ARIZONA DEPARTMENT OF TRANSPORTATION

ADVERTISEMENT FOR BIDS

SPECIAL PROVISIONS

BIDDERS DOCUMENTS

TRACS/Proj. No.:

093 YV 189 F073801C 093-B(230)T
KINGMAN-WICKENBURG HIGHWAY (US 93)
(WICKENBURG RANCH WAY TO VISTA ROYALE)

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, OCTOBER 16, 2026, AT 11:00 A.M. (M.S.T.)

TRACS NO	093 YV 189 F073801C
PROJECT NO	093-B(230)T
TERMINI	KINGMAN – WICKENBURG HIGHWAY (US 93)
LOCATION	WICKENBURG RANCH WAY TO VISTA ROYALE

ROUTE NO.	MILEPOST	DISTRICT	ITEM NO.
US 93	189.9 to 194.2	NORTHWEST	103024

The amount programmed for this contract is $70,600,000. The location and description of the proposed work are as follows:

The proposed work is located in Yavapai County, on US 93, between mileposts 189.9 and 194.2, approximately 6 miles north of Wickenburg. The proposed work consists of reconstructing the existing 2-lane roadway to a 4-lane divided highway with a frontage road and two roundabouts. Additional work includes construction of a new concrete girder bridge, installation of pipe culverts and extension of concrete box culverts, replacement of guardrail and guardrail terminals, placement of new signing and pavement markings, and other related work.

The time allowed for the completion of the work included in the Construction Phase of the contract will be 400 working days.

The time allowed for the completion of the work included in the Landscape Establishment Phase of the contract will be 365 calendar 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.

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 two weeks 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 five working days 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.

The bidder shall provide an electronic proposal guaranty payable to the Arizona Department of Transportation for 10 percent of the amount of the bid.

Prior to the bid opening date, any questions pertaining to the project documents 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: Ata Zarghami, azarghami2@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.

Brahama Singh, PE,
Group Manager,
Contracts & Specifications

Project Advertised on: June 30, 2026

SPECIAL PROVISIONS

FOR

ARIZONA PROJECT

093 YV 189 F0738 01C

093-B(230)T

KINGMAN – WICKENBURG HIGHWAY (US 93)

WICKENBURG RANCH WAY TO VISTA ROYALE

RECONSTRUCT ROADWAY

PROPOSED WORK:

The proposed work is located in Yavapai County, on US 93, between mileposts 189.9 and 194.3, approximately 6 miles north of Wickenburg. The proposed work consists of reconstructing the existing 2-lane roadway to a 4-lane divided highway with a frontage road and two roundabouts. Additional work includes construction of a new concrete girder bridge, installation of pipe culverts and extension of concrete box culverts, replacement of guardrail and guardrail terminals, placement of new signing and pavement markings, and other related work.

PROFESSIONAL ENGINEER SEALS:

These Special Provisions represent the combined efforts of the following organizations:

(1) AECOM Technical Services, Inc

(2) Logan Simpson

(3) ADOT Roadside Development Section

(4) Stanley Consultants, Inc.

A representative of each organization has affixed their seal below, which attests that portions of these Special Provisions were prepared under their direction.

AECOM Technical Services, Inc.
MP 189.9 to 193.0 – Roadway, Structures, Drainage, & Traffic

Logan Simpson
Landscape and Erosion Control

ADOT Roadside Development Section
Seeding & Noxious Weeds

Stanley Consultants, Inc.
MP 193.0 to 194.3 – Roadway, Drainage, & Traffic

(SPC00FA,03/19/26)

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 Engineering Group, Manual of Approved Signs, available on the Department's website,

Arizona Department of Transportation, Traffic Engineering Group, Temporary Traffic Control Design Guidelines, dated April, 2025, available on the Department's website,

Manual on Uniform Traffic Control Devices for Streets and Highways, 2023 edition and Arizona Supplement to the 2023 edition, dated January 2026,

The Proposal Pamphlet which includes the following documents:

These Special Provisions,

Appendix A: Subgrade Acceptance Chart,

Appendix B: Guidelines for Handling Sonoran Desert Tortoises

Appendix C: Slump Loss Test of Portland Cement Concrete,

Appendix D: MSE Wall Compound Stability Search Zone Locations to Verify the Most Critical Failure Case for an MSE Wall with Level Backfill.

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-IFR)

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), as revised by the USDOT DBE Interim Final Rule (IFR) issued October 3, 2025 (hereinafter referred to as IFR).

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, as revised by the IFR.

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 operates in a nondiscriminatory manner and without regard to race or sex, while maximizing efficiency of service;

(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 as revised by the IFR 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) DBE Conscious: a measure or program that is focused specifically on assisting only DBEs.

(H) DBE Neutral: a measure or program that is, or can be, used to assist all small businesses.

(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, as revised by the IFR. That definition is incorporated here.

(1) Any individual who is a citizen (or lawfully admitted permanent resident) of the United States and who a certifier finds to be socially and economically disadvantaged on an individual basis.

(2) A determination that an individual is socially and economically disadvantaged must not be based in whole or in part on race or sex. For that reason, all applicants shall qualify as socially and economically disadvantaged if they can demonstrate that they can meet the relevant criteria described in 49 CFR Part 26.67.

(3) Being born in a particular country does not, standing alone, mean that a person is necessarily socially and economically disadvantaged.

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:

During the transition period, the IFR provides that until the Arizona Unified Certification Program (UCP) completes the recertification process, the Department may not 1) set any DBE contract goals or 2) count any participation towards its overall DBE goal.

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 DBE conscious efforts and DBE neutral efforts once the DBE recertification process is completed in accordance with the IFR. DBE conscious participation occurs where the contractor uses a percentage of DBEs, as defined herein, to meet the contract-specified goal. DBE 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, as revised by the IFR describes DBE 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.

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.

Application Submission. Applications for Disadvantaged Business Enterprise (DBE) certification may be filed 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://utracs.azdot.gov/Home.

Implementation of Revised Federal Standards. Effective October 3, 2025, all certification applications and renewals shall be reviewed and processed in accordance with the 49 CFR Part 26 as revised by the IFR. The revised rule modifies certification standards, documentation, and evidentiary requirements applicable to determinations of social and economic disadvantage, business size, ownership, and control.

Transition Period. During the transition period in which the Department and participating UCP agencies are updating internal procedures and the AZ UTRACS system to implement the revised rule, certification applications may continue to be submitted through the existing online platform. Applicants submitting applications during this period may be required to furnish additional or supplemental documentation consistent with the revised certification criteria upon system update or upon request by the certifying agency.

All applicants, whether filing initial or renewal applications, shall comply with any new or amended federal documentation requirements that become effective under 49 CFR Part 26 as revised by the IFR, including but not limited to personal narrative statements, financial disclosures, and supporting affidavits required to demonstrate eligibility under the revised standards.

The Department is a member of the AZ Unified Certification Program (AZUCP). During the transition period, the list of firms listed in AZ UTRACS were certified prior to October 3, 2025, not in accordance with the IFR, and therefore do not count for DBE credit, unless otherwise

noted in AZ UTRACS. The list indicates 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, as revised by the IFR. 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 in accordance with the IFR. However, SBCs that are not DBEs will not be counted toward DBE participation.

SBCs can register online at the AZ UTRACS website at http://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 Blank:

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 http://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:

During the transition period, the IFR provides that until the UCP completes the recertification process, the Department may not 1) set any DBE contract goals or 2) count any participation towards its overall DBE goal. The Department will not be counting any DBE conscious or DBE neutral efforts towards its overall DBE goal during this transitional period.

The Department has not established contract goals for DBE participation in this contract. Contractors are still encouraged to employ reasonable means to obtain DBE neutral efforts. 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 DBE 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:

During the transition period, the IFR provides that until the UCP completes the recertification process, the Department may not count any participation towards its overall DBE goal. This applies to both DBE conscious and DBE neutral efforts.

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 its 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:

Use of Prohibited Products:

The contractor shall not commit any of the following actions:

(1) Deliver, install, or include any prohibited product under this contract
(2) Propose to deliver, install, or include any prohibited product under this contract
(3) Enter into a new contract to procure or obtain any prohibited product.

For the purpose of this Section, "Prohibited Product" is defined as any telecommunication or video surveillance equipment, systems, or services produced by:

(1) Huawei Technologies Company
(2) ZTE Corporation
(3) Hytera Communications Corporation
(4) Hangzhou Hikivision Digital Technology Company
(5) Dahua Technology Company
(6) Any subsidiary or affiliate of the entities mentioned in this Section

The contractor shall identify the known subsidiaries and affiliates of the aforementioned from the following Website:
https://umd.servicenow.com/itsupport?id=kb_article_view&sysparm_article=KB0014132&sys_kb_id=28015b70dbe0e3849382f1a51d96193f

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.

Concrete Painting:

Concrete structures shall be painted in accordance with Section 610 of the specifications. The color for each structure shall be approved by the Engineer prior to ordering or purchasing paint to be used on the project.

Shoring:

The contractor shall design, construct and then remove temporary excavation support systems (shoring) as required for construction of pipe culverts, box culvert, culvert headwalls, retaining walls, slope paving, miscellaneous structures, and bridges to keep the existing facilities open during construction and to protect workers. Shoring shall remain in place until such time as the new construction is complete and shoring is no longer required. The design of the shoring shall be prepared by and bear the seal and signature of a licensed professional civil or structural engineer registered in the State of Arizona and shall be approved by the Engineer prior to construction. No measurement or direct payment will be made for the design, construction or removal of temporary excavation support systems, the cost of this work considered as included in contract items.

Transition of Select AASHTO Standard Test Method to Arizona Test Method Equivalent:

Whenever reference is made in the specifications to an AASHTO Test Method, the reference shall be construed to mean it's equivalent Arizona Test Method as listed in the table below.

TEST METHOD TRANSITION TABLE	
AASHTO Standard	**Equivalent Arizona Test Method**
R 66	103
R 97	104
R 90	105
T 11, T 27	201
T 85	210
T 84	211
T 335	212
T 99	225

TEST METHOD TRANSITION TABLE	
AASHTO Standard	**Equivalent Arizona Test Method**
	226
T 224	227
T 191	230
T 272	232
T 310	235
T 288, T 289	236
T 176	242
T 99	245
T 272	246
T 304 Method A	247
T 24	317
T 329	406
R 68, T 245	410
T 355	412
T 166	415
R 47	416
T 209	417
T 287	421
T 269	424
T 308	427
	428

Environmental Mitigation Measures:

The contractor's commitments are identified in the Environmental, Permits, Issues, and Commitments (EPIC) Plan Sheet 1F. The contractor shall follow the requirements specified in the EPIC plan sheet 1F and in Subsection 104.16 of the specifications and these Special Provisions.

In addition, the contractor shall pay attention to the project specific environmental commitments that are specified below and in Section 10 of the EPIC Plan Sheet 1F.

(102BID, 03/19/26)

Section 102 BIDDING REQUIREMENTS AND CONDITIONS: of the Standard Specifications is revised to read

102.01 Contract Documents:

(A) General:

The Contract Documents, including but not limited to, Advertisement for Bids, Project Plans, and Proposal Pamphlets will be available in electronic format, on the ADOT Contracts and

Specifications Group website. Any interested party may access the advertised Contract Documents.

(B) Advertisements for Bids:

The advertisement for bids may contain the following information:

- Programmed Amount,
- Project number and name of highway,
- Route number and mileposts,
- Date and time of opening of bids,
- Location of the project,
- General description of work,
- Specified contract time for completion of contract work,
- Statement of proposal requirements,
- Manner in which project plans and specifications may be obtained,
- Type and amount of proposal guaranty.

(C) Proposal Pamphlet:

The Proposal Pamphlet will include the location and general description of the contemplated construction, an approximate estimate of the quantities and types of work to be performed and/or materials to be furnished, a schedule of bid items for which unit prices are invited, the specified time for completion, any applicable Special Provisions or supplemental requirements, and all necessary bidding documents.

102.02 Prerequisites for Bidding:

(A) General:

To submit a valid bid, the bidder shall:

(1) Have prequalification from the Department as necessary for the project, in accordance with Subsection 102.02(B) of the specifications; and

(2) Be included on the project Plansholder List as a Prime in accordance with Subsection 102.02(C) of the specifications.

(B) Prequalification of Bidders:

Prior to submitting a bid, the bidder will (unless waived by the Department) be required to be prequalified with the Department to bid on the project. The submission of Prequalification information and determination of Prequalification shall be in accordance with the requirements of the Rules for Prequalification of Contractors as approved and adopted by the Department.

(C) Plansholder List:

It is the bidder's responsibility to ensure that their firm is on the Plansholder List as a Prime prior to submitting a bid.
Firms may register electronically requesting placement on the project Plansholder List as a Prime contractor as follows:

(1) Go to the ADOT Contracts and Specifications Group Website;

(2) Select "Current Advertisements";

(3) Identify the project of interest;

(4) Click on the "Register" icon;

(5) Select the "Bidder" radio button;

(6) Complete all required fields;

(7) Click "Save". This submits the request to the Department; and

(8) If all required information is provided, the "ADOT C&S Advertisement Registration Confirmation" Screen will appear. An email will also be sent to the email address provided acknowledging the receipt of the request.

Requests to be included on the Plansholder List as a Prime will be evaluated by the Department to determine whether the bidder is prequalified for the project. The Department cannot guarantee that requests to be on the Plansholder List will be considered if the request is submitted less than five working days prior to the bid opening. The Department will send an email to the email address provided notifying the contractor of the results of their request. The Department's email will state whether the request was approved or denied. More information regarding the Department's decision may be obtained by contacting the ADOT Contracts and Specifications Group.

If an individual from a firm submits a duplicate request to be placed on the Plansholder List, the request will be denied. The Department will register the contact person listed on the duplicate request to receive email notices of updates to the project. The Department will send an email to the email address provided notifying the contractor of the results of their request.

(D) Registration for Notifications:

Subcontractors, Vendor and other interested parties may electronically register to receive email notifications regarding updates or changes to specific advertised contracts.

To register:

(1) Go to the ADOT Contracts and Specifications Group Website;

(2) Select “Current Advertisements”;

(3) Identify the project of interest;

(4) Click on the “Register” icon;

(5) Select the “Other” radio button, as applicable;

(6) Select the “Yes” in response to the prompt “Are you interested in registering to be notified about any changes made to this advertisement?”;

(7) Complete all required fields;

(8) Click “Save”. This submits the request to the Department; and

(9) If all required information is provided, the “ADOT C&S Advertisement Registration Confirmation” Screen will appear and a confirmation email will be sent to the email address provided.

All registered parties will receive notifications when changes are made to the associated contract advertisement.

