sources which will be providing material for production. ASTM C1260 and ASTM C1567 tests may be run concurrently.

(1) Coarse aggregate and fine aggregate shall be tested separately in accordance with ASTM C1260, however, the length of test shall be extended to 28 days (30 days from casting). Tests must have been completed within 6 months of the date of the concrete mix submittal.

(2) The combined coarse and fine aggregate shall be tested in accordance with ASTM C1567, modified for combined aggregates, using the proposed mixture design proportions of aggregates, cementitious materials, and/or specific reactivity reducing chemicals. If the expansion does not exceed 0.10% at 28 days, the proposed combined materials will be accepted. If the expansion is greater than 0.10% at 28 days, the aggregates will not be accepted unless adjustments to the combined materials mixture can reduce the expansion to less than 0.10% at 28 days, or new aggregates shall be evaluated and tested.

(3) If lithium nitrate is proposed for use with or without supplementary cementitious materials, the aggregates shall be tested in accordance with Corps of Engineers (COE) Concrete Research Division (CRD) C662 in lieu of ASTM C1567. If lithium nitrate admixture is used, it shall be nominal 30% \pm 0.5% weight lithium nitrate in water. If the expansion does not exceed 0.10% at 28 days, the proposed combined materials will be accepted. If the expansion is greater than 0.10% at 28 days, the aggregates will not be accepted unless adjustments to the combined materials mixture can reduce the expansion to less than 0.10% at 28 days, or new aggregates shall be evaluated and tested.

b. Fine aggregate. Grading of the fine aggregate, as delivered to the mixer, shall conform to the requirements of ASTM C33 and the parameters identified in the fine aggregate material requirements below. Fine aggregate material requirements and deleterious limits are shown in the table below.

Fine Aggregate Material Requirements		
Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate	Loss after 5 cycles: 10% maximum using Sodium sulfate - or - 15% maximum using magnesium sulfate	ASTM C88
Sand Equivalent	45 minimum	ASTM D2419
Fineness Modulus (FM)	$2.50 \leq FM \leq 3.40$	ASTM C136
Limits for Deleterious Substances in Fine Aggregate for Concrete		
Clay lumps and friable particles	1.0% maximum	ASTM C142
Coal and lignite	0.5% using a medium with a density of Sp. Gr. of 2.0	ASTM C123
Total Deleterious Material	1.0% maximum	

c. Coarse aggregate. The maximum size coarse aggregate shall be 1-inch.

Aggregates delivered to the mixer shall be clean, hard, uncoated aggregates consisting of crushed stone, crushed or uncrushed gravel, air-cooled iron blast furnace slag, crushed recycled concrete pavement, or a combination. The aggregates shall have no known history of detrimental pavement staining. Steel blast furnace slag shall not be permitted. Coarse aggregate material requirements and deleterious limits are shown in the table below; washing may be required to meet aggregate requirements.

Coarse Aggregate Material Requirements

Material Test	Requirement	Standard
Resistance to Degradation	Loss: 40% maximum	ASTM C131
Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate	Loss after 5 cycles: 12% maximum using Sodium sulfate - or - 18% maximum using magnesium sulfate	ASTM C88
Flat, Elongated, or Flat and Elongated Particles	8% maximum, by weight, of flat, elongated, or flat and elongated particles at 5:1 for any size group coarser than 3/8 sieve ¹	ASTM D4791
Bulk density of slag ²	Weigh not less than 70 pounds per cubic foot	ASTM C29

¹ A flat particle is one having a ratio of width to thickness greater than five (5); an elongated particle is one having a ratio of length to width greater than five (5).

² Only required if slag is specified.

The amount of deleterious material in the coarse aggregate shall not exceed the following limits:

Limits for Deleterious Substances in Coarse Aggregate

Deleterious material	ASTM	Percentage by Mass
Clay Lumps and friable particles	ASTM C142	1.0
Material finer than No. 200 sieve	ASTM C117	1.0 ¹
Lightweight particles	ASTM C123 using a medium with a density of Sp. Gr. of 2.0	0.5
Chert ² (less than 2.40 Sp Gr.)	ASTM C123 using a medium with a density of Sp. Gr. of 2.40)	0.1 ³

¹ The limit for material finer than 75-µm is allowed to be increased to 1.5% for crushed aggregates consisting of dust of fracture that is essentially free from clay or shale. Test results supporting acceptance of increasing limit to 1.5% with statement indicating material is dust of fracture must be submitted with Concrete mix. Acceptable techniques to characterizing these fines include methylene blue adsorption or X-ray diffraction analysis.

² Chert and aggregates with less than 2.4 specific gravity.

³ The limit for chert may be increased to 1.0 percent by mass in areas not subject to severe freeze and thaw.

d. Combined aggregate gradation. This specification is targeted for a combined aggregate gradation developed following the guidance presented in United States Air Force Engineering Technical Letter (ETL) 97-5: Proportioning Concrete Mixtures with Graded Aggregates for Rigid Airfield Pavements. Base the aggregate grading upon a combination of all the aggregates (coarse and fine) to be used for the mixture proportioning. Three aggregate sizes may be required to achieve an optimized combined gradation that will produce a workable concrete mixture for its intended use. Use aggregate gradations that produce concrete mixtures with well-graded or optimized aggregate combinations. The Contractor shall submit complete mixture information necessary to calculate the volumetric components of the mixture. The combined aggregate grading shall meet the following requirements:

(1) The materials selected and the proportions used shall be such that when the Coarseness Factor (CF) and the Workability Factor (WF) are plotted on a diagram as described in paragraph 501-2.1d(4) below, the point thus determined shall fall within the parallelogram described therein.

(2) The CF shall be determined from the following equation:

$$CF = \frac{\text{(cumulative percent retained on the 3/8 in. sieve)}(100)}{\text{(cumulative percent retained on the No. 8 sieve)}}$$

(3) The WF is defined as the percent passing the No. 8 sieve based on the combined gradation. However, WF shall be adjusted, upwards only, by 2.5 percentage points for each 94 pounds of cementitious material per cubic meter yard greater than 564 pounds per cubic yard.

(4) A diagram shall be plotted using a rectangular scale with WF on the Y-axis with units from 20 (bottom) to 45 (top), and with CF on the X-axis with units from 80 (left side) to 30 (right side). On this diagram a parallelogram shall be plotted with corners at the following coordinates (CF-75, WF-28), (CF-75, WF-40), (CF-45, WF-32.5), and (CF-45, WF-44.5). If the point determined by the intersection of the computed CF and WF does not fall within the above parallelogram, the grading of each size of aggregate used and the proportions selected shall be

changed as necessary. The point determined by the plotting of the CF and WF may be adjusted during production ± 3 WF and ± 5 CF. Adjustments to gradation may not take the point outside of the parallelogram.

e. Contractors combined aggregate gradation. The Contractor shall submit their combined aggregate gradation using the following format:

Contractor's Combined Aggregate Gradation

Sieve Size	Contractor's Concrete mix Gradation (Percent passing by weight)
2 inch	*
1-1/2 inch	*
1 inch	*
3/4 inch	*
1/2 inch	*
3/8 inch	*
No. 4	*
No. 8	*
No. 16	*
No. 30	*
No. 50	*
No. 100	*

501-2.2 Cement. Cement shall conform to the requirements of ASTM C150, Type II.

501-2.3 Cementitious materials.

a. Fly ash. Fly ash shall meet the requirements of ASTM C618, with the exception of loss of ignition, where the maximum shall be less than 6%. Fly ash shall have a Calcium Oxide (CaO) content of less than 15% and a total alkali content less than 3% per ASTM C311. The Contractor shall furnish the previous three most recent, consecutive ASTM C618 reports for each source of fly ash proposed in the concrete mix, and shall furnish each additional report as they become available during the project. The reports can be used for acceptance or the material may be tested independently by the Resident Project Representative (RPR).

b. Slag cement (ground granulated blast furnace (GGBF)). Slag cement shall conform to ASTM C989, Grade 100 or Grade 120. Slag cement shall be used only at a rate between 25% and 55% of the total cementitious material by mass.

c. Raw or calcined natural pozzolan. Natural pozzolan shall be raw or calcined and conform to ASTM C618, Class N, including the optional requirements for uniformity and effectiveness in controlling Alkali-Silica reaction and shall have a loss on ignition not exceeding 6%. Class N pozzolan for use in mitigating Alkali-Silica Reactivity shall have a total available alkali content less than 3%.

d. Ultrafine fly ash and ultrafine pozzolan. UltraFine Fly Ash (UFFA) and UltraFine Pozzolan (UFP) shall conform to ASTM C618, Class F or N, and the following additional requirements:

(1) The strength activity index at 28 days of age shall be at least 95% of the control specimens.

(2) The average particle size shall not exceed 6 microns.

501-2.4 Joint seal. The joint seal for the joints in the concrete pavement shall meet the requirements of Item P-604 or Item P-605 and shall be of the type specified in the plans.

501-2.5 Isolation joint filler. Premolded joint filler for isolation joints shall conform to the requirements of ASTM D1751 or ASTM D1752 and shall be where shown on the plans. The filler for each joint shall be furnished in a single piece for the full depth and width required for the joint, unless otherwise specified by the RPR. When the use of more than one piece is required for a joint, the abutting ends shall be fastened securely and held accurately to shape by stapling or other positive fastening means satisfactory to the RPR.

501-2.6 Steel reinforcement. Reinforcing shall consist of deformed and plain carbon steel bars conforming to the requirements of ASTM A615.

501-2.7 Dowel and tie bars. Dowel bars shall be plain steel bars conforming to ASTM A615 and shall be free from burring or other deformation restricting slippage in the concrete.

a. Dowel Bars. Before delivery to the construction site each dowel bar shall be epoxy coated per ASTM A1078, Type 1, with a coating thickness after curing greater than 10 mils. Patched ends are not required for Type 1 coated dowels. The dowels shall be coated with a bond-breaker recommended by the manufacturer. Dowel sleeves or inserts are not permitted. Grout retention rings shall be fully circular metal or plastic devices capable of supporting the dowel until the grout hardens.

b. Tie Bars. Tie bars shall be deformed steel bars and conform to the requirements of ASTM A615. Tie bars designated as Grade 60 in ASTM A615 or ASTM A706 shall be used for construction requiring bent bars.

501-2.8 Water. Water used in mixing or curing shall be potable. If water is taken from other sources considered non-potable, it shall meet the requirements of ASTM C1602.

501-2.9 Material for curing concrete. Curing materials shall conform to one of the following specifications:

a. Liquid membrane-forming compounds for curing concrete shall conform to the requirements of ASTM C309, Type 2, Class A, or Class B.

b. White polyethylene film for curing concrete shall conform to the requirements of ASTM C171.

c. White burlap-polyethylene sheeting for curing concrete shall conform to the requirements of ASTM C171.

d. Not Used.

501-2.10 Admixtures. Admixtures shall conform to the following specifications:

a. Air-entraining admixtures. Air-entraining admixtures shall meet the requirements of ASTM C260 and shall consistently entrain the air content in the specified ranges under field conditions. The air-entraining agent and any water reducer admixture shall be compatible.

b. Water-reducing admixtures. Water-reducing admixture shall meet the requirements of ASTM C494, Type A, B, or D.

c. Other admixtures. The use of set retarding and set-accelerating admixtures shall be approved by the RPR prior to developing the concrete mix. Retarding admixtures shall meet the

requirements of ASTM C494, Type A, B, or D and set-accelerating admixtures shall meet the requirements of ASTM C494, Type C. Calcium chloride and admixtures containing calcium chloride shall not be used.

d. Lithium Nitrate. The lithium admixture shall be a nominal 30% aqueous solution of Lithium Nitrate, with a density of 10 pounds/gallon, and shall have the approximate chemical form as shown below:

Lithium Admixture

Constituent	Limit (Percent by Mass)
LiNO ₃ (Lithium Nitrate)	30 ±0.5
SO ₄ (Sulfate Ion)	0.1 (max)
Cl (Chloride Ion)	0.2 (max)
Na (Sodium Ion)	0.1 (max)
K (Potassium Ion)	0.1 (max)

The lithium nitrate admixture dispensing and mixing operations shall be verified and certified by the lithium manufacturer's representative.

501-2.11 Epoxy-resin. All epoxy-resin materials shall be two-component materials conforming to the requirements of ASTM C881, Class as appropriate for each application temperature to be encountered, except that in addition, the materials shall meet the following requirements:

- a. Material for use for embedding dowels and anchor bolts shall be Type IV, Grade 3.
- b. Material for use as patching materials for complete filling of spalls and other voids and for use in preparing epoxy resin mortar shall be Type III, Grade as approved.
- c. Material for use for injecting cracks shall be Type IV, Grade 1.
- d. Material for bonding freshly mixed Portland cement concrete or mortar or freshly mixed epoxy resin concrete or mortar to hardened concrete shall be Type V, Grade as approved.

501-2.12 Bond Breaker. Not required.

CONCRETE MIX

501-3.1. General. No concrete shall be placed until an acceptable concrete mix has been submitted to the RPR for review and the RPR has taken appropriate action. The RPR's review shall not relieve the Contractor of the responsibility to select and proportion the materials to comply with this section.

501-3.2 Concrete Mix Laboratory. The laboratory used to develop the concrete mix shall be accredited in accordance with ASTM C1077. The laboratory accreditation must be current and listed on the accrediting authority's website. All test methods required for developing the concrete mix must be included in the lab accreditation. A copy of the laboratory's current accreditation and accredited test methods shall be submitted to the RPR prior to start of construction.

501-3.3 Concrete Mix Proportions. Develop the mix using the procedures contained in Portland Cement Association (PCA) publication, "Design and Control of Concrete Mixtures." Concrete shall be proportioned to achieve a 28-day flexural strength that meets or exceeds the acceptance criteria contained in paragraph 501-6.6 for a flexural strength of 620 psi per ASTM C78.

The minimum cementitious material shall be adequate to ensure a workable, durable mix. The minimum cementitious material (cement plus fly ash, or slag cement) shall be 470 pounds per cubic yard. The ratio of water to cementitious material, including free surface moisture on the aggregates but not including moisture absorbed by the aggregates shall be between 0.38 – 0.45 by weight.

Flexural strength test specimens shall be prepared in accordance with ASTM C192 and tested in accordance with ASTM C78. At the start of the project, the Contractor shall determine an allowable slump as determined by ASTM C143 not to exceed 2 inches for slip-form placement. For fixed-form placement, the slump shall not exceed 3 inches. For hand placement, the slump shall not exceed 4 inches.

The results of the concrete mix shall include a statement giving the maximum nominal coarse aggregate size and the weights and volumes of each ingredient proportioned on a one cubic yard basis. Aggregate quantities shall be based on the mass in a saturated surface dry condition.

If a change in source(s) is made, or admixtures added or deleted from the mix, a new concrete mix must be submitted to the RPR for approval.

The RPR may request samples at any time for testing, prior to and during production, to verify the quality of the materials and to ensure conformance with the applicable specifications.

501-3.4 Concrete Mix submittal. The concrete mix shall be submitted to the RPR at least 30 days prior to the start of operations. The submitted concrete mix shall not be more than 180 days old and must use the materials to be used for production for the project. Production shall not begin until the concrete mix is approved in writing by the RPR.

Each of the submitted concrete mixes (i.e, slip form, side form machine finish and side form hand finish) shall be stamped or sealed by the responsible professional Engineer of the laboratory and shall include the following items and quantities as a minimum:

- Certified material test reports for aggregate in accordance with paragraph 501-2.1. Certified reports must include all tests required; reporting each test, test method, test result, and requirement specified (criteria).
- Combined aggregate gradations and analysis; and including plots of the fine aggregate fineness modulus.
- Reactivity Test Results.
- Coarse aggregate quality test results, including deleterious materials.
- Fine aggregate quality test results, including deleterious materials.
- Mill certificates for cement and supplemental cementitious materials.
- Certified test results for all admixtures, including Lithium Nitrate if applicable.
- Specified flexural strength, slump, and air content.
- Recommended proportions/volumes for proposed mixture and trial water-cementitious materials ratio, including actual slump and air content.

- Flexural and compressive strength summaries and plots, including all individual beam and cylinder breaks.
- Correlation ratios for acceptance testing and Contractor QC testing, when applicable.
- Historical record of test results documenting production standard deviation, when applicable.

501-3.5 Cementitious materials.

a. Fly ash. When fly ash is used as a partial replacement for cement, the replacement rate shall be determined from laboratory trial mixes, and shall be between 20 and 30% by weight of the total cementitious material. If fly ash is used in conjunction with slag cement the maximum replacement rate shall not exceed 10% by weight of total cementitious material.

b. Slag cement (ground granulated blast furnace (GGBF)). Slag cement may be used. The slag cement, or slag cement plus fly ash if both are used, may constitute between 25 to 55% of the total cementitious material by weight.

c. Raw or calcined natural pozzolan. Natural pozzolan may be used in the concrete mix. When pozzolan is used as a partial replacement for cement, the replacement rate shall be determined from laboratory trial mixes, and shall be between 20 and 30% by weight of the total cementitious material. If pozzolan is used in conjunction with slag cement the maximum replacement rate shall not exceed 10% by weight of total cementitious material.

d. Ultrafine fly ash (UFFA) and ultrafine pozzolan (UFP). UFFA and UFP may be used in the concrete mix with the RPR's approval. When UFFA and UFP is used as a partial replacement for cement, the replacement rate shall be determined from laboratory trial mixes, and shall be between 7% and 16% by weight of the total cementitious material.

501-3.6 Admixtures.

a. Air-entraining admixtures. Air-entraining admixture are to be added in such a manner that will ensure uniform distribution of the agent throughout the batch. The air content of freshly mixed air-entrained concrete shall be based upon trial mixes with the materials to be used in the work adjusted to produce concrete of the required plasticity and workability. The percentage of air in the mix shall be 3%. Air content shall be determined by testing in accordance with ASTM C231 for gravel and stone coarse aggregate and ASTM C173 for slag and other highly porous coarse aggregate.

b. Water-reducing admixtures. Water-reducing admixtures shall be added to the mix in the manner recommended by the manufacturer and in the amount necessary to comply with the specification requirements. Tests shall be conducted with the materials to be used in the work, in accordance with ASTM C494.

c. Other admixtures. Set controlling, and other approved admixtures shall be added to the mix in the manner recommended by the manufacturer and in the amount necessary to comply with the specification requirements. Tests shall be conducted with the materials to be used in the work, in accordance with ASTM C494.

d. Lithium nitrate. Lithium nitrate shall be added to the mix in the manner recommended by the manufacturer and in the amount necessary to comply with the specification requirements in accordance with paragraph 501-2.10d.

CONSTRUCTION METHODS

501-4.1 Control Strip. The control strip(s) shall be to the next planned joint after the initial 250 feet of each type of pavement construction (slip-form pilot lane, slip-form fill-in lane, or fixed form). The Contractor shall demonstrate, in the presence of the RPR, that the materials, concrete mix, equipment, construction processes, and quality control processes meet the requirements of the specifications. The concrete mixture shall be extruded from the paver meeting the edge slump tolerance and with little or no finishing. Pilot, fill-in, and fixed-form control strips will be accepted separately. Minor adjustments to the mix design may be required to place an acceptable control strip. The production mix will be the adjusted mix design used to place the acceptable control strip. Upon acceptance of the control strip by the RPR, the Contractor must use the same equipment, materials, and construction methods for the remainder of concrete paving. Any adjustments to processes or materials must be approved in advance by the RPR. Acceptable control strips will meet edge slump tolerance and surface acceptable with little or no finishing, air content within action limits, strength equal or greater than requirements of P501-3.3. The control strip will be considered one lot for payment (no sublots required for control strip). Payment will only be made for an acceptable control strip in accordance with paragraph 501-8.1 using a lot pay factor equal to 100.

501-4.2 Equipment. The Contractor is responsible for the proper operation and maintenance of all equipment necessary for handling materials and performing all parts of the work to meet this specification.

a. Plant and equipment. The plant and mixing equipment shall conform to the requirements of ASTM C94 and/or ASTM C685. Each truck mixer shall have attached in a prominent place a manufacturer's nameplate showing the capacity of the drum in terms of volume of mixed concrete and the speed of rotation of the mixing drum or blades. The truck mixers shall be examined daily for changes in condition due to accumulation of hard concrete or mortar or wear of blades. The pickup and throwover blades shall be replaced when they have worn down 3/4 inch or more. The Contractor shall have a copy of the manufacturer's design on hand showing dimensions and arrangement of blades in reference to original height and depth.

Equipment for transferring and spreading concrete from the transporting equipment to the paving lane in front of the finishing equipment shall be provided. The equipment shall be specially manufactured, self-propelled transfer equipment which will accept the concrete outside the paving lane and will spread it evenly across the paving lane in front of the paver and strike off the surface evenly to a depth which permits the paver to operate efficiently.

b. Finishing equipment.

(1) Slip-form. The standard method of constructing concrete pavements shall be with an approved slip-form paving equipment designed and operated to spread, consolidate, screed, and finish the freshly placed concrete in one complete pass of the machine so that the end result is a dense and homogeneous pavement which is achieved with a minimum of hand finishing. The paver-finisher shall be a heavy duty, self-propelled machine designed specifically for paving and finishing high quality concrete pavements.

(2) Fixed-form. On projects requiring less than 10,000 cubic yards of concrete pavement or irregular areas at locations inaccessible to slip-form paving equipment, concrete pavement may be placed with equipment specifically designed for placement and finishing using stationary side forms. Methods and equipment shall be reviewed and accepted by the RPR. Hand screeding and float finishing may only be used on small irregular areas as allowed by the RPR.

c. Vibrators. Vibrator shall be the internal type. The rate of vibration of each vibrating unit shall be sufficient to consolidate the pavement without segregation or voids. The number, spacing, and frequency shall be as necessary to provide a dense and homogeneous pavement and meet the recommendations of American Concrete Institute (ACI) 309R, Guide for Consolidation of Concrete. Adequate power to operate all vibrators shall be available on the paver. The vibrators shall be automatically controlled so that they shall be stopped as forward motion ceases. The Contractor shall provide an electronic or mechanical means to monitor vibrator status. The checks on vibrator status shall occur a minimum of two times per day or when requested by the RPR.

Hand held vibrators may only be used in irregular areas and shall meet the recommendations of ACI 309R, Guide for Consolidation of Concrete.

d. Concrete saws. The Contractor shall provide sawing equipment adequate in number of units and power to complete the sawing to the required dimensions. The Contractor shall provide at least one standby saw in good working order and a supply of saw blades at the site of the work at all times during sawing operations.

e. Fixed forms. Straight side fixed forms shall be made of steel and shall be furnished in sections not less than 10 feet in length. Forms shall be provided with adequate devices for secure settings so that when in place they will withstand, without visible spring or settlement, the impact and vibration of the consolidating and finishing equipment. Forms with battered top surfaces and bent, twisted or broken forms shall not be used. Built-up forms shall not be used, except as approved by the RPR. The top face of the form shall not vary from a true plane more than 1/8 inch in 10 feet, and the upstanding leg shall not vary more than 1/4 inch. The forms shall contain provisions for locking the ends of abutting sections together tightly for secure setting. Wood forms may be used under special conditions, when approved by the RPR. The forms shall extend the full depth of the pavement section.

501-4.3 Form setting. Forms shall be set to line and grade as shown on the plans, sufficiently in advance of the concrete placement, to ensure continuous paving operation. Forms shall be set to withstand, without visible spring or settlement, the impact and vibration of the consolidating and finishing equipment. Forms shall be cleaned and oiled prior to the concrete placement.

501-4.4 Base surface preparation prior to placement. Any damage to the prepared base, subbase, and subgrade shall be corrected full depth by the Contractor prior to concrete placement. The underlying surface shall be entirely free of frost when concrete is placed. The prepared grade shall be moistened with water, without saturating, immediately ahead of concrete placement to prevent rapid loss of moisture from concrete.

501-4.5 Handling, measuring, and batching material. Aggregate stockpiles shall be constructed and managed in such a manner that prevents segregation and intermixing of deleterious materials. Aggregates from different sources shall be stockpiled, weighed and batched separately at the concrete batch plant. Aggregates that have become segregated or mixed with earth or foreign material shall not be used. All aggregates produced or handled by hydraulic methods, and washed aggregates, shall be stockpiled or binned for draining at least 12 hours before being batched. Store and maintain all aggregates at a uniform moisture content prior to use. A continuous supply of materials shall be provided to the work to ensure continuous placement.

501-4.6 Mixing concrete. The concrete may be mixed at the work site, in a central mix plant or in truck mixers. The mixer shall be of an approved type and capacity. Mixing time shall be measured from the time all materials are placed into the drum until the drum is emptied into the

truck. All concrete shall be mixed and delivered to the site in accordance with the requirements of ASTM C94 or ASTM C685.

Mixed concrete from the central mixing plant shall be transported in truck mixers, truck agitators, or non-agitating trucks. The elapsed time from the addition of cementitious material to the mix until the concrete is discharged from the truck should not exceed 30 minutes when the concrete is hauled in non-agitating trucks, nor 90 minutes when the concrete is hauled in truck mixers or truck agitators. In no case shall the temperature of the concrete when placed exceed 90°F. Retempering concrete by adding water or by other means will not be permitted. With transit mixers additional water may be added to the batch materials and additional mixing performed to increase the slump to meet the specified requirements provided the addition of water is performed within 45 minutes after the initial mixing operations and provided the water/cementitious ratio specified is not exceeded.

501-4.7 Weather Limitations on mixing and placing. No concrete shall be mixed, placed, or finished when the natural light is insufficient, unless an adequate and approved artificial lighting system is operated.

a. Cold weather. Unless authorized in writing by the RPR, mixing and concreting operations shall be discontinued when a descending air temperature in the shade and away from artificial heat reaches 40°F and shall not be resumed until an ascending air temperature in the shade and away from artificial heat reaches 35°F.

The aggregate shall be free of ice, snow, and frozen lumps before entering the mixer. The temperature of the mixed concrete shall not be less than 50°F at the time of placement. Concrete shall not be placed on frozen material nor shall frozen aggregates be used in the concrete.

When concreting is authorized during cold weather, water and/or the aggregates may be heated to not more than 150°F. The apparatus used shall heat the mass uniformly and shall be arranged to preclude the possible occurrence of overheated areas which might be detrimental to the materials.

Curing during cold weather shall be in accordance with paragraph 501-4.13d.

b. Hot weather. During periods of hot weather when the maximum daily air temperature exceeds 85°F, the following precautions shall be taken.

The forms and/or the underlying surface shall be sprinkled with water immediately before placing the concrete. The concrete shall be placed at the coolest temperature practicable, and in no case shall the temperature of the concrete when placed exceed 90°F. The aggregates and/or mixing water shall be cooled as necessary to maintain the concrete temperature at or not more than the specified maximum.

The concrete placement shall be protected from exceeding an evaporation rate of 0.2 psf per hour. When conditions are such that problems with plastic cracking can be expected, and particularly if any plastic cracking begins to occur, the Contractor shall immediately take such additional measures as necessary to protect the concrete surface. If the Contractor's measures are not effective in preventing plastic cracking, paving operations shall be immediately stopped.

Curing during hot weather shall be in accordance with paragraph 501-4.13e.

c. Temperature management program. Prior to the start of paving operation for each day of paving, the Contractor shall provide the RPR with a Temperature Management Program for the concrete to be placed to assure that uncontrolled cracking is avoided. (Federal Highway Administration HIPERPAV 3 is one example of a temperature management program.) As a minimum, the program shall address the following items:

(1) Anticipated tensile strains in the fresh concrete as related to heating and cooling of the concrete material.

(2) Anticipated weather conditions such as ambient temperatures, wind velocity, and relative humidity; and anticipated evaporation rate using Figure 19-9, PCA, Design and Control of Concrete Mixtures.

(3) Anticipated timing of initial sawing of joint.

(4) Anticipated number and type of saws to be used.

d. **Rain.** The Contractor shall have available materials for the protection of the concrete during inclement weather. Such protective materials shall consist of rolled polyethylene sheeting at least 4 mils thick of sufficient length and width to cover the plastic concrete slab and any edges. The sheeting may be mounted on either the paver or a separate movable bridge from which it can be unrolled without dragging over the plastic concrete surface. When rain appears imminent, all paving operations shall stop and all available personnel shall begin covering the surface of the unhardened concrete with the protective covering.

501-4.8 Concrete Placement. At any point in concrete conveyance, the free vertical drop of the concrete from one point to another or to the underlying surface shall not exceed 3 feet. The finished concrete product must be dense and homogeneous, without segregation and conforming to the standards in this specification. Backhoes and grading equipment shall not be used to distribute the concrete in front of the paver. Front end loaders will not be used. All concrete shall be consolidated without voids or segregation, including under and around all load-transfer devices, joint assembly units, and other features embedded in the pavement. Hauling equipment or other mechanical equipment can be permitted on adjoining previously constructed pavement when the concrete strength reaches a flexural strength of 550 psi, based on the average of four field cured specimens per 2,000 cubic yards of concrete placed. The Contractor must determine that the above minimum strengths are adequate to protection the pavement from overloads due to the construction equipment proposed for the project.

The Contractor shall have available materials for the protection of the concrete during cold, hot and/or inclement weather in accordance with paragraph 501-4.7.

a. **Slip-form construction.** The concrete shall be distributed uniformly into final position by a self-propelled slip-form paver without delay. The alignment and elevation of the paver shall be regulated from outside reference lines established for this purpose. The paver shall vibrate the concrete for the full width and depth of the strip of pavement being placed and the vibration shall be adequate to provide a consistency of concrete that will stand normal to the surface with sharp well-defined edges. The sliding forms shall be rigidly held together laterally to prevent spreading of the forms. The plastic concrete shall be effectively consolidated by internal vibration with transverse vibrating units for the full width of the pavement and/or a series of equally placed longitudinal vibrating units. The space from the outer edge of the pavement to longitudinal unit shall not exceed 9 inches for slipform and at the end of the dowels for the fill-in lanes. The spacing of internal units shall be uniform and shall not exceed 18 inches.

The term internal vibration means vibrating units located within the specified thickness of pavement section.

The rate of vibration of each vibrating unit shall be sufficient to consolidate the pavement without, segregation, voids, or vibrator trails and the amplitude of vibration shall be sufficient to be perceptible on the surface of the concrete along the entire length of the vibrating unit and for a distance of at least one foot. The frequency of vibration or amplitude should be adjusted proportionately with the rate of travel to result in a uniform density and air content. The paving

machine shall be equipped with a tachometer or other suitable device for measuring and indicating the actual frequency of vibrations.

The concrete shall be held at a uniform consistency. The slip-form paver shall be operated with as nearly a continuous forward movement as possible and all operations of mixing, delivering, and spreading concrete shall be coordinated to provide uniform progress with stopping and starting of the paver held to a minimum. If for any reason, it is necessary to stop the forward movement of the paver, the vibratory and tamping elements shall also be stopped immediately. No tractive force shall be applied to the machine, except that which is controlled from the machine.

When concrete is being placed adjacent to an existing pavement, that part of the equipment which is supported on the existing pavement shall be equipped with protective pads on crawler tracks or rubber-tired wheels on which the bearing surface is offset to run a sufficient distance from the edge of the pavement to avoid breaking the pavement edge.

Not more than 15% of the total free edge of each 500-foot segment of pavement, or fraction thereof, shall have an edge slump exceeding 1/4 inch, and none of the free edge of the pavement shall have an edge slump exceeding 3/8 inch. (The total free edge of 500 feet of pavement will be considered the cumulative total linear measurement of pavement edge originally constructed as nonadjacent to any existing pavement; that is, 500 feet of paving lane originally constructed as a separate lane will have 1,000 feet of free edge, 500 feet of fill-in lane will have no free edge, etc.). The area affected by the downward movement of the concrete along the pavement edge shall be limited to not more than 18 inches from the edge.

When excessive edge slump cannot be corrected before the concrete has hardened, the area with excessive edge slump will be removed the full width of the slip form lane and replaced at the expense of the Contractor as directed by the RPR.

b. Fixed-form construction. Forms shall be drilled in advance of being placed to line and grade to accommodate tie bars / dowel bars where these are specified.

Immediately in advance of placing concrete and after all subbase operations are completed, side forms shall be trued and maintained to the required line and grade for a distance sufficient to prevent delay in placing.

Side forms shall remain in place at least 12 hours after the concrete has been placed, and in all cases until the edge of the pavement no longer requires the protection of the forms. Curing compound shall be applied to the concrete immediately after the forms have been removed.

Side forms shall be thoroughly cleaned and coated with a release agent each time they are used and before concrete is placed against them.

Concrete shall be spread, screed, shaped and consolidated by one or more self-propelled machines. These machines shall uniformly distribute and consolidate concrete without segregation so that the completed pavement will conform to the required cross-section with a minimum of handwork.

The number and capacity of machines furnished shall be adequate to perform the work required at a rate equal to that of concrete delivery. The equipment must be specifically designed for placement and finishing using stationary side forms. Methods and equipment shall be reviewed and accepted by the RPR.

Concrete for the full paving width shall be effectively consolidated by internal vibrators. The rate of vibration of each vibrating unit shall be sufficient to consolidate the pavement without segregation, voids, or leaving vibrator trails.

Power to vibrators shall be connected so that vibration ceases when forward or backward motion of the machine is stopped.

c. Consolidation. Concrete shall be consolidated with the specified type of lane-spanning, gang-mounted, mechanical, immersion type vibrating equipment mounted in front of the paver, supplemented, in rare instances as specified, by hand-operated vibrators. The vibrators shall be inserted into the concrete to a depth that will provide the best full-depth consolidation but not closer to the underlying material than 2 inches. Vibrators shall not be used to transport or spread the concrete. For each paving train, at least one additional vibrator spud, or sufficient parts for rapid replacement and repair of vibrators shall be maintained at the paving site at all times. Any evidence of inadequate consolidation (honeycomb along the edges, large air pockets, or any other evidence) or over-consolidation (vibrator trails, segregation, or any other evidence) shall require the immediate stopping of the paving operation and adjustment of the equipment or procedures as approved by the RPR.

If a lack of consolidation of the hardened concrete is suspected by the RPR, referee testing may be required. Referee testing of hardened concrete will be performed by the RPR by cutting cores from the finished pavement after a minimum of 24 hours curing. The RPR shall visually examine the cores for evidence of lack of consolidation. Density determinations will be made by the RPR based on the water content of the core as taken. ASTM C642 shall be used for the determination of core density in the saturated-surface dry condition. When required, referee cores will be taken at the minimum rate of one for each 500 cubic yards of pavement, or fraction. The Contractor shall be responsible for all referee testing cost if they fail to meet the required density.

The average density of the cores shall be at least 97% of the original concrete mix density, with no cores having a density of less than 96% of the original concrete mix density. Failure to meet the referee tests will be considered evidence that the minimum requirements for vibration are inadequate for the job conditions. Additional vibrating units or other means of increasing the effect of vibration shall be employed so that the density of the hardened concrete conforms to the above requirements.

501-4.9 Strike-off of concrete and placement of reinforcement. Following the placing of the concrete, it shall be struck off to conform to the cross-section shown on the plans and to an elevation that when the concrete is properly consolidated and finished, the surface of the pavement shall be at the elevation shown on the plans. When reinforced concrete pavement is placed in two layers, the bottom layer shall be struck off to such length and depth that the sheet of reinforcing steel fabric or bar mat may be laid full length on the concrete in its final position without further manipulation. The reinforcement shall then be placed directly upon the concrete, after which the top layer of the concrete shall be placed, struck off, and screed. If any portion of the bottom layer of concrete has been placed more than 30 minutes without being covered with the top layer or if initial set has taken place, it shall be removed and replaced with freshly mixed concrete at the Contractor's expense. When reinforced concrete is placed in one layer, the reinforcement may be positioned in advance of concrete placement or it may be placed in plastic concrete by mechanical or vibratory means after spreading.

Reinforcing steel, at the time concrete is placed, shall be free of mud, oil, or other organic matter that may adversely affect or reduce bond. Reinforcing steel with rust, mill scale or a combination of both will be considered satisfactory, provided the minimum dimensions, weight, and tensile properties of a hand wire-brushed test specimen are not less than the applicable ASTM specification requirements.

501-4.10 Joints. Joints shall be constructed as shown on the plans and in accordance with these requirements. All joints shall be constructed with their faces perpendicular to the surface

of the pavement and finished or edged as shown on the plans. Joints shall not vary more than 1/2-inch from their designated position and shall be true to line with not more than 1/4-inch variation in 10 feet. The surface across the joints shall be tested with a 12-foot straightedge as the joints are finished and any irregularities in excess of 1/4 inch shall be corrected before the concrete has hardened. All joints shall be so prepared, finished, or cut to provide a groove of uniform width and depth as shown on the plans.

a. Construction. Longitudinal construction joints shall be slip-formed or formed against side forms as shown in the plans.

Transverse construction joints shall be installed at the end of each day's placing operations and at any other points within a paving lane when concrete placement is interrupted for more than 30 minutes or it appears that the concrete will obtain its initial set before fresh concrete arrives. The installation of the joint shall be located at a planned contraction or expansion joint. If placing of the concrete is stopped, the Contractor shall remove the excess concrete back to the previous planned joint.

b. Contraction. Contraction joints shall be installed at the locations and spacing as shown on the plans. Contraction joints shall be installed to the dimensions required by forming a groove or cleft in the top of the slab while the concrete is still plastic or by sawing a groove into the concrete surface after the concrete has hardened. When the groove is formed in plastic concrete the sides of the grooves shall be finished even and smooth with an edging tool. If an insert material is used, the installation and edge finish shall be according to the manufacturer's instructions. The groove shall be finished or cut clean so that spalling will be avoided at intersections with other joints. Grooving or sawing shall produce a slot at least 1/8 inch wide and to the depth shown on the plans.

c. Isolation (expansion). Isolation joints shall be installed as shown on the plans. The premolded filler of the thickness as shown on the plans, shall extend for the full depth and width of the slab at the joint. The filler shall be fastened uniformly along the hardened joint face with no buckling or debris between the filler and the concrete interface, including a temporary filler for the sealant reservoir at the top of the slab. The edges of the joint shall be finished and tooled while the concrete is still plastic

d. Dowels and Tie Bars for Joints

(1) Tie bars. Tie bars shall consist of deformed bars installed in joints as shown on the plans. Tie bars shall be placed at right angles to the centerline of the concrete slab and shall be spaced at intervals shown on the plans. They shall be held in position parallel to the pavement surface and in the middle of the slab depth and within the tolerances in paragraph 501-4.10(f.). When tie bars extend into an unpaved lane, they may be bent against the form at longitudinal construction joints, unless threaded bolt or other assembled tie bars are specified. Tie bars shall not be painted, greased, or enclosed in sleeves. When slip-form operations call for tie bars, two-piece hook bolts can be installed.

(2) Dowel bars. Dowel bars shall be placed across joints in the proper horizontal and vertical alignment as shown on the plans. The dowels shall be coated with a bond-breaker or other lubricant recommended by the manufacturer and approved by the RPR. Dowels bars at longitudinal construction joints shall be bonded in drilled holes.

(3) Placing dowels and tie bars. Horizontal spacing of dowels shall be within a tolerance of $\pm 3/4$ inch. The vertical location on the face of the slab shall be within a tolerance of $\pm 1/2$ inch. The method used to install dowels shall ensure that the horizontal and vertical alignment will not be greater than 1/4 inch per feet, except for those across the crown or other grade change joints. Dowels across crowns and other joints at grade changes shall be

measured to a level surface. Horizontal alignment shall be checked perpendicular to the joint edge. The portion of each dowel intended to move within the concrete or expansion cap shall be wiped clean and coated with a thin, even film of lubricating oil or light grease before the concrete is placed. Dowels shall be installed as specified in the following subparagraphs.

(a) Contraction joints. Dowels and tie bars in longitudinal and transverse contraction joints within the paving lane shall be held securely in place by means of rigid metal frames or basket assemblies of an approved type. The basket assemblies shall be held securely in the proper location by means of suitable pins or anchors. Do not cut or crimp the dowel basket tie wires.

At the Contractor's option, dowels and tie bars in contraction joints may be installed by insertion into the plastic concrete using approved equipment and procedures per the paver manufacturer's design. Approval of installation methods will be based on the results of the control strip showing that the dowels and tie bars are installed within specified tolerances as verified by cores or non-destructive rebar location devices approved by the RPR.

(b) Construction joints. Install dowels and tie bars by the cast-in-place or the drill-and-dowel method. Installation by removing and replacing in preformed holes will not be permitted. Dowels and tie bars shall be prepared and placed across joints where indicated, correctly aligned, and securely held in the proper horizontal and vertical position during placing and finishing operations, by means of devices fastened to the forms.

(c) Joints in hardened concrete. Install dowels in hardened concrete by bonding the dowels into holes drilled into the concrete. The concrete shall have cured for seven (7) days or reached a minimum flexural strength of 450 psi before drilling begins. Holes 1/8 inch greater in diameter than the dowels shall be drilled into the hardened concrete using rotary-core drills. Rotary-percussion drills may be used, provided that excessive spalling does not occur. Spalling beyond the limits of the grout retention ring will require modification of the equipment and operation. Depth of dowel hole shall be within a tolerance of $\pm 1/2$ inch of the dimension shown on the drawings. On completion of the drilling operation, the dowel hole shall be blown out with oil-free, compressed air. Dowels shall be bonded in the drilled holes using epoxy resin. Epoxy resin shall be injected at the back of the hole before installing the dowel and extruded to the collar during insertion of the dowel so as to completely fill the void around the dowel. Application by buttering the dowel will not be permitted. The dowels shall be held in alignment at the collar of the hole by means of a suitable metal or plastic grout retention ring fitted around the dowel.

e. Sawing of joints. Sawing shall commence, without regard to day or night, as soon as the concrete has hardened sufficiently to permit cutting without chipping, spalling, or tearing and before uncontrolled shrinkage cracking of the pavement occurs and shall continue without interruption until all joints have been sawn. All slurry and debris produced in the sawing of joints shall be removed by vacuuming and washing. Curing compound or system shall be reapplied in the initial saw-cut and maintained for the remaining cure period.

Joints shall be cut in locations as shown on the plans. The initial joint cut shall be a minimum 1/8 inch wide and to the depth shown on the plans. Prior to placement of joint sealant or seals, the top of the joint shall be widened by sawing as shown on the plans.

501-4.11 Finishing. Finishing operations shall be a continuing part of placing operations starting immediately behind the strike-off of the paver. Initial finishing shall be provided by the transverse screed or extrusion plate. The sequence of operations shall be transverse finishing, longitudinal machine floating if used, straightedge finishing, edging of joints, and then texturing. Finishing shall be by the machine method. The hand method shall be used only on isolated areas of odd slab widths or shapes and in the event of a breakdown of the mechanical finishing

equipment. Supplemental hand finishing for machine finished pavement shall be kept to an absolute minimum. Any machine finishing operation which requires appreciable hand finishing, other than a moderate amount of straightedge finishing, shall be immediately stopped and proper adjustments made or the equipment replaced. Equipment, mixture, and/or procedures which produce more than 1/4 inch of mortar-rich surface shall be immediately modified as necessary to eliminate this condition or operations shall cease. Compensation shall be made for surging behind the screeds or extrusion plate and settlement during hardening and care shall be taken to ensure that paving and finishing machines are properly adjusted so that the finished surface of the concrete (not just the cutting edges of the screeds) will be at the required line and grade. Finishing equipment and tools shall be maintained clean and in an approved condition. At no time shall water be added to the surface of the slab with the finishing equipment or tools, or in any other way. Fog (mist) sprays or other surface applied finishing aids specified to prevent plastic shrinkage cracking, approved by the RPR, may be used in accordance with the manufacturers requirements.

a. Machine finishing with slipform pavers. The slipform paver shall be operated so that only a very minimum of additional finishing work is required to produce pavement surfaces and edges meeting the specified tolerances. Any equipment or procedure that fails to meet these specified requirements shall immediately be replaced or modified as necessary. A self-propelled non-rotating pipe float may be used while the concrete is still plastic, to remove minor irregularities and score marks. Only one pass of the pipe float shall be allowed. Equipment, mixture, and/or procedures which produce more than 1/4 inch of mortar-rich surface shall be immediately modified as necessary to eliminate this condition or operations shall cease. Remove excessive slurry from the surface with a cutting straightedge and wipe off the edge. Any slurry which does run down the vertical edges shall be immediately removed by hand, using stiff brushes or scrapers. No slurry, concrete or concrete mortar shall be used to build up along the edges of the pavement to compensate for excessive edge slump, either while the concrete is plastic or after it hardens.

b. Machine finishing with fixed forms. The machine shall be designed to straddle the forms and shall be operated to screed and consolidate the concrete. Machines that cause displacement of the forms shall be replaced. The machine shall make only one pass over each area of pavement. If the equipment and procedures do not produce a surface of uniform texture, true to grade, in one pass, the operation shall be immediately stopped and the equipment, mixture, and procedures adjusted as necessary.

c. Other types of finishing equipment. Clary screeds, other rotating tube floats, or bridge deck finishers are not allowed on mainline paving, but may be allowed on irregular or odd-shaped slabs, and near buildings or trench drains, subject to the RPR's approval.

Bridge deck finishers shall have a minimum operating weight of 7500 pounds and shall have a transversely operating carriage containing a knock-down auger and a minimum of two immersion vibrators. Vibrating screeds or pans shall be used only for isolated slabs where hand finishing is permitted as specified, and only where specifically approved.

d. Hand finishing. Hand finishing methods will not be permitted, except under the following conditions: (1) in the event of breakdown of the mechanical equipment, hand methods may be used to finish the concrete already deposited on the grade and (2) in areas of narrow widths or of irregular dimensions where operation of the mechanical equipment is impractical.

e. Straightedge testing and surface correction. After the pavement has been struck off and while the concrete is still plastic, it shall be tested for trueness with a 12-foot finishing straightedge swung from handles capable of spanning at least one-half the width of the slab. The straightedge shall be held in contact with the surface in successive positions parallel to the

centerline and the whole area gone over from one side of the slab to the other, as necessary. Advancing shall be in successive stages of not more than one-half the length of the straightedge. Any excess water and laitance in excess of 1/8 inch thick shall be removed from the surface of the pavement and wasted. Any depressions shall be immediately filled with freshly mixed concrete, struck off, consolidated, and refinished. High areas shall be cut down and refinished. Special attention shall be given to assure that the surface across joints meets the smoothness requirements. Straightedge testing and surface corrections shall continue until the entire surface is found to be free from observable departures from the straightedge and until the slab conforms to the required grade and cross-section. The use of long-handled wood floats shall be confined to a minimum; they may be used only in emergencies and in areas not accessible to finishing equipment.

501-4.12 Surface texture. The surface of the pavement shall be finished as designated below for all newly constructed concrete pavements. It is important that the texturing equipment not tear or unduly roughen the pavement surface during the operation. The texture shall be uniform in appearance and approximately 1/16 inch in depth. Any imperfections resulting from the texturing operation shall be corrected to the satisfaction of the RPR.

a. Brush or broom finish. Not used.

b. Burlap drag finish. Burlap, at least 15 ounces per square yard, will typically produce acceptable texture. To obtain a textured surface, the transverse threads of the burlap shall be removed approximately one foot from the trailing edge. A heavy buildup of grout on the burlap threads produces the desired wide sweeping longitudinal striations on the pavement surface.

c. Artificial turf finish. Shall be applied by dragging the surface of the pavement in the direction of concrete placement with an approved full-width drag made with artificial turf. The leading transverse edge of the artificial turf drag will be securely fastened to a lightweight pole on a traveling bridge. At least 2 feet of the artificial turf shall be in contact with the concrete surface during dragging operations. Approval of the artificial turf will be done only after it has been demonstrated by the Contractor to provide a satisfactory texture. One type that has provided satisfactory texture consists of 7,200 approximately 0.85-inch-long polyethylene turf blades per square foot.

501-4.13 Curing. Immediately after finishing operations are completed and bleed water is gone from the surface, all exposed surfaces of the newly placed concrete shall be cured for a 7-day cure period in accordance with one of the methods below. Failure to provide sufficient cover material of whatever kind the Contractor may elect to use, or lack of water to adequately take care of both curing and other requirements, shall be cause for immediate suspension of concreting operations. The concrete shall not be left exposed for more than 1/2 hour during the curing period.

When a two-saw-cut method is used to construct the contraction joint, the curing compound shall be applied to the saw-cut immediately after the initial cut has been made. The sealant reservoir shall not be sawed until after the curing period has been completed. When the one cut method is used to construct the contraction joint, the joint shall be cured with wet rope, wet rags, or wet blankets. The rags, ropes, or blankets shall be kept moist for the duration of the curing period.

a. Impervious membrane method. Curing with liquid membrane compounds should not occur until bleed and surface moisture has evaporated. All exposed surfaces of the pavement shall be sprayed uniformly with white pigmented curing compound immediately after the finishing of the surface and before the set of the concrete has taken place. The curing compound shall not be applied during rainfall. Curing compound shall be applied by mechanical

sprayers under pressure at the rate of one gallon to not more than 150 square feet. The spraying equipment shall be of the fully atomizing type equipped with a tank agitator. At the time of use, the compound shall be in a thoroughly mixed condition with the pigment uniformly dispersed throughout the vehicle. During application, the compound shall be stirred continuously by mechanical means. Hand spraying of odd widths or shapes and concrete surfaces exposed by the removal of forms will be permitted. When hand spraying is approved by the RPR, a double application rate shall be used to ensure coverage. Should the film become damaged from any cause, including sawing operations, within the required curing period, the damaged portions shall be repaired immediately with additional compound or other approved means. Upon removal of side forms, the sides of the exposed slabs shall be protected immediately to provide a curing treatment equal to that provided for the surface.

b. White burlap-polyethylene sheets. Not Used.

c. Water method. The entire area shall be covered with burlap or other water absorbing material. The material shall be of sufficient thickness to retain water for adequate curing without excessive runoff. The material shall be kept wet at all times and maintained for seven (7) days. When the forms are stripped, the vertical walls shall also be kept moist. It shall be the responsibility of the Contractor to prevent ponding of the curing water on the subbase.

d. Concrete protection for cold weather. Maintain the concrete at a temperature of at least 50°F for a period of 72 hours after placing and at a temperature above freezing for the remainder of the 7-day curing period. The Contractor shall be responsible for the quality and strength of the concrete placed during cold weather; and any concrete damaged shall be removed and replaced at the Contractor's expense.

e. Concrete protection for hot weather. Concrete should be continuous moisture cured for the entire curing period and shall commence as soon as the surfaces are finished and continue for at least 24 hours. However, if moisture curing is not practical beyond 24 hours, the concrete surface shall be protected from drying with application of a liquid membrane-forming curing compound while the surfaces are still damp. Other curing methods may be approved by the RPR.

