ARIZONA DEPARTMENT OF TRANSPORTATION

ADVERTISEMENT FOR BIDS

SPECIAL PROVISIONS

BIDDERS DOCUMENTS

TRACS/Proj. No.:

040 NA 283 F064501C 040-D(248)T
FLAGSTAFF-HOLBROOK HIGHWAY (I-40)
(PERKINS VALLEY TI UP (STRUCTURE #1776))

Contracts and Specifications Group
205 S. 17TH Ave., 2nd Floor, M/D 121F
Phoenix, Arizona 85007-3217

ARIZONA DEPARTMENT OF TRANSPORTATION

ADVERTISEMENT FOR BIDS

BID OPENING: FRIDAY, AUGUST 8, 2025, AT 11:00 A.M. (M.S.T.)

TRACS NO	040 NA 283 F0645 01C
PROJECT NO	040-D(248)T
TERMINI	FLAGSTAFF – HOLBROOK HIGHWAY (I-40)
LOCATION	PERKINS VALLEY TI UP (STRUCTURE #1776)

ROUTE NO.	MILEPOST	DISTRICT	ITEM NO.
I-40	283.4	NORTHEAST	103722

The amount programmed for this contract is $11,969,900.00. The location and description of the proposed work are as follows:

The proposed project is located in Navajo County on Interstate 40 on MP 283.4 within the Arizona Dept. of Transportation (ADOT) Northeast Engineering and Maintenance District. The work consists of replacing the existing bridge deck for the Perkins Valley Traffic Interchange Underpass structure bridge. Additional work includes existing guardrail, guardrail terminals, placing pavement markings and other miscellaneous work.

The time allowed for the completion of the work included in this contract will be **350** working days.

The Arizona Department of Transportation, 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 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.

The minimum contract-specified goal for participation by Disadvantaged Business Enterprises in the work, as a percentage of the total amount bid, shall be 0.0 .

Contract documents, and other project documents, if applicable, are available as electronic files, at no charge, from the Department's website through the ADOT Contracts and Specifications Group (https://azdot.gov/business/contracts-and-specifications/current-advertisements).

Documents will be available within one week following the advertisement for bids.

To submit a valid bid, the bidder must (1) have prequalification from the Department as necessary for the project, and (2) be included on the project Plansholder List as a Prime.

The Application for Contractor Prequalification may be obtained from the Contracts and Specifications website.

This project requires electronic bidding. If a request for approval to bid as a Prime Contractor is received less than 48 hours prior to bid opening, the Department cannot guarantee the request will be acted on.

This contract is subject to the provisions of Arizona Revised Statutes Section 42-5075 -- Prime contracting classification; exemptions; definitions.

No award will be made to any contractor who is not a duly licensed contractor in accordance with Arizona Revised Statutes 32-1101 through 32-1170.03.

All labor employed on this project shall be paid in accordance with the minimum wage rates shown in the General Wage Decision. These rates have been determined in accordance with the requirements of the law and issued by the Secretary of Labor for this project. The wage scale is on file in Contracts and Specifications Section and copies may be obtained at all reasonable times.

Persons that require a reasonable accommodation based on language or disability should contact ADOT's Contracts and Specifications Office by phone (602) 712-7221. Requests should be made as early as possible to ensure the State has an opportunity to address the accommodation.

Las personas que requieran asistencia (dentro de lo razonable) ya sea por el idioma o discapacidad deben ponerse en contacto con ADOT (602) 712-7221.

A proposal guaranty in the form of either a certified or a cashier's check made payable to the State Treasurer of Arizona for not less than 10 percent of the amount of the bid or in the form of a surety (bid) bond for 10 percent of the amount of the bid shall accompany the proposal.

Surety (bid) bonds will be accepted only on the form provided by the Department and only from corporate sureties authorized to do business in Arizona.

Bids will be received until the hour indicated and then publicly opened and read. No bids will be received after the time specified.

Prior to the bid opening date, any questions pertaining to the plans, specifications, and bid schedule for this project shall be submitted to the Department in a written format through the Bid Express (Bidx) website at https://www.bidx.com/az/lettings. Questions shall be submitted through the Questions and Answers (Q&A) link located within the corresponding letting date and project proposal number links. The Department may not answer all questions, and any decision on whether a question is answered will be within the sole discretion of the Department. Any questions received less than three working days prior to the bid opening date may not be answered.

The Engineering Specialist assigned to this project is: Rene Teran, rteran@azdot.gov, any correspondence with the Engineering Specialist is subject to posting onto Bidx through the project's Q&A link. Answers to questions will not be given verbally, but will be posted exclusively to the Bidx website.

Kirstin Huston, P.E.
Group Manager
Contracts & Specifications

PROJECT ADVERTISED ON: June 27, 2025

SPECIAL PROVISIONS

FOR

ARIZONA PROJECT

040 NA 283 F0645 01C

040-D(248)T

FLAGSTAFF – HOLBROOK HIGHWAY (I-40)

PERKINS VALLEY TI UP (STRUCTURE # 1776)

BRIDGE REHABILITATION

PROPOSED WORK:

The proposed project is located in Navajo County on Interstate 40 on MP 283.4 within the Arizona Dept. of Transportation (ADOT) Northeast Engineering and Maintenance District. The work consists of replacing the existing bridge deck for the Perkins Valley Traffic Interchange Underpass structure Bridge.. Additional work includes replacing existing guardrail, guardrail terminals, placing pavement markings and other miscellaneous work.

(SPC00FA, 10/19/23)

SPECIFICATIONS:

The work embraced herein shall be performed in accordance with the requirements of the following separate documents:

Arizona Department of Transportation, Standard Specifications for Road and Bridge Construction, Edition of 2021,

Arizona Department of Transportation, Roadway Engineering Group, Construction Standard Drawings, listed in the project plans, and available on the Department's website,

Arizona Department of Transportation, Traffic Group, Manual of Approved Signs, available on the Department's website,

Arizona Department of Transportation, Traffic Group, Traffic Control Design Guidelines, 2019 Edition, available on the Department's website,

Manual on Uniform Traffic Control Devices for Streets and Highways, 2009 edition and Arizona Supplement to the 2009 edition, dated January, 2012,

The Proposal Pamphlet which includes the following documents:

These Special Provisions,

Attachment 1 – Subgrade Acceptance Chart

Attachment 2 – Slump Loss Test of Portland Cement Concrete

Attachment 3 - Evaporation Rate of Surface Moisture

Required Contract Provisions Federal-Aid Construction Contracts (Form FHWA 1273 Revised October 23, 2023),

Standard Federal Equal Employment Opportunity Construction Contract Specifications (Executive Order 11246), July 1, 1978, Revised November 3, 1980 and Revised April 15, 1981,

Title VI / Non-Discrimination Assurances,
Appendix A
Appendix E,

Notice of Requirement for Affirmative Action to Ensure Equal Employment Opportunity (Executive Order 11246), July 1, 1978, Revised November 3, 1980 and Revised April

15, 1981,

Equal Employment Opportunity Compliance Reports, Federal-Aid Projects, February 1, 1977, Revised July 1, 1978, Revised November 3, 1980, Revised April 15, 1981,

Revised September 7, 1983, Revised October 15, 1998, Revised January 1, 2005, Revised August 1, 2005, and Revised March 1, 2015,

Wage Determination Decision,

Bidding Schedule,

Proposal,

Surety (Bid) Bond, 12-1303,

Certification With Regard to the Performance of Previous Contracts or Subcontracts Subject to the Equal Opportunity Clause and the Filing of Required Reports, Federal Aid Projects, April, 1969, Rev. July, 2003,

Certification With Respect to the Receipt of Addenda,

Participation in Boycott of Israel Certification Form,

Forced Labor of Ethnic Uyghurs Ban Certification Form, Rev. November 2022.

BID SUBMISSION:

In submitting a bid, the bidder shall completely execute the following documents:

Proposal,

Bidding Schedule,

Surety (Bid) Bond, 12-1303,

Certification With Regard to the Performance of Previous Contracts or Subcontracts Subject to the Equal Opportunity Clause and the Filing of Required Reports, Federal Aid Projects, April, 1969, Rev. July, 2003,

Certification With Respect to the Receipt of Addenda,

Participation in Boycott of Israel Certification Form, and

Forced Labor of Ethnic Uyghurs Ban Certification Form, Rev. November 2022.

PROPOSAL GUARANTY:

Each bidder is advised to satisfy itself as to the character and the amount of the proposal guaranty required in the Advertisement for Bids.

CONTRACT DOCUMENTS:

The bidder to whom an award is made will be required to execute a Performance Bond and a Payment Bond, each in 100 percent of the amount of the bid, an Insurance Certificate and the Contract Agreement.

A copy of these documents is not included in the Proposal Pamphlet; however, each bidder shall satisfy itself as to the requirements of each document.

The documents, approved by the Department of Transportation, Highways Division, are identified as follows:

Statutory Performance Bond, 12-1301, September, 1992

Statutory Payment Bond, 12-1302, September, 1992

Contract Agreement, 12-0912, August, 2000

Certificate of Insurance, 12-0100, June, 1998

A copy of each document may be obtained by making a request to Contracts & Specifications.

MATERIAL AND SITE INFORMATION:

Projects requiring materials, excavation, or site investigation may have additional information available concerning the material investigations of the project site and adjacent projects. This information, when available and applicable, may be examined in the Office of the Bridge Group-Geotechnical Services, located at 205 S. 17th Avenue, Phoenix, AZ 85007-3212. The contractor may contact Bridge Group at (602) 712-7481 to schedule an appointment to examine the information. This information will not be attached to the contract documents.

(EPRISENGL, 12/19/24)

DISADVANTAGED BUSINESS ENTERPRISES:

1.0 Policy:

The Arizona Department of Transportation (hereinafter the Department) has established a Disadvantaged Business Enterprise (DBE) program in accordance with the regulations of the U.S. Department of Transportation (USDOT), 49 Code of Federal Regulation Part 26 (49 CFR Part 26). The Department has received Federal financial assistance from the U.S. Department of Transportation and as a condition of receiving this assistance, the Department has signed an assurance that it will comply with 49 CFR Part 26.

It is the policy of the Department to ensure that DBEs (hereinafter DBE or DBE firm), as defined in Part 26, have an equal opportunity to receive and participate in USDOT-assisted contracts. It is also the policy of the Department:

(A) To ensure nondiscrimination in the award and administration of USDOT-assisted contracts;

(B) To create a level playing field on which DBEs can compete fairly for USDOT-assisted contracts;

(C) To ensure that the DBE program is narrowly tailored in accordance with applicable law;

(D) To ensure that only firms that fully meet 49 CFR Part 26 eligibility standards are counted as DBEs;

(E) To help remove barriers to the participation of DBEs in USDOT-assisted contracts,

(F) To assist in the development of firms that can compete successfully in the market place outside the DBE program; and

(G) To promote the use of DBEs in all types of federally-assisted contracts and procurement activities.

It is also the policy of the Department to facilitate and encourage participation of Small Business Concerns (SBCs), as defined herein, in USDOT-assisted contracts. The Department encourages contractors to take reasonable steps to eliminate obstacles to SBCs' participation and to utilize SBCs in performing contracts.

2.0 Assurances of Non-Discrimination:

The contractor, subrecipient, or subcontractor shall not discriminate on the basis of race, color, sex or national origin in the performance of this contract. The contractor shall 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 or such other remedy as the State deems appropriate, which may include, but are not limited to:

(A) Withholding monthly progress payments;

(B) Assessing sanctions; and/or

(C) Disqualifying the contractor from future bidding as non-responsible.

The contractor, subrecipient, or subcontractor shall ensure that all subcontract agreements contain this non-discrimination assurance.

3.0 Definitions:

(A) Commercially Useful Function (CUF): Commercially Useful Function is defined in 49 CFR Part 26.55. That definition is incorporated herein by reference.

(B) Disadvantaged Business Enterprise (DBE): A DBE, as defined in 49 CFR Part 26.5, is a for-profit small business concern which meets both of the following requirements:

(1) Is at least 51 percent owned by one or more individuals who are both socially and economically disadvantaged; and,

(2) Whose management and daily business operations are controlled by one or more of the socially and economically disadvantaged individuals who own it.

(C) Joint Check: a two-party check between a subcontractor, DBE and/or non-DBE, a prime contractor and the regular dealer of material supplies.

(D) Joint Venture: an association of a DBE firm and one or more other firms to carry out a single, for-profit business enterprise, for which parties combine their property, capital, efforts, skills and knowledge, and in which the DBE is responsible for a distinct, clearly defined portion of the work of the contract and whose share in the capital contribution, control, management, risks, and profits of the joint venture are commensurate with its ownership interest.

(E) NAICS Code: The North American Industry Classification System (NAICS) is the standard used by Federal statistical agencies in classifying business establishments for the purpose of collecting, analyzing, and publishing statistical data related to the US business economy.

(F) Non-DBE: any firm that is not a DBE.

(G) Race Conscious: a measure or program is one that is focused specifically on assisting only DBEs, including women-owned DBEs.

(H) Race Neutral: a measure or program is one that is, or can be, used to assist all small businesses. For the purposes of this part, race-neutral includes gender-neutrality.

(I) Small Business Concern: a business that meets all of the following conditions:

(1) Operates as a for-profit business

(2) Operates a place of business primarily within the U.S., or makes a significant contribution to the U.S. economy through payment of taxes or use of American products, materials, or labor;

(3) Is independently owned and operated;

(4) Is not dominant in its field on a national basis; and

(5) Does not have annual gross receipts that exceed the Small Business Administration size standards average annual income criteria for its primary North American Industry Classification System (NAICS) code.

(J) Socially and Economically Disadvantaged Individuals: Socially and Economically Disadvantaged Individuals is defined in 49 CFR Part 26.5. That definition is directly incorporated here.

(1) Any individual who is a citizen (or lawfully admitted permanent resident) of the United States and who has been subjected to racial or ethnic prejudice or cultural bias within American society because of his or her identity as a member of a group and without regard to his or her individual qualities. The social disadvantage must stem from circumstance beyond the individual's control.

(2) Any individual who is found to be a socially and economically disadvantaged individual on a case-by-case basis. An individual must demonstrate that he or she has held himself or herself out, as a member of a designated group.

(3) Any individual in the following groups, members of which are rebuttably presumed to be socially and economically disadvantaged:

(i) "Black Americans," which includes persons having origins in any of the Black racial groups of Africa;

(ii) "Hispanic Americans," which includes persons of Mexican, Puerto Rican, Cuban, Dominican, Central or South American, or other Spanish or Portuguese culture or origin, regardless of race;

(iii) "Native Americans," which includes persons who are enrolled members of a federally or State recognized Indian tribe, Alaskan Natives or Native Hawaiians;

(iv) “Asian-Pacific Americans,” which includes persons whose origins are from Japan, China, Taiwan, Korea, Burma (Myanmar), Vietnam, Laos, Cambodia (Kampuchea), Thailand, Malaysia, Indonesia, the Philippines, Brunei, Samoa, Guam, the U.S. Trust Territories of the Pacific Islands (Republic of Palau), the Republic of the Northern Marianas Islands, Macao, Fiji, Tonga, Kiribati, Tuvalu, Nauru, Federated States of Micronesia, or Hong Kong;

(v) “Subcontinent Asian Americans,” which includes persons whose origins are from India, Pakistan, Bangladesh, Bhutan, the Maldives Islands, Nepal or Sri Lanka;

(vi) Women;

(vii) Any additional groups whose members are designated as socially and economically disadvantaged by the Small Business Administration (SBA), at such time as the SBA designation becomes effective.

(4) Being born in a particular country does not, standing alone, mean that a person is necessarily a member of one of the groups listed in this definition.

4.0 Working with DBEs:

The Department works with DBEs and assists them in their efforts to participate in the highway construction program. All bidders should contact the Department’s Business Engagement and Compliance Office (BECO) by phone, through email, or at the address shown below, for assistance in their efforts to use DBEs in the highway construction program of the Department. BECO contact information is as follows:

Arizona Department of Transportation
Business Engagement and Compliance Office
1801 W. Jefferson Street, Ste. 101, Mail Drop 154A
Phoenix, AZ 85007
Phone (602) 712-7761
Email: contractorcompliance@azdot.gov
Website: www.azdot.gov/business/business-engagement-and-compliance

4.01 Business Development Program:

The Department has established the Business Development Program as an initiative to encourage and develop disadvantaged businesses in the highway construction industry. The Department is committed to providing new, emerging, developmental and transitional DBEs with general and firm-specific training and technical assistance. The Department intends for this

assistance to aid DBEs to become competitive within the heavy highway and construction industry market places. In particular, the Department's DBE Supportive Services Program (DBE/SS) is designed to work in collaboration with stakeholder organizations (including departments and agencies of State and Federal Governments, small business organizations, tribal governments, profit and nonprofit corporations) to help DBEs to successfully compete for highway construction projects and become self-sufficient. The program provides educational opportunities for DBEs regarding current market conditions, Federal regulatory compliance, and best business practices. These efforts are reinforced with one-on-one business counseling for DBEs certified in areas that directly support Federal-aid highway projects, small group workshops, conferences, business expositions, regular in-person training opportunities, and regular virtual training opportunities. For guidance regarding this program, refer to the Business Development Program Guidelines available on the BECO website at https://azdot.gov/business/business-engagement-and-compliance/dbe-supportive-services/business-development-program/disadvantaged-business-enterprise-dbe-program/dbe.

The Business Development Program is intended to increase legitimate DBE activities. The program operates in conformity with the Federal DBE rules and regulations. The Department's DBE/SS participants may not circumvent the Federal DBE rules or regulations.

5.0 Applicability:

The Department has established an overall annual goal for DBE participation on Federal-aid contracts. The Department intends for the goal to be met with a combination of race conscious efforts and race neutral efforts. Race conscious participation occurs where the contractor uses a percentage of DBEs, as defined herein, to meet the contract-specified goal. Race neutral efforts are those that are, or can be, used to assist all small businesses or increase opportunities for all small businesses. The regulation, 49 CFR 26, describes race neutral participation as when a DBE wins a prime contract through customary competitive procurement procedures or is awarded a subcontract on a prime contract that does not carry a DBE contract goal.

The provisions are applicable to all bidders including DBE bidders.

6.0 Certification and Registration:

6.01 DBE Certification:

Certification as a DBE shall be predicated on:

(A) The completion and execution of an application for certification as a "Disadvantaged Business Enterprise".

(B) The submission of documents pertaining to the firm(s) as stated in the application(s), including but not limited to a statement of social disadvantage and a personal financial statement.

(C) The submission of any additional information which the Department or the applicable Arizona Unified Certification (UCP) agency may require to determine the firm's eligibility to participate in the DBE program.

(D) The information obtained during the on-site visits to the offices of the firm and to active job-sites.

Applications for certification may be filed online with the Department or the applicable UCP agency at any time through the Arizona Unified Transportation Registration and Certification System (AZ UTRACS) website at https://utracz.azdot.gov/Home/.

DBE firms and firms seeking DBE certification shall cooperate fully with requests for information relevant to the certification process. Failure or refusal to provide such information is a ground for denial or removal of certification.

The Department is a member of the AZ Unified Certification Program (AZUCP). Only DBE firms that are certified by the AZUCP are eligible for credit on Department projects. A list of DBE firms certified by AZUCP is available on the internet at https://utracz.azdot.gov/Home/. The list will indicate contact information and specialty for each DBE firm, and may be sorted in a variety of ways. However, the Department does not guarantee the accuracy and/or completeness of this information, nor does the Department represent that any licenses or registrations are appropriate for the work to be done.

The Department's certification of a DBE is not a representation of qualifications and/or abilities only that the firm has met the criteria for DBE certification as outlined in 49 CFR Part 26. The contractor bears all risks of ensuring that DBE firms selected by the contractor are able to perform the work.

6.02 SBC Registration:

To comply with 49 CFR Part 26.39, the Department's DBE Program incorporates contracting requirements to facilitate participation by Small Business Concerns (SBCs) in federally assisted contracts. SBCs are for-profit businesses registered to do business in Arizona that meet the Small Business Administration (SBA) size standards for average annual revenue criteria for its primary North American Industry Classification System (NAICS) code.

While the SBC component of the DBE program does not require utilization goals on projects, the Department encourages contractors to utilize small businesses that are registered in AZ UTRACS on their contracts, in addition to DBEs meeting the certification requirement. The contractor may use the AZ UTRACS website to search for certified DBEs and registered SBCs that can be used on the contract. However, SBCs that are not DBEs will not be counted toward DBE participation.

SBCs can register online at the AZ UTRACS website at https://utracs.azdot.gov/Home/. The Department's registration of SBCs is not a representation of qualifications and/or abilities. The

contractor bears all risks of ensuring that SBC firms selected by the contractor are able to perform the work.

7.0 DBE Financial Institutions:

The Department thoroughly investigates the full extent of services offered by financial institutions owned and controlled by socially and economically disadvantaged individuals in its service area and makes reasonable efforts to use these institutions. The Department encourages prime contractors to use such institutions on USDOT assisted contracts. However, use of DBE financial institutions will not be counted toward DBE participation.

The Department encourages prime contractors to research the Federal Reserve Board website at www.federalreserve.gov to identify minority-owned banks in Arizona derived from the Consolidated Reports of Condition and Income filed quarterly by banks (FFIEC 031 and 041) and from other information on the Board's National Information Center database.

8.0 Time is of the Essence:

TIME IS OF THE ESSENCE IN RESPECT TO THE DBE PROVISIONS.

9.0 Computation of Time:

In computing any period of time described in this DBE special provision, such as calendar days, the day from which the period begins to run is not counted. When the last day of the period is a Saturday, Sunday, or Federal or State holiday, the period extends to the next day that is not a Saturday, Sunday, or Federal or State holiday. When the Department's offices are closed for all or part of the last day, the period extends to the next day on which the Department's offices are open.

10.0 Contractor and Subcontractor Requirements:

10.01 General:

The contractor shall establish a DBE program that will ensure nondiscrimination in the award and administration of contracts and subcontracts.

Agreements between the bidder and a DBE in which the DBE promises not to provide subcontracting quotations to other bidders are prohibited.

10.02 DBE Liaison:

The contractor shall designate a DBE Liaison responsible for the administration of the contractor's DBE program. The name of the designated DBE Liaison shall be included in the DBE Intended Participation Affidavit Summary.

11.0 Bidders/Proposers List and AZ UTRACS Registration Requirement:

Under 49 CFR Part 26.11, DOTs are required to collect certain information from all contractors and subcontractors who seek to work on federally-assisted contracts in order to set overall and contract DBE goals. The Department collects this information through a Bidders/Proposers List when firms register their companies on the Arizona Unified Transportation Registration and Certification System (AZ UTRACS) web portal at https://utracz.azdot.gov/Home/ a centralized database for companies that seek to do business with the Department. This information will be maintained as confidential to the extent allowed by Federal and State law.

All prime contractors, subcontractors, and DBEs, shall: 1) register in AZ UTRACS, and 2) maintain their profile with current and accurate firm information. Bidders may verify that their firm and each subcontractor is registered using the AZ UTRACS website.

Bidders may obtain additional information at the AZ UTRACS website or by contacting BECO.

Bidders shall create the Bidders/Proposers List in the AZ UTRACS by selecting all subcontractors, service providers, manufacturers and suppliers that expressed interest or submitted bids, proposals or quotes for this contract. The Bidders/Proposers List form must be complete and must include the names for all subcontractors, service providers, manufacturers and suppliers regardless of the bidders' intentions to use those firms on the project.

All bidders must complete the Bidders/Proposers List online at AZ UTRACS whether they are the apparent low bidder or not. A confirmation email will be generated by the system. The bidders shall submit to BECO a copy of the email confirmation no later than 4:00 p.m. on the fifth calendar day following the bid opening. Faxed copies are acceptable.

FAILURE TO SUBMIT THE REQUIRED BIDDERS/PROPOSERS LIST CONFIRMATION EMAIL TO BECO BY THE STATED TIME AND IN THE MANNER HEREIN SPECIFIED SHALL BE CAUSE FOR THE BIDDER BEING DEEMED INELIGIBLE FOR AWARD OF THE CONTRACT.

12.0 DBE Goals:

The Department has not established contract goals for DBE participation in this contract. Contractors are still encouraged to employ reasonable means to obtain DBE participation. Contractors must retain records in accordance with these DBE specifications. The contractor is notified that this record keeping is important to the Department so that it can track DBE participation where only race neutral efforts are employed.

13.0 Payment Reporting:

The contractor shall report on a monthly basis indicating the amounts paid to all subcontractors, of all tiers, working on the project. Reporting shall be in accordance with Subsection 109.06(B)(5) of the specifications.

14.0 Crediting DBE Participation:

14.01 General Requirements:

To count toward DBE participation, the DBE firm must be certified in each NAICS code applicable to the kind of work the firm will perform on the contract. NAICS for each DBE can be found on the AZ UTRACS under the Firm Directory. General descriptions of all NAICS codes can be found at www.naics.com.

The entire amount of a contract that is performed by the DBE's own forces, including the cost of supplies and materials purchased by the DBE for the work on the contract and equipment leased by the DBE will be credited toward DBE participation. Supplies and equipment the DBE subcontractor purchases or leases from the prime contractor or its affiliate will not be credited toward DBE participation.

The contractor bears the responsibility to determine whether the DBE possesses the proper contractor's license(s) to perform the work.

The Department's certification is not a representation of a DBE's qualifications and/or abilities. The contractor bears all risks that the DBE may not be able to perform its work for any reason.

A DBE may participate as a prime contractor, subcontractor, joint venture partner with either a prime contractor or a subcontractor, or as a vendor of materials or supplies. A DBE joint venture partner shall be responsible for a clearly defined portion of the work to be performed, in addition to meeting the requirements for ownership and control.

The dollar amount of work to be accomplished by DBEs, including partial amount of a lump sum or other similar item, shall be on the basis of agreements such as: subcontract, purchase order, hourly rate, and rate per ton.

With the exception of bond premiums, all work must be attributed to specific bid items. Where work applies to several items, the DBE contracting arrangement must specify unit price and amount attributable to each bid item. DBE credit for any individual item of work performed by the DBE shall be the lesser of the amount to be paid to the DBE or the prime contractor's bid price. If the amount bid by the DBE on any item exceeds the prime contractor's bid amount, the prime contractor may not obtain credit by attributing the excess to other items.

Where more than one DBE is engaged to perform parts of an item (for example, supply and installation), the total amount payable to the DBEs will not be considered in excess of the prime contractor's bid amount for that item.

Bond premiums may be stated separately, so long as the arrangement between the prime contractor and the DBE provides for separate payment not to exceed the price charged by the bonding company.

DBE credit may be obtained only for specific work done for the project, supply of equipment specifically for physical work on the project, or supply of materials to be incorporated in the work. DBE credit will not be allowed for costs such as overhead items, capital expenditures (for example, purchase of equipment), and office items.

If a DBE performs part of an item (for example, installation of materials purchased by a Non-DBE), the DBE credit shall not exceed the lesser of (1) the DBE's contract or (2) the prime contractor's bid for the item, less a reasonable deduction for the portion performed by the Non-DBE.

When a DBE performs as a partner in a joint venture, only that portion of the total dollar value of the contract which is clearly and distinctly performed by the DBE's own forces can be credited.

The contractor may credit second-tier subcontracts issued to DBEs by non-DBE subcontractors. Any second-tier subcontract to a DBE must meet the requirements of a first-tier DBE subcontract.

A prime contractor may credit the entire amount of that portion of a construction contract that is performed by the DBE's own forces. The cost of supplies and materials obtained by the DBE for the work of the contract can be included so long as that cost is reasonable. Leased equipment may also be included. No credit is permitted for supplies purchased or equipment leased from the prime contractor or its affiliate(s).

When a DBE subcontracts a part of the work of its contract to another firm, the value of the subcontract may be credited towards DBE participation only if the DBE's subcontractor is itself a DBE and performs the work with its own forces. Work that a DBE subcontracts to a non-DBE firm does not count towards DBE participation.

A prime contractor may credit the entire amount of fees or commissions charged by a DBE firm for providing a bona fide service, such as professional, technical, consultant, or managerial services, or for providing bonds or insurance specifically required for the performance of a USDOT-assisted contract, provided the fees are reasonable and not excessive as compared with fees customarily allowed for similar services.

14.02 Effect of Loss of DBE Eligibility:

If a DBE or a DBE prime contractor is deemed ineligible, decertified, or suspended by the Department in accordance with 49 CFR Part 26.87 and 49 CFR Part 26.88, the following provisions shall apply:

(A) If a DBE firm loses its DBE eligibility because the DBE firm was acquired by a non-DBE firm, no work performed by the DBE firm after the Decision Date will be counted toward DBE participation.

(B) If a subcontract, contract, or supplier arrangement has been executed before the Decision Date, work performed by the DBE firm will be counted toward DBE participation.

(C) If neither paragraph (A) nor paragraph (B) above applies, the work performed by the DBE firm after the Decision Date will be counted toward DBE participation.

(D) If the contractor extends or adds work to the DBE firm's subcontract, that work will not be counted towards DBE participation unless the contractor has obtained prior approval from the Department for DBE credit. Any requests to extend or add work to the DBE firm's subcontract to count towards DBE participation shall be submitted using the request form, made available on BECO's website at https://azdot.gov/business/business-engagement-and-compliance/dbe-contract-compliance/contract-specs-and-forms, to extend Decertified DBE contract for DBE credit.

(E) The Department will consent to such DBE credit only if the added work is within the foreseeable range of added work, given the circumstances of the original DBE contract.

(F) For the purposes of this subsection, "Decision Date" means the date the Department notifies the DBE that it has become ineligible, decertified, or suspended under 49 CFR Part 26.87(c)(4), (g).

14.03 Notifying the Contractor of DBE Certification Status:

Each DBE contract of any tier shall require any DBE subcontractor or supplier that is either decertified or certified during the term of the contract to immediately notify the contractor and all parties to the DBE contract in writing, with the date of decertification or certification. The contractor shall require that this provision be incorporated in any contract of any tier in which a DBE is a participant.

14.04 Police Officers:

DBE credit will not be permitted for procuring DPS officers. For projects on which officers from other agencies are supplied, DBE credit will be given only for the broker fees charged, and will not include amounts paid to the officers. The broker fees must be reasonable.

14.05 Commercially Useful Function:

A prime contractor can credit expenditures to a DBE subcontractor only if the DBE performs a commercially useful function (CUF) on the contract.

In conformity with 49 CFR Part 26.55(c), a DBE performs a CUF when it is responsible for execution of the work of a contract and carries out its responsibilities by actually performing, managing, and supervising the work involved. To perform a commercially useful function, the DBE must also be responsible, with respect to materials and supplies on the contract, for negotiating price, determining quality and quantity, ordering the material, and installing (where applicable) and paying for the material itself that it uses on the project. To determine whether a DBE is performing a commercially useful function, the Department will evaluate the amount of

work subcontracted, industry practices, whether the amount the firm is to be paid under the contract is commensurate with the work it is actually performing and the DBE credit claimed for its performance of the work, and other relevant factors.

A DBE will not be considered to perform a commercially useful function if its role is limited to that of an extra participant in a transaction, contract, or project through which funds are passed in order to obtain the appearance of DBE participation. In determining whether a DBE is such an extra participant, the Department will examine similar transactions, particularly those in which DBEs do not participate.

If a DBE does not perform or exercise responsibility for at least 30 percent 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 within normal industry practice for the type of work involved, the Department will presume that the DBE is not performing a commercially useful function.

When a DBE is presumed not to be performing a commercially useful function as provided above, the DBE may present evidence to rebut this presumption. The Department will determine if the firm is performing a CUF given the type of work involved and normal industry practices.

The Department will notify the contractor, in writing, if it determines that the contractor's DBE subcontractor is not performing a CUF. The contractor will be notified within seven calendar days of the Department's decision.

Decisions on CUF may be appealed to the State Engineer. The appeal must be in writing and personally delivered or sent by certified mail, return receipt requested, to the State Engineer. The appeal must be received by the State Engineer no later than seven calendar days after the decision of BECO. BECO's decision remains in effect unless and until the State Engineer reverses or modifies BECO's decision. The State Engineer will promptly consider any appeals under this subsection and notify the contractor of the State Engineer's findings and decisions. Decisions on CUF matters are not appealable to USDOT.

The Department will conduct project site visits on the contract to confirm that DBEs are performing a CUF. The contractor shall cooperate during the site visits and the Department's staff will make every effort not to disrupt work on the project.

14.06 Trucking:

In conformity with 49 CFR Part 26.55(d), the Department will use the following factors in determining whether a DBE trucking company is performing a commercially useful function. The DBE must be responsible for the management and supervision of the entire trucking operation for which it is responsible on a particular contract.

The DBE must itself own and operate at least one fully licensed, insured, and operational truck used on the contract on every day that credit is to be given for trucking.

The contractor will receive credit for the total value of transportation services provided by the DBE using trucks it owns, insures and operates, and 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 DBE may also lease trucks from a non-DBE firm, including an owner-operator. The DBE who leases trucks with drivers from a non-DBE is entitled to credit for the total value of the transportation services provided by non-DBE leased trucks with drivers not to exceed the value of transportation services on the contract provided by DBE-owned trucks or leased trucks with DBE employee drivers. Additional participation by non-DBE owned trucks with drivers receives credit only for the fee or commission paid to the DBE as a result of the lease agreement.

Example: DBE Firm X uses two of its own trucks on contract. It leases two trucks from DBE Firm Y and six trucks from non-DBE firm Z. DBE credit would be awarded for the total value of transportation services provided by Firm X and Firm Y, and may also be awarded for the total value of transportation services provided by four of the six trucks provided by Firm Z. In all, full credit would be allowed for the participation of eight trucks. DBE credit could be awarded only for the fees or commissions pertaining to the remaining trucks Firm X receives as a result of the lease with Firm Z.

The DBE may lease trucks without drivers from a non-DBE truck leasing company. If the DBE leases trucks from a non-DBE leasing company and uses its own employees as drivers, it is entitled to credit for the total value of these hauling services.

Example: DBE Firm X uses two of its own trucks on a contract. It leases three additional trucks from non-DBE Firm Z. Firm X uses is own employees to drive the trucks leased from Firm Z. DBE credit would be awarded for the total value of the transportation services provided by all five trucks.

For purposes of this section, a lease must indicate that the DBE has exclusive use of and control over the truck. This does not preclude the leased truck from working for others during the term of the lease with the consent of the DBE, so long as the lease gives the DBE absolute priority for use of the leased truck. Leased trucks must display the name and identification number of the DBE. DBE participation will be allowed only for those lease costs related to the time each truck is devoted to the project.

DBE credit for supplying paving grade asphalt and other asphalt products will only be permitted for standard industry hauling costs, and only if the DBE is owner or lessee of the equipment and trucks. Leases for trucks must be long term (extending for a fixed time period and not related to time for contract performance) and must include all attendant responsibilities such as insurance, titling, hazardous waste requirements, and payment of drivers.

14.07 Materials and Supplies:

In conformity with 49 CFR Part 26.55(e), the Department will credit expenditures with DBEs for material and supplies towards DBE participation as follows:

(A) If the materials or supplies are obtained from a DBE manufacturer, 100 percent of the cost of the materials or supplies is credited.

(1) A DBE manufacturer is defined as: a firm that owns, or leases, and operates a factory or establishment that produces, on the premises, the materials, supplies, articles, or equipment required under the contract, and of the general character described by the specifications.

(2) Manufacturing includes blending or modifying raw materials or assembling components to create the product to meet contract specifications. When a DBE makes minor modifications to the materials, supplies, articles, or equipment, the DBE is not a manufacturer. Minor modifications are additional changes to a manufactured product that are small in scope and add minimal value to the final product.

(B) If the materials or supplies are purchased from a DBE regular dealer, 60 percent of the cost of the materials or supplies, (including transportation costs), is credited.

(1) A DBE regular dealer is defined as: a firm that owns, or leases, and operates, or maintains a store or 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 sufficient quantities, and regularly sold or leased to the public in the usual course of business.

(a) To be a regular dealer, the firm must be an established, regular business that engages, as its principal business and under its own name, in the purchase and sale or lease of the products in question.

(b) Items kept and regularly sold by the DBE are of the “general character” when they share the same material characteristics and application as the items specified by the contract.

(2) A firm may be a DBE regular dealer in such bulk items as petroleum products, steel, concrete or concrete products, stone or asphalt without owning and operating a place of business, as provided above, if the person both owns and operates distribution equipment used to deliver the products. Any supplementing of regular dealers’ own distribution equipment must be by a long-term operating lease, and not on an ad-hoc or contract-by-contract basis.

(3) A DBE supplier performs a CUF as a regular dealer and receives credit for 60 percent of the cost of materials or supplies, including transportation cost, when all, or at least 51 percent of, the items under a purchase order or subcontract are provided

from the DBE's inventory, and when necessary, any minor quantities delivered from and by other sources are of the general character as those provided from the DBE's inventory.

(4) A DBE supplier of items that are not typically stocked due to their unique characteristics (e.g., limited shelf life or items ordered to specification) should be considered in the same manner as a regular dealer of bulk items as described above. If the DBE supplier of these items does not own or lease distribution equipment, as described above, it is not a regular dealer.

(5) Packagers, brokers, manufacturers' representatives, or other persons who arrange, facilitate or expedite transactions are not regular dealers within the meaning of this paragraph and the paragraph above.

(C) If the materials or supplies are purchased from a DBE distributor that neither maintains sufficient inventory nor uses its own distribution equipment for the products in question, 40 percent of the cost of materials or supplies (including transportation costs) count for credit.

(1) A DBE distributor is defined as: an established business that engages in the regular sale or lease of the items specified by the contract. A DBE distributor assumes responsibility for the items it purchases once they leave the point of origin (e.g., a manufacturer's facility), making it liable for any loss or damage not covered by the carrier's insurance.

(2) A DBE distributor performs a CUF when it demonstrates ownership of the items in question and assumes all risk for loss or damage during transportation, evidenced by the terms of the purchase order or a bill of lading (BOL) from a third party, indicating Free on Board (FOB) at the point of origin or similar terms that transfer responsibility of the items in question to the DBE distributor.

(3) If paragraph (1) and paragraph (2), above, are met, DBE distributors may receive 40 percent for drop-shipped items.

(4) Terms that transfer liability to the distributor at the delivery destination (e.g., FOB destination), or deliveries made or arranged by the manufacturer or another seller do not satisfy this requirement.

(D) With respect to materials or supplies purchased from a DBE which is neither a manufacturer, a regular dealer, nor a distributor, the following standards shall apply:

(1) The Department will credit the entire amount of the fees or commissions charged by the DBE for: (1) assistance in the procurement of the materials and supplies, or (2) fees or transportation charges for the delivery of materials or supplies required on a job site, toward DBE participation.

(2) The Department will only credit the fees or commissions charged by the DBE if the Department determines the fees to be reasonable and not excessive as compared with fees customarily allowed for similar services.

(3) The cost of the materials and supplies themselves may not be counted toward DBE participation.

(E) The Department will credit expenditures with DBEs for material and supplies (e.g. whether a firm is acting as a regular dealer, distributor or a transaction facilitator) towards DBE participation on a contract-by-contract basis.

(F) The fact that a DBE firm qualifies under a classification (manufacturer, regular dealer, distributor or supplier) for one contract does not mean it will qualify for the same classification on another contract.

(G) The bidder shall be responsible for verifying whether a DBE qualifies as a DBE manufacturer, regular dealer, distributor or supplier.

(1) For each DBE firm listed as a regular dealer or distributor, the bidder must assess a DBE firm's eligibility for 60 or 40 percent credit, respectively, of the cost of materials and supplies based on its demonstrated capacity and intent to perform as a regular dealer or distributor.

(2) To receive credit toward DBE participation, the bidder shall use and submit the form made available on BECO's website at https://azdot.gov/business/business-engagement-and-compliance/dbe-contract-compliance/contract-specs-and-forms, to affirm the DBE firm's capacity and intent to perform as a regular dealer or distributor.

15.0 Joint Checks:

15.01 Requirements:

A DBE subcontractor and a material supplier (or equipment supplier) may request permission for the use of joint checks for payments from the prime contractor to the DBE subcontractor and the supplier. Joint checks may be issued only if all the conditions in this subsection are met.

(A) The DBE subcontractor must be independent from the prime contractor and the supplier, and must perform a commercially useful function. The DBE subcontractor must be responsible for negotiating the price of the material, determining quality and quantity, ordering the materials, installing (where applicable), and paying for the material. The DBE subcontractor may not be utilized as an extra participant in a transaction, contract, or project in order to obtain the appearance of DBE participation.

(B) The use of joint checks will be allowed only if the prime contractor, DBE subcontractor, and material supplier establish that the use of joint checks in similar

transactions is a commonly recognized business practice in the industry, particularly with respect to similar transactions in which DBE's do not participate.

(C) A material or supply contract may not bear an excessive ratio relative to the DBE subcontractor's normal capacity.

(D) There may not be any exclusive arrangement between one prime and one DBE in the use of joint checks that may bring into question whether the DBE is independent of the prime contractor.

(E) Any arrangement for joint checks must be in writing, and for a specific term (for example, one year, or a specified number of months) that does not exceed a reasonable time to establish a suitable credit line with the supplier.

(F) The prime contractor may act solely as the payer of the joint check, and may not have responsibility for establishing the terms of the agreement between the DBE subcontractor and the supplier.

(G) The DBE must be responsible for receiving the check from the prime contractor and delivering the check to the supplier.

(H) The prime contractor cannot require the DBE subcontractor to use a specific supplier, and the prime contractor may not participate in the negotiation of unit prices between the DBE subcontractor and the supplier.

15.02 Procedure and Compliance:

(A) The Business Engagement and Compliance Office must approve the agreement for the use of joint checks in writing before any joint checks are issued. The prime contractor shall submit a DBE joint check request form, available from the BECO website, along with the joint check agreement, to BECO through email within seven calendar days from the time the subcontract is executed.

(B) After obtaining authorization for the use of joint checks, the prime contractor, the DBE, and the supplier must retain documentation to allow for efficient monitoring of the agreement.

(C) Copies of canceled checks must be submitted, with the payment information for the period in which the joint check was issued, electronically through email to BECO, and made available for review at the time of the onsite CUF review. The prime contractor, DBE, and supplier each have an independent duty to report to the Department in the case of any change from the approved joint check arrangement.

(D) Any failure to comply will be considered by the Department to be a material breach of this contract and will subject the prime contractor, DBE, and supplier to contract remedies and, in the case of serious violations, a potential for termination of the

contract, reduction or loss of prequalification, debarment, or other remedies which may prevent future participation by the offending party.

16.0 Certification of Final DBE Payments:

DBE participation on the contract is measured by actual payments made to the DBEs. The contractor shall submit the "Certification of Final DBE Payments" form for each DBE firm working on the contract. This form shall be signed by the contractor and the relevant DBE, and submitted to the Engineer no later than 30 days after the DBE completes its work.

The contractor will not be released from the obligations of the contract until the "Certification of Final DBE Payments" forms are received and deemed acceptable by the Engineer and BECO.

17.0 False, Fraudulent, or Dishonest Conduct:

In addition to any other remedies or actions, the Department will bring to the attention of the USDOT any appearance of false, fraudulent, or dishonest conduct in connection with the DBE program, so that USDOT can take steps such as referral to the Department of Justice for criminal prosecution, referral to the USDOT Inspector General for possible initiation of suspension and debarment proceedings against the offending parties or application of "Program Fraud and Civil Penalties" rules provided in 49 CFR Part 31.

(TITLEVI, 08/19/21)

STANDARD TITLE VI SPECIFIC ASSURANCES:

The Arizona Department of Transportation, 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 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.

GENERAL REQUIREMENTS:

Availability of Documents:

The following project documents, if applicable, will be available in electronic format on the Contracts and Specifications website:

- Project Plans
- Special Provisions
- Proposal Pamphlet
- Cross Sections
- Earthwork Quantity Sheets
- Reports (if available)
- Existing Ground Digital Terrain Model (DTM)
- Design Ground Digital Terrain Model (DTM)

The project plans, special provisions, proposal pamphlet, cross sections, earthwork quantity sheets, and any applicable reports are provided in PDF format. The Department makes no representation or warranties as to the compatibility, usability, or readability of the PDF documents with any system, software, hardware, or application package other than that on which the files were originally saved. The contractor bears the sole risk of any modifications, manipulations, or alterations to the plans, special provisions, proposal pamphlet, and any applicable reports.

The existing ground DTM and the design DTM, if applicable, are provided as DGN files. They are provided for information purposes and contractor convenience only. The DTMs are not part of the contract documents. The contractor's use of the information in the DTMs is at the contractor's sole risk. The Department makes no representation or warranties as to the compatibility, usability, or readability of the DTMs with any system, software, hardware, or application package other than that on which the files were originally prepared. The version of Microstation used to save the DTMs is indicated at http://www.azdot.gov/business/engineering-and-construction/CADD.

The Department is providing the electronic project files to bidders for informational purposes in conjunction with work or services to be provided to the Department under this project. Any use of the electronic files for any purposes other than for this project is prohibited.

BLM Material Sources:

If the contractor elects to pursue the use of material sources on BLM land under Title 30 Code of Federal Regulations, it is at the contractor's sole risk, and the Department bears no responsibility for any delays or costs associated with the request to use material sources on BLM Land.

The Department will not request or pursue any "free-use permit" under Title 23 Code of Federal Regulations or any other arrangement with BLM on this project.

No extension in contract time or compensation will be granted for any attempt by the contractor to utilize BLM land.

Erosion, Sediment Control and Stormwater Quality Protection:

The contractor shall give attention to the impact of the construction operations upon the natural landscape and shall take care to maintain the natural surroundings undamaged. The contractor shall minimize soil disturbance by implementing Low Impact Development **(**LID**)** methods to control erosion as close as possible to the source of disturbance.

The contractor shall maintain the independence of discrete locations of construction by accessing through the paved area only. For project areas above**/**outside the Jurisdictional Waters of the U.S., the contractor shall minimize off-pavement (off-road) soil**/**ground disturbance at each discrete construction location to ensure disturbance is less than one acre (**<** 1 acre) beyond all new shoulder build-up areas (edge of pavement build-up areas). No unpaved temporary construction roads shall be created to directly connect discrete locations of soil**/**ground disturbance above**/**outside the Jurisdictional Waters of the U.S.

The contractor shall use all means necessary to significantly reduce impacts by staging**/**stockpiling and conducting project activities in such a way as to minimize the potential for erosion and discharge of pollutants from the project site.

When required, the contractor shall remove vegetation at finished-grade-level flush cutting without uprooting them for new shoulder build**-**up construction **(**edge of pavement build**-**up**)**. This work shall be done only in the new edge of pavement build**-**up areas.

No separate measurement or direct payment will be made for the Removal **(**flush cutting**)** of existing vegetation in preparation for the new shoulder build**-**up area; the cost being considered is included in the price of the respective contract item of shoulder build-up construction**.**

In addition to what is shown in the plans and**/**or details, the contractor shall apply Sediment Wattles beyond the outer perimeter of new edge of pavement build-up only in the areas of concentrated flow, which may include but not be limited to roadway sag spots and drop-off repair locations. Wattles shall not be placed over any driveways or access roads that intersect with the roadway mainline. Unless otherwise called out in the plans**/**details and approved by the Engineer, such Best Management Practices (BMPs) or Control Measures (CMs) shall not be placed on the flow path of inlets and outlets of drainage facilities. The contractor shall also apply Wattles parallel to the slope contours and beyond the toe of new guardrail end treatment pad slopes and**/**or on the down-slope perimeter of construction disturbed areas**,** pavement reconstruction zones**,** unpaved on-site staging**/**storage, and on-site stockpiling. Sediment Wattles shall be installed in accordance with the manufacturer's instructions and the details shown on the plans. The contractor shall observe ADOT traffic safety standards when installing Sediment Wattles in the traffic clear zone/recovery area. To prevent sediment from bypassing the Wattle end, the end of the Wattle shall be turned up the slopes for a minimum of three **(**3**)** feet to form an **"**L**"** shape. No portion of the Wattle shall be installed within six **(**6**)** feet from the

edge of the pavement. Perimeter/containment control BMPs/CMs shall be applied outside and above adjacent wetlands, as well as water courses. The contractor shall adjust the field layout of erosion control and sediment prevention elements according to the actual limits of soil/ground disturbance as approved by the Engineer. The contractor shall also observe ADOT traffic safety standards when installing perimeter/containment control BMPs/CMs within the traffic clear zone/recovery area.

With the approval of the Engineer, the contractor may choose to replace straw/excelsior Wattles/Logs with equivalent or enhanced BMP/CM products of compost Logs/Wattles, bio-socks, filter socks, compost socks, or compost tubes covered with dense geotextile fabric as the outer layer at no additional cost to the Department. Such replacement may be applicable to protect sensitive biological resources (native species and/or habitats) within the project limit or its vicinity. The color of BMP/CM products of compost Logs/Wattles, bio-socks, filter socks, compost socks, or compost tubes shall be harmonized with the natural surrounding existing ground cover as approved by the Engineer in accordance with the ADOT construction Professional Landscape Architect's (PLA's) evaluation. Black color exterior surface layer of such compost BMP/CM products shall be prohibited. For paved or rocky surfaces, the compost perimeter/containment control and stormwater quality protection BMPs/CMs shall have enough weight so that no staking shall be required for flat construction zones, and gentle slopes of less than five percent (5%). The equivalent compost BMP/CM products stated above shall demonstrate the same or better stormwater pollutants loading/filtering capacities as well as qualities in comparison with straw/excelsior Wattles/Logs. All fabric materials of compost perimeter/containment control and stormwater quality protection BMPs/CMs shall be biodegradable. No separate measurement or direct payment will be made for the replacement of the straw/excelsior Wattles/Logs with compost BMP/CM products; the cost being considered is included in the price of the respective contract item of Wattles/Logs.

Compost material used for perimeter/containment control and stormwater quality protection BMPs/CMs shall not discharge harmful levels of pollutants/nutrients that impair stormwater quality. The Engineer shall randomly sample/exam a minimum of three (3) compost-filled BMPs/CMs by opening the outer fabric layer. Non-compost materials such as animal manures/wastes, city biosolids, rocks, tree barks, unspecified wood chips, construction debris, soil clumps, and/or other unspecified inert material shall NOT be allowed within the compost BMP/CM products.

Wattles/logs, silt fences, bio-socks, filter socks, compost socks, or compost tubes shall be deemed as temporary stormwater quality CMs/BMPs. The non-biodegradable and/or non-photodegradable components of such temporary CMs/BMPs shall be removed when the project site has achieved stabilization as approved by the Engineer. Rock materials used for temporary stormwater quality protection CMs/BMPs may be left on-site to cover unpaved disturbed soil area for permanent stabilization as approved by the Engineer. If approved, on-site rock materials shall be flattened and re-graded to match the final unpaved finished grade.

The contractor is responsible for maintaining the functional longevity and good working conditions of all stormwater quality protection CMs/BMPs during the entire contract time. No separate measurement or direct payment will be made for the maintenance and/or replacement

of such CMs/BMPs to assure manufacturer-specified functionality; the cost being considered is included in the price of the respective contract items.

The contractor is also responsible for protecting Storm Drain Inlets within the project limits from pollutants/contaminants discharged by construction at no additional cost to the Department.

Fine particles including minor miscellaneous dirt, dust, rock fragments, milled asphaltic concrete (AC) or construction debris that may be associated with stormwater discharges into catch basins / Storm Drain Inlets shall be prevented and controlled to maximum extent practicable (MEP) at no additional cost to the Department. Such compliance measures may include frequent dry vacuuming and/or pavement sweeping during construction to ensure no debris, dirt, dust, and material fragments will be built up within twenty-five (25) feet from catch basins / Storm Drain Inlets. On-site staging, material storage and stockpiling shall not be allowed within fifty (50) feet from catch basins / Storm Drain Inlets.

During construction, the contractor shall minimize vehicular travel or equipment operation on the unpaved soil areas to maximum extent practicable (MEP). The contractor shall develop and implement procedures to avoid earth disturbance, soil compaction, and damage to vegetative cover from vehicular travel or equipment operation during inclement weather or unsuitable soil conditions. The contractor shall stabilize all construction disturbed soil areas at no additional cost to the Department. Furthermore, the contractor shall minimize off-site sedimentation including minor miscellaneous dirt, dust, rock fragments or construction debris by eliminating the tracking of such contaminants from construction sites.

No grout, concrete or wash water shall be disposed of within the project limits or its vicinity. The contractor shall install concrete washout CM/BMP as needed and under the direction of the Engineer at no additional cost to the Department. This CM/BMP shall include proper disposal of all excess grout, concrete, and wash water.

The contractor shall not use unpaved areas within the project limits for staging or stockpiling without first installing erosion control and sediment prevention CMs/BMPs and as directed and approved by the Engineer. Staging and stockpiling on the unpaved areas shall be avoided to MEP.

Erosion and Sediment Control beyond the Project Limits:

The contractor shall apply erosion/sediment and water quality protection CMs/BMPs as required by the commercial material source owner and environmental permit standard at no additional cost to the Department.

The contractor shall apply erosion/sediment and water quality protection CMs/BMPs for off-project-site staging, material storage, maintenance yard, disposal spots, and stockpiling areas as required by the facility owner and environmental permit standard at no additional cost to the Department.

If the contractor elects to obtain off-project site for staging, stockpiling, material storage, maintenance yard, or waste disposal, the contractor shall meet the requirements for erosion control, sediment prevention, and stormwater quality protection measures within the written agreements with facility and/or the landowner, as well as environmental permits for such operations.

Ground Disturbance on areas above and outside the Waters of the United States (WOTUS):

The contractor shall minimize the ground disturbance of any unpaved areas within the project limits. If the disturbance is not avoidable due to construction activities, the disturbance areas at each discrete location shall be less than one contiguous acre. If the disturbed areas equal or exceed one contiguous acre, the contractor shall conform to all applicable requirements of Subsection 104.09 of the specifications, the Arizona Pollutant Discharge Elimination System (AZPDES), and/or National Pollution Discharge Elimination System (NPDES) at no additional cost to the Department. Shoulder build-up areas will not be considered as disturbed areas.

(101DEFN, 04/21/22)

SECTION 101 DEFINITIONS AND TERMS:

101.02 Definitions:

Acceptance: of the Standard Specifications is hereby deleted:

Characteristic: of the Standard Specifications is revised to read:

A measurable or an observable property of a material, product, or item of construction.

City, County, Township, or Town: of the Standard Specifications is hereby deleted:

Contract Bonds (Performance Bond and Payment Bond): the title and text of the Standard Specifications is revised to read:

Contract Bonds:

Surety Bonds that include Performance Bond and Payment Bond.

Highway, Street, or Road: of the Standard Specifications is revised to read:

A general term denoting a public way for purposes of travel, vehicular, pedestrian or by other means, including the entire area within the right-of-way.

Roadbed: of the Standard Specifications is revised to read:

The graded portion of a highway, prepared as a foundation for the pavement structure and shoulders.

Roadside Development: of the Standard Specifications is revised to read:

Activities which provide for the preservation of landscape materials and features; the rehabilitation and protection against erosion of all areas disturbed by construction through seeding, sodding, mulching and the placing of other ground covers; or such planting and other improvements as may increase the effectiveness and enhance the appearance of the highway.

State: of the Standard Specifications is revised to read:

The State of Arizona, acting through its authorized representatives.

(102NOBID, 09/19/12)

SECTION 102 BIDDING REQUIREMENTS AND CONDITIONS:

102.03 Suspension from Bidding: of the Standard Specifications is modified to add:

The signature of the bid proposal by a bidder constitutes the bidder's certification, under penalty of perjury under the laws of the United States, that the bidder, or any person associated therewith in the capacity of owner, partner, director, officer, principal investor, project director, manager, auditor, or any position involving the administration of federal funds, has not been, or is not currently, under suspension, debarment, voluntary exclusion or been determined ineligible by any federal agency within the past three years. Signature of the bid proposal also certifies, under penalty of perjury under the laws of the United States, that the bidder does not have a proposed debarment pending. In addition, signature of the bid proposal certifies that the bidder has not been indicted, convicted, or had a civil judgment rendered against (it) by a court of competent jurisdiction in any matter involving fraud or official misconduct within the past three years.

Any exceptions to the above paragraph shall be noted and fully described on a separate sheet and attached to the bid proposal.

(102LOBY, 01/21/21)

SECTION 102 BIDDING REQUIREMENTS AND CONDITIONS:

102.09 Non-Collusion Certification: of the Standard Specifications is modified to add:

(A) Lobbying:

The bidder certifies, by signing and submitting this bid or proposal, to the best of its knowledge and belief, that:

(1) No Federally appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal 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 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 Federal 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. Copies of Form-LLL, "Disclosure Form to Report Lobbying", are available at ADOT Contracts and Specifications Group, 205 South 17th Avenue, Room 121F, Phoenix, AZ 85007.

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 Section 1352, Title 31, U.S. Code. 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 also agrees, by submitting the bid or proposal, that it shall require that the language of this certification be included in all subcontracts and lower tier subcontracts which exceed $100,000 and that all such subcontractors and lower tier subcontractors shall certify and disclose accordingly.

The Department will keep the prime contractors' certifications on file as part of their original bid proposals. Each prime contractor shall keep individual certifications from all subcontractors and lower tier subcontractors on file. Certifications shall be retained for three years following completion and acceptance of any given project.

Disclosure forms for the prime contractor shall be submitted to the Engineer at the pre-construction conference. Disclosure forms for subcontractors and lower tier subcontractors shall be submitted to the Engineer by the prime contractor along with the submittal of each subcontract or lower tier subcontract, as required under Subsection 108.01, when said subcontracts exceed $100,000.00. During the performance of the contract the prime contractor and any affected subcontractors shall file revised disclosure forms at the end of each calendar year quarter in which events occur that materially affect the accuracy of any previously filed disclosure form. Disclosure forms will be submitted by the Engineer to the Federal Highway Administration for further processing.

(102SCSGR, 08/15/24)

SECTION 102 BIDDING REQUIREMENTS AND CONDITIONS:

102.11 **Availability of Documents:** the first paragraph of the Standard Specifications is modified to add:

(l) Survey Control Sheet.

102.11 **Availability of Documents:** the second paragraph of the Standard Specifications is revised to read:

The project plans, special provisions, proposal pamphlet, cross sections, earthwork quantity sheets, survey control sheet, and any applicable reports are provided in PDF format. The Department makes no representation or warranties as to the compatibility, usability, or readability of the PDF documents with any system, software, hardware, or application package other than that on which the files were originally saved. The contractor bears the sole risk of any modifications, manipulations, or alterations to the plans, special provisions, proposal pamphlet, and any applicable reports.

(103AWARD, 09/17/20)

SECTION 103 - AWARD AND EXECUTION OF CONTRACT:

103.04 Award of Contract: of the Standard Specifications is modified to add:

The Department will make the award to the lowest responsible bidder who has the proper licenses.

When a contract is funded, either wholly or in part, by federal funds, an award of contract may be made contingent upon the successful bidder obtaining an appropriate license in accordance with the requirements of Subsection 102.16 of the specifications. The license must be obtained within 60 calendar days following opening of bid proposals. No adjustment in proposed bid prices or damages for delay will be allowed as a result of any delay caused by the lack of an appropriate license.

Failure to acquire the necessary licensing within the specified period of time shall result in either award to the next lowest responsible bidder, or re-advertisement of the contract, as may be in the best interests of the Department.

104.04 Maintenance of Traffic: of the Standard Specifications is modified to add:

A) General Traffic Control Information:

The project traffic control shall be constructed in accordance with Part VI of the Manual on Uniform Traffic Control Devices (MUTCD) 2009 Edition with Revisions 1 and 2 and the Arizona Supplement to the 2009 Edition, the Arizona Department of Transportation Traffic Control Design Guidelines (TCDG) 2019 and the project plans and Specifications. The contractor shall establish the traffic control necessary to provide a safe and efficient work zone without unduly delaying traffic.

The contractor shall develop traffic control plans (TCP) for each work activity that will be done on the project. The traffic control plans shall be submitted to the Engineer for approval one week before the activity shall begin and approval must be given prior to starting that work activity. Changeable message board legends shall be concurrently submitted with the TCP to the Engineer for review and approval.

All signs in conflict with the construction signs shall be removed or covered in place, as directed by the Engineer. The contractor shall store and reinstall items which have been removed or relocated in a manner approved by the Engineer at no additional cost to the Department.

The temporary removal or covering of existing signs shall be in accordance with Section 701-3.11 and 701-5.10 of the specifications.

Traffic control devices shall not be permitted to remain stockpiled on the shoulder until the next closure.
The contractor shall be required to check on all traffic control barricades, signs, and variable message boards twice daily and maintain as needed per specifications.

At all times, the contractor shall conduct construction activities to safeguard pedestrians, cyclists and vehicular access in the vicinity of the project. All holes or trenches left open overnight shall be surrounded by Type II barricades and Type A flashing warning lights, connected by warning tape or rope, as directed by the Engineer. The contractor shall provide plywood coverings, metal plates or some other protection satisfactory to the Engineer over holes. No measurement or payment will be made for the covering and warning devices associated with open cavities; the cost being considered as included in the price of contract bid items.

B) Schedules for Daily Traffic Control Activities:
The contractor shall provide a schedule of daily activities and corresponding traffic control schemes. The information shall be provided in advance of, or during the weekly construction meeting in accordance with the requirements of Subsection 108.03 of the specifications and shall specify the limits of the work activities and related traffic control plan by location, direction, and time.

All lane closures will be subject to the following:

- All work requiring a lane closure shall have a TCP.
- Any exceptions must be approved by the Engineer.
- The contractor shall provide information about any access closures that need to be communicated to the property owners to the Engineer; The Engineer and ADOT Public Relations will contact the property owners or the Engineer may direct the contractor to perform that task. If the property owners agree to the closure of an access, the contractor shall provide the Engineer a work plan – including a time frame of the closures – to provide access to the property.
- If a property has 2 or more driveways/accesses, 1 driveway/access may be closed as long as the contractor has approval from the property owners and the Engineer 2-3 weeks prior to that closure. If a property has only 1 driveway said driveway shall not be closed unless the driveway is closed after business hours and re-opens prior to the start of business.

(104STORM, 11/01/95)

SECTION 104 SCOPE OF WORK:

104.11 Damage by Storm, Flood or Earthquake: Item (D), Idled Equipment and Remobilization, of the Standard Specifications is hereby deleted.

104.11 Damage by Storm, Flood or Earthquake: Items (E) and (F) of the Standard Specifications are revised to read:

(A) Payment for Repair Work:

The State will pay the cost of the repair work as determined in Subsection 109.04.

(B) Termination of Contract:

If the Department elects to terminate the contract, the termination and the determination of the total compensation payable to the contractor shall be governed by the provisions of Subsection 108.11, Termination of Contract for Convenience of the Department.

(104ENVIR, 06/17/21)

SECTION 104 SCOPE OF WORK:

104.12 Environmental Analysis: the fifth and sixth paragraphs of the Standard Specifications are revised to read:

If the contractor elects to do an environmental analysis and use any site, source, or access for the reasons listed above, they choose to do so at their own risk. It is the contractor's responsibility to exercise due diligence when selecting these sites and areas. The contractor shall bear all costs associated with the use of proposed sites, sources, and accesses.

The contractor shall promptly advise the Engineer that it is preparing the environmental analysis and shall submit to the Engineer for review and consultation. The Department will review the submittal and send it to the appropriate agencies and/or jurisdictions for consultation or return it to the contractor for revision. The contractor shall allow a minimum of 60 calendar days after submittal, or subsequent resubmittals, to the Department for the Department to review the environmental analysis and to consult with the appropriate jurisdictions and/or agencies. At the end of the review period, the Engineer will notify the contractor whether or not the environmental analysis is acceptable.

If the approval of the environmental analysis causes a delay to a controlling activity of the project due to the Department's actions in the aforementioned review process, the contractor may seek, and the Engineer may grant, an extension of time in accordance with the terms of Subsection 108.08 of the specifications. The time extension shall not exceed 30 working days for a working-day contract, or 45 calendar days for a calendar-day project. The time extension will not be considered unless the contractor can show evidence of the delay resulting due to the Department's actions in the review process. A time extension request will not be considered or granted for any other reason. No time extension will be granted for a fixed completion date contract.

104.12 **Environmental Analysis:** the items (G) and (O) of the seventh paragraph of the Standard Specifications is revised to read:

(G) The archaeological survey of the proposed source prepared by a person who meets the Secretary of the Interior's Professional Qualification Standards (48 FR 44716) and possesses a current permit for archaeological survey issued by the Arizona State Museum (ASM). The survey shall be prepared in a State Historic Preservation Office (SHPO) standardized format. The survey shall identify all historic properties within the area of potential effect (APE), as defined by the National Historic Preservation Act (36 CFR 800.4). This includes the materials source, processing area, and the haul road. Additionally, the survey report shall identify the effects of the proposed source on any historic properties within the APE, and recommend measures to avoid, minimize, or mitigate those effects. The survey report shall be prepared by the contractor in accordance with SHPO and ASM formatting style for the Historic Preservation Specialist's initial review. After the initial review, the Department will consult with the landowner, SHPO, and Tribes for a minimum of 35 days for the final approval of the survey report.

(O) A description of the impact on federally or state protected or other agency-specific special status wildlife and plants and their habitat, as defined in ADOT's consultant biological procedures on the Department's website. Compliance with the Arizona Native Plant Law shall be coordinated through the Arizona Commission of Agriculture and Horticulture.

104.12 **Environmental Analysis:** the eighth paragraph of the Standard Specifications is revised to read:

Guidance and forms for preparing the environmental analysis are available on the Department's website through the Environmental Planning Group, or by calling Environmental Planning Group at 602-712-7767.

(104VEPC, 03/20/25)

SECTION 104 SCOPE OF WORK:

104.13 **Value Engineering Proposals by the Contractor:** the third paragraph of the Standard Specifications is revised to read:

Any cost savings generated to the contract as a result of VEP offered by the contractor and approved by the Department will be shared between the contractor and the Department, with the contractor receiving 60 percent and the Department receiving 40 percent, as specified in Subsection 104.13(D) of the specifications.

104.13(C) **Conditions:** of the Standard Specifications is modified to add:

(13) The contractor may submit a previously approved VEP from another project.

104.13(D) **Acceptance, Rejection and Payment:** the seventh paragraph of the Standard Specifications is revised to read:

(6) The executed supplemental agreement shall provide that the contractor be paid 60 percent of the net savings amount as reflected by the difference between the cost of the revised work and the cost of the related construction required by the original contract computed at contract bid prices. The net savings will take into account the contractor's cost of developing the VEP and implementing the change, and reducing this amount by the Department's cost for investigating and evaluating the VEP, including any ascertainable collateral costs to the Department. Such collateral costs may include increased costs for maintenance, operation, related work items, additional work items, or elements of related or additional work items.

(104ENVST, 09/19/24)

SECTION 104 SCOPE OF WORK:

104.16 **Environmental Standard Work:** of the Standard Specifications is hereby modified as follows:

All disturbed soils that are not landscaped or otherwise permanently stabilized by construction shall be seeded in accordance with the requirements of Item 8050003 of these special provisions.