102.03 Suspension from Bidding:

The Department may suspend any person and any subsidiary or affiliate of any person from further bidding to the Department and from being a subcontractor or a supplier or otherwise participating in the work:

(A) If that person or any officer, director, employee or agent of that person is convicted, in this State, or any other jurisdiction, of a crime involving any of the following elements or actions:

1) Entering into any contract, combination, conspiracy or other unlawful act in restraint of trade or commerce;

2) Knowingly and willfully falsifying, concealing, or covering up a material fact by trick, scheme, or device;

3) Making false, fictitious, or fraudulent statements or representations;

4) Making or using a false writing or document knowing it to contain a false, fictitious, or fraudulent statement or entry;

5) Misrepresentation or false statement on any application for bonding;

6) Misrepresentation or false statement on any application for prequalification;

(B) If the Department makes a finding of any of the above or finds that the contractor is not a Responsible Bidder or a Responsible Contractor; or

(C) If the Department determines that a contractor, subcontractor, or supplier has repeatedly or willfully failed to comply with federal or state immigration laws.

Under this subsection, a person means any individual, partnership, joint venture, corporation, association, or other entity formed for the purpose of doing business as a contractor, subcontractor, or supplier.

102.04 Availability of Documents:

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

A. Project Plans.
B. Advertisement for Bids.
C. Proposal Pamphlet.
D. Cross Sections.
E. Earthwork Report.
F. Other Available Reports.
G. Existing Ground Digital Terrain Model (DTM).
H. Design Ground Digital Terrain Model (DTM).
I. Survey Control Sheet.

The project plans, proposal pamphlet, cross sections, earthwork report, 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, proposal pamphlet, and any applicable reports.

The existing ground DTM and the design DTM, if applicable, are provided in either DTM or DGN files for informational purposes 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 https://azdot.gov/business/engineering-and-construction/computer-aided-design-and-drafting-cadd.

The Department is providing the available electronic project documents to bidders for informational purposes in conjunction with work or services to be provided to the Department

under the contract. Any use of the electronic files for any purposes other than for this project is prohibited.

102.05 Plansholder Eligibility:

The Department reserves the right to disqualify a prequalified contractor from being a Plansholder for any of the following reasons:

(E) Lack of competency or adequate machinery, plant and other equipment, as revealed by the financial statement and experience questionnaires required under Subsection 102.02 of the specifications.

(F) Incomplete work which, in the judgment of the Department, might hinder or prevent the prompt completion of additional work if awarded.

(G) Failure to pay, or settle satisfactorily, all bills due for work on other contracts.

(H) Failure to comply with any qualification regulations of the Department.

(I) Default under previous contracts.

(J) Unsatisfactory performance on previous work.

(K) Entering into any contract, combination, conspiracy, or other unlawful act in restraint of trade or commerce.

(L) Knowingly and willfully falsifying, concealing, or covering up a material fact by trick, scheme, or device.

(M) Making false, fictitious, or fraudulent statements or representations.

(N) Making or using a false writing or document knowing it to contain a false, fictitious, or fraudulent statement or entry.

(O) Misrepresentation or false statement on any application for bonding.

(P) Misrepresentation or false statement on any application for prequalification.

(Q) Lack of sufficient ability or integrity to complete the contract.

102.06 Interpretation of Quantities in Bidding Schedule:

The quantities appearing in the bidding schedule, except as provided elsewhere, are approximate only and are prepared for the comparison of bids. Payment to the contractor will be made only for the actual quantities of work performed and accepted or materials furnished in accordance with the requirements of the contract. The scheduled quantities of work to be

done and materials to be furnished may each be increased, decreased, or omitted as hereinafter provided in Subsection 104.02 of the specifications.

102.07 Examination of Plans, Specifications and Site of Work:

The bidder shall examine the site of the proposed work and the contract before submitting a Proposal. If no site investigation is performed, the bidder is responsible for all site conditions that should have been discovered had a reasonable site investigation been performed. The submission of a Proposal will be considered conclusive evidence that the bidder is satisfied with the conditions to be encountered in performing the work and as to the requirements of the proposed contract.

The bidder shall take no advantage of any apparent error or omission in the plans, bid schedule items, estimated quantities, specifications, or other contract documents. In the event the bidder discovers such an error or omission, the bidder shall immediately notify the Department. The Department will then make such corrections and interpretations as may be deemed necessary.

Any request for explanation of the meaning or interpretations of the contract shall be submitted in adequate time to allow a reply to reach all bidders before submission of their Bid Proposal. If the Department determines interpretations or explanations are warranted, the response will be issued, if necessary, through an addendum to the contract documents, and will be made available to all prospective bidders before the time set for opening of Proposals.

The Department will not be bound by any statement or representation concerning conditions or description of the work unless they are included in the contract. Oral explanations, interpretations, or instructions given before the opening of the bids by Department employees or agents are not binding.

102.08 Preparation of Proposal:

(R) General:

The bidder shall prepare and submit its proposal using Department-approved bid preparation software.
Proposals shall be prepared and submitted in accordance with the requirements of Subsection 102.08(B) of the specifications.
The bidder shall submit its proposal using the electronic bid process described herein.

(S) Electronic Submittal:

(1) General:

In order to submit a bid electronically, a firm shall have obtained a bidder identification number from the Department, at the office of ADOT Contracts and Specifications Group, 205 South 17th Avenue, Maildrop 121F, Phoenix, AZ 85007, phone (602) 712-7221.

In addition, bidders shall subscribe to Info Tech, Inc., doing business as Infotech's Bid Express® service at www.bidx.com, an online bidding service, and obtain an online Digital ID. Bid Express can be reached at www.bidx.com, phone (888)-352-2439 and/or customer.support@bidx.com. The bidder shall also download and install a copy of the AASHTOWare Project Bids Bid Component from the internet at the Bid Express website. The version of the software currently used by ADOT can then be located by selecting the ADOT tab and the "AASHTOWare Project Bids" link under Downloads.

In order to obtain a Digital ID, bidders shall name at least one authorized signatory, as approved by the Department to commit the firm to the terms and conditions specified in the Proposal and the contract documents.

The bidder shall download the electronic copy of the project EBSX file, listed as an AASHTOWare Project Bids Data File on the Bid Express website. The file includes a schedule of items folder containing the bid schedule, a miscellaneous data folder containing the proposal and attachments, contractor authorization folder containing bidders's contact information, and a bid bond folder. The bidder shall review the proposal and complete the bidding schedule, as specified herein, and the attachments.

The bidder shall include with its bid an email address and recipient name as its contact information for the purpose of receiving the notice of award or other notices related to the bidding. The Department will send the notice of award, executed contract and other notices to the requested email address and recipient name.

It is the contractor's responsibility to provide the updated contact information to the Department if there are any changes to the above requested email address or recipient name prior to the award of the contract.

The bidder shall specify a unit price for each pay item for which a quantity is given in the bidding schedule. The software will automatically produce the extended amount, as the product of the quantity given and the specified unit price.

The bidder shall also download all addenda files issued and update the project file accordingly. The bidder shall be responsible for the successful submission of its electronic bid prior to the time specified for submission of bids. The bidder agrees that the Department bears no liability resulting from the bidder's failure to successfully submit an electronic bid.

(2) Procedure for Missing Bids:

If a bidder believes that its electronically submitted bid should have been read at the bid opening but was not read, the bidder shall notify the Department at CSGroup@azdot.gov of the apparent irregularity and provide its bid receipt for the bid in question no later than three hours after the time specified for submission of bids.

Upon proper notification of a missing bid by a bidder, the Department will notify all bidders that a missing bid has been reported. The Department will begin an investigation to determine the status of the bid, and will review all electronic bids received from Bid Express service.

The Department will direct Infotech to review their records and determine whether the missing bid was submitted. Infotech will make a determination about receipt of the bidder's missing bid.

If requested by the Department, Infotech will attempt to retrieve a copy of the encrypted bid from the bidder's computer.

The Department will partner with Infotech and implement best practices to configure the Bid Express service to decrypt the bid.

If the Department determines that a bid cannot be recovered, the Department will notify all bidders of its determination.

If a missing bid is recovered, the Department will determine the validity of the bid, and may recommend award of the contract to the bidder submitting the missing bid if appropriate. The Department will notify all bidders.

102.09 Non-Collusion Certification:

By submission of its bid electronically, the bidder makes the certification stated in the following paragraph, binding as if it had been signed by the bidder.

The bidder certifies that, pursuant to Subsection 112(c) of Title 23, United States Code and Title 44, Chapter 10, Article 1 of the A.R.S, neither it nor anyone associated with the company, firm, corporation, or individual 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 the submitted bid.

102.10 Irregular Proposals:

(T) Proposals may be considered irregular and may be rejected for any of the following reasons:

(1) If there is a submission of any kind which may tend to make the proposal incomplete, indefinite or ambiguous as to its meaning.

(2) If the bid is mathematically unbalanced.

(3) If the bid is materially unbalanced.

(U) Proposals will be considered irregular and will be rejected for any of the following reasons:

(1) If the bidder or surety fails to provide a proposal guaranty as specified in Subsection 102.11 of the specifications.

(2) If the bidding schedule does not contain a unit price for each pay item listed.

(3) If the bidder fails to meet the required goal for Disadvantaged Business Enterprises (DBE) established in the Special Provisions or show good faith effort as determined by the Department.

102.11 Proposal Guaranty:

The bidder shall provide an electronic proposal guaranty payable to the Arizona Department of Transportation for 10 percent of the amount of the bid.

The surety (bid) bond shall be executed by the bidder and a surety company or companies holding a certificate of authority to transact surety business in this State issued by the Director of the Department of Insurance. The agent for the surety shall be licensed to act as an insurance agent in Arizona.

Bidders shall provide an electronic proposal guaranty as described herein.

Two companies have established web-based surety processing procedures with Bid Express: Surety 2000 (https://surety2000.com/) and Sure Path Network (http://web.insurevision.com/). Bidders may contact these companies for additional information and requirements on electronic proposal guaranty.

102.12 Withdrawal of Proposals:

(V) General:

A bidder may withdraw its electronic submittal at a minimum 30 minutes prior to the time specified for bid opening in writing to the Contracts and Specifications Manager through the Contract and Specifications Group email at CSGroup@azdot.gov------

(W) Conditional Withdrawal:

When proposals for more than one contract are to be publicly read on any one date, a bidder may request in the event it is the apparent low bidder on a given contract or contracts, that one or more subsequent bids be withdrawn.

The bidder shall submit a written request for conditional withdrawal to the Contracts and Specifications Group Manager via email at CSGroup@azdot.gov a minimum of 30 minutes prior to the specified bid opening time.

102.13 Combination or Conditional Proposals:

At the Department's discretion, proposals may be issued for projects either separately or in combination. Bidders may submit bids for the combination or for individual units within the combination, as allowed in the proposal. The Department reserves the right to award

contracts based on separate or combination bids, whichever is most advantageous to the state. Only combination bids specifically authorized in the Department's proposal will be considered.

102.14 Public Opening of Proposals:

Proposals will be opened and read aloud at the time indicated in the advertisement for bid. Bidders, their authorized agents and other interested parties may attend the bid opening while they are read aloud. After the completion of the bid opening, the as-read bid results will then be made available through the ADOT Contracts and Specifications Group website.

102.15 Licensing:

It is the responsibility of the bidder to determine whether it has the appropriate contracting licenses to perform the work. For all projects except Federal-aid funded projects, the bidder shall have the proper licenses at the time of bid opening. The successful bidder's failure to meet with the necessary license requirements at the time of bid opening will result in the rejection of the bid.

On Federal-aid funded projects, the bidder is not required to have the licenses at the time of bidding, but it must procure the licenses from the State Registrar of Contractors, in accordance with A.R.S. 32 1101 et seq. before award can be made, and no later than 60 days after the date bids are opened. The bidder's failure to get the necessary licenses within 60 days after the bid opening date will result in rejection of the bid.

Licensing information is available from:
Arizona Registrar of Contractors
1700 W. Washington St. Suite 105
Phoenix, AZ 85007-2812
Phone: (602) 542-1525
Email: Webmaster@azroc.gov
www.roc.az.gov

102.16 Boycott of Israel:

All bidders are required to certify in their bid proposal on the "Participation in Boycott of Israel Certification" form either:

(X) 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 ARS 35-393.01; or

(Y) The bidder does participate in a boycott of Israel as defined in ARS 35-393.01.

The Department will not recommend award of the contract unless the bidder makes the certification described in subparagraph (A) of this Subsection.

102.17 Forced Labor of Ethnic Uyghurs Ban:

All bidders are required to certify in their bid proposal on the "Forced Labor of Ethnic Uyghurs Ban Certification Form" either:

(A) The bidder does not use the Forced labor of Ethnic Uyghurs as described in A.R.S. 35-394; or

(B) The bidder does use the Forced labor of Ethnic Uyghurs as described in A.R.S. 35-394.

The Department will not recommend award of the contract if the bidder makes the certification described in subparagraph (B) of this Subsection, unless the bidder uses an exempt contractor.

For the purposes of this subsection, a contractor is defined as an exempt contractor if it is a sole proprietorship; has fewer than 10 employees; and/or is a non-profit organization.

(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 revised to read:

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.

(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.

(104TPDDC, 08/21/25)

SECTION 104 SCOPE OF WORK:

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

Prior to construction, alterations to contract phasing, detours, and Maintenance and Protection of Traffic plans shall be reviewed by the Engineer at the preconstruction conference or a pre-activity meeting based on the contractor’s preliminary schedule and proposed contract phasing.

SECTION 104 SCOPE OF WORK:

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

(D) General Traffic Control Information:

The traffic control plans have been prepared in accordance with the MUCTD, the Standard

Specifications, and these Special Provisions. The contractor is responsible for establishing the traffic control necessary to provide a safe and efficient work zone without unduly delaying traffic. Alterations and modifications to the traffic control concepts included in the project plans will be considered if they conform to the references listed above. Any changes to the traffic control plans shall be approved in advance by the Engineer.

Temporary traffic control devices shall not be set up in advance of a closure unless approved by the Engineer. Traffic control devices shall not be installed more than 30 minutes before the beginning of a closure, and shall be entirely removed from the roadway and shoulders within 30 minutes of end of the closure.

Existing signs in conflict with construction signing shall be covered in place as directed by the Engineer. All covered signs shall be uncovered as necessary to restore existing or needed traffic control after the work activities are completed.

(E) Roadway Closures, Construction Time Windows and Lane Restrictions:

In addition to the schedule requirements of subsection 108.03 of the specifications, the contractor shall provide daily schedules of activities and corresponding traffic control schemes. This information shall be provided in advance during the weekly construction meeting and shall specify the limits of the work activities and related traffic control plan by location, direction and time. Traffic control plans shall be submitted to and approved by the Engineer prior to any daytime and nighttime operations.

The contractor shall provide the Engineer with a radio similar to those being used by the contractor and his traffic control personnel so that the Engineer can monitor the initiation and progress of traffic control measures.

The construction schedule and associated traffic control schemes shall be developed in such a way that access is maintained at all times to adjacent roads and trails, unless otherwise approved by the Engineer. Daily schedules shall be developed in a format suitable for release to other agencies and the public, and shall be updated as necessary.