501-4.14 Removing forms. Unless otherwise specified, forms shall not be removed from freshly placed concrete until it has hardened sufficiently to permit removal without chipping, spalling, or tearing. After the forms have been removed, the sides of the slab shall be cured in accordance with paragraph 501-4.13.

If honeycombed areas are evident when the forms are removed, materials, placement, and consolidation methods must be reviewed and appropriate adjustments made to assure adequate consolidation at the edges of future concrete placements. Honeycombed areas that extend into the slab less than approximately 1 inch, shall be repaired with an approved grout, as directed by the RPR. Honeycombed areas that extend into the slab greater than a depth of 1 inch shall be considered as defective work and shall be removed and replaced in accordance with paragraph 501-4.19.

501-4.15 Saw-cut grooving. If shown on the plans, grooved surfaces shall be provided in accordance with the requirements of Item P-621.

501-4.16 Sealing joints. The joints in the pavement shall be sealed in accordance with Item P-604 or P-605.

501-4.17 Protection of pavement. The Contractor shall protect the pavement and its appurtenances against both public traffic and traffic caused by the Contractor's employees and agents until accepted by the RPR. This shall include watchmen to direct traffic and the erection

and maintenance of warning signs, lights, pavement bridges, crossovers, and protection of unsealed joints from intrusion of foreign material, etc. Any damage to the pavement occurring prior to final acceptance shall be repaired or the pavement replaced at the Contractor's expense.

Aggregates, rubble, or other similar construction materials shall not be placed on airfield pavements. Traffic shall be excluded from the new pavement by erecting and maintaining barricades and signs until the concrete is at least seven (7) days old, or for a longer period if directed by the RPR.

In paving intermediate lanes between newly paved pilot lanes, operation of the hauling and paving equipment will be permitted on the new pavement after the pavement has been cured for seven (7) days, the joints are protected, the concrete has attained a minimum field cured flexural strength of 450 psi, and the slab edge is protected.

All new and existing pavement carrying construction traffic or equipment shall be kept clean and spillage of concrete and other materials shall be cleaned up immediately.

Damaged pavements shall be removed and replaced at the Contractor's expense. Slabs shall be removed to the full depth, width, and length of the slab.

501-4.18 Opening to construction traffic. The pavement shall not be opened to traffic until test specimens molded and cured in accordance with ASTM C31 have attained a flexural strength of 450 pounds per square inch when tested in accordance with ASTM C78. If such tests are not conducted, the pavement shall not be opened to traffic until 14 days after the concrete was placed. Prior to opening the pavement to construction traffic, all joints shall either be sealed or protected from damage to the joint edge and intrusion of foreign materials into the joint. As a minimum, backer rod or tape may be used to protect the joints from foreign matter intrusion.

501-4.19 Repair, removal, or replacement of slabs. New pavement slabs that are broken or contain cracks or are otherwise defective or unacceptable as defined by acceptance criteria in paragraph 501-6.6 shall be removed and replaced or repaired, as directed by the RPR, at the Contractor's expense. Spalls along joints shall be repaired as specified. Removal of partial slabs is not permitted. Removal and replacement shall be full depth, shall be full width of the slab, and the limit of removal shall be normal to the paving lane and to each original transverse joint. The RPR will determine whether cracks extend full depth of the pavement and may require cores to be drilled on the crack to determine depth of cracking. Such cores shall have a diameter of 2 inches to 4 inches, shall be drilled by the Contractor and shall be filled by the Contractor with a well consolidated concrete mixture bonded to the walls of the hole with a bonding agent, using approved procedures. Drilling of cores and refilling holes shall be at no expense to the Owner. Repair of cracks as described in this section shall not be allowed if in the opinion of the RPR the overall condition of the pavement indicates that such repair is unlikely to achieve an acceptable and durable finished pavement. No repair of cracks shall be allowed in any panel that demonstrates segregated aggregate with an absence of coarse aggregate in the upper 1/8 inch of the pavement surface.

a. Shrinkage cracks. Shrinkage cracks which do not exceed one-third of the pavement depth shall be cleaned and either high molecular weight methacrylate (HMWM) applied; or epoxy resin (Type IV, Grade 1) pressure injected using procedures recommended by the manufacturer and approved by the RPR. Sandblasting of the surface may be required following the application of HMWM to restore skid resistance. Care shall be taken to ensure that the crack is not widened during epoxy resin injection. All epoxy resin injection shall take place in the

presence of the RPR. Shrinkage cracks which exceed one-third the pavement depth shall be treated as full depth cracks in accordance with paragraphs 501-4.19b and 501-19c.

b. Slabs with cracks through interior areas. Interior area is defined as that area more than 6 inches from either adjacent original transverse joint. The full slab shall be removed and replaced at no cost to the Owner, when there are any full depth cracks, or cracks greater than one-third the pavement depth, that extend into the interior area.

c. Cracks close to and parallel to joints. All full-depth cracks within 6 inches either side of the joint and essentially parallel to the original joints, shall be treated as follows.

(1) Full depth cracks and original joint not cracked. The full-depth crack shall be treated as the new joint and the original joint filled with an epoxy resin.

i. Full-depth crack. The joint sealant reservoir for the crack shall be formed by sawing to a depth of 3/4 inches, $\pm 1/16$ inch, and to a width of 5/8 inch, $\pm 1/8$ inch. The crack shall be sawed with equipment specially designed to follow random cracks. Any equipment or procedure which causes raveling or spalling along the crack shall be modified or replaced to prevent raveling or spalling. The joint shall be sealed with sealant in accordance with P-605 or as directed by the RPR.

ii. Original joint. If the original joint sealant reservoir has been sawed out, the reservoir and as much of the lower saw cut as possible shall be filled with epoxy resin, Type IV, Grade 2, thoroughly tooled into the void using approved procedures.

If only the original narrow saw cut has been made, it shall be cleaned and pressure injected with epoxy resin, Type IV, Grade 1, using approved procedures.

Where a parallel crack goes part way across paving lane and then intersects and follows the original joint which is cracked only for the remained of the width, it shall be treated as specified above for a parallel crack, and the cracked original joint shall be prepared and sealed as originally designed.

(2) Full depth cracks and original joint cracked. If there is any place in the lane width where a parallel crack and a cracked portion of the original joint overlap, the entire slab containing the crack shall be removed and replaced.

d. Removal and replacement of full slabs. Make a full depth cut perpendicular to the slab surface along all edges of the slab with a concrete saw cutting any dowels or tie-bars. Remove damaged slab protecting adjacent pavement from damage. Damage to adjacent slabs may result in removal of additional slabs as directed by the RPR at the Contractor's expense.

The underlying material shall be repaired, re-compacted and shaped to grade.

Dowels of the size and spacing specified for other joints in similar pavement on the project shall be installed along all four (4) edges of the new slab in accordance with paragraph 501-4.10d.

Placement of concrete shall be as specified for original construction. The joints around the new slab shall be prepared and sealed as specified for original construction.

e. Spalls along joints.

(1) Spalls less than one inch wide and less than the depth of the joint sealant reservoir, shall be filled with joint sealant material.

(2) Spalls larger than one inch and/or deeper than the joint reservoir, but less than 1/2 the slab depth, and less than 25% of the length of the adjacent joint shall be repaired as follows:

i. Make a vertical saw cut at least one inch outside the spalled area and to a depth of at least 2 inches. Saw cuts shall be straight lines forming rectangular areas surrounding the spalled area.

- ii. Remove unsound concrete and at least 1/2 inch of visually sound concrete between the saw cut and the joint or crack with a light chipping hammer.
- iii. Clean cavity with high-pressure water jets supplemented with compressed air as needed to remove all loose material.
- iv. Apply a prime coat of epoxy resin, Type III, Grade I, to the dry, cleaned surface of all sides and bottom of the cavity, except any joint face.
- v. Fill the cavity with low slump concrete or mortar or with epoxy resin concrete or mortar.
- vi. An insert or other bond-breaking medium shall be used to prevent bond at all joint faces.
- vii. A reservoir for the joint sealant shall be sawed to the dimensions required for other joints, or as required to be routed for cracks. The reservoir shall be thoroughly cleaned and sealed with the sealer specified for the joints.

(3) Spalls deeper than 1/2 of the slab depth or spalls longer than 25% of the adjacent joint require replacement of the entire slab.

f. Diamond grinding of Concrete surfaces. Diamond grinding shall be completed prior to pavement grooving. Diamond grinding of the hardened concrete should not be performed until the concrete is at least 14 days old and has achieved full minimum strength. Equipment that causes ravels, aggregate fractures, spalls or disturbance to the joints will not be permitted. The depth of diamond grinding shall not exceed 1/2 inch and all areas in which diamond grinding has been performed will be subject to the final pavement thickness tolerances specified.

Diamond grinding shall be performed with a machine specifically designed for diamond grinding capable of cutting a path at least 3 feet wide. The saw blades shall be 1/8-inch wide with sufficient number of flush cut blades that create grooves between 0.090 and 0.130 inches wide; and peaks and ridges approximately 1/32 inch higher than the bottom of the grinding cut. The Contractor shall determine the number and type of blades based on the hardness of the aggregate. Contractor shall demonstrate to the RPR that the grinding equipment will produce satisfactory results prior to making corrections to surfaces.

Grinding will be tapered in all directions to provide smooth transitions to areas not requiring grinding. The slurry resulting from the grinding operation shall be continuously removed and the pavement left in a clean condition. All grinding shall be at the expense of the Contractor.

CONTRACTOR QUALITY CONTROL (CQC)

501-5.1 Quality control program. The Contractor shall develop a Quality Control Program in accordance with Item C-100. No partial payment will be made for materials that are subject to specific quality control requirements without an approved quality control program.

501-5.2 Contractor Quality Control (CQC). The Contractor shall provide or contract for testing facilities in accordance with Item C-100. The RPR shall be permitted unrestricted access to inspect the Contractor's QC facilities and witness QC activities. The RPR will advise the Contractor in writing of any noted deficiencies concerning the QC facility, equipment, supplies, or testing personnel and procedures. When the deficiencies are serious enough to be adversely affecting the test results, the incorporation of the materials into the work shall be suspended immediately and will not be permitted to resume until the deficiencies are satisfactorily corrected.

501-5.3 Contractor QC testing. The Contractor shall perform all QC tests necessary to control the production and construction processes applicable to this specification and as set forth in the CQCP. The testing program shall include, but not necessarily be limited to, tests for aggregate gradation, aggregate moisture content, slump, and air content. A QC Testing Plan shall be developed and approved by the RPR as part of the CQCP.

The RPR may at any time, notwithstanding previous plant acceptance, reject and require the Contractor to dispose of any batch of concrete mixture which is rendered unfit for use due to contamination, segregation, or improper slump. Such rejection may be based on only visual inspection. In the event of such rejection, the Contractor may take a representative sample of the rejected material in the presence of the RPR, and if it can be demonstrated in the laboratory, in the presence of the RPR, that such material was erroneously rejected, payment will be made for the material at the contract unit price.

a. Fine aggregate.

(1) Gradation. A sieve analysis shall be made at least twice daily in accordance with ASTM C136 from randomly sampled material taken from the discharge gate of storage bins or from the conveyor belt.

(2) Moisture content. If an electric moisture meter is used, at least two direct measurements of moisture content shall be made per week to check the calibration. If direct measurements are made in lieu of using an electric meter, two tests shall be made per day. Tests shall be made in accordance with ASTM C70 or ASTM C566.

(3) Deleterious substances. Fine aggregate as delivered to the mixer shall be tested for deleterious substances in fine aggregate for concrete as specified in paragraph 501-2.1b, prior to production of the control strip, and a minimum of every 30-days during production or more frequently as necessary to control deleterious substances.

b. Coarse Aggregate.

(1) Gradation. A sieve analysis shall be made at least twice daily for each size of aggregate. Tests shall be made in accordance with ASTM C136 from randomly sampled material taken from the discharge gate of storage bins or from the conveyor belt.

(2) Moisture content. If an electric moisture meter is used, at least two direct measurements of moisture content shall be made per week to check the calibration. If direct measurements are made in lieu of using an electric meter, two tests shall be made per day. Tests shall be made in accordance with ASTM C566.

(3) Deleterious substances. Coarse aggregate as delivered to the mixer shall be tested for deleterious substances in coarse aggregate for concrete as specified in paragraph 501-2.1c, prior to production of the control strip, and a minimum of every 30-days during production or more frequently as necessary to control deleterious substances.

c. Slump. One test shall be made for each subplot. Slump tests shall be performed in accordance with ASTM C143 from material randomly sampled from material discharged from trucks at the paving site. Material samples shall be taken in accordance with ASTM C172.

d. Air content. One test shall be made for each subplot. Air content tests shall be performed in accordance with ASTM C231 for gravel and stone coarse aggregate and ASTM C173 for slag or other porous coarse aggregate, from material randomly sampled from trucks at the paving site. Material samples shall be taken in accordance with ASTM C172.

e. Unit weight and Yield. One test shall be made for each subplot. Unit weight and yield tests shall be in accordance with ASTM C138. The samples shall be taken in accordance with ASTM C172 and at the same time as the air content tests.

f. Temperatures. Temperatures shall be checked at least four times per lot at the job site in accordance with ASTM C1064.

g. Smoothness for Contractor Quality Control.

The Contractor shall perform smoothness testing in transverse and longitudinal directions daily to verify that the construction processes are producing pavement with variances less than ¼ inch in 12 feet, identifying areas that may pond water which could lead to hydroplaning of aircraft. If the smoothness criteria is not met, appropriate changes and corrections to the construction process shall be made by the Contractor before construction continues

The Contractor may use a 12-foot "straightedge, a rolling inclinometer meeting the requirements of ASTM E2133 or rolling external reference device that can simulate a 12-foot straightedge approved by the RPR. Straight-edge testing shall start with one-half the length of the straightedge at the edge of pavement section being tested and then moved ahead one-half the length of the straightedge for each successive measurement. Testing shall be continuous across all joints. The surface irregularity shall be determined by placing the freestanding (unleveled) straightedge on the pavement surface and allowing it to rest upon the two highest spots covered by its length, and measuring the maximum gap between the straightedge and the pavement surface in the area between the two high points. If the rolling inclinometer or external reference device is used, the data may be evaluated using either the FAA profile program, ProFAA, or FHWA profile program ProVal, using the 12-foot straightedge simulation function.

Smoothness readings shall not be made across grade changes or cross slope transitions. The transition between new and existing pavement shall be evaluated separately for conformance with the plans.

(1) Transverse measurements. Transverse measurements shall be taken for each day's production placed. Transverse measurements shall be taken perpendicular to the pavement centerline each 50 feet or more often as determined by the RPR. The joint between lanes shall be tested separately to facilitate smoothness between lanes.

(2) Longitudinal measurements. Longitudinal measurements shall be taken for each day's production placed. Longitudinal tests shall be parallel to the centerline of paving; at the center of paving lanes when widths of paving lanes are less than 20 feet; and at the third points of paving lanes when widths of paving lanes are 20 ft or greater. When placement abuts previously placed material the first measurement shall start with one half the length of the straight edge on the previously placed material.

Deviations on the final surface course in either the transverse or longitudinal direction that will trap water greater than 1/4 inch shall be corrected with diamond grinding per paragraph 501-4.19f or by removing and replacing the surface course to full depth. Grinding shall be tapered in all directions to provide smooth transitions to areas not requiring grinding. All areas in which diamond grinding has been performed shall be subject to the final pavement thickness tolerances specified in paragraph 501-6.6.

Control charts shall be kept to show area of each day's placement and the percentage of corrective grinding required. Corrections to production and placement shall be initiated when corrective grinding is required. If the Contractor's machines and/or methods produce significant areas that need corrective actions in excess of 10 percent of a day's production, production shall be stopped until corrective measures are implemented by the Contractor.

h. Grade. Grade will be evaluated prior to and after placement of the concrete surface.

Measurements will be taken at appropriate gradelines (as a minimum at center and edges of paving lane) and longitudinal spacing as shown on cross-sections and plans. The final surface of the pavement will not vary from the gradeline elevations and cross-sections shown on the

plans by more than 1/2 inch vertically and 0.1 feet laterally. The documentation will be provided by the Contractor to the RPR within 48 hours.

Areas with humps or depression that exceed grade or smoothness and that retain water on the surface must be ground off provided the course thickness after grinding is not more than 1/2 inch less than the thickness specified on the plans. If these areas cannot be corrected with grinding then the slabs that are retaining water must be removed and replaced in accordance with paragraph 501-4.19d. Grinding shall be in accordance with paragraph 501-4.19f. All corrections will be at the Contractors expense.

501-5.4 Control charts. The Contractor shall maintain linear control charts for fine and coarse aggregate gradation, slump, and air content. The Contractor shall also maintain a control chart plotting the coarseness factor/workability factor from the combined gradations in accordance with paragraph 501-2.1d.

Control charts shall be posted in a location satisfactory to the RPR and shall be kept up to date at all times. As a minimum, the control charts shall identify the project number, the contract item number, the test number, each test parameter, the Action and suspension Limits, or Specification limits, applicable to each test parameter, and the Contractor's test results. The Contractor shall use the control charts as part of a process control system for identifying potential problems and assignable causes before they occur. If the Contractor's projected data during production indicates a potential problem and the Contractor is not taking satisfactory corrective action, the RPR may halt production or acceptance of the material.

a. Fine and coarse aggregate gradation. The Contractor shall record the running average of the last five gradation tests for each control sieve on linear control charts. Superimposed on the control charts shall be the action and suspension limits. Gradation tests shall be performed by the Contractor per ASTM C136. The Contractor shall take at least two samples per lot to check the final gradation. Sampling shall be per ASTM D75 from the flowing aggregate stream or conveyor belt.

b. Slump and air content. The Contractor shall maintain linear control charts both for individual measurements and range (that is, difference between highest and lowest measurements) for slump and air content in accordance with the following Action and Suspension Limits.

c. Combined gradation. The Contractor shall maintain a control chart plotting the coarseness factor and workability factor on a chart in accordance with paragraph 501-2.1d.

Control Chart Limits¹

Control Parameter	Individual Measurements	
	Action Limit	Suspension Limit
Gradation ²	*3	*3
Coarseness Factor (CF)	±3.5	±5
Workability Factor (WF)	±2	±3
Slump	+0.5 to -1 inch	+1 to -1.5 inch
Air Content	±1.5%	±2.0%

¹ Control charts shall developed and maintained for each control parameter indicated.

² Control charts shall be developed and maintained for each sieve size.

³ Action and suspension limits shall be determined by the Contractor.

501-5.5 Corrective action at Suspension Limit. The CQCP shall indicate that appropriate action shall be taken when the process is believed to be out of control. The CQCP shall detail what action will be taken to bring the process into control and shall contain sets of rules to gauge when a process is out of control. As a minimum, a process shall be deemed out of control and corrective action taken if any one of the following conditions exists.

- a. Fine and coarse aggregate gradation. When two consecutive averages of five tests are outside of the suspension limits, immediate steps, including a halt to production, shall be taken to correct the grading.
- b. Coarseness and Workability factor. When the CF or WF reaches the applicable suspension limits, the Contractor, immediate steps, including a halt to production, shall be taken to correct the CF and WF.

c. Fine and coarse aggregate moisture content. Whenever the moisture content of the fine or coarse aggregate changes by more than 0.5%, the scale settings for the aggregate batcher and water batcher shall be adjusted.

d. Slump. The Contractor shall halt production and make appropriate adjustments whenever:

- (1) one point falls outside the Suspension Limit line for individual measurements
OR
- (2) two points in a row fall outside the Action Limit line for individual measurements.

d. Air content. The Contractor shall halt production and adjust the amount of air-entraining admixture whenever:

- (1) one point falls outside the Suspension Limit line for individual measurements
OR
- (2) two points in a row fall outside the Action Limit line for individual measurements.

MATERIAL ACCEPTANCE

501-6.1 Quality Assurance (QA) Acceptance sampling and testing. All acceptance sampling and testing necessary to determine conformance with the requirements specified in this section,

with the exception of coring for thickness determination, will be performed by the RPR. The Contractor shall provide adequate facilities for the initial curing of beams. The Contractor shall bear the cost of providing initial curing facilities and coring and filling operations, per paragraph 501-6.5b(1).

The samples will be transported while in the molds. The curing, except for the initial cure period, will be accomplished using the immersion in saturated lime water method. During the 24 hours after molding, the temperature immediately adjacent to the specimens must be maintained in the range of 60° to 80°F, and loss of moisture from the specimens must be prevented. The specimens may be stored in tightly constructed wooden boxes, damp sand pits, temporary buildings at construction sites, under wet burlap in favorable weather, or in heavyweight closed plastic bags, or using other suitable methods, provided the temperature and moisture loss requirements are met.

501-6.2 Quality Assurance (QA) testing laboratory. Quality assurance testing organizations performing these acceptance tests will be accredited in accordance with ASTM C1077. The quality assurance laboratory accreditation must be current and listed on the accrediting authority's website. All test methods required for acceptance sampling and testing must be listed on the lab accreditation. A copy of the laboratory's current accreditation and accredited test methods will be submitted to the RPR prior to start of construction.

501-6.3 Lot size. Concrete will be accepted for strength and thickness on a lot basis. A lot will consist of a day's production not to exceed 2,000 cubic yards or 3,700 square yards. Each lot will be divided into approximately equal sublots with individual sublots between 400 to 600 cubic yards. Where three sublots are produced, they will constitute a lot. Where one or two sublots are produced, they will be incorporated into the previous or next lot. Where more than one plant is simultaneously producing concrete for the job, the lot sizes will apply separately for each plant.

501-6.4 Partial lots. When operational conditions cause a lot to be terminated before the specified number of tests have been made for the lot or for overages or minor placements to be considered as partial lots, the following procedure will be used to adjust the lot size and the number of tests for the lot.

Where three sublots have been produced, they will constitute a lot. Where one or two sublots have been produced, they will be incorporated into the next lot or the previous lot and the total number of sublots will be used in the acceptance criteria calculation, that is, $n=5$ or $n=6$.

501-6.5 Acceptance Sampling and Testing.

a. Strength.

(1) Sampling. One sample will be taken for each subplot from the concrete delivered to the job site. Sampling locations will be determined by the RPR in accordance with random sampling procedures contained in ASTM D3665. The concrete will be sampled in accordance with ASTM C172.

(2) Test Specimens. The RPR will be responsible for the casting, initial curing, transportation, and curing of specimens in accordance with ASTM C31. Two (2) specimens will be made from each sample and slump, air content, unit weight, and temperature tests will be conducted for each set of strength specimens. Within 24 to 48 hours, the samples will be transported from the field to the laboratory while in the molds. Samples will be cured in saturated lime water.

The strength of each specimen will be determined in accordance with ASTM C78. The strength for each subplot will be computed by averaging the results of the two test specimens representing that subplot.

(3) Acceptance. Acceptance of pavement for strength will be determined by the RPR in accordance with paragraph 501-6.6b(1). All individual strength tests within a lot will be checked for outliers in accordance with ASTM E178, at a significance level of 5%. Outliers will be discarded and the remaining test values will be used to determine acceptance in accordance with paragraph 501-6.5b.

b. Pavement thickness.

(1) Sampling. One core will be taken by the Contractor for each subplot in the presence of the RPR. Sampling locations will be determined by the RPR in accordance with random sampling procedures contained in ASTM D3665. Areas, such as thickened edges, with planned variable thickness, will be excluded from sample locations.

Cores shall be a minimum 4 inch in diameter neatly cut with a core drill. The Contractor will furnish all tools, labor, and materials for cutting samples and filling the cored hole. Core holes will be filled by the Contractor with a non-shrink grout approved by the RPR within one day after sampling.

(2) Testing. The thickness of the cores will be determined by the RPR by the average caliper measurement in accordance with ASTM C174. Each core shall be photographed and the photograph included with the test report.

(3) Acceptance. Acceptance of pavement for thickness will be determined by the RPR in accordance with paragraph 501-6.6.

501-6.6 Acceptance criteria.

a. General. Acceptance will be based on the following characteristics of the completed pavement discussed in paragraph 501-6.5b:

- (1) Strength
- (2) Thickness
- (3) Grade
- (4) Profilograph smoothness. Not used.
- (5) Adjustments for repairs

Acceptance for strength, thickness, and grade, will be based on the criteria contained in accordance with paragraph 501-6.6b(1), 501-6.6b(2), and 501-6.6b(3), respectively.

Production quality must achieve 90 PWL or higher to receive full payment.

Strength and thickness will be evaluated for acceptance on a lot basis using the method of estimating PWL. Production quality must achieve 90 PWL or higher to receive full pavement. The PWL will be determined in accordance with procedures specified in Item C-110.

The lower specification tolerance limit (L) for strength and thickness will be:

Lower Specification Tolerance Limit (L)

Strength	577 psi
Thickness	Lot Plan Thickness in inches, - 0.50 in

b. Acceptance criteria.

(1) Strength. If the PWL of the lot equals or exceeds 90%, the lot will be acceptable. Acceptance and payment for the lot will be determined in accordance with paragraph 501-8.1.

(2) Thickness. If the PWL of the lot equals or exceeds 90%, the lot will be acceptable. Acceptance and payment for the lot will be determined in accordance with paragraph 501-8.1.

(3) Grade. The final finished surface of the pavement of the completed project will not vary from the gradeline elevations and cross-sections shown on the plans by more than 1/2 inch vertically or 0.1 feet laterally. The documentation, stamped and signed by a licensed surveyor shall be in accordance with paragraph 501-5.3h. Payment for sublots that do not meet grade for over 25% of the subplot shall be reduced by 5% and not be more than 95%.

(4) Profilograph roughness for QA Acceptance. Not used.

(5) Adjustments for repair. Sublots with spall repairs, crack repairs, or partial panel replacement, will be limited to no more than 95% payment.

(6) Adjustment for grinding. For sublots with grinding over 25% of a subplot, payment will be reduced 5%.

METHOD OF MEASUREMENT

501-7.1 Concrete pavement shall be measured by the number of square yards of plain and reinforced pavement as specified in-place, completed and accepted.

BASIS OF PAYMENT

501-8.1 Payment. Payment for concrete pavement meeting all acceptance criteria as specified in paragraph 501-6.6. Acceptance Criteria shall be based on results of strength and thickness tests. Payment for acceptable lots of concrete pavement shall be adjusted in accordance with paragraph 501-8.1a for strength and thickness; 501-8.1b for repairs; 501-8.1c for grinding; and 501-8.1d for smoothness, subject to the limitation that:

The total project payment for concrete pavement shall not exceed 100 percent of the product of the contract unit price and the total number of square yards of concrete pavement used in the accepted work (See Note 1 under the Price Adjustment Schedule table below).

Payment shall be full compensation for all labor, materials, tools, equipment, and incidentals required to complete the work as specified herein and on the drawings.

a. Basis of adjusted payment. The pay factor for each individual lot shall be calculated in accordance with the Price Adjustment Schedule table below. A pay factor shall be calculated for both strength and thickness. The lot pay factor shall be the higher of the two values when calculations for both strength and thickness are 100% or higher. The lot pay factor shall be the product of the two values when only one of the calculations for either strength or thickness is 100% or higher. The lot pay factor shall be the lower of the two values when calculations for both strength and thickness are less than 100%.

Price Adjustment Schedule¹

Percentage of Materials Within Specification Limits (PWL)	Lot Pay Factor (Percent of Contract Unit Price)
96 – 100	106
90 – 95	PWL + 10
75 – 90	0.5 PWL + 55
55 – 74	1.4 PWL – 12
Below 55	Reject ²

¹ Although it is theoretically possible to achieve a pay factor of 106% for each lot, actual payment in excess of 100% shall be subject to the total project payment limitation specified in paragraph 501-8.1.

² The lot shall be removed and replaced unless, after receipt of FAA concurrence, the Owner and Contractor agree in writing that the lot will remain; the lot paid at 50% of the contract unit price; and the total project payment limitation reduced by the amount withheld for that lot.

For each lot accepted, the adjusted contract unit price shall be the product of the lot pay factor for the lot and the contract unit price. Payment shall be subject to the total project payment limitation specified in paragraph 501-8.1. Payment in excess of 100% for accepted lots of concrete pavement shall be used to offset payment for accepted lots of concrete pavement that achieve a lot pay factor less than 100%; except for rejected lots which remain in place and/or sublots with adjustments for repairs.

b. Adjusted payment for repairs. The PWL lot pay factor shall be reduced by 5% and be no higher than 95% for sublots which contain repairs in accordance with paragraph 501-4.19 on more than 20% of the slabs within the subplot. Payment factors greater than 100 percent for the strength and thickness cannot be used to offset adjustments for repairs.

c. Adjusted payment for grinding. The PWL lot pay factor shall be reduced by 5% and be no higher than 95% for sublots with grinding over 25% of a subplot.

d. Profilograph Roughness. Not used.

e. Payment. Payment shall be made under:

Item P-501-8.1 Concrete Pavement. per square 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.

ASTM International (ASTM)

ASTM A184 Standard Specification for Welded Deformed Steel Bar Mats for Concrete Reinforcement

ASTM A615 Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement

ASTM A704	Standard Specification for Welded Steel Plain Bar or Rod Mats for Concrete Reinforcement
ASTM A706	Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement
ASTM A775	Standard Specification for Epoxy-Coated Steel Reinforcing Bars
ASTM A884	Standard Specification for Epoxy-Coated Steel Wire and Welded Wire Reinforcement
ASTM A934	Standard Specification for Epoxy-Coated Prefabricated Steel Reinforcing Bars
ASTM A996	Standard Specification for Rail-Steel and Axle-Steel Deformed Bars for Concrete Reinforcement
ASTM A1035	Standard Specification for Deformed and Plain, Low-Carbon, Chromium, Steel Bars for Concrete Reinforcement
ASTM A1064	Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete
ASTM A1078	Standard Specification for Epoxy-Coated Steel Dowels for Concrete Pavement
ASTM C29	Standard Test Method for Bulk Density ("Unit Weight") and Voids in Aggregate
ASTM C31	Standard Practice for Making and Curing Concrete Test Specimens in the Field
ASTM C33	Standard Specification for Concrete Aggregates
ASTM C39	Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
ASTM C70	Standard Test Method for Surface Moisture in Fine Aggregate
ASTM C78	Standard Test Method for Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading)
ASTM C88	Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
ASTM C94	Standard Specification for Ready-Mixed Concrete
ASTM C114	Standard Test Methods for Chemical Analysis of Hydraulic Cement
ASTM C117	Standard Test Method for Materials Finer than 75- μ m (No. 200) Sieve in Mineral Aggregates by Washing
ASTM C123	Standard Test Method for Lightweight Particles in Aggregate
ASTM C136	Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM C131	Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine

ASTM C136	Standard Test Method for Sieve or Screen Analysis of Fine and Coarse Aggregates
ASTM C138	Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete
ASTM C142	Standard Test Method for Clay Lumps and Friable Particles in Aggregates
ASTM C143	Standard Test Method for Slump of Hydraulic-Cement Concrete
ASTM C150	Standard Specification for Portland Cement
ASTM C171	Standard Specification for Sheet Materials for Curing Concrete
ASTM C172	Standard Practice for Sampling Freshly Mixed Concrete
ASTM C173	Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method
ASTM C174	Standard Test Method for Measuring Thickness of Concrete Elements Using Drilled Concrete Cores
ASTM C227	Standard Test Method for Potential Alkali Reactivity of Cement-Aggregate Combinations (Mortar-Bar Method)
ASTM C231	Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C260	Standard Specification for Air-Entraining Admixtures for Concrete
ASTM C295	Standard Guide for Petrographic Examination of Aggregates for Concrete
ASTM C309	Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete
ASTM C311	Standard Test Methods for Sampling and Testing Fly Ash or Natural Pozzolans for Use in Portland Cement Concrete
ASTM C494	Standard Specification for Chemical Admixtures for Concrete
ASTM C566	Standard Test Method for Total Evaporable Moisture Content of Aggregates by Drying
ASTM C595	Standard Specification for Blended Hydraulic Cements
ASTM C618	Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
ASTM C642	Standard Test Method for Density, Absorption, and Voids in Hardened Concrete
ASTM C666	Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing
ASTM C685	Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing
ASTM C881	Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete

ASTM C989	Standard Specification for Slag Cement for Use in Concrete and Mortars
ASTM C1017	Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete
ASTM C1064	Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete
ASTM C1077	Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation
ASTM C1157	Standard Performance Specification for Hydraulic Cement
ASTM C1260	Standard Test Method for Potential Alkali Reactivity of Aggregates (Mortar-Bar Method)
ASTM C1365	Standard Test Method for Determination of the Proportion of Phases in Portland Cement and Portland-Cement Clinker Using X-Ray Powder Diffraction Analysis
ASTM C1567	Standard Test Method for Determining the Potential Alkali-Silica Reactivity of Combinations of Cementitious Materials and Aggregate (Accelerated Mortar-Bar Method)
ASTM C1602	Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete
ASTM D75	Standard Practice for Sampling Aggregates
ASTM D1751	Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
ASTM D1752	Standard Specification for Preformed Sponge Rubber and Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction
ASTM D2419	Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate
ASTM D3665	Standard Practice for Random Sampling of Construction Materials
ASTM D4791	Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate
ASTM E178	Standard Practice for Dealing with Outlying Observations
ASTM E1274	Standard Test Method for Measuring Pavement Roughness Using a Profilograph
ASTM E2133	Standard Test Method for Using a Rolling Inclinator to Measure Longitudinal and Transverse Profiles of a Traveled Surface
American Concrete Institute (ACI)	
ACI 305R	Guide to Hot Weather Concreting
ACI 306R	Guide to Cold Weather Concreting
ACI 309R	Guide for Consolidation of Concrete

Advisory Circulars (AC)

AC 150/5320-6 Airport Pavement Design and Evaluation

Federal Highway Administration (FHWA)

HIPERPAV 3, version 3.2

Portland Concrete Association (PCA)

PCA Design and Control of Concrete Mixtures, 16th Edition

U.S. Army Corps of Engineers (USACE) Concrete Research Division (CRD)

CRD C662 Determining the Potential Alkali-Silica Reactivity of Combinations
of Cementitious Materials, Lithium Nitrate Admixture and
Aggregate (Accelerated Mortar-Bar Method)

United States Air Force Engineering Technical Letter (ETL)

ETL 97-5 Proportioning Concrete Mixtures with Graded Aggregates for Rigid
Airfield Pavements

END ITEM P-501

Item P-603 Emulsified Asphalt Tack Coat

DESCRIPTION

603-1.1 This item shall consist of preparing and treating an asphalt or concrete surface with asphalt material in accordance with these specifications and in reasonably close conformity to the lines shown on the plans.

MATERIALS

603-2.1 Asphalt materials. The asphalt material shall be an emulsified asphalt as specified in ASTM D3628 as an asphalt application for tack coat appropriate to local conditions. The emulsified asphalt shall not be diluted. The Contractor shall provide a copy of the manufacturer's Certificate of Analysis (COA) for the asphalt material to the Resident Project Representative (RPR) before the asphalt material is applied for review and acceptance. The furnishing of COA for the asphalt material shall not be interpreted as a basis for final acceptance. The manufacturer's COA may be subject to verification by testing the material delivered for use on the project.

CONSTRUCTION METHODS

603-3.1 Weather limitations. The tack coat shall be applied only when the existing surface is dry and the atmospheric temperature is 50°F or above; the temperature has not been below 35°F for the 12 hours prior to application; and when the weather is not foggy or rainy. The temperature requirements may be waived when directed by the RPR.

603-3.2 Equipment. The Contractor shall provide equipment for heating and applying the emulsified asphalt material. The emulsion shall be applied with a manufacturer-approved computer rate-controlled asphalt distributor. The equipment shall be in good working order and contain no contaminants or diluents in the tank. Spray bar tips must be clean, free of burrs, and of a size to maintain an even distribution of the emulsion. Any type of tip or pressure source is suitable that will maintain predetermined flow rates and constant pressure during the application process with application speeds under eight (8) miles per hour or seven (700) feet per minute.

The equipment will be tested under pressure for leaks and to ensure proper set-up before use to verify truck set-up (via a test-shot area), including but not limited to, nozzle tip size appropriate for application, spray-bar height and pressure and pump speed, evidence of triple-overlap spray pattern, lack of leaks, and any other factors relevant to ensure the truck is in good working order before use.

The distributor truck shall be equipped with a minimum 12-foot spreader spray bar with individual nozzle control with computer-controlled application rates. The distributor truck shall have an easily accessible thermometer that constantly monitors the temperature of the emulsion, and have an operable mechanical tank gauge that can be used to cross-check the computer accuracy. If the distributor is not equipped with an operable quick shutoff valve, the prime operations shall be started and stopped on building paper.

The distributor truck shall be equipped to effectively heat and mix the material to the required temperature prior to application as required. Heating and mixing shall be done in accordance with the manufacturer's recommendations. Do not overheat or over mix the material.

The distributor shall be equipped with a hand sprayer.

Asphalt distributors must be calibrated annually in accordance with ASTM D2995. The Contractor must furnish a current calibration certification for the asphalt distributor truck from any State or other agency as approved by the RPR.

A power broom and/or power blower suitable for cleaning the surfaces to which the asphalt tack coat is to be applied shall be provided.

603-3.3 Application of emulsified asphalt material. The emulsified asphalt shall not be diluted. Immediately before applying the emulsified asphalt tack coat, the full width of surface to be treated shall be swept with a power broom and/or power blower to remove all loose dirt and other objectionable material.

The emulsified asphalt material shall be uniformly applied with an asphalt distributor at the rates appropriate for the conditions and surface specified in the table below. The type of asphalt material and application rate shall be approved by the RPR prior to application.

Emulsified Asphalt

Surface Type	Residual Rate, gal/SY	Emulsion Application Bar Rate, gal/SY
New asphalt	0.02-0.05	0.03-0.07
Existing asphalt	0.04-0.07	0.06-0.11
Milled Surface	0.04-0.08	.06-0.12
Concrete	0.03-0.05	0.05-0.08

After application of the tack coat, the surface shall be allowed to cure without being disturbed for the period of time necessary to permit drying and setting of the tack coat. This period shall be determined by the RPR. The Contractor shall protect the tack coat and maintain the surface until the next course has been placed. When the tack coat has been disturbed by the Contractor, tack coat shall be reapplied at the Contractor's expense.

603-3.4 Freight and waybills The Contractor shall submit waybills and delivery tickets, during progress of the work. Before the final statement is allowed, file with the RPR certified waybills and certified delivery tickets for all emulsified asphalt materials used in the construction of the pavement covered by the contract. Do not remove emulsified asphalt material from storage until the initial outage and temperature measurements have been taken. The delivery or storage units will not be released until the final outage has been taken.

METHOD OF MEASUREMENT

603-4.1 The emulsified asphalt material for tack coat shall be measured by the ton. Volume shall be corrected to the volume at 60°F in accordance with ASTM D1250. The emulsified asphalt material paid for will be the measured quantities used in the accepted work, provided that the measured quantities are not 10% over the specified application rate. Any amount of emulsified asphalt material more than 10% over the specified application rate for each application will be deducted from the measured quantities, except for irregular areas where

hand spraying of the emulsified asphalt material is necessary. Water added to emulsified asphalt will not be measured for payment.

BASIS OF PAYMENT

603.5-1 Payment shall be made at the contract unit price per ton of emulsified asphalt material. This price shall be full compensation for furnishing all materials, for all preparation, delivery, and application of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item P-603-5.1 Emulsified Asphalt Tack Coat - per ton

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.

ASTM International (ASTM)

ASTM D1250	Standard Guide for Use of the Petroleum Measurement Tables
ASTM D2995	Standard Practice for Estimating Application Rate and Residual Application Rate of Bituminous Distributors
ASTM D3628	Standard Practice for Selection and Use of Emulsified Asphalts

END ITEM P-603

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Item P-604 Compression Joint Seals for Concrete Pavements

DESCRIPTION

604-1.1 This item shall consist of preformed polychloroprene compression seals used for sealing joints of rigid pavements.

MATERIALS

604-2.1 Compression seals. Compression joint seal materials shall be a vulcanized elastomeric compound using polychloroprene as the only base polymer. The material and the manufactured seal shall conform to ASTM D2628.

The joint seal shall be a labyrinth type seal. The uncompressed depth of the face of the compression seal (that is to be bonded to the joint wall) shall be greater than the uncompressed width of the seal, except that for seals one inch or greater in width, the depth need be only one inch or greater. The actual width of the uncompressed seal shall be as recommended by the joint seal manufacturer for the type and width of joints as shown on the plans. The tolerance on the seal shall be +1/8 inch or -1/16 inch, below the top of the pavement surface or bottom of groove for grooved pavement.

The Contractor shall provide a copy of the manufacturer's Certificate of Analysis (COA) for the joint seal material delivered to the project. The COA shall be provided to and approved by the RPR before the material is installed. The furnishing of the vendor's certified test report shall not be interpreted as a basis for final acceptance. The manufacturer's COA may be subject to verification by testing the material delivered for use on the project.

Materials delivered to the job site shall be inspected for defects, unloaded, and stored with a minimum of handling to avoid damage. Storage facilities shall be provided at the job site to protect materials from weather and maintain materials at temperatures recommended by the manufacturer.

Representative sample of joint seal material will be sampled and retained by the RPR for possible testing.

604-2.2 Lubricant/adhesive. Lubricant/adhesive used for the compression elastomeric joint seal shall be a one-component compound conforming to ASTM D2835.

CONSTRUCTION METHODS

604-3.1 Equipment. Machines, tools, and equipment used in the performance of the work required by this section shall be approved by the RPR before the work starts and shall be maintained by the Contractor in satisfactory condition at all times.

a. Joint cleaning equipment.

(1) **Concrete saw.** A self-propelled power saw with water-cooled diamond saw blades shall be provided for cutting joints to the depths and widths specified and for removing filler, existing old joint seal or other material embedded in the joints or adhered to the joint faces.

(2) Waterblasting equipment. Waterblasting equipment shall include a trailer-mounted water tank, pumps, high-pressure hose, a wand with safety release cutoff controls, nozzle, and auxiliary water resupply equipment. The water tank and auxiliary water resupply equipment shall be of sufficient capacity to permit continuous operations. The pumps, hoses, wand, and nozzle shall be of sufficient capacity to permit the cleaning of both walls of the joint and the pavement surface for a width of at least 1/2 inch on either side of the joint. The pump shall be capable of supplying a pressure of at least 3,000 psi. A pressure gauge mounted at the pump shall show at all times the pressure in pounds per square inch (psi) at which the equipment is operating.

(3) Sandblasting equipment. Sandblasting is not allowed.

b. Sealing equipment. Equipment used to install the compression seal shall place the compression seal to the prescribed depths within the specified tolerances without cutting, nicking, twisting, or otherwise damaging the seal. The equipment shall not stretch or compress the seal more than 2.0% longitudinally during installation. The machine shall be an automatic self-propelled joint seal application equipment and shall be engine powered. The machine shall include a reservoir for the lubricant/adhesive, a device for conveying the lubricant/adhesive in the proper quantities to the sides the preformed seal or the sidewalls of the joint, a reel capable of holding one full spool of compression seal, and a power-driven apparatus for feeding the joint seal through a compression device and inserting the seal into the joint. The equipment shall also include a guide to maintain the proper course along the joint being sealed. The machine shall at all times be operated by an experienced operator.

Hand operated joint seal application equipment may be used for localized areas and for projects less than 500 square yards. The equipment shall be a two-axle, four-wheel machine that includes means for compressing and inserting the compression seal into the joint and a reel capable of holding one full spool of compression seal material.

CONSTRUCTION METHODS

604-4.1 Environmental conditions. The ambient temperature and the pavement temperature within the joint wall shall be at least 35°F and rising at the time of installation of the materials. Sealant application will not be permitted if moisture or any foreign material is observed in the joint.

604-4.2 Trial joint seal and lubricant/adhesive installation. Prior to the cleaning and sealing of the joints for the entire project, a control strip at least 200 feet long shall be prepared at a location designated by the RPR using the specified materials and the approved equipment, to demonstrate the materials and construction processes for joint preparation and sealing of all types of joints included in the project. No other joints shall be sealed until the test installation has been approved by the RPR.

If materials or installation do not meet requirements, the materials shall be removed, and the joints shall be cleaned and a new trial joint seal installation shall be performed at the Contractor's expense. The RPR approved trial section will be incorporated into the permanent work.

604-4.3 Preparation of joints. Immediately before installation of the compression joint seal, the joints shall be thoroughly cleaned to remove all laitance, filler, existing sealer, foreign material and protrusions of hardened concrete from the sides and upper edges of the joint space to be sealed. Cleaning shall extend along pavement surfaces at least 1/2 inch on either side of the joint. After final cleaning and immediately prior to sealing, the joints shall be blown out with compressed air and left free of debris and water. Any irregularity in the joint face that would

prevent uniform contact between the joint seal and the joint face shall be corrected prior to the installation of the joint seal.

a. Sawing. Joints shall be sawed to clean and to open them to the full specified width and depth. Immediately following the sawing operation, the joint faces and opening shall be thoroughly cleaned using a water jet to remove all saw cuttings or debris remaining on the faces or in the joint opening. Compression seal shall be installed within three (3) calendar days of the time the joint cavity is sawed. Depth of the joint cavity shall be in accordance with manufacturer's instructions. Submit printed copies of manufacturers' instructions [60 days] prior to use on the project. The saw cut for the joint seal cavity shall at all locations be centered over the joint line. The nominal width of the sawed joint seal cavity shall be as follows; the actual width shall be within a tolerance of $\pm 1/16$ inch:

(1) If a nominal 13/16 inch wide compression seal is furnished, the nominal width of the saw cut shall be 8/16 inches when the pavement temperature at the time of sawing is between +50 and +115°F. If the pavement temperature at the time of sawing is above this range, the nominal width of the saw cut shall be decreased 1/16 inch. If the pavement temperature at the time of sawing is below this range, the nominal width of the saw cut shall be increased 1/16 inch.

(2) If a nominal one inch wide compression seal is furnished, the nominal width of the saw cut shall be 9/16 inches when the pavement temperature at the time of sawing is between +55 and +180°F. If the pavement temperature at the time of sawing is above this range, the nominal width of the saw cut shall be decreased 1/16 inch. If the pavement temperature at the time of sawing is below this range, the nominal width of the saw cut shall be increased 1/16 inch.

(3) The pavement temperature shall be measured and recorded in the presence of the RPR. Measurement shall be made each day before commencing sawing and at any other time during the day when the temperature appears to be moving out of the allowable sawing range.

b. Waterblast cleaning. The concrete joint faces and pavement surfaces extending at least 1/2 inch from the joint edges shall be waterblasted clean. A multiple pass technique shall be used until the surfaces are free of dust, dirt, curing compound, or any residue that might prevent ready insertion or uniform contact of the seal and bonding of the lubricant/adhesive to the concrete. After final cleaning and immediately prior to sealing, the joints shall be blown out with compressed air and left completely free of debris and water.

c. Sandblast cleaning. Sandblast cleaning is not allowed.

d. Rate of progress. Cleaning of the joint faces shall be limited to the linear footage of joint that can be sealed during the same workday.

604-4.4 Installation of the compression seal.

a. Time of installation. Joints shall be sealed within 3 calendar days of sawing the joint seal cavity and the final cleaning of the joint walls, or a temporary seal shall be installed to prevent infiltration of foreign material. If rain interrupts the sealing operations, the joints shall be washed, cleaned with air and be dry before proceeding with installing of the lubricant/adhesive and compression seal.

b. Installation Sequence. Longitudinal joints shall be sealed first, then seal the transverse joints. Transverse joint seals will be continuous from edge to edge of the pavement. Intersections shall be made monolithic by use of joint seal adhesive and care in fitting the intersection parts together. Seals which do not reach an intersection shall be removed and

replaced with new seal as directed by the RPR at the Contractor's Expense. Seal extender pieces shall not be used at intersections.

c. Sealing joints. The sides of the joint seal or the sides of the joint shall be covered with a coating of lubricant/adhesive and the seal installed as specified. Butt joints and seal intersections shall be coated with liberal applications of lubricant/adhesive. Lubricant/adhesive spilled on the pavement shall be removed immediately to prevent setting on the pavement.

The joint seal shall be placed at a uniform depth within the tolerances specified. The compression joint seal shall be placed to a depth of 3/16 inch, $\pm 1/8$ inch, below the pavement surface or below the depth of the groove unless otherwise directed by the RPR.

The seal shall be installed in the longest practicable lengths in longitudinal joints and shall be cut at the joint intersections to provide continuous installation of the seal in the transverse joints. The joint seal shall be installed in an upright position, free from twisting, distortion, and cuts. If stretch of installed joint seal exceeds 1%, adjustments shall be made to the installation equipment and procedure. Stretch of installed joint seals exceeding 2% stretch shall be removed and replaced.

After installation of the longitudinal joint seals, it shall set for a minimum of one (1) hour prior to cutting the seal at the joint intersections. For all transverse joints, the minimum length of the preformed joint seal shall be the pavement width from edge to edge.

604-4.5 Clean-up. Upon completion of the project, all unused materials shall be removed from the site, all lubricant/adhesive on the pavement surface shall be removed, and the pavement shall be left in clean condition.

604-4.6 Quality Control and Quality Assurance.

a. Quality Control The application equipment shall be inspected to assure uniform application of lubricant/adhesive to the sides of the compression joint seal or the walls of the joint. Equipment causing cutting, twisting, nicking, excessive stretching or compressing of the compression seal, or improper application of the lubricant/adhesive, shall not be used until causes of the deficiencies are determined and corrected by the Contractor.

The seal shall be inspected by the Contractor a minimum of once per 400 feet of seal for compliance to the shrinkage or compression requirements. Measurements shall be made at the same interval to determine conformance with depth and width installation requirements.

b. Quality Assurance. Cleaned joints shall be approved by the RPR prior to installation of the lubricant/adhesive and compression joint seal.