The contractor shall not disturb unpaved areas without the approval of the Engineer or as stated in the Environmental, Permits, Issues, and Commitments (EPIC) plan sheet 1F of the project plans. If any unpaved areas are disturbed as a result of the contractor's operation and without the approval of the Engineer, the contractor shall seed the areas with species native to the project vicinity. All seeded areas shall be covered by straw mulch with tacking agent. The contractor shall provide the seed mix to the Engineer for approval prior to placing any seeding. No measurement or payment will be made for seeding, the cost being considered as included in the price of contract items.

(106DMAT, 02/15/11)

SECTION 106 CONTROL OF MATERIALS: of the Standard Specifications is modified to add:

106.15 Domestic Materials and Products:

Steel and iron materials and products used on all projects shall comply with the current "Buy America" requirements of 23 CFR 635.410.

All manufacturing processes to produce steel and iron products used on this project shall occur in the United States. Raw materials used in manufacturing the steel and iron products may be foreign or domestic. Steel or iron not meeting these requirements may be used in products on this project provided that the invoiced cost to the contractor for such steel products incorporated into the work does not exceed either one-tenth of one percent of the total (final) contract cost or $2,500, whichever is greater.

Any process which involves the application of a coating to iron or steel shall occur in the United States. These processes include epoxy coating, galvanizing, painting, or any other coating which protects or enhances the value of covered material.

The requirements specified herein shall only apply to steel and iron products permanently incorporated into the project. "Buy America" provisions do not apply to temporary steel items, such as sheet piling, temporary bridges, steel scaffolding and falsework, or to materials which remain in place at the contractor's convenience.

The contractor shall furnish the Engineer with Certificates of Compliance, conforming to the requirements of Subsection 106.05, which state that steel or iron products incorporated in the project meet the requirements specified. Certificates of Compliance shall also certify that all manufacturing processes to produce steel or iron products, and any application of a coating to iron or steel, occurred in the United States.

Convict-produced materials may not be used unless the materials were produced prior to July 1, 1991 at a prison facility specifically producing convict-made materials for Federal-aid construction projects.

(106CMATLS, 12/21/23)

SECTION 106 CONTROL OF MATERIALS: of the Standard Specifications is modified to add:

106.17 Construction Materials:

A construction material, when used on a federal-aid construction project shall comply with the requirements of Build America, Buy America (BABA) Act specified in Title IX, Subtitle A,

Part 1, Sections 70901 and 70911-70918 (Pub. L. No. 117-58 §§ 70901; §§ 70911-70918) of the Infrastructure Investment and Job Act (IIJA).

A “construction material” that is permanently incorporated on the project shall include an article, material, or supply that is or consists primarily of the following:

1. Non-ferrous metals;
2. Plastic and polymer-based products (including polyvinylchloride, composite building materials, and polymers used in fiber optic cables);
3. Glass (including optic glass);
4. Fiber optic cable (including drop cable);
5. Optical fiber;
6. Lumber;
7. Engineered wood; or
8. Drywall.

Items manufactured through a combination of either two or more materials listed above, or at least one of the materials listed above and a material not listed shall be considered as a manufactured product, rather than as a construction material.

Build America, Buy America provisions specified for manufactured products in Section 70912(6)(B) of the IIJA, do not apply to federal-aid construction projects per FHWA’s existing statutory requirement applicable to manufactured products. A “manufactured product” is considered to be an item that undergoes one or more manufacturing processes before the item can be used on a federal-aid construction project.

Construction materials shall not include cement and cementitious materials; bituminous materials; aggregates such as stone, sand, or gravel; or aggregate binding agents or additives.

All construction materials shall be produced in the United States. This means, all manufacturing processes to produce the construction materials shall occur in the United States. All manufacturing processes for construction materials shall mean the final manufacturing process and the immediately preceding manufacturing stage for the construction material.

The contractor shall furnish the Engineer with Certificates of Compliance, conforming to the requirements of Subsection 106.05 of the specifications, which shall state that the construction materials incorporated in the project meet the requirements specified herein. Certificates of Compliance shall also certify that all manufacturing processes to produce construction materials occurred in the United States.

If the total cost of construction materials incorporated in the project is no more than 5% of the original contract amount or $1,000,000, whichever is lesser, the requirements specified herein will not apply for such construction materials.

Convict-produced materials are prohibited in accordance with the requirements of 23 CFR

635.417.

(107UINSLMTS, 02/20/25)

SECTION 107 LEGAL RELATIONS AND RESPONSIBILITY TO PUBLIC:

107.14 Insurance: the sixth paragraph of the Standard Specifications is revised to read:

Without limiting any liabilities or any other obligations of the contractor, the contractor shall provide and maintain, if commercially available, the minimum insurance coverage listed below until all obligations under this contract are satisfied:

(A) General Liability insurance with a minimum combined single limit of $1,000,000 each occurrence applicable to all premises and operations, and a minimum general aggregate limit of $2,000,000. The policy shall include coverage for bodily injury, broad form property damage (including completed operations), personal injury (including coverage for contractual and employee acts), blanket contractual, independent contractors, products and completed operations. Further, the policy shall include coverage for the hazards commonly referred to as XCU (explosion, collapse and underground). The products and completed operations coverage shall extend for one year past acceptance, cancellation or termination of the work. The policy shall contain a severability of interests provision.

(B) Comprehensive Automobile Liability insurance with a combined single limit for bodily injury and property of not less than $1,000,000 each occurrence with respect to contractor's owned, hired, or non-owned vehicles, assigned to or used in performance of the work.

(C) Workers' Compensation insurance to cover obligations imposed by Federal and State statutes having jurisdiction of its employees engaged in the performance of the work, and Employers' Liability insurance with a minimum limit of $1,000,000. Evidence of qualified self-insured status will suffice for this subsection.

(107UTIL, 04/17/25)

SECTION 107 LEGAL RELATIONS AND RESPONSIBILITY TO PUBLIC:

107.15 Contractor's Responsibility for Utility Property and Services: of the Standard Specifications is modified to add:

Copies of existing ADOT permits, subject to availability, may be obtained from the ADOT Area Permit Supervisor as listed below:

NORTHEAST DISTRICT

(928) 524-5455
(928) 524-5400

2407 Navajo Blvd.
Holbrook, AZ 86025

Email address:
northeastpermit@azdot.gov

The foilowing agencies and utility companies have facilities in the area but are not anticipated to be in conflict:

Navajo County
Grant Evans
928-524-4110
Grant.evans@navajocountyaz.gov

Navajo County has a fiber optic line within two 1.25 inch HDPE underground conduits on the south side of I-40 running longitudinally near the ADOT Right of Way. Navajo County facilities shall be protected in place.

Arizona Public Service (APS)
James Calhoun
928-241-3077
James.Calhoun@aps.com

APS has existing overhead powerlines on the south side of I-40 running longitudinally outside of the ADOT Right of Way. APS facilities shall be protected in place.

Frontier Communications
Larry Lang
928-414-3579
Larry.lang@ftr.com

Frontier has existing facilities in the vicinity outside of the property limits and shall be protected in place.

Sparklight (Cable One)
Andrew Gambino
928-242-7400
Andrew.Gambino@Cableone.biz

Sparklight has existing aerial and underground fiber optic facility on the south side of I-40 running longitudinally outside of the ADOT Right of Way. Sparklight facilities shall be protected in place.

RAILROAD STATEMENT: There is a railroad within ½ mile of the project limits. There is no railroad work on this project. The railroad was notified.

107.15(F) Sewage Discharge Damage Assessments: of the Standard Specifications is revised to read:

The Department will assess sanctions in accordance with the Table 107.15-1 below for each 24-hour period, or portion thereof, for each unplanned breakage that occurs in an active sanitary sewer line as a result of the contractor's operation. The rate of these sanctions is based on the type and quantity of effluent discharged as determined by the Engineer.

These sanctions do not relieve the contractor from any of its responsibilities under the contract, including any liquidated damages that may be assessed under Subsection 108.09 of the specifications for late completion of the project.

The sanctions specified in this subsection will be independent of any penalties imposed by others.

The contractor acknowledges that Regulatory agencies may assess or impose civil or criminal penalties on the contractor resulting from sewer discharges.

The Department will not be responsible for any civil or criminal penalties, fines, damages, or other charges imposed on the contractor by any regulatory agency or court for sewage discharges that are a result, directly or indirectly, of the contractor's work performed under this contract.

TABLE 107.15-1
SANCTIONS
(EACH 24-HOUR PERIOD, OR PORTION THEREOF)

Volume of Discharge	Raw Sewage or Industrial Wastewater	Treated Effluent
Less than 10,000 gallons	$5,000	$1,000
10,000 to 99,999 gallons	$10,000	$2,000
100,000 to 1 million gallons	$25,000	$3,000
Greater than 1 million gallons	$40,000	$5,000

These sanctions will be assessed for each 24-hour period, or portion thereof, until the contractor has completed all of the following tasks:

Stopped the discharge;
Repaired the damaged pipe;
Restored normal service; and
Fully cleaned and disinfected the site to the satisfaction of the Engineer.

Upon completion of tasks (1), (2), and (3) above, and prior to completion of Task (4), the sanctions for the current 24-hour period will be at the rate shown in Table 107.15-1. However, for each subsequent 24-hour period, the assessment will be 1/2 of the rate shown in Table 107.15-1.

The sanctions will continue at the reduced rate until the site has been fully cleaned and disinfected to the satisfaction of the Engineer.

As an example, the amounts assessed each 24-hour period for an unplanned discharge of 20,000 gallons of raw sewage, in which the contractor completes tasks (1), (2), and (3) within the second 24-hour period but does not complete full cleanup until the third 24-hour period, will be as follows:

First 24-hour period:	$10,000
Second 24-hour period:	$10,000
Third 24-hour period:	$5,000

For this example, the total sanction will be $25,000 ($10,000 + $10,000 + $5,000).

(108SUBLT, 10/20/22)

SECTION 108 PROSECUTION AND PROGRESS:

108.01 **Subletting of Contract:** the thirteenth paragraph of the Standard Specifications is revised to read:

If a subcontractor, of any tier, begins work on the contract prior to the contractor submitting the required documentation and receiving consent from the Engineer, the Department will retain $1,000 from monies due or becoming due the contractor. The money retained will be for each subcontractor, of any tier, that starts work without the consent of the Engineer. These sanctions will be in addition to all other retention or liquidated damages provided for elsewhere in the contract.

(108PRCN, 08/19/21)

SECTION 108 PROSECUTION AND PROGRESS:

At the preconstruction conference the contractor shall submit a progress schedule showing the order in which the contractor proposes to carry out the work, the dates on which the contractor and its subcontractors will start the work, including procurement of materials, equipment, etc.; the ordering of articles of special manufacture; the furnishing of drawings, plans and other data required under Subsection 105.03 of the specifications for the review and approval of the Engineer; the inspection of structural steel fabrication; and the

contemplated dates for the completion.

108.03 **Prosecution and Progress:** the third paragraph of the Standard Specifications is revised to read:

At a mutually convenient location and time, the contractor shall meet weekly with the Engineer to discuss construction activities; however, a meeting may be waived if mutually agreed to, due to weather conditions, work progress, or for other reasons. At the meetings, the contractor shall provide the Engineer with a detailed, written schedule of construction activities and phases of work for the current week, forthcoming three week period as well as the construction activities which were performed during the previous week. This schedule shall detail the anticipated start dates and anticipated completion dates of work activities. The weekly schedule should reflect, at a minimum, all activities from the most recently updated project schedule. For work which was completed during the previous week, this schedule shall detail the actual start and completion dates of work activities as well as indicate the status of major ongoing activities. Upon the second occurrence of the contractor failing to provide an accurate schedule as describe herein and after written notification by the Engineer of the first occurrence, the Department will deduct $500 from the contractor's progress payment per each occurrence thereafter. Minutes of the weekly meetings will be kept by the Engineer and a copy given to the contractor for review and acceptance.

(108TIME, 10/15/20)

SECTION 108 PROSECUTION AND PROGRESS:

108.08 **Determination and Extension of Contract Time:** the first paragraph of the Standard Specifications is revised to read:

The time allowed for the completion of the work included in the contract will be 350 working days, and will be known as the "Contract Time."

(108RSLD, 08/17/23)

SECTION 108 PROSECUTION AND PROGRESS:

108.09 Failure to Complete the Work on Time: the Schedule of Liquidated Damages table of the Standard Specifications is revised to read:

SCHEDULE OF LIQUIDATED DAMAGES			
Original Contract Amount		**Liquidated Damages Per Day**	
From More Than:	**To and Including:**	**Calendar Day or Fixed Date:**	**Working Day:**
$ 0	$ 500,000	$ 450	$ 750
500,000	1,000,000	1,000	1,800
1,000,000	2,000,000	1,600	2,100
2,000,000	5,000,000	2,200	2,400
5,000,000	10,000,000	3,200	7,100
10,000,000	30,000,000	8,000	9,600
30,000,000	60,000,000	14,600	16,900
60,000,000	90,000,000	19,900	27,860
90,000,000	-------	26,800	37,520

(108SCHLVL2, 08/19/21)

SECTION 108 PROSECUTION AND PROGRESS: of the Standard Specifications is modified to add:

108.12 Schedules:

(A) Definitions:

Activity:

A discrete, identifiable task or event that contributes to completing the project and can be used to schedule and monitor the work.

Activity ID:

A unique alphanumeric identification code permanently assigned to an activity.

Baseline Schedule:

A Critical Path Method (CPM) schedule illustrating the contractor's committed plan to complete the work within the contract time and used to compare the progress of the work.

Constraint:

A limitation placed on a scheduled activity that affects the start or end date of an activity.

Critical Path:

The longest continuous chain of activities which establishes the minimum overall project duration.

Critical Path Method (CPM):

A network-based planning technique that uses activity durations and relationships to calculate a schedule for the project.

Data Date:

The date from which a schedule is calculated, where all activities occurring earlier than the data date are complete and all activities occurring on or after the data date are planned.

Duration:

The estimated time required to complete an activity as recorded on the Project Schedule.

Float Suppression/Sequestering:

The process of utilizing zero free float techniques that allows an activity to start as late as possible by using all available free float of that activity, by the utilization of overly generous activity durations, or by using overly restrictive calendar non-working periods.

Free Float:

The amount of time an activity may be delayed without delaying the early start date of its successors.

Longest Path:

The longest continuous path of activities through a project, which controls project early

completion.

Look-Ahead Schedule:

A computer-generated schedule that shows the previous week's work and the work planned for the current and next three weeks.

Milestone:

An activity, with no duration, that is typically used to represent the beginning, end, interim stages and significant events of the project, or contractually required dates.

Monthly Progress Schedule:

A monthly update to the approved baseline schedule.

Narrative:

A written report explaining the Project Schedule in detail, as specified in Subsection 108.12(F) of the specifications.

Predecessor:

An activity that affects the start or finish date of another activity with a logically tied relationship.

Preliminary Schedule:

A CPM schedule that shows the Baseline Schedule for the first 60 calendar days of contract time and, the work breakdown structure and milestones for the entire contract.

Project Schedule:

A logic-based critical path for all work leading up to and including substantial completion or final acceptance that is used for tracking the performance of the work. The term "Project Schedule" will refer to one or more of the following:

(a) Baseline Schedule,

(b) Monthly Schedule, or

(c) Recovery Schedule.

Record Schedule:

A CPM schedule that shows the actual start and finish date of each activity, durations, and

all changes.

Recovery Schedule:

A CPM schedule that shows the activity changes to recover the time lost due to incompletion of the work within the contract time as specified in the Monthly Progress Schedule.

Scheduler:

An individual, who creates, maintains and revises the Project Schedule using applicable software.

Successor:

An activity whose start or finish date is affected by the logically tied relationship with another activity.

Time Impact Analysis (TIA):

A forward-looking, prospective schedule analysis developed to demonstrate the impact of a change to the current schedule on its longest path.

Total Float (Float):

The cumulative duration of time an activity may be delayed without delaying the contract time or a contractual milestone.

Work Breakdown Structure (WBS):

A framework for organizing and ordering the work activities into hierarchical groups.

(B) General:

The contractor shall prepare, furnish, and use the Project Schedule to plan, monitor, and report the progress of the work. The schedule shall demonstrate a detailed plan to complete the work in accordance with the contract time and be used in communication to coordinate activities among all affected parties.

The contractor shall provide a Scheduler to create and maintain all schedules, updates, Narratives, reports, and TIA related to this project. The Scheduler shall be proficient in CPM schedule development, analysis of resources applicable to the required detail of the Project Schedule, and shall be able to perform the required tasks using the specified software.

The Scheduler shall be present at all schedule meetings, in person or via teleconference, and made available for discussion or meetings when requested by the Engineer. The

contractor project management personnel, subcontractors, and suppliers shall actively communicate with the Scheduler to develop and maintain accurate updates of progress and schedule revisions throughout the duration of the contract.

The Department's review and comment on a schedule for compliance with this specification does not do the following:

(1) Imply or constitute approval of particular construction methods or relieve the contractor of its responsibility to provide sufficient materials, equipment, and labor to complete the project in accordance with the contract;

(2) Attest to the validity of assumptions, activities, relationships, sequences, resource allocations, or other aspects of the schedule;

(3) Imply the contractor is entitled to a Supplemental Agreement extending the contract time or adjusting the contract price;

(4) Relieve the contractor from compliance with the requirements of the contract or result in the approval of a deviation, exception to or other variation from the contract. Failure to include an element of work required by the contract in the schedule does not release or relieve the contractor from responsibility to perform such work.

In preparing, developing and updating the Project Schedule the contractor shall not utilize:

(1) Float suppression techniques in the schedule, including interim dates imposed by the contractor other than project milestone(s);

(2) The inclusion of activities or constraints in a path or chain leading to a project milestone which are unrelated to the work as specified in the contract;

(3) Activity durations or sequences determined by the Department to be unreasonable in whole or in part.

The contractor shall not use preferential sequencing, whereby activities that could be performed concurrently and are established in the Project Schedule as sequential simply to consume float. The contractor shall not indicate artificial activity durations by inflating activities in the schedule to consume float and influence the Critical Path. Sequestering of float is cause for rejection of the contractor's schedule submittal. If float sequestering is identified, the contractor shall revise the schedule appropriately.

Total Float is a commodity available to both the Department and the contractor for sequential use until depleted and not for the exclusive use or financial benefit of either party. A schedule showing an early completion date shall show the time between the scheduled completion date(s) and the required contract completion deadline(s) as Total Float.

The Department will not be liable to the contractor for delays by any party when the contractor completes the work prior to expiration of contract time.

If a delay in performing the work is caused by the Department, the contractor shall immediately notify the Department in writing that a revision to the contract is necessary in accordance with Subsection 104.02 and Subsection 104.03 of the specifications. The contractor shall include a description of the cause of delay, the projected amount of Total Float to be used, and the revised Monthly Progress Schedule showing the use of the Total Float in the Monthly Progress submittal. The contractor shall work cooperatively with the Department, other contractors, and third parties to identify and implement, to the maximum extent possible, no-cost measures to recover all schedule delays, regardless of the cause of the delays.

The contractor shall coordinate with the Department, local governmental entities, utility companies, railroad companies, and any third party entities when developing and maintaining the Project Schedule. The contractor shall coordinate its planning and scheduling efforts as required to address conflicts and comments received from adjacent projects and other entities.

(C) Preliminary Schedule:

Before the preconstruction conference the contractor shall prepare and submit a Preliminary Schedule for the Engineer's review and approval. The Preliminary Schedule shall comply with Subsection 108.12(D) of the specifications for the first 60 calendar days of contract time and includes the WBS and milestones for the complete contract.

Along with the Preliminary Schedule, the contractor shall include its calendar for the contract period which shall show work days, calendar days, non-work days, and dates. The contractor shall not begin work until the Engineer has approved the Preliminary Schedule.

(D) Baseline Schedule:

The contractor shall submit a Baseline Schedule within 30 calendar days after the acceptance of the Preliminary Schedule for Engineer’s review and approval.

The Baseline Schedule shall be in the following format:

(1) Project ID: The schedule project ID shall match the filename format in Subsection 108.12(K) of the specifications. The project name shall be the route number followed by the project description.

(2) Activity ID: Each activity shall be assigned a unique identification number. Activity ID numbers shall not be changed or reassigned for the duration of the contract. Within each group of the WBS, activity ID’s shall be numbered sequentially in increments of 10 in the order of their start date

or by finish date of a finish milestone. Milestone activities shall begin with “M”. Use 10 characters or less.

(3) Activity Name: Each activity shall be defined with a unique name that contains the description of work. Each name shall at a minimum consist of a verb or work function (i.e. remove, excavate, form, install), an object (i.e. curb, pipe, footing) and a location (i.e. street, station, bridge number). For example, “Install Barrier Dtl C – S1 120+25 Lt”. The activity quantity may be included after location.

The contractor shall create an activity name using the following:

a) Use 50 characters or less;

(a) Use “S1, S2, …” for stage naming if applicable;

(b) Do not use all capital letters;

(c) Keep names readable, but use abbreviations as needed. Do not use periods when abbreviating. All abbreviations shall be consistent; and

(d) Location is not required if object name is specific, such as “CMP #201”.

The contractor shall provide a list of abbreviations and acronyms. The work related to each activity shall be limited to one stage, one area, one traffic control phase, and one responsible party of the contract.

(4) Activity Code: Activities shall be assigned with project activity codes that will be used to classify, categorize and organize activities for reporting. Only use project level activity codes and not global or enterprise codes. At a minimum, all activities shall have an activity code for responsible party, stages, and phases. Additional activity codes shall be added if requested by the Department.

(5) Milestones: The contractor shall separately identify each project milestone, conforming to the scheduling requirements set forth in the contract.

(6) Constraints: The contractor shall not use date constraints to logically begin or complete a project activity unless specific calendar dates are shown in the contract. Specific contract dates may only be applied as a constraint to a milestone activity and input as either a “Start on or After” or “Finish on or Before” date. No other constraint types shall be allowed.

(7) Duration: Activity duration shall not exceed 20 calendar days unless approved by the Engineer. Activity durations shall be at least one calendar day. Durations shall represent the anticipated productivity rates that factor in all limitations to the productivity. Long lead activities such as procurement and Level of Effort activities may exceed 20 calendar days.

(8) Relationships: All activities shall have at least one predecessor and one successor except for the project start and project end milestones. Negative lags or negative floats shall not be allowed. Predecessors and successors shall not be linked to the same activity with different relationship types. The start of an activity shall have a Start-to-Start or Finish-to-Start relationship with preceding activities. The completion of an activity shall have a Finish-to-Start or Finish-to-Finish relationship with succeeding activities. Do not use Start-to-Finish relationships. Do not use Finish-to-Start relationships with a lag or overlap.

(a) Mobilization/Demobilization;

(b) Right of Way Acquisition;

(c) Submittal development;

(d) Submittal review and acceptance;

(e) Submittal and approval of material samples and mix designs;

(f) Submittal and approval of shop drawings;

(g) Long lead items, material and equipment procurement;

(h) Procurement of permits;

(i) Environmental commitments and mitigation activities;

(j) Equipment and plant setup;

(k) Fabrication of special items;

(l) Erection and removal of falsework and shoring;

(m) Utility and railroad relocations;

(n) Cure times for concrete;

(o) Cure times for pavement before striping;

(p) Landscape and seeding establishment periods;

(q) Test periods;

(r) Major traffic stage changes;

(s) Substantial completion;

(t) Punchlist completion; and

(u) Final cleanup;

(9) The schedule shall be in detail to allow day-to-day monitoring and review of the contractor's operations. It shall show the order and interdependence of activities and the sequence of work.

(10) The contractor shall detail the Critical Path activities and logic ties in the schedule to show the work sequencing. The contractor shall use the CPM software to determine the controlling activities in the critical path. The critical activities shall be prominently distinguished on all reports by the use of color or pattern.

(11) The contractor shall provide the number of activities to assure adequate project planning and allow for monitoring and evaluation of work progress.

(12) The contractor shall provide activities as necessary to depict third-party work related to the contract. Third-party work activities may include but is not limited to railroads, utilities, real estate, and government agencies.

(13) Seasonal, winter shutdown, traffic, special event, environmental, or other

contract restrictions shall be considered and included in the schedule for all work. These restrictions shall be addressed with project calendars and shown as non-work days for each major work type. Global calendars shall not be used. Examples of major work types are earthwork, concrete paving, structures, asphalt, drainage, landscaping, etc. The contractor shall include project calendar for curing time if applicable.

(14) The duration for each activity shall include the anticipated production rate and the time for anticipated weather stoppages. The contractor shall not reserve random non-work days in a project calendar to account for weather stoppages.

(15) The schedule shall have a Data Date of the start date shown in the Notice of Award letter.

(16) When processing the schedule in the software, the contractor shall use the following options:

(a) When scheduling progressed activities use Retained Logic;

(b) Calculate start-to-start lag from Early Start;

(c) Define critical activities as Longest Path;

(d) Compute Total Float as Finish Float = Late Finish – Early Finish; and

(e) Calendar for scheduling relationship lag as predecessor activity calendar.

(17) The bar chart schedule plot shall be accompanied by a schedule report of the network with a tabulation of the following data for each activity:

(a) Activity ID;

(b) Activity name;

(c) Original duration;

(d) Early start date;

(e) Early finish date;

(f) Late start date;

(g) Late finish date;

(h) Predecessors;

(i) Successors;

(j) Free float;

(k) Total float;

(l) Primary constraint date;

(m) Calendar; and

(n) Responsibility for activity - e.g., prime contractor, subcontractor, supplier, etc.

(E) Monthly Progress Schedule:

After the approval of the Baseline Schedule, the contractor shall submit a Monthly Progress schedule until the substantial completion of the project. The Monthly Progress Schedule and Narrative shall be prepared and submitted by the 15th day of the month. The Monthly Progress Schedule shall reflect progress up to the data date, forecast finish for in-progress activities and re-forecast early dates for activities planned in the next update period. The Monthly Progress Schedule shall meet all format requirements specified in Subsection 108.12(D) of the specifications and shall include the following:

(1) Actual start and finish dates for completed activities;

(2) Actual start dates, percentage complete, and remaining duration for activities in progress;

(3) All proposed activities, logic, and date revisions required to:

(a) Implement changes in the work;

(b) Detail all impacts on preexisting activities, sequences, and dates;

(c) Reflect the contractor's current approach for work remaining;

(d) Incorporate delays that have been agreed upon between the Department and the contractor; and

(e) Incorporate accepted substitution proposals.

(4) Planned start and finish dates for activities that have not started.

The contractor shall show actual progress based on actual percentage completion of the activity addressed as "Percent Complete" with adjustments to remaining duration and non-calculated progress in the Monthly Progress Schedule. The contractor shall incorporate logic changes and work changes into the Monthly Project Schedule. Percent complete types shall be set to "physical". Each Monthly Project Schedule submittal shall clearly and individually define the progression of the work within the applicable timeframe by updating the current and planned project activities.

If work is performed out of sequence, the contractor shall implement logic changes to allow the out of sequence work to proceed. The contractor shall exclude all revisions for the contractor's convenience when reconciling an extension to a milestone. The contractor shall document changes, which shall be highlighted or identified, in the Monthly Progress Schedule.

The contractor shall impose no other date restrictions in the Monthly Project Schedule, unless the contractor provides an explanation of the basis for such date restrictions and such explanation is acceptable to the Department.
The contractor shall provide additional, separate, filtered reports of the project activities including the following:

(1) Bar chart schedule plot showing all critical path activities, long-term lane closures, and the status of these activities as of the date of the update.

(2) Bar chart schedule plot that compares the contractor's progress to planned progress for each activity.

(3) 30-Day look-ahead report listing all design document submittals.

(4) Total Float report displaying float from least to greatest for all activities with 14 day or less of total float.

(5) 60-Day look-ahead report identifying all required Department and governmental approvals.

(6) 60-Day look-ahead bar chart schedule plot sorted by WBS and activity early start dates including the responsible party.

(7) Monthly expenditure table and cash flow expenditure curve for the project.

If the Engineer requests a revision or justification, the contractor shall provide a revision or justification to the satisfaction of the Engineer within seven calendar days. Failure to comply with the schedule requirements specified herein, or provide revisions or justifications within seven calendar days for Engineer's approval will result in withholding $15,000 of the monthly estimate payments. The withheld money will be paid on the monthly estimate following the approval of the Monthly Progress Schedule with acceptable revisions or justifications.

Once the Monthly Progress Schedule is approved by the Engineer, the contractor shall use the approved Monthly Progress Schedule as the basis for the next Monthly Progress Schedule.

(F) Narrative:

With each Project Schedule submittal, the contractor shall prepare and submit a stand-alone schedule Narrative with details that explain the basis of the submitted Project Schedule. The schedule Narratives shall not be considered notification of delays, supplemental agreements, or other issues.

(1) For the Baseline Schedule, the Narratives shall include at a minimum:

(a) The contractor's site management plan and schedule of activities (e.g., lay down, staging, traffic, and parking);

(b) The use of construction equipment and resources for major items;

(c) The basis and assumptions for critical activity durations and logic;

(d) Compliance with temperature, weather and seasonal

requirements. Show how and where this is applied and accounted for in the schedule;

(e) List all calendars used and describe their usage;

(f) Anticipated hours per shift, shifts per work day, and work days per week;

(g) Justification for all constraints used;

(h) Justification for an activity with a duration exceeding 20 Calendar Days;

(i) Contractor's approach used to apply relationships between activities, including a list of activity relationships with lags and the justification for the use of each lag (e.g., all ties are based on physical relationships between work activities [such as "rebar shall be placed before concrete is placed"] or relationships are used to show limited resources [such as "bridge two follows bridge one" because contractor has only one bridge crew]);

(j) A written construction phasing plan supporting the approach to the work outlined. The written construction phasing plan shall include at a minimum each phase for the maintenance of traffic (MOT), changes in traffic control, and the construction activities and disciplines to be performed under each construction phase. The construction phasing plan shall show dates of MOT phase changes that are coordinated with the schedule;

(k) The reasons for the sequencing of work, including a description of all limited resources, potential conflicts, and other items that may affect the schedule and how they may be resolved;

(l) Anticipated production rates for major activities including but not limited to earthwork, hauling, drainage, asphalt paving, PCCP, curb and gutter paving, barrier walls paving, etc. Each activity shall be shown with its activity ID, activity name, production rate, equipment used to achieve the production rate (include quantity of pieces of equipment with all attachments), and duration of activity;

(2) For Monthly Progress Schedules, Recovery Schedules, and Supplemental Agreement and TIA Schedules, as part of the Narrative, in addition to the

information above, if changes were made, the contractor shall provide a report that includes at a minimum:

(a) Recap and explain progress and days gained or lost versus the previous progress schedule.

(b) Discuss all actions and corrections to be taken to achieve Baseline Schedule milestones.

(c) Explain in detail all critical path activities behind schedule and challenges that may arise with planned critical path activities. Explain all activities that have changed from a non-critical path to the critical path. Identify near-critical path activities that could become critical path activities.

(d) Describe changes in resources and productivity rates to be used on remaining work.

(e) Identify all delays, their extent, responsible party, and explain their causes. Include the amount of weather related delays.

(f) List all activities that have been added or removed from the schedule and an explanation of those changes.

(g) List and explain all changes in activities, sequence, durations, and logic ties. Explain changes caused by each Supplemental Agreement, schedule recovery plans and grouping of related contractor initiated revisions.

(h) Describe all coordination with utility companies and accomplishing utility work.

(i) All negative float shall be explained in detail.

(G) Recovery Schedule:

If the Project Schedule indicates a late completion of the work by 28 or more calendar days, the contractor shall prepare a Recovery Schedule which demonstrates how the contractor intends to reschedule the activities to regain compliance with the contract.

Within ten working days of receipt of the Engineer's written direction, the contractor shall

submit the Recovery Schedule to the Engineer. The contractor shall not be required to prepare a Recovery Schedule if the contractor requests and demonstrates, in writing, entitlement to extension of a completion deadline due to a Department caused delay, and the Engineer concurs that a Recovery Schedule is not required at that time. If the Engineer disputes the contractor's entitlement to a completion deadline adjustment, the contractor shall, within five working days, submit a Recovery Schedule that does not include a completion deadline adjustment.

Within five working days after a rejection by the Engineer of the Recovery Schedule, the contractor shall resubmit a revised Recovery Schedule incorporating the Department's comments. When the Engineer accepts the contractor's Recovery Schedule, the contractor shall, within five working days after the Engineer's acceptance, incorporate such schedule in the Project Schedule, deliver the same to the Department, and proceed in accordance with the approved Recovery Schedule.

All acceleration costs required to bring the contract work back into compliance with project milestones and the contract time due to a contractor caused delay shall be borne solely by the contractor. Whenever a Recovery Schedule is required, the contractor shall provide the following information:

(1) Transmittal letter;

(2) Bar chart schedule plot;

(3) Electronic copy of the file used for the proposed Recovery Schedule; and

(4) Narrative describing all proposed changes to the Project Schedule in detail, with justification for the changes, including the following:

(a) Changes to activity original durations;

(b) Changes to activity relationships and schedule logic;

(c) Cause of schedule slippage and actions taken to recover schedule within the shortest reasonable time (e.g., hiring of additional labor, use of additional construction equipment, and expediting of deliveries);

(d) Float consumption;

(e) Identification of activities that have been added, deleted, or modified; and

(f) Changes to the Project Schedule's Critical Path.

(H) Revisions to Contract:

If the contractor receives a request for extra work from the Department or submits a contract change request in accordance with Subsection 104.02 of the specifications asserting that an event, situation, or change affects a Critical Path of the Project Schedule, the contractor shall prepare and submit a TIA showing the cumulative effect of the change on the completion or fixed milestone date along with a written report describing the time impact in a form satisfactory to the Department complying to Subsection 104.03 of the specifications.

Each TIA shall include a fragmentary network (fragnet) demonstrating the following information:

(1) How the contractor proposes to incorporate a time extension provided for in a Supplemental Agreement;

(2) The impact to the Project Schedule;

(3) The sequence of new and/or existing activity revisions that are proposed to be added to the Project Schedule that is in effect when the change or delay is encountered;

(4) The proposed method for incorporating the delay and its impact to the Project Schedule; and

(5) The computation of two finish dates. The first finish date shall be computed without consideration of impacts by the proposed revision. The second finish date shall be computed with consideration of impacts by the proposed revision.

If a proposed change in planned work results in altering the Critical Path or extending the schedule completion date, the contractor shall submit a Revised Schedule and a TIA within 15 calendar days of the proposed change.

(I) Record Schedule:

The contractor shall prepare a Record Schedule that includes actual start and actual finish dates for all activities. The Record Schedule, once approved, serves as the final update of the Project Schedule. The contractor shall include a written certification with the Record Schedule submittal signed by the Project Manager of the contractor in accordance with the following:

"To the best of my knowledge, the enclosed final update of the project Schedule reflects the actual start and completion dates of the activities for the project contained herein."

The contractor shall submit the Record Schedule to the Engineer for review. Final acceptance will not be issued until the Record Schedule has been approved.

(J) Schedule Meetings and Three Week Look Ahead Schedule:

(1) Baseline Schedule Presentation Meeting:

At a time agreeable to the Engineer, the contractor shall conduct a Baseline Schedule presentation meeting within seven calendar days after submitting the proposed Baseline Schedule. The purpose of this meeting is for the contractor to present and explain the contractor's schedule and construction phasing plan. At a minimum, the following is to be covered at the joint review of the schedule:

(a) WBS;

(b) Sequence of work - step through the schedule activity by activity;

(c) Construction phasing including traffic control phasing and changes;

(d) Resources to include number of construction personnel and production rates used; and

(e) Critical Path review.

(2) Weekly Project Meeting and Look-Ahead Schedule:

At the weekly project meetings, the contractor shall provide the Engineer with a detailed, Look-Ahead Schedule. The Look-Ahead Schedule is a computer generated bar chart schedule plot that shows the previous week's work and the work planned for the current and next three weeks. The contractor shall base the Look-Ahead Schedule on the Project Schedule and provide a greater breakdown of the Project Schedule activities for the purpose of materials inspection and testing. The Look-Ahead Schedule shall clearly note and explain all departures from the Project Schedule. The contractor shall reference the Project Schedule activity ID numbers, WBS, and define subsequent specific daily operations for all work activities scheduled to be performed during the four-week period. The contractor shall identify work being performed by Disadvantaged Business Enterprise (DBE) firms as separate activities. At least one day before the weekly construction activity meetings, the contractor shall submit weekly Look-Ahead Schedules to the Engineer.

(3) Project Schedule Update Meeting:

The contractor shall schedule a joint Project Schedule update meeting to review the Monthly Progress Schedule update on the 15th day of the month or within three days, excluding weekends and holidays thereafter as coordinated with the Engineer. The contractor shall host the meeting and provide an agenda. At a minimum the following items shall be discussed:

(a) The actual progress made until the data date of the schedule update. The review of progress shall include dates for activities actually started and completed, and the duration percentage of work remaining on each activity started. The percentage of work completed shall be calculated by using the quantity and production rate information.

(b) All changes from previously approved schedules.

(c) Actual and potential schedule conflicts.

(d) Supplemental Agreement work and work identified that may lead to supplemental agreement work.

(K) Submittals:

Two 11 x 17 inch hard copies and one pdf copy of each schedule in color listed herein shall be provided to the Engineer. The contractor shall furnish to the Engineer for project use an electronic copy of the schedule. The electronic copy shall be Primavera P6 .xml file format prepared in Primavera software.

The filename of schedules shall be submitted in the following format:

SCHEDULE FILENAME FORMAT	
Preliminary Schedule	TTTTT-YYMM-PSVV
Baseline Schedule	TTTTT-YYMM-BSVV
Monthly Progress Schedule #1	TTTTT-YYMM-MPS01VV
Monthly Progress Schedule #2	TTTTT-YYMM-MPS02VV
Recovery Schedule	TTTTT-YYMM-RCYSVV
TIA Schedule	TTTTT-YYMM-TIASVV
Record Schedule	TTTTT-YYMM-RCDSVV
3 Week Lookahead Schedule	TTTTT-YYMM-LASVV
Schedule Narrative	TTTTT-YYMM-NARVV
Note: (1) TTTTT: First 5 digits of project TRACS number. (2) YYMM: Current 2 digit year and month.	
(3) VV: 2 digit version number (01, 02, etc.).	

All bar chart schedule plots shall be in color and have a size and scale acceptable to the Engineer. Include a title block and a legend on each page. The plot layout shall include a schedule activity table with corresponding bar chart. The activity table shall be grouped by the WBS and include the activity ID, activity name, duration, start date, finish date, and total float. All activities in the bar chart shall be plotted on their start and finish dates. Show relationship lines and data date line. The bar chart shall be time-scaled in two-line format with a date interval set to year/month and type set to calendar.

The contractor shall provide two 8.5 x 11 inch hard copies of the narrative and monthly report with an electronic pdf copy.

The contractor shall provide a schedule log file generated by the software in a .txt file format with all schedule submittals. The log file shall have the same filename as the schedule file. The contractor shall review the log file prior to submittal to verify that the electronic schedule is in compliance with this specification.

(L) Software:

The automated system software shall be Primavera P6.

(109RRBB, 04/18/24)

SECTION 109 MEASUREMENT AND PAYMENT:

109.04(D)(3) Equipment: the first paragraph of the Standard Specifications is revised to read:

Equipment which the Engineer considers necessary for the performance of work will be eligible for payment at the established rates only during the hours that it is operated except as otherwise allowed elsewhere in these specifications. Equipment hours will be recorded to the nearest one-half hour. For the use of equipment owned by the contractor and approved by the Engineer, the contractor will be paid the rental rates, as modified herein, outlined in the Rental Rate Blue Book® (RRBB) for Construction Equipment which is updated by EquipmentWatch™, a division of Fusable, 3200 Rice Mine Road NE, Tuscaloosa, Alabama 35406, phone (888) 307-1713. All rate determinations will be based on the RRBB quarterly rate revisions that are applicable at the time equipment is being used.

(109FAEU, 08/15/24)

SECTION 109 MEASUREMENT AND PAYMENT:

109.04(D)(3)(a) Rental Rates (Without Operators): the equation of the first paragraph of the Standard Specifications is revised to read:

The hourly equipment rental rate (HERR) will be determined by the following formula:

$$HERR = F \times \left[\frac{1.15 \times R}{176}\right] + HOC$$

Where: F= Adjustment Factor to R is 0.933

R= Current RRBB Monthly Rate

HOC= Hourly Operating Cost

(109RET, 10/20/22)

SECTION 109 MEASUREMENT AND PAYMENT:

109.06(B)(3) Partial Payment: of the Standard Specifications is modified to add:

Notwithstanding any provision of Arizona Revised Statutes Section 28-6924, the parties may not agree otherwise.

109.06(B)(4) Final Payment: of the Standard Specifications is modified to add:

Notwithstanding any provision of Arizona Revised Statutes Section 28-6924, the parties may not agree otherwise.

109.06 Partial Payments and Retention: of the Standard Specifications is modified to add:

(C) Payroll Submittals:

The contractor shall submit payrolls electronically through the internet to the Department's web-based certified payroll tracking system. This requirement shall also apply to every lower-tier subcontractor that is required to provide certified payroll reports.

If, by the 15th of the month, the contractor has not submitted its payrolls for all work performed during the preceding month, the Engineer will provide a written notification of the discrepancies to the contractor. For each payroll document that the contractor fails to submit within 10 days after the written notification, the Department will retain $2,500.00 from the progress payment for the current month. The contractor shall submit each complete and correct payroll within 90 days of the date of notification. If the payroll is complete and correct within the 90-day time frame, the Department will release the $2,500.00 on the next monthly estimate. For each payroll that is not acceptable until after the 90-day time frame, the Department will only release $2,000.00 of the $2,500.00 retained. The Department will retain $500.00 as sanctions. Such $500.00 retentions will not relieve the contractor of its responsibility to provide each required payroll, complete and correct, as specified above. These sanctions shall be in addition to all other retention or liquidated damages provided for elsewhere in the contract.

(109SUBPAY, 10/20/22)

SECTION 109 MEASUREMENT AND PAYMENT:

109.06(B)(5) Payment Reporting and Sanctions: the eighth paragraph of the Standard Specifications is revised to read:

For each month that the contractor fails to submit timely and complete payment information the Department will retain $5,000 as sanctions from the monies due to the contractor. After 90 consecutive days of non-reporting, the sanctions will increase to $10,000 for each subsequent month which the contractor fails to report until the information is provided. These sanctions will be in addition to all other retention or liquidated damages provided for elsewhere in the contract.

109.06(B)(8) Non-compliance: of the Standard Specifications is revised to read:

Failure to make prompt partial payment, or prompt final payment including any retention, within the time frames established above, will result in remedies, as the Department deems appropriate, which may include but are not limited to:

Sanctions. These sanctions will be in addition to all other retention or liquidated damages provided for elsewhere in the contract:

The Department will withhold two times the dollar amount not paid to each subcontractor;

If full payment is made within 30 days of the Department's payment to the contractor, the amount withheld by the Department will be released; and

If full payment is made after 30 days of the Department's payment to the contractor, the Department will release 75 percent of the funds withheld. The Department will retain the remaining 25 percent of the monies withheld as sanctions.

Additional Remedies. If the contractor fails to make prompt payment for three consecutive months, or any four months over the course of one project, or if the contractor fails to make prompt payment on two or more projects within 24 months, the Department may, in addition, invoke the following remedies:

Withhold monthly progress payments until the issue is resolved and full payment has been made to all subcontractors, subject to the sanctions described in paragraph (a) above;

Terminate the contract for default in accordance with Subsection 108.10 of the specifications; and/or

Disqualify the contractor from future bidding, temporarily or permanently, depending on the number and severity of violations.

In determining whether the sanctions will be assessed, the extent of the sanctions, or additional remedies assessed, the State Construction Engineer will consider whether there have been other violations on this or other contracts, whether the failure to make prompt payment was due to circumstances beyond the contractor's control, and other circumstances. The contractor may, within 15 calendar days of receipt of the decision of the State Construction Engineer, escalate the decision to the State Engineer. If the contractor does not escalate the decision of the State Construction Engineer, in writing to the State Engineer, within 15 calendar days of receipt of the decision, the contractor will be deemed to have accepted the decision and there will be no further remedy for the contractor. If the contractor escalates the decision to the State Engineer, and the contractor does not agree with the State Engineer's decision, the contractor

may initiate litigation, arbitration or mediation pursuant to Subsection 105.21(D) and (E) of the specifications.

(109LSUM, 02/10/20)

SECTION 109 MEASUREMENT AND PAYMENT:

109.10(A) General: the first paragraph of the Standard Specifications is revised to read:

If the Bidding Schedule contains items shown with an alpha suffix and the alpha suffix is listed herein (or in the Special Provisions), the contractor will be paid on a lump sum basis.

The structure(s) to be paid on the basis of a lump sum amount is (are):

(A) Perkins Valley TI UP (STRUCTURE #1776)

109.10(D) Payment: the last paragraph of the Standard Specifications is revised to read:

Payments made for structural concrete will be adjusted, in accordance with the provisions of Subsection 1006-7.06(B), for material which fails to meet the required 28-day compressive strength when sampled in accordance with the requirements of Subsection 1006-7.

(109FUEL, 02/10/12)

SECTION 109 MEASUREMENT AND PAYMENT: of the Standard Specifications is modified to add:

109.12 Fuel Cost Adjustment:

(**A) General:**

The Department will adjust monthly progress payments up or down as appropriate for cost fluctuations in diesel fuel as determined in accordance with these special provisions.

A fuel cost adjustment will be made when fluctuations in the price of diesel fuel, in excess of 15 percent, occur throughout this contract. The Department will not provide such adjustments for fluctuations in the price of diesel fuel of 15 percent or less.

No adjustments will be made for fluctuations in the price of fuels other than diesel.

(B) Measurement:

The base index price of fuel will be determined by the Department from the selling prices of diesel fuel published by OPIS (Oil Price Information Service). The base index price to be used will be the price for Diesel fuel No. 2, Ultra Low Sulfur, PAD 5, City of Phoenix Rack. The reported average value for the Phoenix area will be used.

The base index price for each month will be the arithmetic average of the selling price for diesel fuel, as specified above, shown in the last four reports received prior to the last Wednesday of the month.

This price will be effective as of the last Wednesday of each month, and will be posted on the Department's website, at http://www.azdot.gov/Highways/cns/bitmat.asp, on or shortly after the last Wednesday of the month.

This price may also be obtained from Contracts and Specifications Services at (602) 712-7221.

This price will be deemed to be the "initial cost" (IC) for diesel fuel on projects for which bids are opened during the following month.

The current index price for diesel fuel in subsequent months will be the base index price, determined as specified above, for the current month. For example; an adjustment for diesel fuel used in May, if applicable, will be based on the "current price" (CP) for May as posted on the last Wednesday of May. The amount of adjustment per gallon will be the net difference between the "initial cost," adjusted by 15 percent, and the current index price. The monthly adjustment will be determined by the Engineer and included in the payment estimate as a fuel adjustment. For fluctuations in excess of 15 percent, fuel cost adjustments will only be made for current price index increases greater than 1.15 times the "initial cost" or for decreases less than 0.85 times the "initial cost." No calculation will be made for fluctuations in the current index price of 15 percent or less when compared to the "initial cost."

The number of gallons of diesel fuel used per month will be considered to equal 1.5 percent of the dollar amount of work reported by the contractor for each month. Such dollar amount will not include incentives earned by the contractor for pavement smoothness, thickness, or strength for Portland cement concrete pavements; for pavement smoothness or quality lots for asphaltic concrete pavements; for any other revenue derived from quality incentives; or for revenue accrued in the previous month for bituminous material cost fluctuations or diesel fuel price adjustments.

A monthly adjustment, if applicable, will be made on this quantity, as shown below:

$$S = \frac{0.015(Q)}{IC} x\ (CP - AC)$$

Where; S = Monetary amount of the adjustment (plus or minus) in dollars
Q = Dollar amount of work completed for the month
CP = Current index price in dollars per gallon

AC = Adjusted "initial cost" (1.15 or 0.85 times IC) in dollars per gallon
IC = "Initial cost" as determined above, dollars per gallon

If adjustments are made in the contract quantities, the contractor shall accept any fuel adjustment as full compensation for increases or decreases in the price of fuel regardless of the amounts of overrun or underrun.

The value calculated above (plus or minus) will be adjusted to include sales tax and other taxes as applicable.

No additional compensation will be made for any additional charges, costs, expenses, etc., which the contractor may have incurred since the time of bidding and which may be the result of any fluctuation in the base index price of diesel fuel.

No adjustments will be made for work performed after Substantial Completion, as defined in Subsection 105.19, has been achieved.

(C) Payment:

Price adjustments will be shown on the monthly progress estimate, but will not be included in the total cost of work for determination of progress or for extension of contract time.

(109BITUMADJ, 04/15/21)

SECTION 109 MEASUREMENT AND PAYMENT: of the Standard Specifications is modified to add:

109.16 Bituminous Price Adjustment:

(A) General:

The term "bituminous material" as used herein shall include asphalt binder, asphalt rubber and emulsified asphalt.

The Department will adjust monthly progress payments as appropriate for market fluctuations in the price of bituminous material.

A price for bituminous material will be determined monthly by the Department based on the selling prices published by the Asphalt Weekly Monitor, a publication of Poten & Partners, Inc. The price will be the arithmetic average of the high and low selling prices for bituminous material shown in the previous four reports for the Arizona/Utah and Southern California regions.

This value will be effective as of the last Wednesday of each month, and will be posted on the ADOT Contracts and Specifications Group website, on or shortly after the last Wednesday of each month.

This price will be deemed the “initial cost” (IC) for bituminous material for projects on which bids are opened during the following month. This price will also be deemed the "current price" (CP) for bituminous material for the following month for projects in construction.

(B) Measurement:

For each item of bituminous material for which there is a specific pay item, and for the bituminous material used in Asphaltic Concrete (Miscellaneous Structural), an adjustment will be made for each month that a quantity of bituminous material was used on the project.

The IC for the month in which the project was bid will be compared with the CP for the appropriate current month. The CP will be as posted on the Department’s website on the last Wednesday of each month, and will be used to adjust costs for bituminous material incorporated into the job during the following month (for example; bituminous material used in May will be adjusted, as specified herein, based on the CP for May as posted on the last Wednesday of April). Any difference in price between these two values will be applied to the quantity of eligible bituminous material incorporated into the work.

Determination of the eligible quantities of bituminous material for adjustment will be based on contractor-furnished invoices, except as described herein.

The tons of emulsified products to which the adjustment will be applicable will be the tons of the emulsified asphalt prior to dilution.

Adjustments in compensation for emulsified asphalts will be made at 60 percent of either the increase or decrease of IC. For emulsified asphalts containing polymer, adjustments in compensation will be made at 66 percent of either the increase or decrease.

The tons of Bituminous Material (Asphalt-Rubber) to which the adjustment is applicable will be 80 percent of the total quantity of the item used. The adjustment is not applicable to the 20 percent of the material which constitutes the crumb rubber additive.

The tons of bituminous material incorporated in Asphaltic Concrete (Miscellaneous Structural) or Asphaltic Concrete (Miscellaneous Structural-Special Mix) to which an adjustment will be applicable is as follows:

(1) For mixes without reclaimed asphalt pavement (RAP), the adjustment will be equal to 5 percent of the quantity, measured in tons, of asphaltic concrete placed, regardless of the actual percentage of bituminous material incorporated into the mix.

(2) For mixes with RAP, the adjustment will be equal to 4 percent of the quantity, measured in tons, of asphaltic concrete placed, regardless of the actual percentage of bituminous material incorporated into the mix.

(3) If the quantity of asphaltic concrete is measured by volume, the

supplemental agreement establishing the method of measurement will specify the manner in which the tons of bituminous material eligible for the adjustment is determined.

(C) Payment:

The tons of bituminous materials which are paid for on the basis of testing by nuclear asphalt content gauge, ignition furnace, or other approved methods to which the adjustment will be applicable, are the tons which have been incorporated into the mixture.

When RAP is used in asphaltic concrete, only the tons of virgin asphalt binder will be subject to a bituminous material price adjustment. RAP binder will not be subject to a price adjustment.

No compensation will be made for changes that may have occurred since the time of bidding and which may be the result of any increase in the IC of bituminous material.

Adjustment in unit prices of items governed by this provision will be made in the next regular monthly progress payment following actual use or application of the bituminous material.

(201PAY, 07/15/21)

SECTION 201 CLEARING AND GRUBBING:

201-5 Basis of Payment: of the Standard Specifications is modified to add:

When clearing and grubbing is not included as a contract pay item, full compensation for any clearing and grubbing necessary to perform the construction operations designated on the project plans or specified in the Special Provisions shall be considered as included in the price of contract item.

ITEM 2020156 – REMOVE (ROCKER BEARING ASSEMBLY):

Description:

The work under this item shall consist of removing the existing rocker bearing assemblies as shown on the plans and as directed by the Engineer.

Construction Requirements:

The contractor shall submit a detailed removal plan to the Engineer for review and approval a minimum of five working days prior to the start of removal operations. Removal operations shall not start until the detailed removal plan has been approved by the Engineer.

The plan shall describe how the structure will be secured and stabilized, specify the method proposed to raise the girders, show the sequence of activities, and provide a list and specifications of the equipment to be used.

The removal of a small portion of lead-based paint will be necessary to permit the existing rocker bearing removal process. The disturbance area shall be limited to the minimum necessary to allow the rocker bearing assemblies to be removed. This lead-based paint removal and compensation shall be in accordance with the requirements of Item 2020366 of these Special Provisions.

The removed rocker bearing assemblies shall become the property of the contractor.

Any damage to the existing girder system due to contractor operation shall be repaired by the contractor as directed by the Engineer at no additional cost to the Department.

Method of Measurement:

Rocker bearing assembly removal will be measured as a unit of each rocker bearing assembly removed.

Basis of Payment:

The accepted quantities of Remove (Rocker Bearing Assembly), measured as provided above, will be paid for at the contract unit price for each, which shall be full compensation for the work, complete in place, as described and specified herein and as shown on the plans.

ITEM 2020366 - REMOVE (LEAD-BASED PAINT MATERIALS):

Description:

The work under these items shall consist of removing lead-based paint materials in accordance with the requirements described herein.

The steel structural members of the Perkins Valley TI UP (Str. No. 1776) have been painted with lead-based paint. The work under this item covers only the initial removal of the lead-based paint which will be necessary to permit the painting of the existing steel structural members.

Existing lead-based paint removal will only be required at locations where the paint has become damaged and is loose or flaking, or at locations requiring repair to structural steel, or at locations requiring attachment of new steel plate and welding. The extent of the existing paint removal shall be at least equal to the damaged area of the girder and shall extend beyond any areas requiring welding.

(A) Lead Abatement Subcontractor:

The contractor shall select a lead abatement subcontractor that has the ability to remove and manage lead-based materials. All individuals performing lead abatement related work on this contract shall possess at least one of the following certifications:

- EPA Lead Supervisor for lead abatement, or
- EPA Lead Worker Certification for all lead abatement workers/laborers.

The certification shall be current, and must be valid throughout the duration of the project. At least one individual with EPA Lead Supervisor certification shall be on-site when lead abatement work is being performed.

The lead abatement subcontractor shall have three years of documented experience performing related work in the State of Arizona.

The contractor shall submit documentation of the lead abatement subcontractor's certifications for all employees to be working on the project and the qualifications of the firm at the preconstruction conference. The contractor's documentation of qualifications shall provide details indicating the types of relevant experience, and shall provide the number of months of each type of experience to be considered for approval.

The Engineer will approve or reject the abatement subcontractor within 10 calendar days after receipt of documentation of experience and certifications.

The contractor will not be allowed an extension in contract time for any delays to the work because of the failure of the contractor's lead abatement subcontractor to meet the Department's qualifications.

(B) Removal Plan:

The lead abatement subcontractor shall be responsible for preparation of a comprehensive removal plan (hereinafter referred to as the removal plan) for removal, handling, storage, and testing of the lead-based paint materials. The removal plan shall also specify the proposed storage container, and the proposed location at which the removed lead-based paint material is to be stored during testing. The removal plan shall include environmental and safety measures to comply with federal, state and local requirements for the removal of regulated material.

The contractor shall submit the removal plan to the Engineer for review a minimum of 10 working days prior to any work that will disturb the lead-based paint material.

The Engineer will determine if the removal plan addresses all the required elements, and will return it as approved or disapproved within 10 calendar days after receipt. The steel structural members of the bridge shall not be disturbed in any way until the removal plan has been approved in writing by the Engineer.

(C) Compliance Responsibility:

All work involved with the removal, handling, temporary storage, and testing of the lead-based paint materials shall be performed by the contractor's lead abatement subcontractor.

However, the contractor shall be fully responsible for the work, and for the proper disposal of the removed lead-based paint materials as specified herein, all in accordance with the applicable federal, state, and local standards, regulations and requirements, including 29 CFR, Lead Exposure in Construction, Interim Final Rule. The contractor shall bear the responsibility for any non-compliance, and shall hold the Department, its agents, officials, and employees harmless from all liability which may result from non-compliance with such applicable Federal, State and Local standards, regulations and requirements.

Construction Requirements:

The contractor shall supply potable water for their employees to wash their hands after handling the lead-based paint materials, prior to eating, drinking, or tobacco use of any kind.

The lead-abatement subcontractor shall remove the lead-based paint materials in accordance with the approved removal plan. The lead-based paint materials shall not be abraded in any way including, but not limited to, grinding, sanding, or heating.

The removed lead-based paint materials shall be placed in the approved storage container (barrel, roll-off, etc.) The lead abatement subcontractor shall perform the Toxicity Characteristic Leaching Procedure (TCLP) analysis on the removed lead-based paint materials. The storage container may be temporarily stored at an ADOT Maintenance facility until the final disposal determination is made. Should the lead abatement subcontractor choose to store the container at an ADOT Maintenance facility, the removal plan shall specify which facility, and the contractor shall contact the facility supervisor to schedule delivery of the container with the removed lead-based paint materials.

After completion of the TCLP analyses, the lead abatement subcontractor shall supplement the removal plan with specific requirements for disposal of the lead-based paint materials. The contractor shall submit the revised removal plan to the Engineer for approval within 10 working days of completion of all TCLP analyses, and before disposal of the lead-based paint material. The contractor shall not store the lead-based paint materials beyond the duration of the contract time. Notice of substantial completion, as specified in Subsection 105.19, will not be given until the lead-based paint materials are removed from the temporary storage site and properly disposed of in accordance with the removal plan, and the Engineer has received the above-referenced certification letter and manifest.

A time extension will not be granted due to the contractor's failure to comply with the requirements specified herein.

Method of Measurement:

Removal of lead-based paint materials from the bridge will be measured on a lump sum basis.

Basis of Payment:

Payment for removal of lead-based material from the bridge will be made at the contract lump sum price, which price shall be full compensation for the work, including development of the removal plan, removal, handling, temporary storage, testing, and, if allowed, disposal of the lead-based paint material as a non-hazardous construction waste

ITEM 2020370 - DISPOSE OF LEAD-BASED PAINT MATERIALS (FORCE ACCOUNT):

Description:

The work under these items shall consist of appropriately disposing of lead-based paint materials in accordance with the requirements described herein.

The steel structural members of the Perkins Valley TI UP (Str. No. 1776) have been painted with lead-based paint. The work under this item covers only the disposal of the lead-based paint which will be necessary to permit the painting of the existing steel structural members.

(A) Lead Abatement Subcontractor:

The contractor shall select a lead abatement subcontractor that has the ability to dispose of lead-based materials. All individuals performing lead abatement related work on this contract shall possess at least one of the following certifications:

- EPA Lead Supervisor for lead abatement, or
- EPA Lead Worker Certification for all lead abatement workers/laborers.

The certification shall be current, and must be valid throughout the duration of the project. At least one individual with EPA Lead Supervisor certification shall be on-site when lead abatement work is being performed.

The lead abatement subcontractor shall have three years of documented experience performing related work in the State of Arizona.

The contractor shall submit documentation of the lead abatement subcontractor’s certifications for all employees to be working on the project and the qualifications of the firm at the preconstruction conference. The contractor’s documentation of qualifications shall provide details indicating the types of relevant experience, and shall provide the number of months of each type of experience to be considered for approval.

The Engineer will approve or reject the abatement subcontractor within 10 calendar days after receipt of documentation of experience and certifications.

The contractor will not be allowed an extension in contract time for any delays to the work because of the failure of the contractor's lead abatement subcontractor to meet the Department's qualifications.

(B) Disposal Plan:

The lead abatement subcontractor shall be responsible for preparation of a comprehensive disposal plan for disposal of the lead-based paint materials. The disposal plan shall also specify the proposed storage container, and the proposed location at which the removed lead-based paint material is to be stored during testing. The disposal plan shall include environmental and safety measures to comply with federal, state and local requirements for the disposal of regulated material.

The contractor shall submit the disposal plan to the Engineer for review a minimum of 10 working days prior to any work that will disturb the lead-based paint material.
The Engineer will determine if the disposal plan addresses all the required elements, and will return it as approved or disapproved within 10 calendar days after receipt. The steel structural members of the bridge shall not be disturbed in any way until the disposal has been approved in writing by the Engineer.

(C) Compliance Responsibility:

All work involved with the disposal of the lead-based paint materials shall be performed by the contractor's lead abatement subcontractor.

However, the contractor shall be fully responsible for the work, and for the proper disposal of the removed lead-based paint materials as specified herein, all in accordance with the applicable federal, state, and local standards, regulations and requirements, including 29 CFR, Lead Exposure in Construction, Interim Final Rule. The contractor shall bear the responsibility for any non-compliance, and shall hold the Department, its agents, officials, and employees harmless from all liability which may result from non-compliance with such applicable Federal, State and Local standards, regulations and requirements.

Construction Requirements:

The contractor shall supply potable water for their employees to wash their hands after handling the lead-based paint materials, prior to eating, drinking, or tobacco use of any kind.

The lead-abatement subcontractor shall dispose the lead-based paint materials in accordance with the approved disposal plan. The lead-based paint materials shall not be abraded in any way including, but not limited to, grinding, sanding, or heating.

The lead-based paint material must be disposed of at a hazardous waste facility, the cost of disposal will be paid under the force account item included in the bid schedule for disposal.

The contractor shall also provide a letter and manifest certifying that the lead abatement subcontractor has disposed of the lead-based paint material in accordance with the final removal plan. Such letter and manifest shall be submitted to the Engineer within 10 working days of final disposal.

The contractor shall not store the lead-based paint materials beyond the duration of the contract time. Notice of substantial completion, as specified in Subsection 105.19, will not be given until the lead-based paint materials are removed from the temporary storage site and properly disposed of in accordance with the removal plan, and the Engineer has received the above-referenced certification letter and manifest.

A time extension will not be granted due to the contractor's failure to comply with the requirements specified herein.

Method of Measurement:

Disposal of lead-based paint materials at a hazardous waste facility will be measured on a force account basis.

Basis of Payment:

Payment for disposal of lead-based material from the bridge will be made at the contract lump sum price, which price shall be full compensation for the work, including development of the disposal plan and disposal of the lead-based paint material as a non-hazardous construction waste.

(203SHLDBU, 02/17/22)

SECTION 203 EARTHWORK:

203-11.03(A) **Placement:** the first paragraph of the Standard Specifications is revised to read:

Shoulder build-up material shall be placed and shaped along the edge of pavement in accordance with the details shown on the project plans, the applicable requirements of Subsection 203-10.03(A) of the specifications, and as directed by the Engineer. Rubbish, debris, and other objectionable matter shall be removed prior to placement of shoulder buildup material. Vegetation shall be cleared as necessary to accommodate placement of shoulder buildup material, but minimized to the maximum extent practicable.

203-11.05 **Basis of Payment:** the last paragraph of the Standard Specifications is revised to read:

No additional measurement or direct payment will be made for clearing vegetation, removing rubbish, debris, and other objectionable matter, the construction or compaction of temporary slope fillets, or for borrow used for shoulder build-up, the costs being considered as included in the price of shoulder build-up.

(303RASBAB, 04/18/24)

SECTION 303 AGGREGATE SUBBASES AND AGREGGATE BASES:

303-2 Materials: of the Standard Specifications is revised to read:

Aggregate for the various classes of aggregate subbases and aggregate bases shall consist of stone, gravel or other approved inert material of similar characteristics, and shall be clean and free from vegetable matter and other deleterious substances.

Aggregate subbase and aggregate base material may be comprised of processed salvaged asphaltic concrete, processed salvaged aggregate base material, processed salvaged Portland Cement Concrete materials, virgin aggregate base materials or any combination of these materials meeting the requirements of Table 303-1. These materials may be from a specific project site or approved commercial source. Processed salvaged materials shall conform to the requirements specified in AASHTO M 319.

Aggregate subbases and aggregate bases shall conform to the requirements of Table 303-1:

TABLE 303-1

Class of Aggregate	Percent Passing Sieve (Inch or No.)									PI, Max.
	3	1-1/2	1	3/4	1/4	4	8	30	200	
1		100	90 - 100				35 - 55		0 - 8.0	3
2		100	90 - 100			38 - 65	25 - 60	10 - 40	3.0 - 12.0	3
3										
4	100				35 - 70				0 - 10.0	5
5	100				30 - 75				0 - 10.0	5
6										

Notes:

The PI (Plasticity Index) will be determined in accordance with the requirements of AASHTO R 58, T 89, and T 90.

Classes 1, 2 and 3 are bases; Classes 4, 5 and 6 are subbases.

The requirements for Class 3 and for Class 6 will be specified in the Special Provisions.

For Class 1 through Class 4 aggregate, the amount of one fractured face coarse aggregate particles shall be at least 50 percent.

Resistance to abrasion for Class 1 through Class 4 aggregate will be determined in accordance with the requirements of AASHTO T 96 and shall meet the following requirements:

Maximum loss of 12 percent at 100 revolutions

Maximum loss of 40 percent at 500 revolutions

When determining gradation of aggregate subbase or aggregate base material containing processed salvaged asphaltic concrete materials, drying to a constant weight shall be performed at a temperature of 140 ± 5 F, in accordance with the requirements of AASHTO T 265.

Aggregate subbase and aggregate base material not conforming to the requirements of

Table 303-1 for gradation and/or PI may be accepted by the Engineer upon the contractor's submittal of testing results demonstrating that the R-Value is at least 79 when determined by AASHTO T 190. At the contractor's option, the material may be reprocessed and re-compacted at no additional cost to the Department.

All metal reinforcement and expansion materials shall be removed from processed salvaged Portland Cement Concrete prior to its use in aggregate subbase and aggregate base material.

The contractor shall submit the testing information for the base and subbase materials which are intended to be used to the Engineer for approval. Any significant change in the materials shall be approved by the Engineer prior to use.