The contractor shall maintain traffic on US 93 at all times, with the exception of the single lane closures listed in Table 104-1. Single lane closures shall be approved by the Engineer. No short-term lane closures will be permitted on weekends or holidays. No travel lane or shoulder restrictions are allowed on weekends or holidays. Weekend is defined as from Friday 12:00 PM to Monday 6:00 AM. Flagging shall be required for the single lane closure of the existing US 93 mainline to maintain traffic while the contractor places the girders on the proposed southbound bridge.

Table 104-1 – Allowable Short-Term Lane Closure Periods	
US 93	**Weekday**
Single Lane Closure	Tuesday, Wednesday, or Thursday: 8:00 PM to 6:00 AM
Crossover Tie-Ins	Tuesday, Wednesday, or Thursday: 8:00 PM to 6:00 AM
Temporary Concrete Barrier placement, paving and striping of existing US 93	Tuesday, Wednesday, or Thursday: 8:00 PM to 6:00 AM

Crossroads shall be kept open at all times.

The contractor shall maintain access to businesses and residential homes at all times.

No work or traffic restrictions shall occur during the following holiday periods. Holidays are defined as 12:00 PM of the last working day prior to the holiday until 6:00 AM of the first working day following the holiday. When holiday falls on Tuesday, the Monday before the holiday is considered part of the holiday. When the holiday falls on a Thursday, the Friday following the holiday is considered part of the holiday.

Recognized Holidays

- New Year's Day
- Civil Rights Day
- Presidents Day
- Memorial Day
- Independence Day
- Labor Day
- Columbus Day
- Veterans Day
- Thanksgiving Day
- Christmas Day

(F) Advance Notification of Closures, Construction Activities

The contractor shall provide a detailed schedule of all requested road restrictions to the Engineer for review and approval a minimum of 7 days in advance of the date for a lane closure. The Engineer will provide the approval of the restriction a minimum 7 days prior to the closure date. The contractor shall place portable changeable message boards to notify the traveling public a minimum of 7 days in advance of any restrictions. The contractor through the Engineer shall coordinate with ADOT Community Relations to notify the public of the road restrictions.

In the event construction requires a partial closure of a driveway the contractor shall notify the Engineer a minimum of 3 days before any driveway restriction.

The contractor shall notify the Engineer a minimum of 21 days prior to the removal of fence adjacent to private property. The Engineer will work with ADOT Communications to notify the affected property owners 14 days before work begins.

The contractor shall notify the Engineer a minimum of 14 days prior to the removal of landscape/hardscape within the temporary construction easement.

104.07 Railway-Highway Provisions: of the Standard Specifications is modified to add:

The contractor is hereby informed that part of the work will be within the right-of-way (ROW) of the BNSF Railway Company (BNSF). The contractor shall contact the BNSF Manager Industry and Public Projects (MIPP) at the phone number specified herein, making reference to BNSF crossing DOT #025369F and milepost 132.38 specified herein, and requests a Temporary Occupancy Permit (TOP) for the project and provides any essential information that includes the key stages of the contractor's progress. The contractor shall obtain a Roadway Surfacing/Resurfacing permit with BNSF.

When approved by BNSF, the executed Contractor's C&C1 (right of entry agreement) becomes the contractor's Temporary Occupancy Permit (TOP). The contractor shall not enter into, or commence work within, the railroad's ROW, or within the existing ADOT easement from BNSF, until the contractor has provided a copy of the executed Contractor's C&C1 to the Engineer. The contractor shall also provide at least 30 days prior written notice to BNSF Manager, Industry and Public Projects about the time when the operations for construction will commence on BNSF right of way, making a reference of BNSF File Number specified herein.

BNSF owns and operates trains over tracks in the project limits, and the project will impact its operations.

Unless approved otherwise in writing by the BNSF, BNSF will not allow any work within their right of way from October 1 to December 31. BNSF may require portions of the contractor's work that may affect railroad operations to be performed during designated specific hours.

Per Form C&C1, the contractor shall take full responsibility for their subcontractors and shall name such subcontractors as insured under the Railroad Protective Policy. However, at BNSF's request, a subcontractor may be required to execute their own C&C1 to include the purchase of their own Railroad Protective Liability Insurance (RPLI).

The contractor is advised that several weeks are required for review and approval of the Contractor's C&C1. The contractor shall anticipate the required time necessary to obtain the C&C1 and schedule its work accordingly. No adjustment to the contract time will be allowed for delays in obtaining a fully executed C&C1. The contractor shall submit the application for C&C1 and make payment of the fee as provided under subsection 107.02 of the specifications.

The contractor shall comply with all requirements of the railroad concerning access, insurance, inspection, flagging requirements, and protection of its property, including, when required, a plan for erosion control. Following award of the contract, the contractor must contact the BNSF Manager Public Projects to begin the Temporary Occupancy application process. All correspondence and formal communications must be directed to the BNSF Manager, Public Projects, with copy to the Engineer. The contractor shall communicate and coordinate work on a daily basis with the BNSF Road Master contact specified herein.

Rafer Nichols
MIPP
BNSF Railway Co
Phone: 817-471-6614
Rafer.Nichols@bnsf.com

When communicating with the BNSF, please reference the following information:

DOT #025369F
Railroad- BNSF
RRMP- 132.38
RRSUBDIV- Southwest
Street- US HWY 93

The contractor is advised that the daily coordination necessary to comply with the requirements of the C&C1 and these Special Provisions may be extensive and that prior to beginning their construction activities it is in his best interest to meet with the Railroad Representative/Roadmaster in order to establish the command hierarchy and the necessary approval protocols for their day-to-day activities.

The contractor shall notify BNSF's Manager of Track Maintenance, or Designated Representative, at least 30 calendar days in advance of commencing work on BNSF property or near BNSF's tracks, when requesting a BNSF flagger in accordance with the requirements of the Temporary Occupancy documents in order to protect BNSF from damage or interference to BNSF's trains and property. No excavation within BNSF ROW is permitted without the approval of the railroad. The contractor shall provide written notice to BNSF Manager Industry and Public Projects, BNSF Road Master and to the Engineer when flagging services are no longer needed.

The contractor is required to communicate those of its or its subcontractor's activities to the Road Master that may affect safety or railroad operations. Any work to be performed by the contractor, which requires flagging protection, shall be deferred until flagging protection is available at the job site.

The contractor is required to procure Railroad Protective Liability Insurance (RPLI) for the duration of the project. In addition to the Certificate of Insurance form, the contractor must provide an Insurance Binder, or a copy of the policy, that designates the specific RPLI coverage. The contractor is not required to purchase this coverage from the BNSF and is encouraged to shop the market for the best available rate.

The contractor shall conduct the work in a safe and orderly manner and according to the plans and specifications. The contractor shall at no times hinder the safe and timely operation of BNSF facilities, nor shall it allow the BNSF- required insurance to lapse at any time. If the contractor shall prosecute the project work in a manner that BNSF deems to be hazardous to its property, facilities or the safe and expeditious movement of its traffic, or the insurance described in the C&C1 documents shall be canceled during the course of the project, then BNSF shall have the right to C&C1 the work, within BNSF right of way, until the acts or omissions of the Contractor have been fully rectified to the satisfaction of BNSF's Manager – Industry & Public Projects, or additional insurance has been delivered to and accepted by BNSF. Such work C&C1page shall not give rise to or impose upon BNSF any liability to the Contractor.

When the contractor receives the executed C&C1 from BNSF, the contractor shall begin a dialog with the BNSF Roadmaster to mutually schedule and coordinate their respective work. The contractor's construction schedule shall identify the time frames for the completion of the contractor's and BNSF's activities, always recognizing that the contractor's activities shall be scheduled around train movements. Construction activities within 25 feet of the operational tracks, or activities (such crane operations) that may foul the tracks will occur only with the approval of BNSF's Roadmaster, or his designated representative. All essential communications between the contractor and BNSF are to be communicated promptly to the Engineer.

All existing BNSF maintenance roadways shall remain open at all times during construction. The contractor shall not deposit any material or debris onto railroad property that, in the opinion of BNSF, would hinder railroad operation, or be unsafe to railroad operations. Contractor will not store material within BNSF's right of way. When contractor personnel and equipment are not working, they shall be at least 25 feet from the centerline of the nearest track. The contractor shall maintain all ditches and drainage structures free of silt or other obstructions which may result from the contractor's operations and to repair promptly eroded areas within BNSF property. The construction site shall be restored as indicated in the Contractor's Temporary Occupancy Agreement and cleaned during the progress of the work to the satisfaction of BNSF. Any ballast material contaminated by the contractor's operations will be replaced by BNSF at the contractor's expense.

All workers, including those employed by subcontractors, will be required to complete the BNSF Contractor Safety Orientation Program prior to entering the property and to complete and submit a photo for the photo identification card. All workers will be required to have in their possession the photo identification card indicating that the worker has taken and passed the course. The course may be taken via the Internet at http://www.bnsfcontractor.com. There is a $25 fee for the course and an additional cost for each photo card per person. BNSF requires protection of fiber optic cable systems which may cross or run parallel to the BNSF corridor. The contractor shall be responsible to contact BNSF and/or the telecommunications companies to determine whether there is any fiber optic cable systems located within the PROJECT boundaries that could be damaged, or their service disrupted, due to the construction of the PROJECT. The contractor shall also pothole all lines either shown on the PLANS or marked in the field in order to verify their locations. The contractor shall also use

all reasonable methods when working in the BNSF rail corridor to determine if any other fiber optic lines may exist. Failure to notify, pothole or identify these lines shall be sufficient cause for the Engineer to sC&C1 construction at no cost to ADOT or BNSF until these items are completed. Costs for repairs and loss of revenues and profits due to damage to these facilities through negligent acts by the contractor shall be the sole responsibility of the Contractor. The Contractor shall indemnify and hold the State and BNSF harmless against and from all cost, liability and expense arising out of or in any way contributed to these negligent acts of the Contractor. The telecommunication companies, at ADOT's expense if prior rights are demonstrated, shall be responsible for the rearrangement of any facilities determined to interfere with the construction. The contractor shall cooperate fully with any company performing these rearrangements. The contractor shall make any and all arrangements to secure the location or relocation of wire lines, pipe lines and other facilities owned by private persons, companies, corporations, political subdivisions or public utilities other than BNSF which may be found necessary to locate or relocate in any manner whatsoever due to the construction of the PROJECT. BNSF "call before you dig" 1-800-533-2891"

It is the contractor's responsibility to coordinate effectively its operations to minimize, if not eliminate, any impact of the project upon BNSF operations. Any loss of service, or revenue, to BNSF beyond that covered by these specifications that is in any way caused by the contractor's actions shall be the sole responsibility of the contractor, at no cost to the project.

BNSF prohibits crossing of railroad tracks. If the contractor desires a temporary or permanent BNSF track crossing for hauling equipment and material across the tracks, a separate agreement must be concluded with BNSF, and such agreement with BNSF must be concurred in by the Engineer. The contractor is hereby advised that ADOT has not and will not negotiate with BNSF for any temporary or permanent crossing of the tracks. The contractor shall correspond with BNSF for the track crossing permit details. Assuming there is no existing road crossing, a road crossing permit would be granted it would then be constructed by BNSF forces. The Department assumes no responsibility for railroad crossings and they are considered initiatives of the contractor. No additional payment will be made for the construction of railroad crossings.

(104SWDEQ, 02/10/20)

SECTION 104 SCOPE OF WORK:

104.09 Prevention of Stormwater Pollution: of the Standard Specifications is revised to read:

(A) General:

The contractor shall follow the requirements of Section 402 of the Clean Water Act (CWA), 33 USC 1251 and other water quality regulations. The CWA regulates discharge of pollutants into the waters of the United States and provides quality standards for surface waters. Section 402 of the CWA provides stormwater pollution prevention regulations. ADEQ's Aquifer Protection Permit (APP) Program regulates temporary concrete washout facilities. The APP

Type 1 Permit (APP 1.12) applies only when projects disturb one or more acres and are covered under the Arizona Department of Environmental Quality Construction General Permit.

The contractor shall minimize ground disturbance to the natural surroundings. No ground disturbing activities shall occur until all applicable permits have been obtained. The applicable permit requirements must always be met.

The contractor shall provide adequate information to the contractor's personnel, including employees of any subcontractors, to ensure that all personnel understand requirements of the applicable permits that are relevant to their job functions.

(B) Clean Water Act, Section 402, Arizona Pollutant Discharge Elimination System (AZPDES):

(1) General Requirements:

The contractor shall be responsible for preparing and processing all documents and implementing the requirements of the Arizona Pollutant Discharge Elimination System (AZPDES) "General Permit for Discharge from Construction Activities to the Waters of the United States," for pollution prevention issued by the Arizona Department of Environmental Quality (ADEQ). That document is hereinafter referred to as the Construction General Permit (CGP) and is available on ADEQ's website.

The work shall include providing, installing, and maintaining, temporary and permanent pollution prevention control measures and removing and disposing of temporary pollution prevention control measures. Control Measures, as hereinafter referenced, shall be deemed to include pollution prevention control as described in the CGP. Control Measures may be temporary or permanent.

The contractor's schedule shall allow sufficient time for the following submittal, review, and approval times:

Table 104-2
Submittal, Review, and Approval Timeframes

Contractor submittal of Erosion Control Coordinator (ECC) qualifications	By the pre-construction conference
Department review and approval of ECC qualifications	within seven calendar days of receipt
Department review and approval of subsequent submittals (if required)	within seven calendar days of receipt
Contractor submittal of SWPPP to Engineer	By the pre-construction conference
Department review and approval of subsequent submittals (if required)	within seven calendar days of receipt
Engineer/contractor joint review of SWPPP	within 10 calendar days after contractor submittal of SWPPP with ADOT approval of the ECC

Approved Notice of Intent (NOI) submittal and review times	as described in the CGP

No increase in contract time will be granted for the contractor's failure to provide acceptable submittals within the specified timeframes.

(2) Stormwater Pollution Prevention Plan (SWPPP):

The SWPPP shall include all information and permit requirements specified in the CGP, and shall also be consistent with applicable state or local programs.

Unless otherwise approved by the Engineer and documented in the SWPPP, the contractor shall not expose a surface area of greater than 750,000 square feet to erosion through clearing and grubbing, or excavation and filling operations within the project limits until temporary or permanent Control Measures for that portion of the project have been installed and accepted by the Engineer.

The contractor shall indicate each 750,000 square-foot sub-area in the SWPPP, along with proposed Control Measures for each sub-area. The SWPPP shall also include the sequence of construction for each sub-area, and installation of the required temporary or permanent Control Measures.

The contractor shall give installation of permanent Control Measures priority over reliance on temporary measures. Permanent Control Measures and drainage structures shall be installed as soon as possible in the construction sequencing of the project, preferably concurrent with construction of the related sub-area or drainage device.

The project plans may include erosion/sediment control plans and details along with a Control Measure Index Sheet (CMIS) to assist the contractor in preparing the SWPPP. The contractor and the contractor's ECC, or other qualified designee, as described in Subsection 104.09(B)(3), shall review the contract documents, and prepare the SWPPP for review by the Engineer. The contractor shall use the Department's SWPPP Template to prepare the SWPPP. The template is available on the Department's Water Resources website.