Conformance to stretching and compression limitations shall be determined by the RPR using the following procedures:

(1) Mark the top surface of the compression seal at one foot intervals in a manner clear and durable to enable length determinations of the seal.

(2) After installation, the distance between the marks on the seal shall be measured by the Contractor.

(3) If the stretching or compression exceeds the specified limit, the seal shall be removed and replaced with new joint seal at the Contractor's Expense. The seal shall be removed up to the last correct measurement.

604-4.7 Acceptance. The joint sealing system (compression seal and lubricant/adhesive) shall be inspected by the RPR for proper rate of cure and bonding to the concrete, cuts, twists, nicks, and other deficiencies. Seals exhibiting any defects prior to final acceptance of the project, shall

be removed from the joint, wasted, and replaced with new material in a satisfactory manner, at the Contractor's expense, as determined by the RPR.

METHOD OF MEASUREMENT

604-5.1 Measurement. The quantity of compression joint seals installed and accepted, will be determined by the linear feet.

BASIS OF PAYMENT

604-6.1 Payment. Payment will be made at the contract unit bid prices per linear foot for the compression joint seals. The unit bid prices shall include the cost of all labor, materials, the use of all equipment, and tools required to complete the work.

Item 604-6.1	Compression Joint Seals for Concrete Pavements (1/2 inch wide) – per linear feet
Item 604-6.2	Compression Joint Seals for Concrete Pavements (1 inch wide) – per linear feet

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.

ASTM International (ASTM)

ASTM D2628	Standard Specification for Preformed Polychloroprene Elastomeric Joint Seals for Concrete Pavements
ASTM D2835	Standard Specification for Lubricant for Installation of Preformed Compression Seals in Concrete Pavements

Corps of Engineers

CRD C548	Standard Specification for Jet-Fuel and Heat Resistant Preformed Polychloroprene Elastomeric Joint Seals for Rigid Pavements
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Unified Facilities Criteria (UFC)

UFC 3-250-08FA	Standard Practice for Sealing Joints and Cracks in Rigid and Flexible Pavements
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END ITEM P-604

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Item P-605 Joint Sealants for Pavements

DESCRIPTION

605-1.1 This item shall consist of providing and installing a resilient and adhesive joint sealing material capable of effectively sealing joints in pavement; joints between different types of pavements; and cracks in existing pavement.

MATERIALS

605-2.1 Joint sealants. Joint sealant materials shall meet the requirements of ASTM D5893 or ASTM D6690.

Each lot or batch of sealant shall be delivered to the jobsite in the manufacturer's original sealed container. Each container shall be marked with the manufacturer's name, batch or lot number, the safe heating temperature, and shall be accompanied by the manufacturer's certification stating that the sealant meets the requirements of this specification.

605-2.2 Backer rod. The material furnished shall be a compressible, non-shrinking, non-staining, non-absorbing material that is non-reactive with the joint sealant in accordance with ASTM D5249. The backer-rod material shall be $25\% \pm 5\%$ larger in diameter than the nominal width of the joint.

605-2.3 Bond breaking tapes. Provide a bond breaking tape or separating material that is a flexible, non-shrinkable, non-absorbing, non-staining, and non-reacting adhesive-backed tape. The material shall have a melting point at least 5°F greater than the pouring temperature of the sealant being used when tested in accordance with ASTM D789. The bond breaker tape shall be approximately $1/8$ inch wider than the nominal width of the joint and shall not bond to the joint sealant.

CONSTRUCTION METHODS

605-3.1 Time of application. Joints shall be sealed as soon after completion of the curing period as feasible and before the pavement is opened to traffic, including construction equipment. The pavement temperature shall be 50°F and rising at the time of application of the poured joint sealing material. Do not apply sealant if moisture is observed in the joint.

605-3.2 Equipment. Machines, tools, and equipment used in the performance of the work required by this section shall be approved before the work is started and maintained in satisfactory condition at all times. Submit a list of proposed equipment to be used in performance of construction work including descriptive data, 14 days prior to use on the project.

a. Tractor-mounted routing tool. Provide a routing tool, used for removing old sealant from the joints, of such shape and dimensions and so mounted on the tractor that it will not damage the sides of the joints. The tool shall be designed so that it can be adjusted to remove the old material to varying depths as required. The use of V-shaped tools or rotary impact routing devices will not be permitted. Hand-operated spindle routing devices may be used to clean and enlarge random cracks.

b. Concrete saw. Provide a self-propelled power saw, with water-cooled diamond or abrasive saw blades, for cutting joints to the depths and widths specified.

c. Sandblasting equipment. Sandblasting is not allowed.

d. Waterblasting equipment. The Contractor must demonstrate waterblasting equipment including the pumps, hose, guide and nozzle size, under job conditions, before approval in accordance with paragraph 605-3.3. The Contractor shall demonstrate, in the presence of the RPR, that the method cleans the joint and does not damage the joint.

e. Hand tools. Hand tools may be used, when approved, for removing defective sealant from a crack and repairing or cleaning the crack faces. Hand tools should be carefully evaluated for potential spalling effects prior to approval for use.

f. Hot-poured sealing equipment. The unit applicators used for heating and installing ASTM D6690 joint sealant materials shall be mobile and shall be equipped with a double-boiler, agitator-type kettle with an oil medium in the outer space for heat transfer; a direct-connected pressure-type extruding device with a nozzle shaped for inserting in the joint to be filled; positive temperature devices for controlling the temperature of the transfer oil and sealant; and a recording type thermometer for indicating the temperature of the sealant. The applicator unit shall be designed so that the sealant will circulate through the delivery hose and return to the inner kettle when not in use.

g. Cold-applied, single-component sealing equipment. The equipment for installing ASTM D5893 single component joint sealants shall consist of an extrusion pump, air compressor, following plate, hoses, and nozzle for transferring the sealant from the storage container into the joint opening. The dimension of the nozzle shall be such that the tip of the nozzle will extend into the joint to allow sealing from the bottom of the joint to the top. Maintain the initially approved equipment in good working condition, serviced in accordance with the supplier's instructions, and unaltered in any way without obtaining prior approval. Small hand-held air-powered equipment (i.e., caulking guns) may be used for small applications.

605-3.3 Preparation of joints. Pavement joints for application of material in this specification must be dry, clean of all scale, dirt, dust, curing compound, and other foreign matter. The Contractor shall demonstrate, in the presence of the RPR, that the method cleans the joint and does not damage the joint.

a. Sawing. All joints shall be sawed in accordance with specifications and plan details. Immediately after sawing the joint, the resulting slurry shall be completely removed from joint and adjacent area by flushing with a jet of water, and by use of other tools as necessary.

b. Sealing. Immediately before sealing, the joints shall be thoroughly cleaned of all remaining laitance, curing compound, filler, protrusions of hardened concrete, old sealant and other foreign material from the sides and upper edges of the joint space to be sealed. Cleaning shall be accomplished by tractor-mounted routing equipment, concrete saw, or waterblaster as specified in paragraph 605-3.2. The newly exposed concrete joint faces and the pavement surface extending a minimum of 1/2 inch from the joint edge shall be sandblasted clean. Sandblasting shall be accomplished in a minimum of two passes. One pass per joint face with the nozzle held at an angle directly toward the joint face and not more than 3 inches from it. After final cleaning and immediately prior to sealing, blow out the joints with compressed air and leave them completely free of debris and water. The joint faces shall be surface dry when the seal is applied.

c. Backer Rod. When the joint opening is of a greater depth than indicated for the sealant depth, plug or seal off the lower portion of the joint opening using a backer rod in accordance

with paragraph 605-2.2 to prevent the entrance of the sealant below the specified depth. Take care to ensure that the backer rod is placed at the specified depth and is not stretched or twisted during installation.

d. Bond-breaking tape. Where inserts or filler materials contain bitumen, or the depth of the joint opening does not allow for the use of a backup material, insert a bond-separating tape breaker in accordance with paragraph 605-2.3 to prevent incompatibility with the filler materials and three-sided adhesion of the sealant. Securely bond the tape to the bottom of the joint opening so it will not float up into the new sealant.

605-3.4 Installation of sealants. Joints shall be inspected for proper width, depth, alignment, and preparation, and shall be approved by the RPR before sealing is allowed. Sealants shall be installed in accordance with the following requirements:

Immediately preceding, but not more than 50 feet ahead of the joint sealing operations, perform a final cleaning with compressed air. Fill the joints from the bottom up to 1/4 inch \pm 1/16 inch below the top of pavement surface; or bottom of groove for grooved pavement. Remove and discard excess or spilled sealant from the pavement by approved methods. Install the sealant in such a manner as to prevent the formation of voids and entrapped air. In no case shall gravity methods or pouring pots be used to install the sealant material. Traffic shall not be permitted over newly sealed pavement until authorized by the RPR. When a primer is recommended by the manufacturer, apply it evenly to the joint faces in accordance with the manufacturer's instructions. Check the joints frequently to ensure that the newly installed sealant is cured to a tack-free condition within the time specified.

605-3.5 Inspection. The Contractor shall inspect the joint sealant for proper rate of cure and set, bonding to the joint walls, cohesive separation within the sealant, reversion to liquid, entrapped air and voids. Sealants exhibiting any of these deficiencies at any time prior to the final acceptance of the project shall be removed from the joint, wasted, and replaced as specified at no additional cost to the airport.

605-3.6 Clean-up. Upon completion of the project, remove all unused materials from the site and leave the pavement in a clean condition.

METHOD OF MEASUREMENT

605-4.1 Joint sealing material shall be measured by the linear foot of sealant in place, completed, and accepted.

BASIS OF PAYMENT

605-5.1 Payment for joint sealing material shall be made at the contract unit price per linear foot. The price shall be full compensation for furnishing all materials, for all preparation, delivering, and placing of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item P-605-5.1 Joint Sealing Filler, per linear foot

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.

ASTM International (ASTM)

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| ASTM D789 | Standard Test Method for Determination of Relative Viscosity of Polyamide (PA) |
| ASTM D5249 | Standard Specification for Backer Material for Use with Cold- and Hot-Applied Joint Sealants in Portland-Cement Concrete and Asphalt Joints |
| ASTM D5893 | Standard Specification for Cold Applied, Single Component, Chemically Curing Silicone Joint Sealant for Portland Cement Concrete Pavements |
| ASTM D6690 | Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt |
| ASTM D7116 | Standard Specification for Joint Sealants, Hot Applied, Jet Fuel Resistant Types for Portland Cement Concrete Pavements |

Advisory Circulars (AC)

- | | |
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| AC 150/5340-30 | Design and Installation Details for Airport Visual Aids |
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END ITEM P-605

Item P-610 Concrete for Miscellaneous Structures

DESCRIPTION

610-1.1 This item shall consist of concrete and reinforcement, as shown on the plans, prepared and constructed in accordance with these specifications. This specification shall be used for all concrete other than airfield pavement which are cast-in-place.

MATERIALS

610-2.1 General. Only approved materials, conforming to the requirements of these specifications, shall be used in the work. Materials may be subject to inspection and tests at any time during their preparation or use. The source of all materials shall be approved by the Resident Project Representative (RPR) before delivery or use in the work. Representative preliminary samples of the materials shall be submitted by the Contractor, when required, for examination and test. Materials shall be stored and handled to ensure preservation of their quality and fitness for use and shall be located to facilitate prompt inspection. All equipment for handling and transporting materials and concrete must be clean before any material or concrete is placed in them.

The use of pit-run aggregates shall not be permitted unless the pit-run aggregate has been screened and washed, and all fine and coarse aggregates stored separately and kept clean. The mixing of different aggregates from different sources in one storage stockpile or alternating batches of different aggregates shall not be permitted.

a. Reactivity. Fine aggregate and coarse aggregates to be used in all concrete shall have been tested separately within six months of the project in accordance with ASTM C1260. Test results shall be submitted to the RPR. The aggregate shall be considered innocuous if the expansion of test specimens, tested in accordance with ASTM C1260, does not exceed 0.08% at 14 days (16 days from casting). If the expansion either or both test specimen is greater than 0.08% at 14 days, but less than 0.20%, a minimum of 25% of Type F fly ash, or between 40% and 55% of slag cement shall be used in the concrete mix.

If the expansion is greater than 0.20%, the aggregates shall not be used, and test results for other aggregates must be submitted for evaluation; or aggregates that meet P-501 reactivity test requirements may be utilized.

610-2.2 Coarse aggregate. The coarse aggregate for concrete shall meet the requirements of ASTM C33 and the requirements of Table 4, Class Designation 5S; and the grading requirements shown below, as required for the project.

Coarse Aggregate Grading Requirements

Maximum Aggregate Size	ASTM C33, Table 3 Grading Requirements (Size No.)
1 1/2 inch	467 or 4 and 67
1 inch	57
3/4 inch	67
1/2 inch	7

610-2.3 Fine aggregate. The fine aggregate for concrete shall meet all fine aggregate requirements of ASTM C33.

610-2.4 Cement. Cement shall conform to the requirements of ASTM C150, Type I, IA, II, IIA, III, IIIA, V.

610-2.5 Cementitious materials.

a. Fly ash. Fly ash shall meet the requirements of ASTM C618, with the exception of loss of ignition, where the maximum shall be less than 6%. Fly ash shall have a Calcium Oxide (CaO) content of less than 15% and a total available alkali content less than 3% per ASTM C311. Fly ash produced in furnace operations using liming materials or soda ash (sodium carbonate) as an additive shall not be acceptable. The Contractor shall furnish the previous three most recent, consecutive ASTM C618 reports for each source of fly ash proposed in the concrete mix, and shall furnish each additional report as they become available during the project. The reports can be used for acceptance or the material may be tested independently by the RPR.

b. Slag cement (ground granulated blast furnace (GGBF)). Slag cement shall conform to ASTM C989, Grade 100 or Grade 120. Slag cement shall be used only at a rate between 25% and 55% of the total cementitious material by mass.

610-2.6 Water. Water used in mixing or curing shall be from potable water sources. Other sources shall be tested in accordance with ASTM C1602 prior to use.

610-2.7 Admixtures. The Contractor shall submit certificates indicating that the material to be furnished meets all of the requirements indicated below. In addition, the RPR may require the Contractor to submit complete test data from an approved laboratory showing that the material to be furnished meets all of the requirements of the cited specifications. Subsequent tests may be made of samples taken by the RPR from the supply of the material being furnished or proposed for use on the work to determine whether the admixture is uniform in quality with that approved.

a. Air-entraining admixtures. Air-entraining admixtures shall meet the requirements of ASTM C260 and shall consistently entrain the air content in the specified ranges under field conditions. The air-entrainment agent and any water reducer admixture shall be compatible.

b. Water-reducing admixtures. Water-reducing admixture shall meet the requirements of ASTM C494, Type A, B, or D. ASTM C494, Type F and G high range water reducing admixtures and ASTM C1017 flowable admixtures shall not be used.

c. Other chemical admixtures. The use of set retarding, and set-accelerating admixtures shall be approved by the RPR. Retarding shall meet the requirements of ASTM C494, Type A,

B, or D and set-accelerating shall meet the requirements of ASTM C494, Type C. Calcium chloride and admixtures containing calcium chloride shall not be used.

610-2.8 Premolded joint material. Premolded joint material for expansion joints shall meet the requirements of ASTM D1751.

610-2.9 Joint filler. The filler for joints shall meet the requirements of Item P-605, unless otherwise specified.

610-2.10 Steel reinforcement. Reinforcing shall consist of reinforcing steel conforming to the requirements of ASTM A615.

610-2.11 Materials for curing concrete. Curing materials shall conform to ASTM C309.

CONSTRUCTION METHODS

610-3.1 General. The Contractor shall furnish all labor, materials, and services necessary for, and incidental to, the completion of all work as shown on the drawings and specified here. All machinery and equipment used by the Contractor on the work, shall be of sufficient size to meet the requirements of the work. All work shall be subject to the inspection and approval of the RPR.

610-3.2 Concrete Mixture. The concrete shall develop a compressive strength of 4000 psi in 28 days as determined by test cylinders made in accordance with ASTM C31 and tested in accordance with ASTM C39. The concrete shall contain not less than 470 pounds of cementitious material per cubic yard. The water cementitious ratio shall not exceed 0.45 by weight. The air content of the concrete shall be 5% +/- 1.2% as determined by ASTM C231 and shall have a slump of not more than 4 inches as determined by ASTM C143.

610-3.3 Mixing. Concrete may be mixed at the construction site, at a central point, or wholly or in part in truck mixers. The concrete shall be mixed and delivered in accordance with the requirements of ASTM C94 or ASTM C685.

The concrete shall be mixed only in quantities required for immediate use. Concrete shall not be mixed while the air temperature is below 40°F without the RPRs approval. If approval is granted for mixing under such conditions, aggregates or water, or both, shall be heated and the concrete shall be placed at a temperature not less than 50°F nor more than 100°F. The Contractor shall be held responsible for any defective work, resulting from freezing or injury in any manner during placing and curing, and shall replace such work at his expense.

Retempering of concrete by adding water or any other material is not permitted.

The rate of delivery of concrete to the job shall be sufficient to allow uninterrupted placement of the concrete.

610-3.4 Forms. Concrete shall not be placed until all the forms and reinforcements have been inspected and approved by the RPR. Forms shall be of suitable material and shall be of the type, size, shape, quality, and strength to build the structure as shown on the plans. The forms shall be true to line and grade and shall be mortar-tight and sufficiently rigid to prevent displacement and sagging between supports. The surfaces of forms shall be smooth and free from irregularities, dents, sags, and holes. The Contractor shall be responsible for their adequacy.

The internal form ties shall be arranged so no metal will show in the concrete surface or discolor the surface when exposed to weathering when the forms are removed. All forms shall be wetted with water or with a non-staining mineral oil, which shall be applied immediately before the

concrete is placed. Forms shall be constructed so they can be removed without injuring the concrete or concrete surface.

610-3.5 Placing reinforcement. All reinforcement shall be accurately placed, as shown on the plans, and shall be firmly held in position during concrete placement. Bars shall be fastened together at intersections. The reinforcement shall be supported by approved metal chairs. Shop drawings, lists, and bending details shall be supplied by the Contractor when required.

610-3.6 Embedded items. Before placing concrete, all embedded items shall be firmly and securely fastened in place as indicated. All embedded items shall be clean and free from coating, rust, scale, oil, or any foreign matter. The concrete shall be spaded and consolidated around and against embedded items. The embedding of wood shall not be allowed.

610-3.7 Concrete Consistency. The Contractor shall monitor the consistency of the concrete delivered to the project site; collect each batch ticket; check temperature; and perform slump tests on each truck at the project site in accordance with ASTM C143.

610-3.8 Placing concrete. All concrete shall be placed during daylight hours, unless otherwise approved. The concrete shall not be placed until the depth and condition of foundations, the adequacy of forms and falsework, and the placing of the steel reinforcing have been approved by the RPR. Concrete shall be placed as soon as practical after mixing, but in no case later than one (1) hour after water has been added to the mix. The method and manner of placing shall avoid segregation and displacement of the reinforcement. Troughs, pipes, and chutes shall be used as an aid in placing concrete when necessary. The concrete shall not be dropped from a height of more than 5 feet. Concrete shall be deposited as nearly as practical in its final position to avoid segregation due to rehandling or flowing. Do not subject concrete to procedures which cause segregation. Concrete shall be placed on clean, damp surfaces, free from running water, or on a properly consolidated soil foundation.

610-3.9 Vibration. Vibration shall follow the guidelines in American Concrete Institute (ACI) Committee 309R, Guide for Consolidation of Concrete.

610-3.10 Joints. Joints shall be constructed as indicated on the plans.

610-3.11 Finishing. All exposed concrete surfaces shall be true, smooth, and free from open or rough areas, depressions, or projections. All concrete horizontal plane surfaces shall be brought flush to the proper elevation with the finished top surface struck-off with a straightedge and floated.

610-3.12 Curing and protection. All concrete shall be properly cured in accordance with the recommendations in American Concrete Institute (ACI) 308R, Guide to External Curing of Concrete. The concrete shall be protected from damage until project acceptance.

610-3.13 Cold weather placing. When concrete is placed at temperatures below 40°F, follow the cold weather concreting recommendations found in ACI 306R, Cold Weather Concreting.

610-3.14 Hot weather placing. When concrete is placed in hot weather greater than 85°F, follow the hot weather concreting recommendations found in ACI 305R, Hot Weather Concreting.

QUALITY ASSURANCE (QA)

610-4.1 Quality Assurance sampling and testing. Concrete for each day's placement will be accepted on the basis of the compressive strength specified in paragraph 610-3.2. The RPR will sample the concrete in accordance with ASTM C172; test the slump in accordance with ASTM C143; test air content in accordance with ASTM C231; make and cure compressive strength

specimens in accordance with ASTM C31; and test in accordance with ASTM C39. The QA testing agency will meet the requirements of ASTM C1077.

The Contractor shall provide adequate facilities for the initial curing of cylinders.

610-4.2 Defective work. Any defective work that cannot be satisfactorily repaired as determined by the RPR, shall be removed and replaced at the Contractor's expense. Defective work includes, but is not limited to, uneven dimensions, honeycombing and other voids on the surface or edges of the concrete.

METHOD OF MEASUREMENT

610-5.1 Concrete shall be considered incidental and no separate measurement shall be made of concrete complete in place and accepted.

BASIS OF PAYMENT

610-6.1 Concrete shall be considered incidental and no separate payment shall be made. This price shall be full compensation for furnishing all materials including reinforcement and embedded items and for all preparation, delivery, installation, and curing of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item P-610-6.1 Concrete, incidental to other work items

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.

ASTM International (ASTM)

ASTM A184	Standard Specification for Welded Deformed Steel Bar Mats for Concrete Reinforcement
ASTM A615	Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
ASTM A704	Standard Specification for Welded Steel Plain Bar or Rod Mats for Concrete Reinforcement
ASTM A706	Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement
ASTM A775	Standard Specification for Epoxy-Coated Steel Reinforcing Bars
ASTM A884	Standard Specification for Epoxy-Coated Steel Wire and Welded Wire Reinforcement
ASTM A934	Standard Specification for Epoxy-Coated Prefabricated Steel Reinforcing Bars
ASTM A1064	Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete

ASTM C31	Standard Practice for Making and Curing Concrete Test Specimens in the Field
ASTM C33	Standard Specification for Concrete Aggregates
ASTM C39	Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
ASTM C94	Standard Specification for Ready-Mixed Concrete
ASTM C136	Standard Test Method for Sieve or Screen Analysis of Fine and Coarse Aggregates
ASTM C114	Standard Test Methods for Chemical Analysis of Hydraulic Cement
ASTM C136	Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM C143	Standard Test Method for Slump of Hydraulic-Cement Concrete
ASTM C150	Standard Specification for Portland Cement
ASTM C171	Standard Specification for Sheet Materials for Curing Concrete
ASTM C172	Standard Practice for Sampling Freshly Mixed Concrete
ASTM C231	Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C260	Standard Specification for Air-Entraining Admixtures for Concrete
ASTM C309	Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete
ASTM C311	Standard Test Methods for Sampling and Testing Fly Ash or Natural Pozzolans for Use in Portland-Cement Concrete
ASTM C494	Standard Specification for Chemical Admixtures for Concrete
ASTM C618	Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
ASTM C666	Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing
ASTM C685	Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing
ASTM C989	Standard Specification for Slag Cement for Use in Concrete and Mortars
ASTM C1017	Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete
ASTM C1077	Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation
ASTM C1157	Standard Performance Specification for Hydraulic Cement
ASTM C1260	Standard Test Method for Potential Alkali Reactivity of Aggregates (Mortar-Bar Method)

ASTM C1365	Standard Test Method for Determination of the Proportion of Phases in Portland Cement and Portland-Cement Clinker Using X-Ray Powder Diffraction Analysis
ASTM C1602	Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete
ASTM D1751	Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Asphalt Types)
ASTM D1752	Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction

American Concrete Institute (ACI)

ACI 305R	Hot Weather Concreting
ACI 306R	Cold Weather Concreting
ACI 308R	Guide to External Curing of Concrete
ACI 309R	Guide for Consolidation of Concrete

END OF ITEM P-610

Item P-620 Runway and Taxiway Marking

DESCRIPTION

620-1.1 This item shall consist of the preparation and painting of numbers, markings, and stripes on the surface of runways, taxiways, and aprons, in accordance with these specifications and at the locations shown on the plans, or as directed by the Resident Project Representative (RPR). The terms “paint” and “marking material” as well as “painting” and “application of markings” are interchangeable throughout this specification.

MATERIALS

620-2.1 Materials acceptance. The Contractor shall furnish manufacturer’s certified test reports, for materials shipped to the project. The certified test reports shall include a statement that the materials meet the specification requirements. This certification along with a copy of the paint manufacturer’s surface preparation; marking materials, including adhesion, flow promoting and/or floatation additive; and application requirements must be submitted and approved by the Resident Project Representative (RPR) prior to the initial application of markings. The reports can be used for material acceptance or the RPR may perform verification testing. The reports shall not be interpreted as a basis for payment. The Contractor shall notify the RPR upon arrival of a shipment of materials to the site. All material shall arrive in sealed containers that are easily quantifiable for inspection by the RPR.

620-2.2 Marking materials.

Table 1. Marking Materials

Paint ¹				Glass Beads ²	
Type	Color	Fed Std. 595 Number	Application Rate Maximum	Type	Application Rate Minimum
Waterborne Type III	White	379925	55 ft ² /gal	Type IV	5 lb/gal
Waterborne Type III	Yellow	33538 or 33655	55 ft ² /gal	Type IV	5 lb/gal
Waterborne Type III	Red	31136	55 ft ² /gal	Type IV	3 lb/gal
Waterborne Type III	Black	37038	55 ft ² /gal	None	None

¹ See paragraph 620-2.2a

² See paragraph 620-2.2b

a. Paint. Paint shall be waterborne in accordance with the requirements of this paragraph. Paint colors shall comply with Federal Standard No. 595.

Waterborne. Paint shall meet the requirements of Federal Specification TT-P-1952F, Type III. The non-volatile portion of the vehicle for all paint types shall be composed of a 100% acrylic polymer as determined by infrared spectral analysis.

b. Reflective media. Glass beads for white and yellow paint shall meet the requirements for Federal Specification TT-B-1325D Type IV, Gradation A.

Glass beads for red and pink paint shall meet the requirements for Type IV, Gradation A.

Glass beads shall be treated with all compatible coupling agents recommended by the manufacturers of the paint and reflective media to ensure adhesion and embedment.

Glass beads shall not be used in black and green paint.

Type III glass beads shall not be used in red and pink paint.

CONSTRUCTION METHODS

620-3.1 Weather limitations. Painting shall only be performed when the surface is dry, and the ambient temperature and the pavement surface temperature meet the manufacturer's recommendations in accordance with paragraph 620-2.1. Painting operations shall be discontinued when the ambient or surface temperatures does not meet the manufacturer's recommendations. Markings shall not be applied when the wind speed exceeds 10 mph unless windscreens are used to shroud the material guns. Markings shall not be applied when weather conditions are forecasts to not be within the manufacturers' recommendations for application and dry time.

620-3.2 Equipment. Equipment shall include the apparatus necessary to properly clean the existing surface, a mechanical marking machine, a bead dispensing machine, and such auxiliary hand-painting equipment as may be necessary to satisfactorily complete the job.

The mechanical marker shall be an atomizing spray-type or airless type marking machine with automatic glass bead dispensers suitable for application of traffic paint. It shall produce an even and uniform film thickness and appearance of both paint and glass beads at the required coverage and shall apply markings of uniform cross-sections and clear-cut edges without running or spattering and without over spray. The marking equipment for both paint and beads shall be calibrated daily.

620-3.3 Preparation of surfaces. Immediately before application of the paint, the surface shall be dry and free from dirt, grease, oil, laitance, or other contaminants that would reduce the bond between the paint and the pavement. Use of any chemicals or impact abrasives during surface preparation shall be approved in advance by the RPR. After the cleaning operations, sweeping, blowing, or rinsing with pressurized water shall be performed to ensure the surface is clean and free of grit or other debris left from the cleaning process.

a. Preparation of new pavement surfaces. The area to be painted shall be cleaned by broom, blower, water blasting, or by other methods approved by the RPR to remove all contaminants, including PCC curing compounds, minimizing damage to the pavement surface.

b. Preparation of pavement to remove existing markings. Existing pavement markings shall be removed by rotary grinding, water blasting, or by other methods approved by the RPR minimizing damage to the pavement surface. The removal area may need to be larger than the area of the markings to eliminate ghost markings. After removal of markings on asphalt pavements, apply a fog seal or seal coat to 'block out' the removal area to eliminate 'ghost' markings.

c. Preparation of pavement markings prior to remarking. Prior to remarking existing markings, existing markings must be removed minimizing damage to the pavement surface, with a method approved by the RPR. After removal, the surface shall be cleaned of all residue or debris.

Prior to the application of markings, the Contractor shall certify in writing that the surface is dry and free from dirt, grease, oil, laitance, or other foreign material that would prevent the bond of the paint to the pavement or existing markings. This certification along with a copy of the paint manufactures application and surface preparation requirements must be submitted to the RPR prior to the initial application of markings.

620-3.4 Layout of markings. The proposed markings shall be laid out in advance of the paint application. The locations of markings to receive glass beads shall be shown on the plans.

620-3.5 Application. A period of 30 days shall elapse between placement of surface course or seal coat and application of the permanent paint markings. Paint shall be applied at the locations and to the dimensions and spacing shown on the plans. Paint shall not be applied until the layout and condition of the surface has been approved by the RPR.

The edges of the markings shall not vary from a straight line more than 1/2 inch in 50 feet, and marking dimensions and spacing shall be within the following tolerances:

Marking Dimensions and Spacing Tolerance

Dimension and Spacing	Tolerance
36 inch or less	±1/2 inch
greater than 36 inch to 6 feet	±1 inch
greater than 6 feet to 60 feet	±2 inch
greater than 60 feet	±3 inch

The paint shall be mixed in accordance with the manufacturer's instructions and applied to the pavement with a marking machine at the rate shown in Table 1. The addition of thinner will not be permitted.

Glass beads shall be distributed upon the marked areas at the locations shown on the plans to receive glass beads immediately after application of the paint. A dispenser shall be furnished that is properly designed for attachment to the marking machine and suitable for dispensing glass beads. Glass beads shall be applied at the rate shown in Table 1. Glass beads shall not be applied to black paint or green paint. Glass beads shall adhere to the cured paint or all marking operations shall cease until corrections are made. Different bead types shall not be mixed. Regular monitoring of glass bead embedment and distribution should be performed.

620-3.6 Application--preformed thermoplastic airport pavement markings.

Preformed thermoplastic pavement markings not used.

620-3.7 Control strip. Prior to the full application of airfield markings, the Contractor shall prepare a control strip in the presence of the RPR. The Contractor shall demonstrate the surface preparation method and all striping equipment to be used on the project. The marking equipment must achieve the prescribed application rate of paint and population of glass beads (per Table 1) that are properly embedded and evenly distributed across the full width of the marking. Prior to acceptance of the control strip, markings must be evaluated during darkness to ensure a uniform appearance.

620-3.8 Retro-reflectance. Reflectance shall be measured with a portable retro-reflectometer meeting ASTM E1710 (or equivalent). A total of 6 reading shall be taken over a 6 square foot area with 3 readings taken from each direction. The average shall be equal to or above the minimum levels of all readings which are within 30% of each other.

Minimum Retro-Reflectance Values

Material	Retro-reflectance mcd/m ² /lux		
	White	Yellow	Red
Initial Type I	300	175	35
Initial Type III	600	300	35
Initial Thermoplastic	225	100	35
All materials, remark when less than ¹	100	75	10

¹ Prior to remarking determine if removal of contaminants on markings will restore retro-reflectance.

620-3.9 Protection and cleanup. After application of the markings, all markings shall be protected from damage until dry. All surfaces shall be protected from excess moisture and/or rain and from disfiguration by spatter, splashes, spillage, or drippings. The Contractor shall remove from the work area all debris, waste, loose reflective media, and by-products generated by the surface preparation and application operations to the satisfaction of the RPR. The Contractor shall dispose of these wastes in strict compliance with all applicable state, local, and federal environmental statutes and regulations.

METHOD OF MEASUREMENT

620-4.1a The quantity of surface preparation shall be measured by the number of square feet for each type of surface preparation specified in paragraph 620-3.3.

620-4.1b The quantity of markings shall be paid for shall be measured by the number of square feet of painting.

620-4.1c The quantity of reflective media shall be paid for by lump sum of reflective media.

620-4.1d The quantity of temporary markings to be paid for shall be lump sum price performed in accordance with the specifications and accepted by the RPR. Temporary marking includes surface preparation, application and complete removal of the temporary marking.

BASIS OF PAYMENT

620-5.1 This price shall be full compensation for furnishing all materials and for all labor, equipment, tools, and incidentals necessary to complete the item complete in place and accepted by the RPR in accordance with these specifications.

620-5.1a Payment for surface preparation shall be made at the contract price for the number of square feet for each type of surface preparation specified in paragraph 620-3.3.

620-5.2b Payment for markings shall be made at the contract price for the number of square feet of painting.

620-5.3c Payment for reflective media shall be made at the contract unit price for lump sum.

620-5.4d Payment for temporary markings shall be made at the contract price for lump sum price. This price shall be full compensation for furnishing all materials and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item P-620-5.1a	Surface Preparation of Pavement to Remove Existing Markings – per square foot
Item P-620-5.1b	Surface Preparation of New Pavement Surfaces – per square foot
Item P-620-5.2a	Yellow Pavement Marking – per square foot
Item P-620-5.2b	White Pavement Marking – per square foot
Item P-620-5.2c	Black Pavement Marking – per square foot
Item P-620-5.2d	Red Pavement Marking – per square foot
Item P-620-5.3c	Reflective Media per – lump sum
Item P-620-5.4d	Temporary Markings – per lump sum

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.

ASTM International (ASTM)

ASTM D476	Standard Classification for Dry Pigmentary Titanium Dioxide Products
ASTM D968	Standard Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive
ASTM D1652	Standard Test Method for Epoxy Content of Epoxy Resins
ASTM D2074	Standard Test Method for Total, Primary, Secondary, and Tertiary Amine Values of Fatty Amines by Alternative Indicator Method
ASTM D2240	Standard Test Method for Rubber Property - Durometer Hardness
ASTM D7585	Standard Practice for Evaluating Retroreflective Pavement Markings Using Portable Hand-Operated Instruments
ASTM E303	Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester
ASTM E1710	Standard Test Method for Measurement of Retroreflective Pavement Marking Materials with CEN-Prescribed Geometry Using a Portable Retroreflectometer
ASTM E2302	Standard Test Method for Measurement of the Luminance Coefficient Under Diffuse Illumination of Pavement Marking Materials Using a Portable Reflectometer

ASTM G154 Standard Practice for Operating Fluorescent Ultraviolet (UV) Lamp
Apparatus for Exposure of Nonmetallic Materials

Code of Federal Regulations (CFR)

40 CFR Part 60, Appendix A-7, Method 24
Determination of volatile matter content, water content, density,
volume solids, and weight solids of surface coatings

29 CFR Part 1910.1200 Hazard Communication

Federal Specifications (FED SPEC)

FED SPEC TT-B-1325D Beads (Glass Spheres) Retro-Reflective

FED SPEC TT-P-1952F Paint, Traffic and Airfield Marking, Waterborne

FED STD 595 Colors used in Government Procurement

Commercial Item Description

A-A-2886B Paint, Traffic, Solvent Based

Advisory Circulars (AC)

AC 150/5340-1 Standards for Airport Markings

AC 150/5320-12 Measurement, Construction, and Maintenance of Skid Resistant
Airport Pavement Surfaces

END OF ITEM P-620

Item D-751 Manholes, Catch Basins, Inlets and Inspection Holes

DESCRIPTION

751-1.1 This item shall consist of construction of manholes, catch basins, inlets, and inspection holes, in accordance with these specifications, at the specified locations and conforming to the lines, grades, and dimensions shown on the plans or required by the RPR.

MATERIALS

751-2.1 Brick. The brick shall conform to the requirements of ASTM C32, Grade MS.

751-2.2 Mortar. Mortar shall consist of one part Portland cement and two parts sand. The cement shall conform to the requirements of ASTM C150, Type I. The sand shall conform to the requirements of ASTM C144.

751-2.3 Concrete. Plain and reinforced concrete used in structures, connections of pipes with structures, and the support of structures or frames shall conform to the requirements of Item P-610.

751-2.4 Precast concrete pipe manhole rings. Precast concrete pipe manhole rings shall conform to the requirements of ASTM C478. Unless otherwise specified, the risers and offset cone sections shall have an inside diameter of not less than 36 inches nor more than 48 inches. There shall be a gasket between individual sections and sections cemented together with mortar on the inside of the manhole. Gaskets shall conform to the requirements of ASTM C443.

751-2.5 Corrugated metal. Corrugated metal shall conform to the requirements of American Association of State Highway and Transportation Officials (AASHTO) M36.

751-2.6 Frames, covers, and grates. The castings shall conform to one of the following requirements:

- a. ASTM A48, Class 35B: Gray iron castings
- b. ASTM A47: Malleable iron castings
- c. ASTM A27: Steel castings
- d. ASTM A283, Grade D: Structural steel for grates and frames
- e. ASTM A536, Grade 65-45-12: Ductile iron castings
- f. ASTM A897: Austempered ductile iron castings

All castings or structural steel units shall conform to the dimensions shown on the plans and shall be designed to support the loadings, aircraft gear configuration and/or direct loading, specified.

Each frame and cover or grate unit shall be provided with fastening members to prevent it from being dislodged by traffic but which will allow easy removal for access to the structure.

All castings shall be thoroughly cleaned. After fabrication, structural steel units shall be galvanized to meet the requirements of ASTM A123.

751-2.7 Steps. The steps or ladder bars shall be gray or malleable cast iron or galvanized steel. The steps shall be the size, length, and shape shown on the plans and those steps that are not galvanized shall be given a coat of asphalt paint, when directed.

751-2.8 Precast inlet structures. Manufactured in accordance with and conforming to ASTM C913.

CONSTRUCTION METHODS

751-3.1 Unclassified excavation.

a. The Contractor shall excavate for structures and footings to the lines and grades or elevations, shown on the plans, or as staked by the RPR. The excavation shall be of sufficient size to permit the placing of the full width and length of the structure or structure footings shown. The elevations of the bottoms of footings, as shown on the plans, shall be considered as approximately only; and the RPR may direct, in writing, changes in dimensions or elevations of footings necessary for a satisfactory foundation.

b. Boulders, logs, or any other objectionable material encountered in excavation shall be removed. All rock or other hard foundation material shall be cleaned of all loose material and cut to a firm surface either level, stepped, or serrated, as directed by the RPR. All seams or crevices shall be cleaned out and grouted. All loose and disintegrated rock and thin strata shall be removed. Where concrete will rest on a surface other than rock, the bottom of the excavation shall not be disturbed and excavation to final grade shall not be made until immediately before the concrete or reinforcing is placed.

c. The Contractor shall do all bracing, sheathing, or shoring necessary to implement and protect the excavation and the structure as required for safety or conformance to governing laws. The cost of bracing, sheathing, or shoring shall be included in the unit price bid for the structure.

d. All bracing, sheathing, or shoring involved in the construction of this item shall be removed by the Contractor after the completion of the structure. Removal shall not disturb or damage finished masonry. The cost of removal shall be included in the unit price bid for the structure.

e. After excavation is completed for each structure, the Contractor shall notify the RPR. No concrete or reinforcing steel shall be placed until the RPR has approved the depth of the excavation and the character of the foundation material.

751-3.2 Brick structures.

a. Foundations. A prepared foundation shall be placed for all brick structures after the foundation excavation is completed and accepted. Unless otherwise specified, the base shall consist of reinforced concrete mixed, prepared, and placed in accordance with the requirements of Item P-610.

b. Laying brick. All brick shall be clean and thoroughly wet before laying so that they will not absorb any appreciable amount of additional water at the time they are laid. All brick shall be laid in freshly made mortar. Mortar not used within 45 minutes after water has been added shall be discarded. Retempering of mortar shall not be permitted. An ample layer of mortar shall be spread on the beds and a shallow furrow shall be made in it that can be readily closed by the laying of the brick. All bed and head joints shall be filled solid with mortar. End joints of stretchers and side or cross joints of headers shall be fully buttered with mortar and a shoved joint made to squeeze out mortar at the top of the joint. Any bricks that may be loosened after

the mortar has taken its set, shall be removed, cleaned, and re-laid with fresh mortar. No broken or chipped brick shall be used in the face, and no spalls or bats shall be used except where necessary to shape around irregular openings or edges; in which case, full bricks shall be placed at ends or corners where possible, and the bats shall be used in the interior of the course. In making closures, no piece of brick shorter than the width of a whole brick shall be used; and wherever practicable, whole brick shall be used and laid as headers.

c. Joints. All joints shall be filled with mortar at every course. Exterior faces shall be laid up in advance of backing. Exterior faces shall be plastered or parged with a coat of mortar not less than 3/8 inch thick before the backing is laid up. Prior to parging, all joints on the back of face courses shall be cut flush. Unless otherwise noted, joints shall be not less than 1/4 inch nor more than 1/2 inch wide and the selected joint width shall be maintained uniform throughout the work.

d. Pointing. Face joints shall be neatly struck, using the weather-struck joint. All joints shall be finished properly as the laying of the brick progresses. When nails or line pins are used, the holes shall be immediately plugged with mortar and pointed when the nail or pin is removed.

e. Cleaning. Upon completion of the work all exterior surfaces shall be thoroughly cleaned by scrubbing and washing with water. If necessary to produce satisfactory results, cleaning shall be done with a 5% solution of muriatic acid which shall then be rinsed off with liberal quantities of water.

f. Curing and cold weather protection. The brick masonry shall be protected and kept moist for at least 48 hours after laying the brick. Brick masonry work or pointing shall not be done when there is frost on the brick or when the air temperature is below 50°F unless the Contractor has, on the project ready to use, suitable covering and artificial heating devices necessary to keep the atmosphere surrounding the masonry at a temperature of not less than 60°F for the duration of the curing period.

751-3.3 Concrete structures. Concrete structures which are to be cast-in-place within the project boundaries shall be built on prepared foundations, conforming to the dimensions and shape indicated on the plans. The construction shall conform to the requirements specified in Item P-610. Any reinforcement required shall be placed as indicated on the plans and shall be approved by the RPR before the concrete is placed.

All invert channels shall be constructed and shaped accurately to be smooth, uniform, and cause minimum resistance to flowing water. The interior bottom shall be sloped to the outlet.

751-3.4 Precast concrete structures. Precast concrete structures shall be furnished by a plant meeting National Precast Concrete Association Plant Certification Program or another RPR approved third party certification program.

Precast concrete structures shall conform to ASTM C478. Precast concrete structures shall be constructed on prepared or previously placed slab foundations conforming to the dimensions and locations shown on the plans. All precast concrete sections necessary to build a completed structure shall be furnished. The different sections shall fit together readily. Joints between precast concrete risers and tops shall be full-bedded in cement mortar and shall: (1) be smoothed to a uniform surface on both interior and exterior of the structure or (2) utilize a rubber gasket per ASTM C443. The top of the upper precast concrete section shall be suitably formed and dimensioned to receive the metal frame and cover or grate, or other cap, as required. Provision shall be made for any connections for lateral pipe, including drops and leads that may be installed in the structure. The flow lines shall be smooth, uniform, and cause minimum resistance to flow. The metal or metal encapsulated steps that are embedded or built into the

side walls shall be aligned and placed in accordance to ASTM C478. When a metal ladder replaces the steps, it shall be securely fastened into position.

751-3.5 Corrugated metal structures. Corrugated metal structures shall be prefabricated. All standard or special fittings shall be furnished to provide pipe connections or branches with the correct dimensions and of sufficient length to accommodate connecting bands. The fittings shall be welded in place to the metal structures. The top of the metal structure shall be designed so that either a concrete slab or metal collar may be attached to allow the fastening of a standard metal frame and grate or cover. Steps or ladders shall be furnished as shown on the plans. Corrugated metal structures shall be constructed on prepared foundations, conforming to the dimensions and locations as shown on the plans. When indicated, the structures shall be placed on a reinforced concrete base.

751-3.6 Inlet and outlet pipes. Inlet and outlet pipes shall extend through the walls of the structures a sufficient distance beyond the outside surface to allow for connections. They shall be cut off flush with the wall on the inside surface of the structure, unless otherwise directed. For concrete or brick structures, mortar shall be placed around these pipes to form a tight, neat connection.

751-3.7 Placement and treatment of castings, frames, and fittings. All castings, frames, and fittings shall be placed in the positions indicated on the plans or as directed by the RPR, and shall be set true to line and elevation. If frames or fittings are to be set in concrete or cement mortar, all anchors or bolts shall be in place before the concrete or mortar is placed. The unit shall not be disturbed until the mortar or concrete has set.

When frames or fittings are placed on previously constructed masonry, the bearing surface of the masonry shall be brought true to line and grade and shall present an even bearing surface so the entire face or back of the unit will come in contact with the masonry. The unit shall be set in mortar beds and anchored to the masonry as indicated on the plans or as directed by the RPR. All units shall set firm and secure.

After the frames or fittings have been set in final position, the concrete or mortar shall be allowed to harden for seven (7) days before the grates or covers are placed and fastened down.

751-3.8 Installation of steps. The steps shall be installed as indicated on the plans or as directed by the RPR. When the steps are to be set in concrete, they shall be placed and secured in position before the concrete is placed. When the steps are installed in brick masonry, they shall be placed as the masonry is being built. The steps shall not be disturbed or used until the concrete or mortar has hardened for at least seven (7) days. After seven (7) days, the steps shall be cleaned and painted, unless they have been galvanized.

When steps are required with precast concrete structures they shall meet the requirements of ASTM C478. The steps shall be cast into the side of the sections at the time the sections are manufactured or set in place after the structure is erected by drilling holes in the concrete and cementing the steps in place.

When steps are required with corrugated metal structures, they shall be welded into aligned position at a vertical spacing of 12 inches.

Instead of steps, prefabricated ladders may be installed. For brick or concrete structures, the ladder shall be held in place by grouting the supports in drilled holes. For metal structures, the ladder shall be secured by welding the top support to the structure and grouting the bottom support into drilled holes in the foundation or as directed by the RPR.

751-3.9 Backfilling.

a. After a structure has been completed, the area around it shall be backfilled with approved material, in horizontal layers not to exceed 8 inches in loose depth, and compacted to the density required in Item P-152. Each layer shall be deposited evenly around the structure to approximately the same elevation. The top of the fill shall meet the elevation shown on the plans or as directed by the RPR.

b. Backfill shall not be placed against any structure until approved by the RPR. For concrete structures, approval shall not be given until the concrete has been in place seven (7) days, or until tests establish that the concrete has attained sufficient strength to withstand any pressure created by the backfill and placing methods.

c. Backfill shall not be measured for direct payment. Performance of this work shall be considered an obligation of the Contractor covered under the contract unit price for the structure involved.

751-3.10 Cleaning and restoration of site. After the backfill is completed, the Contractor shall dispose of all surplus material, dirt, and rubbish from the site. Surplus dirt may be deposited in embankments, shoulders, or as approved by the RPR. The Contractor shall restore all disturbed areas to their original condition. The Contractor shall remove all tools and equipment, leaving the entire site free, clear, and in good condition.

METHOD OF MEASUREMENT

751-4.1 Manholes, catch basins, inlets, and inspection holes shall be measured by the unit.

BASIS OF PAYMENT

751-5.1 The accepted quantities of manholes, catch basins, inlets, and inspection holes will be paid for at the contract unit price per each in place when completed. This price shall be full compensation for furnishing all materials and for all preparation, excavation, backfilling and placing of the materials; furnishing and installation of such specials and connections to pipes and other structures as may be required to complete the item as shown on the plans; and for all labor equipment, tools and incidentals necessary to complete the structure.

Payment will be made under:

Item D-751-5.1	Construct New Concrete Storm Drain Manhole Apron - per each
Item D-751-5.2	Construct New Concrete Handhole Apron - per each
Item D-751-5.3	Construct New FAA Manhole Apron - per each
Item D-751-5.4	Construct New Inlet Frame, Grate and Apron - per each

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.

ASTM International (ASTM)

ASTM A27	Standard Specification for Steel Castings, Carbon, for General Application
ASTM A47	Standard Specification for Ferritic Malleable Iron Castings

ASTM A48	Standard Specification for Gray Iron Castings
ASTM A123	Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A283	Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates
ASTM A536	Standard Specification for Ductile Iron Castings
ASTM A897	Standard Specification for Austempered Ductile Iron Castings
ASTM C32	Standard Specification for Sewer and Manhole Brick (Made from Clay or Shale)
ASTM C144	Standard Specification for Aggregate for Masonry Mortar
ASTM C150	Standard Specification for Portland Cement
ASTM C443	Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets.
ASTM C478	Standard Specification for Precast Reinforced Concrete Manhole Sections
ASTM C913	Standard Specification for Precast Concrete Water and Wastewater Structures.
American Association of State Highway and Transportation Officials (AASHTO)	
AASHTO M36	Standard Specification for Corrugated Steel Pipe, Metallic-Coated, for Sewers and Drains

END OF ITEM D-751

ELECTRICAL TECHNICAL SPECIFICATIONS

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ITEM L-100 ELECTRICAL GENERAL REQUIREMENTS

DESCRIPTION

100-1.1 GENERAL. This Item includes furnishing and installing all material, equipment and apparatus, and all labor, tools, services, and equipment required for the removal of portions of the airfield lighting system as shown on the drawings and installation of new high mast apron lighting system as follows:

- A. The demolition and removal of portions of the existing airfield lighting systems.
- B. Installation of new apron lighting system as specified in this specification and as shown in the drawings.
- C. Apron lighting system also includes installing circuit breakers in existing panelboard, conduit and feeder, and lighting contactor / control cabinet.

Installation shall be in accordance with Specifications FAA-C-1217 and FAA-C-1391, or as noted on the plans. Perform all work not included in the FAA Specifications in accordance with the National Electrical Code, applicable local and Airport standards, and regulations.