Mixing on grade shall be accomplished using a full depth reclamation machine or pulverizer, manufactured for this purpose. Motor graders, gannon boxes, auger scrapers, or other similar devices will not be allowed for mechanical mixing on grade.

If suitable in-place aggregate subbase or aggregate base materials are available, the contractor shall have the option of re-using such materials as processed salvaged aggregate base. Processed salvaged asphaltic concrete and salvaged Portland Cement Concrete materials may be blended with the processed salvaged aggregate subbase, processed salvaged aggregate base and virgin base aggregates. The blended material shall be homogenous mixture in which there is no segregation, crusts, lumps, or nesting, and shall be sampled and tested to meet the requirements specified herein.

303-3.01 Placement: of the Standard Specifications is modified to add:

When processed salvaged materials are utilized, either from in-place or from a commercial source, the Engineer may require a test section of 1000 feet be placed utilizing the processed materials and construction methods proposed for use by the contractor. Full operations shall not proceed until the test section has been tested and approved by the Engineer. The contractor shall use the same equipment, material processing, and construction methods for the remainder of the construction, unless adjustments made by the contractor are approved in advance by the Engineer.

303-3.02 Compaction: of the Standard Specifications is revised to read:

Each layer of aggregate subbase and aggregate base material shall be compacted to a density of not less than 100 percent of the maximum density determined in accordance with the requirements of the applicable test methods of the ADOT Materials Testing Manual, as directed and approved by the Engineer.

The moisture content shall be determined per AASHTO T 265 when determining density for aggregate subbase and aggregate base material containing processed salvaged asphaltic concrete and/or processed salvaged Portland Cement Concrete.

When AASHTO T 265 is utilized to determine moisture content, acceptance testing results for density will be furnished to the contractor up to 24 hours after performance of in-place density testing to allow sufficient time for moisture determination.

303-5 Basis of Payment: of the Standard Specifications is revised to read:

The accepted quantities of aggregate subbase and aggregate base, measured as provided above, will be paid for at the contract unit price per cubic yard, which price shall be full compensation for the work, complete in place.

(404BITUM, 08/18/22)

SECTION 404 BITUMINOUS TREATMENTS:

404-1 Description: of the Standard Specifications is revised to read:

The work under this section shall consist of furnishing all materials and constructing or applying bituminous treatments at the locations designated on the plans and in accordance with the requirements of the specifications and in conformity to the lines shown on the project plans or established by the Engineer.

The bituminous treatments include one or a combination of prime coat, tack coat, and fog coat. The bituminous treatments also include emulsified asphalt chip seal and hot applied chip seal both either with or without fog coat.

When a “hot applied” chip seal is called for on the plans and specifications, it refers to a chip seal using a performance grade asphalt cement or a crumb rubber asphalt as the bituminous material.

404-2.02 Aggregate Materials:

(A) General: the second and third paragraphs of the Standard Specifications are revised to read:

With the exception of precoated cover material, aggregate material shall be sampled for gradation acceptance from the final stockpile prior to being incorporated into the work. The aggregate for the precoated material shall be sampled prior to precoating.

(B) Blotter Material: of the Standard Specifications is revised to read:

Blotter material shall be natural or manufactured sand, volcanic cinders, or other approved material and shall be free of deleterious materials or foreign substances.

The gradation shall meet the following requirements when tested in accordance with the requirements of Arizona Test Method 201:

Sieve Size	Percent Passing
3/8 inch	100
No. 4	80 - 100
No. 16	45 - 80
No. 200	0 - 5.0

(C) Cover Material: of the Standard Specifications is revised to read:

Aggregate for cover material shall be clean gravel or crushed rock, shall be free of clay, and shall not contain calcium carbonate, caliche, synthetic materials, organic matter, or foreign substances. Cover material shall not be obtained from sweepings of previously applied cover material.

The gradation shall meet the following requirements when tested in accordance with the requirements of Arizona Test Method 201.

Sieve Size	Percent Passing	
	Class 1	Class 2
3/4 inch	100	
1/2 inch	97 – 100	100
3/8 inch	70 – 100	97 – 100
1/4 inch	0 – 10	70 – 100
No. 8	0 – 5	0 – 5
No. 200	0 - 2.0	0 - 2.0

Cover material shall meet the following requirements:

Aggregate Characteristics	Test Method	Requirement
Abrasion	AASHTO T 96	100 Rev., Max 9% 500 Rev., Max 40%
Carbonates	Arizona Test Method 238	Maximum 20%
Fractured Coarse Aggregate Particles	Arizona Test Method 212	Minimum 75% one fractured face, determined on plus No. 8 material
Flakiness Index	Arizona Test Method 233	Maximum 20%
Bulk Oven Dry Specific Gravity	Arizona Test Method 210	2.350 – 2.850
Water Absorption	Arizona Test Method 210	0.0 – 2.5%

(D) Precoated Cover Material: of the Standard Specifications is revised to read:

For hot applied chip seals, the cover material shall be precoated with any grade of PG asphalt cement which meets the requirements of Section 1005 of the specifications. The precoating shall be accomplished by mixing at a central plant until the aggregate is evenly coated. The cover material shall have a minimum temperature of 250 degrees F at the time of precoating with asphalt cement. The cover material shall be precoated with approximately 0.40 to 0.60 percent asphalt cement, by weight of the aggregate. The final percentage of asphalt cement used for precoating will be as directed by the Engineer. Precoated cover material shall be dust free upon completion of coating and shall remain dust free prior to being incorporated into the work.

The aggregate for precoated cover material shall meet the requirements in Subsection 404-2.02(C) of the specifications prior to precoating with bituminous material.

No precoated cover material shall be stockpiled following precoating with asphalt cement for more than five calendar days prior to placement, unless otherwise approved by the Engineer.

404-2.03 Bituminous Treatment Material Types and Application Rates: of the Standard Specifications is modified to add:

The type of bituminous material for tack coat and approximate application rate shall be as specified in Subsection 404-4.02 of the specifications.

The type of bituminous material for fog coat shall be CSS-1 and shall be applied at the approximate rate of 0.06 gallons per square yard. Blotter material shall be applied at the approximate rate of 2.0 pounds per square yard.

The bituminous material application rates provided in this Subsection are approximate, and are to be used for bidding purposes, and shall be modified as required herein. Final application rates for all materials shall be those required to ensure the most favorable outcome, as approved by the Engineer.

404-3 Construction Requirements:

404-3.01 Seasonal and Weather Limitations: of the Standard Specifications is revised to read:

(A) General:

At any time, the Engineer may require that the work cease or that the work day be reduced in the event that weather conditions, either existing or expected, are anticipated to have an adverse effect upon the bituminous treatment.

Placement shall cease for the remainder of the day if sustained wind velocities in excess of 15 MPH occur at the project site.

(B) Prime Coat:

Bituminous material used for prime coats shall be applied to an existing aggregate surface only when the ambient temperature in the shade is at least 70 degrees F and when the existing aggregate surface is slightly damp.

(C) Fog Coat:

Bituminous material used for fog coats shall be applied to an existing pavement surface only when the surface is dry, the pavement surface temperature is at least 60 degrees F but does not exceed 175 degrees F, and the ambient temperature at the beginning of the application is at least 50 degrees F and rising but does not exceed 110 degrees F. The application of bituminous material shall be stopped when the ambient temperature is 55 degrees F or less and falling.

(D) Chip Seal:

The contractor's bid submittal and initial construction schedule shall adhere to the beginning and ending dates shown in Subsection 404-4.04(A) of the specifications. Bituminous material used for chip seal coats shall only be placed when the existing pavement surface is dry, the surface temperature is at least 85 degrees F, and the ambient temperature at the beginning of the application of bituminous material is at least 65 degrees F and rising. The application of bituminous material shall be stopped when the ambient temperature is 70 degrees F or less and falling.

No placement of bituminous material for chip seals shall occur if ambient temperatures are forecasted to be at or below 40 degrees F at any time during the day or night after placement.

For hot applied chip seals, no placement shall occur if ambient temperatures exceed, or are forecasted to exceed, 110 degrees F the day before, the day of, or the two days after placement.

404-3.02 Equipment:

(A) Distributor Truck: the first sentence of the first paragraph of the Standard Specifications is revised to read:

Distributor trucks shall be so designed, equipped, maintained and operated that bituminous material at the specified temperature may be applied uniformly on variable widths of surface at readily determined and controlled rates from 0.03 to 1.00 gallons per square yard, with uniform pressure, and with an allowable transverse variation from any specified rate not to exceed 10 percent or 0.02 gallons per square yard, whichever is less.

(A) Distributor Truck: the first sentence of the fourth paragraph of the Standard Specifications is revised to read:

Distributor truck spray bars shall be equipped with the appropriate size nozzles adjusted to

the proper angle with the associated adjustment wrench to achieve maximum overlap of spray and an even application.

(B) Power Brooms: of the Standard Specifications is revised to read:

Power brooms shall be of the rotary or pickup type, capable of completely removing excess blotter material, and cleaning without gouging or tearing the surface.

(D) Aggregate Spreaders: of the Standard Specifications is revised to read:

The application of blotter material shall be accomplished by means of a sand slinger or other equipment approved by the Engineer.

The application of cover material shall be accomplished by means of a calibrated spreader. The spreader shall be a self-propelled, computerized rate-controlled unit capable of an application width of 14 feet or greater. The spreader shall be in good mechanical condition, capable of applying the correct aggregate application rate uniformly across the spread width.

Chip spreader boxes shall be calibrated to ensure consistent discharge across all of the chutes except where the discharge is intentionally adjusted to compensate for site conditions and construction operations.

404-3.03 Traffic Control: of the Standard Specifications is hereby deleted.

404-3.04 Preparation of the Surface: of the Standard Specifications is revised to read:

The surface to be treated shall be thoroughly cleaned prior to applying bituminous material. Man holes, utility covers, and catch basins shall be protected prior to and during application of bituminous material. Self-propelled rotary power brooms, pickup brooms, and hand brooms shall be used immediately in advance of applying the bituminous material.

When a bituminous treatment is to be applied to an existing aggregate surface, the surface shall be uniformly smooth, firm and reasonably true to grades and cross sections as shown on the project plans, and shall be so maintained throughout the placing of the bituminous treatment. In no event shall a bituminous treatment be placed on a soft, uneven base. All holes, depressions or irregularities shall be repaired. All loose and unsuitable material shall be removed and replaced by suitable material, which shall be compacted to produce a dense uniform surface conforming to the adjacent area.

When required, the existing aggregate surface on which the bituminous treatment is to be placed shall be lightly bladed, watered and compacted immediately prior to the application of bituminous material. In extremely dry areas, additional light applications of water may be required prior to the application of the bituminous material to facilitate penetration of the bituminous material.

404-3.05 Application of Bituminous Material: the first, second and third paragraphs of the Standard Specifications are revised to read:

The types, grades, and approximate rates of application of bituminous material shall be as specified in Subsections 404-2.03 of the specifications. The application rates for chip seal coats shall be determined by the contractor in accordance with the requirements herein, subject to approval by the Engineer.

The rates to be applied may vary substantially because of different surface conditions within the project limits. The actual bituminous material application rate shall not vary more than 10 percent from the application rate specified or approved by the Engineer.

The bituminous material shall be uniformly applied to the prepared surface at the rate specified or approved by the Engineer and in one application.

404-3.05 Application of Bituminous Material: the seventh, eighth and ninth paragraphs of the Standard Specifications are revised to read:

In the event that any spots are missed in the application, or any areas develop that do not have a uniform spread or penetration, such areas shall be remedied without delay.

Care shall be taken to prevent the spraying or splattering of bituminous material on adjacent pavements, structures, curb, guardrail, vegetation, or any other object outside of the area designated for spraying.

Removal and disposal of unused bituminous material shall be the contractor's responsibility and at no cost to the Department.

404-3.06 Application of Blotter Material: of the Standard Specifications is revised to read:

The approximate application rate of blotter material, when required as a part of a bituminous treatment, shall be as specified in Subsection 404-2.03 of the specifications; however, the Engineer will specify the exact rate to be applied based on the characteristics of the bituminous treated surface. The specified application rates are based on the wet weight of material.

Blotter material, at the time of spreading, shall be wet but free from running water. Blotter material shall be spread uniformly to the treated surface in one or more applications for a total application rate as specified. Blotter material shall be applied at a time acceptable to the Engineer and before opening to traffic.

Any oversized aggregate or foreign material picked up during stockpiling or loading operations shall be eliminated before entering the spreader. Supplemental spreading or smoothing shall be done by hand methods where necessary.

Prior to final acceptance and when ordered by the Engineer, the contractor shall remove and dispose of any excess blotter material. Removal and disposal of excess blotter material

shall be the contractor's responsibility and at no cost to the Department.

404-3.07 Joints: of the Standard Specifications is revised to read:

(A) General:

Transverse joints with the preceding work, at intersections, and at all existing pavements and structures shall be made by a method approved by the Engineer prior to the start of the work.

Longitudinal joints shall be overlapped between 2 to 6 inches.

Regardless of the width of the roadway to be sealed, the number of longitudinal joints shall be kept to a minimum. Longitudinal joints shall be located to the greatest degree obtainable to coincide with the painted lines between traffic lanes.

(B) Chip Seal:

Unless otherwise directed by the Engineer, transverse joints with the preceding work shall be made by placing building paper over the end of the previous application, and the joining application shall start on the building paper. Once the application process has progressed beyond the paper, the paper shall be disposed of as directed by the Engineer. Transverse joints at other locations shall be made by a method approved by the Engineer prior to the start of the work.

Joints shall be cleaned as deemed necessary by the Engineer prior to the application of bituminous material in the adjacent strip.

404-3 Construction Requirements: of the Standard Specifications is modified to add:

404-3.08 Opening to Traffic:

In the construction or application of bituminous treatments, no traffic or equipment will be permitted on the treated roadway surface until it has been established to the satisfaction of the Engineer that the treated roadway surface will not be damaged or marred under the action of traffic. No traffic of any description shall be allowed on any bituminous treatment until approved by the Engineer.

404-4 Prime Coat: the title and text of the Standard Specifications is revised to read:

404-4 Bituminous Surface Treatment:

404-4.01 Prime Coat:

The type of bituminous material and the approximate application rate shall be as specified in Subsection 404-2.03 of the specifications. The Engineer may adjust the actual application rate based on specific trials and visual observations performed on test areas for different

base conditions.

When it is deemed necessary, areas having excess bituminous material shall be blotted with material as directed by the Engineer.

When directed by the Engineer, the surface of the completed prime coat shall be rolled with a pneumatic-tired roller.

The integrity of the prime coat shall be maintained at all times until the next course is placed or until final acceptance. In the event traffic has caused holes or breaks in the surface, such holes or breaks shall be repaired by the contractor.

404-4.02 Tack Coat:

Tack coat shall be applied prior to placing a bituminous mixture on a primed surface, an existing bituminous surface, or an existing Portland cement concrete pavement surface. Tack coat shall also be applied between each layer of bituminous mixtures. A light coat of bituminous material shall also be applied to edges or vertical surfaces against which a bituminous mixture is to be placed.

The contractor shall choose the bituminous material to be used for tack coat. The Engineer must approve the contractor's choice of bituminous material prior to its use.

The rate of application for the specific usage will be specified by the Engineer. The following table shows approximate tack coat application rates:

Type of Bituminous Material	**Approximate Tack Coat Application Rates: Gallons / Square Yard**		**Payment Factor**
	Prior to Placing ACFC or AR-ACFC	**All Other Tack Coats**	
Emulsified Asphalt (Special Type) – See Note (1) Below.	Not Allowed	0.12	0.7
Emulsified Asphalt (Other than Special Type)	0.08	0.08	1.0
Asphalt Cement	0.06 to 0.08	0.06 to 0.08	1.0
Note: (1) Emulsified Asphalt (Special Type) shall consist of Type SS-1 or CSS-1 emulsified asphalt diluted with water to provide an asphalt content of not less than 26 percent.			

The Engineer may adjust the application rate.

If emulsified asphalt of any type is used, it shall have broken before the bituminous mixture is placed.

Tack coat shall be applied only as far in advance of the placement of the bituminous mixture as is necessary to obtain the proper condition of tackiness. All traffic on a tack coat surface shall be minimized to the greatest extent possible. In no event shall more tack coat be applied in one day than will be covered by the bituminous mixture during that same day.

404-4.03 Fog Coat:

The type of bituminous material and the approximate application rate shall be as specified in Subsection 404-2.03 of the specifications. The material shall be diluted with one part water to one part bituminous material. The specified application rate is based on the diluted material. The Engineer may adjust the actual application rate based on specific trials and visual observations performed on test areas for different pavement conditions.

When specified in Subsection 404-2.03 of the specifications, blotter material shall be applied following the application of bituminous material.

404-4.04 Chip Seal Coat:

(A) General:

The contractor shall prepare their bid submittal and initial construction schedule, submitted at the Preconstruction Conference as described in Subsection 108.03 of the specifications, based on the following beginning and ending dates for placement of the chip seal.

Average Elevation of Project, Feet	Beginning and Ending Dates
0 – 3499	March 15 – May 31
0 – 3499	September 1 – October 31
3500 – 4999	May 1 – September 30
5000 and over	June 1 – August 31

Any proposed placement deviating from the beginning and ending dates shall be detailed in the written schedule of construction submitted at the weekly meeting described in Subsection 108.04 of the specifications. No contract time extension will be granted for placement outside of the beginning and ending dates. Any placement deviating from the beginning and ending dates shall be at the sole risk of the contractor.

The type of bituminous material and the approximate application rate shall be as specified in Subsection 404-2.03 pf the specifications. The type of cover material shall be as specified in Subsection 404-2.03 of the specifications.

The contractor shall determine the application rates and corresponding quantities of bituminous material and cover material for chip seal coat in accordance with Arizona Test Method 819. Application rates are subject to approval by the Engineer. Areas and locations anticipated to require adjustment to the rate(s) shall also be identified.

The application rates and performance of emulsified asphalt chip seals shall be evaluated using the Sweep Test in accordance with ASTM D7000.

The performance of hot applied chip seals shall be verified using the Vialit Retention Test in accordance with EN 1272-3, modified as necessary to account for the specific characteristics of the proposed chip seal.

The actual application rate shall be such that the aggregate is embedded approximately 70 percent (80 percent above 4,000 feet elevation) and excessive tracking of bituminous material does not occur under construction equipment or when opened to traffic.

The actual rate of cover material to be applied shall be such that no more than 5 percent of the chips applied are removed during sweeping and approximately 20 percent void space exists between the aggregate particles once realigned after opening to traffic.

The proposed application rate(s), locations requiring adjustment, and the associated basis for each adjustment, shall be submitted to the Engineer for approval no later than five days following completion of the Pre-Activity Walkthrough as described in Subsection 404-4.04(B) of the specifications and at least five days prior to placement of the test strip.

The basis for any anticipated adjustments shall include use of one or more of the following:

(a) Sand Patch tests performed in accordance with *STP762 Pavement Surface Characteristics and Materials;* Haydon, C.E. (ASTM, 1982),
(b) Appendix B of Chip Seal Guide for Application and Construction; Pavement Preservation Committee of the Arizona Chapter of The Associated General Contractors (AGC-Arizona Chapter, 2013),
(c) Arizona Test Method 742 for mean macrotexture.

The approved application rate(s) and adjustments shall be clearly marked at the corresponding locations and remain visible to equipment operators prior to placement.

At least 10 days prior to chip seal placement, the contractor shall submit a minimum 75-pound sample of uncoated cover material to the Engineer for testing. In addition to the submitted cover material, the contractor shall also submit 3 full gallons of emulsion (5 to 8 gallons for hot applied) in 1-gallon cans in accordance with the requirements of Arizona Test Method 103. The contractor shall also submit 40 pounds of granulated rubber if included in the bituminous material.

(B) Pre-Activity Walkthrough:

Prior to placement, the contractor shall conduct a Pre-Activity Walkthrough with all parties expected to work on the chip seal.

Locations where adjustments in application rate may be appropriate shall be documented.

A location for a test strip, approximately 1,000 feet in length shall be identified. If additional test strip locations are desired due to varying surface conditions, these shall also be identified.

Other factors or site conditions such as turn or deceleration lanes, changes in surface

characteristics, crack fill, and recent patchwork which may affect placement of the chip seal coat shall also be identified. A description of any affecting conditions and the corresponding locations and action to be taken to minimize their impact shall be documented.

In addition to the requirements herein, the items contained on the checklists provided in AGC-Arizona Chapter's Chip Seal Guide for Application and Construction shall be considered.

(C) Chip Seal Test Strip:

Prior to the start of placement, all equipment used in the placement of the chip seal coat shall be verified to be in satisfactory operating condition and in accordance with the requirements herein.

Cover material shall be verified to have appropriate moisture and be in a condition consistent with that in which it existed at the time initial acceptance samples were obtained. Bituminous material certifications shall be verified to indicate that the required type of material is on hand. The bituminous material shall be at the proper temperature prior to application.

The chip seal test strip shall be a minimum of 500 linear feet. The existing pavement surface to receive the test strip shall be verified to have been adequately swept and cleaned and meeting the requirements herein. Anticipated application rates shall have been marked and clearly visible to equipment operators.

During placement of the test strip, all equipment shall be observed to confirm proper operation. The application rate of both the bituminous material and cover material shall be measured and verified using a catch-and-weigh "tarp" method. The application rate of the bituminous material shall also be measured and verified by means of a volume per area calculation using the distributor trucks calibrated thermometer and volume measuring gauge or device.

Rolling shall immediately follow placement of the cover material and be verified to be in conformance with the requirements herein.

For emulsion chip seals, the contractor shall broom the surface to remove excess cover material only after the emulsion has fully broken and cured sufficiently for maximum chip retention.

Prior to any subsequent placement, the test strip shall be observed to have adequate embedment of the cover material without excessive void space between the chips, stacking of chips, or accumulation of chips on the shoulders. If the condition of the test strip is not acceptable, adjustments shall be made as appropriate, and an additional test strip shall be performed.

(D) Application of Bituminous Material for Chip Seal:

The following bituminous material application requirements for chip seal are in addition to the requirements specified in Subsection 404-3.05 of the specifications.

Bituminous material shall not be applied a distance ahead of the chip spreader that results in excessive lag of the rollers allowing hot applied bituminous material to cool or emulsified bituminous material to break prior to achieving adequate embedment of the cover material.

When inclement weather is expected, only the amount of hot applied bituminous material which can receive adequately embedded cover material, or only the amount of emulsified asphalt that can receive adequately embedded cover material and has sufficiently broken, shall be placed prior to the start of inclement weather.

(E) Application of Cover Material:

Cover material shall be immediately and uniformly spread over the freshly applied bituminous material such that aggregate particles are securely adhered and will not roll, tumble, or be picked up during the rolling process. Any oversize aggregate or foreign material picked up during stockpiling or loading operations shall be eliminated before entering the aggregate spreader hopper. Supplemental spreading and smoothing shall be done by hand methods where necessary.

When emulsified asphalt is used, the cover material shall be at a saturated surface-dry condition at the time of spreading.

For hot applied chip seals, and when project conditions require, precoated cover material shall be at a sufficient temperature to facilitate adequate embedment.

(F) Rolling Cover Material:

Following the spreading of cover material, the surface shall be promptly rolled with self-propelled pneumatic-tired rollers. A minimum of three rollers shall be provided; however, a sufficient number of rollers shall be provided to cover the entire width of the material spread in one pass of the compactors and rolling shall continue until a minimum of three passes has been completed.

For chip seals with a hot applied bituminous material the first roller pass shall occur as soon as possible but no longer than 2 minutes after applying the aggregate. The third pass shall be completed quickly enough to embed the aggregate before the binder cools, and no longer than 15 minutes after the binder is applied.

(G) Removal of Loose Cover Material:

The cover material shall be removed by means of a power broom which shall be in good condition and of a design suitable for the work. The action of the broom shall be such that particles which are stuck to the bituminous material will not be dislodged.

For chip seals with an emulsified bituminous material, initial removal of all loose cover material shall not commence prior to two hours after placement or at such time that the Engineer has determined that the emulsion has sufficiently cured.

For chip seals with a hot applied bituminous material, the removal of loose cover material shall commence approximately 30 minutes after the final rolling is completed.

Initial removal of loose cover material shall occur prior to opening to traffic. All loose cover material shall be removed from the paved surface by brooming within 24 hours after application.

After the traffic free period as specified in Subsection 404-4.04(H) of the specifications, but prior to final removal of loose cover material, all traffic permitted by the Engineer shall not exceed 25 miles per hour.

If the Engineer determines that conditions are not conducive to obtaining the best results, brooming shall be discontinued until the Engineer has considered all conditions and has determined the best time for the removal of the cover material.

(H) Minimum Traffic-Free Period:

The minimum traffic-free period for a newly applied emulsion chip seal coat shall be three hours. The contractor's hauling equipment may use the new seal coat surface during the traffic free period at a speed not to exceed 15 miles per hour but shall not make sharp turns of brake abruptly.

(I) Fog Coat on New Chip Seals:

When specified in Subsection 404-2.03 of the specifications, a fog coat shall be placed on the new chip seal following the curing period. The type of bituminous material and the approximate application rate shall be as specified in Subsection 404-2.03 of the specifications. The material shall be diluted with one part water to one part bituminous material. The specified application rate is based on the diluted material. The Engineer may adjust the actual application rate based on specific trials and visual observations performed on test areas for different pavement conditions.

When specified in Subsection 404-2.03 of the specifications, blotter material shall be applied following the application of bituminous material.

(J) Contractor Quality Control:

The contractor shall be responsible for the chip seal design, performing quality control testing on materials, and designating an individual charged with constant observation and monitoring.

Need for an adjustment to application rates or a correction to process or equipment shall be communicated immediately to the necessary personnel.

The initial condition of equipment, materials, and the project and pavement surface conditions shall be documented. The performance and results of the test strip shall be documented. Observations of monitoring activities and quantification of application rates during the test strip and production shall be documented no less frequently than every other placement run.

The cause for any adjustments, including quantifying tests performed, the adjustments made, and the result of such adjustments with regard to acceptability and performance of the chip seal coat shall be documented.

404-5 **Tack Coat:** of the Standard Specifications is hereby deleted.

404-6 **Fog Coat:** of the Standard Specifications is hereby deleted.

404-7 **Chip Seal Coat:** of the Standard Specifications is hereby deleted.

404-8 **Method of Measurement:** the fourth paragraph of the Standard Specifications is revised to read:

The contractor shall be responsible to determine the amount of cover material that will be required to complete the work from the source(s) from which the cover material is obtained.

404-8 **Method of Measurement:** the sixth paragraph of the Standard Specifications is revised to read:

Measurement for payment will be made only for the quantity of bituminous material and for the quantity of aggregate material used in accordance with the requirements of the specifications.

404-9 **Basis of Payment:** of the Standard Specifications is revised to read:

The accepted quantities of the work under this section, complete in place, measured as provided above, will be paid for at the contract unit price as designated in the bidding schedule, except the contract unit price for the quantities of bituminous material will be adjusted on the basis of the test results in accordance with the requirements of Section 1005 of the specifications.

No measurement or direct payment will be made for precoating the cover material, material for precoating, rolling and removal of loose cover material, and removal of loose blotter material.

The contract unit price for each item of bituminous material except tack coat will be considered to include all costs for furnishing, hauling, handling, spreading, and mixing of the material as required.

The unit price for bituminous tack coat is deemed to be the cost to furnish, transport, and store asphalt cement or emulsified asphalt at the project location. Payment for bituminous tack coat will be made at the unit price multiplied by the respective payment factor listed

under Subsection 404-4.02 of the specifications, and adjusted to the nearest dollar.

Unless otherwise specified, the accepted quantity of bituminous tack coat, measured as provided above, will be paid at the contract unit price per ton adjusted as provided above which price shall be full compensation for furnishing, transporting, and storing the exact type, grade or designation of bituminous tack coat specified by the Engineer.

Unless otherwise specified, the accepted quantity of time to apply bituminous tack coat, measured as provided above, will be paid for at the contract unit price per hour which payment shall be full compensation for applying bituminous tack coat.

The bidding schedule quantity for tack coat is based on an estimated application rate of 0.06 gallons per square yard for each application shown on the project plans.

The unit price of bituminous material will be adjusted in accordance with the requirements of Subsection 109.16 of the specifications based on the "initial cost" of bituminous material between the date of bid opening and the date that the material is used on the project.

No measurement or direct payment will be made for furnishing, applying and removing blotter material, furnished in conjunction with the application of a prime coat.

No measurement or direct payment will be made for the maintenance or repair of a prime coat surface.

(409AGGR, 07/18/24)

SECTION 409 ASPHALTIC CONCRETE (MISCELLANEOUS STRUCTURAL): the title of the Standard Specifications is revised to read:

SECTION 409 ASPHALTIC CONCRETE (MISCELLANEOUS STRUCTURAL-SPECIAL MIX):

409-1 Description: the first paragraph of the Standard Specifications is revised to read:

The work under this section shall consist of constructing Asphaltic Concrete (Miscellaneous Structural-Special Mix), hereinafter asphaltic concrete, by furnishing all materials, mixing at a plant, hauling and placing a mixture of aggregate materials, reclaimed asphalt pavement (RAP) if used, mineral admixture, and bituminous material (asphalt cement) to form a pavement course or to be used for other specified purposes, in accordance with the details shown on the project plans and the requirements of the specifications, and as directed by the Engineer.

409-2 Materials: of the Standard Specifications is modified to add:

The bidding schedule quantity of asphaltic concrete is based on an estimated unit weight of **152** pounds per cubic foot.

409-2.01 Mineral Aggregate: of the Standard Specifications is revised to read:

Mineral aggregate shall conform to the following requirements when tested in accordance with the applicable test methods.

Mineral Aggregate Characteristics	Test Method	Requirement
Combined Bulk Oven Dry Specific Gravity	Arizona Test Method 251	2.350 - 2.850
Combined Water Absorption	Arizona Test Method 251	0 - 2.5%
Abrasion	AASHTO T 96	100 Rev., Max 9% 500 Rev., Max 40%
Sand Equivalent	AASHTO T 176 (After thoroughly sieving the sample, no additional cleaning of the fines from the plus No. 4 material is required.)	Minimum 55
Fractured Coarse Aggregate Particles	Arizona Test Method 212	Minimum 85% with at least two fractured faces and minimum 92% with at least one fractured face (plus No. 4 material)
Uncompacted Void Content	Arizona Test Method 247	Minimum 45.0%
Carbonates (1)	Arizona Test Method 238	Maximum 20%

(1): Testing for carbonates only applies if either of the following conditions exist:

(a) The asphaltic concrete is the designed final pavement surface normally used by traffic.

(b) The asphaltic concrete, temporary or otherwise, will be subject to traffic for more than 60 days.

The gradation will be determined in accordance with Arizona Test Method 201, and shall conform to the requirements given below.

Mix Design Grading Limits		
Sieve Size	Percent Passing	
	Without Admix.	With Admix.
1 Inch	100	100
3/4 Inch	90 – 100	90 - 100
3/8 Inch	62 – 77	62 - 77
No. 8	37 – 46	38 -47
No. 40	10 – 18	11 - 19
No. 200	1.5 - 4.5	2.5 – 6.0

Fine mineral aggregate shall be obtained from crushed gravel or crushed rock. All uncrushed material passing the No. 4 sieve shall be removed prior to the crushing, screening, and washing operations necessary to produce the specified gradation. The contractor shall notify the Engineer a minimum of 48 hours in advance of crushing the material to be used as mineral aggregate, so all crushing operations can be inspected. Existing stockpile material which has not been inspected during crushing will not be permitted for use unless the contractor is able to document to the Engineer's satisfaction that the mineral aggregate has been crushed. Any material inspected by the Department as crushed material for the project shall be separated from the contractor’s other stockpiles and reserved for use throughout the project duration.

The contractor may blend uncrushed fine aggregate up to a maximum of 15 percent of the total aggregate, provided that the composite of uncrushed fine aggregate and crushed fine aggregate meets the requirement for uncompacted void content. The uncrushed fine aggregate shall be 100 percent passing the 1/4 inch and not contain more than 4.0 percent passing the No. 200 sieve. Should the contractor modify the method of producing either the uncrushed or crushed fine aggregate, the Engineer shall be immediately notified and the materials sampled and tested for determination of uncompacted void content.

409-2.02 **Bituminous Material:** the first paragraph of the Standard Specifications is revised to read:

Asphalt cement shall be a performance grade (PG) asphalt binder, conforming to the requirements of Section 1005 of the specifications. The type of asphalt binder shall **be PG 70-28 PM.**

409-2.03 **Mineral Admixture:** the second paragraph of the Standard Specifications is revised to read:

The mineral admixture content shall be 2.0 percent, by weight, of the mineral aggregate. However, a minimum of 1.0 percent mineral admixture may be used if the contractor submits test information showing a lowered percentage of mineral admixture produces mix design results for Index of Retained Strength of at least 60 percent (70 percent if the average elevation

of the project is above 3,500 feet) and a Minimum Wet Strength of 150 psi when tested in accordance with Arizona Test Method 802.

409-2.04 Mix Design: the third, fourth, and fifth paragraphs of the Standard Specifications are revised to read:

The mix design shall be prepared by or under the direct supervision of a professional engineer experienced in the development of mix designs and mix design testing. Reclaimed asphalt pavement (RAP) may be used in the mixture if properly designed per Arizona Test Method 833; however, RAP will not be allowed in the mixture when asphalt cement type PG 76-22 TR+ or PG 70-22 TR+ is specified in Subsection 409-2.02 of the specifications. Limits for the usage of RAP shall be in accordance with ADOT Materials Practice and Procedure Directive No. 20, "Guidance on the Use of Reclaimed Asphalt Pavement (RAP) in Asphaltic Concrete". The mix design engineer shall meet the requirements given in ADOT Materials Practice and Procedure Directive No. 4, "Asphaltic Concrete Mix Design Proposals and Submittals". The mix design shall be provided in a format that clearly indicates all the mix design requirements and shall be sealed, signed, and dated by the mix design engineer.

The mix design shall be prepared by a mix design laboratory that has met the requirements of ADOT Materials Practice and Procedure Directive No. 19, "ADOT System for the Evaluation of Testing Laboratories".

If approved by the Engineer, as an alternative to meeting the mix design requirements specified herein, a mix design meeting the requirements of the specifications for a Section 416 Asphaltic Concrete (End Product) (3/4 inch Special Mix), Section 417 Asphaltic Concrete (SHRP) (End Product (1/2 inch Mix), or Section 417 Asphaltic Concrete (SHRP) (End Product) (3/4 inch Mix) may be substituted for use. The type of asphalt binder used in the alternative mix design must be the same as that specified in Subsection 409-2.02 of the specifications. The alternative mix design may include reclaimed asphalt pavement (RAP) if properly designed per Arizona Test Method 833. If a mix design meeting the requirements of Section 417 is used, the number of gyrations for N-design used in the alternative mix design must be at least that which would be specified at the location where the Asphaltic Concrete (Miscellaneous Structural-Special Mix) is to be placed. The lift thickness for the alternative mix design shall conform to the following table.

Alternative Mix Design	Minimum Lift Thickness
Section 416 (3/4 inch Special Mix)	2 inches
Section 417 (1/2 inch mix)	2 inches
Section 417 (3/4 inch mix)	2-1/2 inches

409-2.04 Mix Design: the last three paragraphs of the Standard Specifications are revised to read:

A copy of the mix design and representative samples of the mineral aggregate, mineral admixture, and asphalt cement used in the mix design shall be submitted to the Engineer for calibration of the ignition furnace, and for the determination of sand equivalent, fractured coarse

aggregate particles, and uncompacted void content. The Engineer shall witness the sampling of the mineral aggregate. The mix design and samples shall be submitted to the Engineer at least five working days prior to the start of asphaltic concrete production.

The sand equivalent, fractured coarse aggregate particles, and uncompacted void content shall meet the requirements specified in Subsection 409-2.01 of the specifications. Additional testing of the uncrushed and crushed fine aggregate for uncompacted void content will be required if the method of producing either fine aggregate is modified.

If the mineral aggregate fails to meet the requirements specified herein, asphaltic concrete production shall not commence, and the contractor shall either submit a revised mix design which is representative of the materials produced or correct the deficiencies in the aggregate stockpiles.

The mix design shall meet the following criteria when tested in accordance with the requirements of the following test methods:

Criteria	Requirement	Arizona Test Method
1. Voids in Mineral Aggregate: %, Range	15.0 – 18.0	(See Note)
2. Effective Voids: %, Range	5.3 – 5.7	(See Note)
3. Absorbed Asphalt: %, Range	0 – 1.0	(See Note)
Note: For mixes without RAP, Arizona Test Method 815. For mixes with RAP, Arizona Test Method 833.		

The contractor may make self-directed target changes to the approved mix design within the limits shown below. Requests for self-directed target value changes shall be made in writing and acknowledged by the Engineer prior to start of production. Self-directed target changes shall meet contract requirements for mix design criteria and grading limits.

MEASURED CHARACTERISTICS	ALLOWABLE SELF-DIRECTED TARGET VALUE CHANGES
Gradation (sieve size):	
3/8 inch	±4% from mix design target value
No. 8	±4% from mix design target value
No. 40	±2% from mix design target value
No. 200	±0.5% from mix design target value
Asphalt Cement Content	+0.2% from mix design target value
Effective Voids	None

The contractor may propose target value changes to the approved mix design for the Engineer's approval. The Engineer will determine if the proposed target value change will result in mix production that meets the contract requirements for mix design criteria and grading limits. For acceptance purposes, target value changes will not be retroactive.

In no case shall the approval of mix design changes relieve the contractor of the responsibility for the results obtained by the use of such approved changes.

409-2.05 Sampling and Testing: of the Standard Specifications is revised to read:

Sampling and testing the materials and mixture for quality control purposes shall be the contractor's responsibility. The contractor shall perform sufficient testing to assure that mineral aggregate and asphaltic concrete are produced which meet all specified requirements.

For acceptance purposes, samples of the asphaltic concrete shall be taken by the contractor, under the observation of the Engineer, at random locations designated by the Engineer. A minimum of one sample shall be taken for each 500 tons of asphaltic concrete. Samples shall be taken in accordance with the requirements of Section 2 or Section 3 of Arizona Test Method 104. The Engineer will immediately take custody of the samples. The material will be tested by the Engineer for the following properties:

Test Property	Test Method
Asphalt Cement Content	Arizona Test Method 427 (428 for RAP mixes) (See Note)
Gradation	
Marshall Density	Arizona Test Method 410
Maximum Theoretical Density	Arizona Test Method 417
Effective Voids	Arizona Test Method 424
Note: A new calibration of the ignition furnace shall be performed for each mix design, and at any other time the Engineer directs.	

409-3.01 General: the fourth paragraph of the Standard Specifications is hereby deleted:

409-3.01 General: the ninth paragraph of the Standard Specifications is revised to read:

All wheels and tires of compactors shall be wetted with water, or if necessary soapy water, or a release agent in order to prevent the sticking of asphaltic concrete. All other equipment surfaces shall be treated when necessary with a release agent. Only release agents evaluated through AASHTO Product Evaluation & Audit Solutions (formerly NTPEP) are acceptable for use. The results from AASHTO Product Evaluation & Audit Solutions (formerly NTPEP) testing, when tested in accordance with AASHTO T 383, shall conform to the requirements shown in the table below.

409-3.01 General: the second row of the “Release Agent Test – Requirement” table of the Standard Specifications is hereby deleted:

409-3.03 Acceptance: of the Standard Specifications is revised to read:

Asphaltic concrete will be accepted complete in place unless the result of any test varies from the contractor's mix design target value (TV) as follows:

Test Property	Allowable Variation from Target Value	
Gradation (Sieve sizes)		
3/8 inch	TV –10.0	TV + 10.0
No. 8	TV – 8.0	TV + 8.0
No. 40	TV – 6.0	TV + 6.0
No. 200	TV – 2.5	TV + 2.5
Asphalt Cement Content	TV – 0.60	TV + 0.70
Effective Voids	TV –2.5	TV + 2.0

Within 15 days after receiving notice of any failing test result(s), the contractor may submit a written proposal to accept the material represented by the failing test result(s), in place, at a reduction in cost. If the failing test result(s) are only on asphalt cement content and/or effective voids, the reduction in cost will be $5.00 per ton. If the failing test result(s) are only on gradation, the reduction in cost will be $3.00 per ton. If the failing test result(s) are on asphalt cement content and/or effective voids, and also on gradation, the reduction in cost will be $5.00 per ton. The proposal shall contain an engineering analysis of the anticipated performance of the asphaltic concrete if left in place. The engineering analysis shall also detail any proposed corrective action, and the anticipated effect of such corrective action on the performance. The engineering analysis shall be performed by an independent professional engineer, who is not an employee of the contractor or materials supplier, experienced in asphaltic concrete testing and the development of asphaltic concrete mix designs.

Within three working days, the Engineer will determine whether or not to accept the contractor's proposal. If the proposal is accepted, the asphaltic concrete shall remain in place, at a reduction in cost per ton, as described above, and any necessary corrective action shall be performed at no additional cost to the Department. If the proposal is not accepted, the asphaltic concrete shall be removed at no additional cost to the Department and replaced with asphaltic concrete meeting the requirements of these specifications.

The contractor may request that a sample with a failing test result(s) on gradation and/or asphalt cement content be allowed to remain in place without the completion of an engineering analysis if the application of a self-directed target value change as outlined in section 409-2.04 would have brought the failing test result(s) to within the specified tolerances. This proposal must be made to the Engineer in writing with justification. Once accepted, the material will be allowed to remain in place at the maximum negative pay factor(s). Maximum negative are defined as a minus $3.00 per ton for mixture properties lots in reject for gradation only, minus $5.00 per ton for mixture properties lots in reject for asphalt cement content and/or effective voids only, and minus $5.00 per ton for mixture properties lots in reject for asphalt cement content and/or effective voids and also gradation.

If the asphaltic concrete, represented by failing test results, is used as temporary pavement which will be removed prior to, or after, the completion of construction, the Engineer reserves the right to waive the engineering analysis and accept the material in place, at a cost reduction described above, provided the temporary pavement maintains the functionality of the intended use for the duration of the project.

(411ACFMS, 01/26/16)

SECTION 411 ASPHALTIC CONCRETE FRICTION COURSE (MISCELLANEOUS):

411-2 Materials: of the Standard Specifications is modified to add:

For comparative purposes, quantities shown in the bidding schedule have been calculated based on the following data:

Spread Rate (lb./ sq. yd.)	59
Asphalt Cement, %	6.5
Mineral Admixture, %	1.0

The spread rate specified above includes 25 percent for leveling to provide a minimum 0.5-inch thickness above the leveling thickness. The exact spread rate will be determined by the Engineer.

411-2.03 Bituminous Material: the first paragraph of the Standard Specifications is revised to read:

Asphalt cement shall be a performance grade (PG) asphalt binder, conforming to the requirements of Section 1005 of the specifications. The type of asphalt binder shall be PG 70-22 TR+.

(601SFDECK, 03/15/18)

ITEM 6010102 – SILICA FUME CONCRETE FOR BRIDGE DECKS

1.0 Description:

The work under this item shall consist of furnishing all materials and constructing bridge decks using silica fume concrete to the dimensions shown on the project plans and to the lines and grades established by the Engineer and in accordance with the requirements of the specifications. The work under this item shall also include a field demonstration prior to placement of the bridge deck.

The use of a previously approved mix design will be permitted provided the most recent approval and mix history is within the previous two years and all components of the mixture have not changed. Submittals for mix designs and mix history are reviewed by the Construction & Materials Group for preapproval.

For new silica fume mix designs, the contractor shall submit the name and contact information of the silica fume concrete supplier to the Engineer, within 15 days after contract execution. A minimum of 90 days should be allocated for development, testing, review, and approval of new silica fume concrete mix designs.

No demolition work shall begin until a silica fume concrete mix design has been approved by the Engineer.

2.0 Materials:

All materials and work performed shall be in accordance with Sections 601 and 1006 of the specifications unless otherwise noted herein.

Silica fume concrete shall consist of a mixture of hydraulic cement, fly ash, silica fume, fine aggregate, coarse aggregate, and water. It may also contain air-entraining admixtures, chemical admixtures, and fiber reinforcement.

2.01 Hydraulic Cement:

Hydraulic cement shall conform to the requirements of Section 1006 of the specifications, except Type III shall not be used.

2.02 Water:

The water shall conform to the requirements of Section 1006 of the specifications.

2.03 Aggregates:

The coarse aggregate and fine aggregate shall conform to the requirements of Section 1006 of the specifications.

2.04 Chemical and Air-Entraining Admixtures:

Chemical and air-entraining admixtures shall conform to the requirements of Section 1006 of the specifications.

2.05 Supplementary Cementitious Materials:

Fly ash and natural pozzolan shall conform to the requirements of Section 1006 of the specifications except only fly ash and natural pozzolan conforming to the requirements of ASTM C618 for Class F mineral admixture shall be permitted.

Silica fume shall conform to the requirements of ASTM C1240. Only densified silica fume shall be permitted. Interground silica fume with cement will not be acceptable. Silica fume in bulk or bagged form shall be kept dry.

2.06 Fiber Additive:

Only fiber additives meeting the requirements herein that are on the Department's Approved Products List (APL) shall be used. Copies of the most current version of the APL are available on the internet from the ADOT Research Center through its Product Evaluation Program.

Fiber additive shall conform to the requirements of ASTM C1116 and ASTM D7508. Fiber additive shall be polymeric, made from 100 percent virgin materials, non-corrosive, non-magnetic, and 100 percent alkali free.

The specific type, size, and quantity of fiber shall be determined by the mix designer.

For silica fume concrete placed for a bridge deck or an overlay, micro fiber additive may be used for plastic shrinkage control, subject to approval by the Engineer.

For silica fume concrete placed as an overlay, macro fiber additive shall have a length of 1.5 inches or longer and have a configuration that allows for maximum bond and dispersion in the concrete. A minimum of 5 pounds of fiber per cubic yard of concrete shall be added at the plant during concrete batching.

3.0 Design of Silica Fume Concrete Mixtures:

3.01 Design Criteria:

Silica fume concrete shall conform to the requirements specified in Table 1 and be proportioned in accordance with Section 4.2.3 of ACI 301 to minimize shrinkage.

TABLE 1
Silica Fume Concrete Mix Design Requirements

Minimum 28 Day Compressive Strength Required = 4,500 psi			
Material/Property	Min.	Max.	Unit
Cementitious Material (see Note 1)	595	705	Lbs/CY
Hydraulic Cement	450	495	Lbs/CY
Fly Ash	120	175	Lbs/CY
Fly Ash (by weight of Cementitious Material)	20	25	Percent
Silica Fume (by weight of Cementitious Material)	4		Percent
Water	235	315	Lbs/CY
Water/Cementitious Materials Ratio	0.40	0.45	
Coarse and Fine Aggregates (see Note 2)			
Water Reducers (see Note 3)			

Air-Entraining Admixture (see Note 3)			
Air Content (see Note 4)	4.5	7.5	Percent
Slump (see Note 5 and 1006-4.04)			
Macro Fiber Additive for Overlays (Note 6)	5		Lbs/CY

Note 1: The maximum quantity of cementitious material (Portland cement, fly ash, silica fume) permitted in the mix is based on the nominal maximum aggregate size of the aggregate used in the mix and shall be limited by the amounts indicated below:

Nominal Maximum Aggregate Size	Maximum Cementitious Material Content (Lbs/CY)
1”	615
3/4”	660
1/2”	685
3/8”	705

Note 2: The amount of coarse aggregate, the amount of fine aggregate, and the combined aggregate gradation shall be provided by the contractor.

Note 3: The type and amount of chemical and air-entraining admixtures shall be provided by the contractor, subject to approval by the Engineer. The aggregate correction factor shall be included in the mix design for air entrained mixtures.

Note 4: The air content requirements are waived when the concrete is placed at an elevation below 3,000 feet.

Note 5: The proposed slump shall be chosen by the contractor. Concrete at the proposed slump shall be sufficiently workable to allow proper placement without harmful segregation, bleeding, or incomplete consolidation.

Note 6: When silica fume concrete is placed as an overlay, the concrete shall contain macro fibers. Micro fibers may be used for plastic shrinkage control, subject to approval by the Engineer.

The coarse aggregate size designation shall be chosen by the contractor and approved by the Engineer and shall conform to the size designation and grading requirements of AASHTO M 43. Alternatively, if coarseness and workability factors are utilized to minimize paste content, the factors shall be submitted on a chart similar to that provided in Figure 6.1 of ACI 302.1R-04, *Guide for Concrete Floor and Slab Construction*.

In choosing the size designation, the maximum size of coarse aggregate shall not be larger than one fifth of the narrowest dimension between the sides of adjacent forms, or two thirds of the minimum clear spacing between reinforcing bars, or two thirds of the minimum clear spacing between reinforcing bars and the sides of adjacent forms, or one third of the depth of the placement, whichever is least.

3.02 Trial Batch:

Prior to approval of the silica fume concrete mix design the contractor shall perform a laboratory trial batch of the proposed silica fume concrete. A trial batch will not be required for a previously approved mix design prepared within the last two years.

In addition to the requirements in Table 1, trial batches for silica fume concrete shall demonstrate that the properties of the mixture meet the performance criteria shown in Table 2.

TABLE 2
Silica Fume Concrete Properties and Performance Criteria

Concrete Properties	Test Method	Minimum	Maximum
Concrete Temperature, at point of placement	ASTM C1064	50 ºF	90 ºF
Rapid Chloride Permeability (RCP)	ASTM C1202		1,200 coulombs at 56 days
Shrinkage Potential (see Note 1)	ASTM C157		0.04% at 28 days

Note 1: Shrinkage Potential shall be determined in accordance with ASTM C157, however, the conditioning period shall be modified to consist of an initial 7-day wet curing period followed by a 21-day dry curing period.

3.03 Mix Design and Trial Batch Submittals:

Prior to any silica fume concrete placement, the contractor shall submit to the Engineer for approval either a previously approved mix design or a new mix design. For a new mix design, the submittal shall also include the results of the trial batch(s). A minimum of 90 days should be allocated for development, testing, review, and approval of new silica fume concrete mix designs.

The mix design shall be submitted with the following test data and information which may be included in, or be in addition to, the requirements of Subsection 1006-3.02 of the specifications, demonstrating the properties of the silica fume concrete mix:

a) Design strength

b) Water/cementitious material ratio

c) Fiber type and content

d) Paste content

e) Slump range

f) Target air content

g) Air content of mortar phase

h) Aggregate correction factor for air entrained mixtures

i) Maximum rapid chloride permeability

j) Maximum shrinkage potential

Additionally, the submittal shall provide the mix history or test results of the trial batch specimens for the following:

a) 28-day and 56-day compressive strength

b) Slump

c) Air content

d) Concrete temperature

e) Rapid chloride permeability (RCP), determined in accordance with the requirement of ASTM C1202 / AASHTO T 277

f) Shrinkage potential, determined in accordance with the requirements of ASTM C157, the conditioning period, however, shall be modified to consist of an initial 7-day wet curing period followed by a 21-day dry curing period. The shrinkage potential shall not exceed 0.04 percent or less at 28 days

4.0 Mixing:

The concrete batch shall be mixed in accordance with the requirements of Section 1006 of the specifications. If the concrete contains fiber additives, the concrete shall be monitored to ensure it is thoroughly mixed.

The minimum and maximum allowable air content and slump at point of placement shall be as defined in Table 1. When slump maintenance or adjustment are needed for concrete delivered in truck mixers at the maximum water/cementitious ratio, it shall be accomplished only by the adjustment of water reducers, conforming to the requirements of ASTM C494. Unless otherwise recommended by the product manufacturer, additions of water reducer or air-entraining admixture shall be mixed by 30 revolutions of the drum at mixing speed after the admixture has been added, prior to discharge of any concrete for placement.

Any water necessary to clean fins or the chute after the addition of admixtures will not be allowed unless such water is accounted for on the mix delivery ticket and does not exceed the total quantity of water indicated on the approved mix design. Any additional admixtures, water

to clean fins or chute, and mixing revolutions shall be recorded on the delivery ticket as specified in Subsection 1006-4.01 of the specifications.

Dissolvable bags used to introduce silica fume or fibers into the mix shall become fully dissolved during mixing and shall not adversely affect the properties of the concrete. If bag fragments are observed during discharge, the batch will not be accepted.

5.0 Submittals:

The contractor shall provide the following submittals for approval as described below:

(a) Mix Design – The contractor should allow a minimum of 90 days for completion and approval of a new mix design. See Subsection 3 for mix design requirements. An approved mix design is required prior to any silica fume concrete placement.

(b) Field Demonstration Report – The contractor shall submit the Field Demonstration Report to the Engineer following the Field Demonstration in accordance with Subsection 6.02.

(c) Evaporation Mitigation and Concrete Protection Plan – The contractor shall submit the Evaporation Mitigation and Concrete Protection Plan at the Pre-Placement Meeting in accordance with Subsection 6.03. See Subsection 7 for requirements of the plan.

(d) Concrete Curing Plan – The contractor shall submit the Concrete Curing Plan at the Pre-Placement Meeting in accordance with Subsection 6.03. See Subsection 9 for curing requirements.

(e) Concrete Placement Plan – The contractor shall submit a Concrete Placement Plan meeting the requirements of Subsection 6.04 to the Engineer at the Pre-Placement Meeting.

(f) Quality Control Submittal – The contractor shall submit a document detailing the quality control organization and staff qualifications at the Preconstruction Conference. This document shall include the name, contact information, and credentials of the quality control technicians and any associated engineering/materials testing firm. See Subsection 11 for additional information.

6.0 Construction Requirements:

The contractor shall coordinate the silica fume concrete construction operations and schedule with the Engineer in accordance with the following.

6.01 Pre-Field Demonstration Meeting:

A silica fume concrete pre-field demonstration meeting shall be held before any silica fume concrete placement. The purpose of the pre-field demonstration meeting is to review silica fume concrete requirements for the project and to discuss the impact of silica fume concrete practices and work on the project with the contractor. This meeting shall include the Engineer and other designated Department personnel, the contractor, subcontractors, quality control staff, quality control manager, suppliers, and other parties who will be responsible for implementing the work in accordance with the project plans and specifications.

At the discretion of the Engineer, provided the contractor has previously demonstrated successful placement and curing of silica fume concrete on a project similar in size and scope, the requirements for a full field demonstration may be reduced to determination of the air content, slump, and temperature of the silica fume concrete before and after pumping. Any reduction in field demonstration requirements will be considered prior to the pre-field demonstration meeting following written request by the contractor.

6.02 Field Demonstration:

The contractor shall, a minimum of 14 days prior to any silica fume concrete placement, perform a field demonstration of the silica fume concrete placement proposed for the bridge deck. The field demonstration shall include the production, transportation, pumping, placement, finishing, and curing of silica fume concrete proposed for the bridge deck. To simulate the job conditions during the actual silica fume concrete placement, all aspects of the work shall be duplicated including batching, transportation, travel conditions, placement, equipment, protection, and curing. During the field demonstration, the anticipated pump configurations shall be established and the effects of such on the properties of the plastic concrete shall be determined by obtaining multiple samples, as deemed necessary by the Engineer. The field demonstration shall be carried out by the same personnel that will be placing the silica fume concrete on-site, and shall use the same equipment to be used on the job. The location of the field demonstration shall be at a location in the proximity of the job site, as approved by the Engineer.

The field demonstration shall consist of at least 20 cubic yards. Any silica fume concrete used to prime the pump shall be wasted. The contractor shall demonstrate proper batching, placement, protection, finishing, and curing of silica fume concrete. The silica fume concrete shall be tested on site for conformance with the slump and air content requirements at the final point of discharge of the placement. Slump, air, and temperature shall be determined both before and after pumping.

The field demonstration is the responsibility of the contractor. If the Engineer determines that the contractor’s silica fume concrete practices in the field demonstration are not acceptable or do not conform to the specifications, the field demonstration shall be repeated until all processes for production, transporting, pumping, placing, finishing, protecting, curing, sampling, and testing of silica fume concrete are acceptable. Repetition of the field demonstrations, as determined necessary by the Engineer, shall be done at no additional cost to the Department.

Concrete placed for the field demonstration shall be removed and disposed of off-site, the cost being included in the bid item unit price.

After the field demonstration, the contractor shall submit a final comprehensive report to the Engineer which describes the outcome of the field demonstration including batching, transporting, pumping, placing, finishing, protecting, curing, sampling, and testing of silica fume concrete. The Engineer must approve the field demonstration before concrete placement can proceed.

6.03 Pre-Placement Meeting

After the field demonstration, and at least seven days prior to any subsequent silica fume concrete placement, the contractor shall meet with the Engineer and at a minimum, the parties listed in Subsection 6.01 to discuss and obtain approval from the Engineer for all issues related to bridge deck construction and the placement of silica fume concrete. These issues include:

a) Batch plant, backup batch plant, batching sequence, and NRMCA/ARPA plant and mixer certificates

b) Concrete truck batch size, delivery details, truck routes, travel times, number of mixers, and backup mixers

c) Aggregate stockpile maintenance and silica fume concrete acceptance criteria

d) Quality assurance and contractor quality control, concrete mix proportions and adjustment, pumping and associated air/slump loss, role of key personnel, and contingency plans

e) Evaporation mitigation, concrete protection plan, contingency plan, and role of key personnel

f) For overlays placed on an existing bridge deck: Surface preparation and application of a bonding agent

g) Concrete placement plan, joint details, and finishers certification

h) Evaporation mitigation and concrete protection plan

i) Concrete curing plan (including name and contact information for the individual(s) charged with performing and monitoring the wet curing process) and curing medium application

j) Flow chart identifying the construction steps that will take place from the time silica fume concrete is batched until it has been completely cured and achieved the specified strength

k) Defined process for corrective actions if silica fume concrete does not meet the requirements of this specification (slump, air, temperature, and permeability if any late additions of water).

6.04 Placing Concrete:

Concrete placement shall be in accordance with Subsection 601-3.03 with the following additional requirements.

(A) General Requirements:

The contractor shall submit a concrete placement plan which includes drawings showing the placement sequence, pump locations, construction joint locations, directions of the concrete placement, and any other pertinent data to the Engineer for approval. The concrete placement plan shall be submitted to the Engineer at the pre-placement meeting.

The placing of silica fume concrete will not be permitted until the Engineer is satisfied with the following:

1) the rate of producing and placing concrete will be sufficient to complete the proposed pour and finishing operations within the scheduled time,

2) sufficient fogging and wind protection is in place,

3) an acceptable evaporation rate on the bridge deck has been confirmed,

4) experienced concrete finishers and all necessary finishing tools and equipment are onsite and in satisfactory condition to finish the deck,

5) sufficient curing compound and curing medium is onsite, and

6) all necessary finishing tools and equipment are at the site and in satisfactory condition for use.

Silica fume concrete shall be placed as a single monolithic layer conforming to the specified depth of the placement unless otherwise approved by the Engineer.

In order to minimize the potential for drying of plastic concrete prior to finishing, the rate of concrete discharge, placement, and finishing shall be maintained so that the concrete deposited on the bridge deck is not more than 20 feet ahead of the finishing machine. Any

material drying or stiffening prior to finishing shall be removed and replaced with fresh silica fume concrete at no cost to the Department.

Concrete placement shall be a continuous operation. The forward speed of the finishing machine shall be adjusted to the average progress of production in order that the strike-off operations are as continuous and uninterrupted as possible. If the placement of the concrete is stopped for a period of 30 minutes or more, the contractor shall install a bulkhead, which is transverse to the direction of the placement and at a position where the placement can be finished full-width up to the bulkhead. The bulkhead shall be the full depth of the placement. The previously placed concrete shall be protected, finished, covered, and cured in accordance with the specifications. Further placement is permitted only after a period of twelve hours unless a gap is left in the lane or strip. The gap shall be of sufficient width for the finishing machine to clear the transverse bulkhead installed where the concrete placement was stopped. The previously poured concrete shall be sawn back from the bulkhead, to a point designated by the Engineer, to straight and vertical edges and shall be water blasted or sandblasted before new concrete is placed. For delays of less than 30 minutes, the end of the placement shall be protected from drying with wet burlap.

As soon as the concrete is placed, mechanical screeding shall take place. Hand finishing with a float may be performed if needed to produce a tight uniform surface at the edges of the finishing machine. When such hand finishing is needed, it shall be kept to a minimum to avoid overworking the surface.

The rate of concrete placement and consolidation shall be such that the formation of cold joints within monolithic sections will not occur. Any portion which displays apparent cold joints will be rejected, unless the contractor, at no additional cost to the Department, submits evidence that indicates that either a cold joint does not exist or that a cold joint is not detrimental. The Engineer will be the sole judge in determining the existence of a cold joint and whether its existence is detrimental.

(B) Evaporation:

The expected evaporation rate shall be determined by referencing the weather forecast provided by the National Oceanic and Atmospheric Administration (NOAA). Consideration shall be given to mix properties for temperature as determined by the field demonstration. No consideration shall be given to the effects of fogging equipment and windscreens. If the potential evaporation rate is 0.20 lbs/sq.ft./hr or greater, silica fume concrete placement shall not commence unless the contractor has fully demonstrated that the proposed combination of fogging equipment and windscreens is adequate to establish an environment on the bridge deck where an acceptable evaporation rate can be maintained.

If the expected evaporation rate is 0.20 lbs/sq.ft./hr or greater, the contractor may request a stop work order be issued until such time that more favorable conditions exist. During this time, the contractor will be allowed access to adjust, improve, and measure the effectiveness of fogging equipment and windscreens.

The contractor may elect to work at night, if approved by the Engineer. If approved, night work shall be performed in accordance with Subsection 108.05 of the specifications.

Silica fume concrete shall not be placed when the air temperature in the shade is above 90 °F. Silica fume concrete shall be placed only when the evaporation rate on the bridge deck, with all evaporation mitigation equipment in place in accordance with Subsection 7.0, does not exceed 0.10 pounds per square foot per hour for the entire duration of the concrete placement. The evaporation rate shall be determined using the following equation:

$$E = (T_C^{2.5} - r \cdot T_a^{2.5})(1 + 0.4V) \times 10^{-6}$$

where:

$E =$ Evaporation rate (lb/ft^2 per hour, hundredth)
$T_C =$ Temperature of evaporating surface (°F, nearest whole number)
$T_a =$ Temperature of air (°F, nearest whole number), measured 4 to 6 ft. above surface on windward side, shielded from sun
$r =$ Relative humidity of air (0 to 100%), in decimal form (nearest hundredth), measured 4 to 6 ft. above the surface on windward side, shielded from sun.
$V =$ Wind velocity (mph, nearest whole number), measured 20 in. above surface

The contractor shall have a calibrated device(s) capable of measuring the above weather parameters to the accuracy indicated. An evaporation nomograph (Appendix X) is provided to aid in determining the rate of evaporation after measuring the air temperature, relative humidity, concrete temperature, and wind velocity at the bridge deck. The evaporation nomograph provides a graphic method of estimating evaporation rate. The actual evaporation rate shall be determined by the equation above.

(C) Deck Surface Preparation for Overlays:

When silica fume concrete is placed as an overlay on an existing bridge deck, the final surface of the prepared concrete deck shall be free from oil, grease, rust, and other foreign material that may reduce the bond of the silica fume concrete to the existing deck slab. These contaminants shall be removed by detergent cleaning, sandblasting, waterblasting, or other removal methods as approved by the Engineer.

Construction equipment shall not be on any portion of the areas being overlaid that have undergone final preparation for placing concrete, unless approved the Engineer. Precautionary measures shall be in place to prevent contamination of the prepared surface. Such contamination would include the dripping of petroleum products and contamination tracked onto the concrete surface by equipment or pedestrians. The contractor shall place a material, such as polyethylene film, on the deck surfaces used by equipment. If the deck surface does become contaminated, the contractor will be required to clean the surface as described herein.

Any area of the final surface of the prepared concrete deck contaminated by any materials detrimental to the overlay bond to the concrete deck that cannot be cleaned shall be removed

to such depth as required, at the discretion of the Engineer. Such removal work shall be at no additional cost to the Department.

Exposed reinforcing steel shall be cleaned of rust and corrosive products including oil, dirt, concrete fragments, loose scale and other coating, or any other products which may interfere or adversely inhibit the bond between the existing and new concrete. Exposed reinforcing steel shall be protected from rust or contamination. Rust or contamination which may form on the reinforcing steel following the concrete removal will cause the Engineer to reject the reinforcing steel unless the contractor cleans the steel and removes any trace of rust or contamination products. The cleaning may include sandblasting or shot blasting when necessary, and shall be performed at no additional cost to the Department with no adjustment in contract time or price.

Prior to placement of overlay concrete, existing concrete shall be kept moist for a period of at least 24 hours before receiving fresh concrete. This shall be achieved by thoroughly wetting the surface prior to placement and maintaining it in a continuously moist condition until placement. Any modifications to this requirement to accommodate chemical bonding agent manufacturer recommendations shall be included in the Concrete Placement Plan, and are subject to approval by the Engineer. Acceptable means of maintaining a moist condition are covering the concrete surface with polyethylene sheeting or the use of fog spray or soaker hoses, provided that complete moisture coverage is attained. All freestanding water shall be removed prior to overlay placement. Any standing water in depressions, holes or low areas shall be blown out with compressed air. Any minor accumulation of new corrosion during the moistening period is considered incidental to the soaking process and is not required to be continually re-cleaned.

(D) Bonding Coat for Overlays:

The contractor shall apply a bonding coat to the prepared deck surface in accordance with the manufacturer's recommendations. A chemical bonding agent meeting ASTM C881 for the appropriate type, grade, and class as determined by the Engineer, a polyvinyl acetate chemical bonding agent meeting the requirements of ASTM C1059, Type 1, or a 3-component chemical bonding agent specifically intended for bonding fresh concrete to existing concrete and exposed reinforcing steel surfaces, which contains epoxy and does not create a moisture barrier after it cures, may be used. The chemical bonding agent shall provide sufficient bond meeting the requirements of Subsection 12, have a compressive strength of 4500 psi at 28 days, and have a slant shear bond strength of 1500 psi at 14 days. If the chemical bonding agent requires concrete placement prior to curing, the manufacturer's literature shall indicate that the bonding agent has a minimum open time of 30 minutes at 90 degrees F prior to curing.

The contractor shall provide a Certificate of Compliance for the chemical bonding agent incorporated into the work. If reinforcing steel is exposed, the bonding coat achieved by the chemical bonding agent shall provide corrosion protection.

To avoid compromise of the overlay bond by workers and equipment, application of the bonding agent shall only advance ahead of silica fume concrete placement to the extent necessary. Areas in which the bonding agent has been applied and that are exposed beyond

the manufacturer's indicated open time, or that become contaminated, shall be repaired by the contractor at no additional cost to the Department.

7.0 Evaporation Mitigation and Silica Fume Concrete Protection:

Prior to silica fume concrete placement, fogging equipment shall be in place and in good working order. Windscreens shall be used when the fogging equipment alone cannot maintain the specified evaporation rate and the contractor elects to continue silica fume concrete placement.