The SWPPP shall specify the mechanism whereby revisions may be proposed by the contractor or the Engineer throughout the project and incorporated into the plan, including the review and approval procedure. The Engineer and contractor shall jointly approve and sign each revision to the SWPPP before implementation. Any revisions made by the contractor to amend the approved SWPPP will require two to seven calendar days for review**.**

The contractor shall prepare the SWPPP for the Engineer's review including all information specified herein. The contractor shall submit the SWPPP to the Engineer at the preconstruction conference.

Within 10 calendar days of the SWPPP submittal, the Engineer and contractor will jointly review the contractor's SWPPP. The contractor shall include any additional revisions directed

by the Engineer. The SWPPP shall meet the terms and conditions of the CGP and be compatible with construction sequencing and maintenance of traffic plans.

When agreement has been reached, the Engineer and contractor's ECC will sign the SWPPP. The Engineer's signature will constitute approval of the SWPPP. Upon approval of the SWPPP, the contractor and the Engineer shall each file a Notice of Intent (NOI) as specified in Subsection 104.09(B)(6). The Engineer will provide a copy of the Department's NOI to the contractor to be included in the SWPPP.

The SWPPP shall be maintained in accordance with the CGP. A current copy shall be maintained at a location approved by the Engineer and amended as necessary from the time the contractor files its NOI until the NOT is submitted. The SWPPP shall be available for inspection by entities identified in the CGP, and for use by the Engineer.

No condition of the CGP or the SWPPP shall release the contractor from any responsibilities or requirements under other environmental statutes or regulations.

In accordance with the CGP, the Engineer and the contractor shall confirm the frequency of inspections appropriate for the project. The contractor shall identify the frequency in the SWPPP. The contractor shall inform the Engineer when each inspection will be performed a minimum of 72 hours in advance so the Engineer can jointly perform the inspection if desired.

The contractor shall monitor rainfall on the site with a commercially manufactured rain gauge accurate to within 0.10 inches of rain. Rainfall records shall be maintained in the SWPPP.

(3) Erosion Control Coordinator (ECC):

The contractor shall designate an erosion control coordinator (ECC) to be responsible for approval and implementation of the SWPPP, as well as all other applicable requirements of the CGP. The contractor's ECC shall have the qualifications described in Subsection 104.09(B)(4).

The contractor shall not assume that the person proposed as ECC will be accepted by the Department merely because the experience and education requirements listed herein have been met.

After approval, the contractor shall designate the ECC as a duly authorized representative of the contractor in accordance with, and as defined in, the CGP. Documentation of the delegation of a duly authorized representative shall be included as part of the SWPPP.

The ECC shall be capable of identifying existing and predictable effects of the contractor's operations, and shall have complete authority to direct the contractor's personnel and equipment to implement the requirements described herein, including prompt placement of corrective measures to minimize or eliminate pollution and damage to downstream watercourses. Corrective measures shall be completed in the timeframe required by the CGP and included in the SWPPP as required by the CGP.

The ECC shall at all times be aware of the contractor's work activities, schedule, and effect of the work on the environment. Should the ECC not be present at the project site on a full-time basis, the contractor shall establish procedures to ensure that its ECC is promptly notified of any damage or displacement of the required erosion control measures, whether from construction, vandalism, or other causes.

The contractor bears all risks and liabilities for the failure of its ECC to properly implement the requirements of the CGP.

Failure of the contractor to properly maintain the Control Measures required in the approved SWPPP may be cause for the Engineer to reject the ECC and issue a stop work order, as specified in Subsection 104.09(B)(7).

(4) ECC Certification Requirements:

The ECC shall have successfully completed the mandatory two-day (16 hour) "Erosion Control Coordinator" training class (hereinafter referred to as the training class) provided by the Associated General Contractors (Arizona Chapter), phone (602) 252-3926. No other training can be substituted.

The training class certification is valid for three years. Within 60 days of the end of the three year period, in order to maintain the training class certification, the ECC shall successfully complete either a six-hour "Erosion Control Coordinator Refresher" class (hereinafter referred to as the refresher class), also provided by the Associated General Contractors (Arizona Chapter), or the two-day training class specified above. The refresher class will be required every three years thereafter, prior to the expiration date listed on the previous certificate. Should more than three years (and 60 day grace period) elapse from completion of either the training class or refresher class, the contractor's ECC will be required to successfully complete the two-day training class in order to again be eligible for consideration.

In addition, the contractor's ECC shall have documented experience equal to a minimum of one year from either of the following two categories:

(a) Experience in the implementation of SWPPPs. The ECC's experience shall demonstrate full-time responsibility for directly supervising construction personnel in the installation, inspection, and maintenance of pollution prevention measures.

(b) Experience in stabilization of disturbed areas in environments similar to those on the project.

The contractor's documentation 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 contractor's documentation shall also indicate that the proposed ECC has completed the training class or refresher class. To be considered for approval, the contractor's documentation shall include a copy of the proposed ECC's certification.

(5) Acceptance of ECC and SWPPP:

The contractor shall submit documentation indicating the qualifications of the ECC to the Engineer for approval no later than the pre-construction conference. The Engineer will review the proposed candidate's information within seven calendar days. The contractor may begin development of the SWPPP prior to approval of the ECC. However no clearing, grubbing, earthwork, or other work elements that may be subject to the requirements of the CGP shall be started until the ECC has been approved, the SWPPP finalized and implemented, the NOI completed and filed, and the CGP authorization received by the contractor and the Engineer. If sampling is required, the SWPPP and SAP shall also be reviewed and approved by ADEQ prior to ground disturbance by the contractor.

(6) Notice of Intent:

After the project SWPPP has been approved by the Engineer, the Engineer and the contractor will each complete separate Notice of Intent (NOI) forms for the project. The contractor shall submit the NOI to ADEQ as required by the CGP.

Unless notified otherwise by ADEQ, the contractor will be authorized to begin implementation of the approved SWPPP seven calendar days after acknowledgement of receipt of both NOIs by ADEQ or whenever an authorization certificate is issued by ADEQ, whichever occurs first.

(7) Non-Compliance:

The Engineer may reject the contractor's ECC if, in the opinion of the Engineer, the conditions of the CGP or the SWPPP are not being fulfilled. Rejection of the contractor's ECC shall be for failure to complete any of the following:

(a) Should the Engineer determine that the SWPPP is not being properly implemented; the contractor will be notified in writing of such deficiencies. The contractor's ECC shall fully implement, to the satisfaction of the Engineer, the requirements of the approved SWPPP within three working days.

(b) Should any corrective measures required in the CGP not be completed within the time periods specified therein, the Engineer will notify the contractor in writing. The contractor's ECC shall complete all required corrective measures within two calendar days of such notification, except that direct inflows of sediment into a watercourse shall be corrected within 24 hours.

(c) Should the Engineer determine that routine maintenance of the project's Control Measures is not being adequately performed; the

contractor will be notified in writing. Within three working days, the contractor's ECC shall demonstrate, to the satisfaction of the Engineer that such steps have been taken to correct the problem.

In the event of the ECC's failure to comply with the CGP or any of the above requirements, the Engineer will direct the contractor to stop all affected work and propose a new ECC as soon as possible. However, all Control Measures specified in the SWPPP shall be maintained at all times. No additional work on construction items affected by the SWPPP will be allowed until a new ECC has been approved by the Engineer. The contractor will not be allowed compensation or an extension of contract time for any delays to the work because of the failure of the contractor's ECC to properly fulfill the requirements of the SWPPP.

(8) Notice of Termination:

Upon written approval of the Engineer, the contractor shall complete and submit a Notice of Termination (NOT) to the Engineer for approval. After approval by the Engineer, the contractor shall submit the NOT to ADEQ.

The NOT shall be submitted as described in the CGP.

A copy of the SWPPP and the NOT shall be provided to the Engineer within seven days of the contractor receiving acknowledgement from ADEQ. The copies may be either electronic or hard copies.

(C) Aquifer Protection Requirements (Concrete Washout Facilities):

If the contractor's work requires the use of temporary concrete washout facilities, the contractor shall comply with the requirements of ADEQ's APP Type 1 Permit (APP 1.12). APP 1.12 covers wastewater to an impoundment from washing concrete from trucks, pumps, and ancillary equipment. The contractor shall address concrete washout activities in the project SWPPP.

(D) Measurement and Payment:

Measurement and payment for work specified in the SWPPP will be made in accordance with the requirements of Section 810. Control Measures specified in the contract which are to be accomplished under any of the other various contract items will be paid for as specified under those items.

If a force account pay item for Control Measures is included in the bidding schedule, the contractor may be reimbursed for such additional Control Measures proposed by the contractor but not included with the plans or specifications. Such additional Control Measures must be approved in writing by the Engineer before use. Items for Control Measures approved by the Engineer will be paid in accordance with Subsection 109.04(D). No measurement or payment will be made for such additional items not approved by the Engineer.

No measurement or payment will be made to the contractor for time spent in preparing, reviewing, and revising the SWPPP, the SAP, or providing other required documentation, the cost being considered as included in the price of contract items. No measurement or payment will be made for inspections, training of personnel, the contractor's erosion control coordinator, the contractor's pollution prevention practices and requirements, or maintenance of the Control Measures during a suspension of work, the costs being considered as included in contract items.

No measurement or payment will be made, except as specified below for external laboratory testing, for labor, equipment, and materials required in the SAP, the cost being considered to be included in contract items.

If an item is included on the bidding schedule for Construction Monitoring (Laboratory Testing), the contractor will be reimbursed for those samples tested, as required in the approved SAP, by an accredited laboratory approved by the Arizona Department of Health Services. The contractor will be reimbursed for the invoice amount of each required test, plus an additional markup of ten percent of the invoice amount. No measurement or payment will be made for in-field testing and related equipment, the cost being considered to be included in contract items.

No measurement or payment will be made for temporary concrete washout facilities, the cost being considered to be included in contract items.

Unless otherwise specified, no measurement or payment will be made for maintenance of temporary and permanent Control Measures, the cost being considered as included in contract items.

104.10 Contractor's Responsibility for Work: of the Standard Specifications is revised to read:

The contractor shall implement the requirements of the CGP for pollution prevention due to stormwater runoff during construction, as specified above in Subsection 104.09, Prevention of Stormwater Pollution.

Until final written acceptance of the project by the Engineer, the contractor shall have the charge and care thereof and shall take every precaution against injury or damage to any part thereof by the action of the elements, or from any other cause, whether arising from the execution or from the nonexecution of the work. The contractor shall rebuild, repair, restore and make good all injuries or damages to any portion of the work occasioned by any of the above causes before final acceptance. No reimbursement shall be made for work necessary due to the contractor's failure to comply with the requirements of the SWPPP.

Except as specifically provided under Subsection 104.04, in case of suspension of work from any cause whatever, the contractor shall be responsible for the project and shall take such precautions as may be necessary to prevent damage to the project and provide for normal drainage. The contractor shall maintain Control Measures in working order during any stoppage of work. Based on the nature of the work stoppage, the contractor and the Engineer

shall determine the maintenance requirements. The contractor shall comply with the CGP including inspection of the project.

(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:

(D) Payment for Repair Work:

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

(E) 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:

(E) The Biology Program: of the Standard Specifications is modified to add:

BIO-2: Migratory Bird Treaty Act (MBTA)

BIO-2B: MBTA – General Requirements:

If construction occurs during the breeding season (March 1 to August 31), the contractor shall employ a qualified biologist to conduct a migratory bird nest survey of all affected vegetation within the work area no sooner than 10 days prior to clearing and grubbing. Vegetation removal may proceed if the survey determines that no active bird nests are present. If active nests are found the contractor shall notify the Engineer and avoid and protect the nests. The Engineer will further direct how to avoid and protect nests. If active nests are found in the project work area, the contractor shall not begin work until it is so directed by the Engineer. In the event of a suspension of work the contractor shall refer to the provisions of Subsection 104.02 of the specifications. During the non-breeding season (September 1 to February 28), vegetation removal is not subject to this restriction.

If active bird nests are found during the nest survey and avoidance is not possible, as determined by the Engineer, the contractor shall employ a wildlife rehabilitator who, in coordination with the Department Environmental Planning Biologist and relevant programmatic agreements, will apply for a project specific US Fish and Wildlife Service Migratory Bird Treaty Act Special Purpose – Relocation Permit. The wildlife rehabilitator shall be permitted by the US Fish and Wildlife Service and licensed by the Arizona Game and Fish Department. Relocation of any eggs or nestlings from active nests shall be performed by the wildlife rehabilitator.

No later than 10 working days after the completion of each relocation effort, the contractor shall submit a written report containing the following information to the Engineer:

(1) Project name, location and ADOT project number;

(2) Point of contact;

(3) Date(s) of relocations;

(4) Location of the areas birds where moved from and where they were moved to;

(5) An explanation of why the birds were relocated;

(6) The number of birds relocated; and

(7) Name of rehabilitator, AZGFD rehabilitator license and USFWS permit information.

BIO-4: Bats

Bats are expected to be present in the project area. The contractor shall not remove, harm, or harass bats present in the project area. Bats found within the project area shall be allowed to depart on their own accord before bat exclusionary methods are installed.

The contractor shall employ a qualified biologist to complete a preconstruction bat survey and provide results to the Engineer. Based on the survey results, the Engineer will direct installation of exclusionary measures to the expansion joints and other crevices that could potentially be used by bats.

If no bats are detected, the contractor may install exclusionary measures to the expansion joints and other crevices to preclude use by bats.

If bats are detected, the qualified biologist shall determine whether bats are using the bridge as a day roost, a night roost or a maternity roost (pregnant or lactating bats with attached young). Based on biologist determination the following may apply:

(1) During the breeding period between April 15 and August 31, if bats are roosting on the bridge during the day, and a maternity roost is present, no exclusionary measures shall be installed. Any work on or beneath the bridge will require the approval of the Engineer.

(2) If bats are detected roosting on the bridge during the day, but are not using the bridge as a maternity roost, one-way exclusionary measures may be installed after bats depart for the night.

(3) If bats are roosting at night on the bridge, but are not using the bridge as a day-roost or maternity roost, one-way exclusionary measures can be installed during the day when bats are not present.

(4) Materials used for bat exclusion may include batting, netting, or other material as approved by the Engineer in consultation with the Department biologist.

(5) The contractor shall inspect all installed exclusionary measures daily. Any exclusionary measures found in disrepair, shall be inspected by a qualified biologist to determine if bats have accessed the area. If no bats are found, the exclusionary measures shall be repaired immediately. If bats are found in previously excluded areas, the contractor shall notify the Engineer immediately.

BIO-5: Sonoran Desert Tortoise:

Prior to construction activity the contractor's field personnel including the Project Manager, Assistant Project Manager, General Superintendent, and Project Superintendent shall review the Arizona Department of Transportation Environmental Planning "Sonoran Desert Tortoise Awareness Program Handout" flier, become familiar with the identification and avoidance of the Sonoran Desert tortoise, and follow the notification request, as applicable.