100-1.2 DEMOLITION AND SALVAGE

- A. Removal and salvage of airfield electrical elements is included under this Item shall include but not limited to the specific elements, of the following:
- B. Demolition (removal and non-return to Owner or for re-installation) of other airfield electrical system elements shall include but not limited to the specific elements, of the following:
 - (1) Concrete encased conduit.
 - (2) Existing full-strength concrete pavement where required to trench and install new conduits / duct banks, concrete hand holes and apron light pole foundations.
 - (3) Existing asphalt pavement where required to trench and install new conduits / duct banks, concrete hand holes and apron light pole foundations.
 - (4) Grading and backfill associated with removal of the foregoing elements shall be covered under P-152, "Excavation and Embankment".

100-1.3 NEW CONSTRUCTION GRADING AND BACKFILL.

- A. Excavation, backfill and grading associated with the removal of existing items or construction of the new ducts and conduits shall be installed in accordance with P-152, "Excavation, Subgrade and Embankment" P-153, "Controlled Low-Strength Material (CLSM)" and P-610 "Concrete", there will be no separate measurement or payment for any excavation, backfill, compaction, restoration or materials for slurry or concrete encased conduits and duct banks but shall be considered incidental to the associated item being installed.

100-1.4 RELATED DOCUMENTS. The General Provisions of the Contract, including General and Special Conditions, apply to work specified in this item.

- A. Conflicts between Drawing and Specifications (Contract Documents) and between Contract Documents and references within the Contract Documents: Drawings and specifications are complementary. Work called for by one is binding as if called for by both. Prospective Contractors shall, as part of their proposals, enumerate, identify, and list conflicts they find to exist within the Contract Documents, and between these Documents and the rules, regulations, standards, and codes of the authority having jurisdiction (Airport Authority, City, County) local Utility companies and local County or State governing bodies. No Allowance shall subsequently be made to the Contractor by reason of his/her failure to have brought said discrepancies to the attention of the Owner during the bidding period or by reason of any error on the Contractor's part.
- B. Execution of Contract is evidence that Contractor has examined conditions, drawings and specifications related to work, and is informed to extent and character of work. Claims made during construction for labor and materials required due to difficulties encountered as a result of Contractor's inattention to this issue, which could have been clarified prior to bid had examination been made, will be denied.

100-1.5 TEMPORARY LIGHTING AND CIRCUITS.

- A. Contractor shall coordinate with the RPR and other appropriate airport representatives before the end of each work shift to verify that all airfield lighting circuits are operational. Contractor shall provide all labor and material for this work, non-pay item (NPI).
- B. Contractor shall provide and maintain on site, sufficient equipment required to provide temporary lighting and circuit extensions.
- C. Work associated with taxiway shall be performed during coordinated taxiway closures in segments, reconnected to remaining existing circuit segments and tested for operation prior to the end of each shift before re-opening taxiway if required to prevent the need for excessive temporary cabling.

100-1.6 SPECIFICATIONS AND STANDARDS. As a supplement to the installation requirements of this item, the following standard specifications, and regulations of the issues in effect on the date of this solicitation are incorporated herein by reference and are made a part hereof for electrical work and installation and splicing of underground cables.

NEC National Electrical Code

FAA-STD-019e

Lightning Protection, Grounding, Bonding and Shielding Requirements for Facilities

FAA-C-1391c

Installation and Splicing of Underground Cables

Local Governing Bodies' Public Works Department, City of Buckeye

Codes and Regulations Maricopa Association of Governments (MAG)

American Association of State Highway and Transportation Officials (AASHTO)

- (1) AASHTO LTS-5 (2009: Errata 2009: Amendment 2010) Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals.

ASTM International (ASTM)

- (1) ASTM A123/A123M (2009) Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
- (2) ASTM A153/A153M (2009) Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
- (3) ASTM A575 (1996; R 2007) Standard Specification for Steel Bars, Carbon, Merchant Quality, M-Grades
- (4) ASTM A576 (1900b; R 2006) Standard Specification for Steel Bars, Carbon, Hot-Wrought, Special Quality

Illuminating Engineering Society of North America (IESNA)

- (1) IESNA HB-9 (2000: Errata 2004: Errata 2005: Errata 2006) IES Lighting Handbook.

Institute of Electrical and Electronics Engineers (IEEE)

- (1) IEEE 81 (1983) Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System.
- (2) IEEE C135.1 (1999) Standard for Zinc-Coated Steel Bolts and Nuts for Overhead Line Construction.
- (3) IEEE C2 (2007; Errata 06-1; TIA 07-1: TIA 07-3, Errata 07-2; TIA 08-4; TIA 08-6; TIA 08-7; TIA 08-8; TIA 08-9; TIA 08-10; TIA 08-11; TIA 09-12; TIA 09-13; TIA 09-14; Errata 09-3; TIA 09-15; TIA 09-16; TIA 10-17) National Electrical Safety Code
- (4) IEEE Stds Dictionary (2009) IEEE Standards Dictionary: Glossary of Terms & Definitions

National Electrical Manufacturers Association (NEMA)

- (1) ANSI C136.3 (2005; R 2009) American National Standard for Roadway and Area Lighting Equipment Luminaire Attachments

National Fire Protection Association (NFPA)

- (1) NFPA 70 (2011; TIA 11-1; Errata 2011) National Electrical Code

ASHRAE/IESNA 90.1, 2004

American Welding Society (AWS)

Factory Mutual Institute Association (FM)

Lightning Protection Institute

International Electrical Testing Association

Underwriters Laboratories (UL)

- (1) UL 467(2007) Grounding and Bonding Equipment

When required by law or regulations, the government agency having jurisdiction for inspections shall be given reasonable notice and opportunity to inspect the work. Any work that is enclosed or covered up before such inspection and test shall be uncovered at the Contractor's expense: after it has been inspected, the Contractor shall restore the work to its original condition at his own expense.

100-1.7 SHOP DRAWINGS AND MATERIAL LISTS. Prior to the installation of any material and equipment and within 30 days of contract award, the Contractor shall submit to the RPR for approval electronic PDF copies of manufacturers' brochures containing complete dimensional and performance characteristics, wiring diagrams, installation, and operation instructions, etc., for the equipment listed in the individual L-Series specification Items. Each submittal shall be titled and include the corresponding specification section(s).

A materials list shall be submitted listing each specification paragraph number and stating whether the materials proposed are as specified or are substitutions. If the item is a substitute item, a complete submittal as described in the above paragraph shall be provided for that item.

Submittal data shall be presented in a clear, precise, and thorough manner. Original catalog sheets are preferred. Photocopies are acceptable provide they are as good a quality as the original. Clearly and boldly mark each copy to identify pertinent products or models applicable to this project. Indicate all optional equipment and delete non-pertinent data. Submittals for components of electrical equipment and systems shall identify the equipment for which they apply on each submittal sheet. Markings shall be boldly and clearly made with arrows or circles (highlighting is not acceptable). Contractor is solely responsible for delays in project accruing directly or indirectly from late submissions or resubmissions of submittals.

The data submitted shall be sufficient, in the opinion of the RPR, to determine compliance with the plans and specifications. The Contractor's submittals shall be labeled and titled by specification section. The RPR reserves the right to reject any and all equipment, materials, or procedures, which, in the RPR's opinion, does not meet the system design and the standards and codes, specified herein.

EQUIPMENT AND MATERIALS

100-2.1 EQUIPMENT. Conduits, conduit fittings, conductors, connectors, boxes, and wiring devices shall meet requirements of Specification FAA-C-1217 and Item L-110.

100-2.2 CONDUIT, UNDERGROUND. Conduits run underground are specified in Item L-110 of these specifications.

100-2.3 CONDUIT FITTINGS. Each conduit and nipple entrance to duct and other such electrical enclosures shall be fitted with double locknuts (one each side of metal penetrated) and insulating bushing. Bushings on 1-1/4 inch and larger conduits shall be insulated metallic, type OZ/Gedney Cat. No. IBC Series, or equal; bushings for 3/4 inch and 1 inch shall be plastic insulated T&B rated for 150 C, or equal. All insulated bonding and grounding bushings of conduits for 2400 volts or higher voltages, for conduit going underground, and for conduits going into concrete slabs shall be OZ/Gedney Cat. No. IBC-XX (fitted with grounding lug), or equal. The bushings shall be connected to the grounding system within the terminating enclosure and not on

the underground end. The buried end of each conduit shall be fitted with a thermosetting, plastic-insulated, metallic bushing. All openings where conduits enter junction boxes, other enclosures and shelters shall be sealed weather tight. The conduit shall be capped, if left empty, or sealed with Ducseal, or equal, around the conductors for exterior conduits.

100-2.4 CONCRETE-ENCASED DUCT. Concrete-encased PVC duct shall be as specified in Item L-110.

100-2.5 CONCRETE DUCT MARKERS. (Not Used) Markers shall be as specified in Item L-110 and as detailed on drawings.

100-2.6 CONCRETE HANDHOLES. Hand holes shall be as specified in Item L-115 and as detailed on drawings.

100-2.7 LIGHT BASES AND TRANSFORMER HOUSING. (Not Used) New light bases, transformer housings, junction cans and covers shall be specified in item L-115 or L-125 and as detailed on drawings.

100-2.8 APRON LIGHTING. The following shall be submitted for Apron Lighting Poles:

A. Shop Drawings.

- (1) Steel poles.
- (2) LED Fixtures.
- (3) Remote LED Driver enclosures.
- (4) Hubbell / Gateway wireless control & 7-pin connector drawings
- (5) Gateway devices and mounting drawings
- (6) LED Obstruction Lights, mounting details and step-down transformers.
- (7) Foundation Details with structurally engineered seal.
- (8) Installation Details.
- (9) Include dimensions, wind load determined in accordance with AASHTO LTS-5, pole deflection, pole class, and other applicable information conforming to IESNA HB-9.
- (10) Include seismic design data and calculations for International Building Code (IBC) and all local regulations.

B. Computer Photometric Calculations

- (1) In addition to the normal shop drawing requirements, Contractor shall provide a complete computer photometric calculation from the factory of the fixture manufacturer providing the specific photometric levels from the electrical design. The fixtures can be aimed specifically for avoiding light toward the adjoining taxiways, causing glare to Pilots. If fixtures are field aimed to reduce glare then the minimum foot candle requirements do not apply. A Field photometric test by the Contractor and witnessed by the RPR and City and Airport personnel shall be done and submitted to RPR and City for approval.
- (2) Horizontal illuminance levels for apron lighting are as follows:
 - a. Minimum horizontal illuminance at ground level: 2.0 foot-candles at a distance of 100 feet.
- (3) Vertical illuminance levels for apron lighting are as follows:
 - a. Minimum maintained at 6 feet with light meter facing poles: 2 footcandles at a distance of 100 feet.
 - b. Minimum maintained at 6 feet with light meter facing poles: .2 footcandles at a distance of 200 feet

c. Minimum maintained at 6 feet with light meter facing poles: 0 footcandles at a distance of 300 feet

(4) Pole locations are + or – 5 feet. Pole height shall be as shown on plans (120 feet).

C. Product Data: Submit dimensions, ratings, and performance data.

- (1) Steel Poles.
- (2) Brackets.
- (3) Anchorage Systems.

D. Manufacturer's Instructions.

- (1) Foundation requirements
- (2) Mounting and wiring details
- (3) Submit instructions prior to installation.

100-2.9 CONCRETE HAND HOLES. The Contractor shall furnish and install aircraft load rated pre-cast concrete hand holes in the locations indicated on the Plans and per L-115.

CONSTRUCTION METHODS

100-3.1 EXISTING UTILITIES. Prior to any excavation or trenching, Contractor shall provide utility locator or contact Blue Stake to locate any existing cables and utilities, which will be crossed by the trench. Where existing underground utilities are shown on plans to conflict with existing conduit removal and / or new conduit installation, Contractor shall pothole to verify the location and depth. Ensure these utilities are permanently disconnected if they are going to be demolished. The existing service lines shall be exposed by hand digging in those areas that will be crossed and shall be protected from any damage. If any damage occurs, it shall be the Contractor's responsibility to immediately repair such damage with materials and methods approved by the RPR and in compliance with applicable codes and standards, at Contractor's expense. Existing utilities to be abandoned shall be removed at the point of crossing as shown on the drawings.

100-3.2 DEMOLITION. Airfield Conduit.

Removal of existing concrete encased PVC associated with taxiway(s) that are within the limits of apron pavement reconstruction shall be removed as shown on Plans or as directed by RPR. All existing concrete encasement, PVC conduit, counterpoise and ground rods shall be removed from site and disposed of in accordance with local ordinances. Existing conduit and counterpoise conductor ends shall be protected in place and marked for reconnection to install new conduit as required with encasement removed to install new couplings or molds for exothermically welded splices.

100-3.3 CONDUCTORS. Installation of underground 5 kV series circuits and/or parallel circuit conductors are specified in Item L-108 of these specifications.

100-3.4 GROUNDING. All metal support structures, and metal enclosures shall be grounded in accordance with the requirements of the latest edition of Specifications FAA-C-1217, FAA-C-1391, and FAA-STD-019, as indicated in Item L-108 and as detailed on the drawings.

100-3.5 GROUND RODS. Grounding rods shall be 3/4-inch diameter by 10 feet long copper-jacketed steel. Grounding connections to ground rods where buried or encased shall be by the exothermic weld process, Cadweld or equal. Extruded, drawn or stamped-type ground clamps will not be acceptable. The resistance to ground shall not exceed 25 ohms.

100-3.6 GROUND CONDUCTORS. Equipment grounding conductors shall be insulated copper, except where shown on the project drawings to be bare and sized as shown on the project drawings; and all grounds will be shown in accordance with Article 250 of the National Electrical Code, with FAA-STD-019 and Item L-108. Attachment of wire to supports, boxes, etc., shall be accomplished using approved ground lug attached with a separate stainless-steel screw, lock washer and nut. Screws used for support of the electrical enclosure shall not be used for connection of the ground wire. Pipe straps shall not be used for ground purposes.

COLOR CODING OF GROUND CONDUCTORS

<u>TYPE OF GROUND CONDUCTOR</u>	<u>COLOR OF INSULATION</u>
Grounding Electro Conductor	Bare (solid)- No Insulation
Counterpoise Conductor	Bare (solid) – No Insulation
External Sign and Transformer	
Housing Ground Conductor	Bare – No Insulation
Equipment Grounding Conductor	Green (safety)

The multi-ground system supplements but does not replace the equipment-grounding conductor required by the National Electrical Code.

Each of these separate ground conductors is insulated in order to keep it distinct and not allow contact with any other conductor.

Electrical continuity of cable armor or shield shall be maintained. Grounding of the cable armor or shield shall be required at all terminations and shall be accomplished by connecting a #6 AWG solid bare copper wire to the cable armor or shield by means of a compression-type ground clamp installed within the terminating enclosure. Armor or shield ground wire shall be connected to the ground electrode conductor using split bolt connector, Burndy or equal. Grounding of direct earth burial (DEB) armored power and shielding control cable shall be at each end in accordance with FAA-C-1391.

100-3.7 LIGHTING FIXTURES.

- A. LED light fixtures shall conform to the fixture specification and description provided on the plans. Alternative fixtures may be proposed for the project where they provide the equivalent characteristics, quality, and appearance, subject to approval by the RPR and Owner. The proposed lighting fixture point-by-point print out with light levels noted on ten foot by ten-foot grids shall be provided with complete photometric data and fixture cuts for approval on any substitute units. Refer to Section 100-2.8(b).

100-3.8 APRON POLES.

- A. A high mast flood light assembly shall be defined as a complete functioning assembly with appurtenances – concrete foundation (complete, including drilling, rebar and UFER ground), pole, luminaires, obstruction lights, brackets, driver enclosures, etc.
- B. Product Description: Complete pole assemblies, with luminaires, features and accessories as shown in light fixture schedule.
- C. Provide continuously tapered and seam welded steel lighting standards, conforming to AASHTO LTS-5. Provide two-piece steel poles having minimum 3-gage steel for the lower section and a minimum 7-gage steel for the upper section with factory finish.
- D. Provide poles designed for wind loading of 90 miles per hour determined in accordance with AASHTO LTS-5 while supporting luminaires and all other appurtenances indicated. Provide effective projected areas of luminaires and appurtenances used in calculations specific to the actual products provided on each pole. Provide embedded type concrete bases designed for use with underground supply conductors. Provide an oval-shaped handhole having a minimum clear opening of 4 to 8 inches. Secure handhole cover with stainless steel captive screws. Provide metal poles with an internal grounding connection accessible from the handhole near the bottom of each pole.
- E. Do not install scratched, stained, chipped, or dented poles.
- F. Concrete and reinforcing steel for pole foundations shall be installed per the requirements of Section P-610 – “Structural Portland Cement Concrete”.
- G. The remote LED fixture drivers shall be mounted in a separate enclosure on lower portion of pole to facilitate maintenance and be provided with COP compatible Hubbell control system, 7-pin connectors, and Gateway devices for wireless, individual control of each pole / luminary.
- H. A 3” x 5” brass tag shall be installed 12” above the handhole identifying power source (panel name), circuit numbers and voltages of lighting circuits in the poles.
- I. FAA approved LED L-810 obstruction lights shall be installed on light poles. Each obstruction light shall be installed with its hub at least as high as the top of the pole. Pole Manufacturer or Contractor shall provide any transformers required for powering the obstruction lights. The Contractor shall furnish obstruction lights and all other equipment necessary for installation.

100-3.9 FIELD TESTING OF APRON LIGHTING. After installation of lighting system, the Contractor shall...

Demonstrate that lighting fixtures installation operates satisfactory in the presence of the RPR.

Perform Operational Tests in accordance with referenced standards in this section.

Perform Photometric Tests to verify performance is in accordance with referenced standards in this section 100-2.8b. (2).

Aim lights as required to adjust lighting levels, uniformity or to prevent or correct objectionable glare that could affect aircraft or airside operations.

Provide written documentation and point of contact for operational service.

100-3.10 IDENTIFICATION. Conductors shall be identified as per FAA-C-1217, Section 4.6.5.2.2. Cable tagging and circuit identification markers shall be identified as per FAA-C-1391, Sections 5.11.1 and 5.11.2 and as detailed in the Plans. Transformers, panelboards, constant current regulators, splice cabinets, enclosures and other vault equipment shall be identified by nameplate of nonferrous metal or rigid plastic, engraved with 3/8-inch high lettering with information as per FAA-C-1217, Section 4.16.

100-3.11 POLE FOUNDATION. The Contractor shall furnish and install new light pole foundations. Pole base shall be designed by a registered Structural Engineer in the State of Arizona and constructed per Structural Engineer's sealed construction document. This shall be incidental to the cost of the pole assembly.

100-3.12 POLE ERECTION. The Contractor shall erect the pole on the foundation following the manufacturer's requirements and erection details. The pole shall be level and secure. The pole shall be installed within 2 degrees of vertical. Install poles plumb. Install double nuts to adjust plumb. Grout around each base. Bond and ground luminaries, metal accessories and metal poles.

100-3.13 APRON LIGHTING TESTS. The installation shall be fully tested by continuous operation for not less than 1/2 hour as a completed unit prior to acceptance.

100-3.14 CONTRACTOR TESTING AND SUBMITTALS. Equipment and materials list and shop drawings shall be submitted as per FAA-C-1217, Section 5.1. Testing shall be required and performed as per FAA-C-1217, Section 5.3, and FAA-C-1391, Section 3.3.6. The Contractor shall pretest all cable on the reel prior to installation and provide a copy of the test results to the RPR. The Contractor shall be responsible for repairs or replacement of any cable found defective after installation.

The Contractor shall test existing affected circuits prior to start of construction and the installed airfield lighting and miscellaneous power cables at the completion of this project. The results of the testing shall be provided to the Owner for review and acceptance. The Contractor shall be responsible for repairs or replacement of any cable found defective after installation.

Installation tests in addition to all tests contained in other L-Series Items shall be provided as follows:

Item	Test Required	Manufacturer's Rep. Present?
5 kV Rated Airfield Lighting and Power Cables (On the Reel, Not Including Equipment for Contractor Quality Control. Maybe deleted per-coordination with Engineer).	Megger check at 500 to 1000 Volts prior to installation. Values of insulation resistance for each reel shall be noted and given to the RPR for acceptance. It is expected that the readings will be greater than 1000 meg-ohms (1 gig-ohm).	No

Item	Test Required	Manufacturer's Rep. Present?
5 kV Rated Airfield Lighting and Power Cables (All Circuits Installed in This Project)	Megger check at 500 to 1000 volts at the completion of installation. Test every circuit for conductor-to-ground and conductor-to-conductor (between circuits) insulation resistance. Test results shall be tabulated and given to the RPR for acceptance. It is <u>required</u> that the readings be greater than 100 meg-ohms.	No
5 kV Rated Airfield Lighting and Power Cables (All Circuits Installed in This Project)	Megger check at 500 to 1000 volts at the completion of installation. Test every circuit for conductor-to-ground and conductor-to-conductor (between circuits) insulation resistance. Test results shall be tabulated and given to the RPR for acceptance.	No
5 kV and 600 Volt and Multi-pair Cables	If a power cable puller is used, continuous tape pull tension readings for each section of cable shall be provided to the RPR for review.	No

100-3.15 NOTIFICATION OF TESTING. The Contractor shall notify the RPR and the Airport, a minimum of 48 hours in advance of system, or partial system, testing including, but not limited to, installed cable insulation resistance (megger) testing, and operational testing of any modified lighting circuit.

METHOD OF MEASUREMENT

100-4.1 REMOVE AND SALVAGE ELEVATED TAXIWAY EDGE LIGHT AND ISOLATION TRANSFORMER, REMOVE BASE CAN. The quantity to be measured shall be for the removal of existing taxiway lights to protect from damage within the area of construction. It shall also include removal of existing fixture bases per the Plans and Specifications and as accepted.

100-4.2 EXCAVATE AND REMOVE EXISTING HANDHOLE. The quantity to be measured shall be for the excavation and removal of existing electrical handhole, backfill and compaction to restore the area per P-152 in accordance with the Plans and Specifications and as accepted.

100-4.3 EXCAVATE AND REMOVE EXISTING CONDUIT AND CONDUCTOR. This item shall consist of complete removal and disposal off site of existing underground conduits, direct buried or concrete encased, including any lighting cable in accordance with the Plans and Specifications and as accepted. No separate measurement will be made for multiple conduits in an existing duct bank. This shall also include backfill and restoration of disturbed area as required.

100-4.4 REMOVE EXISTING CONDUCTOR, CONDUIT TO REMAIN. This item shall consist of removal and disposal off site of existing airfield lighting cable from within existing underground

conduits in accordance with the Plans and Specifications and as accepted. Measured quantities for existing cable removals are provided for Contractor to budget a lump sum price for this task. Cable removal is quantified as an effort to remove any number of conductors from within each conduit in a single run or each duct bank conduit. No separate measurement will be made for multiple conductors located in each conduit. No separate measurement will be made for slack.

100-4.5 TEMPORARY AIRFIELD LIGHTING SYSTEM. The quantity to be measured shall be for the installation of new and / or existing temporary L-824, Type C, #8, 5kV airfield lighting or voltage powered NAVAID cables, sleeved, and sandbagged for protection to maintain operation of circuits affected by construction. It shall also include furnishing, installing and removal of temporary cables; temporarily mounting and feeding existing signs, temporary sign covers, and re-circuiting lights and signs as detailed on the Drawings. No separate measurement or payment will be made for moving temporary facilities as required to provide Contractor's access to work sites. The use of temporary cables covered under this item shall be limited to "jumpers" as required to maintain circuit continuity during construction. Cable used for temporary application shall not be used for permanent application.

100-4.6 NEW 25 AMP, 2 POLE, 480V CIRCUIT BREAKERS. The quantity to be measured shall be for the furnishing and installation of a new circuit breakers in existing panelboard installed complete, in accordance with Plans and Specifications tested and accepted by Owner / Engineer. No separate measurement will be made for mounting hardware.

100-4.7 NEW APRON LIGHTING. Installation of new apron light pole assemblies to include the following: light poles, fixture assemblies; including LED fixtures, driver enclosures, mounting brackets, concrete foundation with structurally engineered calculations and UFER (concrete encased grounding electrode); 7 pin connector and Gateway device; circuit ID plaques, LED L-810 Obstruction lights, step down transformers with all conductors, grounding aiming and photometric testing per each complete in accordance with the Plans and Specifications and as accepted.

100-4.8 NEW APRON LIGHTING CONTROL/CONTACTOR CABINET INSTALLED COMPLETE. The quantity to be measured shall be for a new apron lighting control cabinet with lighting contactors, fuses, photocell control with auto, manual and bypass switch installed complete with outdoor NEMA 3R enclosure and all wiring complete in accordance with the Plans and Specifications, tested and accepted.

BASIS OF PAYMENT

100-5.1 ELECTRICAL SERVICES. Payment will be made at the contract price for the electrical services completed and accepted. This price shall be full compensation for furnishing all materials and for all labor, equipment, tools, and incidentals necessary to complete these items.

Payment will be made under:

Item L-100-5.1	Remove and Salvage Existing Taxiway Edge Light and Isolation Transformer, Demo Base Can – per Each
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- Item L-100-5.2 Excavate and Remove Existing Handhole – per Each
- Item L-100-5.3 Excavate and Remove Existing Conduit and Conductor – per Linear Foot
- Item L-100-5.4 Excavate and Remove Existing Conduit. Conductor to Remain – per Linear Foot
- Item L-100-5.5 Temporary Airfield Lighting Circuits – per Lump Sum
- Item L-100-5.6 New 25A, 2-Pole, 480V Circuit Breaker, Installed (Apron Lighting Circuits) – per Each
- Item L-100-5.7 New 100' Steel Pole with 12, 1200-Watt LED Fixtures and LED Obstruction Light on New Concrete Foundation with Grounding Complete – per Each
- Item L-100-5.8 Apron Lighting Control / Contactor Cabinet NEMA 3R, Outdoor Rated Complete – per Each

END OF ITEM L-100

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ITEM L-108 Underground Power Cable for Airports

DESCRIPTION

108-1.1 This item shall consist of furnishing and installing power cables within conduit or duct banks per these specifications at the locations shown on the plans. Also included are the installation of counterpoise wires, ground wires, ground rods and connections, cable splicing, cable marking, cable testing, and all incidentals necessary to place the cable in operating condition as a completed unit to the satisfaction of the Engineer. This item shall not include the installation of duct banks or conduit, trenching and backfilling for duct banks or conduit, or furnishing or installation of cable for FAA owned/operated facilities. Requirements and payment for trenching and backfilling for the installation of underground conduit and duct banks are in Item L-110, Airport Underground Electrical Duct Banks and Conduits.

EQUIPMENT AND MATERIALS

108-2.1 General.

- A. Airport lighting equipment and materials covered by advisory circulars (AC) shall be approved under the Airport Lighting Equipment Certification Program per AC 150/5345-53, current version.
- B. All other equipment and materials covered by other referenced specifications shall be subject to acceptance through manufacturer's certification of compliance with the applicable specification, when requested by the Engineer.
- C. Manufacturer's certifications shall not relieve the Contractor of the responsibility to provide materials per these specifications. Materials supplied and/or installed that do not comply with these specifications shall be removed (when directed by the Engineer) and replaced with materials that comply with these specifications at the Contractor's cost.
- D. All materials and equipment used to construct this item shall be submitted to the Engineer for approval prior to ordering the equipment. Submittals consisting of marked catalog sheets or shop drawings shall be provided. Submittal data shall be presented in a clear, precise, and thorough manner. Original catalog sheets are preferred. Photocopies are acceptable provided they are as good a quality as the original. Clearly and boldly mark each copy to identify products or models applicable to this project. Indicate all optional equipment and delete any non-pertinent data. Submittals for components of electrical equipment and systems shall identify the equipment to which they apply on each submittal sheet. Markings shall be made bold and clear with arrows or circles (highlighting is not acceptable). The Contractor is solely responsible for delays in the project that may accrue directly or indirectly from late submissions or resubmissions of submittals.
- E. The data submitted shall be sufficient, in the opinion of the Engineer, to determine compliance with the plans and specifications. The Contractor's submittals shall be Electronic PDF, organized, labeled, and tabbed by specification section. The Engineer reserves the right to reject any and all equipment, materials, or procedures that do not meet the system design and the standards and codes, specified in this document.
- F. All equipment and materials furnished and installed under this section shall be guaranteed against defects in materials and workmanship for at least twelve (12) months from the date of final acceptance by the Owner. The defective materials and/or equipment shall be repaired or replaced, at the Owner's discretion, with no additional cost to the Owner. The Contractor shall be responsible to maintain a minimum insulation resistance per AC 150/5340-26C, Maintenance Airport Visual Aid Facilities, Table 5-1, and paragraph 5.1.3.1, with isolation

transformers connected in new circuits and new segments of existing circuits through the end of the contract warranty period.

108-2.2 Cable. Underground cable for airfield lighting facilities (runway and taxiway lights and signs) shall conform to the requirements of AC 150/5345-7, Specification for L-824 Underground Electrical Cable for Airport Lighting Circuits latest edition. Conductors for use on 6.6 ampere primary airfield lighting series circuits shall be single conductor, seven-strand, #8 American wire gauge AWG), L-824 Type C, 5,000 volts, non-shielded, with cross-linked polyethylene insulation. L-824 conductors for use on the L-830 secondary of airfield lighting series circuits shall be sized in accordance with the manufacturer's recommendations. All other conductors shall comply with FAA and National Electric Code (NEC) requirements. Conductor sizes noted above shall not apply to leads furnished by manufacturers on airfield lighting transformers and fixtures.

Wire for electrical circuits up to 600 volts shall comply with Specification L-824 and/or Federal Specification J-C-30 and shall be type THWN-2, 75°C. Conductors for parallel (voltage) circuits shall be sized and installed in accordance with NFPA-70, National Electrical Code.

Unless noted otherwise, all 600-volt and less non-airfield lighting conductor sizes are based on a 75°C, THWN-2, 600 Volt insulation, copper conductors, not more than three single insulated conductors, in raceway, in free air. The conduit/duct sizes are based on the use of THWN-2, 600 volt insulated conductors. The Contractor shall make the necessary increase in conduit/duct sizes for other types of wire insulation. In no case shall the conduit/duct size be reduced. The minimum power circuit wire size shall be #12 AWG.

Conductor sizes may have been adjusted due to voltage drop or other engineering considerations. Equipment provided by the Contractor shall be capable of accepting the quantity and sizes of conductors shown in the Contract Documents. All conductors, pigtails, cable step-down adapters, cable step-up adapters, terminal blocks, and splicing materials necessary to complete the cable termination/splice shall be considered incidental to the respective pay items provided.

Cable type, size, number of conductors, strand and service voltage shall be as specified in the Contract Document.

108-2.3 Bare copper wire (counterpoise, bare copper wire ground and ground rods). Wire for counterpoise or ground installations for airfield lighting systems shall be No. 6 AWG bare solid copper wire for counterpoise and/or No. 6 AWG insulated stranded for ground wire per ASTM B3 and ASTM B8 and shall be bare copper wire per ASTM B33. See AC 150/5340-30 for additional details about counterpoise and ground wire types and installation. For voltage powered circuits, the equipment ground conductor shall be minimum No. 6 AWG, 600V rated, Type XHHW insulated, green color, stranded copper equipment ground conductor.

Ground rods shall be copper-clad steel. The ground rods shall be of the length and diameter specified on the plans, but in no case be less than 10 feet long and 3/4 inch in diameter.

108-2.4 Cable connections. In-line connections or splices of underground primary cables shall be of the type called for on the plans and shall be one of the types listed below. No separate payment will be made for cable connections.

- A. The cast splice. Not Used.
- B. The field-attached plug-in splice. Figure 3 of AC 150/5345-26, Specification for L-823 Plug and Receptacle, Cable Connectors, employing connector kits, is acceptable for field attachment to single conductor cable. It shall be the Contractor's responsibility to determine the outside diameter of the cable to be spliced and to furnish appropriately sized connector kits and/or adapters and heat shrink tubing with integral sealant.
- C. The factory-molded plug-in splice. Specification for L-823 Connectors, Factory-Molded to Individual Conductors, is acceptable.

- D. The taped or heat-shrink splice. Taped splices employing field-applied rubber, or synthetic rubber tape covered with plastic tape is acceptable. The rubber tape should meet the requirements of ASTM D4388 and the plastic tape should comply with Military Specification MIL-I-24391 or Commercial Item Description A-A-55809. Heat shrinkable tubing shall be heavy-wall, self-sealing tubing rated for the voltage of the wire being spliced and suitable for direct-buried installations. The tubing shall be factory coated with a thermoplastic adhesive-sealant that will adhere to the insulation of the wire being spliced forming a moisture- and dirt-proof seal. Additionally, heat shrinkable tubing for multi-conductor cables, shielded cables, and armored cables shall be factory kits that are designed for the application. Heat shrinkable tubing and tubing kits shall be manufactured by Tyco Electronics/ Raychem Corporation, Energy Division, or approved equivalent.

In all the above cases, connections of cable conductors shall be made using crimp connectors using a crimping tool designed to make a complete crimp before the tool can be removed. All L-823/L-824 splices and terminations shall be made per the manufacturer's recommendations and listings.

All connections of counterpoise, grounding conductors and ground rods shall be made by the exothermic process or approved equivalent, except that a light base ground clamp connector shall be used for attachment to the light base. See AC 150/5340-30 for additional information about methods of attaching a ground to a galvanized light base. All exothermic connections shall be made per the manufacturer's recommendations and listings.

108-2.5 Splicer qualifications. Every airfield lighting cable splicer shall be qualified in making airport cable splices and terminations on cables rated at or above 5,000 volts AC. The Contractor shall submit to the Engineer proof of the qualifications of each proposed cable splicer for the airport cable type and voltage level to be worked on. Cable splicing/terminating personnel shall have a minimum of three (3) years continuous experience in terminating/splicing medium voltage cable.

108-2.6 Concrete. Concrete for cable markers shall be per Specification Item P-610, Structural Portland Cement Concrete.

108-2.7 Flowable backfill. Flowable material used to backfill trenches for power cable trenches shall conform to the requirements of Item P-153, Controlled Low Strength Material.

108-2.8 Cable identification tags. Cable identification tags shall be made from a non-corrosive material with the circuit identification stamped or etched onto the tag. The tags shall be of the type as detailed on the plans.

108-2.9 Tape. Electrical tapes shall be Scotch™ Electrical Tapes –Scotch™ 88 (1-1/2-inch wide) and Scotch™ 130C® linerless rubber splicing tape (2-inch wide), as manufactured by the Minnesota Mining and Manufacturing Company (3M™), or an approved equivalent.

108-2.10 Electrical coating. Electrical coating shall be Scotchkote™ as manufactured by 3M™, or an approved equivalent.

108-2.11 Existing circuits. Whenever the scope of work requires connection to an existing circuit, the circuit's insulation resistance shall be tested, in the presence of the Engineer. The test shall be performed per this item and prior to any activity that will affect the respective circuit. The Contractor shall record the results on forms acceptable to the Engineer. When the work affecting the circuit is complete, the circuit's insulation resistance shall be checked again, in the presence of the Engineer. The Contractor shall record the results on forms acceptable to the Engineer. The second reading shall be equal to or greater than the first reading or the Contractor shall make the necessary repairs to the circuit to bring the second reading above the first reading. All repair costs including a complete replacement of the L-823 connectors, L-830 transformers and L-824 cable, if necessary, shall be borne by the Contractor. All test results shall be submitted in the Operation and Maintenance (O&M) Manual.

108-2.12 Detectable warning tape. Plastic, detectable, American Wood Preservers Association (AWPA) Red (electrical power lines, cables, conduit, and lighting cable) with continuous legend magnetic tape shall be polyethylene film with a metalized foil core and shall be 3-6 inches wide. Detectable tape is incidental to the respective bid item.

CONSTRUCTION METHODS

108-3.1 General. The Contractor shall install the specified cable at the approximate locations indicated on the plans. Unless otherwise shown on the plans, all cable required to cross under pavements expected to carry aircraft loads shall be installed in concrete encased duct banks. Wherever possible, cable shall be run without splices, from connection to connection.

Cable connections between lights will be permitted only at the light locations for connecting the underground cable to the primary leads of the individual isolation transformers. The Contractor shall be responsible for providing cable in continuous lengths for home runs or other long cable runs without connections unless otherwise authorized in writing by the Engineer or shown on the plans.

In addition to connectors being installed at individual isolation transformers, L-823 cable connectors for maintenance and test points shall be installed at locations shown on the plans. Cable circuit identification markers shall be installed on both sides of the L-823 connectors installed or at least once in each access point where L-823 connectors are not installed.

Provide not less than 3 feet of cable slack on each side of all connections, isolation transformers, light units, and at points where cable is connected to field equipment. Where provisions must be made for testing or for future above grade connections, provide enough slack to allow the cable to be extended at least one foot vertically above the top of the access structure. This requirement also applies where primary cable passes through empty light bases, junction boxes, and access structures to allow for future connections, or as designated by the Engineer.

Primary airfield lighting cables installed shall have cable circuit identification markers attached on both sides of each L-823 connector and on each airport lighting cable entering or leaving cable access points, such as manholes, hand holes, pull boxes, junction boxes, etc. Markers shall be of sufficient length for imprinting the cable circuit identification legend on one line, using letters not less than 1/4 inch in size. The cable circuit identification shall match the circuits noted on the construction plans.

108-3.2 Installation in duct banks or conduits. This item includes the installation of the cable in duct banks or conduit per the following paragraphs. The maximum number and voltage ratings of cables installed in each single duct or conduit, and the current-carrying capacity of each cable shall be per the latest version of the National Electric Code, or the code of the local agency or authority having jurisdiction.

The Contractor shall make no connections or splices of any kind in cables installed in conduits or duct banks.

Unless otherwise designated in the plans, where ducts are in tiers, use the lowest ducts to receive the cable first, with spare ducts left in the upper levels. Check duct routes prior to construction to obtain assurance that the shortest routes are selected and that any potential interference is avoided.

Duct banks or conduits shall be installed as a separate item per Item L-110, Airport Underground Electrical Duct Banks and Conduit. The Contractor shall run a mandrel through duct banks or conduit prior to installation of cable to ensure that the duct bank or conduit is open, continuous, and clear of debris. The mandrel size shall be compatible with the conduit size. The Contractor shall swab out all conduits/ducts and clean light bases, manholes, etc., interiors immediately prior to pulling cable. Once cleaned and swabbed, the light bases and all accessible points of entry to the duct/conduit system shall be kept closed except when installing cables. Cleaning of ducts, light bases, manholes, etc., is incidental to the pay item of the item being cleaned. All raceway systems left open, after initial cleaning, for

any reason shall be re-cleaned at the Contractor's expense. The Contractor shall verify existing ducts proposed for use in this project as clear and open. The Contractor shall notify the Engineer of any blockage in the existing ducts.

The cable shall be installed in a manner that prevents harmful stretching of the conductor, damage to the insulation, or damage to the outer protective covering. The ends of all cables shall be sealed with moisture-seal tape providing moisture-tight mechanical protection with minimum bulk, or alternately, heat shrinkable tubing before pulling into the conduit and it shall be left sealed until connections are made. Where more than one cable is to be installed in a conduit, all cable shall be pulled in the conduit at the same time. The pulling of a cable through duct banks or conduits may be accomplished by hand winch or power winch with the use of cable grips or pulling eyes. Maximum pulling tensions shall not exceed the cable manufacturer's recommendations. A non-hardening cable-pulling lubricant recommended for the type of cable being installed shall be used where required.

The Contractor shall submit the recommended pulling tension values to the Engineer prior to any cable installation. If required by the Engineer, pulling tension values for cable pulls shall be monitored by a dynamometer in the presence of the Engineer. Cable pull tensions shall be recorded by the Contractor and reviewed by the Engineer. Cables exceeding the maximum allowable pulling tension values shall be removed and replaced by the Contractor at the Contractor's expense.

The manufacturer's minimum bend radius or NEC requirements (whichever is more restrictive) shall apply. Cable installation, handling and storage shall be per manufacturer's recommendations. During cold weather, particular attention shall be paid to the manufacturer's minimum installation temperature. Cable shall not be installed when the temperature is at or below the manufacturer's minimum installation temperature. At the Contractor's option, the Contractor may submit a plan, for review by the Engineer, for heated storage of the cable and maintenance of an acceptable cable temperature during installation when temperatures are below the manufacturer's minimum cable installation temperature.

Cable shall not be dragged across base can or manhole edges, pavement, or earth. When cable must be coiled, lay cable out on a canvas tarp, or use other appropriate means to prevent abrasion to the cable jacket.

Re-cabling associated with active runways shall be performed during coordinated runway closures in segments, reconnected to remaining existing circuit segments with new primary connector kits and tested for operation prior to the end of each shift before re-opening runway. Insulation resistance testing of new cable may be performed in segments after each shift before connection to existing circuit and after lighting circuit cable replacement is completed.

108-3.3 Installation of direct-buried cable in trenches. Not Used.

108-3.4 Cable markers for direct-buried cable. Not Used.

108-3.5 Splicing. Connections of the type shown on the plans shall be made by experienced personnel regularly engaged in this type of work and shall be made as follows:

- A. **Cast splices.** These shall be made by using crimp connectors for jointing conductors. Molds shall be assembled, and the compound shall be mixed and poured per the manufacturer's instructions and to the satisfaction of the Engineer.
- B. **Field-attached plug-in splices.** These shall be assembled per the manufacturer's instructions. These splices shall be made by plugging directly into mating connectors. In all cases the joint where the connectors come together shall be wrapped with at least one layer of rubber or synthetic rubber tape and one layer of plastic tape, one-half lapped, extending at least 1-1/2 inches on each side of the joint.
- C. **Factory-molded plug-in splices.** These shall be made by plugging directly into mating connectors. In all cases, the joint where the connectors come together shall be wrapped with at least one layer of rubber or synthetic

rubber tape and one layer of plastic tape, one-half lapped, extending at least 1-1/2 inches on each side of the joint.

- D. **Taped or heat-shrink splices.** A taped splice shall be made in the following manner: Bring the cables to their final position and cut so that the conductors will butt. Remove insulation and jacket allowing for bare conductor of proper length to fit compression sleeve connector with 1/4 inch of bare conductor on each side of the connector. Prior to splicing, the two ends of the cable insulation shall be penciled using a tool designed specifically for this purpose and for cable size and type. Do not use emery paper on splicing operation since it contains metallic particles. The copper conductors shall be thoroughly cleaned. Join the conductors by inserting them equidistant into the compression connection sleeve. Crimp conductors firmly in place with crimping tool that requires a complete crimp before tool can be removed. Test the crimped connection by pulling on the cable. Scrape the insulation to assure that the entire surface over which the tape will be applied (plus 3 inches on each end) is clean. After scraping, wipe the entire area with a clean lint-free cloth. Do not use solvents.

Apply high-voltage rubber tape one-half lapped over bare conductor. This tape should be tensioned as recommended by the manufacturer. Voids in the connector area may be eliminated by highly elongating the tape, stretching it just short of its breaking point. Throughout the rest of the splice less tension should be used. Always attempt to exactly half-lap to produce a uniform buildup. Continue buildup to 1-1/2 times cable diameter over the body of the splice with ends tapered a distance of approximately one inch over the original jacket. Cover rubber tape with two layers of vinyl pressure-sensitive tape one-half lapped. Do not use glyptol or lacquer over vinyl tape as they react as solvents to the tape. No further cable covering, or splice boxes are required.

Heat shrinkable tubing shall be installed following manufacturer's instructions. Direct flame heating shall not be permitted unless recommended by the manufacturer. Cable surfaces within the limits of the heat-shrink application shall be clean and free of contaminants prior to application.

Surfaces of equipment or conductors being terminated or connected shall be prepared in accordance with industry standard practice and manufacturer's recommendations. All surfaces to be connected shall be thoroughly cleaned to remove all dirt, grease, oxides, nonconductive films, or other foreign material. Paints and other nonconductive coatings shall be removed to expose base metal. Clean all surfaces at least 1/4 inch beyond all sides of the larger bonded area on all mating surfaces. Use a joint compound suitable for the materials used in the connection. Repair painted/coated surface to original condition after completing the connection.

108-3.6 Bare counterpoise wire installation for lightning protection and grounding. If shown on the plans or included in the job specifications, bare solid #6 AWG copper counterpoise wire shall be installed for lightning protection of the underground cables. The Engineer shall select one of two methods of lightning protection for the airfield lighting circuit based on the frequency of local lightning:

- A. **Equipotential.** This is where the counterpoise is bonded to the light base (edge lights included) and counterpoise size is as shown on the plans.
- B. **Isolation.** The counterpoise is not bonded to edge light fixtures, in-pavement fixtures are bonded to the counterpoise. Counterpoise size is as shown on the plans.

Counterpoise wire shall be installed in the same trench for the entire length of buried cable, conduits and duct banks that are installed to contain airfield cables.

For edge light fixtures installed in turf (stabilized soils) and for raceways or cables adjacent to the full-strength pavement edge, the counterpoise conductor shall be installed halfway between the pavement edge and the light base, mounting stake, raceway, or cable.

The counterpoise conductor shall be installed 8 inches minimum below grade.

Each light base or mounting stake shall be provided with a grounding electrode.

When a metallic light base is used, the grounding electrode shall be bonded to the metallic light base or mounting stake with a No. 6 AWG bare, annealed, or soft drawn, solid copper conductor.

For raceways installed under pavement; for raceways and cables not installed adjacent to the full strength pavement edge; for fixtures installed in full strength pavement and shoulder pavement and for optional method of edge lights installed in turf (stabilized soils); and for raceways or cables adjacent to the full strength pavement edge, the counterpoise conductor shall be centered over the raceway or cable to be protected as described below.

The counterpoise conductor shall be installed no less than 8 inches above the raceway or cable to be protected, except as permitted below.

The minimum counterpoise conductor height above the raceway or cable to be protected shall be permitted to be adjusted subject to coordination with the airfield lighting and pavement designs.

Where raceway is installed by the directional bore, jack and bore, or other drilling method, the counterpoise conductor shall be permitted to be installed concurrently with the directional bore, jack and bore, or other drilling method raceway, external to the raceway or sleeve.

The counterpoise conductor shall be installed no more than 12 inches above the raceway or cable to be protected.

The counterpoise conductor height above the protected raceway(s) or cable(s) shall be calculated to ensure that the raceway or cable is within a 45-degree area of protection.

The counterpoise conductor shall be bonded to each metallic light base, mounting stake, and metallic airfield lighting component.

All metallic airfield lighting components in the field circuit on the output side of the constant current regulator (CCR) or other power source shall be bonded to the airfield lighting counterpoise system.

The counterpoise wire shall also be exothermically welded to ground rods installed as shown on the plans but not more than 500 feet apart around the entire circuit. The counterpoise system shall be continuous and terminate at the transformer vault or at the power source. It shall be securely attached to the vault or equipment external ground ring or other made electrode-grounding system. The connections shall be made as shown on the plans and in the specifications.

If shown on the plans or in the specifications, a separate equipment (safety) ground system shall be provided in addition to the counterpoise wire using one of the following methods:

- A. A ground rod installed at and securely attached to each light fixture base, mounting stake, and to all metal surfaces at junction/access structures via #6 AWG wire.
- B. For parallel voltage systems only, install a #6 AWG green insulated equipment ground conductor internal to the conduit system and securely attached it to each light fixture base internal grounding lug and to all metal surfaces at junction/access structures. Dedicated ground rods shall be installed and exothermically welded to the counterpoise wires at each end of a duct bank crossing under pavement.

Where an existing airfield lighting system is being extended or modified, the new counterpoise conductors shall be interconnected to existing counterpoise conductors at each intersection of the new and existing airfield lighting counterpoise systems.

108-3.7 Counterpoise installation above multiple conduits and duct banks. Counterpoise wires shall be installed above multiple conduits/duct banks for airfield lighting cables, with the intent being to provide a complete area of protection over the airfield lighting cables. When multiple conduits and/or duct banks for airfield cable are installed in the same trench, the number and location of counterpoise wires above the conduits shall be adequate to provide a complete cone of protection measured 22-1/2 degrees each side of vertical.

Where duct banks pass under pavement to be constructed in the project, the counterpoise shall be placed above the duct bank. Reference details on the construction plans.

108-3.8 Counterpoise installation at existing duct banks. When airfield lighting cables are indicated on the plans to be routed through existing duct banks, the new counterpoise wiring shall be terminated at ground rods at each end of the existing duct bank where the cables being protected enter and exit the duct bank. The new counterpoise conductor shall be bonded to the existing counterpoise system.

108-3.9 Exothermic bonding. Bonding of counterpoise wire shall be by the exothermic welding process. Only personnel experienced in and regularly engaged in this type of work shall make these connections.

Contractor shall demonstrate to the satisfaction of the Engineer, the welding kits, materials, and procedures to be used for welded connections prior to any installations in the field. The installations shall comply with the manufacturer's recommendations and the following:

- A. All slag shall be removed from welds.
- B. Using an exothermic weld to bond the counterpoise to a lug on a galvanized light base is not recommended unless the base has been specially modified. Consult the manufacturer's installation directions for proper methods of bonding copper wire to the light base. See also AC 150/5340-30 for galvanized light base exception.
- C. If called for in the plans, all buried copper and weld material at weld connections shall be thoroughly coated with 6 mm of 3MTM Scotchkote™, or approved equivalent, or coated with coal tar Bitumastic® material to prevent surface exposure to corrosive soil or moisture.

108-3.10 Testing. The Contractor shall furnish all necessary equipment and appliances for testing the airport electrical systems and underground cable circuits before and after installation. The Contractor shall perform all tests in the presence of the Engineer. The Contractor shall demonstrate the electrical characteristics to the satisfaction of the Engineer. All costs for testing are incidental to the respective item being tested. For phased projects, the tests must be completed by phase. The Contractor must maintain the test results throughout the entire project as well as during the warranty period that meet the following:

- A. Earth resistance testing methods shall be submitted to the Engineer for approval. Earth resistance testing results shall be recorded on an approved form and testing shall be performed in the presence of the Engineer. All such testing shall be at the sole expense of the Contractor.
- B. Should the counterpoise or ground grid conductors be damaged or suspected of being damaged by construction activities the Contractor shall test the conductors for continuity with a low resistance ohmmeter. The conductors shall be isolated such that no parallel path exists and tested for continuity. The Engineer shall approve of the test method selected. All such testing shall be at the sole expense of the Contractor.
- C. After installation, the Contractor shall test and demonstrate to the satisfaction of the Engineer the following:
- D. That all affected lighting power and control circuits (existing and new) are continuous and free from short circuits.
- E. That all affected circuits (existing and new) are free from unspecified grounds.