All concrete surfaces shall be protected from drying from the time concrete is discharged and deposited on the bridge deck until the curing compound, as described in Subsection 9.02(A), is applied to the silica fume concrete surface. These requirements apply to both finished and unfinished concrete.

7.01 Water Fogging:

The area 2 to 3 feet immediately above the silica fume concrete shall be continuously kept in a state of high moisture by applying a fog mist as with the fogging equipment described in Subsection 7.02. The moisture from the nozzle shall not be applied under pressure directly upon the concrete and shall not be allowed to accumulate on the concrete in a quantity sufficient to cause a flow or washing of the surface. Application of a non-atomized spray of water, water by brushes, or any other method will not be permitted.

7.02 Fogging Equipment

Fogging equipment shall consist of a mechanically operated pressurized system using incrementally spaced triple headed nozzles or equivalents. The nozzles shall be pointing horizontally, parallel to the surface of the concrete and at a distance not to exceed 36 inches above the concrete surface.

The fogging equipment shall be mounted such that it is stationary. Each nozzle shall be equipped with an easily accessible control capable of varying the volume of water flow and immediately shutting off the water when in the off position. Hand-held fogging equipment will not be allowed.

7.03 Windscreens:

Windscreens shall be used to reduce the evaporation rate when the fogging equipment alone is not sufficient to maintain the evaporation rate within acceptable limits. Windscreens shall project at least 6 feet above the prepared bridge deck surface. Windscreens may be made of any construction material that provides sufficient strength to resist the force of the wind.

7.04 Evaporation Retarding:

If during finishing an unexpected environmental change or delay occurs, a monomolecular film product that aids in retarding the evaporation may be used prior to finishing with the Engineer's approval. The monomolecular film shall be applied in accordance with the manufacturer's recommendations. The evaporation retarder shall be applied in a fine mist using suitable sprayers; it shall not impact the plastic concrete surfaces in a stream.

Concrete surfaces to which an evaporative retardant has been applied shall not be subjected to finishing which mixes the retardant into the plastic concrete. Application of an evaporation retardant shall not delay the placement of curing compound as described in Subsection 9.02(A).

8.0 Finishing Silica Fume Concrete:

8.01 General Requirements:

Delays, such as waiting for concrete surface sheen to disappear, concrete surface strength development, or other reasons, will not be allowed.

After the concrete surface has been brought to its final elevation while the concrete is still in a plastic state, final finishing of the bridge deck shall be accomplished by lightly texturing the concrete surfaces with a burlap drag, or other acceptable medium which, in the opinion of the Engineer, does not excessively displace near surface fibers, if applicable. Concrete protection and curing processes should commence immediately after final finishing and texturing of the concrete surface has been completed.

The deck surface shall be finished to a final surface, free of mortar ridges, hollows, and any other projections. Water shall not be applied to the deck surface at any time during placement or finishing except through fogging in accordance with Subsection 7.01.

Immediately after silica fume concrete is finished, it shall be covered with curing compound as specified in Subsection 9.02(A).

9.0 Curing Silica Fume Concrete:

9.01 General Requirements:

All silica fume concrete shall be cured in strict accordance with Subsection 1006-6(E), however the minimum curing time shall be 14 days. A curing day is defined as a calendar day when the temperature taken in the shade away from artificial heat is above 50 °F for at least 19 hours; or if satisfactory provisions are made to maintain the temperature of concrete surfaces above the minimum curing temperature of 40 °F for the entire 24 hours.

The contractor shall have submitted a proposed curing plan to the Engineer for review and approval during the pre-placement meeting. The contractor's curing plan shall detail the

proposed methods, include proper equipment and material in adequate amounts, describe how the water curing process will be monitored and maintained, and be approved by the Engineer prior to placing silica fume concrete.

Vehicles are not permitted on the concrete until the specified curing time is satisfied and until the concrete has obtained the specified compressive strength when tested in accordance with the requirements of AASHTO T 22 or as approved by the Engineer.

All exposed surfaces of the silica fume concrete shall be kept wet continuously for the entire curing period. Water used for curing that stains or leaves an unsightly residue shall not be used.

9.02 Curing Equipment and Material:

(A) Liquid Membrane Forming Compound

Liquid membrane forming compound shall be in accordance with 1006-2.05.

(B) Liquid Membrane Forming Compound Application:

Liquid membrane forming compound shall be applied in accordance with 1006-6.01(C). Application of the liquid membrane forming compound shall follow immediately behind finishing operations.

(C) Water Curing Medium:

Curing medium shall be capable of temporarily accepting and holding moisture, then gradually releasing that moisture to the concrete surface through contact. Acceptable curing mediums include burlap and burlap/plastic combination. The contractor may propose an alternate curing medium for approval in advance by the Engineer. Earth and sand blankets will not be allowed.

(D) Water Curing Method:

Water curing shall consist of keeping the silica fume concrete surface continuously wet by maintaining a layer(s) of curing medium, as specified in Subsection 9.02(C), in a continuously wet state and in direct contact with the fresh concrete surface for the entire curing period. Application of the curing medium shall begin immediately at such time that placement can be made without marring the surfaces of the concrete.

The curing medium shall be wetted down (without dripping) prior to placement on the concrete surface. Dry curing medium shall not contact the concrete. The curing medium shall be applied manually from the work bridge and shall be carefully placed without marring the surface of the plastic concrete.

Continuous wetting shall be accomplished by supplying water with intermittent flow (directly on a porous type curing medium such as burlap) or through pre-fabricated holes made in burlap/plastic combination sheets.

Regardless of the type of medium used, wet curing shall not be interrupted anytime during the entire curing period. The contractor shall monitor the curing process at a maximum interval of one hour to ensure compliance of the requirements herein.

10.0 Sawed Grooves:

(1) General:

Sawed grooving shall occur after the Engineer has accepted the finished surface and after the concrete curing period has been completed, but before the roadway is opened to traffic. Grooving shall occur prior to the application of any concrete sealer if a sealer is specified in the contract documents. Grooves shall be transverse or longitudinal as shown on the plans.

A self-propelled texturing machine built for grooving of the concrete surfaces shall be used for making the sawed grooves. The saw grooving equipment shall be capable of producing grooves which meet the dimensional requirements specified in Subsection 601-4.01.

Sawed grooves shall terminate at 12 inches ± 3 inches from the face of curbs, bridge rails, or median dividers along each edge of the bridge deck surface. Grooves shall be stopped 9 to 12 inches from any devices installed on the bridge deck, such as scuppers and expansion devices that are perpendicular to the grooves.

For skewed expansion devices on the bridge deck, the direction of the grooves, as specified above, shall not be altered and the grooves shall terminate no closer than 6 inches nor farther than 4 feet from the joint armor. The maximum gap in texturing, from one side to the other of skewed expansion devices shall not exceed 5 feet.

Overlapping of grooves by succeeding passes will not be permitted.

(2) Equipment:

Equipment for grooving shall be as specified in Subsection 601-3.05(D)(2)(c)(2).

(3) Construction:

Grooving shall be accomplished in accordance with Subsection 601-3.05(D)(2)(c)(3).

11.0 Contractor Quality Control:

Contractor quality control shall be performed in accordance with 1006-4.01 with the following additional requirements. Temperature, in accordance with ASTM C 1064, and unit weight, in accordance with ASTM C138, shall be tested once per 40 cubic yards. In addition to the testing frequency requirements in 1006-4.01, gradation and sand equivalent shall also be tested at least once per placement.

As part of the weekly quality control report, the contractor shall provide a placement summary sheet and diagram showing the location of each delivered load of silica fume concrete, and associated quality control test results.

12.0 Acceptance Sampling and Testing:

Acceptance sampling and testing for temperature, slump, air content, and compressive strength shall conform to the requirements of Subsection 1006-7 for Class S concrete, except as modified below.

If testing indicates that a mixer contains concrete with an unacceptable slump or air content, discharge of the concrete from the mixer shall cease and shall not resume until the mix properties have been adjusted, in accordance with the criteria herein, and subsequent testing of concrete discharged away from the bridge deck results in acceptable slump and air content.

For overlays, the bond strength will be determined by the Engineer in accordance with ASTM C882 by compressive strength of slant shear cylinders. Slant shears will be fabricated by the Engineer for each 5,000 square feet of overlay surface area. The required minimum slant shear bond strength is 1,500 psi at 14 days or as indicated on the project plans. Failure to meet the minimum required slant shear bond strength will result in reject of the overlay in accordance with Subsection 106.11.

The Engineer may perform additional concrete testing, sampling, and instrumentation during the production, transportation, and placement of silica fume concrete during the field demonstration and the bridge deck placement. The contractor shall make all necessary provisions to allow for adequate sampling and testing of the silica fume concrete.

Concrete having improper temperature, slump, or air content which is allowed to remain in place, or concrete which has been cured incorrectly, shall be subject to testing for chloride permeability if determined necessary by the Engineer.

Any concrete which fails to meet the chloride permeability requirements shall be removed and replaced at no additional cost to the Department.

13.0 Bridge Deck and Overlay Evaluation and Acceptance:

13.01 General requirements:

At the end of the curing time and after the concrete has attained the specified required compressive strength and curing requirements have been satisfied, the entire bridge deck will be evaluated in accordance with Subsection 13.02. Additionally, overlays will be evaluated in accordance with Subsection 13.03. Placed bridge deck concrete and overlay concrete meeting the requirements herein, or repaired to the satisfaction of the Engineer will be accepted.

13.02 Concrete Cracking Evaluation and Repair:

Within 28 days after each placement, the associated bridge deck will be examined by the Engineer. If the Engineer suspects that other defects exist, more thorough investigation may be required by the Engineer. Any area that displays cracks, or where defects are found, will be marked by the Engineer and shall be repaired or replaced by the contractor as specified herein, or as directed by the Engineer, at no additional cost to the Department.

If the Engineer agrees that the cracks observed may remain in place and be repaired, these cracks shall be filled and sealed as follows:

1. Concrete surfaces shall be sandblasted approximately 1 inch to each side of a cold joint and visible crack to remove laitance.

2. Cold joints and cracks shall be filled completely with an approved low viscosity epoxy or injection type epoxy adhesive appearing on the Department's Approved Products List and in accordance with the manufacturer's recommendations. The contractor shall take adequate precautions to prevent the epoxy from being spilled on the deck. The contractor shall remove all epoxy spills on the deck at no additional cost to the Department.

The contractor shall submit a repair plan which includes proposed materials, application, and related issues to the Engineer for review and approval. The Engineer shall have sole discretion in determining the extent of cracking that will require repair or if cracked areas should be removed and replaced; either shall be completed at no additional cost to the Department.

13.03 Overlay Evaluation:

The entire overlay surface shall be tested in accordance with the requirements of the chain drag procedure in ASTM D4580 to test for bond uniformity and the existence of any delamination between the newly placed concrete overlay and the existing bridge deck concrete. A report presenting the procedure, the equipment, and the results of the drag tests in accordance with ASTM D4580 shall be submitted to the Engineer for approval.

Overlay concrete in unbonded areas, as tested above, or in areas where slant shear bond strength did not meet strength requirements shall be removed and replaced at no additional cost to the Department.

For informational purposes, the contractor shall determine the pull out bond strength between the overlay and the existing concrete in accordance with the requirements of ASTM C1583. The test locations will be selected by the Engineer. A pull out bond strength test (an average of three pull out tests) shall be performed for each 5,000 square feet of the entire overlay surface area.

The pull out bond strength measured when the failure plane takes place at the interface between the existing base concrete and the overlay shall represent the bond strength. The desired pull out bond strength is a minimum of 300 psi at 28 days.

If the failure plane occurs within the existing bridge deck base concrete, the test will be considered satisfactory.

When the failure plane of the bond strength pull out test is within the concrete overlay itself or at the interface between the overlay and the test disk, the test result shall be discarded and a new test shall be performed at another location.

All costs related to the pull out bond testing shall be borne by the contractor. Concrete areas where bond testing was performed shall be repaired using an epoxy resin grout patch material approved by the Engineer and on the latest ADOT Approved Products List.

14.0 Opening to Traffic:

If the contractor desires to resume work on the bridge deck after concrete placement but prior to 28 days, adequate early age strength shall be verified either by means of the maturity method in accordance with Subsection 1006-7.02, or by additional concrete cylinder specimens, both of which being the responsibility of the contractor.

No traffic (construction or non-construction) shall be allowed on the bridge deck before the end of the curing period. The bridge deck may be opened to traffic at the end of the specified curing period provided the concrete has achieved its specified compressive strength and been approved by the Engineer.

15.0 Method of Measurement:

Concrete will be measured to the nearest cubic yard placed. Measurement will be made in accordance with the dimensions shown on the plans or such other dimensions as may be ordered in writing by the Engineer. No deduction will be made for the volume occupied by reinforcing steel embedded in the concrete.

No measurement or direct payment will be made for texturing of the bridge deck with a burlap drag, the cost of such being considered as included in contract items.

Bridge Deck Texturing (Sawed Grooves), when included in the bidding schedule, will be measured to the nearest square yard. The area will be determined by the length of the bridge, approach slabs, and anchor slabs, multiplied by the width of the roadway between the face of curb or bridge rail on each side, less 2.0 feet. The quantity shown on the bidding schedule will be considered final and will not be re-measured unless changes are specified by the Engineer, or if the Engineer or contractor determines that the constructed area varies by an amount greater or less than 2 percent of the quantity shown on the bidding schedule. Such adjustments, if required, shall be in accordance with Subsection 104.02.

16.0 Basis of Payment:

The accepted quantity of silica fume concrete, measured as provided above will be paid for, complete in place, in accordance with the provisions of Subsection 1006-7.06(B).

The contract unit price paid for a bridge deck using this concrete shall include full compensation for furnishing all labor and materials, tools, equipment, field demonstration, pre-placement meeting, concrete mix design and submittals, quality control program, testing, placing, finishing, curing, as well as performing the required cleanup and other related activities necessary to complete the work and meet the requirements of the specifications.

The basis of payment will be made as specified herein and under the provisions specified in the various sections of the specifications covering construction requiring the use of concrete.

ITEM 6010508 BRIDGE REPAIR (FLAME STRAIGHTEN GIRDERS, STIFFENERS AND STRUTS):

Description:

The work consists of flame straightening and repairing steel bridge girders and other structural members that have been damaged by over-height vehicles.

Materials:

Minor structural members that have been lost, or damaged beyond repair, shall be replaced by ASTM A36 steel new members.

All lose and damaged bolts shall be replaced with new bolts that comply with the same performance standards as the original.

Construction Requirements:

The repair work shall conform to Section 604 of the Standard Specifications and includes heat straightening of the damaged steel girder and other structural members.

Repair work shall not be started until the existing paint has been removed.

The heat-straightening/tuning specialist shall closely examine all areas surrounding the point of impact, including secondary connections and adjacent members for cracking. If cracking exists, the specialist shall determine whether the cracks shall be repaired before or after straightening.

Reuse of existing bolts shall not be allowed.

The tips of cracks in webs or flanges shall be located using Magnetic Particle Testing (MT). Cracks and torn areas of the web or flange shall be prepared for welding by air carbon arch gouging and grinding to an acceptable profile. All welding shall be performed in accordance with a Welding Procedure Specifications (WPS) approved by the Engineer. Upon completion of welding, these welds shall be inspected using ultrasonic testing (UT).

The extent of cracking in fillet welds shall be determined by Penetrant Testing (PT) or Magnetic Testing (MT). All fillet weld repairs shall be inspected using MT.

The heat applied shall be between 700 to 1250 degrees Fahrenheit. The temperatures shall be visually monitored by the heat-straightening specialist. The maximum torch tip size shall be 1" diameter. The heat straightening shall be accomplished through the application of V-heat, line heat, and spot heat patterns. Heating shall be performed in such a manner that the only location showing "color" shall be directly under the torch tip. Heating shall start at the apex of the V-heat and shall progress to the base. A heat pattern may not be reheated until the area has cooled completely. Straightening operations may be accelerated by using external jacking devices. The forces applied through these jack devices shall be limited so that the stresses in the member prior to heating operations do not cause deflection or damage to the member.

Heating of structural steel will not be allowed to exceed 1250 °F, as indicated by a “Cherry-Red” color. Heating will be monitored by the Engineer, using temperature sticks provided by the contractor. After being heated, the metal shall be cooled as slowly as possible. Upon completion of straightening, the steel surfaces shall be carefully inspected for the presence of cracks or other signs of distress. Care shall be exercised in the straightening operations so as to not cause additional damage to the members.

If, in the opinion of the Engineer, the contractor’s operations damage the members, the contractor shall be required to modify the method of operations and, at its expense, make all necessary repairs as determined by the Engineer.

The work shall be done by methods not likely to produce fracture or other injury to the steel members being straightened.

Care shall be exercised in the straightening and adjusting operations. The contractor shall employ craftsmen skilled in the art of straightening, flame shrinking and equi-tensioning (tuning) steel members. Craftsmen with a minimum of 10 years experience in the above methods shall be required to perform the work. As part of the contractor’s work plan, references from a

minimum of three similar projects that demonstrate each craftsman's experience and show varying degrees of success with different degrees of severity of damage shall be submitted to the Engineer for approval.

The method used by the contractor to straighten members may necessitate strengthening the member or providing temporary supports for related members to insure adequate strength to resist all existing and applied loads.

After Repairs, Girders shall be repainted per these Special Provisions ITEM 6100026 PAINT STRUCTURE (EXISTING STRUCTURAL STEEL).

Replacement or repair of steel members shall be performed in accordance with Section 604 of the Standard Specifications and these Special Provisions.

During the course of the work, it may be necessary to disconnect, support or adjust steel which is to remain in the structure. For these situations, the contractor shall submit its plan or procedure for disconnecting, supporting or adjusting the steel for the Engineer's approval. The contractor's plan or procedure shall be approved prior to commencement of any of the work included in the plan or procedure.

Tolerances:

Heat straightening shall continue until the member conforms to the following tolerances, as measured with a straight edge:

1. Deflections or bends in the web are ¼ inch or less.
2. Vertical deflections in the flange are ¼ inch or less.
3. Tilt rotation or tip in the flange is ¼ inch or less.
4. Sweep or horizontal alignment of the flange, at the impact area, is ¼ inch in 10 feet or less.
5. If there is a gouge at the point of impact, it is not measured.
6. Diaphragm locations shall be ¼ inch or less from the original measurement.
7. Overall sweep of the beam's length shall be less than ½ inch.

Submittals:

The Contractor shall submit a work plan and a description of the methods and procedures, including the sequence of operations, to be used to straighten and adjust (equi-tension) the existing steel members. Submittals shall include size and descriptions of equipment for applying forces to restrain the distorted areas and for heating the steel. Details of distributing force reactions to the bridge shall also be submitted. Submittals shall conform to Section 105.03, "Plans and Working Drawings" of the Standard Specifications. Distorted areas and

bends shall be straightened by restraining and then alternately heating and cooling the affected region. Procedures and sequences shall conform to the approved submittals. Work shall not begin until the submittals have been approved, in writing, by the Engineer.

Heat straightening and tuning shall be performed by an approved company and supervised by a person who has extensive experience with heat straightening of damaged structural steel members. The following is a list of companies interested in such work:

International Heat Straightening, Inc.
Bismarck, North Dakota (701) 223-5972

Dan R. Dalton, Inc.
Usk, WA (509) 447-3528

Flame On, Inc.
Snohomish, WA (425) 397-7039

Method of Measurement:

ITEM 6010508 - BRIDGE REPAIR (FLAME STRAIGHTEN GIRDERS, STIFFENERS AND STRUTS), shall be measured as a single, Lump Sum unit of work when all damaged members of a bridge structure have been acceptably straightened.

Basis of Payment:

The accepted quantities of ITEM 6010508 - BRIDGE REPAIR (FLAME STRAIGHTEN GIRDERS, STIFFENERS AND STRUTS), as measured above will be paid at the contract unit price, which shall be full compensation for all work, labor, equipment, material, and incidentals required to deliver the work, complete-in-place.

ITEM 6015203 – BEARING (ELASTOMERIC):

Description:

The work under this item shall consist of furnishing and installing elastomeric bearing pads as shown on the plans and in accordance with the requirements of the specifications.

Materials:

Materials shall conform to the requirements of the plans and Section 1013 of the specifications.

Construction Requirements:

Installation of the elastomeric bearing pads shall meet the requirements of the plans and Sections 601 and 1013 of the specifications and as directed by the Engineer. Any damage to the existing girder system due to contractor operation shall be repaired by the contractor as directed by the Engineer at no additional cost to the Department.

Method of Measurement:

Elastomeric bearing pad will be measured as a unit for each elastomeric bearing pad installed.

Basis of Payment:

The accepted quantities of elastomeric bearing pad, measured as provided above, will be paid for at the contract unit price each, which price shall be full compensation for the work, complete in place.

ITEM 6041001 – JACKING BRIDGE SUPERSTRUCTURE:

Description:

The work under this item shall consist of furnishing all labor, equipment, and materials required for raising the existing Perkins Valley TI UP Bridge (Str. No. 1776) to replace existing bearing pads at Abutment #1 and Abutment #2. This work shall include installing lifting frame members, installing steel shim plates, jacking the existing bridge, and any other incidental elements required to achieve proper adjustment of the structure.

Construction Requirements:

Superstructure jacking for bearing assembly replacement and bearing pad replacement shall occur after bridge deck removal work is complete for each phase of construction. The superstructure shall be lifted the minimum height required to install new bearing assemblies or new bearing pads. The contractor shall take due care so as not to damage the existing bridge girders and abutment diaphragms during the jacking operation. Bearing pad contact surfaces shall be clean and free of dust and debris prior to placing new pads.

Contractor shall submit a detailed jacking plan and calculations to the Engineer describing how the structure will be raised including which girders will be raised during each phase of construction. The jacking plan shall include methods for monitoring vertical differences between jacking points, placement of blocking, methods to ensure stability of the structure throughout the lifting process, and the equipment or process necessary to contain any materials from falling onto the roadway.

Calculations shall show the adequacy of all support members and bearing surfaces on any existing structural elements. If the existing abutment diaphragms are used in the jacking

operation, the contractor shall submit calculations to verify the adequacy of the existing diaphragms including the diaphragm bolts. These calculations shall be furnished by the contractor and shall be sealed by a Professional Engineer registered in the State of Arizona.

Method of Measurement:

Jacking Bridge Superstructure will be measured as a single complete unit of work in conformance with the details on the project plans and these Special Provisions.

Basis of Payment:

The accepted quantities of Jacking Bridge Superstructure, measured as provided above, will be paid for at the contract price of lump sum, which shall be full compensation for the work, complete in place, as described and specified herein and as shown on the plans. All other work required to complete these improvements, including equipment access, are considered incidental to this item of work.

SECTION 604 STEEL STRUCTURES:

604-3.08 Erection: of the Standard Specifications is modified to add:

The contractor shall submit a girder erection plan for construction of the new Perkins Valley TI UP Bridge to the Engineer. The girder erection plan must be approved by the Engineer prior to any girder transport and erection activities. The girder erection plan shall be comprehensive and include all features and activities necessary to erect girders in a safe and controlled manor that avoids conflicts with existing structures and meets traffic control requirements. The girder erection plan shall include but is not limited to traffic control, girder transport, equipment, crane/crane pad locations, erection sequence, bracing plan, etc. Bracing shall be placed prior to the release of the erection equipment for each girder. Girders shall be placed accurately on bearings to avoid creating eccentricities capable of initiating imbalance.

It is the responsibility of the contractor to maintain stability of partial and completed girders during the various stages of erection prior to completing the installation of all girders and permanent bracing members.

Temporary bracing, brackets, and all other temporary works that are required to support, stabilize, and assist in the erection of the girders shall be provided by the contractor. Any modifications to the new bridge piers that may be necessary to assist in the erection of the new steel girders shall be approved by the Engineer prior to the commencement of the work. All labor, equipment, and temporary elements required for the erection of the new girders shall be provided by the contractor at no additional expense to the Department.

Contractor shall align the bearing stiffener centerline with the centerline of bearing during the erection process. Jacking of the girders for proper positioning on the bearings may be required

to accommodate change in girder length due to temperature variation. The contractor shall submit the means and methods for aligning the bearings with the girder erection submittal.

The existing Perkins Valley TI UP Bridge (Structure #1776) shall not be utilized for girder transport or temporary haul truck staging for girder lifting and erection activities. Intermittent closures of I-40 near the limits of the bridge work for girder transport and erection are allowed and shall meet the traffic control requirements as stated in the contract plans and section 701 of these Specifications. No cranes for erection purposes will be allowed on Perkins Valley TI UP Bridge (Structure #1776).

The erection plan shall be submitted to the Engineer, at least thirty calendar days prior to the start of girder transport and erection operations.

(608 PANEL, 06/17/21)

SECTION 608 SIGN PANELS:

608-1 Description: of the Standard Specifications is revised to read:

The work under this section shall consist of furnishing and installing sign panels in accordance with the details shown on the plans and the requirements set forth herein.

The sign panels shall be of the following types:

(A) Extruded Aluminum Sign Panels with Direct-Applied, or Demountable Characters;

(B) Flat Sheet Aluminum Sign Panels with Direct-Applied, Electronic-Cut, or Screen-Printed Characters;

(C) Warning, Marker, and Regulatory Sign Panels;

(D) Route Shields for Installation on Sign Panels; and/or

(E) EXIT ONLY Panels for Installation on Sign Panels.

608-2.02 **Extruded Aluminum Sign Panels with Direct-Applied, Digitally-Imaged, or Demountable Characters:** the title and the third paragraph of the Standard Specifications are revised to read:

608-2.02 Extruded Aluminum Sign Panels with Direct-Applied or Demountable Characters:

The letters, numerals, symbols, borders and other features of the sign message shall be direct-applied, or demountable, and shall conform to the requirements of Subsection 608-2.08 or Subsection 608-2.09 of the specifications.

608-2.03 **Flat Sheet Aluminum Sign Panels with Direct-Applied, Digitally Imaged, Electric-Cut or Screen-Printed Characters:** the title and the fifth paragraph of the Standard Specifications are revised to read:

608-2.03 Flat Sheet Aluminum Sign Panels with Direct-Applied, Electronic-Cut, or Screen-Printed Characters:

Messages shall be reflectorized white or, if called for on the plans, opaque black, and shall be produced by either screen printing, direct-applying, or electronic cutting, as specified under Subsections 608-2.09 of the specifications.

608-2.05 **Route Shields (For Installation on Sign Panels):** The first paragraph of the Standard Specifications is revised to read:

Route shields may be demountable or direct-applied.

608-2.06 **EXIT ONLY Panels (For Installation on Sign Panels):** the first paragraph of the Standard Specifications is revised to read:

EXIT ONLY panels may be demountable or direct-applied. Demountable EXIT ONLY panels shall be attached to the sign panel with self-plugging aluminum blind rivets.

608-2.10 **Digitally-Imaged Characters:** of the Standard Specifications is hereby deleted:

(609DRSFD, 09/19/24)

SECTION 609 **DRILLED SHAFT FOUNDATIONS:** of the Standard Specifications is revised to read:

609-1 **Description:**

609-1.01 **General:**

The work under this section shall include furnishing all materials and constructing reinforced concrete shafts formed within a drilled excavation. Each drilled shaft foundation shall consist of a shaft section with or without casing left in place, with or without a rock socket or a belled footing. The drilled shaft foundation shall be constructed in accordance with the details and dimensions shown on the plans, and the requirements specified herein.

609-1.02 Certification:

The contractor shall be responsible to review all available geotechnical investigation reports, and its signature on the proposal form shall certify that the firm performing the drilled shaft operations, whether the prime contractor or a subcontractor, has completed this review. The geotechnical investigation reports are available on the ADOT Contracts and Specifications Group website, under Current Advertisements.

609-1.03 Installation Plan:

The contractor shall provide to the Engineer for review and approval a detailed installation plan containing the following information:

(A) List of proposed equipment to be used including cranes, drills, augers, bailing buckets, final cleaning equipment, desanding equipment, slurry pumps, sampling equipment, tremies or concrete pumps, casing, etc.

(B) Details of overall construction operation sequence and the sequence of shaft construction in bents or groups.

(C) Details of shaft excavation methods, including equipment and procedures for checking the dimensions and alignment of each shaft excavation.

(D) When slurry is selected for borehole stabilization, the contractor shall submit Safety Data Sheets, quality control procedures, and disposal details.

(E) Details of methods to clean the shaft excavation.

(F) Details of reinforcement placement, including support and centralization methods, lifting equipment, and staging location for tied steel reinforcement cages prior to placement.

(G) Details of concrete mix designs and mitigation of possible loss of slump during placement, including slump loss test results in accordance with the requirements shown in Appendix **Attachment 2 – Slump Test of Portland Cement Concrete**.

(H) Details of concrete placement, including concrete volumetric charts, and the elapsed time for slump loss (as defined in Subsection 609-3.07(A) and determined by the slump loss test). The concrete placement duration (as defined in Subsection 609-3.07(A)) shall be submitted for each drilled shaft diameter.

(I) Details of casing dimensions, material and splice details.

(J) List of work experience in previous similar projects.

(K) Other information shown on the plans or as requested by the Engineer.

(L) Emergency horizontal construction joint method if unforeseen stoppage of work or interruption in concrete delivery occurs.

(M) Details of any special access or setup requirements needed to position the drill equipment to advance excavations.

The contractor’s installation plan shall be developed with input from subcontractors, material suppliers, and all others with drilled shaft responsibility. The installation plan shall also identify which portion of the drill shaft construction the contractor and each of the subcontractors will be performing. The documentation required above shall be submitted to the Engineer at least four weeks before work on shafts is to begin. The Engineer will review the initial submittal within 10 working days, and subsequent submittals, as necessary, within five working days. A drilled shaft preconstruction meeting will be scheduled following the final approval of the installation plan and prior to commencement of drilling activity. All parties named in the installation plan shall be represented at the preconstruction meeting. No drilled shaft work shall be performed until the contractor's final submittal has been approved by the Engineer and the preconstruction meeting concluded. Such approval will not relieve the contractor of responsibility for results obtained by use of the installation plan, or any of its other responsibilities under the contract. The contractor shall be responsible to submit a modified installation plan each time a change is made to facilitate construction.

Unless otherwise specified in the Special Provisions, foundations of 4 feet or less in diameter and 30 feet or less in length utilized in light pole and sign post foundations shall be exempt from the requirement to perform integrity testing.

609-2 Materials:

609-2.01 Concrete:

Concrete shall conform to the requirements of Section 1006 of the specifications, with the following additions or modifications:

(A) Cement:

Where concrete is placed in drilled shaft excavations containing slurry or water, the cementitious material content of the concrete shall be between 660 and 750 pounds per cubic yard.

(B) Aggregate:

Maximum nominal aggregate size shall be limited to 1/5 of minimum clear bar spacing (vertical and horizontal), not to exceed 3/4 inch nominal for drilled shafts constructed with a wet method or with temporary casing (excluding collar-only casings), and 1 inch nominal for drilled shafts constructed with a dry method.

(C) Air-Entraining Admixtures:

Air entrainment requirements detailed in Section 1006 shall be utilized in drilled shaft foundations.

(D) Slump:

Unless otherwise specified, or as directed by the Engineer, the concrete slump for the concrete placement duration (as defined in Subsection 609-3.07(A)) shall be 4 to 7 inches for dry, uncased excavations and 7 to 10 inches for all other excavations.

The proposed concrete mix designs may use various admixtures to delay the concrete’s initial set time and/or to reduce slump loss.

609-2.02 Reinforcing Steel:

Reinforcing steel shall conform to the requirements of Section 1003. Welded splices will not be allowed except as shown on the plans.

609-2.03 Casing:

Casing shall be steel and may be of unit or sectional construction. The casing shall be of sufficient strength to withstand handling and driving stresses, to withstand the pressure of concrete and the surrounding earth and to prevent seepage of water. Steel shall conform to the requirements of AASHTO M270 (ASTM A709), Grade A36, unless otherwise specified.

Should telescoped casing be used, the contractor shall not allow concrete to overfill any interior casing. Spillage must be removed from the annulus, or the shaft shall be declared deficient.

Temporary casing shall be clean, inside and out, prior to placement in the excavation. All casing shall be handled so as to limit distortion to within 2 percent of the diameter. No side shear capacity will be allowed where temporary casing installed becomes permanent. If approved by the Engineer and if conditions permit, temporary casings may be corrugated and non-watertight.

The contractor shall be responsible to compensate for loss of frictional capacity in the cased zone if temporary casing is abandoned in the shaft. Such modifications shall be approved by the Engineer, and shall be at no additional cost to the Department.

609-3 Construction Requirements:

609-3.01 General:

The methods and equipment used shall be appropriate for the intended purpose and materials encountered. The allowable methods are the dry method, wet method, temporary casing method, or permanent casing method, as defined by the 2017 LRFD Bridge Construction Specifications 4th Edition, Section 5. The most suitable of the listed methods for the conditions recorded in the geotechnical investigation report, or a combination of these methods, shall be used, subject to approval of the Engineer, to produce sound and durable concrete drilled shaft foundations. The permanent casing method shall be used only when required by the plans or authorized by the Engineer.

If at any time during the construction of the drilled shafts the Engineer determines that the equipment, materials, employees, or procedures are such that defects in the work may occur, the Engineer may stop the work until appropriate changes are made by the contractor. In no case shall the contractor be relieved of its responsibility for constructing acceptable drilled shaft foundations.

609-3.02 Confirmation Shafts:

Unless otherwise specified in the Special Provisions, the contractor shall construct a confirmation shaft to determine the adequacy of the contractor’s equipment, materials, employees, and procedures for completion of the drilled shaft foundations in accordance with the requirements of the plans, specifications, and installation plan. Confirmation shafts may also be waived if approved in writing by the Engineer.

Unless otherwise approved by the Engineer, the confirmation shaft shall be the first drilled shaft foundation to be developed. The Engineer will specify the location of the confirmation shaft, unless shown on the plans. The confirmation shaft holes shall be completed in the same manner as other production shafts. The contractor shall revise its methods and equipment as necessary at any time during the construction of the confirmation shaft hole to satisfactorily complete the excavation. When the contractor fails to satisfactorily demonstrate the adequacy

of its methods, procedures, or equipment; or when unforeseen conditions require revision, such as the need for slurry; the installation plan shall be revised and the adjacent shaft shall be designated as the confirmation shaft for the revised installation plan, as approved by the Engineer.

When shown on the plans or when directed by the Engineer in writing, the reaming of bells or development of rock sockets at specified confirmation shaft holes shall be required to establish feasibility in specific soil strata.

609-3.03 Excavation:

The contractor shall perform all excavation required for the shafts, rock sockets, or belled footings, through any material encountered, to the dimensions and elevations shown on the plans or as directed by the Engineer. Unless otherwise shown on the plans, the maximum deviation from plumb shall be not more than 1.5 percent. The maximum permissible variation of the design center axis for both the borehole and rebar cage at the top shall be 5 percent of the shaft diameter, not to exceed 3 inches from its project plan location. The contractor shall determine plumbness by plumb lines in dry excavations and by Kelly bar position readings at 10-foot intervals in wet excavations, or as approved by the Engineer. The contractor shall provide the Engineer with the plumbness readings for each borehole to verify the plumbness requirements prior to concrete placement in the borehole. When bells or rock sockets are required, they shall be excavated so as to form a bearing area of the size and shape shown on the plans.

If suitable material is not encountered at the design tip elevation shown on the plans, the bottom of any excavated hole shall be lowered, at the direction of the Engineer. When the contractor is directed by the Engineer to excavate past the design tip elevation, the contractor shall be compensated for any additional excavation in accordance with the requirements of Subsection 109.04 of the specifications. The limits of additional excavation will be determined by the Engineer.

When the contractor accidentally excavates beyond the design tip elevation, the criteria are as follows:

(A) If suitable material was encountered due to over excavation, the contractor shall not be compensated for the additional excavation.

(B) If unsuitable material was encountered due to over excavation, the Engineer will direct the contractor to excavate past the unsuitable material; the contractor shall be compensated for the additional excavation in accordance with the requirements of Subsection 109.04 of the specifications.

The reinforcing steel cage and concrete shall not be placed in the shaft until the final excavated hole elevation has been established and the Engineer has approved the completed excavation. Modifications to the reinforcing steel cage shall be in accordance with the requirements of Subsection 609-3.06 of the specifications.

If caving conditions are encountered, no further drilling will be allowed until a construction method is employed that will prevent excessive caving and which is acceptable to the Engineer. If casing is proposed, the shell shall be clean and shall extend to the top of the drilled shaft excavation. The inside diameter of the casing shall not be less than the specified size of the shaft unless approved by the Engineer. The outside diameter of the shaft shall not exceed plan dimension by more than 6 inches unless use of telescoping casing or surface casing is allowed by the installation plan.

Adjacent shafts, unless separated by a minimum of four shaft diameters measured center to center, shall not be excavated until the concrete in the first shaft has been in place for a minimum of 48 hours.

Temporary surface casings may be used to aid shaft alignment and position, and to prevent sloughing of the top of the shaft excavation, if approved by the Engineer. Where temporary casing is used to stabilize excavations that include rock sockets, the temporary casing shall be 6 to 12 inches larger than the rock socket diameter and centered on the rock socket.

If the Engineer determines that the amount of caving is within acceptable limits and the contractor elects to drill under the same methods and procedures, the excavation shall be filled with concrete at no additional cost to the Department, regardless of the extent. Any excavation beyond the dimensions shown on the plans where casings are not used shall be filled with concrete at no additional cost to the Department.

If the use of drilling slurry is to be employed, either with or without the use of casing, the contractor shall use a method of construction which will allow completion of the drilled shaft in a continuous manner without any mixing of concrete and drilling slurry.

Material excavated from shafts and bells and not incorporated elsewhere on the project shall be disposed of by the contractor.

When the plans indicate drilled shafts are to be constructed within embankments, the embankments shall be constructed prior to drilling, except when approved otherwise by the Engineer.

After the completion of the drilled shaft excavation and prior to the placement of the reinforcing steel cage and concrete, all loose material shall be machine cleaned from the shaft. A flight auger or other equipment, as approved by the Engineer, shall be used for cleaning dry excavations where slurry or ground water is not present. Where slurry or ground water is present, the excavation shall be cleaned with a clean-out bucket or similar type of equipment, as approved by the Engineer.

After final removal of all loose material from the bottom of the excavated drill shaft hole, and prior to any concrete placement, the final shaft depths shall be measured with a weighted tape or other methods approved by the Engineer.

For all drilled shaft excavations in soils, the maximum depth of any sediment, loose, and/or disturbed material at any location at the base of the excavated hole shall not exceed 2 inches.

For wet or dry drilled shaft excavations in rock, the maximum depth of any sediment, loose and/or disturbed material at any location at the base of the excavated hole shall not exceed 1/2 inch for 50 percent of the excavated hole base area.

All open excavations shall be covered at the end of each shift in a manner approved by the Engineer.

609-3.04 Drilling Slurry:

(A) General Requirements:

The contractor is responsible to select, formulate, and implement the use of slurry to facilitate drilled shaft construction. Quality control procedures of the slurry implementation shall be detailed in the contractor's submitted installation plan. Only commercially prepared mineral slurries or polymer slurries shall be employed when slurry is used in the drilling process. Mineral slurry shall have both a mineral grain size that will remain in suspension and sufficient viscosity and gel characteristics to transport excavated material to a suitable screening system. For all slurries the percentage and specific gravity of the material used to make the suspension shall be sufficient to maintain the stability of the excavation and to allow proper concrete placement. During construction, the level of the slurry in the shaft excavation shall be maintained at a level of 5 feet or more above the highest expected piezometric pressure head along the depth of the shaft. Unless otherwise approved in advance by the Engineer, slurry shall be injected into the excavation immediately upon encountering ground water. No further excavation shall be completed until slurry has been introduced into the shaft. In the event of a sudden significant loss of slurry to the hole, the construction of that foundation shall be stopped until either a method to stop slurry loss or an alternative construction procedure has been approved by the Engineer.

The slurry shall be premixed thoroughly with clean, fresh water. Adequate time, as prescribed by the slurry manufacturer, shall be allotted for hydration prior to introduction into the shaft excavation. Slurry tanks of adequate capacity shall be required for slurry circulation, storage, and treatment. No excavated slurry pits shall be allowed instead of slurry tanks. No mixing of slurry shall be allowed in the drilled shaft excavation. Mineral slurry shall not stand for more than four hours in the excavation without agitation. If this is not possible, excavation sidewalls shall be cleaned to remove filter cake. Mineral slurry density shall be increased by adding barite only when sodium bentonite is the mineral.

Desanding equipment shall be provided by the contractor as necessary to control mineral slurry sand content. Desanding will not be required for setting casing. The contractor shall take all steps necessary to prevent the slurry from "setting up" in the shaft. Such methods may include agitation, circulation and/or adjusting the properties of the slurry. The contractor shall dispose of all mineral slurry off site at an approved disposal site.

(B) Slurry Inspection and Testing:

Quality control procedures for utilization of slurry shall be detailed in the contractor's submitted installation plan. The contractor shall have suitable apparatus available at the site capable of obtaining slurry samples at any depth within the drilled shaft excavation.

609-3.05 Integrity Testing:

(A) General:

Each drilled shaft foundation completed, unless otherwise noted on the project plans, shall be inspected by means of a cross-hole sonic logging (CSL) survey and a gamma-gamma logging (GGL) survey. The drilled shaft contractor shall furnish and install 2-inch (inside diameter) Schedule 80 PVC pipes for the surveys. The minimum number of PVC-pipe inspection tubes shall be equal to the diameter of the drilled shaft, measured in feet, and rounded-up to the next whole integer, but not less than four, or as specified in the plans. The inspection tubes shall be approximately evenly spaced around the inside circumference of the reinforcing steel cage, or as shown on the project plans. To account for any reinforcing cage stabilizing bars installed by the contractor, the maximum clearance from the reinforcing cage's stirrups to the test tube shall be no more than the size of the vertical reinforcement plus 1 inch. The pipes shall be joined to provide a clean, watertight, and unobstructed opening as specified in Subsection 609-3.05(B) of the specifications. If any damage to the tubes occurs during the installation they shall be repaired or replaced at no additional cost to the Department. If testing cannot be performed because of blockage of the tubes, the contractor shall core drill or otherwise determine the extent of any potential anomalies in the concrete, as approved by the Engineer, at no additional cost to the Department.

CSL and GGL testing shall be performed by a qualified subcontractor selected by the contractor and approved by the Engineer. The subcontractor shall provide the equipment meeting the minimum requirements listed herein, and shall have at least one year experience in CSL survey and GGL survey evaluation. The subcontractor performing the GGL shall provide proof that it is licensed to possess and use radioactive material in accordance with the Arizona Radiation Regulatory Agency. Recorded measurements shall be interpreted and the required reports shall be prepared and sealed by a licensed professional engineer, registered in the State of Arizona, with at least three years of experience in CSL survey and GGL survey evaluation. Resumes of proposed personnel shall be submitted to the Engineer for approval at least four weeks prior to commencement of work.

CSL tests shall be completed within two to four days after concrete placement and GGL tests shall be completed within two to seven days of concrete placement.

The CSL survey and the GGL survey requirements shall be as specified in Subsection 609-3.05(B) of the specifications. Inspection reports containing the acquired raw data, and evaluation reports, shall be provided as specified in Subsection 609-3.05(B) of the specifications. All reports shall be provided to the Engineer within three working days of test completion.

If the testing indicates the presence of anomalies, as defined herein, or the Engineer determines that construction defects may have occurred, the contractor shall conduct remedial testing and make repairs, as specified in Subsection 609-3.05(B)(6) of the specifications, at no additional cost to the Department.

Concrete volumetric charts shall be completed for each drilled shaft. A copy shall be delivered to the Engineer with the submittal of the inspection reports of the associated drilled shaft.

After the inspection of a shaft has been completed and the shaft accepted, all holes and test pipes in the shaft shall be filled with an approved grout.

(B) Testing Requirements:

(1) General:

The inspection tubes shall have a round, regular, internal diameter free of defects or obstructions, including at any pipe joints, in order to permit the free, unobstructed passage of source and receiver probes from top to bottom. The tubes shall be watertight and free from corrosion, with clean internal and external faces, to ensure passage of the probes and to ensure a good bond between the concrete and the tubes. Standard glue-on PVC couplings shall be used. No compression, rubber, or clamp fittings will be allowed. Care shall be taken during reinforcement installation operations to not damage the tubes or break the fasteners of the tubes. Before placement of concrete, pipes shall be checked to ensure they are free from blockages, bends, crimps or other impediments to the free passage of the testing probes.

Each pipe shall be fitted with a watertight shoe on the bottom and a removable cap on the top. The bottom cap of each tube shall be adequately secured such that it can withstand the hydrostatic pressure for the full depth of the shaft without water leakage. The pipes shall be securely attached to the reinforcement cage in a straight line, and in a regular, symmetrical pattern. The tubes shall be adequately secured to the reinforcing cage such that the tubes stay in position during placement of the rebar cage and concrete placement. At a minimum, the tubes shall be securely fastened to the inside of the reinforcing cage at least every 10 feet vertically. The tubes shall be as near to vertical and parallel as possible. The tubes shall extend from 1 inch above the bottom of the reinforcement cage to at least 4 feet above the shaft top, or approximately 2 feet above the top of the rebar cage if above the ground. Under no circumstance shall the tubes be allowed to rest on the bottom of the excavated hole. If the shaft top is below the ground surface, the tubes shall extend at least 2 feet above the ground surface. Joints shall not be allowed in the section(s) of tubes above ground. Any joints required to achieve full length tubes below ground shall be made watertight.

The tube tops shall be bare clean pipe with no pipe joints, level cut, and capped to keep debris out of the tubes. If the rebar cage extends above the top of the tubes, the circular or spiral tie-raps shall temporarily be cleared away from 1 foot below the tube top to approximately 3 feet above. After placement of the reinforcement cage, the tubes shall be filled with clean water as soon as possible, immediately before or within 1 hour after concrete placement. Care shall be

exercised in the removal of caps or plugs from the pipes after installation so as to not apply excess torque, hammering, or other stresses which could break the bond between the tubes and the concrete.

Before the start of testing, the contractor shall:

(a) Run a 1.5 inch diameter 6 foot long rigid cylinder through the complete length of each access tube to check for tube blockage.

(b) Clean the top of the shaft. The shaft top shall serve as the reference zero depth for all cross-hole sonic and gamma-gamma testing. Therefore, the shaft top must be level and, if mud covered, be cleaned before testing.

(c) Provide proper access to the shafts so that the testing subcontractor can park their logging equipment within 2 to 3 feet of each access tube.

(d) Provide any special safety equipment required.

(e) Make sure the access tubes extend to at least 4 feet from the top of the concrete, and are capped and filled with water all the way to the top.

(f) Make sure each access tube is bare (no pipe joints), clean (grind edges and concrete residue), level cut, and capped.

(g) Provide an independent and stable source of 110 Volt, 1000-Watt power.

(h) Using a permanent pen marker, mark each access tube with the shaft designation and tube number. For example, Pier 2 Shaft 3 Tube 4 shall be denoted as P2S3 T4. By definition, Tube 1 is the northernmost tube, with other tubes referenced in a clockwise direction from Tube 1.

The contractor shall also provide documentation that the testing equipment has been calibrated and is functioning properly.

Changes from the design conditions such as: test tube lengths, shaft diameter and the as-drilled tip elevation shall be noted in the report.

(2) Requirements for CSL Tests:

The minimum equipment requirements for CSL shall be as follows:

(a) The ultrasonic source and receiver probes shall be capable of producing records with good signal amplitude and energy through uniform, good quality concrete. The probes shall be of a diameter and have cabling such that they descend freely through the 2 inch internal diameter Schedule 80 PVC pipe for the full depth of the shafts shown on the plans. Probes shall allow a

generated or detected pulse within 6 inches of the bottom of the access tubes. The transmitter probe shall generate an ultrasonic pulse frequency not to exceed 40,000 Hz for drilled shafts 8 feet in diameter or less. For drilled shafts greater than 8 feet in diameter, the frequency to be used shall be determined by the manufacturer's equipment calibration guidelines and shall be approved by the Engineer prior to testing. The weight of each probe shall in all cases be sufficient to allow it to sink under its own weight in the access tubes. The probe housing shall be waterproof to at least 1.5 times the maximum depth of the testing. The receiver probe shall be of a similar size and compatible design to the transmitter probe, and be used to detect the arrival of the ultrasonic pulse generated by the transmitter probe.

(b) The depth of the probes shall be recordable with a measurement wheel or other suitable measuring device.

(c) The CSL equipment shall include a microprocessor-based system for analog to digital conversion and recording of data, for display of individual records, and for analysis of receiver responses and printing of logs.

(d) The CSL system shall have an appropriate filter for amplification of data and cable systems.

(e) Synchronized triggering of the recording system with the ultrasonic pulse shall be a feature of the CSL system.

(f) The system shall be able to indicate zero depth at the shaft top and not at the bottom of access tubes. In addition, the system shall be able to log both from the top of the shaft to the bottom as well as from the bottom to the top.

(3) Testing Procedure Requirements for CSL Tests:

The minimum testing procedure requirements for CSL logging shall be as follows:

(a) Preparation of the tubes for CSL Tests:

All inspection tubes shall be filled with water prior to testing. During testing, the water level in any tube shall not drop below the top of the tube that is being tested.

(b) CSL Procedure:

Information on the shaft bottom and top elevations, tube lengths and position, along with construction dates, shall be provided by the contractor to the CSL logging subcontractor prior to the logging being performed.

All possible tube pairs shall be tested. The tests shall be carried out with the source and receiver probes in the same horizontal plane unless test results indicate potential defects, in

which case the questionable zone shall be further evaluated with angled tests (source and receiver vertically offset in the tubes).

The electronic circuit shall be thoroughly checked. The choice of time base will be such that the "zero signal" and first arrival time are 2 to 3 divisions apart on the horizontal axis. Amplitude shall be such that the signal fills 2/3 to 3/4 of the screen vertically.

Once the slack is taken up out of the cables to provide accurate depth measurements of the logs, the probes shall be pulled simultaneously and uniformly from the bottom of the tubes over the depth wheel or other measuring device. All slack shall be taken out of the cables before the analyzer is switched on. The rate of ascent shall be the rate recommended by the equipment manufacturer. The cross-hole sonic measurements shall be taken at 2-inch intervals or less from the bottom to top of shaft.

(c) Anomaly Identification:

Anomalies in a drilled shaft shall be determined by evaluating the pulse arrival times and amplitude/energy signals. Zones where the measured sonic velocity reduction is 10 percent greater than the local mean measured sonic velocity within a 5-foot interval above and below the suspected anomalous zone shall be reported to the Engineer. In situations where a 5-foot interval is not available above and/or below the suspected anomalous zone, the local mean sonic velocity shall be measured to the top of the shaft or the bottom of the inspection tubes. Further investigations to evaluate the extent of such anomalies may be required by the Engineer, and shall be in accordance with the requirements specified in Subsection 609-3.05(C) of the specifications.

(d) CSL Results:

A report showing the results of the completed CSL survey shall be submitted to the Engineer for each drilled shaft foundation within three working days of completion of testing. The Engineer will review the report within three working days of the contractor's submittal. The report shall include:

(i) Dates of shaft construction; shaft diameters; shaft lengths; shaft tip elevations; shaft cutoff elevations; type and size of drilling equipment; type of slurry if used; description of concrete mix; concrete placement method; shaft layout with shaft numbers.

(ii) Dates of logging; brief description of the testing equipment; identification of shaft logged; location of obstructions in PVC tubes; location of PVC couplers; calibration date, data and plot; summary of any unusual occurrences during testing; description and explanation of adjustments made to instrumentation or data (if any); identification of anomalies using the criteria described herein; delineation of affected tubes; vertical location

and extent of anomalies; and estimated percentage of anomalous cross-sectional area.

(iii) The cross-hole sonic logs expressing the results in terms of velocity and pulse amplitude/energy versus depth. The cross-hole sonic logs shall be presented for each tube pair with all anomalous zones indicated on the logs.

(iv) Analyses of the initial pulse arrival time versus depth, velocity versus depth, and pulse amplitude/energy versus depth.

(v) Appropriate discussion of the results in the text of the report shall be included.

(vi) Tomography of anomalous zones.

(4) Requirements for GGL Tests:

The minimum equipment requirements for GGL shall be as follows:

(a) The gamma-gamma probe shall consist of a rigid cylinder containing a gamma particle emitting source and a gamma particle detector. The probe shall be suspended by a cable of sufficient design and length that it is safely capable of raising and lowering the gamma-gamma probe within a 2-inch internal diameter Schedule 80 PVC inspection pipe to the desired test depths.

(b) The cables affixed to the probe shall be of sufficient strength and durability to raise and lower the probe safely and at a controlled rate of speed. A winch mechanism shall be such that it does not damage the cables or compromise data collected in the test. A means of determining and recording probe depth shall be provided.

(c) The gamma particle emitting source shall be Cesium-137 in a sealed source form.

(d) The gamma-gamma probe detector shall consist of a proven method of gamma detection, such as Geiger Mueller or scintillation-based counters.

(e) The detector shall be connected to a readout device that is capable of displaying or recording counts, densities, and sampling duration or probe speed.

(f) The gamma-gamma probe shall possess a minimum density precision of 1.0 pounds per cubic foot.

(g) The gamma-gamma probe shall have a minimum radius of detection of 4.0 inches in concrete with density between 140 and 160 pounds per cubic foot. The probe shall have the capability of varying the radius of detection up to 7 inches in concrete with density between 140 and 160 pounds per cubic foot. The radius of detection is defined as one half of the center to center distance between the source and the detector. The actual radius of detection used in the test shall be subject to the approval by the Engineer.

(h) Prior to using GGL, the contractor shall provide the Engineer with the calibration of the gamma-gamma probe and readout unit to correlate count rate and concrete density. The calibration shall not be more than one year old, and shall be performed using the same source and detector combination as that proposed for the GGL testing on the project. Furthermore, the calibration shall have been conducted in an environment (e.g., water-filled, Schedule 80 PVC pipes) similar to the shafts being tested for the project. GGL shall not be performed until the Engineer has approved the calibration records. Upon approval, the contractor shall perform the gamma-gamma tests exactly in the manner as the calibration of the probe and readout unit was performed.

(5) Testing Procedure Requirements for GGL Tests:

The minimum testing procedure requirements for GGL shall be as follows:

(a) Preparation of GGL Access Tubes:

A GGL survey may be performed by an experienced subcontractor using inspection tubes completely filled with water only if the gamma-gamma probe has been calibrated in concrete calibration samples that contained inspection tubes filled with water, and the radius of detection and density precision calibration have been performed under water and found to be within the prescribed limits. In the event of gamma-gamma testing in water filled tubes, the water level during testing in any tube shall not drop below the top of the tube.

(b) GGL Procedure:

Information on the shaft bottom and top elevations, tube lengths and position, along with construction dates shall be provided by the contractor to the GGL subcontractor prior to the logging being performed.

The test shall be started by lowering the probe to the bottom of the access tube. When extracting the probe, the readings shall be taken at depth intervals not exceeding 1.5 inches and within the density precision of 1.0 pounds per cubic foot. The probe shall be extracted at a rate of between 8 to 10 feet per minute, and recorded.

To evaluate the repeatability of the GGL tests, the contractor shall perform one repeat log for each shaft in which GGL tests have been performed. After all the tubes in a given shaft have been GGL tested, the repeat log shall be performed in the first tube that was tested.

(c) GGL Data Analysis:

The following steps shall be used in the analysis of the GGL data:

(i) Apply the approved calibration parameters from the concrete calibration samples to the raw count readings and obtain bulk concrete densities. Verify that the data set contains no logging errors, duplicated data or skipped data points.

(ii) Determine the arithmetic mean of a set of bulk densities and record it on each log. A set shall consist of data collected from a single inspection pipe, using the same equipment, within the same time period. Data that shall not be included in the calculation of the mean density are: (1) repetitive data points collected at a single depth, (2) data collected at the top of the drilled shaft where the reading(s) were influenced by the gamma detector component exiting the shaft concrete, (3) data collected in the access tube above the top of the drilled shaft, (4) data affected by the anomalous zones of concrete, and (5) data that cause the population distribution to be statistically non-normal.

(iii) In the event that a known difference in the steel reinforcement layout (e.g., splices using overlapping bars) exists in a segment of a drilled shaft that affects the apparent mean, a separate mean shall be generated and utilized as the mean for that portion of the data.

(iv) Subtract the mean from each data point in the set to obtain a data set that reflects the variation from the mean.

(v) Repeat the above steps for all inspection tubes contained within an individual shaft and plot and present that data as (1) a single plot from all tubes, and (2) an individual plot for each tube.

(d) GGL Standard Deviation Analysis:

The following steps shall be used in the standard deviation analysis of the GGL data:

(i) Determine the standard deviation (SD) of a compilation of bulk densities. A compilation shall consist of data collected from the test drilled shaft using the same equipment, within the same time period. Data that shall not be included in the calculation of the mean density are: (1) repetitive data points collected at a single depth, (2) data collected at the top of the drilled shaft where the reading(s) were influenced by the gamma detector

component exiting the shaft concrete, (3) data collected in the access tube above the top of the drilled shaft, (4) data affected by the anomalous zones of concrete, and (5) data that cause the population distribution to be statistically non-normal.

(ii) The SD value that is used in step 3 shall be between 2.5 and 3.75 pounds per cubic foot. If the calculated value is below 2.5 pounds per cubic foot, then 2.5 pounds per cubic foot shall be used in step 3. If the calculated value is above 3.75 pounds per cubic foot, then 3.75 pounds per cubic foot shall be used in step 3.

(iii) Multiply the value obtained for SD from the above step by -2.0 and -3.0 to obtain values of “Minus Two Standard Deviations” (-2SD) and “Minus Three Standard Deviations” (-3SD), respectively.

(e) Anomaly Identification:

Anomalies in a drilled shaft shall be determined by evaluating the data points developed by the above processes to the -3SD deviation criterion as follows:

(i) In a single inspection tube over any 0.5 foot or greater depth interval, all of the density readings have a value less than the determined value for -3SD.

(ii) In the same inspection tube identified anomalous by the above step, any data point that falls below the value for -3SD within a 1 foot vertical extent immediately above or below, then that depth shall be considered as anomalous in addition to the depth identified in the previous step.

(iii) In all inspection tubes adjacent to inspection tubes already identified as anomalous, if at least one data point within 2 feet vertically above or below the adjacent tube anomaly falls below the value for the -3SD, then the depth in that tube at which the anomaly is found is also anomalous, in addition to the depths identified in the previous two steps.

For the 3 steps above, if the data point falls within an interval of 1-foot or 2 feet from the top or bottom; the interval above shall be to the top of the shaft and the interval below shall be to the bottom of the test tubes.

(f) GGL Results:

A report showing the results of the completed GGL survey shall be submitted to the Engineer for each drilled shaft foundation within three working days of completion of testing. The Engineer shall review the reports within three working days of the contractor’s submittal. The report shall include:

(i) Dates of shaft construction; shaft diameters; shaft lengths; shaft tip elevations; shaft cutoff elevations; type and size of drilling equipment; type of slurry if used; description of concrete mix; concrete placement method; shaft layout with shaft numbers.

(ii) Dates of logging; brief description of the testing equipment; identification number of shafts logged; location of obstructions in PVC tubes; location of PVC couplers; calibration date, data and plot; summary of any unusual occurrences during testing; description and explanation of adjustments made to instrumentation or data (if any); identification of anomalies using the criteria described herein; delineation of affected tubes; vertical location and extent of anomalies; and estimated percentage of anomalous cross-sectional area.

(iii) Plots of each individual tube with the data points and the values of -2SD and -3SD. The plots shall indicate these points and values at all depths. Utilize symbols or line formats that permit lines corresponding to -2SD and -3SD to be distinguishable from data points.

(iv) Appropriate discussion of the results in the text of the report shall be included.

In all inspection tubes adjacent to inspection tubes already identified as anomalous, if at least one data point within 2 feet vertically above or below the adjacent tube anomaly falls below the value for the -3SD, then the depth in that tube at which the anomaly is found is also anomalous, in addition to the depths identified in the previous two steps.

(C) Procedures in Case of Anomaly Detection:

If the testing indicates the presence of anomalous zones, as identified by either the CSL or GGL tests in the drilled shaft foundation, the contractor shall conduct three-dimensional tomographic surveys based on CSL results of the anomalies, at no additional cost to the Department. The results of the tomographic surveys shall be presented in the form of concrete velocity images in two-dimensions (2-D) between each pair of tubes, and in three-dimensions (3-D) for the anomalous zone.

After reviewing the results of the CSL, GGL, and the tomographic surveys, the Engineer will make an assessment of the possibility of defects, considering the impact on design and serviceability. The Engineer will either determine that no further action is required and the drilled shaft is accepted, or that further action by the contractor is required.

If the Engineer determines that further action is required to identify any possible defects in the anomalous zones, the Engineer will direct the contractor to proceed with an excavation investigation if the location of the anomaly can be reached using hand or mechanical excavation. If the Engineer determines that due to the location of the anomalies an excavation

investigation is not feasible, the Engineer will direct the contractor to proceed with a concrete coring investigation or other investigative methods.

The selected investigation shall conform to the following requirements:

(1) Excavation Investigation:

The contractor shall submit an excavation investigation plan to the Engineer for review and approval in order to determine if any defects exist in the anomalous zones. The excavation investigation plan shall include equipment and methods to be used for excavation and concrete removal, the location of the excavation in the vicinity of the designated testing tubes, and provisions for replacement of earthen materials disturbed by excavation. If needed, the excavation investigation plan shall also include a shoring or confined space plan.

The excavation shall extend to a depth of 1-foot below the identified anomaly. After excavation and exposure of the anomaly, all visually deleterious or questionable material shall be removed. Mechanical tools shall be used to remove all inclusions or compromised concrete until competent concrete is encountered.

If the surface of the drilled shafts shows competent concrete, a small section in the center of the identified anomaly shall be removed to a minimum depth of one inch to demonstrate that the concrete surface is consistent with the concrete one inch into the drilled shaft surface.

If the visual inspection is inconclusive, a minimum 3 inch inside diameter core sample shall be obtained from the anomalous zone for either an additional visual inspection or a cylinder strength test. The depth of the core sample shall not exceed 10 feet below the top of the drill shaft. The core shall extend to 12 inches beyond the anomalous zones or as directed by the Engineer.

If the visual inspection or the results of the compressive strength testing indicate the concrete is not acceptable, all of the unacceptable concrete shall be removed and replaced to the limits determined by the Engineer.

(2) Concrete Coring Investigation:

The contractor shall submit a concrete coring investigation plan to the Engineer for review and approval in order to determine if any defects exist in the anomalous zones. The concrete coring investigation plan shall include the following information:

(a) Whether the contractor or a subcontractor will be performing the coring.

(b) The contractor or the subcontractor’s relative experience in successfully coring concrete drilled shafts on a minimum of 3 projects.

(c) The concrete coring method and equipment to be used to drill and remove cores from the drilled shaft concrete.

A hole with a minimum size N-series core shall be advanced from the top of the shaft down to 12 inches below the anomaly. Anomalies detected at depth of less than 25 feet the contractor may elect to use common coring methods. For anomalies detected at depths below 25 feet, a wire-line coring method will be required starting from the top of the shaft to the location of the anomaly as described herein. Care should be taken when coring in order to use the core to assess the quality or compressive strength of the concrete. Cores shall be logged and labeled for use in assessing the required repairs.

Coring shall not begin until the concrete coring investigation plan has been approved by the Engineer.

The number, locations, diameter and depth of the core holes and lengths of individual core runs will be determined by the Engineer. The coring procedure shall avoid damage to the reinforcing steel.

(D) Procedures Post Anomaly Investigation:

After the contractor has performed the work in accordance with the approved investigation plan, and the results indicate that no defects exist in the anomalous zones, the contractor will be compensated for all the work performed under the approved investigation plan in accordance with the requirements specified in Subsection 104.02 of the specifications.

If the Engineer determines that defects exist in the anomalous zones, the contractor shall repair the defects per the requirements of Subsection 609-3.05(E) of the specifications.

(E) Procedures in Case of Defects:

A defect includes any voids, discontinuity, deficient concrete strength, inclusion or crack within the drilled shaft concrete that, in the opinion of the Engineer, requires further investigation, whether or not it is subsequently determined to represent an inadequate or unsafe condition for the completed drilled shaft.

Should the Engineer determine that the anomalous zones reveal defects; the contractor shall submit a plan to repair, replace, or supplement the defective work in a format conforming to the template example forms and mitigation plans found in FHWA-NHI 18-024 Drilled Shafts: Construction Procedures and Design Methods, Geotechnical Engineering Circular No. 10; Appendix F, Drilled Shaft Acceptance: Example Forms and Mitigation Plans and in a manner approved by the Engineer. After review and acceptance by the Engineer, the contractor shall perform the work specified in the approved plan at no additional cost to the Department. The work described herein shall be performed by a contractor or subcontractor that has performed a similar procedure on a minimum of 3 projects.

609-3.06 Reinforcing Steel, Cage, Construction, and Placement:

The reinforcing steel cage for the drilled shaft, consisting of longitudinal bars and spiral hooping or lateral ties shall be completely assembled and placed into the shaft as a unit. All reinforcing steel intersections shall be tied as specified herein. The reinforcing steel unit shall be placed in the shaft no sooner than two hours prior to the start of concreting operations, and shall be placed in accordance with the details shown on the plans.

If approved by the Engineer, bundling of vertical or horizontal reinforcing steel may be allowed if necessary to maintain a minimum bar spacing equal to five times the maximum nominal aggregate size of the concrete. Bundling of spiral reinforcing will not be allowed. A maximum of three bars may be bundled. Bundled vertical or horizontal steel shall be spaced uniformly. The contractor shall also make the necessary modifications, in accordance with the appropriate ACI specifications, to the splicing and tying details for the reinforcing steel, and submit these to the Engineer for approval along with the contractor's request for bundling of steel.

The reinforcing cage shall be adequately supported and anchored from the top to prevent movement from the required location during and for four hours after completion of concrete placement. If temporary casing is used, the reinforcing cage shall be supported prior to removing casing, and for four hours following removal of the casing. The rebar cage shall be kept plumb. The rebar cage shall not rest directly on the bottom of the excavation.

The minimum number of spacers shall be equal to the diameter of the drilled shaft, measured in feet, and rounded-up to the next whole integer, but not less than four. The spacers shall be approximately even spaced along the outside circumference of the reinforcing steel cage. Spacers shall be placed at a maximum vertical spacing of 15 feet. For all drilled shafts, unless otherwise shown on the plans for pedestrian bridges or light pole and sign post foundations, the spacers shall provide for a minimum of 6 inches of concrete cover between the reinforcing steel and the excavation wall. Only smooth plastic roller spacers, with a minimum width of 1-1/2 inches approved by the Engineer will be allowed. Rollers shall be installed per the manufacturer’s recommendations. In no case shall “dobies”, other rectangular “blocks” or bent rebar tied to the reinforcing steel be used in the excavations.