If any Sonoran Desert tortoises are encountered during construction, the contractor shall adhere to the Arizona Game and Fish Department "Guidelines for Handling Sonoran Desert Tortoises Encountered on Development Projects". If any tortoise is encountered during construction the contractor shall notify the Engineer to report the encounter.

The contractor shall report encounters with any Sonoran Desert tortoise (live, injured, or dead) during construction to the Engineer using the Arizona Department of Transportation Sonoran Desert Tortoise Observation Form. The final form shall be sent to Arizona Department of

Transportation Environmental Planning Biology Team to the email address listed in Appendix B within 24 hours of the encounter. Photographs should be taken of tortoises encountered and included in the report if possible.

(F) Specific Vegetation Protection Program: is hereby added to the Standard Specifications:

The contractor shall control noxious and invasive plant species throughout the duration of the project in accordance with the requirements of these special provisions.

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.

(105TPDDC, 08/21/25)

SECTION 105 CONTROL OF WORK:

105.18 Opening Sections of Project to Traffic: of the Standard Specifications is modified to add:

Damage to the project resulting from a third-party shall be reported to the Engineer. Damages to permanent project features, determined by the Engineer as eligible for payment in accordance with the requirements of Subsection 104.04 of the specifications, will be paid for in accordance with Subsection 109.04 of the specifications.

(106DMAT, 12/18/25)

SECTION 106 CONTROL OF MATERIALS:

106.15 Blank: of the Standard Specifications is revised to read:

106.15 Domestic Materials and Products:

Steel and iron materials and products used on this project 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 0.1 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, 12/18/25)

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

106.17 Construction Materials:

A construction material shall comply with the requirements of Build America, Buy America (BABA) Act specified in Title IX, Subtitle A, Part 1, Sections 70901 and 70911-70917 (Pub. L. No. 117-58 §§ 70901; §§ 70911-70917) 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.

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.

(106MAPR, 12/18/25)

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

106.18 Manufactured Products:

Manufactured products used on all projects shall comply with the current “Buy America” requirements of 23 CFR 635.410.

A “manufactured product” is defined as an article, material, or supply that has been processed into a specific form and shape, or combined with other articles, materials, or supplies to create a product with different properties than the individual article, material, or supply. Items manufactured through a combination of two or more materials, or at least one listed construction material and a material not listed, shall be classified as manufactured products.

An item classified as iron or steel product in accordance with the requirements specified in Subsection 106.15 of the specifications or excluded materials such as cement and cementitious materials; bituminous materials; aggregates such as stone, sand, or gravel; or aggregate binding agents or additives is not considered a manufactured product. However, manufactured product may include components that are iron or steel products or excluded materials.

Mixtures of excluded materials delivered to a work site without final form for incorporation into a project are not considered manufactured products.

Precast concrete products, components of precast concrete products that consist wholly or predominantly of iron or steel or a combination of both, will be considered iron and steel product and shall meet the requirements specified in Subsection 106.15 of the specifications.

The intelligent transportation systems and other electronic hardware systems that are installed in the highway right of way or other real property, the cabinets or other enclosures of such systems that consist wholly or predominantly of iron or steel or a combination of both will be considered iron and steel product and shall meet the requirements specified in Subsection 106.15 of the specifications.

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 manufactured products incorporated in the project meet the requirements specified herein. Certificates of Compliance shall also certify that all manufactured products used in the project are manufactured in the United States.

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:

NORTHWEST DISTRICT

Prescott Area:
(928) 777-5874
(928) 777-5861
1109 E. Commerce Drive
Prescott, AZ 86305

Kingman Area:
(928) 681-6010
3660 E. Andy Devine Ave.
Kingman, AZ 86401

Email address:
northwestpermit@azdot.gov

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

ORGANIZATION	CONTACT	CONTACT INFORMATION		MAILING ADDRESS
COX Communications	Jacob Horsman	(623) 328-2202 Jacob.horsman@cox.com	Primary	1550 W. Deer Valley Rd Phoenix, AZ 85027
	Melinda Heliman	(480) 417-9185 Melinda.heliman@cox.com	Secondary	1550 W. Deer Valley Rd Phoenix, AZ 85027
APS	Ben Gowers	(602) 809-3611 Ben.Gowers@aps.com	Primary	P.O. Box 53933, MS 3177 Phoenix, AZ 85072
Centurylink/ Lumen	Robert Davis	(720)854-4341 rdavis@congruex.com	Primary	1553 W. Todd Drive, Ste 201 Tempe, AZ 85283
	Mark Grabowski	(623) 312-6665 mgrabowski@congruex.com	Secondary	1553 W. Todd Drive, Ste 201 Tempe, AZ 85283
	Devan Hakkal	(602) 716-3303 Devan.hakkal@lumen.com	Secondary	5025 N. Black Canyon Hwy Phoenix, AZ 85015

Cox Communications owns underground facilities along the northeast side of US 93 south of Sta 2105+00 and along the north side of Wickenburg Ranch Way east of US 83, and these facilities are not anticipated to be in conflict. The contractor shall protect in place all Cox Communications facilities during construction.

The contractor shall maintain a minimum 12-inch horizontal and vertical clearance to Communications facilities.

APS has overhead and underground power facilities along the east side of US 93 between US 93 Med Cst CL Sta 2109+75.28 to SR 89 Cst CL Sta 123+40; with crossings of US 93 at approximately Sta 2125+80, Sta 211+04, Sta 226+15, and crossing SR 89 at approximately Sta 124+50; and along the west side of US 93 between Sta 2125+80 to SB US 93 Cst CL Sta 226+15. The contractor shall protect in place all APS facilities during construction.

Lumen has overhead and underground communication facilities along the east side of US 93 between US 93 Med Cst CL Sta 2109+75.28 to SR 89 Cst CL Sta 123+40; crossing US 93 at approximately Sta 2125+80, Sta 2146+05, and Sta 2148+00, crossing SR 89 at approximately Sta 110+00; and along the west side of US 93 between Sta 2109+75.28 to SB US 93 Cst CL Sta 226+15. The contractor shall protect in place all Lumen facilities during construction.

There is railroad within the project limits. BNSF Railway crosses the proposed improvements at US 93 Sta. 199+30.

The contractor is cautioned to use care when operating near these facilities.

It shall be the contractor's responsibility to determine the exact location of the utilities prior to any construction operations and to notify the above-mentioned utility companies at least two working days prior to commencing any work on the project.

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:

(1) Stopped the discharge;
(2) Repaired the damaged pipe;
(3) Restored normal service; and
(4) 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:

108.03 **Preconstruction Conference:** the second paragraph of the Standard Specifications is revised to read:

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.

108.04 **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 construction phase of the contract will be 400 working days.

The time allowed for the completion of the work included in the landscape establishment phase of the contract will be 365 calendar days.

The total of the time allowed for the construction phase and the landscape establishment phase will be known as the "Contract Time."

(108RSLD, 06/19/2025)

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	$ 300	$ 1,000
$ 500,000	$ 1,000,000	$ 850	$ 1,700
$ 1,000,000	$ 2,000,000	$ 1,250	$ 2,650
$ 2,000,000	$ 5,000,000	$ 2,100	$ 3,800
$ 5,000,000	$ 10,000,000	$ 3,300	$ 6,850
$ 10,000,000	$ 30,000,000	$ 7,300	$ 10,550
$ 30,000,000	$ 60,000,000	$ 9,350	$ 17,750
$ 60,000,000	$ 90,000,000	$ 19,900	$ 27,850
$ 90,000,000	-------	$ 27,450	$ 38,400

(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;

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

c) Do not use all capital letters;

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

e) 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.

(9) If applicable, the schedule shall include but not be limited to all activities below:

(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;

(10) 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.

(11) 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.

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

(13) 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.

(14) 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.

(15) 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.

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

(17) 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.

(18) 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.

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

(109WFADF, 05/15/25)

SECTION 109 MEASUREMENT AND PAYMENT:

109.04(D)(6) Statements: the title and text of the Standard Specifications is revised to read:

109.04(D)(6) Forms:

The contractor shall prepare the Weekly Force Account Detail form for each week of force account activity. The Weekly Force Account Detail form is a standardized, fillable form made available by the Department on the ADOT Construction Group’s website.

The form shall detail the labor, equipment, and material charges utilized to accomplish the force account work along with all supporting documentation. The contractor shall furnish copies of original receipts (paid invoice cost) for materials, rental equipment cost, including freight and transportation charges, copies of rental rate blue book equipment sheets and certified payrolls.

If materials used on the force account work are not specifically purchased for such work but are taken from the contractor's stock, then instead of invoices, the forms shall contain or be accompanied by an affidavit of the contractor certifying that such materials were taken from stock, that the quantity claimed was actually used, and that the price and transportation claimed represent the actual cost to the contractor.

Force account work shall be tracked daily; however, the contractor shall compile no more than one full week's worth of daily records into a Weekly Force Account Detail form. Each reporting period runs from Saturday through Friday. The contractor shall submit the form within 30 calendar days of the respective week's force account performance. The completed form shall be submitted to the Engineer for review and approval. The Engineer will review the form and supporting documentation against the ADOT Inspector's Daily Force Account Reports, and will verify that the form is timely, complete, and accurate. Payment will not be made until the contractor has furnished applicable forms, detailing the costs of the force account work, including but not limited to the following information:

(a) Labor: name, classification, date, daily hours, hourly rate and fringe rate, and certified payrolls for each foreman and laborer.

(b) Equipment: dates, equipment number, description, operator name, hours used, approved stand-by hours, monthly rental rate, hourly operating cost and rental rate blue book sheets for each unit of equipment.

(c) Rental Equipment (Third Party): invoice, dates used, vendor name, description of equipment, operator name, hours used, invoice rate, hourly operating cost and rental rate blue book sheets for each rental equipment.

(d) Materials: invoice, date used, supplier name, description, quantity, unit of measure and unit cost.

(e) Transportation: freight and express charges on materials, FOB jobsite.

(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:

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

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

(ii) 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

(iii) 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.

(b) 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:

(i) 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;

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

(iii) 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 structures to be paid on the basis of a lump sum amount are:

(A) 12' x 8' BOX CULVERT (CULVERT 196)
(B) (2) 8' x 6' BOX CULVERT (CULVERT 277)
(C) (2) 6' x 4' BOX CULVERT (CULVERT 339)
(D) (2) 6’x7’ BOX CULVERT (CULVERT BE1)
(E) (3) 10' x 7' BOX CULVERT (CULVERT 216)(STRUCTURE NO. 05004)
(F) (4) 10' x 6' BOX CULVERT (CULVERT 326)(STRUCTURE NO. 05003)
(G) SB BNSF OP BRIDGE (STRUCTURE NO. 20313)

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:

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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.

(109PAVSM, 06/15/09)

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

109.13 Measurement and Payment for Asphaltic Concrete Pavement Smoothness:

(A) General:

The final asphaltic concrete pavement surface shall be evaluated for smoothness by testing.

When a surface treatment other than ACFC or AR-ACFC, such as a chip seal coat, is to be placed on a new asphaltic concrete pavement surface as part of the project, the underlying new asphaltic concrete pavement surface will be evaluated for smoothness prior to the placement of the surface treatment.

When an ACFC or AR-ACFC surface treatment is placed on a new Portland cement concrete pavement (PCCP) as part of the project, the ACFC or AR-ACFC surface treatment will be evaluated for smoothness as specified herein, in addition to the PCCP smoothness requirements specified in Section 401 of the specifications.

At the completion of paving, the contractor shall notify the Engineer in writing that the pavement is ready for testing. The Engineer will then evaluate the pavement to be tested. If the Engineer determines that additional pavement preparation is required, the contractor shall perform such preparation as directed by the Engineer. The contractor shall ensure that the pavement to be tested can be driven safely at the design speed. Testing will not be performed

on any portions that cannot be made safe for testing at the design speed, or on any lanes of less than 0.30 miles in length. If requested by the Engineer, the contractor shall broom the pavement immediately prior to testing. No measurement or direct payment will be made for preparing the pavement, the cost being considered as included in the price of contract items.

The Actual Smoothness Value (AS) for each 0.1 lane-mile increment will be determined, by the Department, in accordance with the provisions of Arizona Test Method 829.

Testing will not be done when the ambient air temperature is less than 40 degrees F, or during rain or other weather conditions determined to be inclement by the Engineer.

Traffic control costs during the initial smoothness testing period will be reimbursed under the provisions of Section 701 of the Specifications. Any additional traffic control costs incurred, outside the normal scope of work, due to pavement repairs and subsequent pavement smoothness measurements shall be borne solely by the contractor.

The testing will be performed within ten days after the Engineer has accepted the pavement for testing. The Engineer will notify the contractor of the test results no later than 10 days after the testing has been performed.

Testing will be performed on mainline traffic lanes and will include the full length of the pavement placed under the contract. Unless otherwise specified in the contract documents, testing of distress lanes, shoulders, ramps, tapers, crossroads, and frontage roads will not be performed.

The existing pavement has the following smoothness values (inches per mile).