- F. That the insulation resistance to ground of all new non-grounded high voltage series circuits or cable segments is not less than 100 meg-ohms.
- G. That the insulation resistance to ground of all new non-grounded conductors of new multiple circuits or circuit segments is not less than 100 meg-ohms.
- H. That all affected circuits (existing and new) are properly connected per applicable wiring diagrams.
- I. That all affected circuits (existing and new) are operable. Tests shall be conducted that include operating each control not less than 10 times and the continuous operation of each lighting and power circuit for not less than 1/2 hour.
- J. That the impedance to ground of each ground rod does not exceed 25 ohms prior to establishing connections to other ground electrodes. The fall-of-potential ground impedance test shall be used, as described by American National Standards Institute/Institute of Electrical and Electronic Engineers (ANSI/IEEE) Standard 81, to verify this requirement. As an alternate, clamp-on style ground impedance test meters may be used to satisfy the impedance testing requirement. Test equipment and its calibration sheets shall be submitted for review and approval by the Engineer prior to performing the testing.

Two copies of tabulated results of all cable tests performed shall be supplied by the Contractor to the Engineer. Where connecting new cable to existing cable, ground resistance tests shall be performed on the new cable prior to connection to the existing circuit.

There are no approved "repair" procedures for items that have failed testing other than complete replacement.

METHOD OF MEASUREMENT

108-4.1 Cable or counterpoise wire installed in trench, duct bank or conduit shall be measured by the number of linear feet installed with primary connector kits, grounding conductor and grounding connectors ready for operation, and accepted by Owner / Engineer. Separate measurement shall be made for each single cable (1/C), cable pair (2/C) or feeder set, installed in duct bank or conduit with associated ground wire and connections included in Contractor's price. The measurement for this item shall include additional quantities required for slack – 5' per cable end at each light base, junction can or transformer housing and 15' per cable end at each manhole or hand hole. No separate measurement will be made to multiply the number of individual conductors installed in a single conduit, in one installation effort.

108-4.2 Counterpoise wire and connections are considered incidental to the installation of duct bank or conduit, per item L-110. No separate payment will be made.

108-4.3 Ground rods shall be considered incidental to the installation of counterpoise, light base, transformer housing, sign, or other grounding. No separate payment will be made.

BASIS OF PAYMENT

108-5.1 Payment will be made at the contract unit price for cable and equipment ground installed in duct bank or conduit, in place by the Contractor and accepted by the Engineer. This price shall be full compensation for furnishing all materials and for all preparation and installation of these materials, and for all labor, equipment, tools, and incidentals, including ground rods and ground connectors and trench marking tape, necessary to complete this item.

Payment will be made under:

Item L-108-5.1	L-824, Type C, 2/C #8 AWG, 5kV Cable w/ #6 Bare Copper Ground – per Linear Foot
Item L-108-5.2	2-#4, #4 Neutral, #4 Gnd THWN, 600V (Apron Lighting) – per Linear Foot

MATERIAL REQUIREMENTS

AC 150/5340-26	Maintenance of Airport Visual Aid Facilities
AC 150/5340-30	Design and Installation Details for Airport Visual Aids
AC 150/5345-7	Specification for L-824 Underground Electrical Cable for Airport Lighting Circuits
AC 150/5345-26	Specification for L-823 Plug and Receptacle, Cable Connectors
AC 150/5345-53	Airport Lighting Equipment Certification Program Commercial Item Description
A-A-59544	Cable and Wire, Electrical (Power, Fixed Installation) Commercial Item Description
A-A-55809	Insulation Tape, Electrical, Pressure-Sensitive Adhesive, Plastic
ASTM B3	Standard Specification for Soft or Annealed Copper Wire
ASTM B8	Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft
ASTM B33	Standard Specification for Tin-Coated Soft or Annealed Copper Wire for Electrical Purposes
ASTM D4388	Standard Specification for Nonmetallic Semi-Conducting and Electrically Insulating Rubber Tapes
FED SPEC J-C-30	Cable and Wire, Electrical (Power, Fixed Installation)
MIL-I-24391	Insulation Tape, Electrical, Plastic, Pressure Sensitive

REFERENCE DOCUMENTS

NFPA-70	National Electrical Code (NEC)
NFPA-780	Standard for the Installation of Lightning Protection Systems
MIL-S-23586F	Performance Specification: Sealing Compound (with Accelerator), Silicone Rubber, Electrical
ANSI/IEEE STD 81	IEEE Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System

END OF ITEM L-108

Item L-110 Airport Underground Electrical Duct Banks and Conduits

DESCRIPTION

110-1.1 This item shall consist of underground electrical conduits and duct banks (single or multiple conduits encased in concrete or buried in sand) installed per this specification at the locations and per the dimensions, designs, and details shown on the plans. This item shall include furnishing and installing of all underground electrical duct banks and individual and multiple underground conduits. It shall also include all turbing trenching, backfilling, removal, and restoration of any paved or turfed areas; concrete encasement, mandrelling, pulling lines, duct markers, plugging of conduits, and the testing of the installation as a completed system ready for installation of cables per the plans and specifications. This item shall also include furnishing and installing conduits, counterpoise conductor, ground rods and connections including all incidentals for providing positive drainage of the system. Verification of existing ducts is incidental to the pay items provided in this specification.

EQUIPMENT AND MATERIALS

110-2.1 General.

- A. All equipment and materials covered by referenced specifications shall be subject to acceptance through manufacturer's certification of compliance with the applicable specification when requested by the Engineer.
- B. Manufacturer's certifications shall not relieve the Contractor of the responsibility to provide materials per these specifications and acceptable to the Engineer. Materials supplied and/or installed that do not comply with these specifications shall be removed, when directed by the Engineer and replaced with materials that comply with these specifications, at the Contractor's cost.
- C. All materials and equipment used to construct this item shall be submitted to the Engineer for approval prior to ordering the equipment. Submittals consisting of marked catalog sheets or shop drawings shall be provided. Submittal data shall be presented in a clear, precise, and thorough manner. Original catalog sheets are preferred. Photocopies are acceptable provided they are as good a quality as the original. Clearly and boldly mark each copy to identify products or models applicable to this project. Indicate all optional equipment and delete non-pertinent data. Submittals for components of electrical equipment and systems shall identify the equipment for which they apply on each submittal sheet. Markings shall be made bold and clear with arrows or circles (highlighting is not acceptable). The Contractor is solely responsible for delays in project that accrue directly or indirectly from late submissions or resubmissions of submittals.
- D. The data submitted shall be sufficient, in the opinion of the Engineer, to determine compliance with the plans and specifications. The Contractor's submittals shall be Electronic PDF, labeled and tabbed by specification section. The Engineer reserves the right to reject any and all equipment, materials or procedures that do not meet the system design and the standards and codes specified in this document.
- E. All equipment and materials furnished and installed under this section shall be guaranteed against defects in materials and workmanship for a period of at least twelve (12) months from final acceptance by the Owner. The defective materials and/or equipment shall be repaired or replaced, at the Owner's discretion, with no additional cost to the Owner.

110-2.2 Steel Conduit. Rigid galvanized steel (RGS) conduit and fittings shall be hot dipped galvanized inside and out and conform to the requirements of Underwriters Laboratories Standards 6, 514B, and 1242. All RGS conduits or RGS elbows installed below grade, in concrete, permanently wet locations or other similar environments shall be painted with a 10-mil thick coat of asphaltum sealer or shall have a factory bonded polyvinyl chloride (PVC) cover. Any exposed galvanizing or steel shall be coated with 10 mil of asphaltum sealer. When using PVC coated RGS conduit, care shall be exercised not to damage the factory PVC coating. Damaged PVC coating shall be repaired per the manufacturer's written instructions.

110-2.3 Plastic Conduit. Plastic conduit and fittings shall conform to the following requirements:

- UL 514B covers W-C-1094-Conduit fittings all types, classes 1 thru 3 and 6 thru 10.
- UL 514C covers W-C-1094- all types, Class 5 junction box and cover in plastic (PVC).
- UL 651 covers W-C-1094-Rigid PVC Conduit, types I and II, Class 4.
- UL 651A covers W-C-1094-Rigid PVC Conduit and high-density polyethylene (HDPE) Conduit type III and Class 4.

Underwriters Laboratories Standards UL-651 and Article 352 of the current National Electrical Code shall be one of the following, as shown on the plans:

- A. Type I—Schedule 40 PVC suitable for underground use either direct-buried or encased in concrete.
- B. Type II—Schedule 40 PVC suitable for either above ground or underground use.
- C. Type III – Schedule 80 PVC suitable for either above ground or underground use either direct-buried or encased in concrete.
- D. Type III –HDPE pipe, minimum standard dimensional ratio (SDR) 11, suitable for placement with directional boring under pavement.

The type of solvent cement shall be as recommended by the conduit/fitting manufacturer.

110-2.4 Split Conduit. Split conduit shall be pre-manufactured for the intended purpose and shall be made of steel or plastic.

110-2.5 Conduit Spacers. Conduit spacers shall be prefabricated interlocking units manufactured for the intended purpose. They shall be of double wall construction made of high grade, high density polyethylene complete with interlocking cap and base pads, they shall be designed to accept No. 4 reinforcing bars installed vertically.

110-2.6 Concrete. Concrete shall conform to Item P-610, Structural Portland Cement Concrete, using 1-inch maximum size coarse aggregate with a minimum 28-day compressive strength of 4000 psi. Where reinforced duct banks are specified, reinforcing steel shall conform to ASTM A615 Grade 60. Concrete and reinforcing steel are incidental to the respective pay item of which they are a component part.

110-2.7 Flowable Backfill. Flowable material used to back fill conduit and duct bank trenches shall conform to the requirements of Item P-153, Controlled Low Strength Material. Fill shall be designed to achieve a 28-day compressive strength of 200 psi (1.4 MPa) under pavement.

110-2.8 Detectable Warning Tape. Plastic, detectable, American Wood Preservers Association (AWPA) Red (electrical power lines, cables, conduit, and lighting cable) with continuous legend magnetic tape shall be polyethylene film with a metallized foil core and shall be 3-6 inches wide. Detectable tape is incidental to the respective bid item.

110-2.9 Retro-Fit Existing Pavement. Where conduit is installed under existing asphalt shoulder pavement, Contractor shall saw cut and remove existing section prior to excavation, conduit and counterpoise installation and slurry backfill. Contractor shall repair/replace shoulder pavement in kind. Airside asphalt concrete replacement shall be per structural section 2 on sheet CS-301. Concrete pavement replacement in the facilities yard shall be Type C per MAG STD DTL 200 and MAG Section 336. All saw cuts and pavement repair / replacement shall be considered incidental to the associated item being installed (i.e., there is no separate measurement of payment).

CONSTRUCTION METHODS

110-3.1 General. The Contractor shall install underground duct banks and conduits at the approximate locations indicated on the plans. The Engineer shall indicate specific locations as the work progresses, if required to differ from the plans. Duct banks and conduits shall be of the size, material, and type indicated on the plans or specifications. Where no size is indicated on the plans or in the specifications, conduits shall be not less than 2 inches inside diameter or comply with the National Electrical Code based on cable to be installed, whichever is larger. All duct bank and conduit lines shall be laid so as to grade toward access points and duct or conduit ends for drainage. Unless shown otherwise on the plans, grades shall be at least 3 inches per 100 feet. On runs where it is not practicable to maintain the grade all one way, the duct bank and conduit lines shall be graded from the center in both directions toward access points or conduit ends, with a drain into the storm drainage system. Pockets or traps where moisture may accumulate shall be avoided. No duct bank or underground conduit shall be less than 18 inches below finished grade. Where under pavement, the top of the duct bank shall not be less than 18 inches below the subgrade.

The Contractor shall mandrel each individual conduit whether the conduit is direct-buried or part of a duct bank. An iron-shod mandrel, not more than 1/4 inch smaller than the bore of the conduit shall be pulled or pushed through each conduit. The mandrel shall have a leather or rubber gasket slightly larger than the conduit hole.

The Contractor shall swab out all conduits/ducts and clean base can, manhole, pull boxes, etc., interiors IMMEDIATELY prior to pulling cable. Once cleaned and swabbed the light bases, manholes, pull boxes, etc., and all accessible points of entry to the duct/conduit system shall be kept closed except when installing cables. Cleaning of ducts, base cans, manholes, etc., is incidental to the pay item of the item being cleaned. All raceway systems left open, after initial cleaning, for any reason shall be re-cleaned at the Contractor's expense. All accessible points shall be kept closed when not installing cable. The Contractor shall verify existing ducts proposed for use in this project as clear and open. The Contractor shall notify the Engineer of any blockage in the existing ducts.

For pulling the permanent wiring, each individual conduit, whether the conduit is direct-buried or part of a duct bank, shall be provided with a 200-pound test polypropylene pull rope. The ends shall be secured, and sufficient length shall be left in access points to prevent it from slipping back into the conduit. Where

spare conduits are installed, as indicated on the plans, the open ends shall be plugged with removable tapered plugs, designed for this purpose.

All conduits shall be securely fastened in place during construction and shall be plugged to prevent contaminants from entering the conduits. Any conduit section having a defective joint shall not be installed. Ducts shall be supported and spaced apart using approved spacers at intervals not to exceed 5 feet.

Unless otherwise shown on the plans, concrete encased duct banks shall be used when crossing under pavements expected to carry aircraft loads, such as runways, taxiways, taxi-lanes, ramps, and aprons. When under paved shoulders and other paved areas, conduit and duct banks shall be encased using flow-able fill for protection.

All conduits within concrete encasement of the duct banks shall terminate with female ends for ease in current and future use. Install factory plugs in all unused ends. Do not cover the ends or plugs with concrete.

Where turf is well established and the sod can be removed, it shall be carefully stripped and properly stored.

Trenches for conduits and duct banks may be excavated manually or with mechanical trenching equipment unless in pavement, in which case they shall be excavated with mechanical trenching equipment. Walls of trenches shall be essentially vertical so that a minimum of shoulder surface is disturbed. Blades of graders shall not be used to excavate the trench.

When rock is encountered, the rock shall be removed to a depth of at least 3 inches below the required conduit or duct bank depth and it shall be replaced with bedding material of earth or sand containing no mineral aggregate particles that would be retained on a 1/4 inch sieve. Flow-able backfill may alternatively be used. The Contractor shall ascertain the type of soil or rock to be excavated before bidding. All such rock removal shall be performed and paid for under Item P-152.

Underground electrical warning (Caution) tape shall be installed in the trench above all underground duct banks and conduits in unpaved areas. Contractor shall submit a sample of the proposed warning tape for approval by the Engineer. If not shown on the plans, the warning tape shall be located 6 inches above the duct/conduit or the counterpoise wire if present.

Joints in plastic conduit shall be prepared per the manufacturer's recommendations for the particular type of conduit. Plastic conduit shall be prepared by application of a plastic cleaner and brushing a plastic solvent on the outside of the conduit ends and on the inside of the couplings. The conduit fitting shall then be slipped together with a quick one-quarter turn twist to set the joint tightly. Where more than one conduit is placed in a single trench, or in duct banks, joints in the conduit shall be staggered a minimum of 2 feet.

Changes in direction of runs exceeding 10 degrees, either vertical or horizontal, shall be accomplished using manufactured sweep bends.

Whether or not specifically indicated on the drawings, where the soil encountered at established duct bank grade is an unsuitable material, as determined by the Engineer, the unsuitable material shall be removed per Item P-152 and replaced with suitable material. Alternatively, additional duct bank supports that are adequate and stable shall be installed, as approved by the Engineer.

All excavation shall be unclassified and shall be considered incidental to the respective L-110 pay item of which it is a component part. Dewatering necessary for duct installation, erosion, and turbidity control, per Federal, state, and local requirements is incidental to its respective pay item as a part of Item L-110. The cost of all excavation regardless of type of material encountered shall be included in the unit price bid for the L-110 Item.

Unless otherwise specified, excavated materials that are deemed by the Engineer to be unsuitable for use in backfill or embankments shall be removed and disposed of offsite.

Any excess excavation shall be filled with suitable material approved by the Engineer and compacted per Item P-152.

It is the Contractor's responsibility to locate existing utilities within the work area prior to excavation. Where existing active cables cross proposed installations, the Contractor shall ensure that these cables are adequately protected. Where crossings are unavoidable, no splices will be allowed in the existing cables, except as specified on the plans. Installation of new cable where such crossings must occur shall proceed as follows:

- A. Existing cables shall be located manually. Unearthed cables shall be inspected to assure absolutely no damage has occurred
- B. Trenching, etc., in cable areas shall then proceed with approval of the Engineer, with care taken to minimize possible damage or disruption of existing cable, including careful backfilling in area of cable.

In the event that any previously identified cable is damaged during the course of construction, the Contractor shall be responsible for the complete repair.

110-3.2 Duct Banks. Unless otherwise shown in the plans, duct banks shall be installed so that the top of the concrete envelope is not less than 18 inches below the bottom of the base or stabilized base course layers where installed under runways, taxiways, aprons, or other paved areas, and not less than 18 inches below finished grade where installed in unpaved areas.

Unless otherwise shown on the plans, duct banks under paved areas shall extend at least 3 feet beyond the edges of the pavement or 3 feet beyond any under drains that may be installed alongside the paved area. Trenches for duct banks shall be opened the complete length before concrete is placed so that if any obstructions are encountered, provisions can be made to avoid them. Unless otherwise shown on the plans, all duct banks shall be placed on a layer of concrete not less than 3 inches thick prior to its initial set. The Contractor shall space the conduits not less than 3 inches apart (measured from outside wall to outside wall). All such multiple conduits shall be placed using conduit spacers applicable to the type of conduit. As the conduit laying progresses, concrete shall be placed around and on top of the conduits not less than 3 inches thick unless otherwise shown on the plans. All conduits shall terminate with female ends for ease of access in current and future use. Install factory plugs in all unused ends. Do not cover the ends or plugs with concrete.

Conduits forming the duct bank shall be installed using conduit spacers. No. 4 reinforcing bars shall be driven vertically into the soil a minimum of 6 inches to anchor the assembly into the earth prior to placing the concrete encasement. For this purpose, the spacers shall be fastened down with locking collars attached to the vertical bars. Spacers shall be installed at 5-foot intervals. Spacers shall be in the proper sizes and configurations to fit the conduits. Locking collars and spacers shall be submitted to the Engineer for review prior to use.

When specified, the Contractor shall reinforce the bottom side and top of encasements with steel reinforcing mesh or fabric or other approved metal reinforcement. When directed, the Contractor shall supply additional supports where the ground is soft and boggy, where ducts cross under roadways, or where shown on the plans. Under such conditions, the complete duct structure shall be supported on reinforced concrete footings, piers, or piles located at approximately 5-foot intervals.

All pavement surfaces that are to have ducts installed therein shall be neatly saw cut to form a vertical face. All excavation shall be included in the contract with price for the duct.

Install a plastic, detectable, color as noted, 3 to 6 inches wide tape, 8 inches minimum below grade above all underground conduit or duct lines not installed under pavement. Utilize the 3-inch wide tape only for single conduit runs. Utilize the 6-inch wide tape for multiple conduits and duct banks. For duct banks equal to or greater than 24 inches in width, utilize more than one tape for sufficient coverage and identification of the duct bank as required.

When existing cables are to be placed in split duct, encased in concrete, the cable shall be carefully located and exposed by hand tools. Prior to being placed in duct, the Engineer shall be notified so that he may inspect the cable and determine that it is in good condition. Where required, split duct shall be installed as shown on the drawings or as required by the Engineer.

110-3.3 Conduits Without Concrete Encasement. Trenches for single-conduit lines shall be not less than 6 inches nor more than 12 inches wide. The trench for 2 or more conduits installed at the same level shall be proportionately wider. Trench bottoms for conduits without concrete encasement shall be made to conform accurately to grade so as to provide uniform support for the conduit along its entire length.

Unless otherwise shown on the plans, a layer of fine earth material, at least 4 inches thick (loose measurement) shall be placed in the bottom of the trench as bedding for the conduit. The bedding material shall consist of soft dirt, sand, or other fine fill, and it shall contain no particles that would be retained on a 1/4-inch sieve. The bedding material shall be tamped until firm. Flow-able backfill may alternatively be used.

Unless otherwise shown on plans, conduits shall be installed so that the tops of all conduits within the Airport's secured area where trespassing is prohibited are at least 18 inches below the finished grade. Conduits outside the Airport's secured area shall be installed so that the tops of the conduits are at least 24 inches below the finished grade per National Electric Code (NEC), Table 300.5.

When two or more individual conduits intended to carry conductors of equivalent voltage insulation rating are installed in the same trench without concrete encasement, they shall be spaced not less than 3 inches apart (measured from outside wall to outside wall) in a horizontal direction and not less than 6 inches apart in a vertical direction. Where two or more individual conduits intended to carry conductors of differing voltage insulation rating are installed in the same trench without concrete encasement, they shall be placed not less than 3 inches apart (measured from outside wall to outside wall) in a horizontal direction and not less than 6 inches apart in a vertical direction.

Trenches shall be opened the complete length between normal termination points before conduit is installed so that if any unforeseen obstructions are encountered, proper provisions can be made to avoid them.

Conduits shall be installed using conduit spacers. No. 4 reinforcing bars shall be driven vertically into the soil a minimum of 6 inches to anchor the assembly into the earth while backfilling. For this purpose, the spacers shall be fastened down with locking collars attached to the vertical bars. Spacers shall be

installed at 5-foot intervals. Spacers shall be in the proper sizes and configurations to fit the conduits. Locking collars and spacers shall be submitted to the Engineer for review prior to use.

110-3.4 Markers. The location of each end and of each change of direction of conduits and duct banks shall be marked by a concrete slab marker 2 feet square and 4 - 6 inches thick extending approximately one inch above the surface. The markers shall also be located directly above the ends of all conduits or duct banks, except where they terminate in a junction/access structure or building. Each cable or duct run from a line of lights and signs to the equipment vault must be marked at approximately every 200 feet along the cable or duct run, with an additional marker at each change of direction of cable or duct run.

The Contractor shall impress the word "DUCT" or "CONDUIT" on each marker slab. Impression of letters shall be done in a manner, approved by the Engineer, for a neat, professional appearance. All letters and words must be neatly stenciled. After placement, all markers shall be given one coat of high-visibility orange paint, as approved by the Engineer. The Contractor shall also impress on the slab the number and size of conduits beneath the marker along with all other necessary information as determined by the Engineer. The letters shall be 4 inches high and 3 inches wide with width of stroke 1/2 inch and 1/4-inch-deep or as large as the available space permits. Furnishing and installation of duct markers is incidental to the respective duct pay item.

110-3.5 Backfilling for Conduits. For conduits, 8 inches of sand, soft earth, or other fine fill (loose measurement) shall be placed around the conduits ducts and carefully tamped around and over them with hand tampers. The remaining trench shall then be backfilled and compacted per Item P-152 "Excavation and Embankment" except that material used for back fill shall be select material not larger than 4 inches in diameter.

Flow-able backfill may alternatively be used.

Trenches shall not contain pools of water during back filling operations.

The trench shall be completely backfilled and tamped level with the adjacent surface; except that, where sod is to be placed over the trench, the backfilling shall be stopped at a depth equal to the thickness of the sod to be used, with proper allowance for settlement.

Any excess excavated material shall be removed and disposed of per instructions issued by the Engineer.

110-3.6 Backfilling for Duct Banks. After the concrete has cured, the remaining trench shall be backfilled and compacted per Item P-152 "Excavation and Embankment" except that the material used for backfilling shall be select material not larger than 4 inches in diameter. In addition to the requirements of P-152, where duct banks are installed under pavement, one moisture/density test per lift shall be made for each 250 linear feet of duct bank or one work period's construction, whichever is less.

Flow-able backfill may alternatively be used.

Trenches shall not contain pools of water during backfilling operations.

The trench shall be completely backfilled and tamped level with the adjacent surface; except that, where sod is to be placed over the trench, the backfilling shall be stopped at a depth equal to the thickness of the sod to be used, with proper allowance for settlement.

Any excess excavated material shall be removed and disposed of per instructions issued by the Engineer.

110-3.7 Restoration. All areas disturbed by the work shall be restored to its original condition. The Contractor shall be held responsible for maintaining all disturbed surfaces and replacements until final acceptance. All restoration shall be considered incidental to the respective L-110 pay item. Following restoration of all trenching near airport movement surfaces, the Contractor shall thoroughly visually inspect the area for foreign object debris (FOD) and remove any such FOD that is found. This FOD inspection and removal shall be considered incidental to the pay item of which it is a component part.

METHOD OF MEASUREMENT

110-4.1 Underground conduits and duct banks shall be measured by the linear feet of conduits and duct banks installed, including encasement, counterpoise conductor, ground rods and connections, locator tape, trenching and backfill with designated material, and for drain lines, the termination at the drainage structure, all measured in place, completed, and accepted. Separate measurement shall be made for the various types and sizes.

110-4.2 Retrofit conduits in existing asphalt shoulder pavement shall include saw cutting, slurry backfill and replacement / patch of asphalt pavement in kind.

Section 1.01 BASIS OF PAYMENT

110-5.1 Payment will be made at the contract unit price per linear foot for each type and size of conduit and duct bank completed and accepted, including trench and backfill with the designated material, and, for drain lines, the termination at the drainage structure. This price shall be full compensation for furnishing all materials and for all preparation, assembly, and installation of these materials, and for all labor, equipment, tools, and incidentals necessary to complete this item per the provisions and intent of the plans and specifications.

Payment will be made under:

Item L-110-5.1	Single-way, (1) - 2" Conduit, Slurry Encased, Retrofit in Existing Asphalt– per Linear Foot
Item L-110-5.2	Single-way, (1) - 2" Conduit, Concrete Encased – per Linear Foot
Item L-110-5.3	Multiple-way, (2) - 2" Conduit, Concrete Encased – per Linear Foot
Item L-110-5.4	Multiple-way, (4) - 2" Conduit, Concrete Encased – per Linear Foot
Item L-110-5.5	Multiple-way, (8) - 2" Conduit, Slurry Encased, Retrofit in Existing Asphalt Pavement – per Linear Foot
Item L-110-5.6	Multiple-way, (9) - 2" Conduit, Concrete Encased, Retrofit in Existing Concrete – per Linear Foot
Item L-110-5.7	Multiple-way, (8) - 2" Conduit, Concrete Encased – per Linear Foot
Item L-110-5.8	Multiple-way, (12) - 2" Conduit, Concrete Encased – per Linear Foot
Item L-110-5.9	Multiple-way, (3) - 4" Conduit (Communications), Concrete Encased, Retrofit in Existing Concrete – per Linear Foot

Section 1.02 MATERIAL REQUIREMENTS

Advisory Circular

AC 150/5340-30	Design and Installation Details for Airport Visual Aids
AC 150/5345-53	Airport Lighting Equipment Certification Program

ASTM International (ASTM)

ASTM A615	Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
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 (2,700 kN-m/m ³))
ASTM D2167	Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method
ASTM D2922	Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)

NFPA-70	National Electrical Code (NEC)
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Underwriters Laboratories

Standard 6	Electrical Rigid Metal Conduit - Steel
Standard 514B	Conduit, Tubing, and Cable Fittings
Standard 514C	Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers
Standard 1242	Electrical Intermediate Metal Conduit Steel
Standard 651	Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings
Standard 651A	Type EB and A Rigid PVC Conduit and HDPE Conduit

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Item L-115 Electrical Manholes and Junction Structures

DESCRIPTION

115-1.1 This item shall consist of electrical manholes and junction structures (hand holes, pull boxes, junction cans, etc.) installed per this specification, at the indicated locations and conforming to the lines, grades and dimensions shown on the plans or as required by the Engineer. This item shall include the installation of each electrical manhole and/or junction structures with all associated excavation, backfilling, sheeting, and bracing, concrete, reinforcing steel, ladders, appurtenances, testing, dewatering and restoration of surfaces to the satisfaction of the Engineer.

EQUIPMENT AND MATERIALS

115-2.1 General.

All equipment and materials covered by referenced specifications shall be subject to acceptance through manufacturer's certification of compliance with the applicable specification when so requested by the Engineer.

Manufacturer's certifications shall not relieve the Contractor of the responsibility to provide materials per these specifications. Materials supplied and/or installed that do not comply with these specifications shall be removed (when directed by the Engineer) and replaced with materials that comply with these specifications at the Contractor's cost.

All materials and equipment used to construct this item shall be submitted to the Engineer for approval prior to ordering the equipment. Submittals consisting of marked catalog sheets or shop drawings shall be provided. Submittal data shall be presented in a clear, precise, and thorough manner. Original catalog sheets are preferred. Photocopies are acceptable provided they are as good a quality as the original. Clearly and boldly mark each copy to identify products or models applicable to this project. Indicate all optional equipment and delete any non-pertinent data. Submittals for components of electrical equipment and systems shall identify the equipment to which they apply on each submittal sheet. Markings shall be made bold and clear with arrows or circles (highlighting is not acceptable). The Contractor is solely responsible for delays in the project that may accrue directly or indirectly from late submissions or resubmissions of submittals.

The data submitted shall be sufficient, in the opinion of the Engineer, to determine compliance with the plans and specifications. The Contractor's submittals shall be Electronic PDF, labeled and tabbed by specification section. The Engineer reserves the right to reject any and all equipment, materials or procedures that do not meet the system design and the standards and codes, specified in this document.

All equipment and materials furnished and installed under this section shall be guaranteed against defects in materials and workmanship for a period of at least twelve (12) months from the date of final acceptance by the Owner. The defective materials and/or equipment shall be repaired or replaced, at the Owner's discretion, with no additional cost to the Owner.

115-2.2 Concrete structures. Cast-in-place concrete structures are not used.

Provide precast concrete structures where shown on the plans. Precast concrete structures shall be an approved standard design of the manufacturer. Precast units shall have mortar or bitumastic sealer placed between all joints to make them watertight. The structure shall be designed to withstand **100,000** lbs. aircraft loads, unless otherwise shown on the plans. Openings or knockouts shall be provided in the structure as detailed on the plans.

Threaded inserts and pulling eyes shall be cast in as shown.

If the Contractor chooses to propose a different structural design, signed and sealed shop drawings, design calculations, and other information requested by the Engineer shall be submitted by the Contractor to allow for a full evaluation by the Engineer. The Engineer shall review per the process defined in the General Provisions.

115-2.3 Junction Boxes. Junction boxes shall be L-867 Class 1 (non-load bearing) or L-868 Class 1 (load bearing) airport light bases that are encased in concrete. The light bases shall have a galvanized steel blank cover, gasket, and stainless steel or coated steel hardware per FAA Engineering Brief (EB) #83. Covers shall be 3/8-inch thickness for L-867 and 3/4-inch thickness for L-868.

115-2.4 Mortar. The mortar shall be composed of one part of Portland cement and two parts of mortar sand, by volume. The Portland cement shall be per the requirements in ASTM C150, Type I. The sand shall be per the requirements in ASTM C144. Hydrated lime may be added to the mixture of sand and cement in an amount not to exceed 15% of the weight of cement used. The hydrated lime shall meet the requirements of ASTM C6. Water shall be potable, reasonably clean, and free of oil, salt, acid, alkali, sugar, vegetable, or other substances injurious to the finished product.

115-2.5 Concrete. All concrete used in structures shall conform to the requirements of Item P-610, Structural Portland Cement Concrete.

115-2.6 Frames and Covers. The frames shall conform to one of the following requirements:

- | | | |
|-----------|--------------------|--|
| A. | ASTM A48 | Gray iron castings |
| B. | ASTM A47 | Malleable iron castings |
| C. | ASTM A27 | Steel castings |
| D. | ASTM A283, Grade D | Structural steel for grates and frames |
| E. | ASTM A536 | Ductile iron castings |
| F. | ASTM A897 | Austempered ductile iron castings |

All castings specified shall withstand a maximum tire pressure of **125** psi and maximum load of **100,000** lbs.

All castings or structural steel units shall conform to the dimensions shown on the plans and shall be designed to support the loadings specified.

Each frame and cover unit shall be provided with fastening members to prevent it from being dislodged by traffic, but which will allow easy removal for access to the structure.

All castings shall be thoroughly cleaned. After fabrication, structural steel units shall be galvanized to meet the requirements of ASTM A123.

Each cover shall have the word "**ELECTRIC**" or other approved designation cast on it. Each frame and cover shall be as shown on the plans or approved equivalent. No cable notches are required.

Each manhole shall be provided with a "**DANGER -- PERMIT-REQUIRED CONFINED SPACE, DO NOT ENTER**" safety warning sign as detailed in the Contract Documents and in accordance with OSHA 1910.146 (c)(2).

115-2.7 Ladders. Ladders, if specified, shall be galvanized steel or as shown on the plans.

115-2.8 Reinforcing Steel. All reinforcing steel shall be deformed bars of new billet steel meeting the requirements of ASTM A615, Grade 60.

115-2.9 Bedding/Special Backfill. Bedding or special backfill shall be as shown on the plans.

115-2.10 Flowable Backfill. Flowable material used to backfill shall conform to the requirements of Item P-153, Controlled Low Strength Material.

115-2.11 Cable Racks. Cable Racks shall be of non-conductive plastic. Cable racks shall be located as shown on the plans.

115-2.12 Plastic Conduit. Plastic conduit shall comply with Item L-110, Airport Underground Electrical Duct Banks and Conduits.

115-2.13 Conduit Terminators. Conduit terminators shall be pre-manufactured for the specific purpose and sized as required or as shown on the plans.

115-2.14 Pulling-In Irons. Pulling-in irons shall be manufactured with 7/8-inch diameter hot-dipped galvanized steel or stress-relieved carbon steel roping designed for concrete applications (7 strand, 1/2 inch diameter with an ultimate strength of 270,000 psi (1862 MPa)). Where stress-relieved carbon steel roping is used, a rustproof sleeve shall be installed at the hooking point and all exposed surfaces shall be encapsulated with a polyester coating to prevent corrosion.

115-2.15 Ground Rods. Ground rods shall be one piece, copper clad. The ground rods shall be of the length and diameter specified on the plans, but in no case shall they be less than 10 feet long nor less than 3/4 inch in diameter.

CONSTRUCTION METHODS

115-3.1 Unclassified excavation. It is the Contractor's responsibility to locate existing utilities within the work area prior to excavation. Damage to utility lines, through lack of care in excavating, shall be repaired or replaced to the satisfaction of the Engineer without additional expense to the Owner.

The Contractor shall perform excavation for structures and structure footings to the lines and grades or elevations shown on the plans or as staked by the Engineer. The excavation shall be of sufficient size to permit the placing of the full width and length of the structure or structure footings shown.

All excavation shall be unclassified and shall be considered incidental to the respective L-115 pay item of which it is a component part. Dewatering necessary for L-115 structure installation, erosion and turbidity control, per Federal, state, and local requirements is incidental to its respective pay item as a part of Item L-115. The cost of all excavation regardless of type of material encountered, shall be included in the unit price bid for the L-115 Item.

Boulders, logs, and all other objectionable material encountered in excavation shall be removed. All rock and other hard foundation material shall be cleaned of all loose material and cut to a firm surface either level, stepped or serrated, as directed by the Engineer. All seams, crevices, disintegrated rock, and thin strata shall be removed. When concrete is to rest on a surface other than rock, special care shall be taken not to disturb the bottom of the excavation. Excavation to final grade shall not be made until just before the concrete or reinforcing is to be placed.

The Contractor shall provide all bracing, sheeting, and shoring necessary to implement and protect the excavation and the structure as required for safety or conformance to governing laws. The cost of bracing, sheeting, and shoring shall be included in the unit price bid for the structure.

Unless otherwise provided, bracing, sheeting, and shoring involved in the construction of this item shall be removed by the Contractor after the completion of the structure. Removal shall be effected in a manner that will not disturb, or mar finished masonry. The cost of removal shall be included in the unit price bid for the structure.

After each excavation is completed, the Contractor shall notify the Engineer. Structures shall be placed after the Engineer has approved the depth of the excavation and the suitability of the foundation material.

Prior to installation the Contractor shall provide a minimum of 12 inches of $\frac{3}{4}$ " gravel or a material approved by the Engineer as a suitable base to receive the structure. The base material shall be compacted and graded level and at proper elevation to receive the structure in proper relation to the conduit grade or ground cover requirements, as indicated on the plans.

115-3.2 Concrete Structures. Concrete structures shall be built on prepared foundations conforming to the dimensions and form indicated on the plans. The concrete and construction methods shall conform to the requirements specified in Item P-610. Any reinforcement required shall be placed as indicated on the plans and shall be approved by the Engineer before the concrete is placed.

115-3.3 Precast Unit Installations. Precast units shall be installed plumb and true. Joints shall be made watertight by use of sealant at each tongue-and-groove joint and at roof of manhole. Excess sealant shall be removed and severe surface projections on exterior of neck shall be removed.

115-3.4 Placement and Treatment of Castings, Frames and Fittings. All castings, frames and fittings shall be placed in the positions indicated on the Plans or as directed by the Engineer and shall be set true to line and to correct elevation. If frames or fittings are to be set in concrete or cement mortar, all anchors or bolts shall be in place and position before the concrete or mortar is placed. The unit shall not be disturbed until the mortar or concrete has set.

Field connections shall be made with bolts, unless indicated otherwise. Welding will not be permitted unless shown otherwise on the approved shop drawings and written permission is granted by the casting manufacturer. Erection equipment shall be suitable and safe for the workman. Errors in shop fabrication or deformation resulting from handling and transportation that prevent the proper assembly and fitting of

parts shall be reported immediately to the Engineer and approval of the method of correction shall be obtained. Approved corrections shall be made at Contractor's expense.

Anchor bolts and anchors shall be properly located and built into connection work. Bolts and anchors shall be preset by the use of templates or such other methods as may be required to locate the anchors and anchor bolts accurately.

Pulling-in irons shall be located opposite all conduit entrances into structures to provide a strong, convenient attachment for pulling-in blocks when installing cables. Pulling-in irons shall be set directly into the concrete walls of the structure.

115-3.5 Installation of Ladders. Not Used.

115-3.6 Removal of Sheeting and Bracing. In general, all sheeting and bracing used to support the sides of trenches or other open excavations shall be withdrawn as the trenches or other open excavations are being refilled. That portion of the sheeting extending below the top of a structure shall be withdrawn, unless otherwise directed, before more than 6 inches of material is placed above the top of the structure and before any bracing is removed. Voids left by the sheeting shall be carefully refilled with selected material and rammed tight with tools especially adapted for the purpose or otherwise as may be approved.

The Engineer may order the Contractor to delay the removal of sheeting and bracing if, in his judgment, the installed work has not attained the necessary strength to permit placing of backfill.

115-3.7 Backfilling. After a structure has been completed, the area around it shall be backfilled in horizontal layers not to exceed 6 inches in thickness measured after compaction to the density requirements in Item P-152. Each layer shall be deposited all around the structure to approximately the same elevation. The top of the fill shall meet the elevation shown on the plans or as directed by the Engineer.

Backfill shall not be placed against any structure until permission is given by the Engineer. In the case of concrete, such permission shall not be given until tests made by the laboratory under supervision of the Engineer establish that the concrete has attained sufficient strength to provide a factor of safety against damage or strain in withstanding any pressure created by the backfill or the methods used in placing it.

Where required, the Engineer may direct the Contractor to add, at his own expense, sufficient water during compaction to assure a complete consolidation of the backfill. The Contractor shall be responsible for all damage or injury done to conduits, duct banks, structures, property, or persons due to improper placing or compacting of backfill.

115-3.8 Connection of Duct Banks. To relieve stress of joint between concrete-encased duct banks and structure walls, reinforcement rods shall be placed in the structure wall and shall be formed and tied into duct bank reinforcement at the time the duct bank is installed.

115-3.9 Grounding. A ground rod shall be installed in the floor of all concrete structures so that the top of rod extends 6 inches above the floor. The ground rod shall be installed within one foot of a corner of the concrete structure. Ground rods shall be installed prior to casting the bottom slab. Where the soil condition does not permit driving the ground rod into the earth without damage to the ground rod, the Contractor shall drill a 4-inch diameter hole into the earth to receive the ground rod. The hole around the ground rod shall be filled throughout its length, below slab, with Portland cement grout. Ground rods shall be installed in precast bottom slab of structures by drilling a hole through bottom slab and installing the

ground rod. Bottom slab penetration shall be sealed watertight with Portland cement grout around the ground rod.

A grounding bus of 4/0 bare stranded copper shall be exothermically bonded to the ground rod and loop the concrete structure walls. The ground bus shall be a minimum of one foot above the floor of the structure and separate from other cables. No. 2 American wire gauge (AWG) bare copper pigtailed shall bond the grounding bus to all cable trays and other metal hardware within the concrete structure. Connections to the grounding bus shall be exothermic. If an exothermic weld is not possible, connections to the grounding bus shall be made by using connectors approved for direct burial in soil or concrete per UL 467. Hardware connections may be mechanical, using a lug designed for that purpose.

115-3.10 Cleanup and Repair. After erection of all galvanized items, damaged areas shall be repaired by applying a liquid cold-galvanizing compound per MIL-P-21035. Surfaces shall be prepared, and compound applied per the manufacturer's recommendations.

Prior to acceptance, the entire structure shall be cleaned of all dirt and debris.

115-3.11 Restoration. After the backfill is completed, the Contractor shall dispose of all surplus material, dirt, and rubbish from the site. The Contractor shall restore all disturbed areas equivalent to or better than their original condition. All sodding, grading and restoration shall be considered incidental to the respective L-115 pay item.

The Contractor shall grade around structures as required to provide positive drainage away from the structure.

Areas with special surface treatment, such as roads, sidewalks, or other paved areas shall have the backfill compacted to match surrounding areas, and surfaces shall be repaired using materials comparable to original materials.

Following restoration of all trenching near airport movement surfaces, the Contractor shall thoroughly visually inspect the area for foreign object debris (FOD) and remove any such FOD that is found. This FOD inspection and removal shall be considered incidental to the pay item of which it is a component part.

After all work is completed, the Contractor shall remove all tools and other equipment, leaving the entire site free, clear and in good condition.

115-3.12 Inspection. Prior to final approval, the electrical structures shall be thoroughly inspected for conformance with the plans and this specification. Any indication of defects in materials or workmanship shall be further investigated and corrected. The earth resistance to ground of each ground rod shall not exceed 25 ohms. Each ground rod shall be tested using the fall-of-potential ground impedance test per American National Standards Institute / Institute of Electrical and Electronic Engineers (ANSI/IEEE) Standard 81. This test shall be performed prior to establishing connections to other ground electrodes.

115-3.13 Manhole Elevation Adjustments. The Contractor shall adjust the tops of existing manholes in areas designated in the Contract Documents to the new elevations shown. The Contractor shall be responsible for determining the exact height adjustment required to raise the top of each manhole to the new elevations. The existing top elevation of each manhole to be adjusted shall be determined in the field and subtracted/added from the proposed top elevation.

The Contractor shall remove/extend the existing top section or ring and cover on the manhole structure or manhole access. The Contractor shall then install precast concrete sections or grade rings of the required dimensions to adjust the manhole top to the new proposed elevation or shall cut the existing manhole walls to shorten the existing structure, as required by final grades. Finally, the Contractor shall reinstall the manhole top section or ring and cover on top and check the new top elevation.

The Contractor shall construct a concrete slab around the top of adjusted structures located in graded areas that are not to be paved. The concrete slab shall conform to the dimensions shown on the plans.

115-3.14 Duct Extension to Existing Ducts. Where existing concrete encased ducts are to be extended, the duct extension shall be concrete encased plastic conduit. The fittings to connect the ducts together shall be standard manufactured connectors designed and approved for the purpose. The duct extensions shall be installed according to the concrete encased duct detail and as shown on the plans.

METHOD OF MEASUREMENT

115-4.1 Electrical manholes and junction structures shall be measured by each unit completed in place and accepted. The following additional items are specifically included in each unit:

- All Required Excavation, Dewatering
- Sheeting and Bracing
- All Required Backfilling with On-Site Materials
- Restoration of All Surfaces and Finished Grading, Sodding
- All Required Connections
- Dewatering If Required
- Temporary Cables and Connections
- Ground Rod Testing

115-4.2 Manhole Elevation Adjustments shall be measured by the completed unit installed, in place, completed, and accepted in accordance with the plans. Adjustments shall include relocation of cable racks, re-racking cables, cleaning interiors, new lid sealant and repair or replacement of exterior counterpoise loops as required. Separate measurement shall not be made for the various types and sizes.

115-4.3 Grade and Compact Around Existing Hand Hole Contractor shall verify with RPR if adjustments of 3" or less can be accommodated by grading and compacting around existing structures to taper into surrounding modified grades at a ratio compliant with FAA standards for infield slopes that will not adversely affect drainage. Compaction shall be in compliance with FAA standards and sufficient to resist erosion. Grading shall be measured by the completed unit installed, in place, completed, and accepted in accordance with the plans. Separate measurement shall not be made for the various types and sizes.

BASIS OF PAYMENT

115-5.1 The accepted quantity of electrical manholes and junction structures will be paid for at the Contract unit price per each, complete and in place. This price shall be full compensation for furnishing all materials and for all preparation, excavation, backfilling and placing of the materials, furnishing and installation of appurtenances and connections to duct banks and other structures as may be required to complete the item as shown on the plans and for all labor, equipment, tools, and incidentals necessary to complete the structure.

115-5.2 Payment shall be made at the contract unit price for manhole elevation adjustments. This price shall be full compensation for furnishing all materials and for all preparation, assembly, and installation of these materials, and for all labor, equipment, tools, and incidentals necessary, including but not limited to, spacers, concrete, rebar, dewatering, excavating, backfill, topsoil, sodding and pavement restoration, where required, to complete this item as shown in the plans and to the satisfaction of the Engineer.

Payment will be made under:

- | | |
|----------------|--|
| Item L-115-5.1 | New Handhole, Prefabricated Concrete 4' x 4' x 4' With Aircraft Rated Lid – per Each |
| Item L-115-5.2 | New L-867D 16” Diameter Junction Can with Blank Cover – per Each |
| Item L-115-5.3 | New Size 5 Traffic Rated Pullbox – per Each |

MATERIAL REQUIREMENTS

ANSI/IEEE STD 81 IEEE Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System

Advisory Circular

- | | |
|-----------------|--|
| (AC) 150/5345-7 | Specifications for L-824 Underground Electrical Cable for Airport Lighting Circuits |
| AC 150/5345-26 | Specification for L-823 Plug and Receptacle, Cable Connectors |
| AC 150/5345-42 | Specification for Airport Light Bases, Transformer Housings, Junction Boxes, and Accessories |
| AC 150/5340-30 | Design and Installation Details for Airport Visual Aids |
| AC 150/5345-53 | Airport Lighting Equipment Certification Program |

Commercial Item Description

- | | |
|--------------------|---|
| A-A 59544 | Cable and Wire, Electrical (Power, Fixed Installation) |
| ASTM A27 | Standard Specification for Steel Castings, Carbon, for General Application |
| ASTM A47 | Standard Specification for Ferritic Malleable Iron Castings |
| ASTM A48 | Standard Specification for Gray Iron Castings |
| ASTM A123 Products | Standard Specification for Zinc (Hot Dip Galvanized) Coatings on Iron and Steel |
| ASTM A283 Plates | Standard Specification for Low and Intermediate Tensile Strength Carbon Steel |

ASTM A536	Standard Specification for Ductile Iron Castings
ASTM A615	Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
ASTM A897	Standard Specification for Austempered Ductile Iron Castings
ASTM C144	Standard Specification for Aggregate for Masonry Mortar
ASTM C150	Standard Specification for Portland Cement
ASTM C206	Standard Specification for Finishing Hydrated Lime
FAA EB #83	In Pavement Light Fixture Bolts
MIL-P-21035	Paint High Zinc Dust Content, Galvanizing Repair
NFPA-70	National Electrical Code (NEC)

END OF ITEM L-115

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Item L-125 Installation of Airport Lighting Systems

DESCRIPTION

125-1.1 This item shall consist of airport lighting systems furnished and installed in accordance with this specification, the referenced specifications, and the applicable advisory circulars (ACs). The systems shall be installed at the locations and in accordance with the dimensions, design, and details shown in the plans. This item shall include the furnishing of all equipment, materials, services, and incidentals necessary to place the systems in operation as completed units to the satisfaction of the RPR.

EQUIPMENT AND MATERIALS

125-2.1 General.

A. Airport lighting equipment and materials covered by Federal Aviation Administration (FAA) specifications shall be certified under the Airport Lighting Equipment Certification Program in accordance with AC 150/5345-53, current version. FAA certified airfield lighting shall be compatible with each other to perform in compliance with FAA criteria and the intended operation. If the Contractor provides equipment that does not perform as intended because of incompatibility with the system, the Contractor assumes all costs to correct the system for to operate properly.

B. Manufacturer's certifications shall not relieve the Contractor of their responsibility to provide materials in accordance with these specifications and acceptable to the RPR. Materials supplied and/or installed that do not comply with these specifications shall be removed, when directed by the RPR and replaced with materials, which do comply with these specifications, at the sole cost of the Contractor.

C. All materials and equipment used shall be submitted to the RPR for approval prior to ordering the equipment. Submittals consisting of marked catalog sheets or shop drawings shall be provided. Clearly mark each copy to identify pertinent products or models applicable to this project. Indicate all optional equipment and delete non-pertinent data. Submittals for components of electrical equipment and systems shall identify the equipment for which they apply on each submittal sheet. Markings shall be clearly made with arrows or circles (highlighting is not acceptable). The Contractor shall be responsible for delays in the project accruing directly or indirectly from late submissions or resubmissions of submittals.

D. The data submitted shall be sufficient, in the opinion of the RPR, to determine compliance with the plans and specifications. The Contractor's submittals shall be submitted in electronic PDF format, tabbed by specification section. The RPR reserves the right to reject any or all equipment, materials, or procedures, which, in the RPR's opinion, does not meet the system design and the standards and codes, specified herein.