If the shaft is lengthened by 24 inches or less under any circumstances, the reinforcement and test tubes shall not be extended.

If the shaft is lengthened by more than 24 inches per the direction of the Engineer, the reinforcement and test tubes shall be extended. The Engineer will provide details for the additional reinforcing. Such additional reinforcing will be paid for in accordance with the requirements of Subsection 109.04 of the specifications.

If the shaft is lengthened by more than 24 inches due to over-excavation, the reinforcement and test tubes shall be extended at no additional cost to the Department. The contractor shall submit details for the additional reinforcing to the Engineer for review and approval.

The contractor shall submit a written request to the Engineer for approval of any variation from the splices for reinforcing steel specified in the contract documents.

All reinforcing cages shall be fabricated and supported to avoid damage during the lifting and placing. Any temporary bracing and supports shall be removed prior to final placement. Equipment used for lifting reinforcing cages shall have adequate capacity and boom length to lift the cage clear of the ground. Reinforcing cages shall not be dragged while being moved. Reinforcing cages shall be placed with splices in the lowest possible position within the excavation.

609-3.07 Concrete Placement:

(A) General:

The contractor shall begin placement of concrete within 24 hours after the completion of the drilled shaft excavation. All concrete shall be placed in accordance with Section 601 of the specifications and as specified herein. If slurry excavation is used, concrete shall be placed the same day the excavation is completed.

Prior to concrete placement, the contractor shall make all necessary arrangements to assure the uninterrupted delivery of concrete so that all drilled shaft foundations will be constructed without cold joints.

The Elapsed time for slump loss refers to the duration between the initial mixing of concrete and the point at which the concrete's workability reaches the minimum slump requirements per Subsection 609-2.01(D).

The concrete placement duration refers to an estimate of the entire duration required to fill the drill shaft with concrete. The concrete placement duration shall begin at the initial mixing of the concrete and extend through to the completion of placement of the concrete in the drilled shaft, including removal of any temporary casing that may cause the concrete to flow into the space previously occupied by the casing and transit time.

The concrete placement duration, shall not exceed the elapsed time. If the concrete placement duration exceeds the elapsed time, the Engineer shall be promptly notified and the placement of the drill shaft shall continue to completion. Appropriate measures shall be taken to rectify the situation if needed. The Engineer may determine the need for further action or remedial work. Remedial measures and any additional work required shall be at no additional cost to the Department.

Tremie downpipes and pump pipes shall be made of steel; no aluminum shall be allowed. The inside diameter of the tremie pipe shall be at least 10 inches for all drilled shafts 4 feet or greater in diameter. The inside diameter of the pump pipe shall be at least 5 inches.

(B) Placement in Dry Excavations:

For placement in dry excavations, concrete may be placed by free fall except in fragile, non-cohesive soils where bottom scour is likely to occur, or where other caving conditions exist. The contractor shall prevent concrete from striking either the reinforcing cage or excavation side walls during free fall. Where free fall cannot be used, concrete shall be placed through a suitable clean downpipe.

Concrete vibration for the full height of the shaft is not necessary to achieve proper consolidation of the concrete. However, the shafts shall be vibrated in the top 10 feet. If temporary casing is used, the vibration shall occur after the casing has been removed.

To be considered a dry shaft, the maximum depth of water in the bottom of a drilled shaft excavation at the time of concrete placement shall be no more than 3 inches.

(C) Placement under Slurry or Water:

Concrete shall be placed by tremie methods or by pumping. Care shall be taken to ensure that all the fluid and suspended solids are expelled from the excavation during concrete placement. If concrete is placed by pumping, it shall be in accordance with the requirements of Subsection 601-3.03(C) of the specifications.

The contractor’s installation plan shall demonstrate the procedures used to determine when the tremie pipe is to be raised during concrete placement. The procedure shall assure that the opening of the tremie pipe will be deeper than 5 feet below the surface of the concrete at all times for shaft diameters less than 6 feet, and deeper than 10 feet below the surface of the concrete for shaft diameters 6 feet and larger. A rapid raising or lowering of the tremie will not be permitted.

In order to prevent contamination of concrete placed initially, the lower end of the pump or tremie pipe shall be provided with either a valve, sealable cap, or a plug ("pig"). The discharge end shall be placed at the bottom of the excavation prior to commencement of concrete placement. If a plug is used, it shall be inserted at the top after the pipe has been set in place. Concrete shall then be placed by pushing the plug ahead, separating the concrete from the drilling fluid. Only when the tremie pipe is completely filled shall the open end be lifted off the bottom. The concrete flow that comes to the top of the shaft shall be displaced out of the shaft excavation in a continuous flow until clean, fresh concrete is expelled.

Slurry ejected during concrete placement may be reused provided that it is screened to remove gravel chips or other granular materials, and providing the slurry meets acceptance criteria. Slurry to be discarded shall be disposed of in a manner approved by the Engineer.

Concrete placed under slurry or water shall not be vibrated, except that the top 5 feet of the shaft shall be vibrated after the slurry or water and contaminated concrete have been totally expelled from the shaft. If temporary casing is used, the vibration shall occur after the casing has been removed.

609-3.08 Casing Removal:

During removal of any casing, a sufficient head of not less than 10 feet of fluid concrete in the tremie pipe shall be maintained above the level of concrete in the shaft (outside the tremie pipe), except at the top of the shaft. All contaminated concrete shall be removed from the shaft. Temporary casings shall be removed while the concrete slump is a minimum of 4 inches. The contractor shall maintain a minimum 5-foot head of concrete for shaft diameters of less than 6 feet, and a minimum 10-foot head of concrete for shaft diameters 6 feet or greater, in the casing as it is being removed. Movement of the casing by exerting upward pressure and tapping to facilitate extraction, or extraction with a vibratory hammer will be permitted. Casing extraction shall be at a slow, uniform rate with the force in-line with the shaft axis. The removal method shall prevent the intrusion of water, grout, and soil into the excavation, displacement of the reinforcing steel, and lifting of the concrete.

Due care shall be exercised to prevent upward movement of the shaft concrete and reinforcing steel during casing extraction. Upward movement beyond 1 inch, excluding movement due solely to tension on the top anchoring system, may indicate serious concrete separation or necking problems at the bottom of the casing. The contractor shall be responsible for corrective action which may include leaving the casing in place and compensating for the loss of frictional capacity in the resulting cased zone.

609-4 Method of Measurement:

Drilled shafts will be measured to the nearest linear foot from the top elevation of the shaft to the top elevation of the rock socket stratum, if required, or to the actual bottom of the shaft, as shown on the plans, or as determined in the field by the Engineer.

Rock sockets, when specified, will be measured to the nearest linear foot from the top elevation of the rock socket stratum to the actual bottom of the shaft, as shown on the plans, or as determined in the field by the Engineer.

Bell sections will be measured by the unit for each type of foundation constructed.

609-5 Basis of Payment:

The accepted quantities of drilled shafts and rock sockets, measured as provided above, will be paid for at the contract unit price per lineal foot for the diameter designated in the bidding schedule, complete in place. Price shall include excavation and disposal of spoils; drilling slurry; metal casing; steel reinforcing; Portland cement concrete; any needed forming, curing and finishing; exposing of concrete and the subsequent repair of foundations; furnishing all materials, equipment, and labor for splicing of reinforcing steel; all labor, conduit, and equipment for CSL and GGL; and all required testing and test reports.

No additional payment will be made for metal casing that is to remain in place.

No additional payment will be made for confirmation shafts, as the costs are considered to be included in the cost of constructing the drilled shaft foundation.

Payment for belled sections will be at the contract unit price for each type of foundation constructed, including excavation and concrete beyond the diameter of the shaft.

Obstructions will be defined as either material or objects of excessive dimension, which were not recorded in the geotechnical and foundation report, either in the text or boring logs. Payment for obstructions will be made in accordance with the provisions of Subsection 109.04 of the specifications.

SECTION 609 - DRILLED SHAFT FOUNDATIONS:

609-3.03 Excavation: of the Standard Specifications is modified to add:

The bottom of the drilled shafts shall be cleaned by at least two passes of a "spin-bottom" bucket cleaner immediately (no more than two hours) prior to placement of the reinforcement cage and concrete. A minimum of 50 percent of the base area shall have less than 0.5 inches of loose material after cleaning and a maximum depth not to exceed 1.5 inches. The depth of loose material can be inspected through the use of a sounding rod, weighted tape, or downhole viewing device.

The portion of the drilled shafts in rock shall be prepared following drilling by replacing the outer cutting teeth of the auger tool with a roughening tool that extends approximately 1.7 inches beyond the edge of the auger. Grooves shall be cut by spinning the auger tool on a 6-inch vertical spacing for the entire depth of rock socket.

The Engineer will collect a 2,000 grams sample from the drilled shaft excavation for each ten feet of shaft drilled.

(701FLGSV, 03/20/25)

SECTION 701 MAINTENANCE AND PROTECTION OF TRAFFIC:

701-3.13 Flagging Services: of the Standard Specifications is revised to read:

Flagging services shall consist of 1) Department of Public Safety (DPS) officers with agency vehicles, 2) local enforcement officers with agency vehicles, 3) local enforcement officers without agency vehicles, and 4) civilian flaggers. Local enforcement officers and DPS officers include those who meet the requirements of a Peace Officer under ARS Title 38, generally including anyone certified by the Arizona Peace Officer and Training Board. If available, DPS officers shall be used on Interstate Highways and Urban Freeways. Local enforcement officers will include uniformed officers from local police, tribal police, sheriff departments, or any other agencies that meet the requirements of a Peace Officer under ARS Title 38, generally including

anyone certified by the Arizona Peace Officer and Training Board. An agency vehicle is defined as an agency-issued vehicle that meets the requirements of ARS Title 28. If local enforcement officers do not have access to an agency vehicle, a personal vehicle may be used, but it shall have a make and model similar in appearance of an agency vehicle, and shall be equipped with front and rear-facing red and blue lights. The personal vehicle, when applicable, shall be presented to the Engineer for acceptability prior to its use on the project by local enforcement officers. Approval of the personal vehicle will be at the sole discretion of the Engineer.

The contractor shall be responsible to procure DPS officers, local enforcement officers, and civilian flaggers. The Engineer will determine the types and the number of hours of flaggers as needed based on the project needs. Quantities shown on the traffic control plans and/or bidding schedule are approximate only and prepared for bidding purposes. When procuring DPS officers and local enforcement officers, the contractor shall contact the relevant agency at least two days, excluding weekends and holidays, before flagging services will be required. Such contact must be made between the hours of 7:00 A.M. and 5:00 P.M. (M.S.T.).

In the event that local enforcement officers or DPS officers are temporarily unable to provide flagging services, the contractor shall ensure that traffic control is maintained and all personnel are protected, either by providing civilian flaggers or through other means as approved by the Engineer. No adjustments to the contract will be allowed for any delays resulting from the unavailability of local enforcement officers or DPS officers.

Local enforcement and DPS officers shall not work more than 12 consecutive hour work shift without the permission of the State Construction Engineer unless an emergency situation exists which, in the opinion of the Engineer, requires that the officer remain in the capacity of a flagger.

The contractor shall furnish verification to the Engineer that all civilian flaggers have completed a recognized training and certification program. Flaggers certified by the American Traffic Safety Services Association (A.T.S.S.A.) or by the National Safety Council will be acceptable. Certification through other programs offering flagger training may be allowed upon by the State Construction Engineer's approval. Flagger certification must be current and updated at least once every four years.

701-6.07 Pilot Services, and Flagging Services: of the Standard Specifications is revised to read:

The accepted quantities of pilot vehicles, measured as provided above, will be paid for at the unit bid price for pilot vehicles with driver, which price shall be full compensation for the work, complete in place including, but not limited to, furnishing and maintaining the vehicle and furnishing the driver. Any hour worked after the eight hour regular time will be considered straight-time and will not be paid as overtime pay.

The accepted quantities of flagging services provided by the local enforcement officers (with agency vehicle), DPS officers, and civilian flaggers, measured as provided above, will be paid for at the contract unit price, which price shall be full compensation for the work, complete in

place, including the agency vehicle. Any hour worked after the eight hour regular time will be considered straight-time and will not be paid as overtime pay.

The accepted quantities of flagging services provided by the local enforcement officers without an agency vehicle, measured as provided above, will be paid for at the contract unit price, which price shall be full compensation for the work complete in place. Any hour worked after the eight hour regular time will be considered straight-time and will not be paid as overtime pay. No measurement or payment will be paid for the vehicle, regardless of the type of vehicle is an agency vehicle or not, the cost being considered as included in the price of the contract item.

In addition, the Department has estimated an additional two hours of travel time per officer per day in the quantities shown in the bid schedule. However, if more than two hours of travel time per day is required, such additional hours will be compensated in accordance with the requirements of Subsection 104.02 of the specifications if approved by the State Construction Engineer. Travel time is considered to be supplementary to the hours worked by the officer during a work shift.

(703DTRMKR, 07/21/22)

SECTION 703 DELINEATORS AND MARKERS:

703-2.10 Flexible Delineator Posts: the fourth paragraph of the Standard Specifications is revised to read:

The flexible delineator posts shall be pigmented throughout the entire cross- section (or entire cross-section of the outer layer of multi-layered, multi-material units) so as to produce a uniform color which is an integral part of the material. The posts shall exhibit negligible color fading after 1,000 hours of Xenon Arc Exposure (ASTM G155). The posts shall be made of durable, ultraviolet-resistant, impact-resistant, non-warping, non-metallic, polymeric materials designed for a minimum of 120 months of outdoor service life.

(709PGMNT, 08/18/22)

SECTION 709 DUAL COMPONENT PAVEMENT MARKINGS:

709-2.02(A) Composition: of the Standard Specifications is revised to read:

The epoxy resin material shall be within the following compositional requirements:

Component	Percent by Weight	
	White	Yellow
White Pigment (Titanium Dioxide)	18 - 25	10 - 17
Organic Yellow Pigment	---	7 - 10
Epoxy Resin	75 - 82	73 - 83

The white pigmented pavement marking material shall be tested in accordance with ASTM D3723 and shall conform to the requirements specified in ASTM D476 (Type II).

709-2.02(K) Color: of the Standard Specifications is revised to read:

The colors of the applied markings shall comply with the requirements specified in ASTM D6628 and shall conform to the following:

The white color shall match Federal Test Standard Number 595B, color chip no. 37875; and

The yellow color shall match Federal Test Standard Number 595B, color chip no. 33583.

709-2.02(L) Yellowness Index: of the Standard Specifications is revised to read:

The initial yellowness index value of the white material shall be tested in accordance with ASTM E313. The sample shall be cured for 72 hours at room temperature (75 $\pm$ 2 degrees F) prior to testing. The initial yellowness index shall not exceed a value of 8.

The yellowness index value of the white material shall be tested in accordance with ASTM E313 and ASTM G154. The sample shall be cured for 72 hours at room temperature (75 $\pm$ 2 degrees F) and then exposed in the QUV chamber for 72 hours and 500 hours respectively. The yellowness index values shall not exceed the values shown in the table below.

Exposure Time (hours)	Yellowness Index
72	15
500	27

(710SWZ, 05/20/2021)

SECTION 710 SMART WORK ZONE SYSTEMS: the title and text of the Standard Specifications is revised to read:

SECTION 710 SMART WORK ZONE SYSTEM:

710-1 Description:

The work under this section shall consist of furnishing and installing a fully functional, automated, and portable Smart Work Zone (SWZ) system; operating, maintaining, and servicing the portable SWZ system; and relocating and removing various components of the system, as specified herein and in accordance with the project plans and specifications.

710-1.01 Abbreviations:

Wherever the following abbreviations are used in these specifications, the contract, or in other contract documents, they are to be construed the same as the respective expressions represented:

CCTV	Closed-Circuit Television
CMB	Changeable Message Board
DMS	Dynamic Message Sign
DLMS	Dynamic Lane Merge Subsystem
FMS	Freeway Management System
GPS	Global Positioning System
GPSLS	Global Positioning System Location Sensor
GUI	Graphical User Interface
O&M	Operations and Maintenance
PDA	Power Distribution Assembly
PTZ	Pan, Tilt, and Zoom
QWS	Queue Warning Subsystem
SAB	Smart Arrow Board
SFS	Speed Feedback Sign
SWZ	Smart Work Zone
TCP	Traffic Control Plan
TDC	Traffic Data Collection
TDCS	Traffic Data Collection Subsystem
TEES	Truck Entry/Exit Subsystem
TMCS	Traffic Monitoring Camera Subsystem
TOC	Traffic Operations Center
TTS	Travel Time Subsystem
VSL	Variable Speed Limit
VSLS	Variable Speed Limit Sign
WZDx	Work Zone Data Exchange

710-1.02 Definitions:

Wherever the following definitions are used in these specifications, the contract, or in other contract documents, the intent and meaning shall be interpreted as follows:

(A) SWZ System:

The SWZ system is a broad range of portable communications-based information and electronic technologies placed in and around work zones to enhance transportation and improve safety and mobility. The real-time information and automation provided by the SWZ system is used by contractors and transportation agencies to alter traffic control strategies and provide traveler information to better inform motorists of upcoming traffic conditions, allow motorists the opportunity to alter their travel routes, and/or modify the travel behavior within

work zones. The SWZ system is comprised of one or multiple SWZ subsystems that operate together.

(B) SWZ Area:

The SWZ area is the area where SWZ field devices are deployed near, within, and/or around the project and work zone limits.

(C) Active Work Space:

The active work space is the area that is anticipated to have the largest concentration of field personnel within the work zone during a specific day or construction shift. The personnel working in active work space are exposed to the dangers of an errant vehicle.

(D) Work Zone:

The work zone is the entire area in which traffic control, which includes, static signs and SWZ field devices are implemented.

(E) Traffic Data Collection Subsystem (TDCS):

The TDCS is a component of the SWZ system that is capable of detecting, processing, and disseminating real-time traffic information such as vehicle speeds, traffic volumes, and travel time/delay within and in advance of the work zone for use by other SWZ subsystems, third-party traveler information systems, and/or to archive work zone traffic conditions. This subsystem could also include the use of third-party data, solely, or in combination with site specific gathered data.

(F) Queue Warning Subsystem (QWS):

The QWS is a component of the SWZ system that uses the real-time TDCS information to determine traffic queue lengths. The QWS warns approaching travelers of slowed or stopped traffic conditions through warning messages displayed on SWZ CMBs. When a queue begins to form, the QWS automates the display of warning messages on the associated SWZ CMB displays located in advance of the anticipated queueing areas. The QWS also alerts field personnel and remote SWZ system operators of the real-time queueing conditions.

(G) Dynamic Lane Merge Subsystem (DLMS):

The DLMS is a component of the SWZ system that uses the real-time TDCS information and SWZ CMBs, in advance of a lane closure, to instruct approaching travelers when to merge. When traffic volumes are high or a potential queueing condition is detected by the DLMS, the DLMS automates the display of messages that instruct drivers to merge later. When traffic volumes are low and a potential queueing condition is not detected in advance of the lane closure, the DLMS automates the display of messages that instruct drivers to merge earlier.

(H) Travel Time Subsystem (TTS):

The TTS is a component of the SWZ system that uses the real-time TDCS information and SWZ CMBs, in advance of the work zone, to determine the approximate travel time between the SWZ CMB location and another fixed point as shown on the project plans, or at the end of the work zone. The TTS automates the display of messages on each CMB to inform the drivers of the associated travel time (at predetermined locations) through the work zone. In addition, the TTS is capable of comparing real-time TDCS information to historical travel time information to estimate the approximate travel delay that a driver can expect, when traveling through the work zone.

(I) Traffic Monitoring Camera Subsystem (TMCS):

The TMCS is a component of the SWZ system that uses closed-circuit television (CCTV) cameras to provide real-time video streams that are monitored on-site by field personnel using a mobile display device and/or remotely by the Engineer, Traffic Operations Center (TOC) operators, and the District to view real-time roadway traffic conditions within the work zone.

(J) Variable Speed Limit (VSL) Subsystem:

The VSL subsystem is a component of the SWZ system that uses TDCS real-time traffic information and variable speed limit signs (VSLS) to dynamically reduce or increase regulatory speed limits in the work zone. Regulatory speed limits are dynamically reduced in the active work space. Regulatory speed limits are dynamically increased within the same area of the work zone when the construction personnel are not present.

(K) Truck Entry/Exit Subsystem (TEES):

The TEES is a component of the SWZ system that uses the real-time TDCS information to determine the entry of construction vehicles to the roadway from the work area and warns approaching travelers of slow-moving vehicles ahead. The TEES may warn drivers by displaying a message on a SWZ CMB or by illuminating flashing warning lights attached to a static sign. Once the construction vehicle has entered the roadway and a pre-determined amount of time has passed, the TEES no longer displays the warning message until it detects another construction vehicle entering the roadway from the work area. The TEES also alerts the field personnel and remote SWZ system operators when the system is activated.

(L) SWZ System Software:

The SWZ system software is a software platform that can receive, store, analyze, send, and display real-time information from the TDCS, QWS, DLMS, TTS, TMCS, TEES and VSL subsystem field devices, Department furnished data from roadway sensors, or other third-party sources. The SWZ system software provides the required automation, GUI, user device applications, and system reports required to operate and maintain each respective SWZ subsystem deployed within the SWZ area.

710-2 Materials (Equipment, Workers, Devices and Facilities):

The SWZ system shall contain the selected SWZ subsystems including all necessary auxiliary field device equipment, the SWZ system software for each selected SWZ subsystem, the communications and third-party data services, system operations, maintenance, and support services to provide a complete SWZ system. The selected SWZ subsystems may consist of one or more of the following: TDCS, QWS, DLMS, TTS, TMCS, TEES, VSL, or other type of subsystem as indicated on the plans or specifications.

The auxiliary field device equipment shall include all appurtenances such as traffic detectors, changeable message boards, CCTV cameras, variable speed limit signs, static SWZ signs, device trailers, mounting assemblies, communications and geolocating devices, power assemblies, wiring, and accessories.

The communications services shall include all services needed for connecting the field devices to the remote SWZ system software and connecting the SWZ system software to the internet and communications service provider networks that the system users and Department representatives have access to for connectivity into the SWZ system.

The system operations, maintenance, and support services shall include all services required to deploy, integrate, configure, test, operate, and maintain the SWZ system communications and geolocating devices, third-party data services, field devices, and software for continuous operations in and around the project work zones.

710-2.01 General Requirements:

The contractor shall submit the SWZ system and the associated field devices as part of the TCP and safety plan.

Except as specified herein, all equipment, procedures used by workers, devices, and facilities shall conform to the requirements of Subsection 701-2 of the specifications.

(A) Documentation:

The contractor shall submit a SWZ material proposal at the preconstruction conference or when reasonably feasible. If the contractor’s SWZ material proposal is not submitted at the preconstruction conference, each SWZ subsystem submittal shall be shown in the work schedule.

The contractor's SWZ material proposal shall include the following and any other necessary documents to fully describe the proposed SWZ subsystems and field device items:

(1) Certificate of Compliance:

A Certificate of Compliance conforming to the requirements of Subsection 106.05 of the specifications shall be submitted for each SWZ subsystem assembly. The Department reserves

the right to require Certificates of Compliance for the subsystem functionality provided within the SWZ system software, for each field device assembly component, and for third-party data sources.

The Department reserves the right to perform independent evaluations or tests on any SWZ System Software, equipment, or service supplied by the contractor in the work zone.

(2) SWZ Technician Credentials:

The credentials of the contractor's designated SWZ technician(s) skilled in the operation of all the SWZ system equipment and software shall be submitted to the Engineer for approval. There shall be a designated SWZ technician for each shift of work and the qualifications of the designated technician(s) shall demonstrate the following:

(a) The technician is locally available while the SWZ system is in use and able to respond to the SWZ system issues in person within one hour of notification.

(b) The technician has the training and experience necessary to perform all SWZ field equipment deployments, device configurations, system testing, trouble shooting, maintenance, and component level repair or replacement.

(c) The technician is employed by a contractor that has a minimum of 3 years of experience deploying SWZ technologies on projects with roadway construction valued at one million dollars or more, or has relevant experience that is approved by the Engineer.

If the contractor would like to replace one or more SWZ technician(s), then the new technician(s) shall be approved by the Engineer prior to assuming these duties on the project.

(3) Communications Site Assessment:

A communications site assessment shall be submitted to the Engineer for approval at least six weeks before mobilizing field equipment for deployment in the project area. The communications site assessment shall identify the specific communications service(s) that the contractor has selected for connecting the field devices to the remote SWZ system software and for documenting the contractor's approach for verifying these communications services are available within the project limits.

The results of this communications site assessment shall be summarized and indicate that the selected communications approach(es) provides sufficient data network capacity and coverage needed for proper SWZ system operations within and in advance of the work zone.

(4) System Configuration Plan:

The contractor shall submit a SWZ system configuration plan to the Engineer for approval at least six weeks before mobilizing field equipment for deployment in the project area. The plan shall describe the system logic and field device layout concepts to be used. The SWZ system configuration plan shall demonstrate the following:

(a) The general deployment locations of each subsystem element within the SWZ area such as, but not limited to, TDC, CMB assembly, VSLS assembly, traffic monitoring camera assembly, SAB assembly, SFS assembly, GPSLS assembly, and auxiliary SWZ equipment for each type of anticipated TCP. The plan shall include the role played by each of these device locations in the overall deployment concepts of the SWZ system.

(b) The operational logic used for each required SWZ subsystem (i.e., TDCS, QWS, DLMS, TTS, TMCS, TEES and VSL) that describes the system's response when various traveler information and system logic thresholds are reached. This shall include, but is not limited, to the following:

(i) Systems that generate alert messages, how the alert messages are received (via text and email), and the Department representatives that will receive the alert messages.

(ii) System logic configuration thresholds, limits, controls, and display messages that have been coordinated with the Department for initial system configuration.

(iii) Configuration thresholds, limits, controls, and display messages that can be changed by system users via the SWZ software interface, and system safeguards that are in place to limit the ranges and messages that are selectable by these system users.

(c) Documentation and specification details for the deployed devices that support access or receipt of the WZDx information.

(5) SWZ System Operations and Maintenance Plan:

The contractor shall submit a SWZ system O&M plan to the Engineer for approval at least four weeks before mobilizing field equipment for deployment in the project area. The SWZ system O&M plan shall identify the contractor's means and methods for deploying, operating, and maintaining the SWZ system equipment and software. The SWZ system O&M plan shall demonstrate the following:

(a) A qualified SWZ technician locally available and assigned for every work shift. Contact information shall be provided for each SWZ technician so

that the Engineer can notify the technician(s) of a SWZ system issue and the SWZ technician can respond to the SWZ system issue in person within one hour of notification.

(b) A customer support phone number, email address, and days/hours of support provided for the SWZ system software and each associated subsystem.

(c) A process in place for maintaining continuous operations of SWZ field devices, including but not limited to:

(i) Replacing batteries as needed.

(ii) Refueling fuel tanks before the fuel runs out.

(iii) Moving equipment to keep pace with moving or changing construction activities, changing traffic queuing conditions, TCP changes, or as directed by the Engineer or contractor.

(iv) Adjusting SWZ system software configurations, setting different software logic thresholds and limits, setting days/times and system activities with the software scheduler, selecting different display messages to be posted on the SWZ CMB, changing user alerts and recipients receiving the alerts, changing system software users and levels of access, and making changes to the system logic, configuration, and users in general.

(v) Maintaining a SWZ system equipment maintenance log for all associated O&M activities.

(vi) Repairing or replacing equipment that has been damaged, stolen, or has become an inoperable component of the overall SWZ system.

(6) SWZ Software User Training Curriculum Outline and Schedule:

A SWZ Software User Training Curriculum Outline and Schedule shall be submitted for each SWZ subsystem assembly. The training curriculum and contractor provided training shall reflect the actual needs of the Department's system users and field personnel and include the following sections:

(a) Theory of Operation
(b) Field Device Layout Concepts and Associated Data Collection
(c) System Logic, Limits, and Safeguards
(d) GUI and Operating Procedures
(e) System User Access Levels and Permissions
(f) System Alerts and Types of Alert Messages

(g) Generating System Data Reports and Graphics
(h) SWZ Software Customer Support Services
(i) Procedures for Reporting Concerns or Requesting Changes with the SWZ Software Configuration and Field Device Deployments

The contractor shall coordinate with the Engineer to identify mutually agreed upon training dates and times for each training class.

(7) SWZ Software User Access Privileges and Alert Messages:

The contractor shall coordinate with the Engineer and provide a SWZ User Access Privileges submittal that clearly identifies each Department user by first and last name and the associated level of access that each of these users will have when logging into the system.

The contractor shall coordinate with the Engineer and provide a SWZ Alert Messages submittal that clearly identifies each Department stakeholder by first and last name, the associated types of system generated alerts they will receive and the method (email or text) the alert is received.

(8) SWZ System Data Reports:

The contractor shall submit an example set of each required SWZ system data report to the Engineer for approval at least two weeks before deploying SWZ field equipment in the project area. The example set shall demonstrate the contractors proposed format for each report, the types of data included within each report, the frequency of the data within the report (i.e., once per minute, five minutes, etc.), and the time period to by covered by each individual report (i.e., each report represents a days' worth of data, a weeks' worth of data, etc.). The SWZ system data reports shall be submitted on a weekly basis, in the approved format, and contain the actual work zone data collected during that week of SWZ system deployment.

In accordance with the ADOT Work Zone Safety & Mobility Policy, to monitor and measure work zone impacts during construction, the SWZ system data report shall include the following sets of data:

(a) Travel delay
(b) Queue lengths
(c) Crash occurrences

Each SWZ system data report shall include the geolocation(s) that the data is associated with.

If the intelligence of the SWZ subsystem(s) required in the project plans and specifications does not generate the above sets of data and the associated reports, then the SWZ system provided shall have the ability to support manual entry of this data and the ability to archive and generate reports of the manually entered data.

The contractor's SWZ system data reports shall include any other information that may be required for each type of SWZ subsystem deployed.

(9) Subsystem Acceptance Testing Procedures:

A system acceptance testing procedures submittal shall be submitted for each SWZ subsystem assembly to demonstrate proper operation of all subsystems and device configurations. The testing procedures shall include the following:

(a) Initial System and Device Testing

Initial system and device testing is intended to demonstrate that each subsystem component provided and its associated configurations for the project work zone successfully achieves all of the required functionality, performance, and reporting requirements.

(b) Individual SWZ Field Device Location Testing

Individual SWZ field device location testing is intended to verify that a specific field device is configured correctly, communicating, and operating properly when moved in the SWZ area after initial system setup.

(10) Certificate of Analysis:

A Certificate of Analysis conforming to the requirements of Subsection 106.05 of the specifications shall be submitted for each SWZ subsystem assembly each time the contractor deploys an associated field device component and completes the associated tests in accordance with the approved subsystem acceptance testing procedures.

(B) Auxiliary SWZ Equipment:

Auxiliary SWZ equipment is considered incidental components that may be required to achieve a fully functional SWZ system. The following are some common types of auxiliary equipment and their associated minimum requirements:

(1) SWZ System Communications:

All SWZ systems shall provide the necessary communications devices and services to connect the field devices to the remote SWZ system software and to connect the SWZ system software to the internet and communications service provider networks. The SWZ system communications shall provide continuous service to the devices of the system operators, users, and Department representatives.

The SWZ system communications devices and services provided shall be in accordance with the approved communications site assessment, as described in Subsection 710-2.01 (A)(3) of the specifications. The SWZ system communications devices and services shall provide sufficient data network capacity and coverage needed for proper SWZ system operations within the SWZ area.

(2) Safety Protocols for Smart Devices:

All SWZ systems shall be deployed in accordance with the following safety protocols for smart devices:

(a) Each device shall be up to date prior to being deployed with latest release of operating system (OS)\firmware and relevant security patches. Update releases shall be tracked and deployed routinely to keep device OS\firmware current.

(b) WiFi networks in use shall only be configured to use WPA2 PSK w/ AES and use complex passphrases; diceware passphrases are preferred and rotating pass-phrases is a good practice.

(c) SNMP capabilities shall be disabled if not intended for use; SNMPv3 shall be configured for use if SNMP is needed (when device is capable).

(d) Syslog shall be configured and used to monitor deployed devices.

(e) Telnet shall be disabled, SSH shall be enabled and restricted to SSHv2 only. Keys used for encryption shall be at least 2048 bit.

(f) Trusted Certificate Authority generated SSL\TLS certificates shall be used on web management UIs to ensure end to end encryption. If possible, the following SSL\TLS version, SSLv 1, 2, 3, and TLS v1.0,1.1 shall be disabled.

(g) The use of strong ciphers shall be required for both TLS and SSH encryption, any medium or low strength ciphers (i.e. RC4, DES\3DES, etc.) shall be disabled or kept at a lower priority.

(h) Default\built-in account usernames and passwords shall be changed to follow complexity settings. (e.g. default admin). If possible, these built-in accounts shall be disabled.

(i) Users or administrators shall be provided with unique accounts for login purposes and shall be configured to comply with the following complexity settings, when the device is capable:

i Previous 24 passwords remembered and can’t be re-used

ii 30-day maximum password age before resetting is required

iii 15 character minimum length (Diceware pass phrase preferred)

iv Passwords must use at least 2 numbers and 2 special characters

v Must be stored encrypted, and cannot be stored using reversible encryption

vi Account must be locked-out for 30 minutes upon 3 invalid logon attempts

(j) The gateway (i.e., cell modem/router) that is handling the remote communications to the local smart devices shall be secured by setting up firewall rules so that the gateway communicates only with the pre-defined devices, known trusted IP addresses, and keeps out unauthorized traffic.

(3) Geolocation of SWZ System Devices and Information:

The geolocation of intelligent field devices and data sets reported shall be provided using a GPS device accurate within 3 meters (9.84 feet) of the actual location or by some other method for geolocating devices and information, as approved by the Engineer. The GPS device used for the TDC, CMB, VSLS, traffic monitoring camera, SAB, SFS, and intelligent field device assemblies, shall be considered auxiliary SWZ equipment that is incidental to these device locations. The GPSLS assembly is a standalone GPS device location and shall not be considered an auxiliary integral part of any other intelligent field device.

All SWZ systems shall provide a GUI that displays the actual deployed location of each intelligent device, including the standalone GPSLS assemblies, that is communicating with the SWZ system software using the approved geolocating method.

All third-party information used by the SWZ system software and used within SWZ system data reports shall include the geolocation(s) associated with the information provided.

(4) SWZ Field Device Power Supply:

All SWZ system field devices shall be independently powered and shall be powered for operation continuously during all deployment periods within the SWZ area and shall be provided with a means for alerting remote system users and operators of a low power or loss of power condition.

The SWZ system shall have the ability to archive and generate reports on power condition alert messages received from SWZ system field devices deployed within the SWZ area. This archived data shall include the associated device name and number and shall include the date and time of each alert message.

All power supplies shall have capacity to support at least 72 hours of continuous operation. Examples of acceptable power supplies include:

(a) Battery Powered Devices: The contractor shall replace batteries and equipment as necessary for continuous SWZ system operations in accordance with the approved SWZ system O&M plan.

(b) Solar Power Distribution Assemblies: The contractor shall clean and adjust the position of solar panels and replace equipment as necessary for continuous SWZ system operations in accordance with the approved SWZ system O&M plan.

(c) Gas and Liquid Fuel Powered Devices: The contractor shall replace fuel and equipment as necessary for continuous SWZ system operations in accordance with the approved SWZ system O&M plan.

(5) Portable Field Device Trailers:

When SWZ system field devices are mounted to portable trailers deployed within the SWZ area the portable trailers shall meet the following requirements:

(a) Trailer Number: All trailers deployed within the SWZ area shall have a trailer number that is easily visible from the first vehicle travel lane adjacent to the deployed trailer. All trailers deployed in the SWZ area shall have different numbers to uniquely identify and differentiate one trailer from another.

(b) Towing Support: The trailers shall be street legal, have functioning brake lights when being towed, support driving speeds up to 65-mph when being towed, and be equipped with a standard size trailer hitch.

(c) Leveling Legs: The trailers shall have adjustable leveling legs that can support the weight of a fully loaded trailer with the tires removed. The adjustable height of the legs should be able to raise the trailer wheels a minimum of four inches between the bottom of the wheels and a flat/level surface that the trailer is standing on. Each leg shall be independently adjustable to support leveling the base of the trailer when deployed on a sloped area.

(d) Wind Loading: With all stabilizing devices in place, the fully loaded trailer shall be capable of withstanding wind gusts up to 80-mph without overturning or changing orientation.

(e) Display Tile Angle Adjustments: When mounting brackets are provided for CMBs and VSLSs, they shall be provided with the ability to adjust the tilt angle of the display board in accordance with the display board manufacturer’s recommendations for the optimal viewing angle.

(f) Pole Rotating Adjustments: When fixed-height or telescoping poles are provided to increase the mounting height of cameras and traffic detection devices, they shall be provided with the ability to rotate the pole, from ground level, in support of adjusting the horizontal viewing/detection angle of the device(s) mounted towards the top of the pole.

(g) Equipment Enclosures: When equipment enclosures are provided to house electronic communications, geolocating devices, local processing devices, batteries, and other PDA components, they shall be provided with security provisions to deter and delay theft of equipment inside the housing.

(6) Static Traffic Control Devices for SWZ Field Equipment:

Static traffic control devices for SWZ field equipment shall consist of furnishing, installing, maintaining, moving and removing barricades, warning signs, cones, and other traffic control devices, per the approved traffic control plans, through or around the SWZ system field device locations deployed in or adjacent to the work zone. The static traffic control devices for SWZ field equipment shall be provided in accordance with the requirements of Part VI of the current edition of the Manual on Uniform Traffic Control Devices (MUTCD) and the current edition of the associated ADOT MUTCD supplement.

710-2.02 SWZ Traffic Data Collection (TDC) Location:

Each TDC location shall be equipped with all detecting, processing, and disseminating equipment and functionality needed to deliver real-time traffic information. The traffic data collected, shall be practicable for the SWZ subsystem identified such as vehicle speeds, traffic volumes, and occupancy within an area of the roadway that provides a single direction of travel with one or more travel lanes for that location. If required in the project plans or special provisions, additional traffic data shall be collected for vehicle classification and all data shall be collected “per lane”. Each TDC location shall include all of the equipment necessary to provide a fully functional component of the SWZ system.

A minimum of two TDC locations shall be provided to generate the required travel time and travel delay traffic information; unless a third-party traveler information system is used to provide the travel time/delay for the location (i.e. a single route between two or more points).

All TDC locations shall provide the SWZ system software the following information:

(A) Vehicle speeds averaged together within a maximum time interval of one-minute.

(B) Traffic volume count for each one-minute time interval.

(C) Travel time and delay information for each one-minute time interval, computed by the TDC locations, or computed by the SWZ system software based on the per minute data provided by the TDC location(s).

(D) For each location that has multiple travel lanes, the traveler information provided shall be a representative sample of all travel lanes combined as one for the same direction of travel.

(E) All real-time traffic information provided to the SWZ system shall be time stamped with the actual date and time, with a tenth of a second accuracy, for each one-minute time interval sent to the SWZ system software.

Each TDC location deployed within the SWZ area shall have a number to uniquely identify that location and differentiate it from all other TCD locations. When the TDC location is comprised of field traffic sensor(s) the location number shall be displayed within the SWZ system software and shall be easily visible by field personnel at the location were the device(s) are mounted. When the field traffic sensors are mounted on a portable field device trailer the TDC location number used shall be the same number that is visible on the trailer.

When third-party data is used to collect the traffic data, the location number only needs to be displayed within the SWZ system software to identify each location where the data is being collected. When third-party data is used to collect travel-times between two locations, a unique route number shall be used to identify the location of each different route.

All TDC locations shall provide additional traveler information, as necessary, to achieve the functionality of other SWZ subsystems required by the project plans and specifications.

710-2.03 SWZ Changeable Message Board (CMB) Assembly:

Each SWZ CMB assembly shall be equipped with a changeable message display board and all processing and disseminating equipment, and have the functionality required to deliver automated messages generated by the SWZ system software to the travelling public via the message display boards of the SWZ CMB assembly. Each SWZ CMB assembly shall include all of the equipment necessary to provide a fully functional component of the SWZ system.

Each SWZ CMB assembly shall be provided and deployed in accordance with the MUTCD requirements for portable changeable message signs (MUTCD Section 6F.60) and the following:

(A) The SWZ CMB shall support the display of three lines of eight characters per line or should consist of a full matrix display.

(B) The letter height used for SWZ CMB messages should be a minimum of 18 inches, unless deployed on low speed facilities (40-mph or less). Shorter letter sizes may be used for SWZ CMB messages when deployed on low speed facilities provided that the message is legible from at least 650 feet.

(C) Under low light level conditions, the SWZ CMB shall automatically adjust its light source to meet the MUTCD legibility requirements and not impair the driver's vision.

(D) The SWZ CMB shall be provided with a default message state that is used when communications with the SWZ system software are lost for a predetermined amount of time. The default message state shall support the following options:

(1) A blank display with no message,
(2) A pre-approved message for the project and location, and
(3) Continue to display the last message received from the SWZ system software.

(E) The SWZ CMB shall be provided with local manual override controls. When the local manual override controls are used, the SWZ CMB shall:

(1) Display only traffic operational, warning, and guidance information, and shall not be used for advertising messages.

(2) Display messages that consist of no more than two phases, and a phase should consist of no more than three lines of text. Each phase should be capable of being understood by itself, regardless of the order in which it is read. Messages should be centered within each line of the legend. If more than one portable SWZ CMB is simultaneously legible to road users, then only one of the signs should display a sequential message at any given time. Each phase shall have a display time of at least two seconds and the sum of the display times for both of the phases should be a maximum of eight seconds.

Each SWZ CMB assembly deployed within the SWZ area shall have a unique number to identify that location and differentiate it from other SWZ CMB locations. When the SWZ CMB assembly is mounted on a portable field device trailer the SWZ CMB assembly number used shall be the same number that is visible on the trailer.

710-2.04 SWZ Traffic Monitoring Camera Assembly:

Each traffic monitoring camera assembly shall be provided with all cameras, video processing and disseminating equipment, and functionality needed to provide real-time viewing of traffic and roadway conditions, from a remote location and through the SWZ system software. Each SWZ traffic monitoring camera assembly shall provide the ability to view all approaching directions of the roadway, relative to the camera assembly deployment location, using one or more cameras mounted at an appropriate mounting height for viewing the roadway and traffic conditions. Each SWZ traffic monitoring camera assembly shall include all of the equipment necessary to provide a fully functional component of the SWZ system.

All SWZ traffic monitoring camera assembly locations shall provide the following camera functionality:

(A) Ability to provide a video stream from each camera that can be viewed remotely from the SWZ system software GUI interface display window.

(B) Ability to adjust the field of view (i.e., pan, tile, and zoom) of each camera, remotely from the SWZ system software, locally at the camera assembly location, or both.

(C) Ability to support both daytime and nighttime operations. During daytime operations a color video stream shall be provided. During nighttime operations the camera shall function in low light conditions and support color, black-and-white, or both types of video streams.

(D) Ability to adjust the camera iris and focus manually, via auto-Iris and auto-focus functionality, or both.

(E) Ability to set and select camera pre-set positions, one for each approaching direction of the roadway, relative to the camera assembly deployment location, when a pan-tile-zoom functionality is provided for remote operations.

(F) Ability to adjust the mounting height of each camera.

Each traffic monitoring camera assembly location deployed within the SWZ area shall have a unique number to identify that location and differentiate it from other traffic monitoring camera assembly locations. When the traffic monitoring camera assembly is mounted on a portable field device trailer the traffic monitoring camera assembly location number used shall be the same number that is visible on the trailer.

710-2.05 SWZ Variable Speed Limit Sign (VSLS) Assembly:

Each VSLS assembly shall be provided with a changeable message display board for posting regulatory speed limits and all processing and disseminating equipment and functionality needed to deliver SWZ system software generated speed limits to the traveling public via the changeable message display board of the VSLS assembly. Each VSLS assembly shall include all equipment necessary to provide a fully functional component of the SWZ system.

Each VSLS assembly shall be provided and deployed in accordance with the MUTCD requirements for Regulatory Speed Limit Signs (MUTCD Section 2B.13) and the following:

(A) The VSLS display shall be the R2-1 sign type, per the MUTCD, with white colored lighted pixels that display the speed limit message on a black background.

(B) The speed limits shall be displayed in multiples of 5 mph.

(C) Under low light level conditions, the VSLS display shall automatically adjust its light source to meet the MUTCD legibility requirements and not impair the driver's vision.

(D) The VSLS display shall be provided with a default message state that is used when communications with the SWZ system software is lost for a predetermined amount of time. The default message state shall support the following options:

(1) Blank display with no speed limit message,

(2) Pre-approved speed limit message for the project and location, and

(3) Continue to display last speed limit message received from the SWZ system software.

(E) The VSLS assembly shall be provided with local manual override controls. When the local manual override controls are used, the VSLS display shall:

(1) Only display speed limits in multiples of 5 mph, and

(2) Provide a blank display with no speed limit message when moving the sign to a new deployment area.

(F) A "VARIABLE SPEED ZONE AHEAD" warning sign shall be used in advance of the first VSLS location deployed to inform road users of a variable speed limit zone where the speed limit may be reduced by more than 10 mph. The Variable Speed Zone Ahead warning sign shall be a similar shape, size, and color to the Reduced Speed Limit Ahead (W3-5) or XX MPH Speed Zone Ahead (W3-5a) sign type of the MUTCD.

(G) An "END OF VARIABLE SPEED ZONE" sign shall be used after the last VSLS location deployed to inform road users that the variable speed limit zone has ended. The End of Variable Speed Zone warning sign shall be a similar size and color to the Reduced Speed Limit Ahead (W3-5) or XX MPH Speed Zone Ahead (W3-5a) sign type of the MUTCD.

(H) A warning beacon shall be used in combination with a "VARIABLE SPEED ZONE AHEAD" warning sign and the "END OF VARIABLE SPEED ZONE" warning sign when required in the project plans and specifications. When required, warning beacons shall comply with the MUTCD (Section 4L.03).

Each VSLS assembly deployed within the SWZ area shall have a unique number to identify that location and differentiate it from other VSLS locations. When the VSLS assembly is mounted on a portable field device trailer the VSLS assembly number used shall be the same number that is visible on the trailer.

710-2.06 Smart Arrow Board (SAB) Assembly:

Each SAB assembly shall be provided with an arrow board for indicating lane closures all processing and disseminating equipment and functionality needed to SWZ system software generated arrow, chevron symbols and patterns as described in the MUTCD and these specifications. Each SAB assembly shall include all equipment necessary to provide a fully functional component of the SWZ system.

Each SAB assembly shall be provided and deployed in accordance with MUTCD Section 6F.61 and the following:

(A) The SAB assembly shall provide the functionality for the user to identify the GPS coordinates of the SAB assembly through the SWZ system software GUI. Changes in the GPS coordinates of the SAB shall be logged within the SWZ system software with a timestamp.

(B) The SAB assembly shall provide the functionality for the user to identify the display state of the SAB assembly through the SWZ system software GUI. Changes in the display state of the SAB shall be logged within the SWZ system software with a timestamp.

(C) The SAB display shall be provided with a default display state that is used when communications with the SWZ system software is lost for a predetermined amount of time. The default message state shall support the following options:

(1) Blank display with no chevron, arrow, or other pattern,

(2) Sequential chevron pattern, and

(3) Continue to display the last display state received from the SWZ system software.

(D) The SAB assembly shall be provided with local manual override controls. When the local manual override controls are used, the SAB display state shall conform to the MUTCD and these specifications.

Each SAB assembly deployed within the SWZ area shall have a unique number to identify that location and differentiate it from other SAB locations.

710-2.07 Speed Feedback Sign (SFS) Assembly:

Each SFS assembly shall be provided with a static speed limit sign, a changeable message display, and all processing and disseminating equipment and functionality needed to detect and display the speed of approaching vehicles. Each SFS assembly shall include all equipment necessary to provide a fully functional component of the SWZ system.

Each SFS assembly shall be provided and deployed in accordance with the MUTCD requirements for Regulatory Speed Limit Signs (MUTCD Section 2B.13) and the following:

(A) The static sign display shall be the R2-1 sign type, per the MUTCD, with white background and black legend. The pixels of the changeable message display shall be white on a black background.

(B) The changeable message display shall be two digits displayed in miles per hour with character height of 24 inches at a minimum.

(C) The changeable message display shall have the ability to:

(1) Continuously show the speed of an approaching vehicle and not flash regardless of speed limit or preset thresholds

(2) Display a blank message if the detected vehicle speed is between 0% and 50% of the predetermined speed limit setting.

(3) Display the speed of the approaching vehicle if the speed is greater than 50% of the predetermined speed limit setting.

(D) The SFS assembly shall provide the functionality for the user to identify the GPS coordinates of the SFS assembly through the SWZ system software GUI. Changes in GPS coordinates of the SFS shall be logged in the SWZ system software with a timestamp.

(E) Each SFS assembly deployed within the SWZ area shall have a unique number to identify that location and differentiate it from other SFS locations.

710-2.08 GPS Location Sensor (GPSLS) Assembly:

Each GPSLS assembly shall be provided with all processing and disseminating equipment and functionality needed to determine the GPS location of the GPSLS and communicate that location to the SWZ system software. Each GPSLS assembly shall include all equipment necessary to provide a fully functional component of the SWZ system.

The GPSLS assemblies are intended to be standalone intelligent devices used to mark a specific location of interest within the work zone. The following are some examples for how the GPSLS assemblies are intended to be used:

(A) The SAB includes an auxiliary GPS location device that marks the beginning of a lane restriction within the work zone, but the SWZ system software and operator doesn’t know where the end of the lane restriction is located, so a standalone GPSLS assembly is placed at the end of the lane restriction to inform the SWZ system software logic of where the lane restriction ends.

(B) In some work zones it may be desired to know where the Road Work Ahead, End of Work Zone, or other static construction signs are located, so a standalone GPSLS assembly will be placed at each of these static sign locations to inform the SWZ system software logic of where the work zone starts and ends.

Each GPSLS assembly shall be provided in accordance with the following:

(A) The GPSLS assembly shall provide the functionality for the user to identify the GPS coordinates of the GPSLS assembly through the SWZ system software GUI. Changes in GPS coordinates of the GPSLS shall be logged in the SWZ system software with a timestamp.

(B) Each GPSLS assembly deployed within the SWZ area shall have a unique number to identify that location and differentiate it from other GPSLS assembly locations.

710-2.09 SWZ System Software:

The SWZ system software shall receive, store, analyze, and display real-time information from each TDC location, SWZ CMB assembly, VSLS assembly, traffic monitoring camera assembly, SAB assembly, SFS assembly, GPSLS assembly, and the associated auxiliary SWZ equipment deployed within the project SWZ area. The software shall provide the control logic, system configurations, automation, and commands for the SWZ CMB and VSLS display messages and speed limits.

The SWZ system software shall be furnished with all hardware, device drivers, and auxiliary SWZ equipment necessary to provide a fully functional component of the SWZ system that is accessed remotely by system operators, users, and Department representatives via the internet and by utilizing the software's client interface provided for use during the project.

The SWZ system software and services shall include setting limits and controls on the types of messages that can be displayed on SWZ CMB assemblies in accordance with Subsection 710-2.03 of the specifications

The SWZ system software and services shall include an option to create a "Message Library" of project specific and Engineer approved messages that can be displayed on the SWZ CMBs within the SWZ area.

The SWZ system client interface shall:

Not have a limit to the number of Department representatives that can access the SWZ system software independently from different locations throughout the State of Arizona using an internet link and web browser. The SWZ system software shall be configured to limit the level of access granted to different users to help protect against accidental and malicious acts that can impact the integrity of system performance, configurations, CMB display messages, and posted VSLS speed limits.

Be a vendor hosted web site or software application(s) downloadable from one or more internet locations identified by the SWZ system software vendor(s).

Be accessible using personal computers (PC) running a Windows operating system and mobile devices running an Apple or Android operating system. The version of Windows used shall be compatible with the versions supported by the Engineer and TOC.

Include a GUI that displays the location of each TDC location, SWZ CMB assembly, VSLS assembly, traffic monitoring camera assembly, SAB assembly, SFS assembly, and GPSLS assembly deployed within the project SWZ area on a map and provides the associated unique numbers that identifies each location. The SWZ system software shall be configured to use the same unique numbers that have been imprinted on the actual devices in the SWZ area.

Provide the ability for Department representatives to see the current status of each TDC location, SWZ CMB assembly, VSLS assembly, and traffic monitoring camera assembly deployed within the project SWZ area, view all recorded data received from these field devices and the archived results of manual and system processed commands sent to field devices which display messages and speed limits to the traveling public.

The SWZ system software shall include a data exchange compliant with the WZDx Specification. The data exchange provided by the contractor shall update as the conditions of the work zone are changed, work zones are added, and work zones are removed through the SWZ system software.

The SWZ system software shall be comprised of the following subsystems integrated together as one complete system, as multiple separate software platforms, or any combination thereof, as required by the project plans and special provisions:

(A) Traffic Data Collection Subsystem (TDCS):

The TDCS shall be integrated with each TDC location deployed within the SWZ area to receive, archive, process, and disseminate the real-time traffic information for use by the other SWZ subsystems and by the Department for historical information, documentation, and future analyses.

The SWZ system GUI shall be configured to display each TDC location deployed within the SWZ area and the TDCS shall provide the following:

(1) Traffic volume counts for each direction of travel impacted by construction activities within every one-minute time interval for data archiving.

(2) Vehicle speeds for each direction of travel impacted by construction activities averaged together within a maximum time interval of one-minute for data archiving.

(3) The actual posted speed limit for each direction of travel impacted by construction activities and a speed limit compliance value based on the actual vehicle speed value compared to the posted speed limit value within every one-minute time interval for data archiving.

(4) Travel time between two points, one at near the beginning of the work zone and one at the end, averaged together within a maximum time interval of one-minute for data archiving for each direction of travel impacted by construction activities.

(5) Travel delay between two points, one at near the beginning of the work zone and one at the end, averaged together within a maximum time interval of one-minute for data archiving for each direction of travel impacted by construction activities. The travel delay values shall be based on the SWZ system generated real-time travel time data compared to a contractor provided “baseline set travel time data” that represents the typical travel time between the same two points, for each one-minute interval with each day of the week, when there was no construction or incident that would cause a travel delay.

(6) Queue lengths in locations when construction activities are causing or anticipated to cause traffic queuing for each direction of travel. The contractor proposed maximum time interval for data archiving and the methods used to determine queue lengths shall be approved by the Engineer prior to SWZ system deployment within the work zone.

(7) Traffic volume counts, vehicle speeds, speed limit compliance, travel time, travel delay, and queue length values based on longer time intervals, as selected by the Department representative through the SWZ system client interface, for generating the associated traffic information reports.

(8) Traffic volume counts, vehicle speeds, speed limit compliance, travel time, travel delay, and queue length values based on longer time intervals and associated alert message thresholds approved by the Engineer to send SWZ system generated alert messages to Department representatives via email or text messages.

(9) Crash occurrence data for each incident that occurred within the SWZ area based on the following data generated by the SWZ system or input into the SWZ system, by the contractor, using the SWZ system client interface:

(a) Geolocation coordinates of the crash
(b) Direction of travel the crash occurred in
(c) Approximate time the crash occurred
(d) Approximate time the crash was cleared from the travel lanes
(e) Approximate time the crash was cleared from the site
(f) Description of the crash

The TDCS shall be integrated with other required SWZ subsystems and receive, process, and disseminate additional types of the real-time traffic information that may be required by these other SWZ subsystems.

(B) Queue Warning Subsystems (QWS):

The QWS shall be integrated with the TDCS and the SWZ CMB assemblies to determine traffic queue lengths and warn approaching travelers of slowed or stopped traffic conditions.

The SWZ system GUI shall be configured to display each SWZ CMB assembly and TDC location associated with the QWS and the QWS component of the SWZ system and services shall provide the following:

(1) The ability to set and change real-time traffic information thresholds, within ranges approved by the Engineer, for the QWS automation logic that decides which queue warning message to display on each associated SWZ CMB location.

(2) The ability to set and change which messages from the “Message Library” can be used by the QWS for each of the different logic threshold scenarios.

(3) The ability to set a minimum time, within ranges approved by the Engineer, that a QWS generated message should be displayed on each SWZ CMB, before the QWS can change the message.

(4) When a queue begins to form, the QWS shall automate the process of displaying warning messages on the associated SWZ CMB assemblies located in advance of the anticipated queueing areas.

(5) The ability to send alert messages to Department representatives via email and text messages when the QWS displays and removes warning messages on the associated SWZ CMB assemblies

(6) The ability to send request messages to the Department’s TOC operators via email and text messages asking them to consider displaying and removing queue warning related messages on specific FMS DMS locations in advance of the queueing area.

(C) Dynamic Lane Merge Subsystems (DLMS):

The DLMS shall be integrated with the TDCS and the SWZ CMB assemblies to determine traffic volumes and queueing conditions in advance of a lane or shoulder closure and instruct approaching travelers of when they should merge.

The SWZ system GUI shall be configured to display each SWZ CMB assembly and TDC locations associated with the DLMS. The DLMS components of the SWZ system and services shall provide the following:

(1) The ability to set and change real-time traffic information thresholds, within ranges approved by the Engineer, for the DLMS automation logic that decides which merge message to display on each associated SWZ CMB location.

(2) The ability to set and change which messages from the “Message Library” can be used by the DLMS for each of the different logic threshold scenarios.

(3) The ability to set a minimum time, within ranges approved by the Engineer, that a DLMS generated message should be displayed on each SWZ CMB, before the DLMS can change the message.

(4) When traffic volumes are high, or a potential queueing condition is detected by the DLMS, the DLMS shall automate the process of displaying pre-approved messages on the associated SWZ CMB assemblies that instruct drivers to merge later.

(5) When traffic volumes are low, and a potential queueing condition is not detected by the DLMS, the DLMS shall automate the process of displaying pre-approved messages on the associated SWZ CMB assemblies that instruct drivers to merge earlier.

(6) The ability to send alert email or text messages to Department representatives when the DLMS automatically changes messages on the associated SWZ CMB assemblies.

(7) The ability to send request messages to the Department’s TOC operators via email or text messages asking them to consider adding or removing merge instructions displayed on specific FMS DMS locations in advance of the closure.

(D) Travel Time Subsystems (TTS):

The TTS shall be integrated with the TDCS and the SWZ CMB assemblies to determine real time travel times and travel delays between each associated SWZ CMB assembly and an Engineer approved end destination point within the SWZ area. The TTS shall also provide display messages on each respective SWZ CMB with the travel time and travel delay information.

The SWZ system GUI shall be configured to display each SWZ CMB assembly and TDC route associated with the TTS. The TTS component of the SWZ system and services shall provide the following:

(1) The ability to set and change real-time traffic information thresholds, within ranges approved by the Engineer, for the TTS automation logic that decides which travel time or travel delay message to display on each respective SWZ CMB.

(2) The ability to set and change which messages from the “Message Library” can be used by the TTS for each of the different logic threshold scenarios.

(3) The ability to set a minimum time, within ranges approved by the Engineer, that a TTS generated message should be displayed on each SWZ CMB, before the TTS can change the message.

(4) The ability to set the following types of Engineer approved rules for how the travel times and travel delay values will be displayed with the respective SWZ CMB display messages:

(a) Round the time value to the nearest multiple of five or ten, or round-up to the nearest multiple of five or ten.

(b) Display the time as greater than or less than a fixed time period when the real-time value exceeds or is below this value respectively.

(5) The ability to send alert email or text messages to Department representatives when the TTS displays a specific type of message on one of the respective SWZ CMB, or if the travel times and travel delay values exceed a predetermined threshold.

(E) Traffic Monitoring Camera Subsystem (TMCS):

The TMCS shall be integrated with all the SWZ traffic monitoring camera assembly locations within the SWZ area and provide real-time viewing of the associated camera video streams for field personnel using mobile display devices and remotely by the Engineer, the TOC operators, and the District to monitor real-time roadway traffic conditions within the work zone.

The SWZ system GUI shall be configured to display the location of each SWZ traffic monitoring camera assembly and the TMCS component of the SWZ system and services shall provide the following:

(1) The ability to view the real-time video stream of SWZ traffic monitoring camera assembly location when selected from within the SWZ system GUI.

(2) Ability to adjust the field of view (i.e., pan, tilt, and zoom) of each SWZ traffic monitoring camera assembly.

(3) Ability to select between daytime and nighttime operations for each SWZ traffic monitoring camera assembly.

(4) Ability to adjust the iris and focus of each SWZ traffic monitoring camera assembly.

(5) Ability to set and select pre-set field of view positions of each SWZ traffic monitoring camera assembly, when PTZ cameras are deployed.

(F) Variable Speed Limit (VSL) Subsystem:

The VSL subsystem shall be integrated with the TDCS and the VSLS assemblies located in the SWZ area to reduce regulatory speed limits within the area(s) of the work zone that has the largest concentration of construction personnel exposed to the danger of an errant vehicle and raises the speed limit when construction workers are not present.

The configuration of the VSL subsystem shall include the unique number of a TDC location that is deployed near the center of the Active Work Space and this field device location shall be referred to as the Active Work Space TDC location. The VSL subsystem shall provide system automation logic that changes the posted speed limits based on the real-time traffic information it receives from the Active Work Space TDC location.

The VSL subsystem shall include a variable that represents the length of the Active Work Space and the ability to set a maximum value for this variable. This maximum value which represents the maximum allowable Active Work Space length shall be set to two-miles, unless otherwise approved by the Engineer.

The SWZ system GUI shall be configured to display the Active Work Space TDC location, the length of the Active Work Space, the location of each SWZ VSLS deployed within the work zone, and the real-time speed limit posted on each SWZ VSLS. The VSL subsystem component of the SWZ system and services shall provide the following:

(1) The ability to only post speed limits in multiples of 5 mph on a VSLS.

(2) The ability to set a minimum and maximum speed limit value that can be posted on a VSLS for each direction of travel within the project limits.

(3) The ability to set a minimum time frame or minimum frequency between changes that a VSL subsystem generated speed limit should be displayed on each VSLS, before the VSL subsystem can change the speed limit.

(4) The ability to set a maximum value that can be used for lowering speed limits between any two consecutive VSLS locations within the same direction of travel.

(5) The intelligence needed to dynamically know which SWZ VSLS are in advance of the Active Work Space, within the Active Work Space, and subsequent to the Active Work Space, each time the contractor moves the Active Work Space TDC location within the project limits.

(6) The intelligence needed to dynamically lower the posted speed limits within the Active Work Space and on the VSLS directly in advance of the Active Work Space, while dynamically raising the speed limits on the other VSLS devices to the maximum allowable speed limit for the work zone.

(7) The ability to set and change VSL subsystem logic and Active Work Space TDC real-time traffic information thresholds, within ranges approved by the Engineer, for the VSL subsystem automation logic that decides which speed limits to post each respective SWZ CMB.

(8) The ability to dynamically raise the speed limits posted on all the VSLS to the maximum speed limit value or other user selectable lower value based on the time-of-day and day-of-week scheduler and manual overrides to the schedule.

(9) The ability to only allow the speed limit message displayed on each VSLS to be in accordance with an R2-1 sign type, per the MUTCD, with white colored lighted pixels for displaying the speed limit message on a black background.

(10) The ability to send alert email and text messages to Department representatives when the speed limit messages on the associated VSLS contain a user selectable speed limit value.

(G) Truck Entry/Exit Subsystem (TEES):

The TEES shall be integrated with the TDCS and either a SWZ CMB assembly or a static sign with attached flashing warning lights and GPSLS assembly to determine when construction vehicles are entering the roadway from the work area and warn approaching travelers of slow-moving vehicles ahead.

The SWZ system GUI shall be configured to display each SWZ CMB assembly or static sign with attached flashing warning lights and GPSLS assembly and all TDC locations associated with the TEES. The TEES components of the SWZ system and services shall provide the following:

(1) When construction vehicles leave the work area and enter the roadway, the TEES shall automate the process of displaying either pre-approved messages on the associated SWZ CMB assemblies or illuminating the flashing warning lights on the associated static sign with GPSLS assembly that warn drivers of slow-moving vehicles ahead.

(2) The ability to set and change the time, within ranges approved by the Engineer, that a TEES generated warning should be displayed on either the associated SWZ CMB assembly or the associated static sign with attached warning lights and GPSLS assembly, before the TEES can change or remove the warning.

(3) The ability to send alert email or text messages to Department representatives when the TEES automatically changes messages on the associated SWZ CMB assemblies or illuminates the flashing warning lights on the associated static sign with GPSLS assembly .

710-2.10 Data Submittal:

The SWZ system software shall record all loss of communications, low power, and loss of power alerts for the project duration.

The SWZ system software vendor shall also record the following data before final project acceptance:

(1) All real-time traffic information received by the SWZ system software from all TDC locations deployed in the SWZ area and received by third-party sources, and all real-time traffic information generated by the SWZ system software within every one-minute time interval.

(2) All messages posted on all SWZ CMB assemblies deployed in the SWZ area.

(3) All speed limits on all VSLS assemblies deployed in the SWZ area.

(4) All geolocation data associated with these devices and the required device data.

(5) A date and time stamp that the data pertains to each data set.

This data shall be submitted electronically to the Engineer in a format compatible with the Work Zone Data Exchange Common Core Data Specification version available at the time of the project’s bid opening date.

710-3 Construction Requirements:

The contractor shall coordinate with the Engineer and provide the SWZ software user training to the Department representatives. The contractor shall provide the Department representatives with SWZ software user access privileges including alert messages.

The SWZ system shall be deployed in accordance with the approved TCP, communications site assessment, system configuration plan, and subsystem acceptance testing procedures and provide the required certificate of analysis.

The contractor shall operate and maintain the SWZ system in accordance with the approved SWZ system O&M plan, relocate TDC locations, SWZ CMB assemblies, VSLS assemblies, traffic monitoring camera assemblies, SAB assemblies, SFS assemblies, and GPSLS assemblies and the associated auxiliary SWZ equipment deployed within the project SWZ area as necessary to achieve the SWZ system operational objectives. The required certificate of analysis shall be submitted to the Engineer each time one of the field device locations is moved.

During deployment in the SWZ area, the contractor shall submit the required SWZ system data reports to the Engineer for approval within the Engineer approval time frames.

Any deficiencies in the communications site assessment, SWZ system configuration plan, O&M plan, devices, equipment, services, or other elements of work listed herein will be brought to the attention of the contractor by the Engineer and all deficiencies shall be corrected before the close of that work shift, unless otherwise specified.

710-4 Method of Measurement:

SWZ system will be measured on a lump sum basis for a fully functional complete in place system.

TDC location, SWZ CMB assembly, traffic monitoring assembly, VSLS assembly, SAB assembly, SFS assembly, and GPSLS assembly will be measured by the day for each 24-hour day that the SWZ is in place and functional for the in-use condition, with no loss of communications or power failures for 98 percent of the calendar day or 98 percent of the portion of the calendar day that the system is in place.