Route Id	Direction	From MP	From MP Offset	To MP	To MP Offset	COLLECTION DATE	Avg IRI
U 093	S	189	0.90	189	1.00	5/6/2024	97.98
U 093	S	189	1.00	190	0.10	5/6/2024	79.68
U 093	S	190	0.10	190	0.20	5/6/2024	106.42
U 093	S	190	0.20	190	0.30	5/6/2024	152.88
U 093	S	190	0.30	190	0.40	5/6/2024	112.21
U 093	S	190	0.40	190	0.50	5/6/2024	107.90
U 093	S	190	0.50	190	0.60	5/6/2024	169.90
U 093	S	190	0.60	190	0.70	5/6/2024	200.95
U 093	S	190	0.70	190	0.80	5/6/2024	226.11
U 093	S	190	0.80	190	0.90	5/6/2024	120.79
U 093	S	190	0.90	190	1.00	5/6/2024	105.19
U 093	S	190	1.00	191	0.10	5/6/2024	191.52
U 093	S	191	0.10	191	0.20	5/6/2024	128.25
U 093	S	191	0.20	191	0.30	5/6/2024	140.57
U 093	S	191	0.30	191	0.40	5/6/2024	189.62
U 093	S	191	0.40	191	0.50	5/6/2024	129.99

Route Id	Direction	From MP	From MP Offset	To MP	To MP Offset	COLLECTION DATE	Avg IRI
U 093	S	191	0.50	191	0.60	5/6/2024	115.97
U 093	S	191	0.60	191	0.70	5/6/2024	176.17
U 093	S	191	0.70	191	0.80	5/6/2024	175.12
U 093	S	191	0.80	191	0.90	5/6/2024	182.64
U 093	S	191	0.90	192	0.00	5/6/2024	197.06
U 093	S	192	0.00	192	0.10	5/6/2024	218.94
U 093	S	192	0.10	192	0.20	5/6/2024	134.71
U 093	S	192	0.20	192	0.30	5/6/2024	128.23
U 093	S	192	0.30	192	0.40	5/6/2024	154.73
U 093	S	192	0.40	192	0.50	5/6/2024	166.60
U 093	S	192	0.50	192	0.60	5/6/2024	165.76
U 093	S	192	0.60	192	0.70	5/6/2024	150.43
U 093	S	192	0.70	192	0.80	5/6/2024	135.54
U 093	S	192	0.80	192	0.90	5/6/2024	174.64
U 093	S	192	0.90	192	1.00	5/6/2024	195.91
U 093	S	192	1.00	193	0.10	5/6/2024	186.74
U 093	S	193	0.10	193	0.20	5/6/2024	162.46
U 093	S	193	0.20	193	0.30	5/6/2024	159.04
U 093	S	193	0.30	193	0.40	5/6/2024	153.86
U 093	S	193	0.40	193	0.50	5/6/2024	194.52
U 093	S	193	0.50	193	0.60	5/6/2024	218.32
U 093	S	193	0.60	193	0.70	5/6/2024	146.64
U 093	S	193	0.70	193	0.80	5/6/2024	97.06
U 093	S	193	0.80	193	0.90	5/6/2024	149.29
U 093	S	193	0.90	194	0.00	5/6/2024	78.35
U 093	S	194	0.00	194	0.10	5/6/2024	87.60
						AVG	151.58
U 093	N	189	0.99	190	0.08	5/6/2024	71.77
U 093	N	190	0.08	190	0.18	5/6/2024	78.15
U 093	N	190	0.18	190	0.28	5/6/2024	115.82
U 093	N	190	0.28	190	0.38	5/6/2024	170.61
U 093	N	190	0.38	190	0.48	5/6/2024	126.69
U 093	N	190	0.48	190	0.58	5/6/2024	181.93
U 093	N	190	0.58	190	0.68	5/6/2024	178.32
U 093	N	190	0.68	190	0.78	5/6/2024	196.73
U 093	N	190	0.78	190	0.88	5/6/2024	175.55
U 093	N	190	0.88	190	0.98	5/6/2024	101.29
U 093	N	190	0.98	191	0.08	5/6/2024	167.66
U 093	N	191	0.08	191	0.18	5/6/2024	149.69
U 093	N	191	0.18	191	0.28	5/6/2024	121.82

Route Id	Direction	From MP	From MP Offset	To MP	To MP Offset	COLLECTION DATE	Avg IRI
U 093	N	191	0.28	191	0.38	5/6/2024	134.07
U 093	N	191	0.38	191	0.48	5/6/2024	146.72
U 093	N	191	0.48	191	0.58	5/6/2024	95.19
U 093	N	191	0.58	191	0.68	5/6/2024	107.79
U 093	N	191	0.68	191	0.78	5/6/2024	189.79
U 093	N	191	0.78	191	0.88	5/6/2024	107.76
U 093	N	191	0.88	191	0.98	5/6/2024	187.95
U 093	N	191	0.98	192	0.08	5/6/2024	192.14
U 093	N	192	0.08	192	0.18	5/6/2024	124.97
U 093	N	192	0.18	192	0.28	5/6/2024	150.92
U 093	N	192	0.28	192	0.38	5/6/2024	157.07
U 093	N	192	0.38	192	0.48	5/6/2024	160.21
U 093	N	192	0.48	192	0.58	5/6/2024	202.65
U 093	N	192	0.58	192	0.68	5/6/2024	233.65
U 093	N	192	0.68	192	0.78	5/6/2024	221.86
U 093	N	192	0.78	192	0.88	5/6/2024	210.70
U 093	N	192	0.88	192	0.98	5/6/2024	161.94
U 093	N	192	0.98	193	0.07	5/6/2024	177.89
U 093	N	193	0.07	193	0.17	5/6/2024	256.45
U 093	N	193	0.17	193	0.27	5/6/2024	136.33
U 093	N	193	0.27	193	0.37	5/6/2024	101.83
U 093	N	193	0.37	193	0.47	5/6/2024	171.97
U 093	N	193	0.47	193	0.57	5/6/2024	227.80
U 093	N	193	0.57	193	0.67	5/6/2024	227.70
U 093	N	193	0.67	193	0.77	5/6/2024	195.57
U 093	N	193	0.77	193	0.87	5/6/2024	115.16
U 093	N	193	0.87	193	0.97	5/6/2024	173.09
U 093	N	193	0.97	194	0.06	5/6/2024	128.95
U 093	N	194	0.06	194	0.16	5/6/2024	132.64
						AVG	158.73

US 93 Mainline Widening – New Construction

The Correction Value (CV) for this contract is 91 inches per mile.

US 93 Existing Mainline – Mill and SMA Fill

The Correction Value (CV) for this contract is 92 inches per mile.

Any 0.1 lane-mile increment having an Actual Smoothness Value (AS) equal to or greater than the Correction Value (CV) shall be repaired by the contractor at no additional expense to the Department.

If repairs are required, the contractor shall prepare a written proposal detailing corrective actions and submit the proposal to the Engineer within 10 working days after the contractor's receipt of test results. Within three working days, the Engineer will review the submitted proposal and either accept it, or reject it and ask for a new proposal. If rejected, the contractor shall, within 10 working days, prepare and submit a new proposal for corrective action, based on discussions with the Engineer. The Engineer will review, and either accept or reject, the new proposal within three working days of receipt.

Upon completion of any necessary repairs, the 0.1 lane-mile increments containing repaired areas will be re-tested in accordance with the provisions of Arizona Test Method 829. Resultant values from re-testing will be used in determining the adjustment in payment to the contractor.

(B) Payment:

An adjustment in payment to the contractor will be made as follows.

The adjustment in payment, either incentive or disincentive, for each 0.1 lane-mile increment shall be determined using the following formulas:

US 93 Mainline Widening – New Construction:

When AS < 39:

Incentive = [(39- AS) / (39 + 2)] x 3,750

When AS >43:

Disincentive = [(43 - AS) / (39 + 2)] x 1,200

US 93 Existing Mainline – Mill and SMA Fill:

When AS < 40:

Incentive = [(40- AS) / (40 + 2)] x 2,700

When AS >52:

Disincentive = [(52 - AS) / (40 + 2)] x 1,200

The existing smoothness values, and the values (other than AS) which are utilized in the incentive and disincentive formulas, are determined prior to the contract bid opening date and are not subject to revision or dispute after the awarding of the contract.

US 93 Mainline Widening – New Construction:

The total adjustment in payment to the contractor shall be the summation of the individual adjustments for the respective 0.1 lane-mile increments, except the maximum total incentive allowed shall be 11,000 per tested lane-mile.

US 93 Existing Mainline – Mill and SMA Fill:

The total adjustment in payment to the contractor shall be the summation of the individual adjustments for the respective 0.1 lane-mile increments, except the maximum total incentive allowed shall be 9,000 per tested lane-mile.

For projects where pavement is removed and replaced to grade, followed by an ACFC or an AR-ACFC overlay, no smoothness measurements will be made for the following areas:

Pavement placed within 35 feet of the termini of the project.

Pavement placed within 35 feet of the approaches and departures for bridge structures not being overlain as part of the project.

For projects where pavement is removed and replaced to grade, followed by an overlay, followed by an ACFC or an AR-ACFC overlay, no smoothness measurements will be made for the following areas:

Pavement placed within 100 feet of the termini of the project.

Pavement placed within 100 feet of the approaches and departures for bridge structures not being overlain as part of the project.

Bridges and their approaches and departures that are overlain as part of the project will be subject to the smoothness requirements.

(109DRSCH, 02/10/20)

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

109.15 Draw Schedule:

At the preconstruction conference, the contractor shall submit a planned monthly Draw Schedule for the project. Payments reflected in the Draw Schedule shall be based on the value of the monthly work to be completed. No construction work shall begin and no payments will be made until the Draw Schedule is submitted and approved by the Engineer. Failure of the contractor to comply with this requirement constitutes a waiver of entitlement to additional compensation or a time extension.

Under no circumstances will the Department make payments to the contractor that exceed the actual value of the work completed.

(109BITUMADJ, 06/19/25)

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 mixes, 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 (TR+) to which the adjustment is applicable will be 92 percent of the total quantity of the item used. The adjustment is not applicable to the 8 percent of the material which constitutes the crumb-rubber additive.

The tons of bituminous material in Asphaltic Concrete mixes, subject to price adjustment shall be calculated as follows, based on the approved mix design target values and the quantity of Asphaltic Concrete placed—regardless of the actual percentage of binder incorporated:

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

$$PA = (CP - IC) \times ACP \times F$$

Where: PA = Price Adjustment monetary amount (plus or minus in dollars)
CP = Current index price (dollars per ton)
IC = Initial Cost at time of bid (dollars per ton)
ACP = Asphaltic Concrete Placed (tons)
F = Eligible Asphalt Cement %

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

(1) For mixes without reclaimed asphalt pavement (RAP):

F = Approved Mix Design Target Asphalt Cement %

(2) For mixes with RAP:
F = Approved Mix Design Target Asphalt Cement % – Mix Design RAP Asphalt Cement contribution %

(3) For mixes using PG TR+ Terminal Blend (8 % Crumb Rubber):
F = 0.92 x (Approved Mix Design Target Asphalt Cement %)

(4) For mixes using Asphalt-Rubber Blend (20 % Crumb Rubber):
F = 0.80 x (Approved Mix Design Target Asphalt Cement %)

(5) 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:

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.

Price adjustments will be calculated using the measurement methods described above. Only the tons of virgin asphalt binder determined by those methods will be subject to a bituminous material price adjustment.

No price adjustment will be made for the RAP binder in the mix.

No price adjustment will be made for the 8% of binder comprising crumb rubber when (TR+) is used.

No price adjustment will be made for the 20% of binder comprising crumb rubber in the asphalt-rubber material blend.

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.

SECTION 202 REMOVAL OF STRUCTURES AND OBSTRUCTIONS: the first paragraph of the Standard Specifications is hereby deleted.

SECTION 202 REMOVAL OF STRUCTURES AND STRUCTURES:

202-3.01 General: of the Standard Specifications is modified to add:

Items designated on the plans to be salvaged shall be delivered to the Wickenburg Maintenance Yard 600 E. Wickenburg Way, Suite B Wickenburg, AZ 85390. The contractor shall contact Brent Brinkley (928-684-2131, bbrinkley@azdot.gov) at least five working days prior to delivery to make arrangements.

202-3.03(B) Bituminous Pavement: of the Standard Specifications is modified to add:

All removed asphaltic concrete shall become the property of the contractor.

202-3.03(C) Bituminous Pavement Removal by Milling: of the Standard Specifications is modified to add:

Any milled asphaltic concrete material not used on the project shall be removed and delivered to the Wickenburg Maintenance Yard 600 E. Wickenburg Way, Suite B Wickenburg, AZ 85390 as specified by the Department. Contact Brent Brinkley (928-684-2131, bbrinkley@azdot.gov) five working days prior to delivery to arrange delivery of material.

202-3.05 Removal of Bridges: of the Standard Specifications is modified to add:

Prior to the removal of bridge joints, the contractor shall collect the waste (e.g., dirt, paint etc.,) from the bridge joint(s) areas and test it for lead contamination (>HUD/EPA levels) and asbestos contamination (NESHAP). If the waste material is found to have lead and/or asbestos, it shall be disposed in accordance with all applicable federal, state, and local regulations.

The cost associated with this work will be compensated under a line item force account.

ITEM 2020047 – REMOVAL OF SIGNS:

Description:

The work under this item shall be consists of removing sign assemblies from the locations shown on the project plans and in accordance with the requirements of the plans and these specifications.

A sign assembly includes all posts, foundations, and panels at each location. A sign assembly may include one or multiple sign posts, foundations and panels.

Construction Requirements:

The contractor shall remove the ground mounted signs and object marker assembles with their sign supports and foundations at the locations called out in the project plans after the Engineer determines the signs are no longer necessary for traffic due to the reconstruction work and approved traffic control.

All items to be removed and which will not be incorporated into the new work shall be removed in a manner which will not produce unnecessary damage or disturbance. The contractor shall not disturb any other signs, signposts, foundations, delineators, object markers, or milepost markers not specifically indicated on the project plans or in these Special Provisions to be removed unless otherwise directed by the Engineer. Any items, which are not identified to be removed but which, are damaged, as a result of the construction shall be replaced at no additional cost to the Department. The signs, sign posts, foundations and object markers that are removed shall become the property of the contractor.

The contractor shall remove existing sign and object marker foundations. Holes, cavities and depressions resulting from the removal of signs and object markers, except in areas to be excavated, shall be backfilled with suitable material which shall be compacted to a density of not less than 95 percent of the maximum density as determined in accordance with the requirements of the applicable test methods of the ADOT Materials Testing Manual, as directed and approved by the Engineer.

Method of Measurement:

Remove sign assembly will be measured per each sign assembly removed regardless of number of sign panels, posts or foundations.

Basis of Payment:

The accepted quantities of this signpost assembly, 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, including disposal and backfilling and compacting the holes resulting from the removal, as specified herein and as shown on the project plans.

ITEM 2020155 REMOVE (SIGN PANEL):

Description:

The work under this item shall consist of removing sign panels and hardware at the locations shown on the project plans and as specified herein.

Construction Requirements:

The contractor shall remove the sign panels from the existing sign posts in accordance with Subsection 202-3.06 of the specifications.

The sign panel and hardware shall become the property of the contractor and disposed of offsite in accordance with Subsection 107.11 of the specifications.

Method of Measurement:

Remove (Sign Panel) will be measured on a per each sign panel removed

Basis of Payment:

The accepted quantities of Remove (Sign Panel), measured as provided above, will be paid for at the contract unit price per each, which price shall be full compensation for the work, complete in place.

ITEM 2020185 – REMOVE (BRIDGE BARRIER TRANSITION)

Description:

The work under this item shall consist of furnishing all labor, equipment, and materials required for removing four existing barrier transitions on the existing Matthie RR OP bridge (structure number 780) as shown in the project plans. This work shall include complete removal of existing barrier transitions.

Construction Requirements:

Construction requirements shall conform to subsection 202-3 of the specifications.
See plans for removal details of the existing barrier transitions.

The existing reinforcement called out to be incorporated into the new concrete bridge barrier transition shall be protected in place as noted in the project plans.

Method of Measurement:

Remove (Bridge Barrier Transition) will be measured for each bridge barrier transition removed.

Basis of Payment:

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

ITEM 2020350 - REMOVE (WOODY VEGETATION):

Description:

The work under this item includes the removal and disposal of existing woody vegetation

within the project limits as designated herein and as approved by the Engineer.

Construction Requirements:

The contractor shall examine the project site before submitting a proposal in accordance with the requirements of Subsection 102.07 of the specifications.