E. All equipment and materials furnished and installed under this section shall be guaranteed against defects in materials and workmanship for a period of at least twelve (12) months from final acceptance by the Owner. The defective materials and/or equipment shall be repaired or replaced, at the Owner's discretion, with no additional cost to the Owner.

F. All LED light fixtures, with the exception of obstruction lighting (AC 150/5345-43) must be warranted by the manufacturer for a minimum of 4 years after date of installation inclusive of all electronics." Obstruction lighting warranty is set by the individual manufacturer.

EQUIPMENT AND MATERIALS

125-2.2 Conduit/Duct. Conduit shall conform to Specification Item L-110 Airport Underground Electrical Duct Banks and Conduits.

125-2.3 Cable and Counterpoise. Cable and Counterpoise shall conform to Item L-108 Underground Power Cable for Airports.

125-2.4 Tape. Rubber and plastic electrical tapes shall be Scotch Electrical Tape Numbers 23 and 88 respectively, as manufactured by 3M Company or an approved equal.

125-2.5 Cable Connections. Cable Connections shall conform to Item L-108 Installation of Underground Cable for Airports.

125-2.6 Retroreflective Markers. Retroreflective markers shall be type L-853 and shall conform to the requirements of AC 150/5345-39.

125-2.7 Runway and Taxiway Lights. Runway and taxiway lights shall conform to the requirements of AC 150/5345-46. Lamps shall be of size and type indicated, or as required by fixture manufacturer for each lighting fixture required under this contract. Filters shall be of colors conforming to the specification for the light concerned or to the standard referenced.

LIGHTS

Type	Class	Mode	Style	Option	Base	Filter	Trans- former	Notes
L-861T(L)	2 – Base Mounted	1 – 6.6A	N/A	4 – (Mounting Hardware)	L-867 1.5" Threaded Frangible Coupling	Blue LEDs & Globes Glass	10/15W	LED 14" Height

125-2.8 Runway and Taxiway Signs. Not Required

125-2.9 Runway End Identifier Light (REIL). Not Required

125-2.10 Precision Approach Path Indicator (PAPI). Not Required

125-2.11 Circuit Selector Cabinet. Not Required

125-2.12 Light Base and Transformer Housings. Light Base and Transformer Housings should conform to the requirements of AC 150/5345-42. Light bases shall be Type L-867 or L-868, Class 1A, Size B shall be provided as indicated or as required to accommodate the fixture or device installed thereon. All light bases and transformer housings shall be furnished with 3/4" drain holes, internal and external grounding tabs and 2" grommeted conduit openings, in accordance with the Plans. Shallow bases may be required where drainage culverts conflict with placement.

Base plates, cover plates, and adapter plates shall be provided to accommodate assorted sizes of fixtures. All bolts used for securing light fixtures and covers to light bases shall be stainless steel, installed with anti-seize compound. Two piece serrated / anti-vibration lock washers shall be used for in-pavement lights.

125-2.13 Isolation Transformers. Isolation Transformers shall be Type L-830, size as required for each installation. Transformer shall conform to AC 150/5345-47.

INSTALLATION

125-3.1 Installation. The Contractor shall furnish, install, connect, and test all equipment, accessories, conduit, cables, wires, buses, grounds, and support items necessary to ensure a complete and operable airport lighting system as specified here and shown in the plans.

The equipment installation and mounting shall comply with the requirements of the National Electrical Code and state and local code agencies having jurisdiction.

The Contractor shall install the specified equipment in accordance with the applicable advisory circulars and the details shown on the plans.

125-3.2 Testing. All lights shall be fully tested by continuous operation for not less than 24 hours as a completed system prior to acceptance. The test shall include operating the constant current regulator in each step not less than 10 times at the beginning and end of the 24-hour test. The fixtures shall illuminate properly during each portion of the test.

125-3.3 Shipping and Storage. Equipment shall be shipped in suitable packing material to prevent damage during shipping. Store and maintain equipment and materials in areas protected from weather and physical damage. Any equipment and materials, in the opinion of the RPR, damaged during construction or storage shall be replaced by the Contractor at no additional cost to the owner. Painted or galvanized surfaces that are damaged shall be repaired in accordance with the manufacturer's recommendations.

125-3.4 Elevated and In-pavement Lights. Water, debris, and other foreign substances shall be removed prior to installing fixture base and light.

A jig or holding device shall be used when installing each light fixture to ensure positioning to the proper elevation, alignment, level control, and azimuth control. Light fixtures shall be oriented with the light beams parallel to the runway or taxiway centerline and facing in the required direction. The outermost edge of fixture shall be level with the surrounding pavement. Surplus sealant or flexible embedding material shall be removed. The holding device shall remain in place until sealant has reached its initial set.

If applicable, bolts used to secure in-pavement light fixtures to L-868 bases shall be of sufficient length to provide full thread engagement through all spacer rings (3 maximum), flanges and multi-hole adapter rings with at least three threads exposed at bottom of base can flange, torqued to 12.5ft pounds.

METHOD OF MEASUREMENT

125-4.1 Taxiway lights will be measured by the number of each type installed as completed units in place, ready for operation, and accepted by the RPR.

BASIS OF PAYMENT

125-5.1 Payment will be made at the Contract unit price for each complete runway or taxiway light, guidance sign or reflective marker installed by the Contractor and accepted by the RPR. This payment will be full compensation for furnishing all materials and for all preparation, assembly, and installation of these materials, and for all labor, equipment, tools, and incidentals necessary to complete this item.

Payment will be made under:

Item L-125-5.1	New Elevated L-861T(L) LED Taxiway Edge Light and Isolation Transformer on New L-868 Base Can with Conversion Ring - Per Each
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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.

Advisory Circulars (AC)

AC 150/5340-18	Standards for Airport Sign Systems
AC 150/5340-26	Maintenance of Airport Visual Aid Facilities
AC 150/5340-30	Design and Installation Details for Airport Visual Aids
AC 150/5345-5	Circuit Selector Switch
AC 150/5345-7	Specification for L-824 Underground Electrical Cable for Airport Lighting Circuits
AC 150/5345-26	Specification for L-823 Plug and Receptacle, Cable Connectors
AC 150/5345-28	Precision Approach Path Indicator (PAPI) Systems
AC 150/5345-39	Specification for L-853, Runway and Taxiway Retroreflective Markers
AC 150/5345-42	Specification for Airport Light Bases, Transformer Housings, Junction Boxes, and Accessories
AC 150/5345-44	Specification for Runway and Taxiway Signs

AC 150/5345-46	Specification for Runway and Taxiway Light Fixtures
AC 150/5345-47	Specification for Series to Series Isolation Transformers for Airport Lighting Systems
AC 150/5345-51	Specification for Discharge-Type Flashing Light Equipment
AC 150/5345-53	Airport Lighting Equipment Certification Program

Engineering Brief (EB)

EB No. 67	Light Sources Other than Incandescent and Xenon for Airport and Obstruction Lighting Fixtures
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SECTION III-E

GEOTECHNICAL INVESTIGATION REPORT

DESCRIPTION

1.1 GENERAL. The Geotechnical Investigation Report and Laboratory Analysis for this project was prepared by Western Technologies, Inc., dated September 28, 2022. The report contains existing soil condition summaries, laboratory test summaries along with graphical bore logs, subgrade treatment recommendations, and new pavement design options.

This report provided a pre-design analysis on existing pavement thickness and subsurface soil conditions, and this information is shown on the plans. However, this information shall not be used for contractual purposes as a warranty of interpreted subsurface conditions such as those indicated by borings, corings, cross sections or discussion of the subsurface conditions contained in the reports. The Geotechnical services were provided, the findings obtained and recommendations were prepared in accordance with generally accepted engineering principles and practices. This warranty is in lieu of all other warranties, either expressed or implied.

GEOTECHNICAL EVALUATION REPORT

PHOENIX SKY HARBOR INTERNATIONAL AIRPORT WEST AIR CARGO APRON RECONSTRUCTION

WT Reference No. 2121JA227

PREPARED FOR:

Trace Consulting, LLC
1201 East Jefferson Street, Suite 3
Phoenix, Arizona 85034

Attn: Mr. Chintan Jhaveri, P.E.

September 28, 2022



Armando de la Rocha, P.E.
Senior Geotechnical Engineer

A handwritten signature in black ink, appearing to read "Randolph Marwig".

Randolph Marwig, P.E.
President





September 28th, 2022

Trace Consulting LLC
1201 E. Jefferson Street Suite 3
Phoenix, Arizona 85034

Attn: Mr. Chintan Jhaveri, P.E.
Project Manager

Re: Geotechnical Evaluation Job. No. 2121JA227
Phoenix Sky Harbor International Airport – West Air Cargo Apron Reconstruction
Phoenix, Arizona

INTRODUCTION

Western Technologies Inc. (WT) has performed geotechnical engineering and pavement design services at Phoenix Sky Harbor International Airport – West Air Cargo (WAC) Apron Reconstruction in accordance with our proposal (Ref. No. 2121PA329) dated October 29, 2021. A field exploration consisting of subsurface exploration (coring of asphalt concrete layer and soil borings) was conducted on November 12, 2021. The results of that work and subsequent laboratory testing of soils were used to develop this report.

PROJECT DESCRIPTION

Based on information provided by Client, the project will consist of the potential reconstruction of the WAC apron at the Phoenix Sky Harbor International Airport located in Phoenix, Arizona. This apron is located toward the west end of the airport. Based on information provided the approximate area to be reconstructed is about 98,000 sq. yd. The reconstruction may be divided into two rectangular areas, one measuring approximately 1,150 ft X 555 ft and the other at 735 ft x 330 ft (Measurements are from Google Earth aerial photos). A reconstruction of the existing pavement structure with either Asphalt Concrete (AC) or Portland Cement Concrete Pavement (PPCP) is anticipated. The Client will notify WT should any of our information or assumptions not be correct.

The purpose of our geotechnical engineering services was to perform a subsurface exploration and laboratory testing on collected subgrade soil samples for the development of pavement design reconstruction alternatives and construction specifications for the WAC apron. No testing on the recovered asphalt concrete cores to determine its feasibility as a supporting layer was performed; it was considered that the existing pavement has exceeded its design life and reconstruction was in place.

SUBSURFACE EXPLORATION

The subsurface exploration consisted of coring the asphalt concrete layer and advancing soils borings at 12 locations to depths of about ten (10) feet or until auger refusal and 6 locations to depths of about five (5) feet below existing site grade. The approximate locations of the cores and soil borings are shown on Plates 2 entitled Boring Location Diagram. The logs of the borings are included in Appendix A of this report.

Strata encountered during the subsurface exploration were identified and logged. Asphalt concrete cores and loose and relatively undisturbed samples of subgrade samples were taken and submitted to the WT materials laboratory for testing. The borings were backfilled with native material at each boring and the removed asphalt concrete cores were replaced with non-shrinking grout. Coring of the asphalt concrete pavement was performed before advancing the soil borings.

Soils encountered in the borings located on the apron consisted predominantly of non-plastic loose to very dense poorly graded/well graded GRAVEL with Silt and Sand (GP-GM, GW-GM), Silty GRAVEL (GM), and Silty SAND with Gravel (SM). Soil strata and classifications are shown on the attached boring logs. The pavement structural sections encountered at the borings locations are presented in the following table:

Phoenix Sky Harbor Airport – WAC Apron Reconstruction Existing Pavement Section				
Boring No.	Asphalt Concrete Layer (in.)			
	Bottom	Middle	Top	Total AC
1	2.4	3.3	2.4	8.1
2	3.1	2.9	1.9	7.9
3	2.2	4.1	2.2	8.5
4	2.5	4.2	1.8	8.5
5	3.1	3.8	2.1	9.0
6	2.6	4.2	2.2	9.0
7	2.9	4.3	1.9	9.1
8	2.7	3.9	2.3	9.0
9	1.9	4.1	1.6	7.7
10	2.4	4.2	2.2	8.8
11	3.0	4.1	2.3	9.4
12	2.3	3.9	2.1	8.3
13	3.0	2.9	2.5	8.4
14	2.7	3.9	2.1	8.7
15	3.4	3.4	2.1	8.9
16	3.6	3.1	2.2	8.9
17	3.3	3.1	2.1	8.4
18	3.1	3.1	2.3	8.5

Mean	8.6
St. Deviation	0.4
Mean - St. Deviation	8.2

It is observed on the table above and on photos of the recovered cores (see Appendix D) that the existing AC pavement section consists of three lifts. The average total thickness of the AC layers for the apron is 8.6 inches with a standard deviation of 0.4 inches. As it was mentioned above, no testing was performed on any of the asphalt concrete cores.

LABORATORY TESTING

Soil samples obtained during the subsurface exploration were tested in WT's materials laboratories in Phoenix and Tucson. Laboratory testing on collected subgrade soil samples consisted of in-situ dry density and moisture content, grain size distribution, Atterberg limits, maximum density-optimum moisture content (Proctor test), and California Bearing Ratio (CBR).

Relatively undisturbed samples obtained from the upper five feet on the borings indicated in-situ dry densities ranging from 100 to 131 pounds-per-cubic-foot (pcf) with an average value of 118 pcf and standard deviation of 8.3 pcf. In-situ moisture contents ranged from 2.8 to 18.7 percent with an average value of 6.5% and standard deviation of 4.0%. The percent material passing the No. 200 sieve ranged from 7 to 36 percent. The tested materials were predominantly non-plastic (NP) loose to very dense poorly graded/well graded GRAVEL with Silt and Sand (GP-GM, GW-GM), Silty SAND with Gravel (SM).

Two maximum dry density/optimum moisture tests (Proctors) were performed on representative samples from Borings No. 1, 2, 7, 8, 9, and 10 and from Borings No. 3, 4, 5, 6, 11 and 12. The tests were performed in accordance with ASTM D-1557 Method C. The maximum dry density of the samples tested ranged from 139.5 to 142.5 pcf, with optimum moisture contents ranging from 5.4 to 5.7 percent.

Two 3-point California Bearing Ratio (CBR) test were performed on the same samples tested for Proctor tests. The samples were compacted to dry densities ranging from about 94.8 to 101.4 percent of their maximum dry density values and to percent moisture content relatively close or slightly above to the optimum moisture content values. The resulting CBR values for the test ranged from about 92.9 to about 179. The CBR values representing 95% of the Modified Proctor density ranged from about 95 to about 135. CBR test results indicated that swell ranged from -0.4 to -0.1 percent under a surcharge weight of 20 pounds. Therefore, the subgrade soils will not require treatment for swell potential. Plates B-9 to B-12 present the results of the CBR tests (in tabular and graph forms). It should be noted that comparing the in-situ dry densities of the subgrade material obtained with the ring samples to the maximum dry densities (Proctor densities), the percent compaction of the subgrade ranges from about 79 to 92 percent.

The recovered asphalt concrete cores were grouped into two groups: Group 1 from borings No. 1 to 12, and Group 2 from borings No. 13 to 18. The cores were crushed and tested for grain size distribution and Atterberg limits, modified Proctors, and CBR for the purpose of potential use as a recycled materials either to be used within the pavement structure (sub-base like layer) or on the shoulders. The crushed asphalt concrete material classified as a non-plastic, well graded GRAVEL (GW) with maximum dry density ranging from 118.1 pcf to 119.7 pcf and optimum moisture content ranging from 10.7% to 11.7%. CBR results at 95% Compaction yielded values ranging from 17 to 28. Plates B-13 to B-20 in Appendix B show the test results on this material.

PAVEMENT HISTORY

Construction history information obtained from the "2004 Pavement Management Program Update, Phoenix Sky Harbor International Airport" report indicates that the WAC, identified as the section ACARG-01, with area dimensions of 979 feet long by 950 feet wide, and a structural section consisting of 8 inches of Asphalt Concrete (AC) over 15 inches of Aggregate Base Course (ABC) over 18 inches of Subbase. This section was built in 1992. The AC layer consisted of 2 inches of surface course (P-401) over two 3-inch thick layers of asphalt concrete base course (P-401).

In 2012 a pavement rehabilitation investigation was performed by WT; the project consisted of the potential rehabilitation of about 95,000 sq.yd of WAC (the west section of the current project). The subsurface exploration consisted of coring and advancing soil borings to a depth of about 10 ft below existing site grade or to refusal. Results of that evaluation indicated that the pavement section at that time consisted of an AC layer with a mean thickness of 8.2 inches and standard deviation of 0.5 inches over an aggregate base course (ABC) of about 20.2 inches (standard deviation of about 3.6 inches). Three CBR tests were performed on representative collected (blended) subgrade samples. Two of the tests were 3-point CBR tests, compacted to Modified Proctor percent compaction ranging from about 92 to 100 percent; the third test was a 1-point CBR prepared to a percent compaction of 101.7% Modified Proctor. The results of the CBR tests ranged from about 19 to 117. The CBR values representing 100% of the Modified Proctor density ranged from about 43 to 117.

PAVEMENT DESIGN RECOMMENDATIONS

The pavement design for the proposed reconstruction of the WAC Apron is based on the Aircraft Mix presented on the table below, provided by Client and the Airport Authority. The procedure presented in FAA AC No. 150/5320-6G, Chapter 3, Section 3.13 “Flexible Pavement Design”, Section 3.14 “Rigid Pavement Design,” and the FAARFIELD v2.0 software will be followed for the design of the pavement structure alternatives.

Aircraft Fleet Mix

No.	Name	Gross Wt. lbs	Annual Departures	% Annual Growth
1	ERJ-145 XR	53,252	11,683	-4.78
2	CRJ900	85,000	6,114	2.80
3	EMB-190 STD	105,712	14,949	-1.51
4	A319NEO	167,325	9,689	1.26
5	A320-200 OPT	172,850	100,000	1.97
6	A321-200 OPT	207,025	28,348	2.73
7	B777-200	547,000	1,667	1.30
8	B767-300 ER/Freighter	413,000	3,700	3.00
9	A320-200 opt	172,850	20,874	1.97

Design Soil Parameters

The CBR test results performed on selected samples yielded values well in excess of the maximum allowed value for gravelly soils of 33.3 or its equivalent Elastic Modulus, E, of 50,000 psi. Based on this criteria, the allowed maximum value of **50,000 psi** was input into FAARFIELD for pavement analysis and design.

Analysis/Design Procedure – WAC Apron

The analysis and design procedures were performed using FAA’s FAARFIELD v2.0 software, the design Aircraft Fleet mix and soil parameters shown above.

Two pavement section alternatives were considered for reconstruction purposes:

- 1) AC (P-401/P-403) Surface over AC Stabilized (P-401/P-403) over ABC (P-209) over prepared SG (P-152).
- 2) PCCP (P-501) Surface over AC Stabilized (P-401/P-403) over ABC (P-209) over Prepared Subgrade (P-152). Alternatively, as indicated FAA AC 150/5320-6G, Section 1.6.4

“Pavement Structure,” Note 7 to Table 1.1, P209 may be used as a stabilized base layer when geotechnical laboratory testing indicates that its CBR is greater than 100.

Alternative No. 1: AC Surface (P-401/P-403) over AC Stabilized (P-401/P-403) over ABC (P-209) over Prepared Subgrade (P-152).

The reconstruction alternative would require working on the existing subgrade and consequently the following earthwork recommendations are provided. Earthwork to be performed should comply with the requirements of Item P-152 “Excavation and Embankment” of FAA AC No. 150/5370-10H. Because this alternative allows working with the existing subgrade, the pavement sections in FAARFIELD were designed using a CBR value of 33.3 for the 95% Compaction ASTM D-1557.

FAARFIELD yielded an AC Surface layer (P-401) of 4 inches; for pavement construction purposes and for achieving better compaction of the AC layer, we recommend placing a 5-inch thick asphalt concrete surface course (instead of the 4-inch recommended by FAARFIELD) in two P-401 lifts: one 2-inch thick lift over a 3-inch thick. The 5-inch AC surface course should go over two 2.5-inch thick P-403 asphalt concrete base course. A ¾-inch maximum size aggregate is also recommended for these lifts. The mix design should be performed using the Marshall method with 75 blows per specimen face. Asphalt cement should comply with the requirements for PG 70-16 binder in accordance with AASHTO MP1-93, Specification for Performance Graded Asphalt Binder. A tack coat should be applied in accordance with FAA Item P-603 between lifts of asphalt concrete. The recommended AC pavement section is presented in the following table:

Design CBR Subgrade	AC - Surface (P-401/P403) (in.)	AC-Stabilized (P-401/P-403) (in.)	ABC (P-209) (in.)	Total Thickness (in.)
33.3: @ 95% ASTM D1557	5	5	6	15

The subgrade compaction requirements for the 95% Compaction condition should be as follows:

Depth of Compaction (inches)	Percent Compaction ASTM D-1557
0 - 12	95

For earthwork design, excavation quantities are estimated to shrink 15 percent when compacted as embankment. Ground compaction of 0.1 foot is estimated when placing embankment on previously uncompacted soils.

Alternative No. 2: PCCP Surface (P-501) over AC Stabilized (P-401/P-403) over ABC (P-209) over Prepared Subgrade (P-152).

The procedure presented in FAA AC No. 150/5320-6G, Section 3.14 “Rigid Pavement Design” and the FAARFIELD v2.0 software were followed for the design of the apron pavement structure. The design CBR value for preliminary pavement design used in the analysis will be the maximum allowed by FAA on gravelly soils of 33.3 or 50,000 psi.

For analysis and design purposes, a stabilized base layer consisting of 5 inches of asphalt concrete (P-401/P-403) was considered. A 6-inch Item P-209 – Crushed Aggregate Base Course underlying the stabilized layer was also considered in the pavement analysis and design. The following table presents the results obtained by FAARFIELD:

Design CBR Subgrade	PCCP - Surface (P-501) (in.)	AC-Stabilized (P-401/P-403) (in.)	ABC (P-209) (in.)	Total Thickness (in.)
33.3: @ 95% ASTM D1557	19	5	6	30

As indicated above, a P-209 with CBR equal to or greater than 100 can be used as a stabilized layer underneath the P-501 PCCP surface layer. This condition was modeled into FAARFIELD as a User Defined layer; subgrade modulus remains the same at CBR of 33.3 or 50,000 psi. The resulting and recommended section is the following:

Design CBR Subgrade	PCCP – Surface (P-501) (in.)	ABC-Stabilized (P-209) CBR > 100 (in.)	Total Thickness (in.)
33.3: @95% ASTM D1557	19	10	31

The computer output generated by the FAA design software, FAARFIELD, is presented in Appendix C.

The recommended maximum joint spacing for a slab thickness thicker than 16 inches over stabilized base layer is 20 feet (Table 3-7, FAA AC No. 150/5320-6G). The ratio of the longest side of a slab to the shortest side of a slab at two intersecting sides should not exceed 1.25 in non-reinforced pavements.

Some of the other design parameters are the following:

- 650 psi Concrete Flexural Strength (*)
- 4,000,000 psi Concrete Modulus of Elasticity
- 0.15 Concrete Poisson's Ratio
- Non-Frost Design Condition

(*) FAA recommends that the strength used for thickness design should be reduced by 5 percent when stating the P-501 specification requirements for the 28-day flexural strength. Based on this requirement, it is recommended to specify a flexural strength of 620 psi on the P-501 specifications.

Analysis/Design Procedure – Service Road

It is understood that a service road will be located on the periphery to the WAC apron. No information regarding the traffic to be serviced by this facility to estimate the design Equivalent Axle Loads (ESALs) was available at the time of preparing this FINAL report. Based on previous experience at PSHIA on similar Service Road structures, similar supporting subgrade, and no traffic information, the recommended pavement section has been:

- 7.5 inches AC (MAG 321)
- 8.0 inches Prepared Subgrade (MAG 301, prepared at 95% ASTM D698)

This section may be reviewed if traffic information becomes available.

Life Cycle Cost Analysis

For the purpose of performing a Life Cycle Cost Analysis (LCCA), the following estimated pavement life for the AC and PCCP alternatives are recommended:

- AC (P-401/P-403) Alternative: 20 Year design life
- PCCP (P-501) Alternative: 40 Year design life

CLOSURE

This report concludes our scope of services for the Phoenix Sky Harbor Airport – WAC Apron Reconstruction project. The boring logs and related information included in this report are indicators of subsurface conditions only at the specific locations and times noted. The recommendations presented are based in part upon data derived from a limited number of samples obtained from widely spaced subsurface explorations. Variations from the field

Trace Consulting, LLC
Job No. 2121JA227

conditions represented by the borings may become evident during construction. If variations appear, we should be contacted to re-evaluate our recommendations.

We prepared this report as an aid to the designers of the proposed project. The comments, statement, recommendations and conclusions set forth in this report reflect the opinions of the authors. These opinions are based upon conditions at the location of specific tests, observations and data developed to satisfy the scope of services defined by the contract documents.

Work on your project was performed in accordance with generally accepted industry standards and practices by professionals providing similar services in this locality. No other warranty, express or implied, is made.

Sincerely,
WESTERN TECHNOLOGIES INC.



Armando de la Rocha, P.E.
Senior Geotechnical Engineer

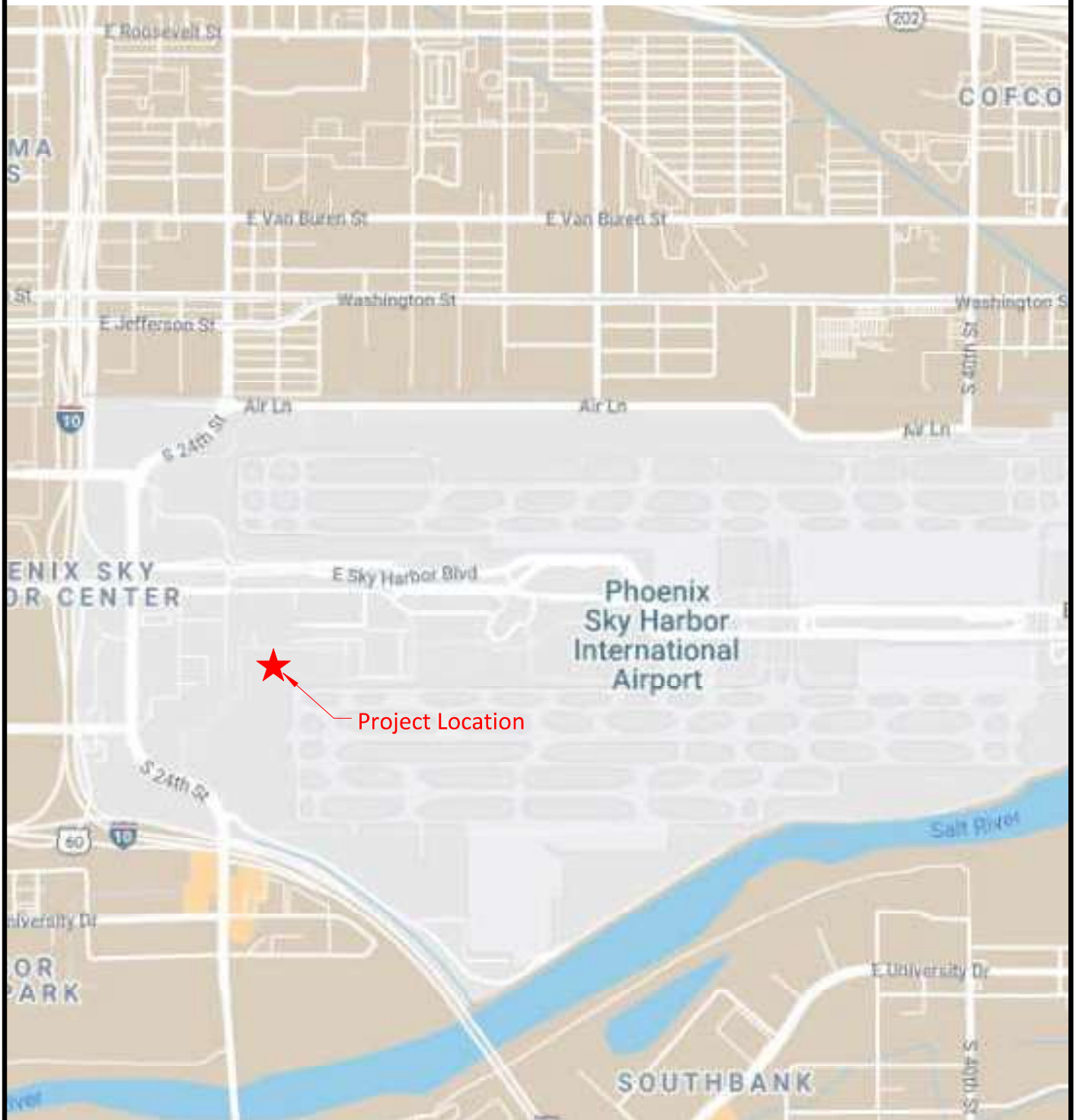
Randolph H. Marwig, P.E.
President

Attachments: Boring Location Diagram
 Boring Log Notes and Boring Logs, Appendix A
 Laboratory Test Results, Appendix B
 FAARFIELD results, Appendix C
 Photos, Appendix D

Copies to: Addressee (email)



NOT TO SCALE



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PROJECT VICINITY MAP

WEST AIR CARGO APRON RECONSTRUCTION
PHOENIX SKY HARBOR AIRPORT
PHOENIX, ARIZONA

WT Job No. 2121JA227

PLATE 1



NOT TO SCALE



LEGEND



Approximate Boring Location

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BORING LOCATION DIAGRAM

WEST AIR CARGO APRON RECONSTRUCTION
PHOENIX SKY HARBOR AIRPORT
PHOENIX, ARIZONA

WT Job No. 2121JA227

PLATE 2

APPENDIX A

Allowable Soil Bearing Capacity	The recommended maximum contact stress developed at the interface of the foundation element and the supporting material.
Backfill	A specified material placed and compacted in a confined area.
Base Course	A layer of specified aggregate material placed on a subgrade or subbase.
Base Course Grade	Top of base course.
Bench	A horizontal surface in a sloped deposit.
Caisson/Drilled Shaft	A concrete foundation element cast in a circular excavation which may have an enlarged base (or belled caisson).
Concrete Slabs-On-Grade	A concrete surface layer cast directly upon base course, subbase or subgrade.
Crushed Rock Base Course	A base course composed of crushed rock of a specified gradation.
Differential Settlement	Unequal settlement between or within foundation elements of a structure.
Engineered Fill	Specified soil or aggregate material placed and compacted to specified density and/or moisture conditions under observations of a representative of a soil engineer.
Existing Fill	Materials deposited through the action of man prior to exploration of the site.
Existing Grade	The ground surface at the time of field exploration.
Expansive Potential	The potential of a soil to expand (increase in volume) due to absorption of moisture.
Fill	Materials deposited by the actions of man.
Finished Grade	The final grade created as a part of the project.
Gravel Base Course	A base course composed of naturally occurring gravel with a specified gradation.
Heave	Upward movement.
Native Grade	The naturally occurring ground surface.
Native Soil	Naturally occurring on-site soil.
Rock	A natural aggregate of mineral grains connected by strong and permanent cohesive forces. Usually requires drilling, wedging, blasting or other methods of extraordinary force for excavation.
Sand and Gravel Base Course	A base course of sand and gravel of a specified gradation.
Sand Base Course	A base course composed primarily of sand of a specified gradation.
Scarify	To mechanically loosen soil or break down existing soil structure.
Settlement	Downward movement.
Soil	Any unconsolidated material composed of discrete solid particles, derived from the physical and/or chemical disintegration of vegetable or mineral matter, which can be separated by gentle mechanical means such as agitation in water.
Strip	To remove from present location.
Subbase	A layer of specified material placed to form a layer between the subgrade and base course.
Subbase Grade	Top of subbase.
Subgrade	Prepared native soil surface.

COARSE-GRAINED SOILS
LESS THAN 50% FINES

GROUP SYMBOLS	DESCRIPTION	MAJOR DIVISIONS
GW	WELL-GRADED GRAVEL OR WELL-GRADED GRAVEL WITH SAND, LESS THAN 5% FINES	GRAVELS MORE THAN HALF OF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE SIZE
GP	POORLY-GRADED GRAVEL OR POORLY-GRADED GRAVEL WITH SAND, LESS THAN 5% FINES	
GM	SILTY GRAVEL OR SILTY GRAVEL WITH SAND, MORE THAN 12% FINES	
GC	CLAYEY GRAVEL OR CLAYEY GRAVEL WITH SAND, MORE THAN 12% FINES	
SW	WELL-GRADED SAND OR WELL-GRADED SAND WITH GRAVEL, LESS THAN 5% FINES	SANDS MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE SIZE
SP	POORLY-GRADED SAND OR POORLY-GRADED SAND WITH GRAVEL, LESS THAN 5% FINES	
SM	SILTY SAND OR SILTY SAND WITH GRAVEL, MORE THAN 12% FINES	
SC	CLAYEY SAND OR CLAYEY SAND WITH GRAVEL, MORE THAN 12% FINES	

NOTE: Coarse-grained soils receive dual symbols if they contain 5% to 12% fines (e.g., SW-SM, GP-GC).

FINE-GRAINED SOILS
MORE THAN 50% FINES

GROUP SYMBOLS	DESCRIPTION	MAJOR DIVISIONS
ML	SILT, SILT WITH SAND OR GRAVEL, SANDY SILT, OR GRAVELLY SILT	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50
CL	LEAN CLAY OF LOW TO MEDIUM PLASTICITY, SANDY CLAY, OR GRAVELLY CLAY	
OL	ORGANIC SILT OR ORGANIC CLAY OF LOW TO MEDIUM PLASTICITY	
MH	ELASTIC SILT, SANDY ELASTIC SILT, OR GRAVELLY ELASTIC SILT	SILTS AND CLAYS LIQUID LIMIT MORE THAN 50
CH	FAT CLAY OF HIGH PLASTICITY, SANDY FAT CLAY, OR GRAVELLY FAT CLAY	
OH	ORGANIC SILT OR ORGANIC CLAY OF HIGH PLASTICITY	
PT	PEAT AND OTHER HIGHLY ORGANIC SOILS	HIGHLY ORGANIC SOILS

NOTE: Fine-grained soils may receive dual classification based upon plasticity characteristics (e.g. CL-ML).

SOIL SIZES

COMPONENT	SIZE RANGE
BOULDERS	Above 12 in.
COBBLES	3 in. – 12 in.
GRAVEL	No. 4 – 3 in.
Coarse	¾ in. – 3 in.
Fine	No. 4 – ¾ in.
SAND	No. 200 – No. 4
Coarse	No. 10 – No. 4
Medium	No. 40 – No. 10
Fine	No. 200 – No. 40
Fines (Silt or Clay)	Below No. 200

NOTE: Only sizes smaller than three inches are used to classify soils

CONSISTENCY

CLAYS & SILTS	BLOWS PER FOOT
VERY SOFT	0 – 2
SOFT	3 – 4
FIRM	5 – 8
STIFF	9 – 15
VERY STIFF	16 – 30
HARD	OVER 30

RELATIVE DENSITY

SANDS & GRAVELS	BLOWS PER FOOT
VERY LOOSE	0 – 4
LOOSE	5 – 10
MEDIUM DENSE	11 – 30
DENSE	31 – 50
VERY DENSE	OVER 50

NOTE: Number of blows using 140-pound hammer falling 30 inches to drive a 2-inch-OD (1½-inch ID) split-barrel sampler (ASTM D1586).

PLASTICITY OF FINE GRAINED SOILS

PLASTICITY INDEX	TERM
0	NON-PLASTIC
1 – 7	LOW
8 – 20	MEDIUM
Over 20	HIGH

DEFINITION OF WATER CONTENT

DRY
SLIGHTLY DAMP
DAMP
MOIST
WET
SATURATED

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METHOD OF CLASSIFICATION

PLATE

A-2

The number shown in "**BORING NO.**" refers to the approximate location of the same number indicated on the "Boring Location Diagram" as positioned in the field by pacing or measurement from property lines and/or existing features, or through the use of Global Positioning System (GPS) devices. The accuracy of GPS devices is somewhat variable.

"**DRILLING TYPE**" refers to the exploratory equipment used in the boring wherein **HSA = hollow stem auger**, and the dimension presented is the outside diameter of the HSA used.

"**N**" in "**BLOW COUNTS**" refers to a 2-inch outside diameter split-barrel sampler driven into the ground with a 140 pound drop-hammer dropped 30 inches repeatedly until a penetration of 18 inches is achieved or until refusal. The number of blows, or "blow count", of the hammer is recorded for each of three 6-inch increments totaling 18 inches. The number of blows required for advancing the sampler for the last 12 inches (2nd and 3rd increments) is defined as the Standard Penetration Test (SPT) "**N**"-Value. Refusal to penetration is considered more than 50 blows per 6 inches. (Ref. ASTM D1586).

"**R**" in "**BLOW COUNTS**" refers to a 3-inch outside diameter ring-lined split barrel sampler driven into the ground with a 140 pound drop-hammer dropped 30 inches repeatedly until a penetration of 12 inch is achieved or until refusal. The number of blows required to advance the sampler 12 inches is defined as the "**R**" blow count. The "**R**" blow count requires an engineered conversion to an equivalent SPT N-Value. Refusal to penetration is considered more than 50 blows per foot. (Ref. ASTM D3550).

"**CS**" in "**BLOWS/FT.**" refers to a 2½-in. outside diameter California style split-barrel sampler, lined with brass sleeves, driven into the ground with a 140-pound hammer dropped 30 inches repeatedly until a penetration of 18 inches is achieved or until refusal. The number of blows of the hammer is recorded for each of the three 6-inch increments totaling 18 inches. The number of blows required for advancing the sampler for the last 12 inches (2nd and 3rd increments) is defined as the "**CS**" blow count. The "**CS**" blow count requires an engineered conversion to an equivalent SPT N-Value. Refusal to penetration is considered more than 50 blows for a 6-inch increment. (Ref. ASTM D 3550)

"**SAMPLE TYPE**" refers to the form of sample recovery, in which **N** = Split-barrel sample, **R** = Ring-lined sample, "**CS**" = California style split-barrel sample, **G** = Grab sample, **B** = Bucket sample, **C** = Core sample (ex. diamond bit rock coring).

"**DRY DENSITY (LBS/CU FT)**" refers to the laboratory-determined dry density in pounds per cubic foot. The symbol "**NR**" indicates that no sample was recovered.


"**WATER (MOISTURE) CONTENT**" (% of Dry Wt.) refers to the laboratory-determined water content in percent using the standard test method ASTM D2216.

"**USCS**" refers to the "Unified Soil Classification System" Group Symbol for the soil type as defined by ASTM D2487 and D2488. The soils were classified visually in the field, and where appropriate, classifications were modified by visual examination of samples in the laboratory and/or by appropriate tests.

These notes and boring logs are intended for use in conjunction with the purposes of our services defined in the text. Boring log data should not be construed as part of the construction plans nor as defining construction conditions.

Boring logs depict our interpretations of subsurface conditions at the locations and on the date(s) noted. Variations in subsurface conditions and characteristics may occur between borings. Groundwater levels may fluctuate due to seasonal variations and other factors.

The stratification lines shown on the boring logs represent our interpretation of the approximate boundary between soil or rock types based upon visual field classification at the boring location. The transition between materials is approximate and may be more or less gradual than indicated.






<p>Geotechnical Environmental Inspections Materials</p>  <p>Western Technologies Inc. The Quality People Since 1955 wt-us.com</p>	<p>BORING LOG NOTES</p>	<p>PLATE A-3</p>
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DATE DRILLED: 11-12-21
 LOCATION: See Location Diagram
 ELEVATION: Not Determined

BORING NO. 1

EQUIPMENT TYPE: CME-75
 DRILLING TYPE: 7" H.S.A
 FIELD ENGINEER: A. Gonzalez

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

MOISTURE CONTENT (% OF DRY WT.)	DRY DENSITY (LBS/CU FT)	SAMPLE TYPE	SAMPLE	BLOWS/FT.	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION
								Asphalt concrete 8.1-in.
3.3	128	B		54		GP-GM		Poorly Graded GRAVEL with silt and sand; light brown-gray, moist dense
		R						
12.4	116	R		19	5	SM		Silty SAND; light brown-gray, medium dense, moist
								Auger Refusal at 7.5-Feet on Cobbles
					10			

- N- STANDARD SAMPLER
- R- RING SAMPLER
- B- BUCKET SAMPLE
- G- GRAB SAMPLE
- M- OPEN SAMPLER - (no rings)

NOTES: **Groundwater Not Encountered**


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 LOCATION: PHOENIX, ARIZONA
 PROJECT NO.: 2121JA227

BORING LOG




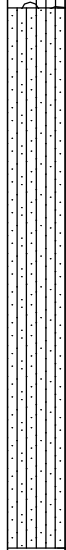

PLATE
A-4

DATE DRILLED: **11-12-21**
 LOCATION: **See Location Diagram**
 ELEVATION: **Not Determined**

BORING NO. 2

EQUIPMENT TYPE: **CME-75**
 DRILLING TYPE: **7" H.S.A**
 FIELD ENGINEER: **A. Gonzalez**

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

MOISTURE CONTENT (% OF DRY WT.)	DRY DENSITY (LBS/CU FT)	SAMPLE TYPE	SAMPLE	BLOWS/FT.	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION
								Asphalt concrete 7.9-in.
3.2	126	R		45		GP-GM		Poorly Graded GRAVEL with silt and sand; light brown, moist medium dense
13.2	117	R		20	5	SM		Silty SAND; light brown, medium dense, moist
		R		28 NR	10			
Boring Terminated at 11.0-Feet								

- N- STANDARD SAMPLER
- R- RING SAMPLER
- B- BUCKET SAMPLE
- G- GRAB SAMPLE
- M- OPEN SAMPLER - (no rings)

NOTES: **Groundwater Not Encountered**


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 LOCATION: **PHOENIX, ARIZONA**
 PROJECT NO.: **2121JA227**

BORING LOG




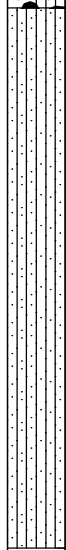

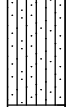
PLATE
A-5

DATE DRILLED: 11-12-21
 LOCATION: See Location Diagram
 ELEVATION: Not Determined

BORING NO. 3

EQUIPMENT TYPE: CME-75
 DRILLING TYPE: 7" H.S.A
 FIELD ENGINEER: A. Gonzalez

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

MOISTURE CONTENT (% OF DRY WT.)	DRY DENSITY (LBS/CU FT)	SAMPLE TYPE	SAMPLE	BLOWS/FT.	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION
								Asphalt concrete 8.5-in.
2.8	129	R		47		GW-GM		Well Graded GRAVEL with silt and sand; light brown, moist medium dense
8.8	102	R		10	5	SM		Silty SAND with gravel; light brown, loose, moist
		R		27 NR	10			medium dense
Boring Terminated at 11.0-Feet								

- N- STANDARD SAMPLER
- R- RING SAMPLER
- B- BUCKET SAMPLE
- G- GRAB SAMPLE
- M- OPEN SAMPLER - (no rings)

NOTES: **Groundwater Not Encountered**

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 LOCATION: PHOENIX, ARIZONA
 PROJECT NO.: 2121JA227

PLATE

A-6









BORING LOG

DATE DRILLED: 11-12-21
 LOCATION: See Location Diagram
 ELEVATION: Not Determined

BORING NO. 4

EQUIPMENT TYPE: CME-75
 DRILLING TYPE: 7" H.S.A
 FIELD ENGINEER: A. Gonzalez

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

MOISTURE CONTENT (% OF DRY WT.)	DRY DENSITY (LBS/CU FT)	SAMPLE TYPE	SAMPLE	BLOWS/FT.	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION
								Asphalt concrete 8.5-in.
3.7	119	B				SM		Silty SAND with gravel; light brown, moist
		R		59				dense
18.7	100	R		14	5	SM-SC		Silty Clayey SAND; light brown, loose, moist
		R		50/4"	10			increase sand content, very dense
Boring Terminated at 11.0-Feet								

- N- STANDARD SAMPLER
- R- RING SAMPLER
- B- BUCKET SAMPLE
- G- GRAB SAMPLE
- M- OPEN SAMPLER - (no rings)

NOTES: **Groundwater Not Encountered**

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 LOCATION: PHOENIX, ARIZONA
 PROJECT NO.: 2121JA227

PLATE

A-7





BORING LOG

DATE DRILLED: 11-12-21
 LOCATION: See Location Diagram
 ELEVATION: Not Determined

BORING NO. 5

EQUIPMENT TYPE: CME-75
 DRILLING TYPE: 7" H.S.A
 FIELD ENGINEER: A. Gonzalez

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

MOISTURE CONTENT (% OF DRY WT.)	DRY DENSITY (LBS/CU FT)	SAMPLE TYPE	SAMPLE	BLOWS/FT.	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION
3.2	120	B		50/5"	5	SM		Asphalt concrete 9.0-in.
		R						Well graded GRAVEL with silt and sand; light brown, moist very dense
		R		19				Silty SAND; light brown, medium dense, moist
Auger Refusal at 6.0-Feet on Cobbles								

- N- STANDARD SAMPLER
- R- RING SAMPLER
- B- BUCKET SAMPLE
- G- GRAB SAMPLE
- M- OPEN SAMPLER - (no rings)

NOTES: **Groundwater Not Encountered**

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 LOCATION: PHOENIX, ARIZONA
 PROJECT NO.: 2121JA227

BORING LOG





PLATE
A-8

DATE DRILLED: 11-12-21
 LOCATION: See Location Diagram
 ELEVATION: Not Determined

BORING NO. 6

EQUIPMENT TYPE: CME-75
 DRILLING TYPE: 7" H.S.A
 FIELD ENGINEER: A. Gonzalez

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

MOISTURE CONTENT (% OF DRY WT.)	DRY DENSITY (LBS/CU FT)	SAMPLE TYPE	SAMPLE	BLOWS/FT.	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION
3.3	113	B		37	5	GW-GM		Asphalt concrete 9.0-in.
		R						Well Graded SAND with silt and sand; light brown, moist medium dense
		R		34		SM	Silty SAND; light brown, medium dense, moist	
Auger Refusal at 6.0-Feet on Cobbles								

- N- STANDARD SAMPLER
- R- RING SAMPLER
- B- BUCKET SAMPLE
- G- GRAB SAMPLE
- M- OPEN SAMPLER - (no rings)

NOTES: **Groundwater Not Encountered**


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 LOCATION: PHOENIX, ARIZONA
 PROJECT NO.: 2121JA227

BORING LOG





PLATE
A-9

DATE DRILLED: **11-12-21**
 LOCATION: **See Location Diagram**
 ELEVATION: **Not Determined**

BORING NO. 7

EQUIPMENT TYPE: **CME-75**
 DRILLING TYPE: **7" H.S.A**
 FIELD ENGINEER: **A. Gonzalez**

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

MOISTURE CONTENT (% OF DRY WT.)	DRY DENSITY (LBS/CU FT)	SAMPLE TYPE	SAMPLE	BLOWS/FT.	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION
3.2	109	B		31	5	GP-GM		Asphalt concrete 9.0-in.
		R						Poorly Graded GRAVEL with silt and sand; light brown, moist medium dense
		N						hard drilling very dense
				50/1" NR				Auger Refusal at 4.5-Feet on Cobbles

- N- STANDARD SAMPLER
- R- RING SAMPLER
- B- BUCKET SAMPLE
- G- GRAB SAMPLE
- M- OPEN SAMPLER - (no rings)

NOTES: **Groundwater Not Encountered**


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PROJECT: **PHOENIX SKY HARBOR INTERNATIONAL AIRPORT**
 LOCATION: **PHOENIX, ARIZONA**
 PROJECT NO.: **2121JA227**

PLATE
A-10








BORING LOG

DATE DRILLED: **11-12-21**
 LOCATION: **See Location Diagram**
 ELEVATION: **Not Determined**

BORING NO. 8

EQUIPMENT TYPE: **CME-75**
 DRILLING TYPE: **7" H.S.A**
 FIELD ENGINEER: **A. Gonzalez**

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

MOISTURE CONTENT (% OF DRY WT.)	DRY DENSITY (LBS/CU FT)	SAMPLE TYPE	SAMPLE	BLOWS/FT.	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION
								Asphalt concrete 9.0-in.
		B				GP-GM		Poorly Graded GRAVEL with silt and sand; light brown, moist
		R		60 NR				dense
11.7	110	R		10	5	SC		Clayey SAND with gravel; light brown, loose, moist
						CL		Sandy Lean CLAY; brown, moist
19.5	106	R		25	10			very stiff
Boring Terminated at 11.0-Feet								

- N- STANDARD SAMPLER
- R- RING SAMPLER
- B- BUCKET SAMPLE
- G- GRAB SAMPLE
- M- OPEN SAMPLER - (no rings)

NOTES: **Groundwater Not Encountered**


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PROJECT: **PHOENIX SKY HARBOR INTERNATIONAL AIRPORT**
 LOCATION: **PHOENIX, ARIZONA**
 PROJECT NO.: **2121JA227**

PLATE
A-11










BORING LOG

DATE DRILLED: **11-12-21**
 LOCATION: **See Location Diagram**
 ELEVATION: **Not Determined**

BORING NO. 9

EQUIPMENT TYPE: **CME-75**
 DRILLING TYPE: **7" H.S.A**
 FIELD ENGINEER: **A. Gonzalez**

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

MOISTURE CONTENT (% OF DRY WT.)	DRY DENSITY (LBS/CU FT)	SAMPLE TYPE	SAMPLE	BLOWS/FT.	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION
5.3	129							Asphalt concrete 7.6-in.
		B				GP-GM		Poorly graded GRAVEL with silt and sand; light brown, damp
		R		43				medium dense
		R		19	5	SM		Silty SAND; light brown, medium dense, damp
		R		15	10	SM		loose
						CL		Sandy Lean CLAY; brown, moist
						SM		Silty SAND; brown-gray, moist
Boring Terminated at 11.0-Feet								

- N- STANDARD SAMPLER
- R- RING SAMPLER
- B- BUCKET SAMPLE
- G- GRAB SAMPLE
- M- OPEN SAMPLER - (no rings)

NOTES: **Groundwater Not Encountered**


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PROJECT: **PHOENIX SKY HARBOR INTERNATIONAL AIRPORT**
 LOCATION: **PHOENIX, ARIZONA**
 PROJECT NO.: **2121JA227**