Measurement for payment of the TDC location, SWZ CMB assembly, traffic monitoring assembly, VSLS assembly, SAB assembly, SFS assembly, and GPSLS assembly will begin on the day they are installed in place and fully functional. When the elements are not needed, they shall be removed or covered and will not be measured unless they are required to stay on site in anticipation of future use or emergency use as determined by the Engineer. Should devices be required on site for these purposes, they will be measured and paid for at the contract unit prices. During non-working periods such as holidays and weekends, the elements in place will be measured for payment. During these non-working periods the contractor shall conduct a minimum of one check per day to verify that the elements are in place and in satisfactory condition.

Elements of work which are lost, stolen, destroyed, or are deemed unacceptable by the Engineer, while in use on a project shall be replaced by the contractor at no additional cost to the Department.

710-5 Basis of Payment:

SWZ system, measured as provided above, will be paid for at the contract lump sum price, which price shall be full compensation for the work, complete in place, as specified herein and shown on the plans, including all materials, equipment, and labor necessary to facilitate the SWZ system mobilization; obtain the Engineer's approval of required submittal documentation; provide SWZ system software, the SWZ client interface and user training, initial system configurations and associated acceptance testing, SWZ software user access privileges, alert messages, and SWZ system data reports; provide system and equipment operations and maintenance, deployment location changes, and support services as needed to maintain a fully functional and operational SWZ system for the duration of the project; and removal of all SWZ equipment. Documentation of all lessons learned as a result of the SWZ installation, deployment, and removal shall also be included in the lump sum payment.

The accepted quantities of TDC locations, SWZ CMB assemblies, traffic monitoring camera assemblies, VSLS assemblies, SAB assemblies, SFS assemblies and GPSLS assemblies measured as provided above, will be paid for at the contract unit price each for the type of location or assembly designated in the bidding schedule, fully deployed and in operation in the SWZ area, which price shall be full compensation for the work described and specified herein and on the plans, and all other components necessary to provide a complete functional assembly for monitoring the SWZ area traffic conditions and controlling the SWZ operations.

Eighty percent of the contract lump sum price for the SWZ system will be paid upon satisfactory installation of a fully functional system, system, and operating, maintaining and servicing the SWZ system.

Twenty percent of the contract lump sum price for the SWZ system will be paid upon final removal.

Measurement and payment of static traffic control devices as shown on the TCP that are used in conjunction with the SWZ field equipment shall be paid for under their respective bid items.

No payment will be made for relocation of work elements and SWZ system configuration changes.

No payment will be made for setting up or relocating the necessary elements of work and associated protective devices that are moved concurrently with the advancing operation or removal at the end of a shift.

No payment will be made for the elements of work listed herein for non-working periods resulting from a suspension of work that, in the opinion of the Engineer, is due to the fault of the contractor. In any case, the contractor shall continue to be responsible for maintaining all SWZ system components in proper functioning condition at all times.

ITEM 8050003 — SEEDING (CLASS II):

The work under this item shall consist of furnishing all materials, preparing the soil, applying Class II seed, establishing, and maintaining the seeded areas along with final mulch cover.

Areas to be seeded are those disturbed or unvegetated areas listed herein, shown on the plans, called for in the contractor's erosion/sediment control plan, Nonpoint Source (NPS) pollution control plan, Stormwater Quality Protection Plan (SQPP), Stormwater Runoff Pollution Control Plan, Decentralized Stormwater Management Plan, Stormwater Runoff Mitigation Plan, Stormwater Management Plan (SWMP), Biotechnical Erosion Control Plan, Post-Construction Stormwater Management Plan (PCSMP), Integrated Vegetation Management Plan (IVMP), Functional Landscape Ecological Restoration Plan, Assisted Migration Plan (AMP), or designated by the Engineer. All construction support activities disturbed unpaved temporary construction access, unpaved on-site staging, unpaved on-site material storage, and unpaved on-site stockpiling areas shall ultimately be seeded unless otherwise stabilized by equivalent permanent stabilization measures. If not seeded, the equivalent permanent stabilization measures shall be evaluated by a Construction Professional Landscape Architect (PLA) and approved by the Engineer. Unless otherwise prohibited by environmental permit, seeding is required to stabilize the unpaved disturbed dry area within the Waters of the U.S. Seeding area below the Ordinary High-Water Mark (OHWM) shall exclude any definable low flow channel(s). The seeding area below the OHWM shall also exclude the area directly under bridge(s).

Seeding may be included as part of a landscape project as specified in Section 807 or used for erosion control as part of a Storm Water Pollution Prevention Plan (SWPPP) as specified in Subsection 104.09 of the specifications, or both.

In either case, seeding shall be accomplished in two (2) stages. The first stage shall consist of tillage; furnishing and applying compost, chemical fertilizer, and sulfur; furnishing and planting the contract-specified seed mix; and furnishing, applying and affixing final mulch cover. The second stage, beginning after the first stage has been accepted by the Engineer, shall be a 45-calendar-day period during which time the contractor shall be responsible for maintaining and stabilizing the seeded and mulched areas, and restoring damaged or eroded areas.

Seeding construction shall be completed before Substantial Completion. The 45-calendar-day seeding maintenance period, including any re-seeding work if required after Initial Seeding Construction Acceptance, shall be completed before project Final Acceptance.

Seeding used as part of a SWPPP shall be completed before Substantial Completion, or sooner as required in the SWPPP. The 45-calendar-day seeding maintenance period, including any re-seeding work if required after Initial Seeding Construction Acceptance, shall be completed before project Final Acceptance.

No time extension will be granted for seeding not completed as specified herein.

Seeding areas below the OHWM shall be exempted from the 45-calendar-day maintenance period requirement.

An on-site pre-activity seeding construction meeting shall be coordinated by Construction PLA. The necessity of half-acre (0.5 acre) sample demonstrative area of Class II Seeding shall be verified for the seeded areas greater than five (> 5) acres excluding shoulder build-up areas (edge of pavement build-up areas). The contractor shall guarantee in writing to furnish all suitable equipment for soil tillage, seeding, and mulching during pre-activity seeding construction meeting as evaluated by a Construction PLA, as well as approved by the Engineer.

2.0 Materials:

2.01 General:

The contractor shall avoid persistent herbicide residues contamination in the soil. Soil sterilant herbicides, especially bare-ground herbicides with long-lasting Soil Persistence, shall be prohibited to use for all unpaved project areas that will be seeded. Pre-emergence herbicides shall be prohibited from unpaved project areas that will eventually be seeded.

Appropriate documentation, as specified below, shall be submitted to the Engineer a minimum of 30 calendar days before the start of a scheduled seeding activity. No materials shall be delivered to the site until the documentation has been approved by the Engineer.

Unless otherwise specified, Certificates of Compliance conforming to the requirements of Subsection 106.05 of the specifications shall be provided for all materials.

The contractor shall also provide tests from accredited laboratories for all materials, as specified herein. Should the contractor perform its own testing, such test results shall also be provided to the Engineer.

2.02 Seed:

(A) General Requirements:

The species, variety, and strain of seed (designated elsewhere herein as contract-specified seed) shall be as shown on the plans or as specified herein. The contract-specified seed shall be obtained from seed suppliers through harvesting of wildland collections, or field-grown seeds grown prior to or during the contract period.

A Certificate of Analysis for each seed species shall be furnished to the Engineer at least four (4) weeks prior to the seeding construction. No seed shall be furnished to, or delivered to, the project until approved by the Engineer and Roadside Development. The Certificates of Analysis shall contain the following information for each seed sample: the test results of the Fifty States Noxious Weed list, all seeds including weed seeds listed, purity and germination, tetrazolium test results, when used and any pathology found to be present. The sample testing, when available for the native plant species, shall use the rules for testing seeds published by the “Association of Official Seed Analysts” or the “Society of Commercial Seed Technologists.”

If the samples indicate species listed as noxious, restricted, or invasive, the lot will be rejected or evaluated for use on the project. The list of noxious, restricted, or invasive species is located at Roadside Development and linked to the following website:

http://www.azdot.gov/business/engineering-and-construction/roadway-engineering/roadside-development

Within 30 calendar days after the award of contract, the contractor shall submit the name of the seeding subcontractor to be used, along with written confirmation from seed suppliers and**/**or collectors, on their letterhead, that the source(s) for the contract-specified seed has been secured. A minimum of three (3) separate confirmation letters from seed suppliers, providers, and**/**or collectors shall be presented through the Engineer for a Construction PLA's evaluation within the context of reliable sources. If any of the contract-specified seed is expected to be unavailable prior to the time specified for seeding, in accordance with Subsection 2**.**02(B) below, the contractor shall notify the Engineer at this same time.

The seed shall be delivered to the project site unmixed in standard, sealed, undamaged containers for each seed species. Each container shall be labeled in accordance with the appropriate provisions of the Arizona Revised Statutes and the U.S. Department of Agriculture rules and regulations under the Federal Seed Act. Labels shall indicate the scientific genus, species, subspecies**/**varieties or strains of seed, the percentage of germination, purity, weed content, and testing information. Unless otherwise approved by Roadside Development Section through the Engineer, the date of analysis for Tetrazolium Test **(**TZ**)** shall not be more than 15 months prior to the delivery date from a seed provider**/**supplier. A Certificate of Analysis from an accredited seed-testing laboratory, and conforming to Subsection 106**.**05 of the specifications, shall accompany each container of seed.

Unless otherwise approved by Roadside Development through the Engineer, weed content of the contract-specified seed mix shall not exceed 0**.**5 percent (**≤** 0**.**5**%**).

In addition to Federal Seed Act Regulations, unless otherwise approved by Roadside Development through the Engineer, the contamination of seed lots from the following noxious **/** invasive plant species shall not be permitted.

NOXIOUS / INVASIVE WEEDS WATCH LIST FOR THE CONTAMINATED SEED LOTS	
SCIENTIFIC NAME	**COMMON NAME**
Amaranthus retroflexus	Redroot Amaranth **/** Redroot Pigweed **/** Red-Rooted Pigweed **/** Rough Pigweed
Bassia scoparia **(syn.** *Kochia scoparia***)**	Kochia **/** Fireweed
Bothriochloa bladhii **(syn.** *Andropogon bladhii* **/** *Andropogon caucasicus* **/** *Andropogon intermedius* **/** *Bothriochloa caucasica* **/** *Bothriochloa intermedia***)**	Caucasian Bluestem
Bothriochloa ischaemum	Yellow Bluestem

NOXIOUS / INVASIVE WEEDS WATCH LIST FOR THE CONTAMINATED SEED LOTS	
SCIENTIFIC NAME	**COMMON NAME**
Brassica tournefortii	Sahara Mustard **/** Mediterranean Mustard **/** Mediterranean Turnip **/** Prickly Turnip
Bromus tectorum	Cheatgrass **/** Downy Brome **/** Broncograss **/** Downy Chess **/** Soft Chess **/** Drooping Brome
Cynodon dactylon **(syn.** *Capriola dactylon***)**	Bermudagrass **/** Devilgrass
Centaurea melitensis	Malta Star-thistle **/** Napa Star Thistle **/** Tocalote
Cenchrus spinifex **(syn.** *Cenchrus incertus* **/** *Cenchrus pauciflorus* **/** *Cenchrus parviceps***)**	Field Sandbur **/** Coastal Sandbur **/** Common Sandbur
Chorispora tenella	Crossflower **/** Purple Mustard **/** Blue Mustard **/** Musk Mustard **/** Beanpodded Mustard **/** Tenella Mustard
Cuscuta spp**.**	Dodder / Angel Hair / Devil's Hair / Devil's Ringlet / Goldthread / Hairweed / Lady's Laces / Strangleweed / Witch's Hair / Amarbel
Eragrostis lehmanniana	Lehmann Lovegrass
Euphorbia esula	Leafy Spurge **/** Green Spurge **/** Wolf's Milk
Euphorbia prostrata **(syn.** *Chamaesyce prostrata* **/** *Euphorbia chamaesyce***)**	Prostrate Spurge **/** Prostrate Sandmat **/** Ground Spurge **/** Blue Weed
Onopordum acanthium	Scotch Thistle **/** Cotton Thistle
Pennisetum ciliare **(syn.** *Cenchrus ciliaris***)**	Buffelgrass **/** African Foxtail Grass
Physalis spp**.**	Ground Cherry **/** Jerusalem Cherry **/** Strawberry Tomato
Salsola kali subsp**.** *tragus* **(syn.** *Salsola iberica***)**	Russian Thistle **/** Tumbleweed
Setaria faberi	Japanese Bristlegrass **/** Giant Foxtail
Setaria pumila **(syn.** *Chaetochloa glauca / Chaetochloa lutescens / Panicum glaucum / Setaria glauca***)**	Yellow Foxtail **/** Pigeon Grass / Yellow Bristlegrass
Setaria viridis	Green Bristlegrass **/** Pigeon Grass / Wild Millet **/** Green Foxtail
Solanum physalifolium **(syn.** *Solanum physalifolium / Solanum sarachoides / Solanum villosum***)**	Hoe Nightshade **/** Argentine Nightshade **/** Green Nightshade **/** Hairy Nightshade

The contractor shall provide all seed tag labels to the Engineer. No payment will be made for seeds until tag labels and Certificates of Analysis from all seeds to be used on the project have been submitted as specified.

Both the contractor and the seed supplier shall store seed under dry conditions, at temperatures of between 35 °F and 120 °F, and out of direct sunlight. Prior to using the seed, the contractor, as well as seed supplier, shall both provide a certification letter to the Engineer verifying that the seed was stored as specified herein.

Legume seed shall be inoculated with appropriate bacteria cultures approved by the Engineer, in accordance with the culture manufacturer's instructions.

Tetrazolium staining shall be acceptable to test for germination and hard seed. Cut or fill testing will not be allowed. As directed by the Engineer, seeds with an expiration date past the acceptable test date or not meeting the specified conditions for storage shall be retested by the contractor. The Engineer may perform random sampling of seeds throughout the project. Mixing of the specified seed at the project site shall be under the supervision of the Engineer.

Application rates of seed as specified are for Pure Live Seed (PLS). PLS is determined by multiplying the sum of the percent germination of seeds, including hard or dormant seeds, by the percent purity.

Diversified seed mix species and the PLS rates are shown in Table 1 below**:**

TABLE 1			
DIVERSIFIED SEED MIX—for All Unpaved Disturbed Areas, Unvegetated Areas, Receiving Pervious Areas (RPA), Decentralized Stormwater Management Areas, and/or Designated Areas			
Botanical Name	**Common Name**	**PLS Rate (Pounds Per Acre)**	**Per Pound Value for Substitution (see text)**
Achillea lanulosa	Western Yarrow	1	$40
Astragalus canadensis	Canadian Milkvetch	1	$80
Artemisia frigida	Fringed Sagebrush	0.2	$100
Asclepias speciosa	Showy Milkweed	2	$150
Asclepias tuberosa	Butterfly Milkweed	1	$300
Bothriochloa barbinodis	Cane Beardgrass	1	$45
Bouteloua curtipendula cv**.** Vaughn *****	Sideoats Grama	2	$15
Bouteloua gracilis cv**.** Hachita	Blue Grama	1	$15
Coreopsis tinctoria	Plains Coreopsis	1	$20
Dalea purpurea	Violet Prairie Clover	3	$50
Distichlis stricta **(syn.** Distichlis spicata**)**	Desert Saltgrass	1	$70
Encelia farinosa	Incienso Brittlebush	3	$35
Encelia frutescens	Button Brittlebush	1	$30
Gaillardia aristata	Blanket Flower	2	$20
Gaillardia pulchella	Firewheel	0.5	$20
Hedysarum boreale	Boreal Sweet-Vetch	1	$100
Hilaria jamesii	Galleta Grass	3	$40
Koeleria macrantha	Prairie Junegrass	0.5	$30
Lupinus bicolor	Miniature Lupine	4	$65
Linum lewisii	Blue Flax	2	$10
Oryzopsis hymenoides **(syn.** Achnatherum hymenoides**)**	Indian Ricegrass	3	$10
Phacelia crenulata	Notch-leaf Phacelia	1	$50
Poa fendleriana	Muttongrass	0.5	$70
Pascopyrum smithii	Western Wheatgrass	2	$17

Penstemon palmeri	Palmer Penstemon	2	$80
Sporobolus airoides	Alkali Sacaton	0.3	$30
Senna covesii	Coues' Cassia	2	$50
Sporobolus cryptandrus	Sand Dropseed	0.1	$10
Sitanion hystrix **(syn.** Elymus elymoides**)**	Squirrel-tail Grass	2	$45
Verbesina encelioides	Golden Crownbeard **/** Cowpen Daisy	1	$100
Zinnia acerosa	Dwarf White Zinnia	1	$150
Estimated Per Acre Subtotal Value for Seeds Only			**$ 2,529.00**

***** Niner may be furnished if Vaughn is determined by Roadside Development as unavailable from seed sources.

(B) Seed Substitution:

No substitution of the contract-specified seed will be allowed unless evidence is submitted documenting that the contractor has made a diligent effort to obtain the contract-specified seed from either seed suppliers or collectors, and that the contract-specified seed will not become available prior to the time specified for seeding in the contractor's approved construction schedule.

The contractor may also request a substitution if the lowest price available for the contract-specified seed is greater than two (2.0) times the value shown in Table 1. The contractor shall provide documentation from a minimum of three (3) seed suppliers or collectors supporting such a request. Documentation shall include copies of the invoices from each supplier or collector. Only those invoices obtained within three (3) weeks of the time specified for seeding in the contractor's approved construction schedule will be acceptable.

Should a substitution of the contract-specified seed be requested for one of the two (2) reasons specified above, and the contractor's documentation is approved by the Engineer, the Department's Roadside Development Section will specify an alternate seed within five (5) working days of the Engineer's approval of the contractor's documentation. The alternate seed will only be allowed when there is an insufficient quantity of the contract-specified seed, as determined in the previous two (2) paragraphs, for the areas to be seeded as called for herein or as required for erosion control. The contractor shall obtain and apply the alternate seed, as required, to all such remaining areas. Unless otherwise approved by the Engineer, the approved alternate seed will only be allowed until such time that contract-specified seed meeting the availability and price requirements specified herein can be provided.

For each pound of contract-specified seed not provided by the contractor, the value indicated in Table 1 will be deducted from the contract amount. The price per pound for the alternate seed selected by the Department, as specified above, will be determined in accordance with Subsection 109.04(D)(2) of the specifications. No additional adjustments will be made for

substituting the alternate seed, the costs being considered as included in the contract item for seeding.

No payment will be made for areas seeded with unapproved seed. No payment will be made for areas seeded until the entire approved seed mix **(**including all authorized seed substitutions**/**adjustments**)** is executed.

2.03 Tacking Agent:

Tacking agent shall be a naturally occurring organic compound and shall be non-toxic. The tacking agent shall be a product typically used for binding soil and mulch in seeding or erosion control operations. Approved types shall consist of mucilage or gum by dry weight as active ingredient obtained from guar or plantago. The tacking agent shall be labeled indicating the type and mucilage purity.

The contractor shall have the tacking agent swell volume tested by an approved testing laboratory using the USP method. The standard swell volume shall be considered as 30 milliliters per gram. Material shall have a swell volume of at least 24 milliliters per gram. Certified laboratory test results for homogenous consistency shall be furnished to the Engineer for each shipment of tacking agent to be used on project areas. Tacking agent rates shall be adjusted to compensate for swell volume variation. Material tested with lesser swell volume shall have the tacking agent rate increased by the same percentage of decrease in swell volume from the standard 30 milliliters per gram. Material tested with greater volume may reduce tacking agent rates by the same percentage of increase in swell volume from the standard 30 milliliters per gram. Tacking agent shall be pure material without starches, bentonite, or other compounds that would alter the swell volume test results of mucilage, or the effectiveness of the tacking.

2.04 Thermally-Refined Wood Fiber:

Wood cellulose fiber mulch shall conform to the requirements of Subsection 805-2**.**03 of the Standard Specifications, except as modified herein, and shall be from thermo-mechanically processed wood, processed to contain no growth germination inhibiting factors. The mulch shall be from virgin wood, manufactured and processed so the fibers will remain in uniform suspension in water under agitation to form homogenous slurry. Paper products will not be considered as virgin wood. The thermally-refined wood fiber mulch shall have the properties shown in Table 2 below:

TABLE 2	
Virgin Wood Cellulose Fiber	90**%** min**.**
Recycled Cellulose Fiber	10**%** max**.**
Ash Content	0**.**8**% +/-**0**.**3**%**
pH	4**.**5 **+/-**1**.**0
Water Holding Capacity	10 **:** 1 **(**water **:** fiber**)** Min**.**

2.05 Weed Free Straw Mulch:

(A) General:

Straw mulch including barley straw shall conform to the requirements of Subsection 805-2.03 of the Standard Specifications, except as modified herein, and shall be from the current season's crop. A letter of certification from the supplier shall be required stating that the straw was baled less than twelve (12) months from the delivery date. Additionally, a bill of sale for straw material shall be presented for a Construction PLA's evaluation within context from reliable sources through the Engineer.

All straw, including hydraulically applied straw, shall be free from noxious weeds in compliance with the standards and procedures of the North American Weed Management Association (NAWMA) or the Arizona Crop Improvement Association (ACIA). The contractor shall provide documentation, including a transit certificate, and appropriate labels and/or marking twine, from the ACIA or NAWMA that straw materials to be used for mulch are free of noxious weeds. The straw shall be accompanied by the certification, labels and/or marking twine at the time of delivery to the project site. Straw delivered to the project without such information will be rejected and promptly removed from the project.

Rye straw and oat straw will not be acceptable.

(B) Weed Free Straw Mulch for Hydraulic Application:

Hydraulically applied straw mulch shall be wheat, barley, or rice straw processed into various particle sizes, mixed with water and tacking material, and applied as a non-clogging slurry using a hydroseeder. A minimum of 70 percent (70%) of wheat, barley, or rice straw in the mix shall be not less than 1/2 inch ± 1/4 inch in length. Straw particles may be longer provided that the particles can be used with the selected hydroseeder without clogging. Hydraulically applied straw mulch, as furnished by the manufacturer, may contain up to ten (10) percent paper or cotton materials in dry weight. Hydraulically applied straw mulch shall also contain 20 percent (20%) of wood fiber in dry weight. The combined dry weight percentage of paper, cotton, and wood fiber materials together shall be not less than 15 percent (15%) nor more than 30 percent (30%) of the hydraulically applied straw mulch. The date of installation of hydraulically applied straw mulch cover shall be less than twelve (12) months from the date of production. The date of production of hydraulically applied straw mulch material shall be presented for a Construction PLA's verification through the Engineer. All hydraulically applied straw mulch material shall also meet the requirements of Subsection 805-2.05 (A) stated above.

2.06 Slow-release Chemical Fertilizer and Sulfur:

Chemical fertilizer shall conform to the requirements of Subsection 805-2.06 of the specifications and shall be the kind hereafter specified. Fertilizer shall be composed of a mixture of one part sulfur-coated urea 25-4-8, one-part monoammonium phosphate 11-52-0-, and one-part methylene urea 38-0-0. The sulfur-coated urea, a blended fertilizer 25-4-8, shall have approximately 80 percent (80%) of the nitrogen defined as slow release, and contain five

percent (5%) Iron, ten percent (10%) sulfur and trace amounts of zinc and manganese. The result shall be a 24-18-2 chemical blended fertilizer, as specified herein.

In addition to the fertilizer mixture, agricultural sulfur compounds, comprised of between 80 percent (80**%**) and 96 percent (96**%**) sulfur, shall be applied at the rate specified in Section 3.02. Chemical fertilizer and sulfur shall not be applied to the seeding area below the OHWM.

2.07 Water:

Water shall be free of oil, acid, salts or other substances which are harmful to plants. All non-potable water shall be tested for its suitability for seeding**/**planting with the water quality-related concerns of salinity, pathogens and contaminants. The water quality testing result shall be presented for a Construction PLA's evaluation through the Engineer. An Arizona Guide to Water Quality and Uses **(**web link**:** ***https://extension.arizona.edu/sites/extension.arizona.edu/files/pubs/az1610.pdf*** **)** Figure 8, Water Quality and Uses Triangle shall be considered as reference for testing result evaluation and approval.

Water Quality Standards for seeding on construction projects that reach or exceed one-contiguous-acre **(≥** 1 contiguous acre**)** permit threshold soil**/**ground disturbance defined under current Arizona Pollutant Discharge Elimination System (AZPDES) Construction General Permit (CGP) and**/**or National Pollutant Discharge Elimination System (NPDES) CGP**:**

(A) On Arizona Non-Native Americans Land **(Non-Tribal)**, water quality for seeding construction within 0**.**25-mile buffer zones of Impaired and**/**or Outstanding Arizona Waters (OAWs) shall meet the standards of current AZPDES CGP, as well as requirements of these Special Provisions.

The web link of ADEQ's eMaps within the State of Arizona:
https://www.azdeq.gov/emaps

(B) Water quality for seeding construction within Arizona Native Americans Land **(Tribal)** shall meet the standards of EPA-established or approved Total Maximum Daily Loads (TMDLs) under current NPDES CGP, as well as requirements of these Special Provisions.

The web link of EPA-established or approved TMDLs within the State of Arizona:
https://www.epa.gov/npdes/epas-stormwater-discharge-mapping-tools

The source of water shall be approved by a Construction PLA through the Engineer prior to use.

2.08 Compost:

Compost in bulk or furnished in containers or bags, shall consist of composted organic vegetative materials, and may contain worm castings. No animal manures or city biosolids shall

be used in the composting or added to the compost. Prior to being furnished on the project, compost samples shall be tested for the specified microbiological and nutrient conditions, including maturity and stability, by a testing laboratory approved for testing organic materials. During pre-activity seeding construction meeting, compost test written results submitted to the Engineer for approval shall be within nine (9) months from the date of the official lab test.

Compost material shall be dark brown in color with the parent material composted and no longer visible. The structure shall be a mixture of fine and medium size particles and humus crumbs. The maximum particle size shall be within the capacity of the contractor's equipment for application to the constructed slopes. The odor shall be that of rich humus with no ammonia or anaerobic odors.

Bulk Compost shall also meet the requirements of Table 3**:**

TABLE 3	
Cation Exchange Capacity **(**CEC**)**	Greater than 45 meq**/**100 g
Carbon **:** Nitrogen Ratio **(**C **:** N**)**	Less than 20 **:** 1
pH **(**of extract**)**	5**.**0 **–** 8**.**5
Organic Matter Content	Greater than 30**%**
Total Nitrogen **(**not added**)**	Greater than 1**%**
Micronutrients **(**added**)**	S, Ca, Mg, Na, Fe, Al, Mn, Cu, Zn, B
Maturity Index	Greater than 50**%** on Maturity Index at a 10 **:** 1 ratio
Stability Indicator, CO_2 Evolution**:** Biologically Available C **(**BAC**)**	Less than 4mg CO_2-C**/**g OM**/**day is desirable**.** From 4 through 8mg CO_2-C**/**g OM**/**day is acceptable**.** Greater than 8mg CO_2-C**/**g OM**/**day is not acceptable**.**
The CEC lab testing method shall refer to EPA9081 at the web link**:** *http://epa.gov/osw/hazard/testmethods/sw846/pdfs/9081.pdf*	

Bulk compost is preferred and shall be applied to areas designated for seeding at the specified rate of 15 cubic yards per acre prior to final tillage for incorporation into the soil seedbed. Unless otherwise approved by the Engineer, bulk compost shall be engaged to all areas where equipment can be operated for final tillage in order to incorporate into the soil seedbed**.** Bulk compost may be substituted with hydraulically applied compost for small sized projects that cover less than five (**<** 5) acres of Class II Seeding as evaluated by a Construction PLA, as well as approved by the Engineer.

The volume of bulk compost shall be measured and documented for Construction PLA's verification and approval through the Engineer.

In areas where bulk compost cannot be applied by broadcast methods, compost shall be applied hydraulically as per the approval of the Engineer. Hydraulically applied compost shall be applied at the rate of 5 cubic yards **(**or 135 cubic feet**)** per acre to mini-benched slopes or on other approved areas for incorporation into the soil seedbed. For seeding areas 3**:**1 and flatter where bulk compost cannot be employed, hydraulically applied compost shall be utilized at the rate of 5 cubic yards **(**or 135 cubic feet**)** per acre as per the approval of the Engineer. Hydraulically applied compost may also be combined with seed, soil amendments and fertilizer in the same slurry prior to the final mulch cover with the approval of the Engineer.

The volume of hydraulically applied compost shall be measured and documented for Construction PLA's verification and approval through the Engineer.

Hydraulically applied compost shall meet the requirements of Table 4 below:

TABLE 4	
Cation Exchange Capacity **(**CEC**)**	Greater than 40 meq**/**100 g *****
Carbon **:** Nitrogen Ratio **(**C **:** N**)**	Less than 20 **:** 1
pH **(**of extract**)**	5**.**0 **–** 8**.**5
Organic Matter Content	Greater than 35**%**
Total Nitrogen **(**not added**)**	Greater than 1**%**
Micronutrients **(**added**)**	S, Ca, Mg, Na, Fe, Al, Mn, Cu, Zn, B
Stability Indicator, CO_2 Evolution**:** Biologically Available C **(**BAC**)**	Less than 4mg CO_2-C**/**g OM**/**day is desirable**.** From 4 through 8mg CO_2-C**/**g OM**/**day is acceptable**.** Greater than 8mg CO_2-C**/**g OM**/**day is not acceptable**.**
Moisture Content by Weight	From 15**%** through 25**%**
The CEC lab testing method shall refer to EPA9081 at the web link**:** *http://epa.gov/osw/hazard/testmethods/sw846/pdfs/9081.pdf*	

***** When CEC is from 50 meq**/**100 g through 55 meq**/**100 g, in order to be approved, the contractor may add 100 pounds additional Hydraulically Applied Compost per acre to compensate for the lower-than-standard CEC value.

Compost shall not be applied to the seeding area below the OHWM. The choice between bulk compost and hydraulically applied compost shall be evaluated, as well as coordinated by a Construction PLA according to specific project conditions with the approval of the Engineer.

2.09 Soil Conditioners:

Soil conditioners, when required, will be as shown in the Special Provisions.

3.0 Construction Requirements:

3.01 General:

Seeding Operations:

At least two (2) weeks prior to beginning seeding, the contractor shall complete and submit a batch mix and seed application form to the Engineer for approval. The batch mix form will be supplied by the Engineer.

After acceptance of the form stated above, the Engineer and contractor in coordination with Construction PLA shall determine a half-acre (0.5 acre) sample demonstrative area to be seeded and mulched prior to applying seed to the remainder of the project. Both regular straw mulch and hydraulically applied straw mulch shall be applied to the sample demonstrative area, as determined during on-site pre-activity seeding construction meeting. Both straw mulches shall be representative of the materials proposed for use on the project. If the seeding and mulching procedures, as well as outcomes, are acceptable by Construction PLA, the contractor shall begin seeding operations as specified herein. Photographic Documentation of half-acre (0.5 acre) sample demonstrative seeded/mulched area shall be recorded and submitted to a Construction PLA, as comparative standard representation (mandatory visual reference) for Seeding Acceptance under Subsection 3.07 stated below.

The contractor shall notify the Engineer at least two (2) days prior to commencing any phase of seeding operations for the remainder of the project.

The equipment and methods used to distribute seeding materials shall provide an even and uniform application of seed, mulch, and other materials at the specified rates.

It is the contractor's responsibility to furnish all suitable equipment for soil tillage, seeding, and mulching at no additional cost to the Department.

Unless specified otherwise in the Special Provisions, seeding operations shall not be performed on undisturbed soil outside the clearing and grubbing limits of the project or on steep rock cuts.

The contractor shall coordinate the seeding operations with the grading operations to determine mobilization frequency as embankment and cut slopes are finished throughout the duration of the project. Seeding shall be done during suitable weather and soil conditions (soil–water and soil–temperature regimes) for tillage and placement of materials. Seeding operations shall not be performed below 35 degrees Fahrenheit (°F). Seeding operations shall not be performed when wind exceeds ten (10) miles per hour or, in the opinion of the Engineer, conditions would prevent uniform application of materials or would carry seeding materials into areas not designated for seeding. If wind exceeds ten (10) miles per hour, the seeding operation shall be evaluated by a Construction PLA and approved by the Engineer. If approved, the contractor shall perform seeding operation close to the ground surface with a hydro-seeding hose and hand-held hose-end sprayer nozzle or other equivalently effective seeding methods to guarantee all seeding materials are applied on the target area without being blown away by

wind. The contractor is responsible for protecting ambient air and water quality during the seeding operation.

The contractor shall not expose an area greater than 750,000 square feet **(**≤17**.**22 acre**)** at any one location within the project limits until the seeding proposed for that portion of the project has been installed and accepted by the Engineer. Seeding shall be accomplished within 14 days after slopes and disturbed areas have been completed. Seeding operations shall comply with Subsection 104**.**09 and the applicable portions of Section 203 of the specifications, and as directed by the Engineer.

Frequent mobilizations may be required to accomplish seeding as specified herein. The Department will consider the cost of such multiple mobilizations to be included in the price bid for the seeding. No adjustments will be made to the contract for the number of seeding mobilization activities. Should the contractor fail to provide seeding for a sub-area as specified herein, the Engineer will immediately notify the contractor of such non-compliance. Should the contractor fail to immediately remedy the unstabilized area, the Engineer may suspend work until such seeding stabilization has been completed or proceed to provide the necessary seeding stabilization. The entire cost of such work will be deducted from the monies due or to become due to the contractor. In addition, no adjustment to the contract time will be made for suspensions resulting from the contractor's failure to provide seeding for a sub-area within the time periods specified herein.

3.02 Tillage:

Where equipment can operate, the area to be seeded shall be prepared with a ripper bar, chisel plow, or with other devices to provide thorough soil cultivation to the depth specified below. It is the contractor's responsibility to furnish all suitable equipment for soil tillage at no additional cost to the Department.

Where equipment is not suitable for operation, hand tillage and**/**or other manual methods shall be utilized as approved by the Engineer. Tillage depth shall follow the requirements specified herein in accordance with assessment**/**measurement from a Construction PLA, as well as acceptance by the Engineer.

For areas too steep to be prepared for seeding after the slope has been completed, as determined by the Engineer, tillage shall be accomplished with appropriate equipment as the slope is being constructed. On slope areas, all tillage shall be horizontal and parallel to the contours of the areas involved in order to create a roughened surface condition to reduce stormwater runoff velocity and volume. All seeding areas suitable for tillage shall be pre-tilled to promote on-site stormwater infiltration and alleviate stormwater surface runoffs, as a part of stormwater peak flow and Volume Reduction Approaches (VRAs). All seeding areas suitable for tillage shall be adequately pre-tilled to minimize pollutant loads anticipated in nonpoint source stormwater runoffs. All project areas eroded shall be restored to the specified condition, grade, and slope as directed prior to seeding.

Cut slopes shall be prepared with ridges and deep tillage or shall be mini-benched so as to detain rainwater**/**moisture close to its source. On fill slopes, the operations shall be conducted in such a manner as to form minor ridges thereon to assist in retarding runoff associated erosion**/**pollution and favor germination of the seed through detaining rainwater**/**moisture close to its source.

Except as specified herein, slopes shall be constructed in accordance with Subsection 203-3**.**03(B) of the specifications. Cut slopes flatter than 3**:**1 (horizontal to vertical) shall be tilled a minimum of 12 inches in depth, and fill slopes flatter than 3**:**1 shall be tilled to a six-inch minimum depth. All slopes steeper than 3**:**1, and areas which could potentially be affected by underground utilities, shall be tilled to a minimum six (6) inches in depth, and left in a roughened surface condition as they are constructed.

Track-walking or imprinting of rocky new fill slopes through mechanical methods in lieu of tillage may be allowable if accepted by a Construction PLA, through the Engineer. All final impression marks generated by track-walking or imprinting shall be horizontal and parallel to the contours of slope areas involved in order to create a roughened surface condition and reduce stormwater runoff velocity, enhance erosion**/**sediment control, as well as energy**/**velocity dissipation.

Tillage shall be a minimum of two (2) inches in depth for the first ten (10) feet from the toe of AC wedge including shoulder build-up areas (edge of pavement build-up areas) or from the outside edge of curb and gutter.

Care shall be taken during the seeding operations to prevent damage to existing trees and shrubs in the seeding area in accordance with the requirements of Subsection 107**.**11 of the specifications.

Tillage may require passing the equipment over the area several times to provide thorough soil cultivation. Furrows from the village shall be no more than 12 inches apart. No work shall be done when the moisture content of the soil is unfavorable to tillage.

All competitive vegetation shall be uprooted prior to seeding and the soil shall be left in a friable roughened surface condition free of clods or large stones over four (4) inches in any dimension, and other foreign material that would interfere with the seeding operation. Exposed stones larger than four (4) inches shall be removed and disposed of in an approved manner prior to grading and seeding. Invasive and non-native weed species shall be eradicated according to the MISCELLANEOUS WORK **(**CONTROL OF NOXIOUS PLANTS**)** of these Special Provisions whenever applicable.

All disturbed soil areas covered with existing chipped wood materials and**/**or native plant residues, which will <u>not</u> interfere with the tillage operation, shall be tilled for incorporation into the soil along with chemical fertilizer, as well as soil amendments (sulfur and compost) prior to final tillage and seeding.

Regardless of the method of seeding application, all areas prepared with tilling shall have chemical fertilizer and soil amendments (sulfur and compost) uniformly applied and incorporated (disked) into the soil prior to final tillage and seeding.

Chemical fertilizer and sulfur shall be applied at the rate of 200 pounds each per acre. Bulk compost shall be applied at the rate of 15 cubic yards per acre.

Unless otherwise approved by the Engineer, bulk compost shall be applied using broadcast methods to all areas where equipment can be operated. For areas where bulk compost cannot be applied by broadcast methods, as evaluated by a Construction PLA and determined by the Engineer, compost shall be applied hydraulically at the rate specified in Section 2.08 above. Hydraulically applied compost shall not be combined with final mulch cover in the same slurry. However, seed, sulfur and fertilizer may be utilized together with hydraulically applied compost in the same slurry with the approval of the Engineer. Final mulch cover shall be installed on top of all seeded areas as a separate construction sub-phase.

Slopes 3:1 and flatter shall have fertilizer, sulfur, and compost tilled/disked into a minimum of the top four (4) inches of the surface. Slopes steeper than 3:1 shall have fertilizer, sulfur, and compost uniformly broadcast for incorporation into the soil as directed by the Engineer. Unless otherwise operated together with hydraulically applied compost for the approved locations, fertilizer and sulfur shall not be applied hydraulically to areas for seeding.

Tillage shall not be applied for the seeding area below the OHWM.

For mini-benched slopes, fertilizer, compost, and sulfur shall be applied at the specified rates with no tillage or incorporation.

Seeding shall not initiate until all tillage areas and/or mini-benched slopes are accomplished as approved by a Construction PLA through the Engineer.

3.03 Seeding:

(A) General:

Drill seeding with straw mulch shall be considered as the preferred method of seed application when practicable. Unless otherwise approved by the Engineer, drill seeding shall be used for all areas with slopes of 3:1 or less.

Hydroseeding shall be the alternative method for seed distribution for slopes in excess of 3:1, and where drill seeding is not practicable or suitable for soil conditions and seed types, as determined by the Engineer.

Seeds not suitable for drill seeding and hydroseeding methods shall be broadcast manually. Areas to be seeded manually shall be completed after the final soil tillage and prior to any drill or hydroseeding.

Regardless of the seeding method(s), the contractor is responsible to guarantee intimate seed-soil contact. Seed application on top of straw mulch cover or hydraulically applied straw mulch cover shall be rejected. To guarantee intimate seed-soil contact, seed application on top of existing exposed chipped wood materials and/or plant residues ground cover shall be rejected.

Final straw mulch cover or hydraulically applied straw mulch cover shall be applied on all seeded areas, as specified in Sections 3.04 and/or 3.05, within 24 hours of seed application. The seeding application shall be accomplished prior to installation of straw mulch cover or hydraulically applied straw mulch cover. Combining the seed application process with the mulching process will not be acceptable. By implementing Low Impact Development (LID) source-control measure, the contractor shall install a final straw mulch cover or hydraulically applied final straw mulch cover to minimize raindrop splash erosion and wind erosion/dust, as close as possible at the source of disturbance to protect all seeded areas. Thermally-refined wood fiber shall not be utilized solely as final mulch cover to protect all seeded areas. Seeds shall be neither exposed nor visible after the installation of straw mulch cover or hydraulically applied straw mulch cover.

Unless otherwise specified in the Special Provisions, Class II seeding areas shall not be watered after planting.

(B) Drill Method:

After the tillage and incorporation of fertilizer, sulfur, and compost is completed and accepted by the Engineer, seed shall be planted with a drill seeder capable of accurately metering the specific seed mix. Use of a drill seeder shall not damage the prepared seedbed and shall provide a soil cover over the planted seed.

Seed shall be planted approximately 1/4 inch deep, with a maximum depth of 1/2 inch. The distance between the furrows produced using the drill process shall not be more than eight (8) inches. If the furrow openers on the drill exceed eight (8) inches, the area shall be drilled twice. Seeding shall be done with grass seeding equipment with double disc openers, depth bands, packer wheels or drag chains, rate control attachments, seed boxes with agitators and separate boxes for small seeds. Seed of different sizes shall be sowed from at least two (2) separate boxes adjusted or set to provide the planting rate as specified.

(C) Hydroseed Method:

Areas and seed types not suitable for drill-seeding, as determined by the Engineer, shall be hydroseeded. The contract-specified seed shall be applied in a slurry containing 200 pounds of thermally-refined wood fiber and a minimum of 40 pounds tacking agent per acre. Seed shall not be in the slurry for more than 30 minutes. Hydroseeded areas shall have 100 percent (100%) coverage from all directions as evaluated by a Construction PLA, as well as approved by the Engineer. Hydroseeded areas shall also be mulched, as specified in Sections 3.04 or 3.05, within 24 hours of application of the seed.

(D) Manual Application:

Manually applied seeds shall be broadcast evenly to produce uniform distribution over the seeded areas.

3.04 Applying Straw Mulch as Final Mulch Cover on Top of Seeded Areas:

(A) General:

Within 24 hours after each area is planted, straw mulch shall be uniformly applied at the minimum rate of 2 1/2 tons per acre for areas to be crimped and tacked, and minimum two (2) tons per acre for tacked-only areas. Except for edge of pavement build-up areas, and unless otherwise specified by the Engineer, straw mulch shall be applied to all seeded areas. Areas to receive hydraulically applied straw mulch, if directed by the Engineer, shall be mulched in accordance with Section 3.05.

During seeding and mulching operations, care shall be exercised to prevent drifting and displacement of materials. Mulch material, which is placed upon trees and shrubs, roadways, structures, and upon any areas where mulching is not specified, or which is placed in excessive depths on mulching areas, shall be removed as directed. Mulch materials which are deposited in matted condition shall be loosened and uniformly spread to the specified depth over the mulching areas. Any unevenness in materials shall be immediately corrected by the contractor. In addition, the contractor shall minimize production of dust or other airborne particulate matter during application of straw mulch, either by moistening the straw, modifying equipment with misters, or through other means approved by the Engineer.

Except as specified in the next paragraph, straw mulch applied to seeded areas shall be immediately affixed by crimping and tacking after application. No mulch shall be applied to seeding areas which cannot be crimped and/or tacked by the end of each day. Any drifting or displacement of mulch before crimping and/or tacking shall be corrected by the contractor at no additional cost to the Department.

Crimping shall not be required for areas that are steeper than 3:1. Crimping may also be waived, when specifically directed by the Engineer, for drill seeded or hydroseeded areas with rocky conditions or other areas deemed unsuitable by the Engineer for crimping. Straw mulch applied to such areas shall only be tacked, as specified in Subsection 3.04(C) below.

Prior to the application of a tacking agent, protective covering shall be placed on all structures and objects where stains would be objectionable. All necessary precautions shall be taken to protect the traveling public and vehicles from damage due to drifting spray.

(B) Anchorage by Crimping:

Except as specified above in 3.04(A), crimping shall be required for all straw mulched areas. Straw mulch shall be anchored into the soil with a heavy disc. Discs shall be flat and serrated, with at least 1/4-inch thickness having dull edges, and spaced no more than nine (9) inches

apart. Straw mulch shall be anchored to a depth of at least two (2) inches and shall not be covered with an excessive amount of soil. Anchoring operations shall be across the slopes where practical, with no more than two (2) passes of the anchoring equipment. Immediately following the crimping operation, the crimped area shall be tacked as specified in Subsection 3.04(C) below.

(C) Anchorage by Tacking:

Straw mulch shall be anchored by tacking, using a slurry consisting of a minimum of 150 pounds of tacking agent, 500 pounds of thermally refined wood fiber mulch, and 300 gallons of water per acre. The contractor may increase the quantities of components to ensure the stability of the straw mulch to provide erosion control during the 45-calendar-day maintenance period at no additional cost to the Department.

3.05 Hydraulically Applied Straw Mulch with Tacking Agent as Final Mulch Cover on Top of Seeded Areas:

Areas seeded but not practical for straw mulch, as determined by the Engineer, shall have hydraulically applied straw mulch with tacking agent applied at the variable rates shown in Table 5 below.

TABLE 5

Slope (H:V)	Hydraulically Applied Straw Mulch (pounds per acre – dry weight)	Tacking Agent (pounds pure mucilage per acre – dry weight)	Thermally-Refined Wood Fiber (pounds per acre – dry weight)
Flat to 6:1	2,000	150	400
From greater than 6:1 to 3:1	2,500	150	500
Greater than 3:1	3,000	200	600
Erosive Soil Slopes or Highly Erosive Areas*	3,500	250	700
* As determined by Engineer			

The contractor shall submit a batch (tank) mix quantity schedule for mulch application to the Engineer for approval prior to mixing hydraulically applied straw mulch, thermally-refined wood fiber, and tacking agent in a slurry. Batch mixing and coverage will be monitored throughout the seeding operations. The contractor shall coordinate the mixing and application operations with the Engineer in advance of all mixing. Fertilizer or seed shall not be mixed into any slurry for temporary erosion control mulch application. To guarantee intimate seed-soil contact, seed shall not be mixed into any slurry with hydraulically applied straw mulch as final mulch cover.

3.06 Shoulder Build-up Areas — Edge of Pavement Build-up Areas:

Seeding shall be applied to all new earthen and milled asphaltic concrete edge of pavement build-up areas. Edge of pavement build-up areas shall be tilled two (2) inches deep from the toe of AC wedge to the toe of the edge of pavement build-up area prior to seeding.

After the two-inch tillage is complete, compost, fertilizer, seeding, and mulching shall be done in three (3) separate steps. For the first step, fertilizer and compost shall be broadcast evenly over both types of edge of pavement build-up areas. For the next step, seed shall be applied by hydroseeding for both types of areas. For the third step, seeded edge of pavement build-ups comprised of milled asphaltic concrete shall have hydraulically applied straw mulch and tacking agent applied, and earthen edge of pavement build-up areas shall have straw mulch or hydraulically applied straw mulch applied, with a tacking agent in either case. No crimping shall be required.

The application rate of hydraulically applied straw mulch and tacking agent shall be as specified in Table 5 above.

3.07 Seeding Acceptance:

After application, the Engineer will inspect seeded areas or sub-areas for conformance to the contract requirements. The contractor shall correct, to the satisfaction of the Engineer, any areas not conforming to the specifications. The 45-calendar-day seeding maintenance period will begin upon Initial Seeding Construction Acceptance of an area by a Construction PLA through the Engineer.

The contractor shall maintain and stabilize each area or sub-area, including edge of pavement build-up area(s), for a minimum period of 45 calendar days, after Initial Seeding Construction Acceptance, as evaluated by a Construction PLA, as well as approved by the Engineer. Any areas damaged from erosion, or those that have less than 90 percent (**<** 90**%**) of the remaining final mulch cover, shall be re-seeded, re-mulched, and re-tacked at no additional cost to the Department. The Construction PLA shall assess the seeded area in comparison to the pre-established half-acre (0**.**5 acre) sample demonstrative area for Class II Seeding to determine the necessity of re-seeding, re-mulching, and re-tacking.

A new 45-calendar-day maintenance period for an area is not required after re-seeding work, however the initial or original period remains in effect.

4.0 Method of Measurement:

Seeding (Class II) will be measured by the acre, to the nearest one acre of ground surface seeded. Measurements will be along the ground surface for the areas seeded and mulched, as approved by the Engineer.

5.0 Basis of Payment:

During pre-activity construction meeting, the contractor in conjunction with Engineer shall verify and be in agreement with the quantity of seeding areas as evaluated by a Construction PLA. The quantity of areas to be seeded shall be in compliance with environmental requirements.

The accepted quantities for Seeding (Class II), measured as provided above, will be paid in two (2) phases corresponding to the application stage and the 45-calendar-day maintenance stage.

Upon completion of the application stage through evaluation by a Construction PLA and acceptance by the Engineer in the presence of contractor, the contractor will be paid 70 percent (70**%**) of the contract bid price per acre for the completed work. Such price will be considered full compensation for furnishing and applying the contract-specified seed mix, fertilizers, soil amendments, tillage, mulch materials, and tacking agent, all required testing, as well as all equipment and labor required to complete the work as specified herein.

Upon completion of the 45-calendar-day seeding maintenance stage, and acceptance by a Construction PLA through the Engineer, the contractor will be paid the remaining 30 percent (30**%**) of the contract bid price per acre for the completed work. Such price will be considered full compensation for seeding maintenance, including all equipment, labor, and materials required to correct deficiencies in seeded, mulched areas, as specified herein.

No measurement or payment will be made for any of the mobilizations required to apply and stabilize the seeding for each area or sub-area, as specified herein, the cost being considered as included in the contract price for Seeding (Class II).

No measurement or payment will be made for traffic control for work during the 45-calendar-day seeding maintenance period.

An adjustment to the contract will be made if a contractor-requested seed substitution is approved as specified in Subsection 2**.**02(B) above.

(910CBARR, 05/16/24)

SECTION 910 CONCRETE BARRIERS:

910-2 Materials: of the Standard Specifications is revised to read:

Unless otherwise shown on the plans, concrete shall be Class S Portland cement concrete conforming to the requirements of Section 1006 of the specifications with a compressive strength of at least 4,000 pounds per square inch at 28 days.

Reinforcing steel shall be in accordance with the requirements of Section 1003 of the specifications.

Dowels shall be corrosion resistant coated dowel bars conforming to the requirements of AASHTO M 254, Type A.

Grout for pressure grouting the joints of precast barriers shall conform to the requirements of Subsection 602-2.03 of the specifications.

Grout for the bedding of precast barriers shall conform to the requirements of Subsection 913-2.01(D) of the specifications.

Joint sealant shall be a latex sealing compound conforming to the requirements of ASTM C834, applied as recommended in ASTM C1193.

910-3.01 General: of the Standard Specifications is revised to read:

Unless otherwise required by the project plans or Special Provisions, concrete barrier shall be constructed by any of the following methods or combinations thereof, at the contractor's option:

(A) Cast-in-place by slip-form;

(B) Cast-in-place by fixed forms; and/or

(C) Precast

Concrete barriers shall have a smooth, uniform appearance in their final position, conforming to the horizontal and vertical lines shown on the project plans or as ordered by the Engineer.

When concrete barriers are to be constructed on recently completed bridges, the barriers shall be placed after falsework has been released and as long after superstructure construction as the progress of the work will permit, unless otherwise ordered by the Engineer.

Concrete barriers and concrete barrier transitions which are constructed on bridge structures, approach slabs and anchor slabs shall be constructed by cast-in-place, fixed-form methods. Precast or slip-form methods will not be allowed.

When a concrete barrier is not placed on pavement, the supporting material shall be shaped and finished in reasonably close conformity to the lines, grades and dimensions established by the Engineer or shown on the project plans.

The material shall be compacted to at least 95 percent of the maximum density determined in accordance with the requirements of the applicable test methods of the ADOT Materials Testing Manual, as directed and approved by the Engineer.

All exposed surfaces shall be given a Class II finish and shall be in accordance with the requirements of Subsection 601-3.05 of the specifications. Curing of concrete shall be in accordance with the requirements of Subsection 1006-6 of the specifications.

Construction of barrier reinforcement shall conform to the requirements of Subsection 605-3 of the specifications.

Concrete placement shall not be conducted over live traffic.

Barrier markers shall be installed in accordance with the details shown on the plans.

910-3.02 Cast-In-Place by Slip-Form or Extrusion: the title and the text of the Standard Specifications are revised to read:

910-3.02 Cast-In-Place by Slip-Form:

(A) General:

Concrete barriers constructed by using a slip-form machine or similar equipment shall be of well compacted, dense concrete. At the option of the contractor, concrete may be made with materials continuously batched by volume and mixed in a continuous mixer in accordance with the requirements of ASTM C685, except that sampling, testing, and acceptance of the concrete will be in accordance with the requirements of Section 1006 of the specifications.

The contractor may be required to furnish evidence of successful operation of the slip-form machine or other related equipment prior to beginning work. Slip-forming equipment shall be controlled by guidelines or wireless controls set from survey marks shown on the project plans or established by the Engineer. The slip-forming equipment shall be readily adjustable to conform to the proposed grade lines and vertically during the forward motion of the machine to conform to the pre-determined grade line during operations. A grade line gauge or pointer shall be attached to the machine in such a manner that a continual comparison can be made between the barrier being placed and the established grade line as indicated by the offset guide line.

In lieu of the above method for maintaining the barrier grade, the slip-form machine may be operated on rails, forms, or on an existing pavement.

Slip-form barrier will be considered to not require additional finishing if the surface meets the requirements of a Class II finish as described in Subsection 601-3.05 of the specifications and the alignment is satisfactory. If the barrier does not meet these requirements, operations shall be stopped until adjustments are made to the equipment or the concrete mix that will result in an acceptable product. Barriers that cannot be refinished to meet the specifications for a Class II finish shall be removed and replaced at the contractor’s expense. Barriers that have unsatisfactory alignment and straightedge tolerance shall be penalized or replaced in accordance with these specifications.

Concrete shall be placed and consolidated by methods that do not cause harmful segregation. To produce the required consolidation, the equipment shall be operated under sufficient speed and uniform restraint to the forward motion.

The concrete shall be of such consistency that after slip-forming operations it will maintain the shape of the barrier without support. The contractor shall ensure the integrity and positioning of all barrier steel reinforcement and conduit throughout slip-forming operations, maintaining adequate clear cover and spacing requirements as shown in the project plans. At the contractor's option, additional barrier steel reinforcement may be added at no additional cost to the Department.

Unless otherwise specified in the Special Provisions, the contractor shall construct a confirmation section of concrete barrier to demonstrate to the Engineer successful slip-forming operations during concrete barrier placement. Confirmation sections of concrete barrier may be waived if approved by the Engineer in writing. The confirmation section shall be a minimum of 100 feet to 300 feet in length and constructed in accordance with the requirements of the contract documents. The confirmation section will be evaluated for conformance to the requirements of the contract documents by the Engineer. If the confirmation section is determined to be non-compliant, those sections of concrete barrier not in conformance, shall be removed and replaced at no additional cost to the department. In addition, a revised plan for placement of the concrete barrier shall be submitted to the Engineer for approval. A maximum of two confirmation sections may be constructed to demonstrate successful slip-forming operations. If the contractor fails to demonstrate compliance with the contract requirements after 2 completed confirmation sections, the Engineer may disallow use of the slip-form method.

If at any time during concrete barrier placement the Engineer determines the slip-forming operations to be non-compliant with the contract requirements, the contractor may be required to construct additional confirmation sections and/or revise the plan for placement of the concrete barrier in order to demonstrate to the Engineer conformity of slip-forming operations.

(B) Dimensional Tolerances:

(1) The top of exposed faces of the barrier shall comply with the following tolerances to be accepted at 100 percent of the unit price bid per linear foot.

(a) When a 10-foot long straightedge is placed on the top surface of the barrier, it shall not vary by more than 1/4 inch from the straightedge.

(b) When a 10-foot straightedge is placed along the face of the barrier, it shall not vary by more than 1/2 inch from the straightedge.

(c) The horizontal alignment shall not deviate by more than that allowed in Section 401 of the specifications when placed adjacent to Portland Cement Concrete Pavement.

All other barrier dimensions shall not deviate by more than 1/2 inch from plan alignment.

(2) The top and exposed faces of the barrier shall comply with the following tolerances to be accepted at 75 percent of the unit price bid per linear foot.

(a) When a 10-foot long straightedge is placed on the top surface of the barrier, it shall not vary by more than 1/2 inch from the straightedge.

(b) When a 10-foot straightedge is placed along the face of the barrier, it shall not vary by more than 3/4 inch from the straightedge.

(c) The horizontal alignment shall not deviate by more than that allowed in Section 401 of the specifications when placed adjacent to Portland Cement Concrete Pavement.

All other barrier dimensions shall not deviate by more than 3/4 inch from plan alignment.

Those portions of the barrier not in compliance with the minimum requirements specified in in this subsection shall be removed and replaced at no additional cost to the Department.

910-3.04 **Precast:** The first paragraph of the Standard Specifications is revised to read:

Precast concrete barriers shall be cast in accordance with the requirements of Section 601 of the specifications.

ITEM 9210007 SLOPE PAVING (EXPOSED AGGREGATE)

Description:

The work under this item consists of furnishing all materials, equipment and labor, and constructing slope paving at the locations shown on the project plans. Slope paving shall be constructed in accordance with the project plans and referenced standard drawings, and shall conform to the requirements of the Standard Specifications and these Special Provisions.

Materials:

All materials shall conform to the requirements on the project plans and the applicable Standard Specifications sections.

Construction Requirements:

The contractor shall prepare sample panels of exposed aggregate slope paving utilizing his proposed method for exposing the aggregate and shall obtain the Engineer's approval prior to construction.

Slope paving shall only be constructed on uniformly compacted material. The slope shall be dampened, with water, in a manner and to dampness acceptable to the Engineer just prior to concrete placement.

Method of Measurement:

Slope Paving will be measured by the square yard of exposed slope paving surface area.

Basis of Payment:

The accepted quantities of Slope Paving, measured as provided above, will be paid for at the contract unit price per square yard, which price shall be full compensation for the work complete in place and as specified herein and shown on the project plans including preparation of sample panels.

(923OJT, 09/17/20)

SECTION 923 BLANK: the title and text of the Standard Specifications is revised to read:

SECTION 923 ON-THE-JOB TRAINING WITH GOALS:

923-1 Description:

The contractor shall provide On-The-Job training (OJT) aimed at moving minorities, women, and disadvantaged trainees into journeymen in various types of construction trades or job classifications in accordance with 23 CFR Part 230, Part 230.111 and Part 230, Appendix B.

It is the intention of these Special Provisions that training be provided in the construction classifications/crafts rather than for office support positions. Some off-site training is permissible as long as the training is an integral part of an approved training program and does not comprise of a significant part of the overall training.

923-1.01 General:

Training and upgrading of minorities and women toward journeyman status is the primary objective of these Special Provisions. Accordingly, the contractor shall make every effort to enroll minority, women, and disadvantaged trainees (e.g., by conducting systematic and direct recruitment through public and private sources likely to yield minority and women trainees) to the extent that such persons are available within a reasonable area of recruitment. The contractor will be responsible for demonstrating the steps that it has taken in pursuance thereof, prior to a determination as to whether the contractor is in compliance with these Special Provisions. This training commitment is not intended, and shall not be used, to discriminate against any applicant for training, whether a member of a minority group or not.

The OJT goal on this project is **600** hours with a minimum required number of training hours of 600 for each trainee.

The contractor shall provide training and see that all trainees are afforded opportunities to participate in as much training as is practically possible to provide. Due to turnover and attrition of trainees in any one trainee slot, it is expected that continuous trainee replacements may be necessary during the contract work period.

Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training. Trainees shall be distributed among the work classifications on the basis of the contractor's needs and the availability of journeymen in the various classifications within a reasonable area of recruitment. The ratio of apprentices and OJT Trainees to journeymen shall not be greater than permitted by the terms of the approved training program being utilized.
It is normally expected that a trainee will begin training on the project as soon as feasible after start of work utilizing the skill involved and remain on the project as long as training opportunities exist in the assigned work classification or until the trainee has completed the training program. It is not required that all trainees be on the project for the entire length of the contract.

No employee shall be employed as a trainee in a classification in which they have successfully completed a training course leading to journeyman status, or in which they have been employed as a journeyman. The contractor shall satisfy this requirement by including appropriate questions in the employment application or by other suitable means. The contractor shall maintain documentation that shows the employee's work and training history.

923-1.02 Subcontractor OJT Trainees:

The contractor may, at its discretion, utilize approved subcontractors on the project to meet its OJT goal on the project. In the event that the contractor subcontracts a portion of the contract work, the contractor shall determine how many, if any, of the trainees are to be trained by the subcontractor. However, the contractor shall retain the primary responsibility for meeting the training requirements outlined in this Special Provision. The contractor shall ensure that these Special Provisions are made applicable to such subcontract.

The subcontractor's OJT Trainee(s) must be employed by the subcontractor and be enrolled in an approved training program.

923-1.03 Definitions:

Banking-Carryover Hours:

OJT hours completed by a trainee that exceeds the amount of required hours on the project and are eligible to be credited to a future project. Banked-Carryover hours will only be credited when the same trainee that completed the excess hours is used on the future project.

Business Engagement and Compliance Office (BECO):

BECO is responsible for oversight of the OJT program, which targets under-represented segments of the U.S. workforce, including minorities, women and disadvantaged individuals. BECO assesses OJT hour goals on contracts and monitors them to ensure that trainees receive the required number of training hours.

Classification/Craft:

Type of occupational category, trade, or job being done by a trainee on a federal-aid funded highway construction project.

Disadvantaged Persons:

A person who meets one of the following:

(1) Receives, or is a member of a family and/or household, which receives cash payments under a Federal, State, or local income-based public assistance program;

(2) Is a member of a family and/or household that receives (or has been determined within the 6-month period prior to registration for the program involved to be eligible to receive) Food Stamps/EBT card under the Food Stamp Act of 1977;

(3) Is a foster child on behalf of whom State or local government payments are made;

(4) Does not have a high school diploma or GED; or

(5) Is from a family whose total annual household income is below the federal poverty limits.

Journeyman:

A person who is capable of performing all the duties within a given job classification or craft.

OJT Trainee:

A person who is:

(1) A minority, woman, or disadvantaged individual enrolled in an approved training program; or

(2) Any other individual enrolled in an approved training program, whose training hours are, approved by the Department, and can be credited toward the OJT contract goals.

Show Cause Notice:

A written notification from the Department to the contractor based on a determination of non-compliance with the requirements of these Special Provisions. The notice informs the contractor of the specific basis for the determination and provides the opportunity for the contractor to present an explanation why they were unable to meet the training goal.

923-1.04 Computation of Time:

In computing any period of time described in this OJT special provision, the day from which the period begins to run is not counted, and when the last day of the period is a Saturday, Sunday or Federal or State holiday, the period extends to the next day that is not a Saturday, Sunday, or Federal or State holiday. In circumstances where the Department's offices are closed for all or part of the last day, the period extends to the next day on which Department's offices are open.

923-1.05 OJT Training Programs:

The minimum length and type of training for each classification will be established in the training program selected by the contractor and approved by the Department and FHWA. The Department and FHWA will approve a program if it is reasonably calculated to meet equal employment opportunity obligations and qualifies the average trainee for journeyman status in the classification concerned by the end of the training period as defined in the training program.

The Department recognizes the following OJT Training programs:

(A) OJT Programs approved by FHWA or Apprenticeship programs the Department of Labor (DOL) prior to the start of the trainee commencing work.

(B) Registered union or other approved apprenticeship programs registered with the Bureau of Apprenticeship, U.S. DOL, Employment and Training Administration, Bureau of Apprenticeship and Training or the Arizona Apprenticeship Office, Arizona Department of Economic Security programs recognized by the Bureau.

Approval of a training program other than those specified above to be used for the contract must be approved by the Department and FHWA prior to the trainee commencing work on the classification covered by the program. Contractors intending to submit a training program for approval prior to the start of a contract must submit the program as soon as possible after notification of contract award as approval of a training program may take up to four weeks. Several FHWA approved training program templates for specified classifications are available on the BECO website.

The contractor shall furnish each trainee with a copy of the Training Program the trainee is enrolled in, and other documentation related to the training program. The contractor shall

provide training that develops the skills outlined in the training program. Multiple OJT training programs can be used on the project.

All training programs shall be administered in a manner consistent with the equal employment obligations of federal-aid highway construction contracts. The Department reserves the right to request documentation that the contractor's training program fulfills these obligations.

The trainee will be paid the appropriate trainee Davis-Bacon wage rates for training classifications/crafts on federally-funded projects. The contractor shall compensate trainees not less than the rate outlined in the approved training program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination.

The contractor shall provide for the maintenance of records and furnish/submit required information and reports documenting its performance under these Special Provisions. Such records shall be available at reasonable times and places for inspection or review by the Department and FHWA.

923-1.06 OJT Liaison:

The contractor shall designate an OJT Liaison who shall be responsible for monitoring and administering the contractor's OJT Program and monitoring the trainees' progress. The OJT Liaison may have other responsibilities for the contractor. The OJT Liaison shall serve as the point of contact for the Department regarding information, documentation, and conflict resolution relating to the contractor's OJT program.

923-2 Online Resources:

OJT System Website:
https://adot.dbesystem.com

BECO Website:
https://azdot.gov/business/business-engagement-and-compliance

923-3 Requirements:

923-3.01 Documentation:

Documentation related to OJT training can be found on the Department's BECO website. The contractor shall complete and submit the following information to the Department:

(A) OJT Commitment/Schedule:

The contractor shall submit the completed OJT Commitment/Schedule through the Department's online OJT System, no later than the preconstruction conference. The OJT

Commitment/Schedule shall include the project information, project training plan information, project training schedule, and the contractor's signature of acknowledgement.
If the monthly training hours commitment, as shown on the OJT Commitment/Schedule changes, or is projected to change, during the progression of the project a supplemental OJT Commitment/Schedule shall be submitted in the online OJT System. The supplemental OJT Commitment/Schedule shall be submitted within 5 days of a change.

If the OJT Commitment/Schedule or the supplemental OJT Commitment/Schedule shows less than the OJT goal for the project, the contractor shall submit to the Engineer Good Faith Effort documentation, as described below in Subsection 923-3.01(C), that demonstrates reasons why the contractor cannot meet the OJT goal.

(B) OJT Enrollment and Progression:

(1) OJT Enrollment:

OJT Enrollment information shall be submitted through the Department's online OJT System by the contractor at least 5 days prior to a trainee's start date. OJT Enrollment information shall be completed and includes the trainee's name and address, employment status, gender and ethnicity, training program (s), classification/craft, and whether banked hours are being requested from a previous project.

BECO will review the OJT Enrollment information within 5 days, and if approved, hours will be retroactively credited to the date the OJT Enrollment information is received by BECO.