During the pre-construction meeting, the contractor, in conjunction with the Engineer, shall verify and be in agreement with the proposed quantities and locations of woody vegetation to be removed as evaluated by an ADOT Construction Professional Landscape Architect (PLA). The limits of woody vegetation to be removed are shown on the project plans. The quantities and locations shall also be in compliance with environmental requirements.

The contractor, in coordination with the Engineer, shall identify the woody vegetation and have the ADOT construction PLA evaluate it prior to removal. The contractor shall field verify the quantity and location of all woody vegetation to be removed as part of this project.

Before starting removal activities, the contractor shall coordinate with the Engineer at the pre-construction conference to obtain a permit from the Arizona State Department of Agriculture (ASDOA) to transport/export removed woody vegetation away from the project site. If the contractor utilizes chipping methods for on-site disposal, as well as spreading of removed native vegetation, no permit will be required from ASDOA. In that case, all native woody vegetation shall be chipped on-site as specified herein.

The contractor shall also coordinate with the Engineer, project stakeholders, as well as an ADOT Construction PLA to ensure that vegetation removal will comply with the Arizona Native Plant Law, Clean Water Act (CWA) Section 404 regulations, Section 404 permit, and project-specific stipulations.

If the contractor damages existing features, including guardrails and barrier walls, inlets and outlets of drainage facilities, flow paths of the inlets and outlets as well as other drainage facilities, they shall be repaired or replaced as directed by the Engineer and at no additional cost to the Department.

Woody vegetation is defined as trees, shrubs, bushes, and other woody plant materials. Cacti, succulents, or other herbaceous vegetation shall not be considered as woody vegetation.

Woody vegetation-associated stumps, as well as rootballs, shall be removed only if they interfere with safety, construction, structure, and/or roadway features.

Native low shrubs/subshrubs including but not limited to *Calliandra* spp., *Encelia* spp., *Ephedra* spp., *Ericameria* spp. *Larrea* sp., *Parthenium* sp., *Psilostrophe* spp., *Senna* spp., *Simmondsia* sp., and *Zinnia* spp., that will not impede safety and/or construction, shall remain on site. Woody vegetation that is deemed a sight obstruction within the sight distance area shall be permanently removed as evaluated by ADOT construction PLA with approval from the Engineer.

The contractor shall coordinate with the Engineer to identify and tag the woody vegetation to be removed prior to construction. No work shall begin until the woody vegetation has been identified, tagged and the removal techniques have been approved by the Engineer.

The contractor shall remove all identified woody vegetation within the traffic clear zone/recovery area, or as otherwise directed by the Engineer. For the purpose of this specification, the clear zone/recovery area is defined as a distance of 30 feet measured horizontally from the edge of the traveled lane (edge line pavement marking).

Identified woody vegetation within the sight triangle at road/street intersections shall be subject to removal. In areas where guardrails are present, identified woody vegetation (trees, shrubs, and bushes) behind new guardrails and new end sections shall be cleared a distance of 20 feet, measured horizontally from the back of the guardrail post. Identified woody vegetation within 20 feet of new barrier walls measured horizontally from the back of barrier walls, shall also be subject to removal. Woody vegetation to be removed beyond both traffic clear zone/recovery areas and 20 feet outside of guardrails/barrier walls will be evaluated by an ADOT construction PLA with approval from the Engineer.

Woody vegetation in highly erosive slopes or washes (Waters of the U.S.) shall be removed as close to the natural ground as possible with minimal disturbance to the surrounding ground surface as directed by the Engineer. The contractor shall not disturb or remove vegetation outside the construction limits without the written approval of the Engineer.

The contractor shall remove the identified woody vegetation to finished grade level by flush cutting without uprooting them. In order to prevent stump regrowth, the applicable remaining stumps shall be promptly treated with a suitable herbicide so that the identified woody vegetation will not sprout new growth from the stumps. Herbicide stump treatment shall not be conducted on plant species such as common evergreen coniferous shrubs, bushes, and trees, which are typically unlikely to generate any stump regrowth. The stump treatment process will be evaluated by an ADOT construction PLA with approval from the Engineer.

The stump treatment herbicide shall meet the requirements of these special provisions (See Items 9240181 and 9240182 if applicable).

The woody vegetation to be removed shall include but not be limited to the approximate quantities as shown in the bid schedule in coordination with ADOT Construction PLA through the Engineer. The contractor shall consult and verify with the ADOT Northwest Engineering and Maintenance District through the Engineer for the exact quantities and locations.

After field verification, the contractor shall mark up the project layout plans (engineering drawings) for the proposed quantities and locations as approved by the Engineer.

The contractor shall properly dispose of all materials and debris generated from the removal activities. The contractor may use chipping methods to spread out removed native woody plant materials on-site if approved by the Engineer. Chipped wood materials shall be spread out on the surface of the disturbed soil area or designated project area with a thickness of no more than one inch. For areas to be seeded, chipped wood material shall be placed after the

completion of seeding. Chipped wood material shall not be placed on paved areas, shoulder build-up areas or the edge of pavement build-up areas. To promote intimate seed-soil contact, chipped wood material shall not be placed on areas to be seeded prior to seeding.

The contractor shall avoid damaging the vegetation that is to remain in place. If limbs or branches of vegetation that are intended to remain are broken or damaged during removal, the contractor shall first ensure that the plant will survive and then trim the damaged limbs or branches with clean, straight cuts. If a plant not intended for removal has been damaged and is not expected to survive, the contractor shall replace the damaged plant as directed by the Engineer and at no additional cost to the Department.

The contractor shall keep the roadway pavement, shoulders, and shoulder build-up areas clear at all times.

All disturbed areas shall be stabilized in accordance with the CWA Final Stabilization criteria, unless otherwise directed by the Engineer. Understory/underbrush exposed soil areas beneath the removed vegetation canopies shall also be hydraulically seeded without tillage and according to the requirements of these Special Provisions per Item. Seeding is not required for the understory/underbrush exposed soil areas covered with chipped wood materials and/or native plant residues ground cover.

Invasive and non-native woody vegetation shall be eradicated in accordance with the requirements of these Special Provisions per Items 9240181 and 9240182.

The responsible herbicide applicator shall be licensed under the appropriate category as required by State Law.

Method of Measurement:

Removal of woody vegetation will be measured by the unit acre, to the nearest one acre of ground surface with all woody vegetation elements removed, chipped, or disposed of as specified herein. This item will be measured only in areas identified for the removal of woody vegetation.

Basis of Payment:

The accepted quantity of woody vegetation removal, measured as provided above, will be paid for at the contract unit price per acre, which price shall be full compensation for the work, complete in place, including disposal, and herbicide treatment of the remaining stumps.

The eradication of invasive and non-native woody vegetation will be measured and paid for under Items 9240181 and 9240182.

There will be no separate measurement or payment for chipping, spreading, or removing the chips, and returning the disturbed area to pre-construction grades unless otherwise called for in the plans or as directed by the Engineer.

The work under this item is independent from the Clearing and Grubbing item and shall be measured and paid for separately. The acreage of each item shall not overlap or be combined for payment.

SECTION 203 EARTHWORK:

203-2 General: of the Standard Specifications is modified to add:

All subgrade material shall fall within the acceptable range as shown in the Subgrade Acceptance Chart included in Appendix A of the Special Provisions.

203-3.03(B) Slopes: the second sentence of the first paragraph is revised to read:

When earth slopes are to be seeded, the surface shall be finished to a loose, evenly roughened condition, in accordance with the requirements of Item 8050003 of the specifications.

203-3.03(B) Slopes: of the Standard Specifications is modified to add:

(1) Rounding, Warping, Surface Treatments and Foreslopes:

Except in rock, the intersection of new roadway cut slopes with native ground surfaces shall be rounded as shown on the project plans. Rock that is highly weathered and disintegrated to such an extent that it will work and handle as earth shall be considered as earth, and the slopes shall be rounded the same as earth slopes. A layer of earth overlaying a rock cut shall be rounded above the rock in the same manner as earth slopes. Final shaping and cleanup may require hand labor.

At the intersections of cuts and fills, slopes shall be adjusted and warped to flow into each other or into the natural ground surfaces without noticeable breaks.

The final slope rounding, blending, and warping shall be approved by the Engineer. Local adjustments in slopes shall be made, as directed by the Engineer, to avoid damage to standing trees, cacti, and other natural features; marring weathered rock surfaces; and to harmonize the cut slopes with existing landscape features. The transition of such adjusted slopes shall be gradual.

Earth slopes shall be finished to be free from all trash and foreign debris (nonorganic).

(2) Ripping Soil Cut Slopes:

After slope rounding and warping are completed, earth and highly weathered and disintegrated rock with soil characteristics and with slope ratios of 2H:1V (horizontal to vertical [H:V])or flatter shall be ripped horizontally to a depth of not less than 1 foot with equipment capable of operating safely on the slopes. The space between ripped furrows shall be

approximately 2 feet. Cut slopes shall be ripped as the slope is excavated, unless other methods are approved by the Engineer. Cut slopes that are not ripped as the slope is excavated shall be ripped prior to seeding at no additional expense to the Department.

Equipment will not be allowed on slopes following ripping. Ripped slopes shall be seeded promptly following ripping, and prior to the next rainfall in accordance with Section 805, Seeding, of these Special Provisions.

203-3.03 (D) Unsuitable Material: of the Standard Specifications is modified to add:

Unsuitable material has been identified as overexavation on the plans by station limits and will require replacement with suitable materials. The unsuitable material removed will be acceptable for use as embankment fill either outside of the roadway prism limits or three feet below subgrade within the roadway prism limits.

203-3.05 Basis of Payment: of the Standard Specifications is modified to add:

No measurement or direct payment will be made for the construction of permanent berms or dikes as shown on the plans, the cost of this work shall be considered included in the price of the roadway excavation item.

(203QCEW, 07/15/05)

SECTION 203 EARTHWORK: of the Standard Specifications is modified to add:

203-2.02 Contractor Quality Control:

The contractor shall perform the quality control measures described in Subsection 106.04(C). At the weekly meeting, the contractor shall be prepared to explain and discuss how the following processes will be employed:

(a) Backfill production, including crusher methods, pit extraction, and washing.

(b) Stockpile management, including stacking methods, separation techniques, stockpile pad thickness, and segregation prevention.

(c) Transporting and placing, including transport technique, lift thickness, processing and mixing technique, and compaction methods.

(d) Excavation and transporting, including method of excavation and transporting methods.

(e) Embankment, including method of mixing, compaction methods, unsuitable material control, waste site, and lift thickness.

The contractor shall obtain samples and perform the tests specified in the following table:

CONTRACTOR QUALITY CONTROL TESTING REQUIREMENTS			
TYPE OF TEST	TEST METHOD	SAMPLING POINT	MINIMUM TESTING FREQUENCY
Structural Backfill			
Gradation	ARIZ 201	Stockpile	1 per 500 CY per Source
PI	AASHTO T 89 AASHTO T 90		
Proctor Density	ARIZ 225 ARIZ 226 ARIZ 245	Stockpile	1 per Source and as needed
Field Density	ARIZ 227 ARIZ 230 ARIZ 232 ARIZ 235 ARIZ 246	In-place	1 per 200 CY, minimum 1 per lift
Subgrade			
Gradation	ARIZ 201	Roadway	1 per Soil Type
PI	AASHTO T 89 AASHTO T 90		
Proctor Density	ARIZ 225 ARIZ 226 ARIZ 245	Roadway	1 per Soil Type
Field Density	ARIZ 227 ARIZ 230 ARIZ 232 ARIZ 235 ARIZ 246	Roadway	1 per 1,000 feet
Natural Ground for Embankment Less than 5 Feet			
Proctor Density	ARIZ 225 ARIZ 226 ARIZ 245	In-place	1 per Soil Type
Field Density	ARIZ 227 ARIZ 230 ARIZ 232 ARIZ 235 ARIZ 246	In-place	1 per 1,000 feet
Embankment			
Proctor Density	ARIZ 225 ARIZ 226 ARIZ 245	In-place	1 per Soil Type

CONTRACTOR QUALITY CONTROL TESTING REQUIREMENTS			
TYPE OF TEST	TEST METHOD	SAMPLING POINT	MINIMUM TESTING FREQUENCY
Field Density	ARIZ 227 ARIZ 230 ARIZ 232 ARIZ 235 ARIZ 246	In-place	1 per 1,000 feet per lift
Borrow Within Three Feet of Finished Subgrade Elevation			
Gradation	ARIZ 201	In-place	1 per 2,000 CY
PI	AASHTO T 89 AASHTO T 90		

(203STRBKFL, 10/21/21)

SECTION 203 EARTHWORK:

203-5.03(B)(1) Structure Backfill: the first paragraph of the Standard Specifications is revised to read:

Structure backfill material shall be selected from excavation or from a source selected by the contractor. It shall not contain frozen lumps, chunks of clay, or other objectionable material. Backfill material shall not contain salvaged asphaltic concrete materials. Backfill material to be used for metal piles or similar items of metal shall have a value of resistivity not less than 2,000 ohm-centimeters or the value shown on the plans. Backfill material shall have a pH value between 6.0 and 10.0, inclusive, when placed against metal installations, except aluminum. Backfill material shall have a pH value between 6.0 and 9.0, inclusive, when placed against aluminum installations. Backfill material shall have a pH value between 6.0 and 12.0, inclusive, when placed against installations other than metal. Tests for pH and resistivity shall be in accordance with the requirements of Arizona Test Method 236.

(203ERWK, 07/16/20)

SECTION 203 EARTHWORK:

203-9.02 Materials: the last sentence of the Standard Specifications is revised to read:

Borrow placed within three feet of the finished subgrade elevation shall conform to the following requirement:

PC + (2.83 x PI) shall not exceed 87,

where:

PC = Percent of material passing the No. 200 sieve (determined in accordance with Arizona Test Method 201), and

PI = Plasticity Index (determined in accordance with AASHTO T 90).

(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.

SECTION 208 SEPARATION GEOTEXTILE FABRIC:

208-2.01 Geotextile Fabric: of the Standard Specifications is modified to add:

Separation geotextile fabric shall be nonwoven and shall meet the requirements for high survivability fabric.

(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:

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

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

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

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

(5) 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

(6) 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.

SECTION 303 AGGREGATE SUBBASES AND AGGREGATE BASES:

303-2 Materials: of the Standard Specification is modified to add:

TABLE 303-1

Class of Aggregate	Percent Passing Sieve (Inch or No.)							PI. Range
	3	1 ½	1	¾	¼	8	200	
3		100	90-100			35-55	5-15	7 to 13

(303QCAB, 07/15/05)

SECTION 303 AGGREGATE SUBBASES AND AGGREGATE BASES: of the Standard Specifications is modified to add:

303-3.04 Contractor Quality Control:

The contractor shall perform the quality control measures described in Subsection 106.04(C). At the weekly meeting, the contractor shall be prepared to explain and discuss how the following processes will be employed:

(a) Aggregate production, including crusher methods, pit extraction, and washing.

(b) Stockpile management, including stacking methods, separation technique, stockpile pad thickness, and segregation prevention.