PLATE

A-12







BORING LOG

DATE DRILLED: **11-12-21**
 LOCATION: **See Location Diagram**
 ELEVATION: **Not Determined**

BORING NO. 10

EQUIPMENT TYPE: **CME-75**
 DRILLING TYPE: **7" H.S.A**
 FIELD ENGINEER: **A. Gonzalez**

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

MOISTURE CONTENT (% OF DRY WT.)	DRY DENSITY (LBS/CU FT)	SAMPLE TYPE	SAMPLE	BLOWS/FT.	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION
3.5	120	B		58	5	GW-GM		Asphalt concrete 8.8-in.
		R						Well Graded GRAVEL with silt and sand; light brown, moist dense
		R		45	5	SM-SC		Silty Clayey SAND; light brown, medium dense, moist
		R		18 NR	10			
Boring Terminated at 11.0-Feet								

- N- STANDARD SAMPLER
- R- RING SAMPLER
- B- BUCKET SAMPLE
- G- GRAB SAMPLE
- M- OPEN SAMPLER - (no rings)

NOTES: **Groundwater Not Encountered**


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PROJECT: **PHOENIX SKY HARBOR INTERNATIONAL AIRPORT**
 LOCATION: **PHOENIX, ARIZONA**
 PROJECT NO.: **2121JA227**

PLATE
A-13






BORING LOG

DATE DRILLED: 11-12-21
 LOCATION: See Location Diagram
 ELEVATION: Not Determined

BORING NO. 11

EQUIPMENT TYPE: CME-75
 DRILLING TYPE: 7" H.S.A
 FIELD ENGINEER: A. Gonzalez

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

MOISTURE CONTENT (% OF DRY WT.)	DRY DENSITY (LBS/CU FT)	SAMPLE TYPE	SAMPLE	BLOWS/FT.	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION
3.5	122	B		62	5	GW-GM		Asphalt concrete 9.4-in.
		R						Well Graded GRAVEL with silt and sand; light brown, moist dense
		R		20	SM		Silty SAND; light brown, medium dense, moist	
Auger Refusal at 6.0-Feet on Cobbles								

- N- STANDARD SAMPLER
- R- RING SAMPLER
- B- BUCKET SAMPLE
- G- GRAB SAMPLE
- M- OPEN SAMPLER - (no rings)

NOTES: **Groundwater Not Encountered**



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PROJECT: PHOENIX SKY HARBOR INTERNATIONAL AIRPORT
 LOCATION: PHOENIX, ARIZONA
 PROJECT NO.: 2121JA227

PLATE
A-14

BORING LOG

DATE DRILLED: 11-12-21
 LOCATION: See Location Diagram
 ELEVATION: Not Determined

BORING NO. 12

EQUIPMENT TYPE: CME-75
 DRILLING TYPE: 7" H.S.A
 FIELD ENGINEER: A. Gonzalez

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

MOISTURE CONTENT (% OF DRY WT.)	DRY DENSITY (LBS/CU FT)	SAMPLE TYPE	SAMPLE	BLOWS/FT.	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION
								Asphalt concrete 8.3-in.
3.3	117	R		54		GW-GM		Well Graded GRAVEL with silt and sand; light brown, moist dense
5.8	113	R		50/4"	5	SM		Silty SAND with gravel; light brown, very dense, moist
Auger Refusal at 6.0-Feet on Cobbles								
10								

- N- STANDARD SAMPLER
- R- RING SAMPLER
- B- BUCKET SAMPLE
- G- GRAB SAMPLE
- M- OPEN SAMPLER - (no rings)

NOTES: **Groundwater Not Encountered**

Geotechnical Environmental Inspections Materials



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PROJECT: PHOENIX SKY HARBOR INTERNATIONAL AIRPORT
 LOCATION: PHOENIX, ARIZONA
 PROJECT NO.: 2121JA227

BORING LOG






PLATE
A-15

DATE DRILLED: 11-12-21
 LOCATION: See Location Diagram
 ELEVATION: Not Determined

BORING NO. 13

EQUIPMENT TYPE: CME-75
 DRILLING TYPE: 7" H.S.A
 FIELD ENGINEER: A. Gonzalez

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

MOISTURE CONTENT (% OF DRY WT.)	DRY DENSITY (LBS/CU FT)	SAMPLE TYPE	SAMPLE	BLOWS/FT.	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION
								Asphalt concrete 8.4-in.
3.7	119	B		57		GP-GM		Poorly Graded GRAVEL with silt and sand; light brown, moist
		R						dense
5.3	125	R		40	5	SM-SC		Silty Clayey SAND with gravel; brown, moist
								medium dense
Boring Terminated at 6.0-Feet								

- N- STANDARD SAMPLER
- R- RING SAMPLER
- B- BUCKET SAMPLE
- G- GRAB SAMPLE
- M- OPEN SAMPLER - (no rings)

NOTES: **Groundwater Not Encountered**

Geotechnical
 Environmental
 Inspections
 Materials



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PROJECT: PHOENIX SKY HARBOR INTERNATIONAL AIRPORT
 LOCATION: PHOENIX, ARIZONA
 PROJECT NO.: 2121JA227

PLATE
A-16






BORING LOG

DATE DRILLED: 11-12-21
 LOCATION: See Location Diagram
 ELEVATION: Not Determined

BORING NO. 14

EQUIPMENT TYPE: CME-75
 DRILLING TYPE: 7" H.S.A
 FIELD ENGINEER: A. Gonzalez

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

MOISTURE CONTENT (% OF DRY WT.)	DRY DENSITY (LBS/CU FT)	SAMPLE TYPE	SAMPLE	BLOWS/FT.	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION
3.6	122	B		48	5	GM		Asphalt concrete 8.7-in.
		R						
		R		8 NR	5	SM		Silty SAND; light brown, moist loose
Boring Terminated at 6.0-Feet								

- N- STANDARD SAMPLER
- R- RING SAMPLER
- B- BUCKET SAMPLE
- G- GRAB SAMPLE
- M- OPEN SAMPLER - (no rings)

NOTES: **Groundwater Not Encountered**

Geotechnical
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PROJECT: PHOENIX SKY HARBOR INTERNATIONAL AIRPORT
 LOCATION: PHOENIX, ARIZONA
 PROJECT NO.: 2121JA227

PLATE
A-17




BORING LOG

DATE DRILLED: 11-12-21
 LOCATION: See Location Diagram
 ELEVATION: Not Determined

BORING NO. 15

EQUIPMENT TYPE: CME-75
 DRILLING TYPE: 7" H.S.A
 FIELD ENGINEER: A. Gonzalez

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

MOISTURE CONTENT (% OF DRY WT.)	DRY DENSITY (LBS/CU FT)	SAMPLE TYPE	SAMPLE	BLOWS/FT.	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION
								Asphalt concrete 8.9-in.
8.6	117	R		36		SM		Silty SAND with gravel; light brown, moist medium dense
10.6	103	R		12	5			increase silt content, with clay content, loose
Boring Terminated at 6.0-Feet								

- N- STANDARD SAMPLER
- R- RING SAMPLER
- B- BUCKET SAMPLE
- G- GRAB SAMPLE
- M- OPEN SAMPLER - (no rings)

NOTES: **Groundwater Not Encountered**


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PROJECT: PHOENIX SKY HARBOR INTERNATIONAL AIRPORT
 LOCATION: PHOENIX, ARIZONA
 PROJECT NO.: 2121JA227

PLATE
A-18




BORING LOG

DATE DRILLED: 11-12-21
 LOCATION: See Location Diagram
 ELEVATION: Not Determined

BORING NO. 16

EQUIPMENT TYPE: CME-75
 DRILLING TYPE: 7" H.S.A
 FIELD ENGINEER: A. Gonzalez

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

MOISTURE CONTENT (% OF DRY WT.)	DRY DENSITY (LBS/CU FT)	SAMPLE TYPE	SAMPLE	BLOWS/FT.	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION
								Asphalt concrete 8.9-in.
5.7	131	R		46		SM		Silty SAND with gravel; light brown, moist medium dense
5.3	120	R		62	5			with clay content, dense
Boring Terminated at 6.0-Feet								

- N- STANDARD SAMPLER
- R- RING SAMPLER
- B- BUCKET SAMPLE
- G- GRAB SAMPLE
- M- OPEN SAMPLER - (no rings)

NOTES: **Groundwater Not Encountered**


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PROJECT: PHOENIX SKY HARBOR INTERNATIONAL AIRPORT
 LOCATION: PHOENIX, ARIZONA
 PROJECT NO.: 2121JA227

PLATE
A-19


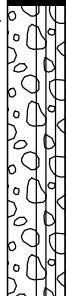

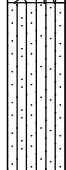
BORING LOG

DATE DRILLED: 11-12-21
 LOCATION: See Location Diagram
 ELEVATION: Not Determined

BORING NO. 17

EQUIPMENT TYPE: CME-75
 DRILLING TYPE: 7" H.S.A
 FIELD ENGINEER: A. Gonzalez

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

MOISTURE CONTENT (% OF DRY WT.)	DRY DENSITY (LBS/CU FT)	SAMPLE TYPE	SAMPLE	BLOWS/FT.	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION
								Asphalt concrete 8.4-in.
5.1	124	R		50		GM-GP		Poorly Graded GRAVEL with silt and sand, light brown, moist dense
11.6	113	R		25	5	SM		Silty SAND; light brown, moist medium dense
Boring Terminated at 6.0-Feet								

- N- STANDARD SAMPLER
- R- RING SAMPLER
- B- BUCKET SAMPLE
- G- GRAB SAMPLE
- M- OPEN SAMPLER - (no rings)

NOTES: **Groundwater Not Encountered**


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PROJECT: PHOENIX SKY HARBOR INTERNATIONAL AIRPORT
 LOCATION: PHOENIX, ARIZONA
 PROJECT NO.: 2121JA227

PLATE
A-20





BORING LOG

DATE DRILLED: 11-12-21
 LOCATION: See Location Diagram
 ELEVATION: Not Determined

BORING NO. 18

EQUIPMENT TYPE: CME-75
 DRILLING TYPE: 7" H.S.A
 FIELD ENGINEER: A. Gonzalez

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

MOISTURE CONTENT (% OF DRY WT.)	DRY DENSITY (LBS/CU FT)	SAMPLE TYPE	SAMPLE	BLOWS/FT.	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION
								Asphalt concrete 8.5-in.
5.7	128	R		50/5"		GP-GM		Poorly Graded GRAVEL with silt and sand; light brown, moist very dense
6.8	122	R		42	5	SC-SM		Silty Clayey SAND; light brown, medium dense, moist
Boring Terminated at 6.0-Feet								

- N- STANDARD SAMPLER
- R- RING SAMPLER
- B- BUCKET SAMPLE
- G- GRAB SAMPLE
- M- OPEN SAMPLER - (no rings)

NOTES: **Groundwater Not Encountered**

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 LOCATION: PHOENIX, ARIZONA
 PROJECT NO.: 2121JA227

PLATE
A-21

BORING LOG

APPENDIX B

Boring No.	Depth (ft)	USCS Group Symbol	Particle Size Distribution Percent Passing by Weight					Atterberg Limits		Initial Dry Density (pcf)	Initial Water Content (%)	Moisture-Density Relationship			Sulfates (ppm)	Chlorides (ppm)	Remarks
			3/4"	#4	#10	#40	#200	LL	PI			Maximum Dry Density (pcf)	Optimum Moisture Content (%)	Method			
1, 2, 7, 8, 9, 10	0-5	GP-GM										139.5	5.4	D1557C			12, 13
3, 4, 5, 6, 11, 12	0-5	GW-GM										142.5	5.7	D1557C	97		12, 13
1	0-5	GP-GM	80	44	36	19	7	NV	NP	128	3.3						12
	2-3	GP-GM								116	12.4						12
	5-6	SM															11
2	0-5	GP-GM	72	35	28	17	8	NV	NP	126	3.2						12
	2-3	GP-GM								117	13.2						12
	5-6	SM															11
3	0-5	GW-GM	80	46	36	21	8	NV	NP	129	2.8						12
	2-3	GW-GM								102	8.8						12
	5-6	GW-GM															11
4	0-5	SM	96	76	70	60	36	NV	NP	119	3.7						12
	2-3	SM								100	18.7						12
	5-6	SM															11

Remarks

1. Compacted density is approximately 95% of ASTM D698 maximum density at a moisture content slightly below optimum.
2. Submerged to approximate saturation.
3. Slight rebound after saturation.
4. Sample disturbance observed.
5. Expansion Index (EI) test in accordance with ASTM D4829.
6. Chloride Content (ARIZ 736a).
7. Sulfate Content (ARIZ 733a).
8. pH (ARIZ 237b).
9. Minimum Resistivity (ARIZ 236c).
10. Test Method ASTM D698 / AASHTO T99.
11. Field Visual Classification (ASTM D 2488).
12. Laboratory Soil Classification (ASTM D 2487).
13. Test Method ASTM D1557 / AASHTO T180.
14. From the ADOT Family of Curves for Maricopa County.
15. See Corrosion Plate.
16. Initial Dry Density and Initial Water Content from Remolded Swell.

Notes: Initial Dry Density and Initial Water Content are in-situ values unless otherwise noted.

NP = Non-Plastic NV = No Value



PROJECT: PHOENIX SKY HARBOR INTERNATIONAL AIRPORT

JOB NO.: 2121JA227

SOIL PROPERTIES

PLATE

B-1

Boring No.	Depth (ft)	USCS Group Symbol	Particle Size Distribution Percent Passing by Weight					Atterberg Limits		Initial Dry Density (pcf)	Initial Water Content (%)	Moisture-Density Relationship			Sulfates (ppm)	Chlorides (ppm)	Remarks
			¾"	#4	#10	#40	#200	LL	PI			Maximum Dry Density (pcf)	Optimum Moisture Content (%)	Method			
5	0-5	GW-GM	80	46	36	22	9	NV	NP	120	3.2					12	
	2-3	GW-GM														12	
6	0-5	GW-GM	83	46	37	22	9	NV	NP	113	3.3					12	
	2-3	GW-GM														12	
7	0-5	GP-GM	83	51	42	26	12	NV	NP	109	3.2					12	
	2-3	GP-GM														12	
8	0-5	GP-GM	76	46	37	22	9	NV	NP	110	11.7					12	
	5-6	GP-GM								106	19.5					11	
	10-11	CL														11	
9	0-5	GP-GM	78	45	37	21	9	NV	NP	129	5.3					12	
	2-3	GP-GM														12	
10	0-5	GW-GM	70	38	30	18	8	NV	NP	120	3.5					12	
	2-3	GW-GM														12	
11	0-5	GW-GM	81	46	36	22	9	NV	NP	122	3.5					12	
	2-3	GW-GM														12	

Remarks

1. Compacted density is approximately 95% of ASTM D698 maximum density at a moisture content slightly below optimum.
2. Submerged to approximate saturation.
3. Slight rebound after saturation.
4. Sample disturbance observed.
5. Expansion Index (EI) test in accordance with ASTM D4829.
6. Chloride Content (ARIZ 736a).
7. Sulfate Content (ARIZ 733a).
8. pH (ARIZ 237b).
9. Minimum Resistivity (ARIZ 236c).
10. Test Method ASTM D698 / AASHTO T99.
11. Field Visual Classification (ASTM D 2488).
12. Laboratory Soil Classification (ASTM D 2487).
13. Test Method ASTM D1557 / AASHTO T180.
14. From the ADOT Family of Curves for Maricopa County.
15. See Corrosion Plate.
16. Initial Dry Density and Initial Water Content from Remolded Swell.

Notes: Initial Dry Density and Initial Water Content are in-situ values unless otherwise noted.
 NP = Non-Plastic NV = No Value



PROJECT: PHOENIX SKY HARBOR INTERNATIONAL AIRPORT

JOB NO.: 2121JA227

SOIL PROPERTIES

PLATE

B-2

Boring No.	Depth (ft)	USCS Group Symbol	Particle Size Distribution Percent Passing by Weight					Atterberg Limits		Initial Dry Density (pcf)	Initial Water Content (%)	Moisture-Density Relationship			CBR at 95% Compaction	Sulfates (ppm)	Chlorides (ppm)	Remarks
			3/4"	#4	#10	#40	#200	LL	PI			Maximum Dry Density (pcf)	Optimum Moisture Content (%)	Method				
12	0-5	GW-GM	79	39	31	20	9											12
	2-3	GW-GM							117	3.3								12
	5-6	GW-GM						113	5.8									11
13	2-3	SM							119	3.7								11
	5-6	CL							125	5.3								11
14	2-3	SM							122	3.6								11
	5-6	CL							117	8.6								11
15	2-3	SM							103	10.6								11
	5-6	CL																11
	5-6	CL																11
16	0-5	GP-GM	87	50	41	22	9											12
	2-3	GP-GM							131	5.7								12
	5-6	SM-SC							120	5.3								11
17	2-3	SM							124	5.1								11
	5-6	SM							113	11.6								11
18	2-3	SM							128	5.7								11
	5-6	SM-SC							122	6.8								11

Remarks

1. Compacted density is approximately 95% of ASTM D698 maximum density at a moisture content slightly below optimum.
 2. Submerged to approximate saturation.
 3. Slight rebound after saturation.
 4. Sample disturbance observed.
 5. Expansion Index (EI) test in accordance with ASTM D4829.
 6. Chloride Content (ARIZ 736a).
 7. Sulfate Content (ARIZ 733a).
 8. pH (ARIZ 237b).
 9. Minimum Resistivity (ARIZ 236c).
 10. Test Method ASTM D698 / AASHTO T99.
 11. Field Visual Classification (ASTM D 2488).
 12. Laboratory Soil Classification (ASTM D 2487).
 13. Test Method ASTM D1557 / AASHTO T180.
 14. From the ADOT Family of Curves for Maricopa County.
 15. See Corrosion Plate.
 16. Initial Dry Density and Initial Water Content from Remolded Swell.
- Notes: Initial Dry Density and Initial Water Content are in-situ values unless otherwise noted.
NP = Non-Plastic NV = No Value



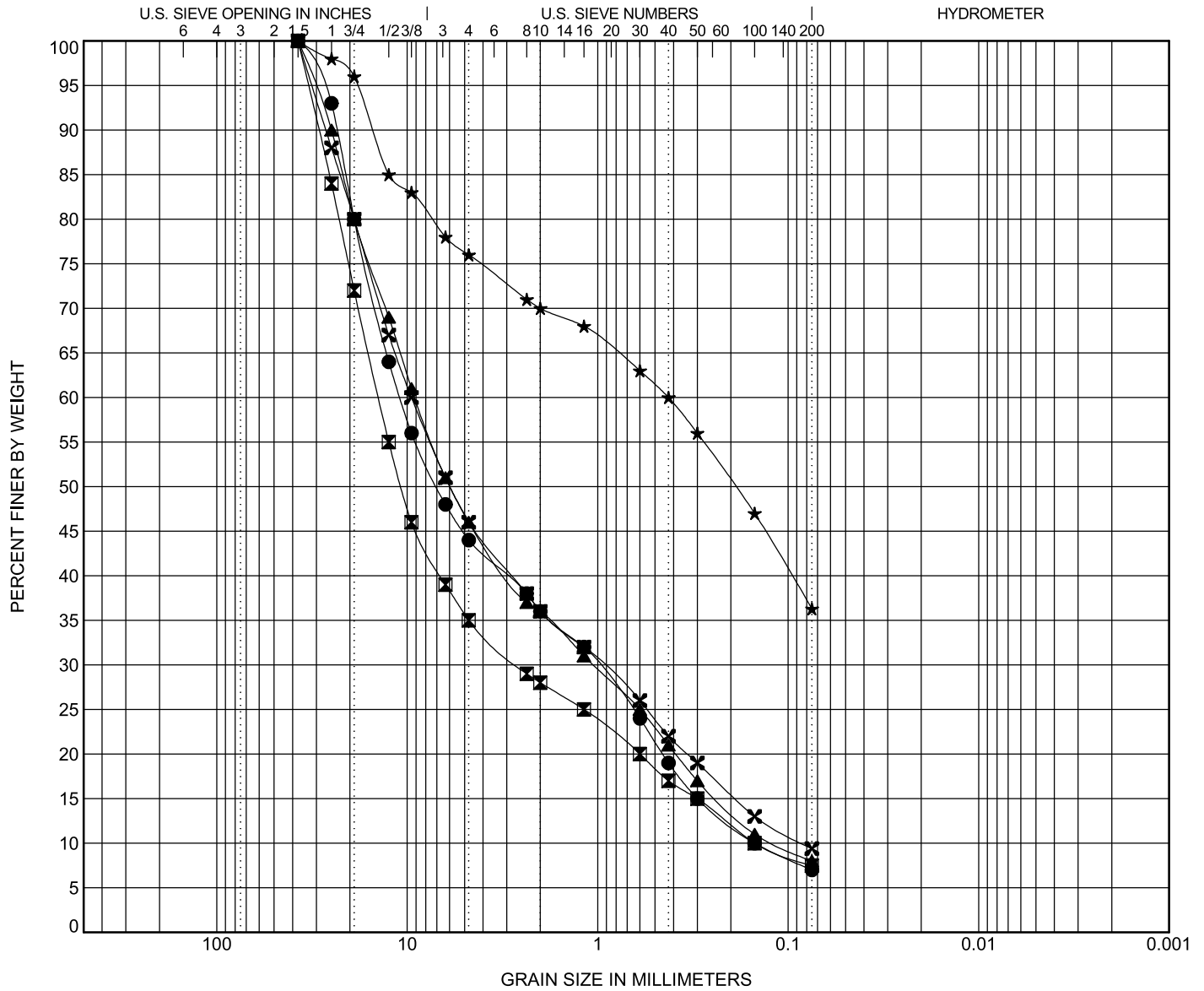
PROJECT: PHOENIX SKY HARBOR INTERNATIONAL AIRPORT

JOB NO.: 2121JA227

SOIL PROPERTIES

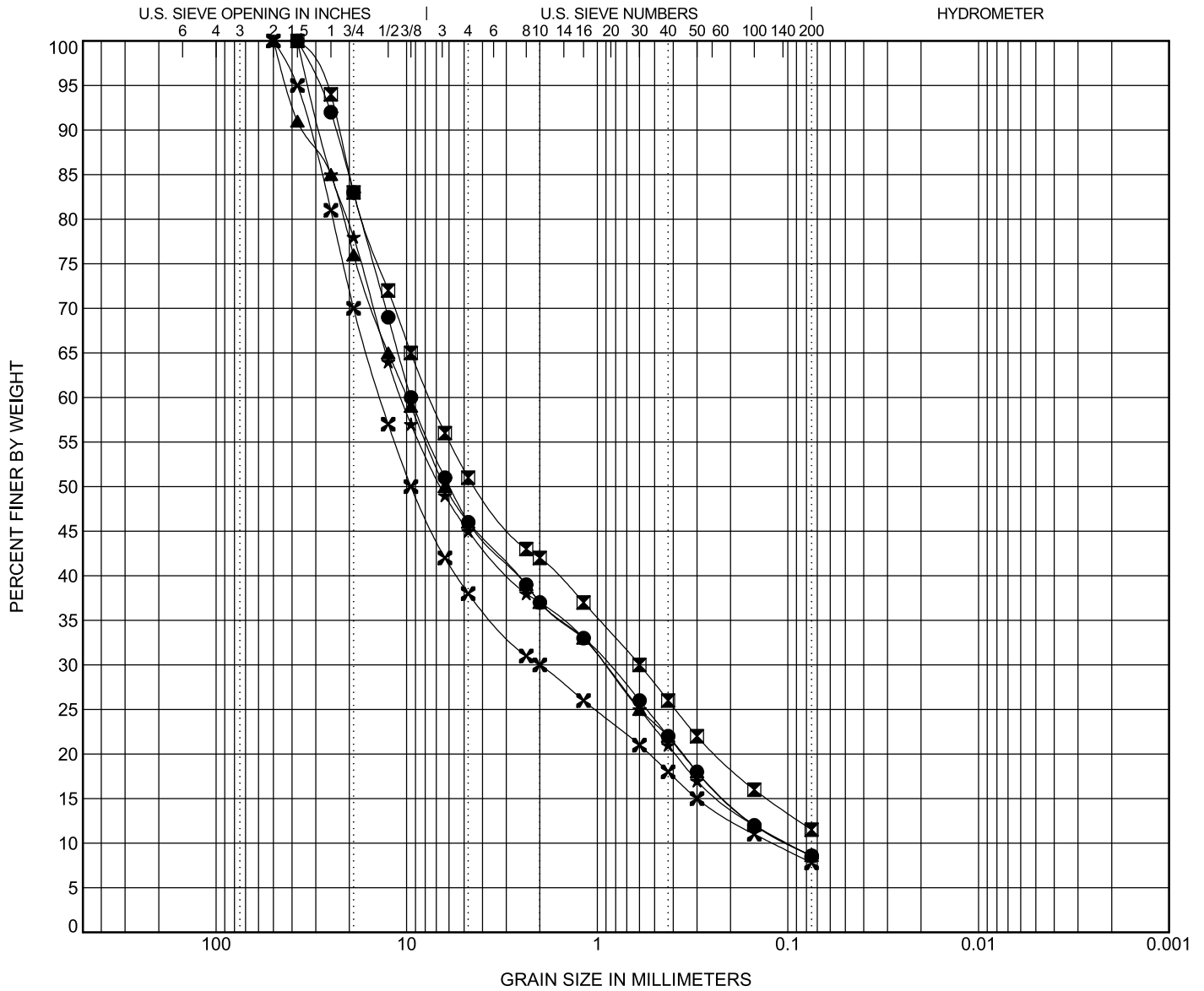
PLATE

B-3



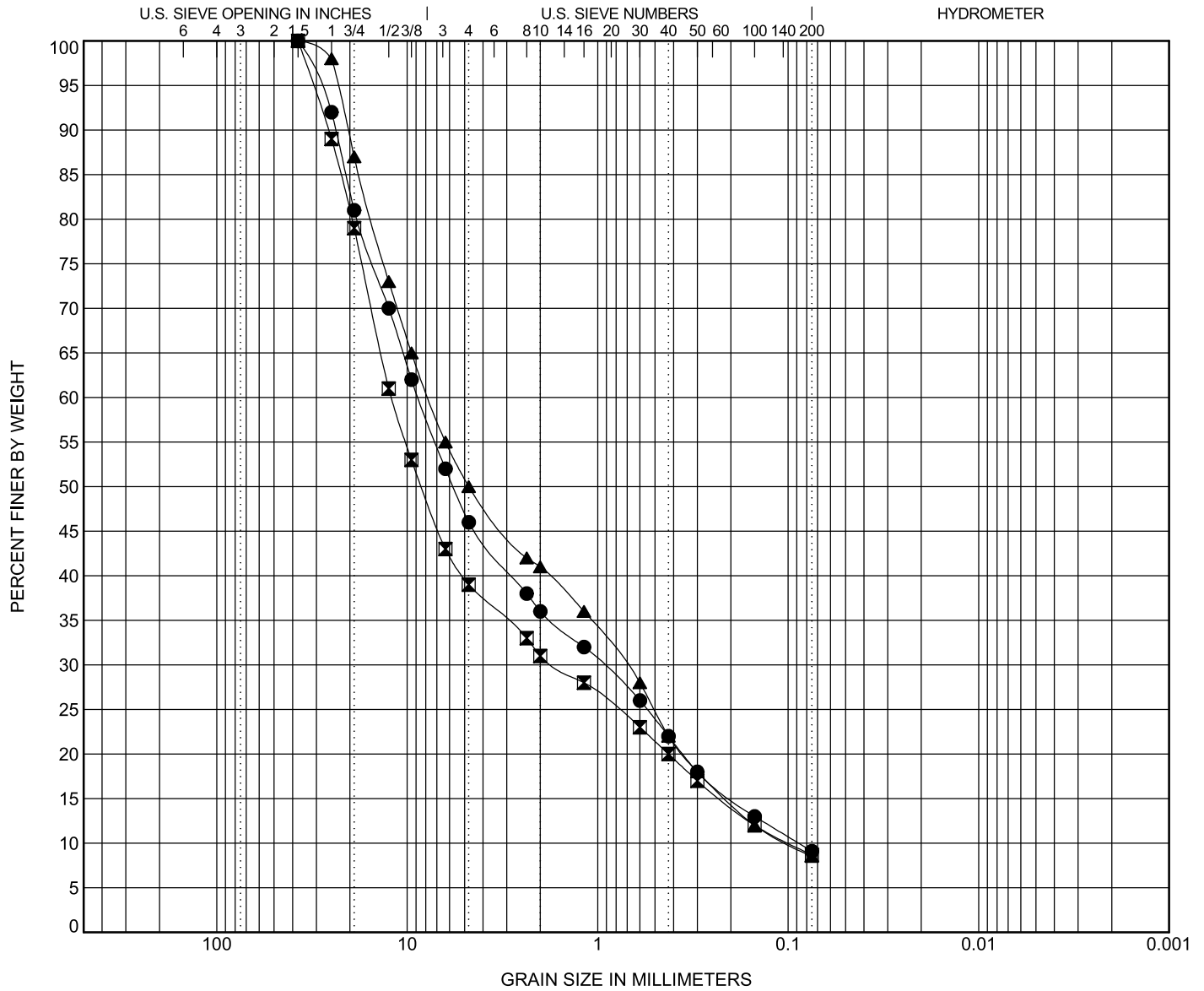
COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Sample Identification	Symbol	Classification	LL	PL	PI	C _c	C _u	F _m
● B-1	2.5 ft GP-GM	Poorly Graded GRAVEL with silt and sand	NP	NP	NP	0.61	72.65	1.21
☒ B-2	2.5 ft GP-GM	Poorly Graded GRAVEL with silt and sand	NP	NP	NP	3.32	94.25	0.99
▲ B-3	2.5 ft GW-GM	Well Graded GRAVEL with silt and sand	NP	NP	NP	1.02	76.58	1.25
★ B-4	2.5 ft SM	Silty SAND with gravel	NP	NP	NP			2.66
✕ B-5	2.5 ft GW-GM	Well Graded GRAVEL with silt and sand	NP	NP	NP	1.11	112.85	1.29
Sample Identification	D ₁₀₀	D ₆₀	D ₃₀	D ₁₀	%Gravel	%Sand	%Silt	%Clay
● B-1	2.5 ft	37.5	10.897	0.996	0.15	56.0	37.0	7.0
☒ B-2	2.5 ft	37.5	14.138	2.652	0.15	65.0	27.5	7.5
▲ B-3	2.5 ft	37.5	9.118	1.054	0.119	54.0	38.0	8.0
★ B-4	2.5 ft	37.5	0.425			24.0	39.7	36.3
✕ B-5	2.5 ft	37.5	9.5	0.942	0.084	54.0	36.6	9.4



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Sample Identification	Symbol	Classification	LL	PL	PI	C _c	C _u	F _m
● B-6	2.5 ft GP-GM	Poorly Graded GRAVEL with silt and sand	NP	NP	NP	0.82	95.22	1.29
☒ B-7	2.5 ft GP-GM	Poorly Graded GRAVEL with silt and sand	NP	NP	NP	0.80	127.03	1.46
▲ B-8	2.5 ft GP-GM	Poorly Graded GRAVEL with silt and sand	NP	NP	NP	0.85	99.67	1.28
★ B-9	2.5 ft GP-GM	Poorly Graded GRAVEL with silt and sand	NP	NP	NP	0.78	105.86	1.25
✕ B-10	2.5 ft GW-GM	Well Graded GRAVEL with silt and sand	NP	NP	NP	2.41	113.99	1.05
Sample Identification	D ₁₀₀	D ₆₀	D ₃₀	D ₁₀	%Gravel	%Sand	%Silt	%Clay
● B-6	2.5 ft	37.5	9.5	0.883	0.1	54.0	37.4	8.6
☒ B-7	2.5 ft	37.5	7.562	0.6	0.1	49.0	39.5	11.5
▲ B-8	2.5 ft	50	9.945	0.916	0.1	54.0	37.4	8.6
★ B-9	2.5 ft	37.5	10.686	0.916	0.101	55.0	36.5	8.5
✕ B-10	2.5 ft	50	13.768	2	0.121	62.0	30.2	7.8

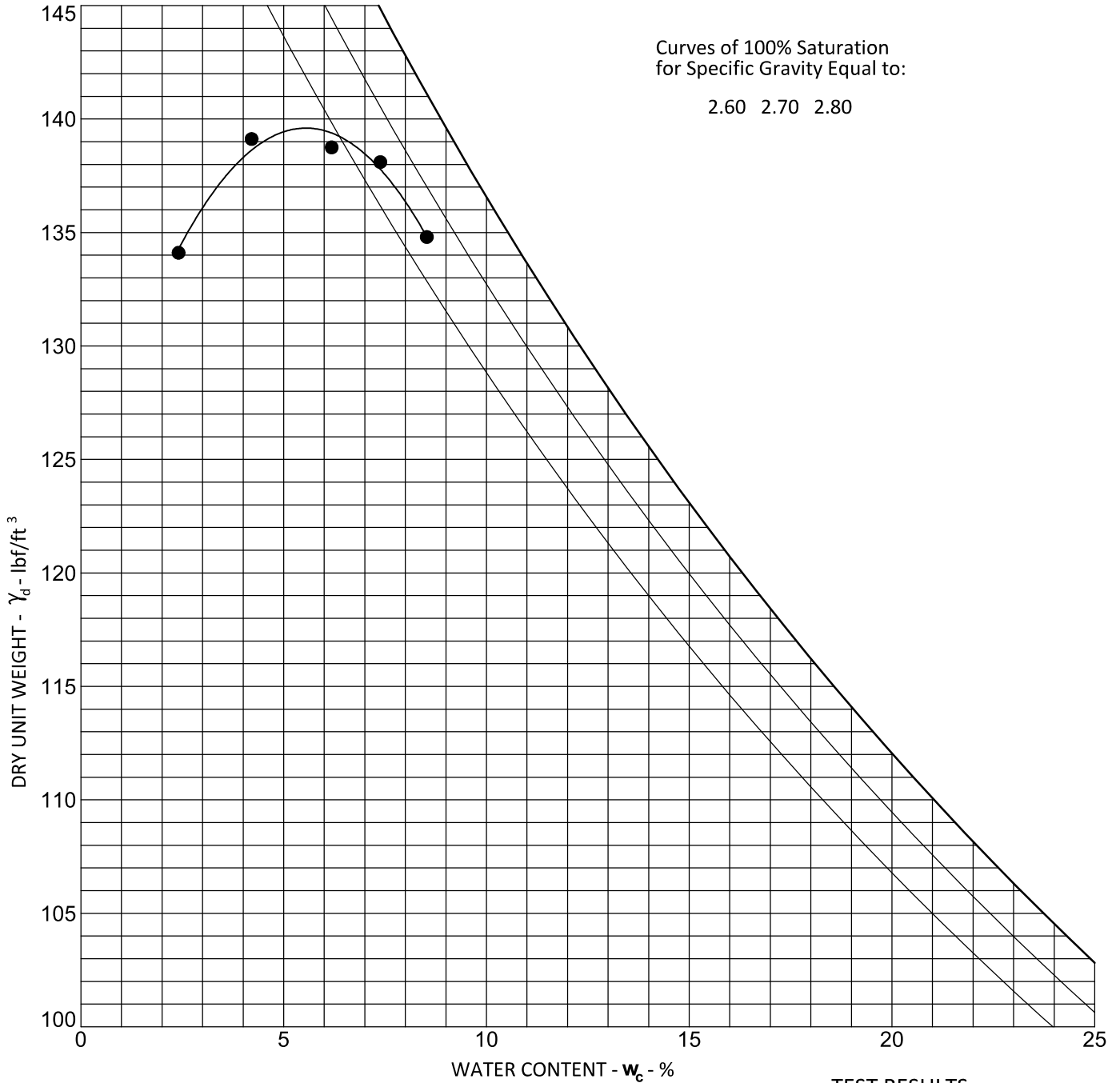


COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Sample Identification	Symbol	Classification	LL	PL	PI	C _c	C _u	F _m
● B-11 2.5 ft	GW-GM	Well Graded GRAVEL with silt and sand	NP	NP	NP	1.15	99.43	1.28
☒ B-12 2.5 ft	GW-GM	Well Graded GRAVEL with silt and sand	NP	NP	NP	2.36	122.56	1.12
▲ B-16 2.5 ft	GP-GM	Poorly Graded GRAVEL with silt and sand	NP	NP	NP	0.65	76.64	1.38

Sample Identification	D ₁₀₀	D ₆₀	D ₃₀	D ₁₀	%Gravel	%Sand	%Silt	%Clay
● B-11 2.5 ft	37.5	8.751	0.942	0.088	54.0	36.9	9.1	
☒ B-12 2.5 ft	37.5	12.078	1.677	0.099	61.0	30.3	8.7	
▲ B-16 2.5 ft	37.5	7.736	0.711	0.101	50.0	41.5	8.5	

LABORATORY COMPACTION CHARACTERISTICS - STANDARD EFFORT



TEST RESULTS

Source of Material	<u>B-1 at 2.5 ft</u>	Maximum Dry Density	<u>139.6</u> PCF
Description of Material	<u>Poorly Graded GRAVEL with silt and sand</u> <u>Percent Passing US Standard No. 200 Sieve = 7%</u>	Optimum Water Content	<u>5.4</u> %
Test Method	<u>ASTM D1557 Method C</u>		

ATTERBERG LIMITS

$\frac{LL}{NP}$	$\frac{PL}{NP}$	$\frac{PI}{NP}$
-----------------	-----------------	-----------------

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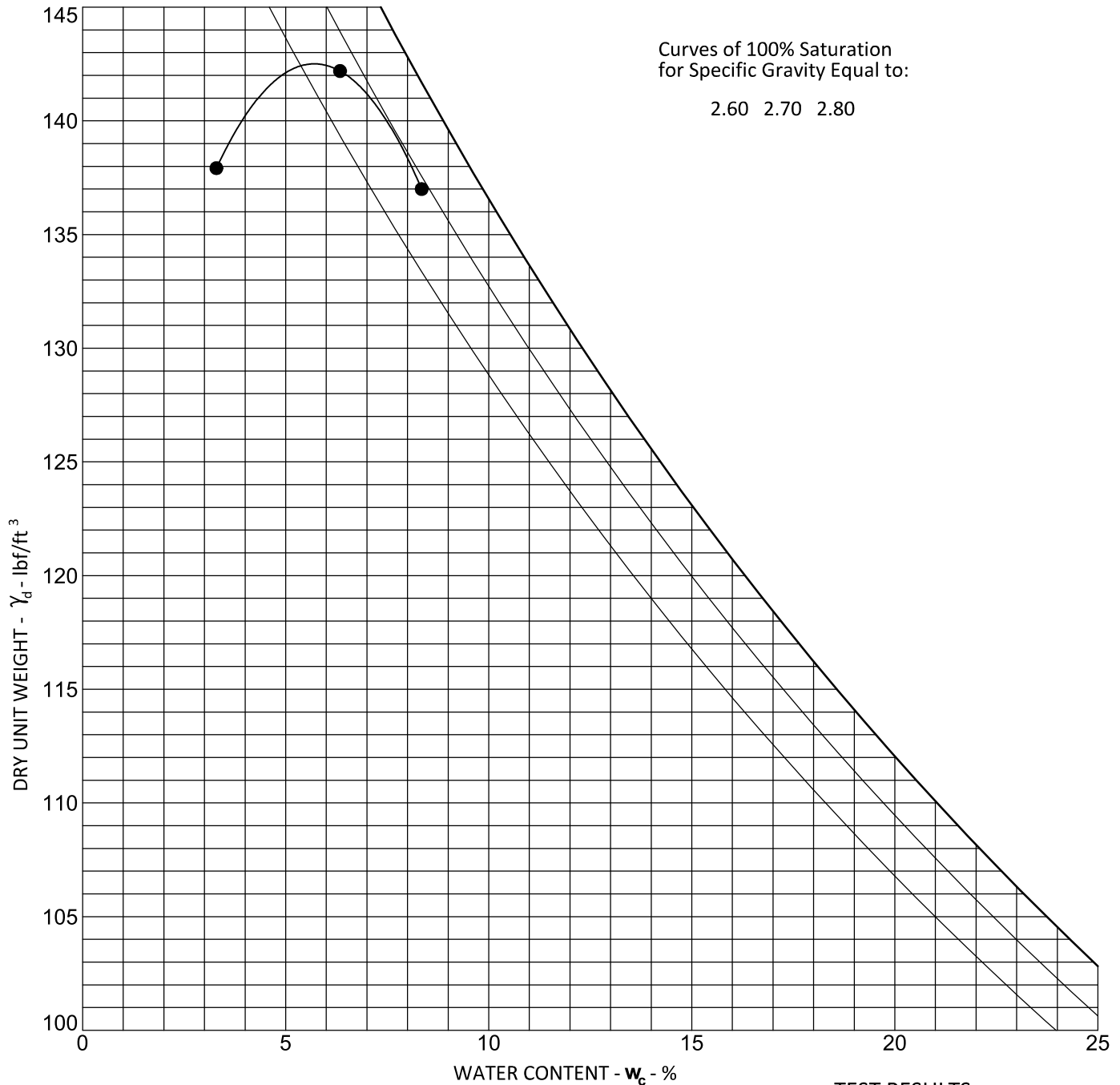
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PROJECT: PHOENIX SKY HARBOR INTERNATIONAL AIRPORT
LOCATION: PHOENIX, ARIZONA
PROJECT NO.: 21211A227

PLATE
B-7

COMPACTION CURVE

LABORATORY COMPACTION CHARACTERISTICS - STANDARD EFFORT



TEST RESULTS

Source of Material	<u>B-3 at 2.5 ft</u>	Maximum Dry Density	<u>142.5</u> PCF
Description of Material	Well Graded GRAVEL with silt and sand Percent Passing US Standard No. 200 Sieve = 8%	Optimum Water Content	<u>5.7</u> %
Test Method	<u>ASTM D1557 Method C</u>		

ATTERBERG LIMITS

$\frac{LL}{NP}$	$\frac{PL}{NP}$	$\frac{PI}{NP}$
-----------------	-----------------	-----------------

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PROJECT: PHOENIX SKY HARBOR INTERNATIONAL AIRPORT
LOCATION: PHOENIX, ARIZONA
PROJECT NO.: 21211A227

PLATE

B-8

COMPACTION CURVE

**CALIFORNIA BEARING RATIO
(CBR)**

Client **TRACE CONSULTING, LLC**
1201 EAST JEFFERSON STREET, SUITE 3
PHOENIX, AZ 85034

Date of Report **12/08/2021**
 Job No. **2121JA277**
 Event / Invoice No.
 Authorized By
 Sampled By **A. GONZALEZ**
 Submitted By **A. GONZALEZ**

Lab No. **117756**
 Date
 Date **11/12/2021**
 Date **11/12/2021**

Project **PHOENIX SKY HARBOR AIRPORT**
 Type / Use of Material **SUBGRADE**
 Sample Source / Location **SUBGRADE**
 Testing Authorized **A. DE LA ROCHA**

Location **Borings 1, 2, 7, 8, 9, 10 (0' - 5')**
 Supplier / Source **SOIL BORINGS**
 Source / Location Desig. By
 Date

TEST RESULTS

LABORATORY COMPACTION CHARACTERISTICS ASTM D698 AASHTO T99 ASTM D1557 AASHTO T180 **METHOD C**

MAXIMUM DRY DENSITY, PCF **139.5**

OPTIMUM MOISTURE, % **5.4**

BEARING RATIO OF LABORATORY-COMPACTED SPECIMENS, ASTM D1883

COMPACTIVE EFFORT, BLOWS PER LAYER	10	25	56
DRY DENSITY AT COMPACTION, PCF	133.2	137.9	141.4
PERCENT OF MAXIMUM DRY DENSITY, %	95.5	98.8	101.4
MOISTURE BEFORE COMPACTION, %	5.5	5.7	5.3
MOISTURE AFTER COMPACTION, %	3.9	4.8	4.2
MOISTURE AFTER SOAKING (TOP ONE INCH), %	6.4	5.5	6.0
SWELL, %	-0.1	-0.2	-0.4
CALIFORNIA BEARING RATIO AT 0.100 INCH PENETRATION	133.3	99.9	111.1
CALIFORNIA BEARING RATIO AT 0.200 INCH PENETRATION	141.7	188.3	166.7
SURCHARGE WEIGHT, LBS.	20	20	20
PERCENT OF PLUS 19 MM MATERIAL, %	0	0	0

Comments:

Copies To: **CLIENT - (1)**

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B-9



SOIL COMBINATION BORINGS 1, 2, 7, 8, 9, 10

◆ CBR
 ■ 95% Proctor
 ▲ B-1 & B-9 Native
 ✱ B-2 Native
 ✱ B-7 Native
 ● B-8 Native
 — B-10 Native

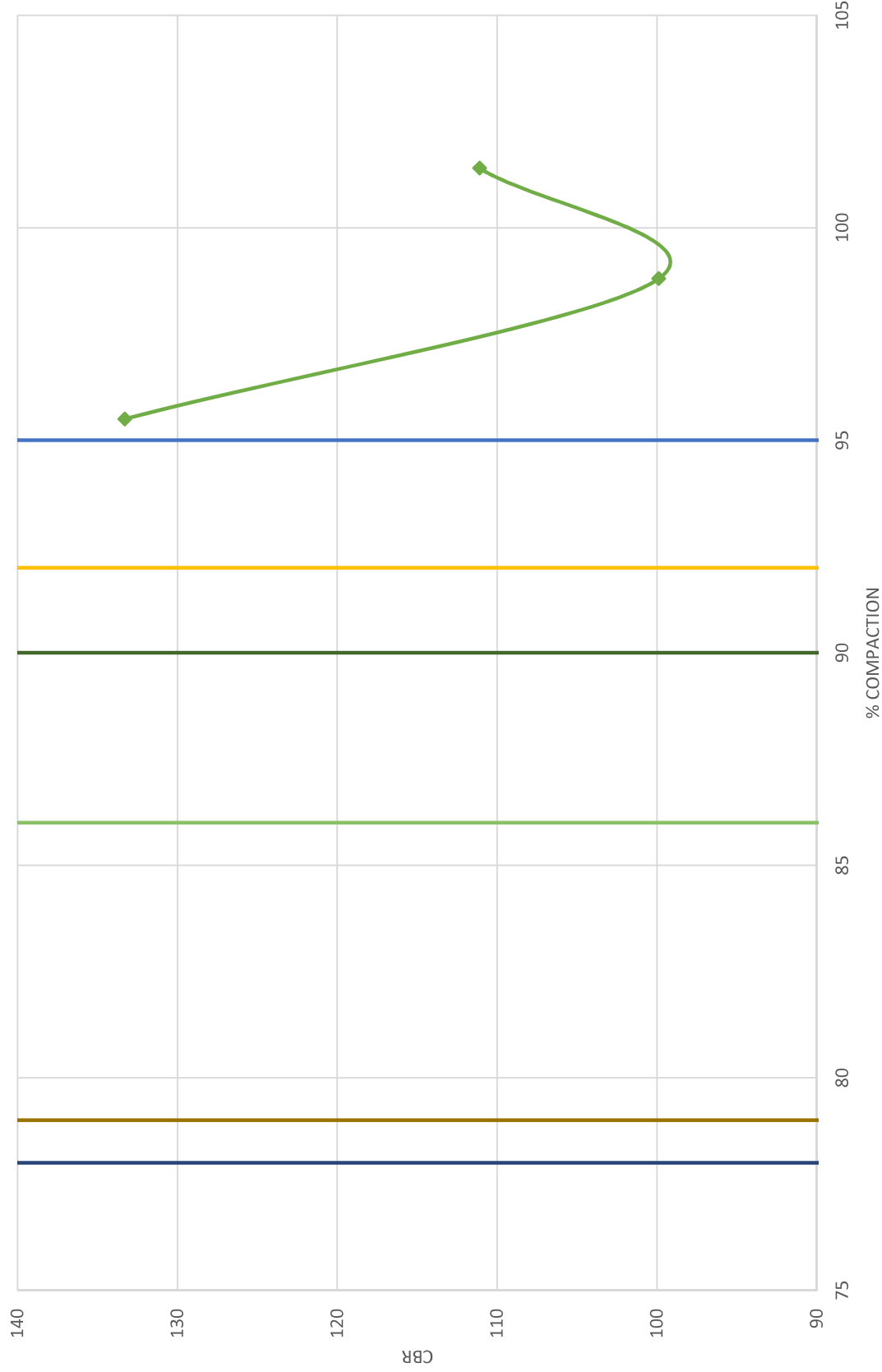


PLATE:
B-10

PROJECT: PHOENIX SKY HARBOR INTERNATIONAL AIRPORT WAC APRON RECONSTRUCTION
JOB NO.: 2121JA227

CALIFORNIA BEARING RATIO (CBR) CHART

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**CALIFORNIA BEARING RATIO
(CBR)**

Client **TRACE CONSULTING, LLC**
1201 EAST JEFFERSON STREET, SUITE 3
PHOENIX, AZ 85034

Date of Report **1/11/2022**
 Job No. **2121JA277**
 Event / Invoice No.
 Authorized By
 Sampled By **A. GONZALEZ**
 Submitted By **A. GONZALEZ**

Lab No. **117757**
 Date
 Date **11/12/2021**
 Date **11/12/2021**

Project **PHOENIX SKY HARBOR AIRPORT**
 Type / Use of Material **SUBGRADE**
 Sample Source / Location **SUBGRADE**
 Testing Authorized **A. DE LA ROCHA**

Location **Borings 3, 4, 5, 6, 11, 12 (0' – 5')**
 Supplier / Source **SOIL BORINGS**
 Source / Location Desig. By