To receive OJT credit, apprentice's current apprentice certificate or proof of registration from a union or approved apprenticeship program shall be uploaded into LCPtracker by the contractor within 5 days of the apprentice's start date, in addition to completing the OJT enrollment information in the online OJT System.

If the Arizona Apprenticeship Office Representative's signature is missing from the apprentice certificate, the contractor shall also upload the apprentice's US Department of Labor, Office of Apprenticeship Certificate to LCPtracker. The contractor shall not receive training credit or reimbursement until the certificate is uploaded.

(2) Progression of Training and Change of Status:

Progression of Training-Level Up and Change of Status shall be submitted through the Department's online OJT System each time a trainee advances, progresses to another training level or milestone in his/her training program, or has a change of job classification. Hours will be retroactively credited to the date the information is received.

Hours that exceed the maximum indicated in the program for a certain level will not be credited. Once a level is completed, the trainee should be moved to the next level towards journeyman status.

(C) Good Faith Efforts:

Good Faith Efforts are those efforts designed to achieve equal opportunity through positive, proactive and continuous results-oriented measures (23 CFR 230.409(g)(4)). Good Faith Efforts may include, but are not limited to:

(1) Solicitation of existing employees to gain referrals for minority, women, and disadvantaged persons;

(2) Upgrading minority, women, and unskilled workers into the skilled classifications when possible;

(3) Accepting applications at the project site, at the contractor's office or online;

(4) Review and follow up on previously received applications from minority, women, and disadvantage persons;

(5) Documentation of efforts to achieve diversity on federal-aid projects and the contractor's workforce in general;

(6) Contact the ADOT BECO OJT Supportive Services Program to inquire about potential trainee candidates from ADOT-sponsored Pre-Apprentice programs.

(7) Contact construction recruitment organizations throughout Arizona;

(8) Review of the construction-specific recruitment publications in Arizona;

(9) Publish a recruitment notification in local newspapers and other sources.

923-3.02 Training Program Completion:

Once the trainee completes the required number of levels and hours of training for the same classification or craft, or completes an approved training program, the trainee is considered to have completed the training program it is enrolled under. The contractor shall not receive OJT credit for hours exceeding the maximum number of training hours required for completion of the selected training program.

Once a trainee completes a specific training level for a classification or craft, the contractor shall not be permitted to submit that trainee for enrollment or reimbursement at that same level within the same classification or craft, however the same trainee can be enrolled in a different classification or craft.

MisThe contractor shall provide documentation showing the type and length of training satisfactorily completed to each trainee and the Department upon successful completion of a training program.

For an apprenticeship program, the Apprenticeship office will issue a certificate of completion in said craft, a DOL certificate, and a journeyman's card.

923-3.03 Banking-Carryover Hours:

At the completion of the project, the contractor may submit a Banking-Carryover Hours request in the Department's online OJT System, to carryover training hours for a specific trainee on the project to be used on a future project. Banked hours that are carried over to a project may lower the required number of training hours the contractor is required to complete on that project. The trainee shall be placed on a subsequent project with the intent that the trainee is progressing towards completion of a training program. Banked hours cannot be transferred to other trainees. No additional payment will be paid for banked hours carried over to other projects.

Trainee hours working on multiple projects at the same time can be accumulated to be counted as banked hours to be used on a single future project by the same trainee.

923-3.04 OJT Project Completion and Banked Hours Request:

OJT Project Completion and Banked Hours shall be submitted through the Department's online OJT System within 60 days of completion of training.

923-4 Method of Measurement:

OJT training hours will be measured by the hour to the nearest half hour.

Measurement of hours towards the training goal will be made as the OJT trainee completes hours on the project. Hours are considered complete if the trainee performs hours on the project, is OJT enrolled, and provides required training by the program.

No measurement for payment will be made for trainee hours in which OJT enrollment information has not been received and approved by the Department.

923-5 Basis of Payment:

The accepted quantities of hours, measured as provided above, will be paid for at a unit price of $3 per hour for training provided to trainee/apprentice in accordance with an approved training program and minimum number of training hour goal on the project.

No payment shall be made to the contractor if either the failure to provide the required training, or the failure to hire the trainee as a journeyman is caused by the contractor and evidences a

lack of Good Faith Effort on the part of the contractor in meeting the requirements of this Special Provision.

The Engineer may approve reimbursement for training hours in excess of the minimum training requirement of the project not to exceed the maximum number of training hours for the trainee's current level of training outlined in the training program.

Payment for offsite training may only be made when the contractor does one or more of the following and the trainees are concurrently employed on a federal-aid project;

(A) Contributes to the cost of the training,

(B) Provides the instruction to the trainee

(C) Pays the trainee's wages during the offsite training period.

No additional payment will be made for banked hours utilized to meet the project goal.

923-6 Monitoring and Compliance Mechanisms:

(A) Monthly Reporting:

Contractors shall report monthly hours for each trainee in the online OJT System by the 15th of the month following the month of training hours completed.

(B) Monitoring:

The Department will conduct periodic reviews of trainee hours and monitor contractor's progress towards meeting the OJT goal on the project.

(C) Site Visits:

The Department may conduct periodic monitoring site visits to the worksite to review OJT Program compliance, during working hours on the project. The Department will notify the OJT liaison at least 24 hours prior to a site visit if the OJT Liaison is required to be at the site visit. The site reviews may include, among other activities, interview of trainees, the contractor, and its employees. The contractor shall cooperate in the review and make its employees available. The contractor's OJT Liaison shall be reasonably available to meet with Department staff as well as be available to respond to periodic emails and phone calls from the Department to check on the progress of OJT Trainees. The Department will make efforts to ensure minimal disruption to the work and coordinate site visit times with other Department divisions, as applicable (for example, Davis-Bacon interviews).

(D) Compliance Determination:

Compliance will be determined at the end of the project by the Departments evaluation of:

(1) The contractor's use of trainees in conformance with the approved training program;

(2) The number of trainees and hours completed on the project as reported on the OJT Project Completion in the Department's online OJT System; or

(3) Any Good Faith Effort documentation submitted by the contractor throughout the life of the project as to why the contract OJT goal was not met.

(4) Whether the trainees used in the project were a minority, woman or disadvantaged individual

If at the conclusion of the project, the contractor shows evidence of a lack of Good Faith Effort with the compliance requirements identified above the Department will issue a Show Cause Notice outlining any findings of non-compliance.

The contractor may submit a written response to the Department providing any additional evidence that it made Good Faith Efforts to meet the OJT goal within 30 days of receiving a Show Cause Notice.

If the contractor fails to submit a written response to the Show Cause Notice within the specified period or the written response to the Show Cause Notice does not cause the Department to change its findings of non-compliance, the Department will issue its Final Notice of non-compliance to the contractor regarding the non-compliance.

If a Final Notice of non-compliance is issued, the Department will deduct an amount equal to twice the contract unit price ($3) multiplied by the number of hours not completed towards the goal as shown in the equation below. The amount will be deducted from the contractor's final payment.

2 x Contract Unit Price ($3) x (OJT Hour Goal – OJT Hours Completed)

ITEM 9240010 - FORCE ACCOUNT WORK (REINFORCED CONCRETE REPAIR):

Description:

The work under this item covers the repair of loose and spalling concrete at existing abutments and pier of the Perkins Valley TI UP Bridge (Str. No. 1776). The objective of this repair is to provide adequate bonding, provide protection to the reinforcement, and to restore the original shape of the concrete.

Material:

The material shall be a high early strength pre-mixed structural concrete patch containing cementitious materials with a minimum 28-day compressive strength (f'c) of 4,000 psi. The patch material shall be listed on the ADOT Approved Product List.

Construction Requirements:

Areas to be repaired shall be determined by the Engineer with the assistance of the contractor. After all repair locations have been marked, the contractor shall remove only loose and spalling concrete as directed by the Engineer. Removal shall not extend more than two inches below existing reinforcing.

Existing reinforcement shall be thoroughly cleaned to remove all rust and corrosion. All dirt, grease, and other deleterious materials shall be removed from the repair areas and an approved bonding agent shall be applied to repair areas prior to placement of concrete in place according to the manufacture's recommendations. Tools used for concrete removal shall be approved by the Engineer prior to the start of any concrete repair work. Equipment and tools shall not be used to remove spalling concrete, which, in the opinion of the Engineer, may cause the removal of excess quantities of sound concrete along with spalling concrete.

Spalled areas shall be repaired in accordance with the applicable requirements of Section 402 of the Standard Specifications.

Measurement and Payment:

Reinforced Concrete Repair will be measured and paid for on a Force Account basis in accordance with the requirements of Subsection 109.04(D) of the Standard Specification.

Payment for this item will be limited to measures not previously required by individual contract items. Patch repairs that become necessary as a result of improper, unauthorized, unwarranted, or unnecessary construction activities shall be corrected at the contractor's expense.

ITEM 9240117 – Misc. Work (BRIDGE REPAIR)(PENETRATING SEALER):

Description:

The work under this item shall consist of furnishing and placing a penetrating crack sealer on the exposed concrete surfaces of both abutments of the Perkins Valley TI UP (Str. No. 1776) in accordance with the project plans, the manufacturer's recommendations, and the requirements of the specifications.

Penetrating crack sealer shall be applied to both abutments after the new concrete bearing seat pedestals and backwalls have been constructed and after the completion of any reinforced

concrete spall repair work. Penetrating crack sealer shall cover all exposed surfaces of the backwall and cap beam.

Materials:

Provide a penetrating water repellent treatment solution (penetrating sealer) consisting of an organosilicon compound dissolved in a solvent carrier. Provide a solvent carrier that produces a hydrophobic surface covalently bonded to the concrete when applied.

Use one of the following organosilicon compounds:

- Alkyl-alkoxysilane
- Oligomerous alkyl-alkoxysiloxane.

Provide a solution meeting the following requirements:

- Solvent carrier leaves less than 1 percent residue upon evaporation.
- Certified to meet or exceed the performance criteria listed below based on a single application of the solution according to the manufacturer's recommended rate of coverage.
- Does not stain, discolor, or darken the concrete.
- Application does not alter the surface texture or form a coating on concrete surfaces.
- VOC content less than 600 g/L.
- Treated concrete is surface dry a maximum of 30 minutes after application.

(A) Testing Requirements

Provide a repellent that, when applied to concrete meets the following requirements:

Test	Duration	Max Absorption	Method
Absorption	48 hours	1% by weight	ASTM C 642
	50 days	2% by weight	ASTM C 642
Chloride Ion Penetration	90 days	0.75 lb / yd^3	AASHTO T 259
		Depth: 0.5 inch to 1 inch	AASHTO T 260

Construction Requirements:

The contractor shall follow the manufacturer's recommendations for surface preparation and application.

Before starting work, provide the Engineer with the following information:

- Treatment solution, including: brand name, manufacturer's name, and a copy of the manufacturer's unabridged application procedures
- Equipment to be used
- Surface preparation methods

- Application methods
- Weather limitations
- Treatment solution manufacturer's certified personnel

Methods shown in these specifications are typical of general installations and may be modified per the System Provider's recommendations as approved by the Engineer.

(A) Equipment

All equipment for cleaning the existing concrete surface and applying the sealer system shall be in accordance with the System Provider's recommendations as approved by the Engineer prior to commencement of any work.

(B) Surface Preparation

Concrete surfaces must be clean, dry and free from oils, grease, soil, efflorescence, dust, laitance, frost, and curing compounds. Surfaces shall be cleaned per the recommendation of the manufacturer and to the satisfaction of the Engineer and the manufacturer's representative.

Large areas may be blown dust free with compressed air, washed and let dry. After cleaning with water, remove excess moisture that may delay surface drying or inhibit surface penetration of the repellent treatment solution.

- New Concrete:

Allow new concrete to cure for at least 28 days before applying surface treatment. After rain or water cleaning, allow concrete surfaces to dry for at least 8 hours before applying penetrating water repellent treatment solution.

- Existing Concrete:

After rain or water cleaning, allow concrete surfaces to dry for at least 8 hours before applying penetrating water repellent treatment solution.
The Engineer shall perform a visual inspection of the prepared surfaces prior to application. The Engineer will accept surfaces cleaned per the manufacturer's recommendations.

(C) Trial Application

Prior to application of the penetrating sealer, a test area must be performed to determine proper application rate, techniques and required surface preparation. The location of the trial applications shall be approved by the Engineer.

The number of the trial applications required shall be as many as necessary for the contractor to demonstrate the ability to apply an acceptable seal and competency in ability to perform the work.

(D) Application of Penetrating Sealer

The application of the penetrating sealer shall not begin until the concrete is completely surface dry.

Application of the sealer will begin from the highest point; top to bottom. A low pressure (20-30 lbs.) sprayer or roller can be used to apply a uniform coat. Succeeding passes must overlap the previous run down. Check dried area for absorption and apply second coat if necessary. The contractor shall not over apply the penetrating sealer. Application of the sealer shall be per the recommendation of the manufacturer, and to the satisfaction of the Engineer and the manufacturer's representative.

Application rates shall be:

a. 20% silane applied at 60 SF/Gal
b. 40% silane applied at 125 Sf/Gal
c. 100% silane applied at 250 Sf/Gal

The Engineer shall perform a visual inspection of the treated surfaces after application. The Engineer will accept surfaces treated per the manufacturer's recommendations.

(E) Weather Limitations

Application of the penetrating water repellent treatment solution shall be per the "Acceptable Weather Conditions During Application" table and the manufacturer's recommendations, whichever is more restrictive.

Acceptable Weather Conditions During Application	
Weather Condition	**Acceptable Range**
Air or Concrete Surface Temperature	Above 40^{o}F and within the manufacturers recommended application temperature range.
Wind Speed	Below 25 mph
Precipitation	No precipitation

If the concrete becomes wet from rain; the contractor shall wait a minimum of 24 hours prior to applying the penetrating sealer to the concrete surfaces

(F) Control of Materials

Use penetrating water repellent treatment solution in unopened containers with numbered seals and the manufacturer's label. Ensure the manufacturer marks the containers with the following information:

- Manufacturer's name and address

- Product name
- Date of manufacture
- Expiration date
- Lot identification number

Protect materials in the original unopened containers in a storage facility that provides safe and secure storage.

Method of Measurement:

Bridge Repair (Penetrating Sealer) will be measured by the square foot.

Basis of Payment:

The accepted quantities of Bridge Repair (Penetrating Sealer), measured as provided above, will be paid for at the contract unit price per square foot, which shall be full compensation for the work, complete in place, as described herein and as shown in the project plans.

(924CQC, 09/17/20)

ITEM 9240170 - CONTRACTOR QUALITY CONTROL:

Description:

The work under this item shall consist of furnishing all personnel, materials, supplies, facilities and equipment necessary to perform all certification of test equipment, sampling, testing, and other control actions. The work shall also include the preparation of linear control charts, Weekly Quality Control Reports, and other reports and records as described in Subsection 106.04(C) of the Specifications.

Method of Measurement:

Contractor quality control will be measured for payment on a lump sum basis as a single unit of work.

Basis of Payment:

(A) General:

The accepted quantities of contractor quality control, measured as provided above, will be paid at the contract lump sum price, which price shall be full compensation for the work, complete, as described and specified herein.

Partial payments under this item will be made in accordance with the following provisions:

(1) The first partial payment price will be the lesser of 25 percent of the contract lump sum price for contractor quality control, or 1 percent of the original total contract bid amount.

(2) The remaining portion of the lump sum price will be prorated over the duration of the original contract on a monthly basis, and monthly progress payments will be made.

If adjustments to pay items covered under Contractor Quality Control are approved by supplemental agreement, an equitable adjustment to the lump sum amount for Contractor Quality Control may be made. Any adjustment to Contractor Quality Control shall be included in the supplemental agreement and the adjusted amount, less previous payments, will be prorated equally over the remaining contract period, including any related time extensions.

(B) Delinquent Reports:

Failure of the contractor to submit complete and accurate Weekly Quality Control Reports, current to the most recent Wednesday submittal date, will be grounds for the Engineer to deduct monies from the contractor's progress payment.

For each Weekly Quality Control Report that is not complete and accurate, and not submitted to the Engineer by the Wednesday submittal date specified in Subsection 106.04(C)(6), the Department will deduct $2,500.00 from the progress payment for the current month.

For each delinquent Weekly Quality Control Report submitted to the Engineer within 10 days, excluding weekends and holidays, of the original Wednesday due date, $2,000.00 will be returned on the next regular estimate, provided all of the requirements specified herein and in Subsection 106.04(C)(6) have been met, and the report is complete and accurate. No deducted monies will be returned for reports submitted more than 10 days, excluding weekends and holidays, beyond the original Wednesday due date.

All deducted monies which are retained by the Department, as specified above, are liquidated damages.

(925SRVY, 08/16/19)

SECTION 925 CONSTRUCTION SURVEYING AND LAYOUT: of the Standard Specifications is revised to read:

925-5 Basis of Payment: the fourth paragraph of the Standard Specifications is revised to read:

If additional staking and layout are required as a result of additional work ordered by the Engineer, such work will be paid under items listed in the table below.

ITEM	PREDETERMINED RATE
9250101-ONE-PERSON SURVEY PARTY	$110 per hour
9250102-TWO-PERSON SURVEY PARTY	$150 per hour
9250103-THREE-PERSON SURVEY PARTY	$190 per hour
9250106-SURVEY MANAGER	$175 per hour
9250105–OFFICE SURVEY TECHNICIAN	$85 per hour

(1001MATL, 06/17/21)

SECTION 1001 MATERIAL SOURCES: of the Standard Specifications is revised to read:

1001-1 Description:

The work under this section shall consist of the procuring of borrow, topsoil, subbase and base materials, mineral aggregates for concrete structures, surfacing, and landscape plating, from sources either designated on the project plans or in the Special Provisions or from other sources.

1001-2 General:

The contractor shall determine for itself the type of equipment and work required to produce a material meeting the requirements of the specifications.

Sites from which material has been removed shall, upon completion of the work, be left in a neat and presentable condition. Where practicable, borrow pits, gravel pits, and quarry sites shall be located so that they will not be visible from the highway.

The contractor shall provide an environmental analysis, as specified in Subsection 104.12 of the specifications, for any source proposed for use regardless of whether a previously

approved environmental analysis exists for the site.

In accordance with Subsection 104.12 of the specifications, the contractor may utilize an existing environmental analysis approved after January 1, 1999, provided that the analysis is updated as necessary to be in compliance with current regulations and with the contractor's planned activities.

It shall be the responsibility of the contractor to conduct any necessary investigations, explorations, and research, on-site and otherwise, before and after submitting the bid proposal, to satisfy itself that the specified quantity and/or quality of material exists in any proposed material source.

The contractor shall not produce material for the project, mobilize crushing equipment or clear a worksite prior to approval of the environmental analysis.

The contractor shall comply with the requirements of the landowner or agency having jurisdiction over the land.

The Department makes no representation regarding quality or quantity of materials in any source.

1001-2.01 Information Available:

The Department maintains a listing of materials sources for which a completed environmental analysis is available and the landowner has allowed the source to be placed on the list. Further information on material sources is available at https://azdot.gov/business/environmental-planning/material-source-guidance.

1001-2.02 Material Sources in Floodplains:

Any development of a material source that is determined to be in a flood plain must meet the requirements of the appropriate local, state, and federal agencies, including as applicable, the U.S. Army Corps of Engineers, Section 404 of the Clean Water Act, ADEQ or Tribal 401 Water Quality Certification, and the National or Arizona Pollutant Discharge Elimination System (NPDES/AZPDES).

If the contractor wishes to procure a material source within a floodplain, the contractor or material supplier shall submit a Floodplain Use Permit application to the appropriate floodplain management agency. The contractor shall submit to the Department documentation that the Floodplain Use Permit for the material source was approved and signed by the appropriate agency's Floodplain Administrator. The contractor or material supplier shall comply with all the requirements of the Floodplain Use Permit, including renewal of the Permit as needed or required.

The Department will require an engineering report if the material source is situated in the 100 year floodplain of any stream or watercourse, and located within one mile upstream and two miles downstream of any highway structure or surfaced roadway crossing. The

engineering report shall be prepared by a professional engineer with expertise in hydrology, hydraulics, river mechanics, and fluvial geomorphology. The engineering report shall address the effects of the potential for structural damages following a 100 year flood event.

All other permits required to obtain a material source shall be furnished to the Department upon request.

Surplus material from agency administered flood control management projects may be used as borrow material only if the contractor submits written evidence to the Engineer that the flood control agency project was fully designed and funded.

Material sources in floodplains located on Native American Tribal Lands will be considered for use on an individual analysis. The analysis shall include a review of applicable land use plans, floodplain management plans, environmental plans, applicable laws and regulations pertaining to Native American Tribal Lands, and an engineering analysis of the effects on any highway facility or structure. The contractor shall obtain from the Bureau of Indian Affairs (BIA) and the Native American Tribal Council all permits, licenses, and approvals for the Department to review.

1001-2.03 Protection and Restoration:

The contractor shall comply with the requirements of Subsections 107.11 and 107.12 of the specifications for protecting and restoring the material source. The contractor shall assume full responsibility to protect and rehabilitate the material source to the satisfaction of the Department and in compliance with the requirements of the Federal Land Management Agency (FLMA) having jurisdiction or by the owner of the material source.-

1001-3 Proposed Source:

1001-3.01 Approval Requirements:

(A) General:

The contractor shall notify the Engineer prior to or at the preconstruction conference as to the source that it proposes to use.

The contractor acknowledges that all the conditions set forth in this subsection shall be met prior to the source being approved for use.

Other than sampling and testing, the requirements of this subsection shall be completed prior to initiation of any activities that disturb the existing conditions at the proposed source.

Regulatory changes, specification changes, or other reasons may preclude the approval of a materials source. The contractor acknowledges that the Department may refuse to approve a material source even if the Department had approved the source for other projects.

(B) Specific Conditions for Approval:

The use of a source will require written approval by the Engineer. No approval will be given until the contractor has complied with the following conditions:

(1) The contractor has submitted an environmental analysis, as specified in Subsection 104.12 of the specifications, of the source proposed for use and the Department has reviewed the analysis and satisfied itself that the use of such source will not have an adverse social, economic or environmental impact. The requirements of Subsection 1001-3.01 of the specifications shall be completed prior to initiation of any activities that disturb the existing conditions at the proposed source.

(2) The contractor has furnished the Engineer with evidence that he has secured the rights to the source, including ingress and egress.

(C) Historical and Cultural Resources:

The archaeological survey report of the proposed material source shall be prepared by the contractor's archaeological consultant and shall conform to the requirements of Subsection 104.12 of the specifications.

In the event that prehistoric or historic structures and prehistoric or historic artifacts are encountered during any activity related to the construction of the material source, the contractor shall immediately cease operations within a 50 foot radius of the discovery location and notify the Engineer. In the event that an unmarked human burial and/or funerary remains are encountered during any activity related to the construction of the material source, the contractor shall immediately cease operations within a 100 foot radius of the discovery location and notify the Engineer. The Engineer will contact the Environmental Planning – Historic Preservation Team so that appropriate notification of the discovery is made per state and federal regulations.

After notifying the Engineer, the contractor shall, within good faith, secure the area and take all reasonable measures to protect the historical and cultural resources. No activity shall resume unless authorized by the Engineer. The Engineer will not authorize resumption of any activity until receiving confirmation from the Environmental Planning – Historic Preservation Team that the contractor may commence work.

If the Department determines that the proposed use will have major adverse impact on cultural or historic resources, the Department will not allow the use of the source.

(D) Permit from Navajo Nation:

For projects located on the Navajo Reservation, the Navajo Nation has adopted a permitting

system for any sources, regardless of whether on or off the Navajo reservation, which are to supply material for projects located within its boundaries. No material source will be approved until the contractor submits a copy of the permit from the Navajo Nation allowing materials from the proposed source to be used on the project. For information concerning the permit, the contractor shall contact the Navajo Nation Historic Preservation Office.

(E) Bureau of Land Management Material Sources:

If the contractor elects to pursue the use of material sources on BLM land under Title 30 Code of Federal Regulations, it is at the contractor's sole risk, and the Department bears no responsibility for any delays or costs associated with the request to use material sources on BLM Land.

The Department will not request or pursue any "free-use permit" under Title 23 Code of Federal Regulations or any other arrangement with BLM on this project.

1001-4 Special Access within Right Of Way:

The contractor may submit a request to the District Engineer to approve special access to a controlled access highway if special access is not shown on the project plans.

The request by the contractor shall be accompanied by an environmental analysis and by documents which specify the point(s) of access, the acquisition of right of way, the manner in which access will be attained, the traffic control plan, and crossovers, along with all other appropriate data which will allow the District Engineer to evaluate its request. If the request is approved, a supplemental agreement shall be entered into.

All costs associated with the special access requested by the contractor shall be borne by the contractor, including, but not limited to, cattle guards, fences, gates and restoration work.

When access is not being utilized, gates shall be closed and locked. Upon completion of all operations, the area within the right of way that has been disturbed shall be restored to the condition existing prior to the contractor's operations.

The decision by the District Engineer to deny a request by the contractor will be considered to be final.

1001-5 Fences and Cattle Guards:

Where the haul roads to material sources cross existing fence lines in areas where there is livestock of any kind, temporary cattle guards shall be installed by the contractor at each crossing.

The livestock operator or owner shall be contacted prior to the beginning of any operations and effective measures shall be taken and means provided by the contractor to prevent livestock from straying.

In operations where conditions will exist that are dangerous to livestock of any kind, temporary cattle guards and fence shall be installed around the pit area by the contractor to protect livestock.

Temporary cattle guards and fence installed by the contractor shall be removed and existing fence disturbed shall be replaced or reconstructed and all fence shall be left in as good condition as it was prior to the beginning of work.

(1003REBAR,12/17/20)

SECTION 1003 REINFORCING STEEL: of the Standard Specifications is revised to read:

1003-1 General Requirements:

Reinforcing steel shall be furnished in the sizes, shapes, and lengths shown on the plans and in conformance with the requirements of the specifications.

Certificates of Compliance conforming to the requirements of Subsection 106.05 of the specifications shall be submitted for epoxy coated reinforcing bars, as well as uncoated reinforcing bars, wire, and welded wire fabric. In addition, for epoxy coated reinforcing bars, Certificates of Compliance shall be submitted from the coating manufacturer and Certificates of Analysis shall be submitted from the coating applicator.

When reinforcing steel is delivered to the project site, the contractor shall furnish the Engineer with a copy of all shipping documents. Each shipping document shall show the sizes, lengths, and weights of the reinforcing steel separately for each structure.

Reinforcing steel shall be free of dirt, oil, paint and grease and shall conform to the requirements of Section 605 of the specifications. Reinforcing steel shall be protected at all times from damage. All reinforcing steel shall be free of dirt, oil, paint and grease. Rust, surface irregularities, or mill scale will not be the cause for rejection, provided the weight, dimensions, cross-sectional area, and tensile properties of a manually wire brushed test specimen are not less than the requirements of the specifications.

1003-2 Reinforcing Bars:

Except when used for wire ties or spirals, steel bars used as reinforcement in concrete shall be deformed and shall conform to the requirements of ASTM A615 for Grade 60 steel. Unless otherwise specified, steel bars meeting the requirements of ASTM A706 may be substituted for ASTM A615 steel bars. When ASTM A706 bars are used, tack welding of the reinforcement will not be permitted unless approved by the Engineer.

Samples of reinforcing bars taken at the supplier's or fabricator's place of business shall be defined as pre-shipment samples, while those samples obtained from stockpile or shipment at the project shall be defined as project samples. A shipment shall be considered any amount of reinforcing bars delivered to a project on any given day, of one transported load.

Reinforcing bars sizes No. 4, No. 5, and No. 6 will be accepted with the submission of a Certificate of Compliance. All other reinforcing bar sizes shall be subject to pre-shipment and project sampling as outlined below.

1003-2.01 Pre-Shipment Sampling:

Prior to shipment of reinforcing bars to the project, the supplier or contractor shall contact Materials Group, Structural Materials Testing Section to obtain a laboratory number referenced to the project number. A random sample shall be taken at the supplier’s place of business and delivered to the Structural Materials Testing Section. For bar size No. 14, the sample shall be one piece not less than 42 inches in length, selected at random for each shipment up to 30 tons. For bar size No. 18, the sample shall be one piece not be less than 42 inches in length, selected at random for each shipment up to 50 tons. For all other bar sizes, the sample shall be one piece not less than seven feet in length, selected at random for each shipment up to 20 tons. Samples shall be submitted for each bar size, grade, heat number, and manufacturer in the shipment. The pre-shipment bars that are obtained from the supplier or fabricator must be accompanied by a Certificate of Compliance. The information shown on the certificate must match the bar identification marks. If no Certificate of Compliance is available or the information shown on the certificate is incomplete or inaccurate, the bars will not be accepted for testing.

When the supplier or fabricator makes a shipment to a project, a Certificate of Compliance shall be furnished stating that the material in the shipment is from the same stock as the pre-shipment sample covered by the laboratory number assigned by the Structural Materials Testing Section. Reinforcing bars represented by the pre-shipment sample failing to comply with the specification requirements shall not be used on any project.

1003-2.02 Project Sampling:

The Engineer reserves the right to sample reinforcing bars at any time. Project samples shall consist of one sample bar not less than seven feet in length for all bar sizes. Placement of the reinforcing bars shall not be delayed while the contractor is awaiting test results.

Concrete placement operations shall not begin until satisfactory test results of the project sample bars are obtained.

When the supplier or fabricator makes a shipment to a project from outside the Phoenix or Tucson areas, or not otherwise subjected to pre-shipment sampling, the shipment shall be

accompanied by a Certification of Compliance. Before any reinforcing bars from a shipment is to be incorporated into the project work, a project sample shall be taken, tested, and approved by the Structural Materials Testing Section. A project sample shall be taken as soon as practical upon arrival at the job site. A different project sample that is representative of each bar size, grade, heat number, and manufacturer from that shipment will be required. The sampling requirements described for pre-shipment sampling for the Phoenix or Tucson areas shall be used.

1003-3 Wire:

Steel wire used as spirals or ties for reinforcement in concrete shall conform to the requirements of AASHTO M 336. Wire shall be deformed or cold drawn (smooth).

1003-4 Welded Wire Fabric:

Welded wire fabric for concrete reinforcement shall conform to the requirements of AASHTO M 336.

1003-5 Epoxy Coated Reinforcing Bars:

1003-5.01 Steel:

Reinforcing bars shall conform to the requirements of Subsection 1003-2 of the specifications.

Epoxy coated reinforcing bars will be sampled and tested in the same manner as uncoated reinforcing bars. The coating and flexibility of the epoxy coated reinforcing bars will also be tested by the Department for acceptance.

1003-5.02 Epoxy for Coating:

A list of powdered epoxy resins which have passed prequalification tests, as described in ASTM A775, “Epoxy Coated Steel Reinforcing Bars”, is maintained on the Department’s Approved Products List (APL). The powdered epoxy resins selected by the contractor and furnished by the manufacturer shall be of the same material and quality as the resins listed on the APL, and shall be applied and cured in the same manner used to coat the test bars in the original powder prequalification test. Copies of the most current version of the APL are available on the internet from the ADOT Research Center through its Product Evaluation Program.

Prequalification testing may be performed by the National Bureau of Standards, State laboratories, or qualified private laboratories.

The Certificate of Compliance from the coating manufacturer shall properly identify the batch and/or lot number, material, quantity of batch, date of manufacture, name and address of manufacturer, and a statement that the material is the same composition as the initial sample prequalified for use. The certificate shall also state that production bars and prequalification bars have been identically prepared and applied with epoxy powders.

Patching or repair material, compatible with the coating and inert in concrete shall be made available by the epoxy coating manufacturer. This material shall be suitable to repair areas of the coating which were damaged during fabrication or handling in the field.

1003-5.03 Application of Coating:

The coating applicator's facility shall be subject to approval by the Department. Applications for approval of facilities shall be made to the Department by the coating applicator.

The surface to be coated shall be blast cleaned in accordance with the requirements of the Society for Protective Coatings, Surface Preparation Standard SSPC-SP10, Near White Blast Cleaning.

The powdered epoxy resin coating shall be applied to the cleaned surface as soon as possible after cleaning and before visible oxidation occurs. In no case shall more than eight hours elapse between cleaning and coating.

The protective epoxy coatings shall be applied by the electrostatic spray method or the electrostatic fluidized bed method in accordance with the recommendations of the coating manufacturer. The epoxy coating may be applied before or after fabrication of the reinforcing bars.

The epoxy coating shall be applied as a smooth uniform coat. After curing, the coating thickness shall be in accordance with the requirements of ASTM A775. Coating thickness shall be controlled by taking measurements on a representative number of bars from each production lot. Coating thickness measurements shall be conducted by the method outlined in the Society for Protective Coatings Paint Application Standard SSPC-PA2.

The coating shall be checked visually after cure for continuity. It shall be free from holes, voids, contamination, cracks and damaged areas.

The coating shall not have more than two holidays (pinholes not visible to the naked eye) in any linear foot of the coated item. A holiday detector shall be used, in accordance with the manufacturer's instructions, to check the coating for holidays.

The flexibility of the coating shall be evaluated on a representative number of bars selected from each production lot. The coated bar shall be bent 120 degrees (after rebound) around a six-inch diameter mandrel. The bend shall be done at a uniform rate and may take up to

one minute to complete. The test specimens shall be at thermal equilibrium between 68 and 85 degrees F at the time of testing. No cracking of the coating shall be visible to the naked eye on the outside radius of the bent bar.

The contractor shall furnish a Certificate of Analysis from the coating applicator with each shipment of coated steel. In addition to the requirements of Subsection 106.05 of the specifications, the Certificate of Analysis shall state that the coated items and coating material have been tested in accordance with the requirements of this subsection and that the entire lot is in a fully cured condition.

The coating applicator shall be responsible for performing quality control and tests. This will include inspection and testing to determine compliance with the requirements of this subsection for the coating thickness, continuity of coating, coating cure, and flexibility of coating.

The Department reserves the right to have its authorized representative observe the preparation, coating, and testing of the reinforcing bars. The representative shall have free access to the plant, and any work done when access has been denied will be automatically rejected.

If the representative elects, lengths of coated bars may be taken from the production run on a random basis for test, evaluation, and check purposes by the Department.

1003-5.04 Shop Repair:

Epoxy coated reinforcing bars which do not meet the requirements for coating thickness, continuity of coating, coating cure, or flexibility of coating shall not be repaired.

Reinforcing bars with these defects shall be replaced, or alternately stripped of epoxy coating, recleaned and recoated in accordance with the requirements of this specification.

Coating breaks due to fabrication and handling shall be repaired with patching material if the defective area exceeds 2 percent of the surface area of the bar in a one-foot length and the damaged spot is larger than 1/4 inch by 1/4 inch.

The repair of coating breaks shall be limited to bars on which the total of the defective coating areas does not exceed 5 percent of the surface area of the reinforcing bar. Bars with greater than 5 percent damage shall be replaced, or alternately stripped of epoxy coating, recleaned and recoated in accordance with the requirements of this specification.

1003-6 Prestressing Reinforcing Steel

Prestressing reinforcing steel shall conform to the requirements of Section 602-2.01 of the specifications.

Prestressing steel shall be high-tensile steel wire, high-tensile seven-wire strand or high-tensile alloy bars, as shown in the plans.

High-tensile steel wire shall conform to the requirements of AASHTO M 204.

High-tensile seven-wire strand shall conform to the requirements of AASHTO M 203 for Grade 270. In addition to the 0.5-inch diameter prestressing steel typically shown on the plans, 0.6-inch diameter seven-wire strand may be used for cast-in-place prestressed structures.

High-tensile alloy bars shall conform to the requirements of AASHTO M 275.

All prestressing steel shall be satisfactorily protected from damage by abrasion, moisture, rust, or corrosion and shall be free of dirt, rust, oil, grease, or other deleterious substances.

For every five reels of prestressing steel furnished, one sample not less than six feet long, will be tested by the Engineer. Samples of the furnished reels with the manufacturer's Certificate of Compliance, a mill certificate, and a test report may be shipped directly by the manufacturer to the Engineer.

1003-7 Dowel Bars for Portland Cement Concrete Pavement

Dowel bars shall be round, plain steel bars of the dimensions shown on the plans conforming to the requirements of AASHTO M 254 with Type B coating. The core material shall conform to the requirements of ASTM A615, Grade 60.

Epoxy coated dowel bars shall also conform to the requirements of Subsection 1003-5 of the specifications.

The Contractor shall furnish a Certificate of Compliance that properly identifies the coating material, the number of each batch of coating material used, quantity represented, date of manufacture, name and address of manufacturer, and a statement that the supplied coating material meets the requirements of AASHTO M 254 with Type B coating.

(1005PG, 12/21/23)

SECTION 1005 BITUMINOUS MATERIALS:

1005-3 Bituminous Material Requirements:

1005-3.01 Asphalt Cement: of the Standard Specifications is revised to read:

Asphalt cement shall be a performance grade (PG) asphalt binder conforming to the requirements of AASHTO M 320. Air blown/oxidized asphalt, Polyphosporic acid (PPA) modification and re-refined/recycled engine oil bottom (REOB) will not be accepted. The pressure aging temperature for all binders, including Terminal Blend rubberized binder and Polymer modified asphalt binder shall be as specified below:

PG Asphalt Binder	Pressure Aging Temperature
PG 70-XX and above	110 ºC
PG 64-XX and below	100 ºC

If Terminal Blend rubberized binder (XX-XXTR+) is used, it shall conform to the requirements of Table 1005-1 and 1005-1a.

If Polymer modified asphalt binder (XX-XXPM) is used, it shall conform to the requirements of Table 1005-1 and 1005-1b.

If, during asphaltic concrete production, it is determined by testing that asphalt cement fails to meet the requirements for the specified grade, the asphaltic concrete represented by the corresponding test results shall be evaluated for acceptance. Should the asphaltic concrete be allowed to remain in place, the contract unit price for asphalt cement will be adjusted by the percentage shown in Table 1005-1. Should the asphalt cement be in reject status, the contractor may, within 15 days of receiving notice of the reject status, supply an engineering analysis of the expected performance of the asphaltic concrete in which the asphalt cement is incorporated. The engineering analysis shall detail any proposed corrective action and the anticipated effect of such corrective action on the performance. Within three working days, the Engineer will determine whether or not to accept the contractor's proposal. If the proposal is rejected, the asphaltic concrete shall be removed and replaced with asphaltic concrete meeting the requirements of the specifications at no additional expense to the Department. If the contractor's proposal is accepted, the asphaltic concrete shall remain in place at the applicable percent of contract unit price allowed, and any necessary corrective action shall be performed at no additional cost to the Department.

1005-3.03 Emulsified Asphalt: the fourth paragraph of the Standard Specifications is revised to read:

Emulsified asphalts shall be homogeneous. If emulsified asphalt has separated, it shall be thoroughly mixed to insure homogeneity. If emulsified asphalt has separated due to freezing, it shall not be used. Emulsified asphalt shall not be used after 30 days from production.

1005-3.04 Emulsified Asphalt (Special Type): of the Standard Specifications is revised to read:

Emulsified asphalt (special type) shall consist of Type SS-1 or CSS-1 diluted with water to provide an asphalt content not less than 26 percent. The water used shall be potable. Potable water obtained from public utility distribution lines will be acceptable. The water used shall be free of injurious amounts of oil, acid, alkali, clay, vegetable matter, silt, or other harmful matter. The material shall not be diluted in the field.

1005-3.07 Other Requirements: the tables 1005-1a and 1005-1b of the Standard Specifications are revised to read:

TABLE 1005-1a
Terminal Blend rubberized binder (XX-XXTR+)

Test Property	Test Method	Requirement	Test Result	Percent of Contract Unit Price Allowed
Solubility, %, minimum	ASTM D7553 or ASTM 2042	98	-----	-----
Elastic Recovery, @ 10 ºC, %, minimum	AASHTO T 301	75	75 70 - 74 < 70	100 80 65 (1)

(1) Reject Status: The pay adjustment applies if allowed to remain in place.

Notes:

In case of dispute, ASTM D2042 shall be used to determine the Solubility.

The asphalt binder shall contain a minimum of 8 percent crumb rubber and a minimum of 3 percent SBS (styrene-butadiene-styrene) polymer.

The crumb rubber shall be derived from processing whole scrap tires or shredded tire materials. The tires from which the crumb rubber is produced shall be taken from automobiles, trucks, or other equipment owned and operated in the United States. The processing shall not produce, as a waste product, casings or other round tire material that can retain moisture when stored or disposed of above ground.

Modified binders shall be blended at the source of supply and delivered as a

homogenous mixture to the job site.

Modified Binders stored at the asphalt concrete mixing plant for more than two weeks or beyond the supplier recommended shelf life, whichever is less, shall be sampled and tested.

TABLE 1005-1b
Polymer Modified Asphalt Binder (XX-XXPM)

Test Property	Test Method	Requirement	Test Result	Percent of Contract Unit Price Allowed
Solubility, %, minimum	ASTM D7553 or ASTM D2042	98	-----	-------
Elastic Recovery @ 10^{o}C, %, minimum	AASHTO T 301	75	≥ 75 70 - 74 < 70	100 80 65 (1)

(1) Reject Status: The pay adjustment applies if allowed to remain in place.

Notes:

In case of dispute, ASTM D2042 shall be used to determine the Solubility.

Asphalt binder shall contain a minimum of 3 percent SBS (styrene-butadiene-styrene) polymer.

Modified binders shall be blended at the source of supply and delivered as a homogenous mixture to the job site.

Modified Binders stored at the asphalt concrete mixing plant for more than two weeks or beyond the supplier recommended shelf life, whichever is less, shall be sampled and tested.

1005-3.07 **Other Requirements:** the table 1005-1c of the Standard Specifications is hereby deleted.

1005-3.07 **Other Requirements:** the table 1005-3 of the Standard Specifications is revised to read:

TABLE 1005-3
EMULSIFIED ASPHALTS

Tests On Emulsion	Test Method	Requirement					
		RS-1	CRS-1	RS-2	CRS-2	SS-1	CSS-1
Viscosity: Saybolt Furol, seconds, range 77 °F 122 °F	AASHTO T 59	20-100	20-100	50-400	50-400	20-100	20-100
Settlement: 5 days, %, maximum	AASHTO T 59	5	5	5	5	5	5
Sieve: Retained on No. 20, %, maximum	AASHTO T 59 (1)	0.10	0.10	0.10		0.10	0.10
Particle Charge	AASHTO T 59		Pos.		Pos.		Pos. (2)
Demulsiability: 35 mL, 0.02 N calcium chloride %, minimum	AASHTO T 59	60		60			
Classification: Uncoated particles, %, minimum	Arizona Test Method 502				55		
Residue: (3) Residue, %, minimum (4)		55	60	63	65	57	57

Notes:

(1) Distilled water shall be used. Two percent sodium oleate solution will not be accepted.

(2) If the Particle Charge Test result is inconclusive, material having a maximum PH value of 6.7 will be acceptable.

(3) Residue will be obtained in accordance with the requirements of Arizona Test Method 504 and shall conform to all the requirements of AASHTO M 320 for PG 64-16, except that for CRS-2 the dynamic shear (G*/Sin δ) on the original residue shall be a minimum of 1.00 kPa and a maximum of 1.50 kPa.

(4) Residue by evaporation may be determined in accordance with the

requirements of Arizona Test Method 512; however, in case of dispute, AASHTO T 59 will be used.

1005-3.07 **Other Requirements:** the note (2) of Table 1005-3a of the Standard Specifications is revised to read:

(2) Testing shall be performed on residue by distillation. Testing on residue by oven evaporation will not be accepted.

1005-3.07 **Other Requirements:** the table 1005-5 of the Standard Specifications is revised to read:

TABLE 1005-5

EMULSIFIED RECYCLING AGENTS

Tests on Emulsified Recycling Agent	Test Method	Requirement			
		ERA-1	ERA-5	ERA-25	ERA-75
Viscosity: Saybolt Furol, 77 °F, seconds range	AASHTO T 59	15 - 40	15 - 100	15 - 100	15 - 100
Miscibility	AASHTO T 59	Passes	Passes	Passes	Passes
Sieve Test: %, maximum	AASHTO T 59 (1)	0.10	0.10	0.10	0.10
Particle Charge	AASHTO T 59	Positive	Positive	Positive	Positive
Residue: (2) Residue, %, minimum	(3)	60	60	60	60

Notes:

(1) Distilled water shall be used. Two percent sodium oleate solution will not be accepted.

(2) Residue will be obtained in accordance with the requirements of Arizona Test Method 504 and shall conform to the requirements specified in Table 1005-4.

(3) Residue by evaporation may be determined in accordance with the requirements of Arizona Test Method 512; however, in case of dispute, AASHTO T 59 will be used.

1005-3.07 Other Requirements: the Paving Asphalt row of the table 1005-6 of the Standard Specifications is modified to add:

TABLE 1005-6 OTHER REQUIREMENTS			
Grade of Asphalt Specification Designation	**Range of Temperatures for Application by Spraying, °F (Not applicable for Plant Mixing)**	**Range of Aggregate Temperatures for Plant Mixing, °F**	**Basis of Conversion, Average Gallons Per Ton at 60 °F**
Paving Asphalt	275 - 400	------	
PG 76-22 PM			231
PG 70-22 PM			232
PG 64-28 PM			233

(1006PCC, 09/21/23)

SECTION 1006 PORTLAND CEMENT CONCRETE:

1006-2.01(A) General: of the Standard Specifications is revised to read:

Cementitious material is defined as an inorganic material or a mixture of inorganic materials that sets and develops strength by chemical reaction with water by formation of hydrates and is capable of doing so under water. In this specification, cementitious materials are defined as hydraulic cement (Portland cement, Portland-pozzolan cement or Portland-limestone cement) and supplementary cementitious materials (fly ash, natural pozzolan, or silica fume).

1006-2.01(B) Hydraulic Cement: the first paragraph of the Standard Specifications is revised to read:

Hydraulic cement shall consist of Portland cement, Portland-pozzolan cement or Portland-limestone cement.

1006-2.01(B) Hydraulic Cement: of the Standard Specifications is modified to add:

Portland-limestone cement shall conform to the requirements of ASTM C595 for blended hydraulic cement with moderate sulfate resistance, Type IL (MS).

1006-2.01(C)(2) Flyash and Natural Pozzolan: of the Standard Specifications is revised to read:

Fly ash and natural pozzolan shall conform to the requirements of ASTM C618 for Class C, F, or N.

TABLE 1006-5 Design Criteria: the column heading of the third column of the Standard Specifications is revised to read:

		Cementitious Material Content: Lbs. per Cu Yd. Minimum - Maximum		

1006-3.02(C) Mix Design Submittal Requirements: the items (16) and (18) of the Standard Specifications are revised to read:

(16) Volume of each material measured to the nearest hundredth of a cubic foot;

(18) Total volume measured to the nearest hundredth of a cubic foot;

1006-7.02(A) General: the fifth paragraph of the Standard Specifications is revised to read:

Concrete shall be sampled in accordance with ASTM C172 for acceptance testing of temperature, slump, unit weight and yield (when required) and air content (when required) as well as for fabrication of test cylinders for compressive strength determination at 28 days except that the concrete shall be sampled once during discharge at the middle portion of the batch. ASTM C172 includes sampling from stationary, paving and truck mixers, and from agitating and non-agitating equipment used to transport central-mixed concrete and from continuous mixing equipment as described in Specification ASTM C685/C685M. Sampling shall be at the point of discharge from truck mixers. Sufficient care shall be taken to obtain a representative sample by diverting the entire stream of the concrete to prevent segregation. Samples shall be of sufficient size to perform all the required tests and fabricate the necessary test cylinders but in no case less than 1 cubic foot.

1006-7.02(B) Class S and Class B Concrete: of the Standard Specifications is revised to read:

For Class S concrete with a compressive strength requirement less than 4000 psi, or Class B concrete, a strength test will consist of the average strength of two test cylinders. However, if the compressive strengths of the two test cylinders differ by more than 10 percent from the average of the two, the strength test result shall be the cylinder with the highest compressive strength.

For Class S concrete with a compressive strength requirement equal to or greater than 4000 psi, or Class P concrete, the compressive strength of each sample shall be determined by averaging the results of the three test cylinders. However, if the compressive strength of any one of the three test cylinders differs by more than 10 percent from the average of the three, its result shall be discarded and the compressive strength shall be the average of the remaining two cylinders. Should the individual compressive strength of any two of the three remaining cylinders differ by more than 10 percent from the average of the three, the results will be discarded and the compressive strength shall be the strength of the remaining cylinder.

1006-7.03(A)(3) Consistency: the third paragraph of the Standard Specifications is revised to read:

When the concrete is pumped, samples for consistency will be taken as the concrete leaves the mixer.

TABLE 1006-10 Air Entrainment Requirements: the table of the Standard Specifications is revised to read:

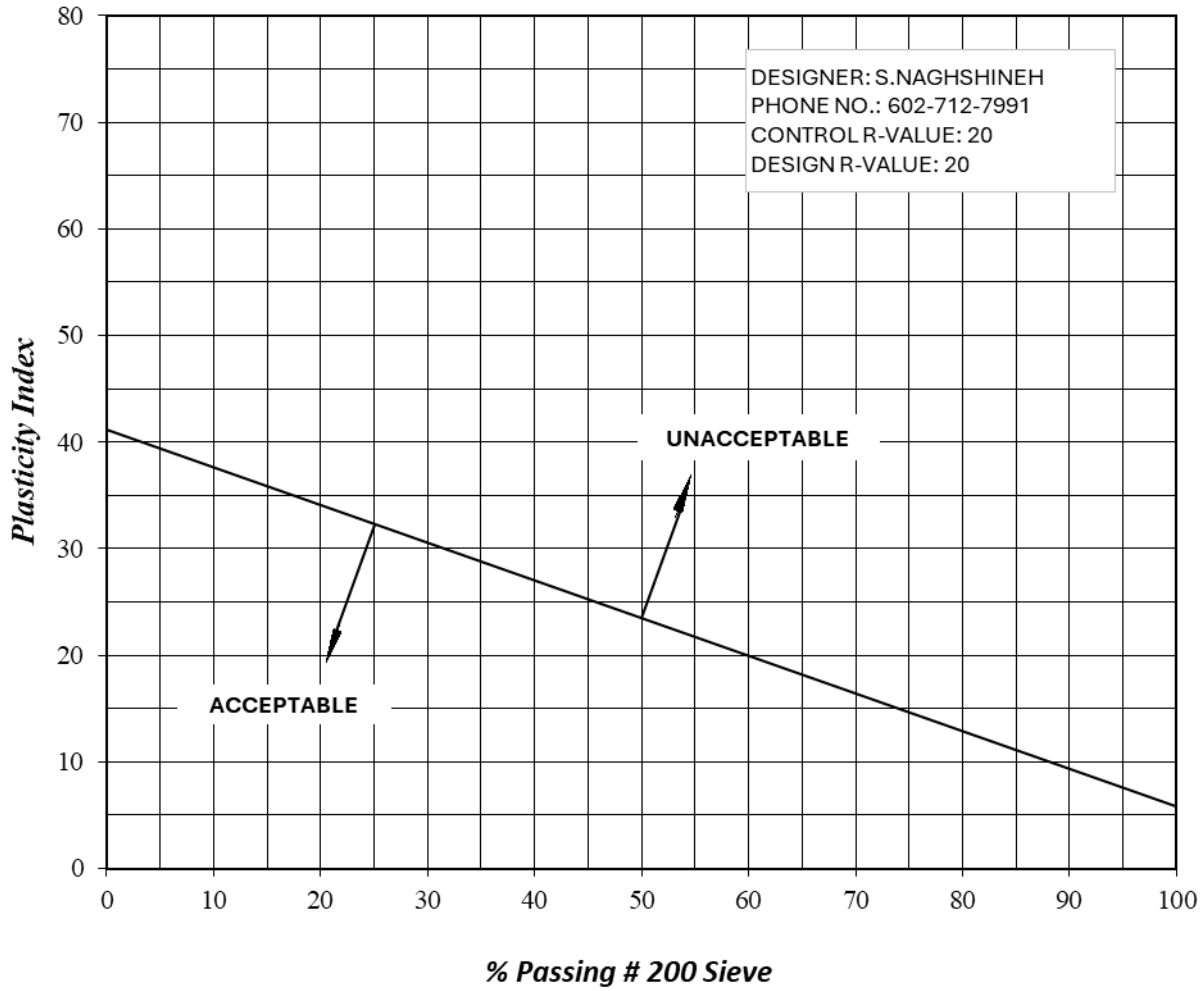
TABLE 1006-10
Air Entrainment Requirements

Elevation	Air Entrainment Required	Required Air Content by Volume (%)
3000 feet or above	Yes	4 to 7
Below 3000 feet	Contractor's Option	≤ 7

Attachment 1

Subgrade Acceptance Chart

TYPICAL SECTION
PERKINS VALLEY TI UP STR 1776
040 NA 185 F064501C / 040-D(248)T



SUBGRADE
ACCEPTANCE CHART

I-40
Within project limits

Attachment 2

Slump Loss of Test of Portland Cement Concrete

Slump Loss Test of Portland Cement Concrete:

This method shall be used to determine the slump loss of freshly mixed Portland Cement Concrete over a period of time. The purpose of this test procedure is to ensure that the concrete will maintain the minimum required slump throughout the anticipated concrete hauling and placement period.

The slump loss test results shall be submitted as part of the installation plan described in subsection 609-1.03 and performed prior to the mix design being submitted to the Engineer for approval.

The Slump Loss Test of Portland Cement Concrete shall be performed by a certified technician meeting the requirements of the ACI Concrete Field Testing Technician Grade I or equivalent and shall be per the following procedure and guidelines:

(A) The test shall be performed on a sample of mixed concrete that complies with the proposed concrete mix design submitted for the drilled shaft foundations.

(B) A test batch of the proposed concrete mix design submitted for the drilled shaft foundations shall be prepared at a temperature consistent with ambient and concrete temperatures anticipated during actual concrete placement.

(C) The test batch shall be a minimum of three cubic yards.

(D) After the test batch has been mixed per the mix design requirements, a minimum of one cubic foot of the concrete shall be sampled in accordance with the requirements of ASTM C172.

(E) An initial test shall be performed for slump (per ASTM C143) and ambient and concrete temperatures (per ASTM C1064). Air content shall be tested per ASTM C231 or ASTM C173, if required by the proposed concrete mix design.

To simulate in-place plastic concrete, the certified technician shall:

(1) Discharge approximately one cubic yard of the test batched concrete in a hole, form or suitable container having approximate dimensions of three feet by three feet by three feet deep. The dimensions of the hole form or suitable container used may be adjusted based on project requirements.

(2) Line the hole, form or suitable container with plastic to prevent moisture loss. Cover the top of the hole, form or suitable container with plastic to prevent rapid evaporation.

(3) Isolate the concrete from vibration for the duration of the test.

(4) Obtain at least one cubic foot of concrete from the test simulated in-place concrete every hour and perform testing until the slump has reached the specified minimum slump requirements per section 609-2.01(D).

(5) Re-cover the simulated in-place concrete with plastic after each slump test.

The contractor shall submit to the Engineer the following in tabular and graphical form, and shall include these results in the installation plan described in Subsection 609-1.03:

(a) The Elapsed Time

(b) Slump from simulated in-place sample

(c) Air Temperature

(d) Concrete Temperature

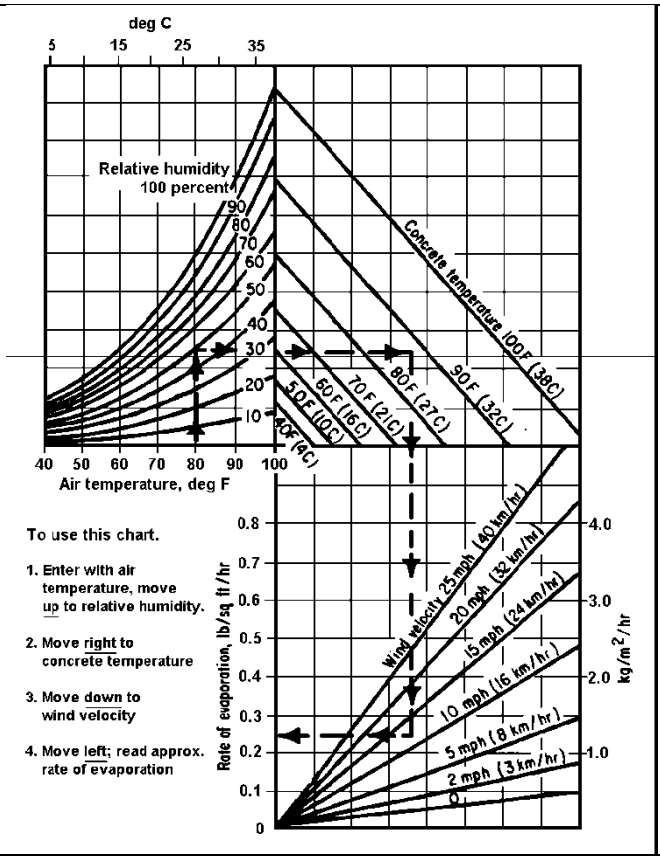
(e) Percent Air (if air entrained)

The graphical form shall depict time versus each of the tests performed. The contractor shall also submit the type (hole, form or suitable container) and its respective dimensions used for the simulated in place testing.

The Engineer may require additional testing after review of the results.

Attachment 3

Evaporation Rate of Surface Moisture



Note: Example shown by dashed lines is for an air temperature of 80°F, relative humidity of 50 percent, concrete temperature of 87°F, and a wind velocity of 12 miles per hour. This result is a rate of evaporation of 0.24 pounds per square foot per hour.

ATTACHMENT 3- Evaporation Rate of Surface Moisture

REQUIRED CONTRACT PROVISIONS
FEDERAL-AID CONSTRUCTION CONTRACTS

I. GENERAL

1. Form FHWA-1273 must be physically incorporated in each construction contract funded under title 23, United States Code, as required in 23 CFR 633.102(b) (excluding emergency contracts solely intended for debris removal). The contractor (or subcontractor) must insert this form in each subcontract and further require its inclusion in all lower tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services). 23 CFR 633.102(e).

The applicable requirements of Form FHWA-1273 are incorporated by reference for work done under any purchase order, rental agreement or agreement for other services. The prime contractor shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider. 23 CFR 633.102(e).

Form FHWA-1273 must be included in all Federal-aid design-build contracts, in all subcontracts and in lower tier subcontracts (excluding subcontracts for design services, purchase orders, rental agreements and other agreements for supplies or services) in accordance with 23 CFR 633.102. The design-builder shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Contracting agencies may reference Form FHWA-1273 in solicitation-for-bids or request-for-proposals documents, however, the Form FHWA-1273 must be physically incorporated (not referenced) in all contracts, subcontracts and lower-tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services related to a construction contract). 23 CFR 633.102(b).

2. Subject to the applicability criteria noted in the following sections, these contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract. 23 CFR 633.102(d).

3. A breach of any of the stipulations contained in these Required Contract Provisions may be sufficient grounds for withholding of progress payments, withholding of final payment, termination of the contract, suspension / debarment or any other action determined to be appropriate by the contracting agency and FHWA.

4. Selection of Labor: During the performance of this contract, the contractor shall not use convict labor for any purpose within the limits of a construction project on a Federal-aid highway unless it is labor performed by convicts who are on parole, supervised release, or probation. 23 U.S.C. 114(b). The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors. 23 U.S.C. 101(a).

II. NONDISCRIMINATION (23 CFR 230.107(a); 23 CFR Part 230, Subpart A, Appendix A; EO 11246)

The provisions of this section related to 23 CFR Part 230, Subpart A, Appendix A are applicable to all Federal-aid construction contracts and to all related construction subcontracts of $10,000 or more. The provisions of 23 CFR Part 230 are not applicable to material supply, engineering, or architectural service contracts.

In addition, the contractor and all subcontractors must comply with the following policies: Executive Order 11246, 41 CFR Part 60, 29 CFR Parts 1625-1627, 23 U.S.C. 140, Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 794), Title VI of the Civil Rights Act of 1964, as amended (42 U.S.C. 2000d et seq.), and related regulations including 49 CFR Parts 21, 26, and 27; and 23 CFR Parts 200, 230, and 633.

The contractor and all subcontractors must comply with: the requirements of the Equal Opportunity Clause in 41 CFR 60-1.4(b) and, for all construction contracts exceeding $10,000, the Standard Federal Equal Employment Opportunity Construction Contract Specifications in 41 CFR 60-4.3.

Note: The U.S. Department of Labor has exclusive authority to determine compliance with Executive Order 11246 and the policies of the Secretary of Labor including 41 CFR Part 60, and 29 CFR Parts 1625-1627. The contracting agency and the FHWA have the authority and the responsibility to ensure compliance with 23 U.S.C. 140, Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 794), and Title VI of the Civil Rights Act of 1964, as amended (42 U.S.C. 2000d et seq.), and related regulations including 49 CFR Parts 21, 26, and 27; and 23 CFR Parts 200, 230, and 633.

The following provision is adopted from 23 CFR Part 230, Subpart A, Appendix A, with appropriate revisions to conform to the U.S. Department of Labor (US DOL) and FHWA requirements.

1. Equal Employment Opportunity: Equal Employment Opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (*see* 28 CFR Part 35, 29 CFR Part 1630, 29 CFR Parts 1625-1627, 41 CFR Part 60 and 49 CFR Part 27) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140, shall constitute the EEO and specific affirmative action standards for the contractor's project activities under this contract. The provisions of the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR Part 35 and 29 CFR Part 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

a. The contractor will work with the contracting agency and the Federal Government to ensure that it has made every good faith effort to provide equal opportunity with respect to all of its terms and conditions of employment and in their review of activities under the contract. 23 CFR 230.409 (g)(4) & (5).

b. The contractor will accept as its operating policy the following statement:

> "It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, sexual orientation, gender identity, color, national origin, age or disability. Such action shall include: 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, pre-apprenticeship, and/or on-the-job training."

2. EEO Officer: The contractor will designate and make known to the contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active EEO program and who must be assigned adequate authority and responsibility to do so.

3. Dissemination of Policy: All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action or are substantially involved in such action, will be made fully cognizant of and will implement the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:

a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer or other knowledgeable company official.

b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.

c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minorities and women.

d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.

e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

4. Recruitment: When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minorities and women in the area from which the project work force would normally be derived.

a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minorities and women. To meet this requirement, the contractor will identify sources of potential minority group employees and establish with such identified sources procedures whereby minority and women applicants may be referred to the contractor for employment consideration.

b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, the contractor is expected to observe the provisions of that agreement to the extent that the system meets the contractor's compliance with EEO contract provisions. Where implementation of such an agreement has the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Federal nondiscrimination provisions.

c. The contractor will encourage its present employees to refer minorities and women as applicants for employment. Information and procedures with regard to referring such applicants will be discussed with employees.

5. Personnel Actions: Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, sexual orientation, gender identity, national origin, age or disability. The following procedures shall be followed:

a. The contractor will conduct periodic inspections of project sites to ensure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.

b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.

c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.

d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with its obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action

within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of their avenues of appeal.

6. Training and Promotion:

a. The contractor will assist in locating, qualifying, and increasing the skills of minorities and women who are applicants for employment or current employees. Such efforts should be aimed at developing full journey level status employees in the type of trade or job classification involved.

b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs (i.e., apprenticeship and on-the-job training programs for the geographical area of contract performance). In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision. The contracting agency may reserve training positions for persons who receive welfare assistance in accordance with 23 U.S.C. 140(a).

c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.

d. The contractor will periodically review the training and promotion potential of employees who are minorities and women and will encourage eligible employees to apply for such training and promotion.

7. Unions: If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use good faith efforts to obtain the cooperation of such unions to increase opportunities for minorities and women. 23 CFR 230.409. Actions by the contractor, either directly or through a contractor's association acting as agent, will include the procedures set forth below:

a. The contractor will use good faith efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minorities and women for membership in the unions and increasing the skills of minorities and women so that they may qualify for higher paying employment.

b. The contractor will use good faith efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, sexual orientation, gender identity, national origin, age, or disability.

c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the contracting agency and shall set forth what efforts have been made to obtain such information.

d. In the event the union is unable to provide the contractor with a reasonable flow of referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, sexual orientation, gender identity, national origin, age, or disability; making full efforts to obtain qualified and/or qualifiable minorities and women. The failure of a union to provide sufficient referrals (even though it is obligated to provide exclusive referrals under the terms of a collective bargaining agreement) does not relieve the contractor from the requirements of this paragraph. In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the contracting agency.

8. Reasonable Accommodation for Applicants / Employees with Disabilities: The contractor must be familiar with the requirements for and comply with the Americans with Disabilities Act and all rules and regulations established thereunder. Employers must provide reasonable accommodation in all employment activities unless to do so would cause an undue hardship.

9. Selection of Subcontractors, Procurement of Materials and Leasing of Equipment: The contractor shall not discriminate on the grounds of race, color, religion, sex, sexual orientation, gender identity, national origin, age, or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The contractor shall take all necessary and reasonable steps to ensure nondiscrimination in the administration of this contract.

a. The contractor shall notify all potential subcontractors, suppliers, and lessors of their EEO obligations under this contract.

b. The contractor will use good faith efforts to ensure subcontractor compliance with their EEO obligations.

10. Assurances Required:

a. The requirements of 49 CFR Part 26 and the State DOT's FHWA-approved Disadvantaged Business Enterprise (DBE) program are incorporated by reference.

b. The contractor, subrecipient or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR part 26 in the award and administration of DOT-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 recipient deems appropriate, which may include, but is not limited to:
(1) Withholding monthly progress payments;
(2) Assessing sanctions;
(3) Liquidated damages; and/or
(4) Disqualifying the contractor from future bidding as non-responsible.

c. The Title VI and nondiscrimination provisions of U.S. DOT Order 1050.2A at Appendixes A and E are incorporated by reference. 49 CFR Part 21.

11. Records and Reports: The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following the date of the final payment to the contractor for all contract work and shall be available at reasonable times and places for inspection by authorized representatives of the contracting agency and the FHWA.

a. The records kept by the contractor shall document the following:

(1) The number and work hours of minority and non-minority group members and women employed in each work classification on the project;

(2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women; and

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minorities and women.

b. The contractors and subcontractors will submit an annual report to the contracting agency each July for the duration of the project indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on Form FHWA-1391. The staffing data should represent the project work force on board in all or any part of the last payroll period preceding the end of July. If on-the-job training is being required by special provision, the contractor will be required to collect and report training data. The employment data should reflect the work force on board during all or any part of the last payroll period preceding the end of July.

III. NONSEGREGATED FACILITIES

This provision is applicable to all Federal-aid construction contracts and to all related construction subcontracts of more than $10,000. 41 CFR 60-1.5.