Date

TEST RESULTS

LABORATORY COMPACTION CHARACTERISTICS ASTM D698 AASHTO T99 ASTM D1557 AASHTO T180 **METHOD C**

MAXIMUM DRY DENSITY, PCF **142.5**

OPTIMUM MOISTURE, % **5.7**

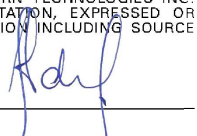
BEARING RATIO OF LABORATORY-COMPACTED SPECIMENS, ASTM D1883

COMPACTIVE EFFORT, BLOWS PER LAYER	10	25
DRY DENSITY AT COMPACTION, PCF	135.1	140.6
PERCENT OF MAXIMUM DRY DENSITY, %	94.8	98.7
MOISTURE BEFORE COMPACTION, %	6.0	6.2
MOISTURE AFTER COMPACTION, %	5.6	4.8
MOISTURE AFTER SOAKING (TOP ONE INCH), %	6.7	6.1
SWELL, %	-0.1	-0.1
CALIFORNIA BEARING RATIO AT 0.100 INCH PENETRATION	92.9	178.6
CALIFORNIA BEARING RATIO AT 0.200 INCH PENETRATION	119.1	228.6
SURCHARGE WEIGHT, LBS.	20	20
PERCENT OF PLUS 19 MM MATERIAL, %	0	0

Comments:

Copies To: **CLIENT – (1)**

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SOIL COMBINATION BORINGS 3, 4, 5, 6, 11, 12

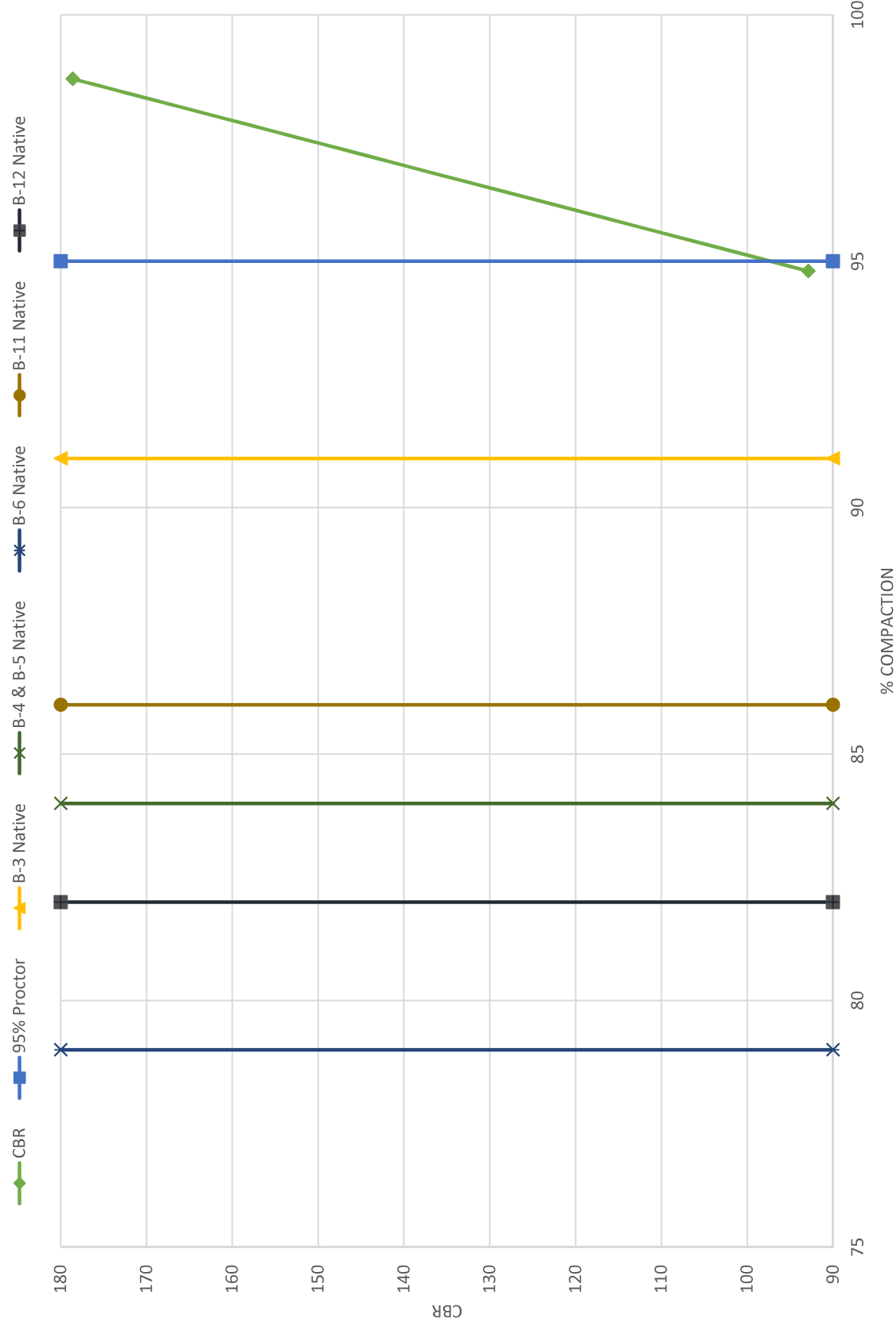


PLATE:
B-12

PROJECT: PHOENIX SKY HARBOR INTERNATIONAL AIRPORT WAC APRON RECONSTRUCTION
JOB NO.: 2121JA227

CALIFORNIA BEARING RATIO (CBR) CHART

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Group No.	Depth (ft)	USCS Group Symbol	Particle Size Distribution Percent Passing by Weight				Atterberg Limits		Initial Dry Density (pcf)	Initial Water Content (%)	Moisture-Density Relationship			CBR at 95% Compaction	Sulfates (ppm)	Chlorides (ppm)	Remarks
			3/4"	#4	#10	#40	#200	LL			PI	Maximum Dry Density (pcf)	Optimum Moisture Content (%)				
1	0-1	GW	80	19	10	3	1	NV	NP			119.7	10.7	D1557C	17		12, 13
2	0-1	GW	86	19	9	2	0	NV	NP			118.1	11.7	D1557C	28		12, 13

Remarks

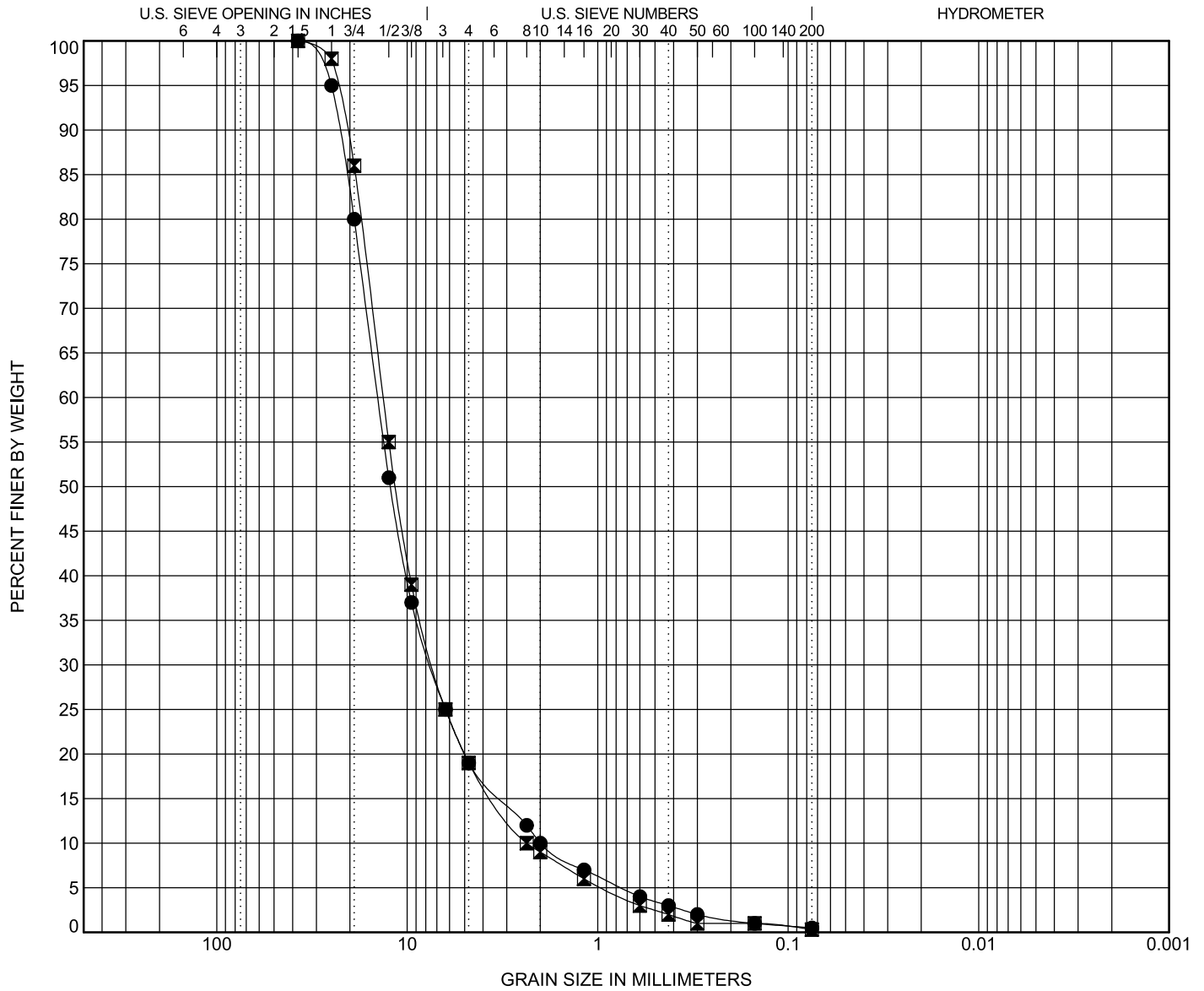
1. Compacted density is approximately 95% of ASTM D698 maximum density at a moisture content slightly below optimum.
2. Submerged to approximate saturation.
3. Slight rebound after saturation.
4. Sample disturbance observed.
5. Expansion Index (EI) test in accordance with ASTM D4829.
6. Chloride Content (ARIZ 736a).
7. Sulfate Content (ARIZ 733a).
8. pH (ARIZ 237b).
9. Minimum Resistivity (ARIZ 236c).
10. Test Method ASTM D698 / AASHTO T99.
11. Field Visual Classification (ASTM D 2488).
12. Laboratory Soil Classification (ASTM D 2487).
13. Test Method ASTM D1557 / AASHTO T180.
14. From the ADOT Family of Curves for Maricopa County.
15. See Corrosion Plate.
16. Initial Dry Density and Initial Water Content from Remolded Swell.

Notes: Initial Dry Density and Initial Water Content are in-situ values unless otherwise noted.
 NP = Non-Plastic NV = No Value



PROJECT: PHOENIX SKY HARBOR INTERNATIONAL AIRPORT
 JOB NO.: 2121JA227
A/C CORE PROPERTIES

PLATE
B-13

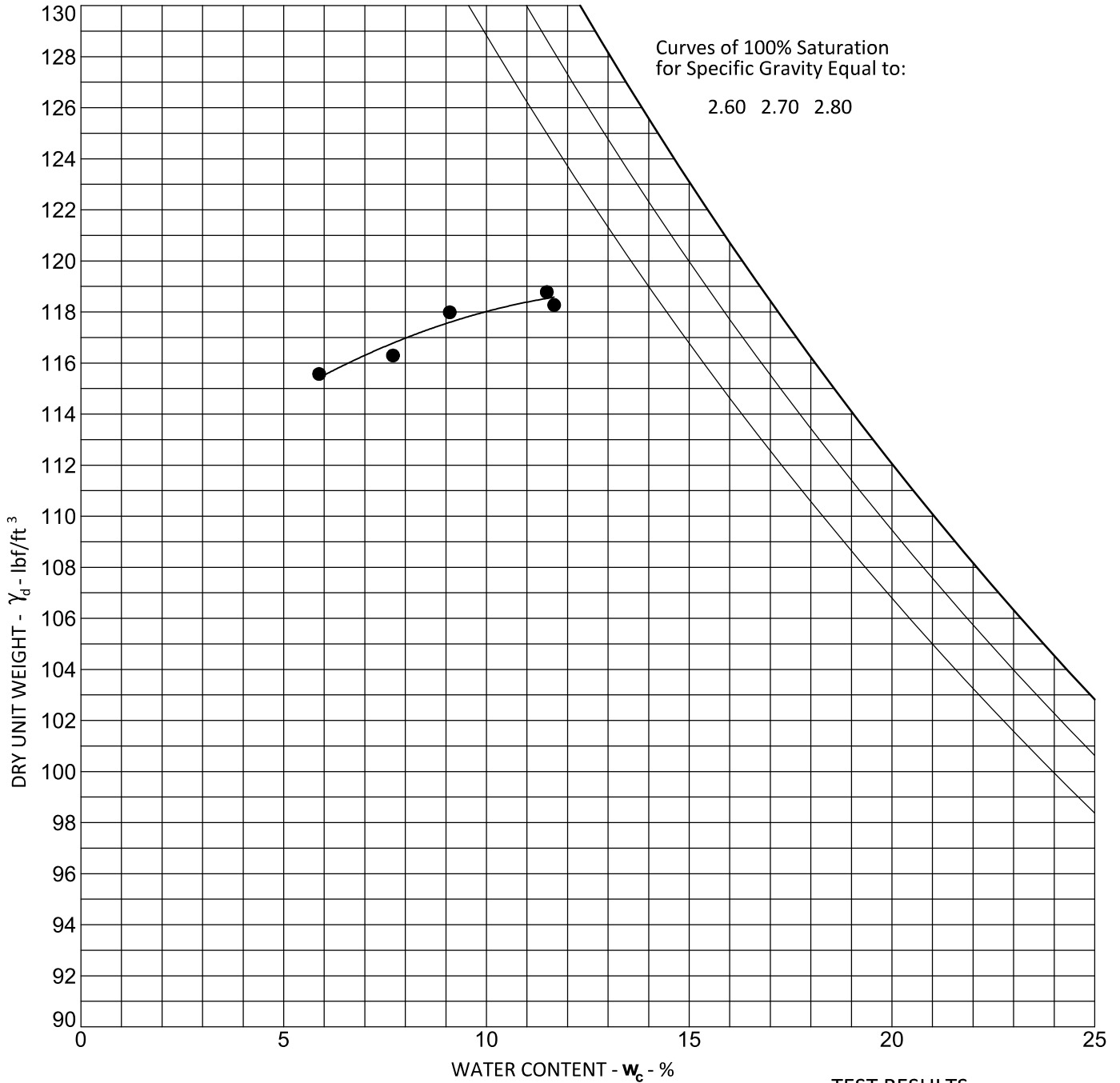


COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Sample Identification	Symbol	Classification	LL	PL	PI	C _c	C _u	F _m
● A/C Core G.-1 0.5 ft	GW	Well Graded GRAVEL with sand	NP	NP	NP	1.96	7.12	0.37
✕ A/C Core G.-2 0.5 ft	GW	Well Graded GRAVEL with sand	NP	NP	NP	1.69	5.67	0.33

Sample Identification	D ₁₀₀	D ₆₀	D ₃₀	D ₁₀	%Gravel	%Sand	%Silt	%Clay
● A/C Core G.-1 0.5 ft	37.5	14.235	7.476	2	81.0	18.5	0.5	
✕ A/C Core G.-2 0.5 ft	37.5	13.373	7.295	2.36	81.0	18.7	0.3	

LABORATORY COMPACTION CHARACTERISTICS - STANDARD EFFORT



TEST RESULTS

Source of Material A/C Core Group-1 at 0.5 ft
 Description of Material Well Graded GRAVEL with sand
Percent US Standard No. 200 Sieve = 0.5%
 Test Method ASTM D1557 Method C

Maximum Dry Density 119.7 PCF
 Optimum Water Content 10.7 %
ASTM Rock Corrected Maximum Density = 121.9 at 10.0% Moisture Content

ATTERBERG LIMITS

<u>LL</u>	<u>PL</u>	<u>PI</u>
<u>NP</u>	<u>NP</u>	<u>NP</u>

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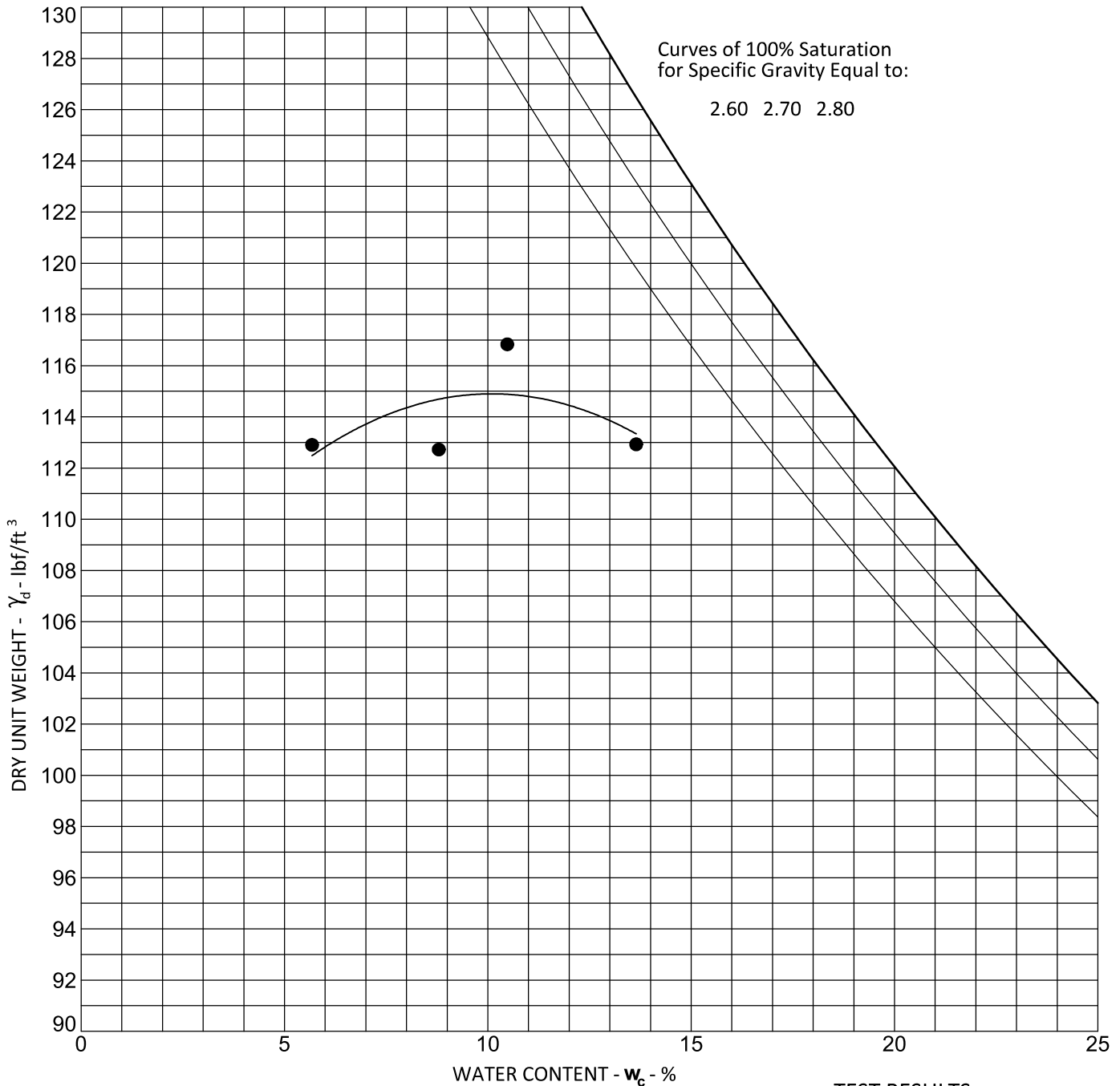
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PROJECT: PHOENIX SKY HARBOR INTERNATIONAL AIRPORT
 LOCATION: PHOENIX, ARIZONA
 PROJECT NO.: 21211A227

PLATE
B-15

COMPACTION CURVE

LABORATORY COMPACTION CHARACTERISTICS - STANDARD EFFORT



TEST RESULTS

Source of Material A/C Core Group-2 at 0.5 ft
 Description of Material Well Graded GRAVEL with sand
Percent US Standard No. 200 Sieve = 0.3%
 Test Method ASTM D1557 Method C

Maximum Dry Density 118.1 PCF
 Optimum Water Content 11.7 %
ASTM Rock Corrected Maximum Density = 121.4 at 10.6% Moisture Content

ATTERBERG LIMITS

<u>LL</u>	<u>PL</u>	<u>PI</u>
<u>NP</u>	<u>NP</u>	<u>NP</u>

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PROJECT: PHOENIX SKY HARBOR INTERNATIONAL AIRPORT
 LOCATION: PHOENIX, ARIZONA
 PROJECT NO.: 21211A227

PLATE
B-16

COMPACTION CURVE

**CALIFORNIA BEARING RATIO
(CBR)**

Client **TRACE CONSULTING, LLC**
1201 EAST JEFFERSON STREET, SUITE 3
PHOENIX, AZ 85034

Date of Report
 Job No. **2121JA277**
 Event / Invoice No.
 Authorized By
 Sampled By **A. GONZALEZ**
 Submitted By **A. GONZALEZ**
 Lab No. **20063**
 Date **11/12/2021**
 Date **11/12/2021**

Project **PHOENIX SKY HARBOR AIRPORT**
 Type / Use of Material **ASPHALT CONCRETE**
 Sample Source / Location **ASPHALT CONCRETE**
 Testing Authorized **A. DE LA ROCHA**

Location **GROUP 1 (B-1 to B-12)**
 Supplier / Source **CRUSHED A/C CORES**
 Source / Location Desig. By
 Date

TEST RESULTS

LABORATORY COMPACTION CHARACTERISTICS ASTM D698 AASHTO T99 ASTM D1557 AASHTO T180 **METHOD C**

MAXIMUM DRY DENSITY, PCF **119.7**
 OPTIMUM MOISTURE, % **10.7**

BEARING RATIO OF LABORATORY-COMPACTED SPECIMENS, ASTM D1883

COMPACTIVE EFFORT, BLOWS PER LAYER	10	25	56
DRY DENSITY AT COMPACTION, PCF	97.7	108.4	120.9
PERCENT OF MAXIMUM DRY DENSITY, %	81.6	90.5	101.0
MOISTURE BEFORE COMPACTION, %	8.4	9.7	8.5
MOISTURE AFTER COMPACTION, %	8.2	7.0	6.5
DRY DENSITY AFTER SOAKING, PCF	99.4	110.3	120.8
MOISTURE AFTER SOAKING (TOP ONE INCH), %	4.7	6.1	7.0
MOISTURE AFTER SOAKING (AVERAGE OF TOTAL SAMPLE), %	6.7	8.3	8.2
SWELL, %	-1.2	-0.8	-0.1
CALIFORNIA BEARING RATIO AT 0.100 INCH PENETRATION	6	8	34
CALIFORNIA BEARING RATIO AT 0.200 INCH PENETRATION	5	9	39
SURCHARGE WEIGHT, LBS.	20	20	20
PERCENT OF PLUS 19 MM MATERIAL, %	0	0	0

Comments:

Copies To: **CLIENT – (1)**

B-17

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CRUSHED A/C CORES GROUP 1



PLATE:

B-18

PROJECT: PHOENIX SKY HARBOR INTERNATIONAL AIRPORT WAC APRON RECONSTRUCTION
 JOB NO.: 21211A227

CALIFORNIA BEARING RATIO (CBR) CHART

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**CALIFORNIA BEARING RATIO
(CBR)**

Client **TRACE CONSULTING, LLC**
1201 EAST JEFFERSON STREET, SUITE 3
PHOENIX, AZ 85034

Date of Report
 Job No. **2121JA277**
 Event / Invoice No.
 Authorized By
 Sampled By **A. GONZALEZ**
 Submitted By **A. GONZALEZ**

Lab No. **20064**
 Date
 Date **11/12/2021**
 Date **11/12/2021**

Project **PHOENIX SKY HARBOR AIRPORT**
 Type / Use of Material **ASPHALT CONCRETE**
 Sample Source / Location **ASPHALT CONCRETE**
 Testing Authorized **A. DE LA ROCHA**

Location **GROUP 2 (B-13 to B-18)**
 Supplier / Source **CRUSHED A/C CORES**
 Source / Location Desig. By
 Date

TEST RESULTS

LABORATORY COMPACTION CHARACTERISTICS ASTM D698 AASHTO T99 ASTM D1557 AASHTO T180 **METHOD C**

MAXIMUM DRY DENSITY, PCF **118.1**

OPTIMUM MOISTURE, % **11.7**

BEARING RATIO OF LABORATORY-COMPACTED SPECIMENS, ASTM D1883

COMPACTIVE EFFORT, BLOWS PER LAYER	10	25	56
DRY DENSITY AT COMPACTION, PCF	88.2	99.0	113.5
PERCENT OF MAXIMUM DRY DENSITY, %	74.7	83.8	96.1
MOISTURE BEFORE COMPACTION, %	9.9	10.2	10.8
MOISTURE AFTER COMPACTION, %	9.5	6.5	4.6
DRY DENSITY AFTER SOAKING, PCF	90.6	101.5	115.3
MOISTURE AFTER SOAKING (TOP ONE INCH), %	4.6	5.3	6.9
MOISTURE AFTER SOAKING (AVERAGE OF TOTAL SAMPLE), %	6.4	6.4	7.8
SWELL, %	-1.3	-2.2	-0.2
CALIFORNIA BEARING RATIO AT 0.100 INCH PENETRATION	13	14	30
CALIFORNIA BEARING RATIO AT 0.200 INCH PENETRATION	11	12	30
SURCHARGE WEIGHT, LBS.	20	20	20
PERCENT OF PLUS 19 MM MATERIAL, %	0	0	0

Comments:

Copies To: **CLIENT – (1)**

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A. De La Rocha

CRUSHED A/C CORES GROUP 2

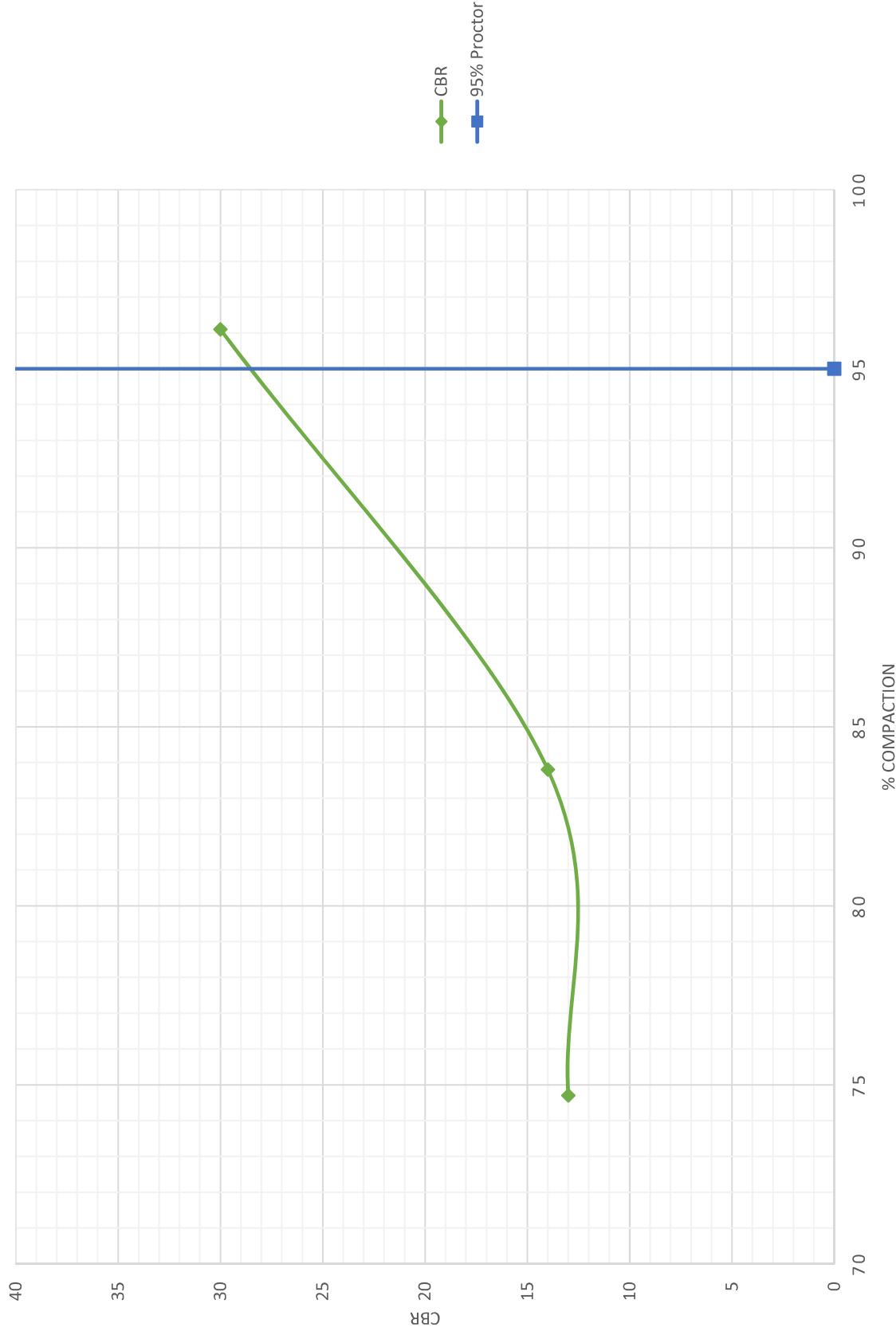


PLATE:
B-20

PROJECT: PHOENIX SKY HARBOR INTERNATIONAL AIRPORT WAC APRON RECONSTRUCTION
JOB NO.: 2121JA227

CALIFORNIA BEARING RATIO (CBR) CHART

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APPENDIX C

Federal Aviation Administration FAARFIELD 2.0 Section Report

FAARFIELD 2.0.2 (Build 03/31/2021)

Job Name: FAARFIELD - Full Fleet Mix

Section: Conventional - Full Fleet Mix

Analysis Type: New Flexible

Last Run: Thickness Design 2022-06-10 16:30:42

Design Life = 20 Years

Total thickness to the top of the subgrade = 15.0in.

Pavement Structure Information by Layer

No.	Type	Thickness in.	Modulus psi	Poisson's Ratio	Strength R psi
1	P-401/P-403 HMA Surface	4.0	200000	0.35	0
2	P-401/P-403 HMA Stabilized	5.0	400000	0.35	0
3	P-209 Crushed Aggregate	6.0	77534	0.35	0
4	Subgrade	0	37500	0.35	0

Airplane Information

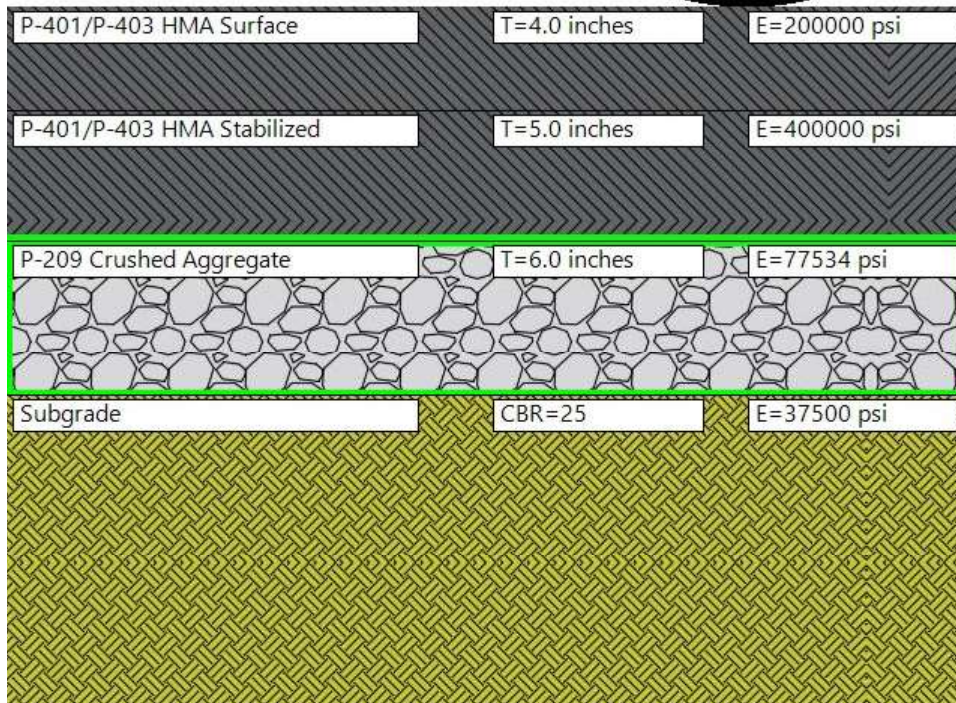
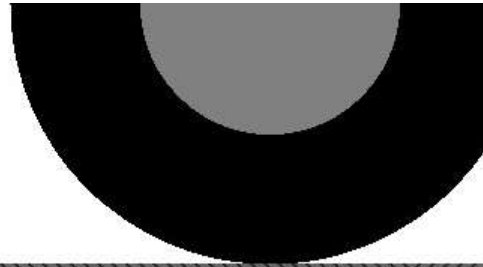
No.	Name	Gross Wt. lbs	Annual Departures	% Annual Growth
1	ERJ-145 XR	53352	11683	-4.78
2	CRJ900	85000	6114	2.8
3	EMB-190 STD	105712	14949	-1.51
4	A319neo	167325	9689	1.26
5	A320-200 opt	172850	100000	1.97
6	A321-200 opt	207025	28348	2.73
7	B777-200	547000	1667	1.3
8	B767-300 ER/Freighter	413000	3700	3
9	A320-200 opt	172850	20874	1.97

Additional Airplane Information

Subgrade CDF

No.	Name	CDF Contribution	CDF Max for Airplane	P/C Ratio
1	ERJ-145 XR	0.00	0.00	2.02
2	CRJ900	0.00	0.00	1.71
3	EMB-190 STD	0.00	0.00	1.71
4	A319neo	0.00	0.00	1.67
5	A320-200 opt	0.00	0.00	1.7
6	A321-200 opt	0.35	0.35	1.64
7	B777-200	0.00	0.00	2.01
8	B767-300 ER/Freighter	0.01	0.01	1.76
9	A320-200 opt	0.00	0.00	1.7

User Is responsible For checking frost protection requirements.



Federal Aviation Administration FAARFIELD 2.0 Section Report

FAARFIELD 2.0.2 (Build 03/31/2021)

Job Name: FAARFIELD - Full Fleet Mix

Section: Conventional - Full Fleet Mix

Analysis Type: New Rigid

Last Run: Thickness Design 2022-06-10 17:53:23

Design Life = 20 Years

Total thickness to the top of the subgrade = 29.8in.

Pavement Structure Information by Layer

No.	Type	Thickness in.	Modulus psi	Poisson's Ratio	Strength R psi
1	P-501 PCC Surface	18.8	4000000	0.15	650.0
2	P-401/P-403 HMA Stabilized	5.0	400000	0.35	0
3	P-209 Crushed Aggregate	6.0	93657	0.35	0
4	Subgrade	0	50000	0.4	0

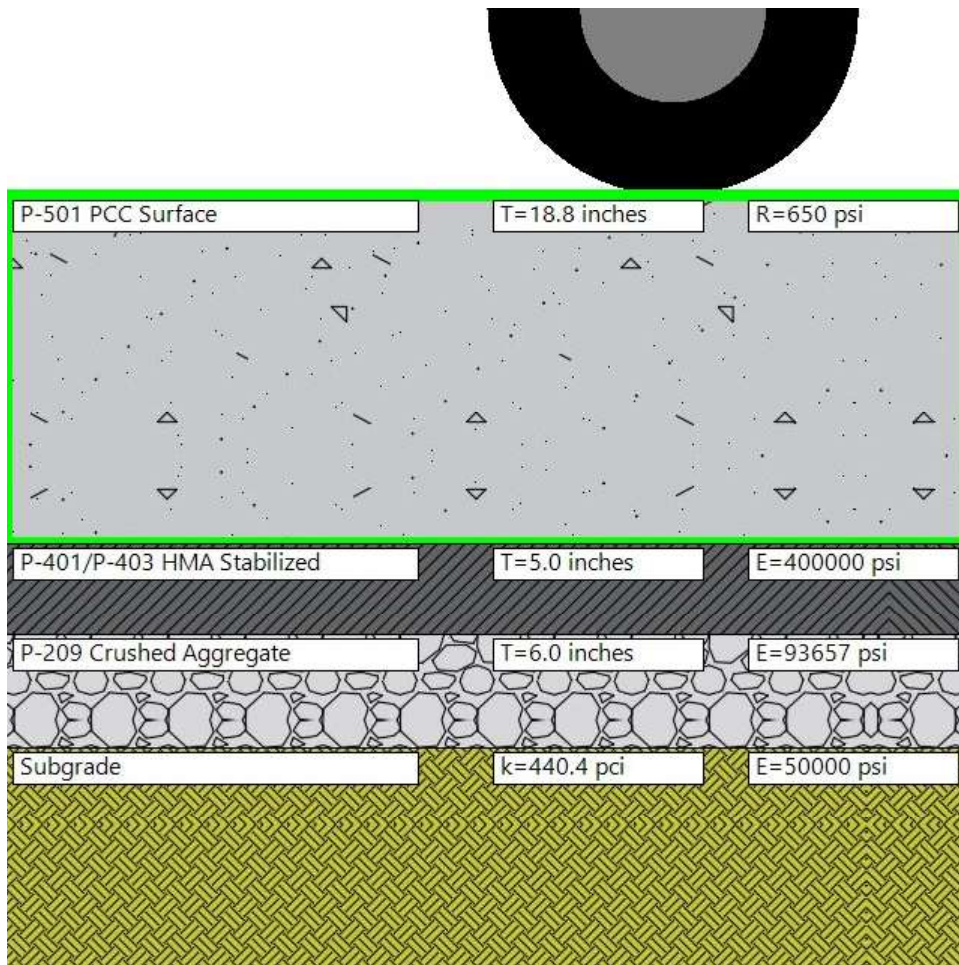
Airplane Information

No.	Name	Gross Wt. lbs	Annual Departures	% Annual Growth
1	ERJ-145 XR	53352	11683	-4.78
2	CRJ900	85000	6114	2.8
3	EMB-190 STD	105712	14949	-1.51
4	A319neo	167325	9689	1.26
5	A320-200 opt	172850	100000	1.97
6	A321-200 opt	207025	28348	2.73
7	B777-200	547000	1667	1.3
8	B767-300 ER/Freighter	413000	3700	3
9	A320-200 opt	172850	20874	1.97

Additional Airplane Information

No.	Name	CDF Contribution	CDF Max for Airplane	P/C Ratio
1	ERJ-145 XR	0.00	0.00	5.27
2	CRJ900	0.00	0.00	4.17
3	EMB-190 STD	0.00	0.00	3.85
4	A319neo	0.00	0.00	3.56
5	A320-200 opt	0.00	0.00	3.67
6	A321-200 opt	0.99	0.99	3.42
7	B777-200	0.00	0.00	4.18
8	B767-300 ER/Freighter	0.00	0.00	3.61
9	A320-200 opt	0.00	0.00	3.67

User Is responsible For checking frost protection requirements.



Federal Aviation Administration FAARFIELD 2.0 Section Report

FAARFIELD 2.0.2 (Build 03/31/2021)

Job Name: FAARFIELD - PCCP Full Fleet Mix

Section: Conventional - Full Fleet Mix

Analysis Type: New Rigid

Last Run: Thickness Design 2022-09-27 15:58:47

Design Life = 20 Years

Total thickness to the top of the subgrade = 29.0in.

Pavement Structure Information by Layer

No.	Type	Thickness in.	Modulus psi	Poisson's Ratio	Strength R psi
1	P-501 PCC Surface	19.0	4000000	0.15	650.0
2	User Defined	10.0	150000	0.35	0
3	Subgrade	0	50000	0.4	0

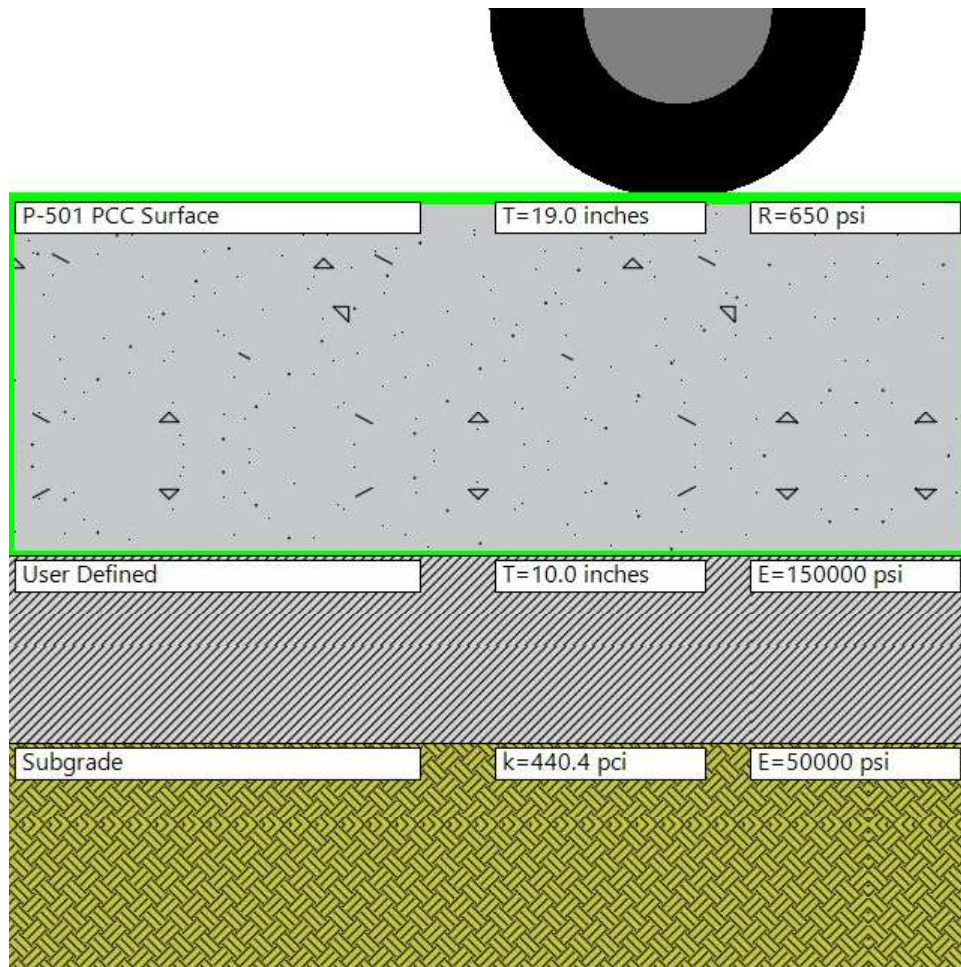
Airplane Information

No.	Name	Gross Wt. lbs	Annual Departures	% Annual Growth
1	ERJ-145 XR	53352	11683	-4.78
2	CRJ900	85000	6114	2.8
3	EMB-190 STD	105712	14949	-1.51
4	A319neo	167325	9689	1.26
5	A320-200 opt	172850	100000	1.97
6	A321-200 opt	207025	28348	2.73
7	B777-200	547000	1667	1.3
8	B767-300 ER/Freighter	413000	3700	3
9	A320-200 opt	172850	20874	1.97

Additional Airplane Information

No.	Name	CDF Contribution	CDF Max for Airplane	P/C Ratio
1	ERJ-145 XR	0.00	0.00	5.27
2	CRJ900	0.00	0.00	4.17
3	EMB-190 STD	0.00	0.00	3.85
4	A319neo	0.00	0.00	3.56
5	A320-200 opt	0.00	0.00	3.67
6	A321-200 opt	1.00	1.00	3.42
7	B777-200	0.00	0.00	4.18
8	B767-300 ER/Freighter	0.00	0.00	3.61
9	A320-200 opt	0.00	0.00	3.67

User Is responsible For checking frost protection requirements.



APPENDIX D



PHOTOGRAPHIC LOG

PHOENIX SKY HARBOR INTERNATIONAL AIRPORT

TRACE CONSULTING, LLC
1291 EAST JEFFERSON STREET, SUITE 3
PHOENIX, ARIZONA 85034

WT Job No.: 2121JA227

12/1/2021



B1 Core Thickness: 8.1-in
Top: 2.4-in, Middle 3.3-in, Bottom: 2.4-in.



B2 Core Thickness: 7.9-in
Top: 1.9-in, Middle 2.9-in, Bottom: 3.1-in.



B3 Core Thickness: 8.5-in
Top: 2.2-in, Middle 4.1-in, Bottom: 2.2-in.



B4 Core Thickness: 8.5-in
Top: 1.8-in, Middle 4.2-in, Bottom: 2.5-in.



PHOTOGRAPHIC LOG

PHOENIX SKY HARBOR INTERNATIONAL AIRPORT

TRACE CONSULTING, LLC
1291 EAST JEFFERSON STREET, SUITE 3
PHOENIX, ARIZONA 85034

WT Job No.: 2121JA227

12/1/2021



B5 Core Thickness: 9.0-in
Top: 2.1-in, Middle 3.8-in, Bottom: 3.1-in.



B6 Core Thickness: 9.0-in
Top: 2.2-in, Middle 4.2-in, Bottom: 2.6-in.



B7 Core Thickness: 9.1-in
Top: 1.9-in, Middle 4.3-in, Bottom: 2.9-in.



B8 Core Thickness: 9.0-in
Top: 2.3-in, Middle 3.9-in, Bottom: 2.7-in.



PHOTOGRAPHIC LOG

PHOENIX SKY HARBOR INTERNATIONAL AIRPORT

TRACE CONSULTING, LLC
1291 EAST JEFFERSON STREET, SUITE 3
PHOENIX, ARIZONA 85034

WT Job No.: 2121JA227

12/1/2021



B9 Core Thickness: 7.7-in
Top: 1.6-in, Middle 4.1-in, Bottom: 1.9-in.



B10 Core Thickness: 8.8-in
Top: 2.2-in, Middle 4.2-in, Bottom: 2.4-in.



B11 Core Thickness: 9.4-in
Top: 2.3-in, Middle 4.1-in, Bottom: 3.0-in.



B12 Core Thickness: 8.3-in
Top: 2.1-in, Middle 3.9-in, Bottom: 2.3-in.



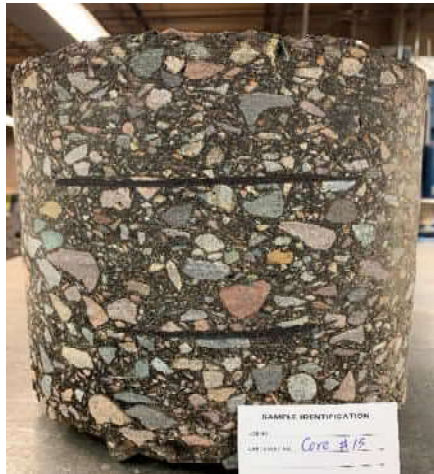
PHOTOGRAPHIC LOG

PHOENIX SKY HARBOR INTERNATIONAL AIRPORT

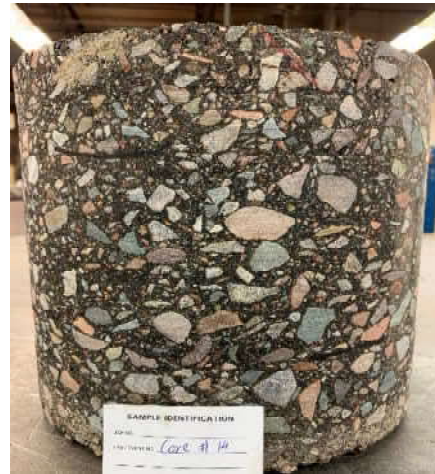
TRACE CONSULTING, LLC
1291 EAST JEFFERSON STREET, SUITE 3
PHOENIX, ARIZONA 85034

WT Job No.: 2121JA227

12/1/2021



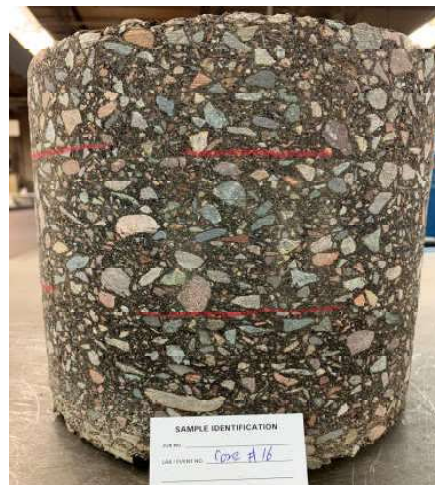
B13 Core Thickness: 8.4-in
Top: 2.5-in, Middle 2.9-in, Bottom: 3.0-in.



B14 Core Thickness: 8.7-in
Top: 2.1-in, Middle 3.9-in, Bottom: 2.7-in.



B15 Core Thickness: 8.9-in
Top: 2.1-in, Middle 3.4-in, Bottom: 3.4-in.



B16 Core Thickness: 8.9-in
Top: 2.2-in, Middle 3.1-in, Bottom: 3.6-in.



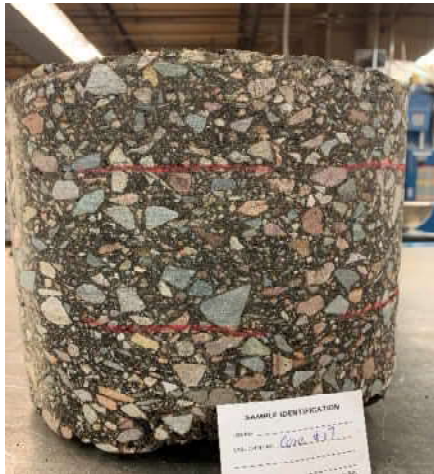
PHOTOGRAPHIC LOG

PHOENIX SKY HARBOR INTERNATIONAL AIRPORT

TRACE CONSULTING, LLC
1291 EAST JEFFERSON STREET, SUITE 3
PHOENIX, ARIZONA 85034

WT Job No.: 2121JA227

12/1/2021



B17 Core Thickness: 8.4-in
Top: 2.1-in, Middle 3.1-in, Bottom: 3.3-in.



B18 Core Thickness: 8.5-in
Top: 2.3-in, Middle 3.1-in, Bottom: 3.1-in.