As prescribed by 41 CFR 60-1.8, the contractor must ensure that facilities provided for employees are provided in such a manner that segregation on the basis of race, color, religion, sex, sexual orientation, gender identity, or national origin cannot result. The contractor may neither require such segregated use by written or oral policies nor tolerate such use by employee custom. The contractor's obligation extends further to ensure that its employees are not assigned to perform their services at any location under the contractor's control where the facilities are segregated. The term "facilities" includes waiting rooms, work areas, restaurants and other eating areas, time clocks, restrooms, washrooms, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing provided for employees. The contractor shall provide separate or single-user restrooms and necessary dressing or sleeping areas to assure privacy between sexes.

IV. DAVIS-BACON AND RELATED ACT PROVISIONS

This section is applicable to all Federal-aid construction projects exceeding $2,000 and to all related subcontracts and lower-tier subcontracts (regardless of subcontract size), in accordance with 29 CFR 5.5. The requirements apply to all projects located within the right-of-way of a roadway that is functionally classified as Federal-aid highway. 23 U.S.C. 113. This excludes roadways functionally classified as local roads or rural minor collectors, which are exempt. 23 U.S.C. 101. Where applicable law requires that projects be treated as a project on a Federal-aid highway, the provisions of this subpart will apply regardless of the location of the project. Examples include: Surface Transportation Block Grant Program projects funded under 23 U.S.C. 133 [excluding recreational trails projects], the Nationally Significant Freight and Highway Projects funded under 23 U.S.C. 117, and National Highway Freight Program projects funded under 23 U.S.C. 167.

The following provisions are from the U.S. Department of Labor regulations in 29 CFR 5.5 “Contract provisions and related matters” with minor revisions to conform to the FHWA-1273 format and FHWA program requirements.

1. Minimum wages (29 CFR 5.5)

a. *Wage rates and fringe benefits.* All laborers and mechanics employed or working upon the site of the work (or otherwise working in construction or development of the project under a development statute), 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 basic hourly 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. As provided in paragraphs (d) and (e) of 29 CFR 5.5, the appropriate wage determinations are effective by operation of law even if they have not been attached to the contract. Contributions made or costs reasonably anticipated for bona fide fringe benefits under the Davis-Bacon Act (40 U.S.C. 3141(2)(B)) on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph 1.e. 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 must be paid the appropriate wage rate and fringe benefits on the wage determination for the classification(s) of work actually performed, without regard to skill, except as provided in paragraph 4. of this section. 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 classifications and wage rates conformed under paragraph 1.c. of this section) and the Davis-Bacon poster (WH–1321) must 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.

b. *Frequently recurring classifications.* (1) In addition to wage and fringe benefit rates that have been determined to be prevailing under the procedures set forth in 29 CFR part 1, a wage determination may contain, pursuant to § 1.3(f), wage and fringe benefit rates for classifications of laborers and mechanics for which conformance requests are regularly submitted pursuant to paragraph 1.c. of this section, provided that:

(i) The work performed by the classification is not performed by a classification in the wage determination for which a prevailing wage rate has been determined;

(ii) The classification is used in the area by the construction industry; and

(iii) The wage rate for the classification bears a reasonable relationship to the prevailing wage rates contained in the wage determination.

(2) The Administrator will establish wage rates for such classifications in accordance with paragraph 1.c.(1)(iii) of this section. Work performed in such a classification must be paid at no less than the wage and fringe benefit rate listed on the wage determination for such classification.

c. *Conformance.* (1) The contracting officer must 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 be classified in conformance with the wage determination. Conformance of an additional classification and wage rate and fringe benefits is appropriate only when the following criteria have been met:

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

(ii) The classification is used in the area by the construction industry; and

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

(2) The conformance process may not be used to split, subdivide, or otherwise avoid application of classifications listed in the wage determination.

(3) 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 will be sent by the contracting officer by email to *DBAconformance@dol.gov*. 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.

(4) 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 will, by email to *DBAconformance@dol.gov*, 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.

(5) The contracting officer must promptly notify the contractor of the action taken by the Wage and Hour Division under paragraphs 1.c.(3) and (4) of this section. The contractor must furnish a written copy of such determination to each affected worker or it must be posted as a part of the wage determination. The wage rate (including fringe benefits where appropriate) determined pursuant to paragraph 1.c.(3) or (4) of this section must 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.

d. *Fringe benefits not expressed as an hourly rate.* 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 may either pay the benefit as stated in the wage determination or may pay another bona fide fringe benefit or an hourly cash equivalent thereof.

e. *Unfunded plans.* 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, in accordance with the criteria set forth in § 5.28, 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.

f. *Interest.* In the event of a failure to pay all or part of the wages required by the contract, the contractor will be required to pay interest on any underpayment of wages.

2. Withholding (29 CFR 5.5)

a. *Withholding requirements.* The contracting agency may, upon its own action, or must, upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor so much of the accrued payments or advances as may be considered necessary to satisfy the liabilities of the prime contractor or any subcontractor for the full amount of wages and monetary relief, including interest, required by the clauses set forth in this section for violations of this contract, or to satisfy any such liabilities required by any other Federal contract, or federally assisted contract subject to Davis-Bacon labor standards, that is held by the same prime contractor (as defined in § 5.2). The necessary funds may be withheld from the contractor under this contract, any other Federal contract with the same prime contractor, or any other federally assisted contract that is subject to Davis-Bacon labor standards requirements and is held by the same prime contractor, regardless of whether the other contract was awarded or assisted by the same agency, and such funds may be used to satisfy the contractor liability for which the funds were withheld. In the event of a contractor's failure to pay any laborer or mechanic, including any apprentice or helper working on the site of the work all or part of the wages required by the contract, or upon the contractor's failure to submit the required records as discussed in paragraph 3.d. of this section, the contracting agency may on its own initiative and after written notice to the contractor, 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.

b. *Priority to withheld funds.* The Department has priority to funds withheld or to be withheld in accordance with paragraph

2.a. of this section or Section V, paragraph 3.a., or both, over claims to those funds by:

(1) A contractor's surety(ies), including without limitation performance bond sureties and payment bond sureties;

(2) A contracting agency for its reprocurement costs;

(3) A trustee(s) (either a court-appointed trustee or a U.S. trustee, or both) in bankruptcy of a contractor, or a contractor's bankruptcy estate;

(4) A contractor's assignee(s);

(5) A contractor's successor(s); or

(6) A claim asserted under the Prompt Payment Act, 31 U.S.C. 3901–3907.

3. Records and certified payrolls (29 CFR 5.5)

a. *Basic record requirements* (1) *Length of record retention.* All regular payrolls and other basic records must be maintained by the contractor and any subcontractor during the course of the work and preserved for all laborers and mechanics working at the site of the work (or otherwise working in construction or development of the project under a development statute) for a period of at least 3 years after all the work on the prime contract is completed.

(2) *Information required.* Such records must contain the name; Social Security number; last known address, telephone number, and email address of each such worker; each worker's correct classification(s) of work actually performed; 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 40 U.S.C. 3141(2)(B) of the Davis-Bacon Act); daily and weekly number of hours actually worked in total and on each covered contract; deductions made; and actual wages paid.

(3) *Additional records relating to fringe benefits.* Whenever the Secretary of Labor has found under paragraph 1.e. of this section 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 40 U.S.C. 3141(2)(B) of the Davis-Bacon Act, the contractor must 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.

(4) *Additional records relating to apprenticeship.* Contractors with apprentices working under approved programs must maintain written evidence of the registration of apprenticeship programs, the registration of the apprentices, and the ratios and wage rates prescribed in the applicable programs.

b. *Certified payroll requirements* (1) *Frequency and method of submission.* The contractor or subcontractor must submit weekly, for each week in which any DBA- or Related Acts-covered work is performed, certified payrolls to the contracting agency. The prime contractor is responsible for the submission of all certified payrolls by all subcontractors. A contracting agency or prime contractor may permit or require contractors to submit certified payrolls through an electronic system, as long as the electronic system requires a legally valid electronic signature; the system allows the contractor, the contracting agency, and the Department of Labor to access the certified payrolls upon request for at least 3 years after the work on the prime contract has been completed; and the contracting agency or prime contractor permits other methods of submission in situations where the contractor is unable or limited in its ability to use or access the electronic system.

(2) *Information required.* The certified payrolls submitted must set out accurately and completely all of the information required to be maintained under paragraph 3.a.(2) of this section, except that full Social Security numbers and last known addresses, telephone numbers, and email addresses must not be included on weekly transmittals. Instead, the certified payrolls need only include an individually identifying number for each worker (*e.g.,* the last four digits of the worker's Social Security number). The required weekly certified payroll information may be submitted using Optional Form WH–347 or in any other format desired. Optional Form WH–347 is available for this purpose from the Wage and Hour Division website at *https://www.dol.gov/sites/dolgov/files/WHD/legacy/files/wh347/.pdf* or its successor website. It is not a violation of this section for a prime contractor to require a subcontractor to provide full Social Security numbers and last known addresses, telephone numbers, and email addresses to the prime contractor for its own records, without weekly submission by the subcontractor to the contracting agency.

(3) *Statement of Compliance.* Each certified payroll submitted must be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor, or the contractor's or subcontractor's agent who pays or supervises the payment of the persons working on the contract, and must certify the following:

(i) That the certified payroll for the payroll period contains the information required to be provided under paragraph 3.b. of this section, the appropriate information and basic records are being maintained under paragraph 3.a. of this section, and such information and records are correct and complete;

(ii) That each laborer or mechanic (including each helper and apprentice) working 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 29 CFR part 3; and

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

(4) *Use of Optional Form WH–347.* The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH–347 will satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 3.b.(3) of this section.

(5) *Signature.* The signature by the contractor, subcontractor, or the contractor's or subcontractor's agent must be an original handwritten signature or a legally valid electronic signature.

(6) *Falsification.* The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under 18 U.S.C. 1001 and 31 U.S.C. 3729.

(7) *Length of certified payroll retention.* The contractor or subcontractor must preserve all certified payrolls during the course of the work and for a period of 3 years after all the work on the prime contract is completed.

c. *Contracts, subcontracts, and related documents.* The contractor or subcontractor must maintain this contract or subcontract and related documents including, without limitation, bids, proposals, amendments, modifications, and extensions. The contractor or subcontractor must preserve these contracts, subcontracts, and related documents during the course of the work and for a period of 3 years after all the work on the prime contract is completed.

d. *Required disclosures and access* (1) *Required record disclosures and access to workers.* The contractor or subcontractor must make the records required under paragraphs 3.a. through 3.c. of this section, and any other documents that the contracting agency, the State DOT, the FHWA, or the Department of Labor deems necessary to determine compliance with the labor standards provisions of any of the applicable statutes referenced by § 5.1, available for inspection, copying, or transcription by authorized representatives of the contracting agency, the State DOT, the FHWA, or the Department of Labor, and must permit such representatives to interview workers during working hours on the job.

(2) *Sanctions for non-compliance with records and worker access requirements.* If the contractor or subcontractor fails to submit the required records or to make them available, or refuses to permit worker interviews during working hours on the job, the Federal agency may, after written notice to the contractor, sponsor, applicant, owner, or other entity, as the case may be, that maintains such records or that employs such workers, 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, or to permit worker interviews during working hours on the job, may be grounds for debarment action pursuant to § 5.12. In addition, any contractor or other person that fails to submit the required records or make those records available to WHD within the time WHD requests that the records be produced will be precluded from introducing as evidence in an administrative proceeding under 29 CFR part 6 any of the required records that were not provided or made available to WHD. WHD will take into consideration a reasonable request from the contractor or person for an extension of the time for submission of records. WHD will determine the reasonableness of the request and may consider, among other things, the location of the records and the volume of production.

(3) *Required information disclosures.* Contractors and subcontractors must maintain the full Social Security number and last known address, telephone number, and email address of each covered worker, and must provide them upon request to the contracting agency, the State DOT, the FHWA, the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or other compliance action.

4. Apprentices and equal employment opportunity (29 CFR 5.5)

a. *Apprentices* (1) *Rate of pay.* Apprentices will be permitted to work at less than the predetermined rate for the work they perform 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 (OA), or with a State Apprenticeship Agency recognized by the OA. A person who is not individually registered in the program, but who has been certified by the OA or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice, will be permitted to work at less than the predetermined rate for the work they perform in the first 90 days of probationary employment as an apprentice in such a program. In the event the OA or a State Apprenticeship Agency recognized by the OA withdraws approval of an apprenticeship program, the contractor will no longer be permitted to use apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(2) *Fringe benefits.* Apprentices must 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, fringe benefits must be paid in accordance with that determination.

(3) *Apprenticeship ratio.* The allowable ratio of apprentices to journeyworkers on the job site in any craft classification must not be greater than the ratio permitted to the contractor as to the entire work force under the registered program or the ratio applicable to the locality of the project pursuant to paragraph 4.a.(4) of this section. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated in paragraph 4.a.(1) of this section, must 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 this section must be paid not less than the applicable wage rate on the wage determination for the work actually performed.

(4) *Reciprocity of ratios and wage rates.* Where a contractor is performing construction on a project in a locality other than the locality in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyworker's hourly rate) applicable within the locality in which the construction is being performed must be observed. If there is no applicable ratio or wage rate for the locality of the project, the ratio and wage rate specified in the contractor's registered program must be observed.

b. *Equal employment opportunity.* The use of apprentices and journeyworkers under this part must be in conformity with

the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

c. Apprentices and Trainees (programs of the U.S. DOT).

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. 23 CFR 230.111(e)(2). The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeyworkers shall not be greater than permitted by the terms of the particular program.

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 as provided in 29 CFR 5.5.

6. Subcontracts. The contractor or subcontractor must insert FHWA-1273 in any subcontracts, along with the applicable wage determination(s) and such other clauses or contract modifications as the contracting agency may by appropriate instructions require, and a clause requiring the subcontractors to include these clauses and wage determination(s) in any lower tier subcontracts. The prime contractor is responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in this section. In the event of any violations of these clauses, the prime contractor and any subcontractor(s) responsible will be liable for any unpaid wages and monetary relief, including interest from the date of the underpayment or loss, due to any workers of lower-tier subcontractors, and may be subject to debarment, as appropriate. 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 as provided in 29 CFR 5.5.

9. Disputes concerning labor standards. As provided in 29 CFR 5.5, 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. a. By entering into this contract, the contractor certifies that neither it 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 40 U.S.C. 3144(b) or § 5.12(a).

b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of 40 U.S.C. 3144(b) or § 5.12(a).

c. The penalty for making false statements is prescribed in the U.S. Code, Title 18 Crimes and Criminal Procedure, 18 U.S.C. 1001.

11. Anti-retaliation. It is unlawful for any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, or to cause any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, any worker or job applicant for:

a. Notifying any contractor of any conduct which the worker reasonably believes constitutes a violation of the DBA, Related Acts, this part, or 29 CFR part 1 or 3;

b. Filing any complaint, initiating or causing to be initiated any proceeding, or otherwise asserting or seeking to assert on behalf of themselves or others any right or protection under the DBA, Related Acts, this part, or 29 CFR part 1 or 3;

c. Cooperating in any investigation or other compliance action, or testifying in any proceeding under the DBA, Related Acts, this part, or 29 CFR part 1 or 3; or

d. Informing any other person about their rights under the DBA, Related Acts, this part, or 29 CFR part 1 or 3.

V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

Pursuant to 29 CFR 5.5(b), the following clauses apply to any Federal-aid construction 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 29 CFR 5.5(a) or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchpersons 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. 29 CFR 5.5.

2. Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph 1. of this section the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages and interest from the date of the underpayment. 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 watchpersons and guards, employed in violation of the clause set forth in paragraph 1. of this section, in the sum currently provided in 29 CFR 5.5(b)(2)* 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 section.

* $31 as of January 15, 2023 (See 88 FR 88 FR 2210) as may be adjusted annually by the Department of Labor, pursuant to the Federal Civil Penalties Inflation Adjustment Act of 1990.

3. Withholding for unpaid wages and liquidated damages

a. *Withholding process.* The FHWA or the contracting agency may, upon its own action, or must, upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor so much of the accrued payments or advances as may be considered necessary to satisfy the liabilities of the prime contractor or any subcontractor for any unpaid wages; monetary relief, including interest; and liquidated damages required by the clauses set forth in this section on this contract, 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 that is held by the same prime contractor (as defined in § 5.2). The necessary funds may be withheld from the contractor under this contract, any other Federal contract with the same prime contractor, or any other federally assisted contract that is subject to the Contract Work Hours and Safety Standards Act and is held by the same prime contractor, regardless of whether the other contract was awarded or assisted by the same agency, and such funds may be used to satisfy the contractor liability for which the funds were withheld.

b. *Priority to withheld funds.* The Department has priority to funds withheld or to be withheld in accordance with Section IV paragraph 2.a. or paragraph 3.a. of this section, or both, over claims to those funds by:

(1) A contractor's surety(ies), including without limitation performance bond sureties and payment bond sureties;

(2) A contracting agency for its reprocurement costs;

(3) A trustee(s) (either a court-appointed trustee or a U.S. trustee, or both) in bankruptcy of a contractor, or a contractor's bankruptcy estate;

(4) A contractor's assignee(s);

(5) A contractor's successor(s); or

(6) A claim asserted under the Prompt Payment Act, 31 U.S.C. 3901–3907.

4. Subcontracts. The contractor or subcontractor must insert in any subcontracts the clauses set forth in paragraphs 1. through 5. of this section and a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor is responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs 1. through 5. In the event of any violations of these clauses, the prime contractor and any subcontractor(s) responsible will be liable for any unpaid wages and monetary relief, including interest from the date of the underpayment or loss, due to any workers of lower-tier subcontractors, and associated liquidated damages and may be subject to debarment, as appropriate.

5. Anti-retaliation. It is unlawful for any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, or to cause any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, any worker or job applicant for:

a. Notifying any contractor of any conduct which the worker reasonably believes constitutes a violation of the Contract Work Hours and Safety Standards Act (CWHSSA) or its implementing regulations in this part;

b. Filing any complaint, initiating or causing to be initiated any proceeding, or otherwise asserting or seeking to assert on behalf of themselves or others any right or protection under CWHSSA or this part;

c. Cooperating in any investigation or other compliance action, or testifying in any proceeding under CWHSSA or this part; or

d. Informing any other person about their rights under CWHSSA or this part.

VI. SUBLETTING OR ASSIGNING THE CONTRACT

This provision is applicable to all Federal-aid construction contracts on the National Highway System pursuant to 23 CFR 635.116.

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the contracting agency. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635.116).

a. The term “perform work with its own organization” in paragraph 1 of Section VI refers to workers employed or leased by the prime contractor, and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor or lower tier subcontractor, agents of the prime contractor, or any other assignees. The term may include payments for the costs of hiring leased employees from an employee leasing firm meeting all relevant Federal and State regulatory requirements. Leased employees may only be included in this term if the prime contractor meets all of the following conditions: (based on longstanding interpretation)

(1) the prime contractor maintains control over the supervision of the day-to-day activities of the leased employees;
(2) the prime contractor remains responsible for the quality of the work of the leased employees;

(3) the prime contractor retains all power to accept or exclude individual employees from work on the project; and

(4) the prime contractor remains ultimately responsible for the payment of predetermined minimum wages, the submission of payrolls, statements of compliance and all other Federal regulatory requirements.

b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid or propose on the contract as a whole and in general are to be limited to minor components of the overall contract. 23 CFR 635.102.

2. Pursuant to 23 CFR 635.116(a), the contract amount upon which the requirements set forth in paragraph (1) of Section VI is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.

3. Pursuant to 23 CFR 635.116(c), the contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the contracting officer determines is necessary to assure the performance of the contract.

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the contracting agency has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract. (based on long-standing interpretation of 23 CFR 635.116).

5. The 30-percent self-performance requirement of paragraph (1) is not applicable to design-build contracts; however, contracting agencies may establish their own self-performance requirements. 23 CFR 635.116(d).

VII. SAFETY: ACCIDENT PREVENTION

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR Part 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract. 23 CFR 635.108.

2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR Part 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704). 29 CFR 1926.10.

3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704).

VIII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, Form FHWA-1022 shall be posted on each Federal-aid highway project (23 CFR Part 635) in one or more places where it is readily available to all persons concerned with the project:

18 U.S.C. 1020 reads as follows:

"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 11, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined under this title or imprisoned not more than 5 years or both."

IX. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT (42 U.S.C. 7606; 2 CFR 200.88; EO 11738)

This provision is applicable to all Federal-aid construction contracts in excess of $150,000 and to all related subcontracts. 48 CFR 2.101; 2 CFR 200.327.

By submission of this bid/proposal or the execution of this contract or subcontract, as appropriate, the bidder, proposer, Federal-aid construction contractor, subcontractor, supplier, or vendor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401-7671q) and the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251-1387). Violations must be reported to the Federal Highway Administration and the Regional Office of the Environmental Protection Agency. 2 CFR Part 200, Appendix II.

The contractor agrees to include or cause to be included the requirements of this Section in every subcontract, and further agrees to take such action as the contracting agency may direct as a means of enforcing such requirements. 2 CFR 200.327.

X. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, consultant contracts or any other covered transaction requiring FHWA approval or that is estimated to cost $25,000 or more – as defined in 2 CFR Parts 180 and 1200. 2 CFR 180.220 and 1200.220.

1**. Instructions for Certification – First Tier Participants:**

a. By signing and submitting this proposal, the prospective first tier participant is providing the certification set out below.

b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective first tier participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective first tier participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction. 2 CFR 180.320.

c. The certification in this clause is a material representation of fact upon which reliance was placed when the contracting agency determined to enter into this transaction. If it is later determined that the prospective participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the contracting agency may terminate this transaction for cause of default. 2 CFR 180.325.

d. The prospective first tier participant shall provide immediate written notice to the contracting agency to whom this proposal is submitted if any time the prospective first tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances. 2 CFR 180.345 and 180.350.

e. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180, Subpart I, 180.900-180.1020, and 1200. “First Tier Covered Transactions” refers to any covered transaction between a recipient or subrecipient of Federal funds and a participant (such as the prime or general contract). “Lower Tier Covered Transactions” refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). “First Tier Participant” refers to the participant who has entered into a covered transaction with a recipient or subrecipient of Federal funds (such as the prime or general contractor). “Lower Tier Participant” refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

f. The prospective first tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction. 2 CFR 180.330.

g. The prospective first tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions," provided by the department or contracting agency, entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the $25,000 threshold. 2 CFR 180.220 and 180.300.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. 2 CFR 180.300; 180.320, and 180.325. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. 2 CFR 180.335. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the System for Award Management website (https://www.sam.gov/). 2 CFR 180.300, 180.320, and 180.325.

i. Nothing contained in the foregoing shall be construed to require the establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of the prospective participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

j. Except for transactions authorized under paragraph (f) of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default. 2 CFR 180.325.

* * * * *

2. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – First Tier Participants:

a. The prospective first tier participant certifies to the best of its knowledge and belief, that it and its principals:

(1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency, 2 CFR 180.335;.

(2) Have not within a three-year period preceding this proposal 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) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property, 2 CFR 180.800;

(3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (a)(2) of this certification, 2 CFR 180.700 and 180.800; and

(4) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default. 2 CFR 180.335(d).

(5) Are not a corporation that has been convicted of a felony violation under any Federal law within the two-year period preceding this proposal (USDOT Order 4200.6 implementing appropriations act requirements); and

(6) Are not a corporation with 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 (USDOT Order 4200.6 implementing appropriations act requirements).

b. Where the prospective participant is unable to certify to any of the statements in this certification, such prospective participant should attach an explanation to this proposal. 2 CFR 180.335 and 180.340.

* * * * *

3. **Instructions for Certification - Lower Tier Participants:**

(Applicable to all subcontracts, purchase orders, and other lower tier transactions requiring prior FHWA approval or estimated to cost $25,000 or more - 2 CFR Parts 180 and 1200). 2 CFR 180.220 and 1200.220.

a. By signing and submitting this proposal, the prospective lower tier participant is providing the certification set out below.

b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances. 2 CFR 180.365.

d. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180, Subpart I, 180.900 – 180.1020, and 1200. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations. “First Tier Covered Transactions” refers to any covered transaction between a recipient or subrecipient of Federal funds and a participant (such as the prime or general contract). “Lower Tier Covered Transactions” refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). “First Tier Participant” refers to the participant who has entered into a covered transaction with a recipient or subrecipient of Federal funds (such as the prime or general contractor). “Lower Tier Participant” refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated. 2 CFR 1200.220 and 1200.332.

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the $25,000 threshold. 2 CFR 180.220 and 1200.220.

g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the System for Award Management website (https://www.sam.gov/), which is compiled by the General Services Administration. 2 CFR 180.300, 180.320, 180.330, and 180.335.

h. 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 clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily

excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment. 2 CFR 180.325.

* * * * *

4. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Participants:

a. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals:

(1) is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency, 2 CFR 180.355;

(2) is a corporation that has been convicted of a felony violation under any Federal law within the two-year period preceding this proposal (USDOT Order 4200.6 implementing appropriations act requirements); and

(3) is a corporation with 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. (USDOT Order 4200.6 implementing appropriations act requirements)

b. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant should attach an explanation to this proposal.

* * * * *

XI. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts which exceed $100,000. 49 CFR Part 20, App. A.

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal 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.

b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal 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.

2. 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.

3. The prospective participant also agrees by submitting its bid or proposal that the participant shall require that the language of this certification be included in all lower tier subcontracts, which exceed $100,000 and that all such recipients shall certify and disclose accordingly.

XII. USE OF UNITED STATES-FLAG VESSELS:

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, or any other covered transaction. 46 CFR Part 381.

This requirement applies to material or equipment that is acquired for a specific Federal-aid highway project. 46 CFR 381.7. It is not applicable to goods or materials that come into inventories independent of an FHWA funded-contract.

When oceanic shipments (or shipments across the Great Lakes) are necessary for materials or equipment acquired for a specific Federal-aid construction project, the bidder, proposer, contractor, subcontractor, or vendor agrees:

1. To utilize privately owned United States-flag commercial vessels to ship at least 50 percent of the gross tonnage (computed separately for dry bulk carriers, dry cargo liners, and tankers) involved, whenever shipping any equipment, material, or commodities pursuant to this contract, to the extent such vessels are available at fair and reasonable rates for United States-flag commercial vessels. 46 CFR 381.7.

2. To furnish within 20 days following the date of loading for shipments originating within the United States or within 30 working days following the date of loading for shipments originating outside the United States, a legible copy of a rated, ‘on-board’ commercial ocean bill-of-lading in English for each shipment of cargo described in paragraph (b)(1) of this section to both the Contracting Officer (through the prime contractor in the case of subcontractor bills-of-lading) and to the Office of Cargo and Commercial Sealift (MAR-620), Maritime Administration, Washington, DC 20590. (MARAD requires copies of the ocean carrier's (master) bills of lading, certified onboard, dated, with rates and charges. These bills of lading may contain business sensitive information and therefore may be submitted directly to MARAD by the Ocean Transportation Intermediary on behalf of the contractor). 46 CFR 381.7.

ATTACHMENT A - EMPLOYMENT AND MATERIALS PREFERENCE FOR APPALACHIAN DEVELOPMENT HIGHWAY SYSTEM OR APPALACHIAN LOCAL ACCESS ROAD CONTRACTS (23 CFR 633, Subpart B, Appendix B)
This provision is applicable to all Federal-aid projects funded under the Appalachian Regional Development Act of 1965.

1. During the performance of this contract, the contractor undertaking to do work which is, or reasonably may be, done as on-site work, shall give preference to qualified persons who regularly reside in the labor area as designated by the DOL wherein the contract work is situated, or the subregion, or the Appalachian counties of the State wherein the contract work is situated, except:

a. To the extent that qualified persons regularly residing in the area are not available.

b. For the reasonable needs of the contractor to employ supervisory or specially experienced personnel necessary to assure an efficient execution of the contract work.

c. For the obligation of the contractor to offer employment to present or former employees as the result of a lawful collective bargaining contract, provided that the number of nonresident persons employed under this subparagraph (1c) shall not exceed 20 percent of the total number of employees employed by the contractor on the contract work, except as provided in subparagraph (4) below.

2. The contractor shall place a job order with the State Employment Service indicating (a) the classifications of the laborers, mechanics and other employees required to perform the contract work, (b) the number of employees required in each classification, (c) the date on which the participant estimates such employees will be required, and (d) any other pertinent information required by the State Employment Service to complete the job order form. The job order may be placed with the State Employment Service in writing or by telephone. If during the course of the contract work, the information submitted by the contractor in the original job order is substantially modified, the participant shall promptly notify the State Employment Service.

3. The contractor shall give full consideration to all qualified job applicants referred to him by the State Employment Service. The contractor is not required to grant employment to any job applicants who, in his opinion, are not qualified to perform the classification of work required.

4. If, within one week following the placing of a job order by the contractor with the State Employment Service, the State Employment Service is unable to refer any qualified job applicants to the contractor, or less than the number requested, the State Employment Service will forward a certificate to the contractor indicating the unavailability of applicants. Such certificate shall be made a part of the contractor's permanent project records. Upon receipt of this certificate, the contractor may employ persons who do not normally reside in the labor area to fill positions covered by the certificate, notwithstanding the provisions of subparagraph (1c) above.

5. The provisions of 23 CFR 633.207(e) allow the contracting agency to provide a contractual preference for the use of mineral resource materials native to the Appalachian region.

6. The contractor shall include the provisions of Sections 1 through 4 of this Attachment A in every subcontract for work which is, or reasonably may be, done as on-site work.

STANDARD FEDERAL EQUAL EMPLOYMENT OPPORTUNITY
CONSTRUCTION CONTRACT SPECIFICATIONS
EXECUTIVE ORDER 11246, July 1, 1978

(Revised November 3, 1980)

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, United States 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:

(i) Black (all persons having origins in any of the Black African racial groups not of Hispanic origin):

(ii) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish Culture or origin, regardless or race):

(iii) 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

(iv) 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 or 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 CFR 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 must 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 7 a through p 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 ad 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

5. Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the Contractor has 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 nonworking training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees must be employed by the Contractor during the training period, and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must 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 on-site 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 site 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 therefor, 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 women 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 complied 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 on site 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 CFR Part 60-3.

l. Conduct, at least annually, an inventory and evaluation at least of all minority and

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.

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 nonsegregated 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 actions obligations (7a through p). The efforts of a contractor association, joint contractor- union, contractor community, or other similar group of which the contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under 7a through p 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 seperate 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, the Contractor may be in violation of the Executive Order if a 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 under utilized).

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 CFR 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 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 numbers, 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 al imitation 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).

ADOT

TITLE VI / NON-DISCRIMINATION ASSURANCES
APPENDIX A

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

1. **Compliance with Regulations:** The contractor (hereinafter includes consultants) will comply with the Acts and the Regulations relative to Non-discrimination in Federally-assisted programs of the U.S. Department of Transportation, the *Federal Highway Administration,* as they may be amended from time to time, which are herein incorporated by reference and made a part of this contract.

2. **Non-discrimination:** The contractor, with regard to the work performance by it during the contract, 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. The contractor will not participate directly or indirectly in the discrimination prohibited by the Acts and the Regulations, including employment practices when the contract covers any activity, project, or program set forth in Appendix B of 49 CFR 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 will be notified by the contractor of the contractor's obligations under this contract and the Acts and Regulations relative to Non-discrimination on the grounds of race, color, or national origin.

4. **Information and Reports:** The contractor will provide all information and reports required by the Acts, the Regulations, 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 Recipient or the *Federal Highway Administration* to be pertinent to ascertain compliance with such Acts, Regulations, and instructions. Where any information required of a contractor is in the exclusive possession of another who fails or refuses to furnish the information, the contractor will so certify to the Recipient or the *Federal Highway Administration,* as appropriate, and will set forth what efforts it has made to obtain the information.

5. **Sanctions for Noncompliance:** In the event of a contractor's noncompliance with the Non-discrimination provisions of this contract, the Recipient will impose such contract sanctions as it or the *Federal Highway Administration* ,may determine to be appropriate, including, but not limited to:

   a. withholding payments to the contractor under the contract until the contractor complies; and/or
   b. cancelling, terminating, or suspending a contract, in whole or in part.

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

ADOT

TITLE VI / NON-DISCRIMINATION ASSURANCES
APPENDIX E

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

Pertinent Non-Discrimination Authorities:

- Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d *et seq.,* 78 stat. 252), (prohibits discrimination on the basis of race, color, national origin): and 49 CFR Part 21.
- The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, (42 U.S.C. § 4601), (prohibits unfair treatment of persons displaced or whose property has been acquired because of Federal or Federal-aid programs and projects);
- Federal-Aid Highway Act of 1973, (23 U.S.C. § 324 *et seq.*), (prohibits discrimination on the basis of sex);
- Section 504 of the Rehabilitation Act of 1973, (29 U.S.C. § 794 *et seq.*), as amended, (prohibits discrimination on the basis of disability); and 49 CFR Part 27;
- The Age Discrimination Act of 1975, as amended, (42 U.S.C. § 6101 *et seq.*), (prohibits discrimination on the basis of age);
- Airport and Airway Improvement Act of 1982, (49 USC § 471, Section 47123), as amended, (prohibits discrimination based on race, creed, color, national origin, or sex);
- The Civil Rights Restoration Act of 1987, (PL 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 such programs or activities are Federally funded or not);
- Titles II and III of the Americans with Disabilities Act, which prohibit discrimination on the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing entities (42 U.S.C. §§ 12131-12189) as implemented by Department of Transportation regulations at 49 C.F.R. parts 37 and 38;
- The Federal Aviation Administration's Non-discrimination statute (49 U.S.C. § 47123) (prohibits discrimination on the basis of race, color, national origin, and sex);
- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, which ensures discrimination against minority populations by discouraging programs, policies, and activities with disproportionately high and adverse human health or environmental effects on minority and low-income populations;
- Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency, and resulting agency guidance, national origin discrimination includes discrimination because of limited English proficiency (LEP). To ensure compliance with Title VI, you must take reasonable steps to ensure that LEP persons have meaningful access to your programs (70 Fed. Reg. at 74087 to 74100);
- Title IX of the Education Amendments of 1972, as amended, which prohibits you from discriminating because of sex in education programs or activities (20 U.S.C. 1687 et. seq).

NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION
TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY
(EXECUTIVE ORDER 11246)

JULY 1, 1978 (Revised November 3, 1980)

(Revised April 15, 1981)

1. The bidder's attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Specifications" set forth herein.

2. The goals and timetables for minority and female participation, expressed in percentage terms for the Contractor's aggregate work force in each trade on all construction work in the covered area, are as follows:

	Minority	Female
Tucson and balance of Pima County	24.1	6.9
Cochise, Graham, Greenlee and Santa Cruz Counties	27.0	6.9
Phoenix and balance of Maricopa County	15.8	6.9
Apache, Coconino, Gila, Mohave, Navajo, Pinal, Yavapai and Yuma Counties	19.6	6.9

These goals are applicable to all the Contractor's construction work (whether or not it is Federal or federally assisted) performed in all areas where he has Federal or federally assisted work.

The Contractor's compliance with the Executive Order and the regulations in 41 CFR 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 CFR 60-4.3 (a), and its efforts to meet the goals. The hours of minority and female employment and training must 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 CFR Part 60-4. Compliance with the goals will be measured against the total work hours performed.

EQUAL EMPLOYMENT OPPORTUNITY
COMPLIANCE REPORTS

(Project, Training and Annual)

Federal-Aid Projects

February 1, 1977; Revised July 1, 1978; Revised November 3, 1980
Revised April 15, 1981; Revised September 7, 1983
Revised October 15, 1998; Revised August, 1, 2005;
Revised March 1, 2015

ANNUAL REPORT:

For each contract in the amount of $10,000 or more, and for each subcontract, regardless of tier not including material suppliers, in the amount of $10,000 or more, the contractor and each subcontractor regardless of tier shall submit an annual Equal Employment Opportunity (EEO) Report containing all the information required on Form FHWA-1391. Contractors and subcontractors are required to submit the required information through the LCPtracker system, a labor compliance software monitoring certified payroll and prevailing wage.

The staffing figures to be reported should represent the project workforce on board in all or any part of the last payroll period preceding the end of July.

The report shall be submitted no later than September 1.

"General Decision Number: AZ20250033 06/06/2025

Superseded General Decision Number: AZ20240033

State: Arizona

Construction Type: Highway

County: Navajo County 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)(1).

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 $17.75 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 2025.
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 $13.30 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours performing on that contract in 2025.

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	01/03/2025
1	06/06/2025

ENGI0012-068 12/01/2024

	Rates	Fringes
POWER EQUIPMENT OPERATOR:		
Drill Rig/Auger	$ 35.56	18.12

IRON0075-013 08/01/2024

	Rates	Fringes
Ironworker	$ 39.50	18.91

---

* LABO1184-025 06/01/2025

	Rates	Fringes
Laborer: Asphalt, Includes Raker, Shoveler, Spreader and Distributor	$ 29.91	9.26

---

* LABO1184-030 06/01/2025

	Rates	Fringes
Laborer: Mason Tender	$ 29.91	9.26

---

* LABO1184-038 06/01/2025

	Rates	Fringes

Laborer: Pipelayer	$ 31.98	9.26

SUAZ2023-018 11/19/2024

	Rates	Fringes
Carpenter: Formwork Concrete	$ 33.16	10.71
Laborer: General	$ 32.35	6.98
Painter: Sign and Display Erector	$ 19.06	2.99
Power Equipment Operator: Bobcat/Skid Steer/Skid Loader	$ 32.53	0.00
Power Equipment Operator: Compactor/Roller	$ 32.89	0.00
Power Equipment Operator: Concrete Screed	$ 33.90	0.00
Power Equipment Operator: Crane / Derricks	$ 48.32	14.18
Power Equipment Operator: Excavator/Trackhoe	$ 39.48	0.00
Power Equipment Operator: Forklift	$ 38.76	9.20
Power Equipment Operator: Loader/Front End Loader	$ 38.06	0.00
Power Equipment Operator: Motor Grader/Blade	$ 41.46	0.00
Power Equipment Operator: Oiler	$ 31.86	10.01
Power Equipment Operator: Paver/Spreader/Finish equipment (asphalt, aggregate, & concrete)	$ 30.40	0.06
Traffic Control	$ 20.00	0.00
Truck Driver: Dump	$ 24.50	2.75

Truck Driver: Water.....$ 33.40 0.00

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

==========

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) (iii)).

The body of each wage determination lists the classifications and wage rates that have been found to be prevailing for the type(s) of construction and geographic area covered by the wage determination. The classifications are listed in alphabetical order under rate identifiers indicating whether the particular rate is a union rate (current union negotiated rate), a survey rate, a weighted union average rate, a state adopted rate, or a supplemental classification rate.

Union Rate Identifiers

A four-letter identifier beginning with characters other than

""SU"", ""UAVG"", ?SA?, or ?SC? denotes that a union rate was prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2024. PLUM is an identifier of the union whose collectively bargained rate 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. The date, 07/01/2024 in the example, is the effective date of the most current negotiated rate.

Union prevailing wage rates are updated to reflect all changes over time that are reported to WHD in the rates in the collective bargaining agreement (CBA) governing the classification.

Union Average Rate Identifiers

The UAVG identifier indicates that no single rate prevailed for those classifications, but that 100% of the data reported for the classifications reflected union rates. EXAMPLE: UAVG-OH-0010 01/01/2024. UAVG indicates that the rate is a weighted union average rate. OH indicates the State of Ohio. The next number, 0010 in the example, is an internal number used in producing the wage determination. The date, 01/01/2024 in the example, indicates the date the wage determination was updated to reflect the most current union average rate.

A UAVG rate will be updated once a year, usually in January, to reflect a weighted average of the current rates in the collective bargaining agreements on which the rate is based.

Survey Rate Identifiers

The ""SU"" identifier indicates that either a single non-union rate prevailed (as defined in 29 CFR 1.2) for this classification in the survey or that the rate was derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As a weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SUFL2022-007 6/27/2024. SU indicates the rate is a single non-union prevailing rate or a weighted average of survey data for that classification. FL indicates the State of Florida. 2022 is the year of the 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. The date,

6/27/2024 in the example, indicates the survey completion date for the classifications and rates under that identifier.

?SU? wage rates typically remain in effect until a new survey is conducted. However, the Wage and Hour Division (WHD) has the discretion to update such rates under 29 CFR 1.6(c)(1).

State Adopted Rate Identifiers

The ""SA"" identifier indicates that the classifications and prevailing wage rates set by a state (or local) government were adopted under 29 C.F.R 1.3(g)-(h). Example: SAME2023-007 01/03/2024. SA reflects that the rates are state adopted. ME refers to the State of Maine. 2023 is the year during which the state completed the survey on which the listed classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 01/03/2024 in the example, reflects the date on which the classifications and rates under the ?SA? identifier took effect under state law in the state from which the rates were adopted.

WAGE DETERMINATION APPEALS PROCESS

1) Has there been an initial decision in the matter? This can be:

a) a survey underlying a wage determination
b) an existing published wage determination
c) an initial WHD letter setting forth a position on a wage determination matter
d) an initial conformance (additional classification and rate) determination

On survey related matters, initial contact, including requests for summaries of surveys, should be directed to the WHD Branch of Wage Surveys. Requests can be submitted via email to davisbaconinfo@dol.gov or by mail to:

Branch of Wage Surveys
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

Regarding any other wage determination matter such as

conformance decisions, requests for initial decisions should be directed to the WHD Branch of Construction Wage Determinations. Requests can be submitted via email to BCWD-Office@dol.gov or by mail 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 an initial decision has been issued, then any interested party (those affected by the action) that disagrees with the decision can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Requests for review and reconsideration can be submitted via email to dba.reconsideration@dol.gov or by mail 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 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.

==========

END OF GENERAL DECISION"

ARIZONA DEPARTMENT OF TRANSPORTATION
INFRASTRUCTURE DELIVERY AND OPERATIONS DIVISION
CONTRACTS AND SPECIFICATIONS GROUP

BID SCHEDULE

CONTRACT # 2024086

TRACS No.	Project No.	Item	County	District	Gross Length	Net Length	Prepared By:
040 NA 283 F064501C	040-D-(248)T	103722	NAVAJO	NORTHEAST	0.1		Rene Teran

Highway Termini	Location	Work Description
• FLAGSTAFF - HOLBROOK HIGHWAY (I-40)	• Perkins Valley TI UP 1776	• Capacity Additions (Major Bridge Rehabilitation)

BID SCHEDULE

040 NA 283 F064501C

Item No.	Item Description	Unit	Quantity	Unit Price	Extended Amount
2020027	REMOVAL OF CONCRETE BARRIER	L.FT.	301		
2020054	REMOVE (END TERMINAL)	EACH	1		
2020088	REMOVE BITUMINOUS PAVEMENT (MILLING) (4 1/2" TO 6")	SQ.YD.	3,348		
2020115	REMOVE (GUARDRAIL TRANSITION)	EACH	1		
2020155	REMOVE (SIGNS, POSTS AND FOUNDATIONS)	EACH	6		
2020157	REMOVE (EXISTING BRIDGE SIGN STRUCTURE)	EACH	1		
2020158	REMOVE (AND REPLACE SIGN PANEL)	EACH	27		
2030112	SHOULDER BUILD-UP (MILLED AC)	L.FT.	749		
2030113	SHOULDER BUILD-UP (COMPACTION)	HOUR	1		
2030301	ROADWAY EXCAVATION	CU.YD.	229		
2050001	GRADING ROADWAY FOR PAVEMENT	SQ.YD.	190		
3030022	AGGREGATE BASE, CLASS 2	CU.YD.	135		
4040111	BITUMINOUS TACK COAT	TON	1		
4040116	APPLY BITUMINOUS TACK COAT	HOUR	1		
4040125	FOG COAT	TON	1		

BID SCHEDULE

040 NA 283 F064501C

Item No.	Item Description	Unit	Quantity	Unit Price	Extended Amount
4040165	BLOTTER MATERIAL	SQ.YD.	1,444		
4090006	ASPHALTIC CONCRETE (MISCELLANEOUS STRUCTURAL) (SPECIAL MIX)	TON	914		
4110001	ASPHALTIC CONCRETE FRICTION COURSE (MISC.)	TON	35		
6070006	BREAKAWAY SIGN POST W8X18	L.FT.	60		
6070026	FOUNDATION FOR BREAKAWAY SIGN POST W8X18	EACH	3		
6070038	SLIP BASE	EACH	9		
6070054	SIGN POST (PERFORATED) (2 S)	L.FT.	20		
6070057	SIGN POST (PERFORATED) (2 1/2 T)	L.FT.	150		
6070060	FOUNDATION FOR SIGN POST (CONCRETE)	EACH	11		
6080005	REGULATORY, WARNING, OR MARKER SIGN PANEL	SQ.FT.	110		
6080018	EXTRUDED ALUMINUM SIGN PANEL	SQ.FT.	220		
6080025	FLAT SHEET ALUMINUM SIGN PANEL	SQ.FT.	400		
7015010	TEMPORARY CONCRETE BARRIER (INSTALLATION AND REMOVAL)	L.FT.	4,980		
7015020	TEMPORARY IMPACT ATTENUATORS (INSTALLATION AND REMOVAL)	EACH	10		

BID SCHEDULE

040 NA 283 F064501C

Item No.	Item Description	Unit	Quantity	Unit Price	Extended Amount
7015091	SPECIALTY SIGNS	SQ.FT.	1,036		
7016020	TEMPORARY CONCRETE BARRIER (IN USE)	L.FT.-DAY	646,000		
7016021	TEMPORARY IMPACT ATTENUATORS (IN USE)	EACH-DAY	1,000		
7016030	BARRICADE (TYPE 1, TYPE 2, VERT.PANEL, TUBULAR MARKER)	EACH-DAY	15,200		
7016031	BARRICADE (TYPE 3, HIGH LEVEL FLAG TREE)	EACH-DAY	1,800		
7016032	PORTABLE SIGN STAND (RIGID)	EACH-DAY	2,450		
7016033	PORTABLE SIGN STAND (SPRING TYPE)	EACH-DAY	8,940		
7016035	WARNING LIGHT (TYPE A)	EACH-DAY	19,626		
7016037	WARNING LIGHT (TYPE C)	EACH-DAY	15,200		
7016039	EMBEDDED SIGN POST	EACH-DAY	14,616		
7016050	TRUCK-MOUNTED ATTENUATOR	EACH-DAY	41		
7016051	TEMPORARY SIGN (LESS THAN 10 S.F.)	EACH-DAY	12,760		
7016052	TEMPORARY SIGN (10 S.F. OR MORE)	EACH-DAY	16,266		
7016061	FLASHING ARROW PANEL	EACH-DAY	95		

BID SCHEDULE

040 NA 283 F064501C

Item No.	Item Description	Unit	Quantity	Unit Price	Extended Amount
7016067	CHANGEABLE MESSAGE BOARD (CONTRACTOR FURNISHED)	EACH-DAY	1,008		
7016075	FLAGGING SERVICES (CIVILIAN)	HOUR	2,600		
7016079	FLAGGING SERVICES (UNIFORMED OFFICER)	HOUR	2,830		
7017020	TEMPORARY AND PORTABLE TRAFFIC CONTROL SIGNAL (INSTALL & REMOVE)	L.SUM	1		
7017025	TEMPORARY AND PORTABLE TRAFFIC CONTROL SIGNAL (IN USE)	DAY	100		
7017030	SEQUENTIAL FLASHING WARNING LIGHT	EACH-DAY	900		
7030070	DELINEATOR (M-31) (SINGLE GREEN)	EACH	8		
7080201	WATERBORNE-TYPE I PAVEMENT MARKING (PAINTED) (WHITE)	L.FT.	26,150		
7080202	WATERBORNE-TYPE I PAVEMENT MARKING (PAINTED) (YELLOW)	L.FT.	18,700		
7080206	WATERBORNE-TYPE I PAVEMENT MARKING (PAINTED SYMBOL) (ARROW)	EACH	4		
7090001	DUAL COMPONENT PAVEMENT MARKING (WHITE EPOXY)	L.FT.	39,225		
7090002	DUAL COMPONENT PAVEMENT MARKING (YELLOW EPOXY)	L.FT.	28,050		

BID SCHEDULE

040 NA 283 F064501C

Item No.	Item Description	Unit	Quantity	Unit Price	Extended Amount
7090012	DUAL COMPONENT PAVEMENT SYMBOL	EACH	4		
7100001	SWZ SYSTEM	L.SUM	1		
7100100	SWZ TDC LOCATION (IN USE)	EACH-DAY	120		
7100200	SWZ CMB ASSEMBLY (IN USE)	EACH-DAY	40		
7100300	SWZ TRAFFIC MONITORING CAMERA ASSEMBLY (IN USE)	EACH-DAY	40		
7100500	SWZ SMART ARROW BOARD	EACH-DAY	40		
8050003	SEEDING (CLASS II)	ACRE	1		
8101021	EROSION CONTROL (WATTLES) (9")	L.FT.	1,000		
9010001	MOBILIZATION	L.SUM	1		
9050004	GUARD RAIL, W-BEAM, SINGLE FACE (MASH)(STD. C-10.04)	L.FT.	75		
9050005	GUARD RAIL, W-BEAM, SINGLE FACE (MASH)	L.FT.	25		
9050028	GUARD RAIL TERMINAL (FLARE TYPE)	EACH	2		
9050419	GUARD RAIL TRANSITION (STD C-10.30)	EACH	1		
9050420	GUARD RAIL TRANSITION (STD C-10.31)	EACH	1		

BID SCHEDULE

040 NA 283 F064501C

Item No.	Item Description	Unit	Quantity	Unit Price	Extended Amount
9100008	CONCRETE BARRIER (C-10.70)	L.FT.	202		
9160001	EMBANKMENT CURB	L.FT.	108		
9170001	EMBANKMENT SPILLWAY (C-4.10)	L.FT.	110		
9170021	INLET (C-4.10) (SINGLE)	EACH	2		
9170042	OUTLET (C-4.20)	EACH	2		
9230003	ON-THE-JOB TRAINING WITH GOALS	HOUR	600	$3.00	$1,800.00
9240170	CONTRACTOR QUALITY CONTROL	L.SUM	1		
9250001	CONSTRUCTION SURVEYING AND LAYOUT	L.SUM	1		

BID SCHEDULE

040 NA 283 F064501C

Item No.	Item Description	Unit	Quantity	Unit Price	Extended Amount
Perkins Valley TI UP					
2020009 A	REMOVAL OF STRUCTURAL CONCRETE	CU.YD.	237		
2020058 A	REMOVE AND SALVAGE (BRIDGE RAILING)	L.FT.	529		
2020156 A	REMOVE (ROCKER BEARING ASSEMBLY)	EACH	8		
2020170 A	REMOVE (EXISTING SLOPE PAVING)	SQ.YD.	346		
2020366 A	REMOVE LEAD-BASED PAINT MATERIALS	L.SUM	1		
2020370 A	DISPOSE OF LEAD-BASED PAINT MATERIALS (FORCE ACCOUNT)	L.SUM	1	$10,000.00	$10,000.00
2030501 A	STRUCTURAL EXCAVATION	CU.YD.	70		
2030506 A	STRUCTURE BACKFILL	CU.YD.	85		
6010003 A	STRUCTURAL CONCRETE (CLASS S) (F'C = 3,500)	CU.YD.	138		
6010102 A	SILICA FUME CONCRETE FOR BRIDGE DECKS	CU.YD.	284		
6010508 A	BRIDGE REPAIR (FLAME STRAIGHTEN GIRDERS, STIFFENERS AND STRUTS)	L.SUM	1		
6011150 A	SINGLE SLOPE BRIDGE CONCRETE BARRIER AND TRANSITION (38")	L.FT.	572		
6011343 A	DECK JOINT ASSEMBLY (FLANGELESS STRIP SEAL)	L.FT.	80		
6011371 A	APPROACH SLAB (SD 2.01)	SQ.FT.	1,422		

BID SCHEDULE

040 NA 283 F064501C

Item No.	Item Description	Unit	Quantity	Unit Price	Extended Amount
Perkins Valley TI UP					
6015203 A	BEARING (ELASTOMERIC)	EACH	12		
6040001 A	STRUCTURAL STEEL	LB.	191,320		
6041001 A	JACKING BRIDGE SUPERSTRUCTURE	L.SUM	1		
6050002 A	REINFORCING STEEL	LB.	18,385		
6050012 A	REINFORCING STEEL (EPOXY COATED)	LB.	106,440		
6050101 A	PLACE DOWELS	EACH	162		
6090060 A	DRILLED SHAFT FOUNDATION (60")	L.FT.	99		
6090084 A	DRILLED SHAFT FOUNDATION (84")	L.FT.	35		
6091030 A	DRILLED SHAFTS (ROCK) (54")	L.FT.	20		
6091031 A	DRILLED SHAFTS (ROCK) (78")	L.FT.	18		
6100026 A	PAINT STRUCTURE (EXISTING STRUCTURAL STEEL)	SQ.FT.	15,648		
9210007 A	SLOPE PAVING (EXPOSED AGGREGATE)	SQ.YD.	886		
9240010 A	FORCE ACCOUNT WORK (REINFORCED CONCRETE REPAIR)	L.SUM	1	$20,000.00	$20,000.00
9240117 A	MISCELLANEOUS WORK (BRIDGE REPAIR)(PENETRATING SEALER)	SQ.FT.	1,154		

BID SCHEDULE

040 NA 283 F064501C

Item No.	Item Description	Unit	Quantity	Unit Price	Extended Amount
Perkins Valley TI UP					
9240120 A	MISCELLANEOUS WORK (ADD SHEAR STUDS TO EXISTING ABUTMENT DIAPRAGM)	EACH	66		
9240121 A	MISCELLANEOUS WORK (ADD CONNECTOR PLATES TO EXISTING GIRDERS)	EACH	8		
9240122 A	MISCELLANEOUS WORK (ADD BEARING ASSEMBLIES TO EXISTING GIRDERS)	EACH	8		
9240127 A	MISCELLANEOUS WORK (DRILL HOLES THROUGH EXISTING BEARING STIFFENERS)	EACH	24		

BID TOTAL :

PROPOSAL

TO THE ARIZONA DEPARTMENT OF TRANSPORTATION:

Gentlemen:

The following Proposal is made for constructing project

040 NA 283 F064501C 040-D(248)T
FLAGSTAFF-HOLBROOK HIGHWAY (I-40)
(PERKINS VALLEY TI UP (STRUCTURE #1776))

in the State of Arizona.

The following Proposal is made on behalf of _____

_____ and no others.
(NAME OF COMPANY, FIRM, OR CORPORATION)

The undersigned hereby certifies that (s)he has been duly authorized to submit a proposal on behalf of the company, firm, or corporation mentioned above; and further certifies, pursuant to Subsection 112(c) of Title 23, United States Code and Title 44, Chapter 10, Article 1 of the Arizona Revised Statutes, that neither (s)he nor anyone associated with the company, firm, or corporation mentioned above has, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free competitive bidding in connection with such project and furthermore that no member or employee of the Arizona Department of Transportation is personally or financially interested, directly or indirectly, in the Proposal, or in any purchase or sale of any materials or supplies for the work to which it relates, or in any portion of the profits thereof.

The undersigned certifies that the approved Plans, Standard Specifications, Special Provisions and forms of Contract and Bond authorized by the Arizona Department of Transportation and constituting essential parts of this proposal, have been carefully examined, and also that the site of the work has been personally inspected. The undersigned declares that the amount and nature of the work to be done is understood and that at no time will misunderstanding of the Plans, Specifications, Special Provisions, or conditions to be overcome, be plead. On the basis of Plans, Specifications, Special Provisions, and the forms of Contract and Bond proposed for use, the undersigned proposes to furnish all the necessary equipment, materials, machinery, tools, apparatus, and other means of construction, and labor to do all the work in the manner specified, and to accept, as full compensation therefor, the sum of the various products obtained by multiplying each unit price, herein bid for the work or materials, by the quantity thereof actually incorporated in the complete project, as determined by the State Engineer. The undersigned understands that the quantities mentioned herein are approximate only and are subject to increase or decrease and hereby proposes to perform all quantities of work as either increased or decreased, in accordance with the provisions of the Specifications, at the unit price bid in the Bidding Schedule.

The undersigned further proposes to perform all extra work that may be required on the basis provided in the Specifications and to give such work personal attention and to secure economical performance.

The undersigned further proposes to execute the Contract Agreement and furnish satisfactory Bond within ten calendar days from the date of Notice of Award, time being of the essence. The undersigned further proposes to begin work as specified in the contract attached hereto, and to complete the work on or before expiration of the contract time as defined in the Specifications, and maintain at all times a Payment Bond and a Performance Bond, approved by the State Engineer, in an amount equal to one hundred (100) percent of the total bid. These bonds shall serve not only to guarantee the completion of the work on the part of the undersigned, but also to guarantee the excellence of both workmanship and material and the payment of all obligations incurred, until the work is finally accepted and the provisions of the Plans, Standard Specifications and Special Provisions fulfilled.

The undersigned hereby agrees to provide an electronic Proposal Guaranty in the amount and character named in the Advertisement for Bids. The Proposal Guaranty is submitted as a guaranty of the good faith of the bidder, and that the bidder will enter into written contract, as provided, to do the work, if successful in securing the award thereof, and it is hereby agreed that if at any time other than as provided in the Proposal there should be failure on the part of the undersigned to execute the Contract and furnish satisfactory Bond as herein provided, the State of Arizona, in either of such events, shall be entitled and is hereby given the right to retain the said Proposal Guaranty as liquidated damages.

If by a Corporation:

(Seal)

Corporate Name: _____

Corporate Mailing Address: _____ Zip Code: _____

Incorporated under the laws of the State of: _____

By (Signature): _____ Date: _____

President: _____

Secretary: _____

Treasurer: _____

If by a Firm or Partnership:

Firm or Partnership Mailing Name: _____

Firm or Partnership Address: _____

By (Signature): _____ Date: _____

Name and Address of Each Member: _____

_____

_____

_____

_____

If by an Individual:

Signature: _____ Date: _____

Mailing Address: _____

ARIZONA DEPARTMENT OF TRANSPORTATION

SURETY (BID) BOND

(Penalty of this bond must not be less than 10% of the bid amount)

KNOW ALL MEN BY THESE PRESENTS, THAT _____

_____

as Principal, hereinafter called the Principal, and _____

_____

a corporation duly organized under the laws of the state of _____
hereinafter called the Surety, holding a certificate of authority to transact surety business in this State issued by the Director of the Department of Insurance, are held and firmly bound unto the Arizona Department of Transportation, as Obligee, hereinafter called the Obligee, in the sum of Ten Percent (10%) of the amount of the bid of Principal, submitted by Principal to the Arizona Department of Transportation 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.

WHEREAS, the Principal is herewith submitting its proposal for TRACS/Project No.

040 NA 283 F064501C 040-D(248)T
FLAGSTAFF-HOLBROOK HIGHWAY (I-40)
(PERKINS VALLEY TI UP (STRUCTURE #1776))

NOW THEREFORE, if the Obligee, acting by and through its Transportation board, shall accept the proposal of the Principal and the Principal shall enter into contract with the Obligee in accordance with the terms of such proposal, and give such bonds and certificates of insurance as may be specified in the contract documents 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 shall pay to the Obligee 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 is void. Otherwise it remains in full force and effect.

IN WITNESS WHEREOF, we hereunto set our hands and seals:

_____
Principal

_____
By

_____
Title

_____
Surety

_____
By Attorney-in-Fact

_____
Address Attorney-in-Fact

Subscribed and sworn before me
this _____ day of _____, 20 _____.

My Commission expires: _____

_____
Notary Public

R9/13

CERTIFICATION WITH REGARD TO THE PERFORMANCE OF PREVIOUS CONTRACTS OR SUBCONTRACTS SUBJECT TO THE EQUAL OPPORTUNITY CLAUSE AND THE FILING OF REQUIRED REPORTS
APRIL, 1969

The bidder _____, proposed subcontractor _____, hereby certifies that it has _____, has not _____, participated in a previous contract or subcontract subject to the equal opportunity clause, as required by Executive Orders 10925, 11114, or 11246, and that it has _____, has not _____, filed with the Joint Reporting committee, the Director of the Office of Federal Contract Compliance, a Federal Government contracting or administering agency or the former President's Committee on Equal Employment Opportunity, all reports due under the applicable filing requirements.

_____
(Company)

By: _____

_____
(Title)

Date: _____

Note: The above certification is required by the Equal Employment Opportunity Regulations of the Secretary of Labor (41 CFR 60-1.7b (1),) and must be submitted by bidders and proposed subcontractors only in connection with contracts and subcontracts which are subject to the equal opportunity clause. Contracts and subcontracts which are exempt from the equal opportunity clause are set forth in 41 CFR 60-1.5 (Generally only contracts or subcontracts of $10,000 or under are exempt.)

Currently, Standard Form 100 (EEO-1) is the only report required by the Executive Orders or their implementing regulations.

Information concerning Standard Form 100 (EEO-1) is available from:

Joint Reporting Committee
P.O. Box 19100
Washington, D.C. 20036-9100

Proposed prime contractors and subcontractors who have participated in a previous contract or subcontract subject to the Executive Orders and have not filed the required reports should note that 41 CFR 60-1.7(b)(1) prevents the award of contracts and subcontracts unless such contractor submits a report covering the delinquent period or such other period specified by the Federal Highway Administration or by the Director, Office of Federal Contract Compliance, U.S. Department of Labor.

040 NA 283 F064501C 040-D(248)T
FLAGSTAFF-HOLBROOK HIGHWAY (I-40)
(PERKINS VALLEY TI UP (STRUCTURE #1776))

R7/03

CERTIFICATION WITH RESPECT TO THE

RECEIPT OF ADDENDA

In the submission of a bid and by the signing of the Proposal, this will certify that the following numbered addenda issued on this project have been brought to my personal attention and furthermore that I understand and agree that those will be made a part of the Contract.

Addendum No. _____, _____, _____, _____, _____

_____
PRINT NAME OF CONTRACTOR

_____
SIGNATURE

_____
TITLE

_____
DATE

040 NA 283 F064501C 040-D(248)T
FLAGSTAFF-HOLBROOK HIGHWAY (I-40)
(PERKINS VALLEY TI UP (STRUCTURE #1776))

REVISED 05/02

ARIZONA DEPARTMENT OF TRANSPORTATION

PARTICIPATION IN BOYCOTT OF ISRAEL CERTIFICATION FORM

Unless and until the District Court's injunction in Jordahl is stayed or lifted, the Anti-Israel Boycott Provision (A.R.S. § 35-393.0l(A)) is unenforceable and the State will take no action to enforce it. This attachment (Participation in Boycott of Israel) is no longer a mandatory part of the offer. Offers will not be evaluated based on whether this certification has been completed.

040 NA 283 F064501C 040-D(248)T
FLAGSTAFF-HOLBROOK HIGHWAY (I-40)
(PERKINS VALLEY TI UP (STRUCTURE #1776))

This Certification is required in response to legislation enacted to prohibit the State from contracting with companies currently engaged in a boycott of Israel. To ensure compliance with A.R.S. §35-393.01, this form must be completed and returned with the bid. The bidder understands that this response will become public record and may be subject to publicinspection.

As defined by A.R.S. §35-393.01:

1. "Boycott" means engaging in a refusal to deal, terminating business activities or performing other actions that are intended to limit commercial relations with Israel or with persons or entities doing business in Israel or in territories controlled by Israel, if those actions are taken either:
   (a) In compliance with or adherence to calls for a boycott of Israel other than those boycotts to which 50 United States Code section 4607(c) applies.
   (b) In a manner that discriminates on the basis of nationality, national origin or religion and that is not based on a valid business reason.
2. "Company" means a sole proprietorship, organization, association, corporation, partnership, joint venture, limited partnership, limited liability partnership, Limited Liability Company or other entity or business association, and includes a wholly owned subsidiary, majority-owned subsidiary, parent company or affiliate.
3. "Direct holdings" means all publicly traded securities of a company that are held directly by the state treasurer or a retirement system in an actively managed account or fund in which the retirement system owns all shares or interests.
4. "Indirect holdings" means all securities of a company that are held in an account or fund, including a mutual fund, that is managed by one or more persons who are not employed by the state treasurer or a retirement system, if the state treasurer or retirement system owns shares or interests either:
   (a) Together with other investors that are not subject to this section.
   (b) That are held in an index fund.
5. “Public entity" means this State, a political subdivision of this STATE or an agency, board, commission or department of this state or a political subdivision of this state.
6. “Public fund" means the state treasurer or a retirement system.
7. "Restricted companies" means companies that boycott Israel.
8. "Retirement system" means a retirement plan or system that is established by or pursuant to title38.

All Bidders must select one of thefollowing:

_____**The bidder does not participate in, and agrees not to participate in during the term of the contract a boycott of Israel in accordance with A.R.S. §35-393.01.**

_____The bidder **does** participate in a boycott of Israel as defined by A.R.S. §35-393.01.

By submitting this response, the bidder agrees to indemnify and hold the State, its agents and employees, harmless from any claims or causes of action relating to the State’s action based upon reliance on the above representations, including the payment of all costs and attorney fees incurred by the State in defending such an action.

Company Name	Signature of Person Authorized to Sign
Address	Printed Name
City State Zip	Title

ARIZONA DEPARTMENT OF TRANSPORTATION

Forced Labor of Ethnic Uyghurs Ban Certification Form

Forced Labor of Ethnic Uyghurs Ban

Please note that if any of the following apply to the Contractor, then the bidder shall select the "Exempt Contractor" option below:

- Contractor is a sole proprietorship;
- Contractor has fewer than ten (10) employees; OR
- Contractor is a non-profit organization.

040 NA 283 F064501C 040-D(248)T
FLAGSTAFF-HOLBROOK HIGHWAY (I-40)
(PERKINS VALLEY TI UP (STRUCTURE #1776))

Pursuant to A.R.S. § 35-394, written certification is required to show that the company entering into a contract with a public entity does not use the forced labor, or use 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.

Under A.R.S. §35-394:

1. "Company" means an organization, association, corporation, partnership, joint venture, limited partnership, limited liability partnership, limited liability company or other entity or business association, including a wholly owned subsidiary, majority-owned subsidiary, parent company or affiliate, that engages in for-profit activity and that has ten or more full-time employees.

2. "Public entity" means this State, a political subdivision of this State or an agency, board, commission or department of this State or a political subdivision of this State.

In compliance with A.R.S. §§ 35-394 et seq., all bidders must select <u>one</u> of the following:

☐	The bidder **<u>does not</u>** use, and agrees not to use during the term of the contract, any of the following: • Forced labor of ethnic Uyghurs in the People's Republic of China; • Any goods or services produced by the forced labor of ethnic Uyghurs in the People's Republic of China; or • 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.
☐	The bidder **<u>does</u>** participate in use of Forced Uyghurs Labor as described in A.R.S. § 35-394.
☐	**Exempt Contractor.** Select all statements that applies to this Contractor: ☐ Contractor is a sole proprietorship; ☐ Contractor has fewer than ten (10) employees; and/or ☐ Contractor is a non-profit organization.

Company Name

Signature of Person Authorized to Sign

Address

Printed Name

City State Zip

Title