(c) Transporting and placing, including transport technique, lift thickness, processing and mixing technique, and compaction methods.

The contractor shall obtain samples and perform the tests specified in the following table:

CONTRACTOR QUALITY CONTROL TESTING REQUIREMENTS			
TYPE OF TEST	TEST METHOD	SAMPLING POINT	MINIMUM TESTING FREQUENCY
Aggregate Base Class 1, 2, or 3			
Fractured Coarse Aggregate Particles	ARIZ 212	Crusher belt or Stockpile	1 per 1,200 CY
Gradation	ARIZ 201	Crusher belt or Stockpile	1 per 600 CY
PI	AASHTO T 89 AASHTO T 90		
Proctor Density	ARIZ 225 ARIZ 226 ARIZ 245	Crusher belt or Stockpile	1 per Source and as needed
Field Density	ARIZ 227 ARIZ 230 ARIZ 232 ARIZ 235 ARIZ 246	Roadway	1 per 600 CY
Aggregate Subbase Class 4, 5, or 6			
Fractured Coarse Aggregate Particles (Class 4)	ARIZ 212	Crusher Belt or Stockpile	1 per 1,200 CY
Gradation	ARIZ 201	Crusher Belt or Stockpile	1 per 600 CY
PI	AASHTO T89 AASHTO T90		
Proctor Density	ARIZ 225 ARIZ 226 ARIZ 245	Crusher belt or Stockpile	1 per Source and as needed

CONTRACTOR QUALITY CONTROL TESTING REQUIREMENTS			
TYPE OF TEST	TEST METHOD	SAMPLING POINT	MINIMUM TESTING FREQUENCY
Field Density	ARIZ 227 ARIZ 230 ARIZ 232 ARIZ 235 ARIZ 246	Roadway	1 per 600 CY

(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: is hereby added to the Standard Specifications:

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 emulsified asphalt chip seal with fog coat shall be CRS-2P and shall be applied at the approximate rate of 0.50 gallons per square yard. The cover material shall be Class 1. An estimated application rate of 0.012 cubic yards per square yard shall be used for bidding purposes.

The type of bituminous material for the fog coat shall be CSS-1, and shall be applied at the approximate rate of 0.10 gallons per square yard. Blotter material shall be applied at the approximate rate of 2 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 06/19/25)

SECTION 409 ASPHALTIC CONCRETE (MISCELLANEOUS STRUCTURAL): the title and text of the Standard Specifications is revised to read:

SECTION 409 ASPHALTIC CONCRETE (MISCELLANEOUS STRUCTURAL-SPECIAL MIX):

409-1 Description:

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.

The contractor shall acquire and make all arrangements for a source or sources of material, furnish a mix design which will meet the design criteria specified hereinafter, and provide all the equipment, materials, and labor necessary to complete the work.

409-2 Materials:

The bidding schedule quantity of asphaltic concrete is based on an estimated unit weight of 150 pounds per cubic foot.

409-2.01 Mineral Aggregate:

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 – 3.0%
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	AASHTO T 335	Minimum 85% with at least two fractured faces and minimum 92% with at least one fractured face (plus No. 4 material)
Uncompacted Void Content	AASHTO T 304 Method A	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 AASHTO T 11 and AASHTO 27, and shall conform to the requirements given below.

Mix Design Grading Limits				
Sieve Size	Percent Passing			
	1/2 Inch Mix		3/4 inch Mix	
	Without Admixture	With Admixture	Without Admixture	With Admixture
1-1/4 Inch	---	---	---	---
1 Inch	---	---	100	100
3/4 Inch	100	100	90-100	90-100
1/2 Inch	90 - 100	90-100	---	---
3/8 Inch	67 - 82	67 - 82	62 - 77	62 - 77
No. 8	40 - 48	41 - 49	37 - 46	38 - 47
No. 40	10 - 18	11 - 19	10 - 18	11 - 19
No. 200	1.5 - 4.5	2.5 – 6.0	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:

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 76-22 PM.

The percent of asphalt cement used shall be based on the weight of total mix (asphalt cement, mineral aggregate, and mineral admixture).

The contractor shall provide the laboratory mixing and compaction temperature ranges to the mix design laboratory for each PG asphalt binder used for mix design purposes. The laboratory mixing temperature range is defined as the range of temperatures where the un-aged asphalt binder has a rotational viscosity of 0.17 ± 0.02 Pascal·seconds, measured in accordance with AASHTO T 316. The laboratory compaction temperature range is defined

as the range of temperatures where the un-aged asphalt binder has a rotational viscosity of 0.28 ± 0.03 Pascal·seconds, measured in accordance with AASHTO T 316. The testing required in AASHTO T 316 shall be performed at 275 degrees F and 350 degrees F, and a viscosity-temperature curve developed in accordance with ASTM D2493. The viscosity-temperature curve shall be included in the mix design report. For PG asphalt binders that have a maximum laboratory mixing temperature exceeding 325 degrees F or a maximum laboratory compaction temperature exceeding 300 degrees F, the laboratory mixing and compaction temperature ranges shall be specified in writing by the asphalt binder supplier. The laboratory mixing and compaction temperature ranges, as well as the actual laboratory mixing and compaction temperatures used, shall be reported on the mix design. The contractor shall ensure that the asphalt binder supplier information required in this paragraph is provided to all appropriate parties in a timely manner, and that copies are included in the mix design report. The laboratory mixing and compaction temperatures are for mix design purposes only. Field mixing and compaction temperatures are specified in Subsection 409-3 of the specifications.

409-2.03 Mineral Admixture:

Mineral admixture shall be either Portland cement, blended hydraulic cement, or hydrated lime conforming to the following requirements:

Material	Requirement
Portland Cement, Type I or II	ASTM C150
Blended Hydraulic Cement, Type IP or 1L	ASTM C595
Hydrated Lime	ASTM C1097

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.

The certification and acceptance of Portland cement, blended hydraulic cement, and hydrated lime shall be in accordance with ADOT Materials Practice and Procedure Directive No. 13, "Certification and Acceptance of Hydraulic Cement, Fly Ash, Natural Pozzolan, Silica Fume, and Lime".

409-2.04 Mix Design:

Utilizing mineral aggregate which has been crushed, processed, separated, and stockpiled, a mix design shall be formulated and submitted by the contractor to the Engineer. The mineral aggregate samples used for mix design purposes shall be representative of aggregate materials to be used during production.

The mix design shall be based on the mix design criteria and other requirements specified herein, utilizing asphalt cement and mineral admixture of the type and from the sources proposed for use in the production of asphaltic concrete.

Mix designs shall be developed utilizing a minimum ratio of three (3) for the lift thickness to nominal maximum aggregate size.

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. Limits for the usage of RAP shall be per 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) (1/2 inch Special Mix), 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 (1/2 Inch Special Mix)	1-1/2 Inches
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

The contractor may propose the use of a mix design that has been developed for a previous project. The proposed mix design shall meet the requirements of these specifications. The contractor shall provide evidence that the type and source of bituminous material, the type of mineral admixture, and the source and methods of producing mineral aggregate, and RAP material if applicable, have not changed since the formulation of the previous mix design. The contractor shall also provide current test results for all specified characteristics of the mineral

aggregate, and RAP material if applicable, proposed for use. The Engineer will determine if the previously used mix design is suitable for the intended use and if the previous use of the mix design was satisfactory to the Department. The Engineer will either approve or disapprove the proposed mix design. Should the Engineer disapprove the use of the previously used mix design, the contractor shall prepare and submit a new mix design proposal in accordance with the requirements of these specifications.

A previously used mix design older than two years from the date it was formulated, sealed, signed, and dated shall not be allowed for use. Once approved for use on a project, a previously used mix design may be used for the duration of that project.

Test results used in the formulation of the mix design must be from testing performed no earlier than 45 days prior to the date the mix design is signed by the mix design engineer. Historical abrasion values may be supplied on sources provided the testing was conducted within the past two years.

The mix design shall be submitted to the Engineer under a cover letter signed by an authorized representative of the contractor.

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	3.8 – 4.2	(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:

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 the plate method in AASHTO R 97. 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	AASHTO T 308 (for both Non-RAP and RAP mixes) (See Note)
Gradation	
Marshall Density	AASHTO R 68
Maximum Theoretical Density	AASHTO T 209
Effective Voids	AASHTO T 269
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 Construction Requirements:

409-3.01 General:

All courses of asphaltic concrete shall be compacted as required, smooth and true to the required lines, grades, and dimensions.

Smoothness of the final pavement surface shall be tested, and payment for smoothness made, in accordance with Subsection 109.13 of the specifications. In addition to the requirements of Subsection 109.13 of the specifications, the following requirements shall also be met:

(A) The surface of the final lift of asphaltic concrete placed under this section of the specifications shall be tested and shall not vary by more than 1/8 inch from the lower edge of a 10-foot straightedge when it is placed in the longitudinal direction (including across transverse joints), and when it is placed in the transverse direction across longitudinal joints;

(B) The surface of any lift of asphaltic concrete placed under this section of the specifications, other than the final lift, shall be tested and shall not vary by more than 1/4 inch from the lower edge of a 10-foot straightedge when it is placed in the longitudinal direction (including across transverse joints), and when it is placed in the transverse direction across longitudinal joints; and

(C) All deviations exceeding the specified tolerances above shall be corrected by the contractor, to the satisfaction of the Engineer.

The asphaltic concrete hot plant shall conform to the requirements of Section 403 of the specifications.

The moisture content of the asphaltic concrete immediately behind the paver shall not exceed 0.5 percent. The moisture content will be determined in accordance with the requirements of AASHTO T 329.

Asphaltic concrete shall be placed only when the temperature of the surface on which the asphaltic concrete is to be placed is at least 65 degrees F.

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 asphaltic concrete.

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:

RELEASE AGENT TEST	REQUIREMENT
Asphalt Stripping Test Diluted Non-Diluted (Full Strength)	 No Stripping No Stripping
Asphalt Performance Test	Less than or equal to 10.0% after the third cycle

Release agents which degrade, dissolve, or in any way damage the bituminous material shall not be used. Diesel fuel shall not be used as a release agent.

Asphaltic concrete immediately behind the laydown machine shall be in a thoroughly mixed, free-flowing, and workable condition, be free of lumps and crusts, and have a minimum temperature of 275 degrees F.

All courses of asphaltic concrete shall be placed and finished by means of self-propelled paving machines except under certain conditions or at certain locations where the Engineer deems the use of self-propelled paving machines impractical.

The speed of the paving machine shall be coordinated with the production of the plant and an adequate number of trucks for hauling asphaltic concrete shall be available in order to achieve, as far as practical, a continuous operation.

Self-propelled paving machines shall spread the mixture within the specified tolerances, without segregation or tearing, true to the line, grade, and crown indicated on the project plans. Pavers shall be equipped with hoppers and augers which will distribute the mixture uniformly in front of adjustable screeds.

Pavers shall be equipped with a screed for the full width being paved, heated if necessary, and capable of spreading and finishing all courses of asphaltic concrete.

Pavers shall be equipped with automatic screed controls with sensors for either or both sides of the paver, capable of sensing grade from an outside reference line, sensing the transverse slope of the screed, and providing the automatic signals which operate the screed to maintain the desired grade and transverse slope.

Failure of the control system to function properly shall be cause for the suspension of the placing of asphaltic concrete.

The base or subgrade upon which asphaltic concrete is to be placed shall be prepared and maintained in a firm condition until asphaltic concrete is placed. It shall not be frozen or excessively wet.

Before asphaltic concrete is placed, the surface to be paved shall be cleaned of all objectionable material and tacked with bituminous material in accordance with the requirements of Section 404 of the specifications.

Longitudinal joints of each course shall be staggered a minimum of 1 foot with relation to the longitudinal joint of any immediate underlying course. Longitudinal joints shall be located within 1 foot of the center of a lane or within 1 foot of the centerline between two adjacent lanes.

The contractor shall schedule its paving operations to minimize exposed longitudinal edges. Unless otherwise approved by the Engineer, the contractor shall limit the placement of asphaltic concrete courses, in advance of adjacent courses, to one shift of asphaltic concrete production. The contractor shall schedule its paving operations in such a manner to eliminate exposed longitudinal edges over weekends or holidays.

409-3.02 Compaction:

Compaction shall consist of an established sequence of coverage using specified types of compactors. A pass shall be defined as one movement of a compactor in either direction. Coverage shall be the number of passes as are necessary to cover the entire width being paved.

The rolling sequence, the type of compactor to be used and the number of coverages required shall be as follows:

Rolling Sequence	Type of Compactor		No. of Coverages	
	Option No. 1	Option No. 2	Option No. 1	Option No. 2
Initial	Static Steel	Vibrating Steel	1	1
Intermediate	Pneumatic Tired	Vibrating Steel	2 - 6*	2 - 4*
Finish	Static Steel	Static Steel	1 - 3	1 - 3
Note: * Based on the roller pattern which exhibits the best performance.				

The Engineer shall select the option for compaction and, when pneumatic-tired compactors are used, will designate the tire pressure.

Steel wheel compactors shall not be used in the vibratory mode for courses of 1 inch or less in nominal thickness nor when the temperature of the asphaltic concrete falls below 180 degrees F. Steel wheel compactors shall weigh not less than 8 tons.

Initial and intermediate compaction shall be completed before the temperature of the asphaltic concrete falls below 200 degrees F. All edges shall be rolled with a pneumatic tired compactor, or other methods approved by the Engineer, while the mixture is still hot.

Compaction will be deemed to be acceptable on the condition that the asphaltic concrete is compacted using the type of compactors specified, ballasted and operated as specified and with the number of coverages of the compactors as specified.

409-3.03 Acceptance:

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 25 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 (i.e. reduction in serviceability, in years) of the asphaltic concrete if left in place. The engineering analysis shall also detail the potential root cause of the problem, any proposed corrective action, and the anticipated effect of such corrective action on the performance. The engineering analysis shall only include acceptance or referee test results, as applicable to the standard specifications. The engineering analysis shall include the expected additional cost to the Department (over original performance life) to maintain the pavement at an acceptable condition. The engineering analysis shall include supporting information such as pictures of the area, control charts, plant and field records, etc. 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.

409-4 Method of Measurement:

Asphaltic concrete will be measured by the ton for the mixture actually used, which will include the weight of mineral aggregate, bituminous material, and mineral admixture. Measurement will include any weight used in construction of intersections, turnouts, curbs, spillways and spillway inlets, ditches, catch basin entrances, median strips, sidewalks, or other miscellaneous items or surfaces.

409-5 Basis of Payment:

409-5.01 General:

The accepted quantities of asphaltic concrete, measured as provided above, will be paid for at the contract unit price per ton for the bituminous mixture complete in place.

No direct payment will be made for the bituminous material and mineral admixture in the asphaltic concrete, or the bituminous material for tack coat and application of tack coat, the price being considered as included in the price paid for asphaltic concrete.

Asphaltic concrete may be measured, by volume, upon the execution of a supplemental agreement which will specify the manner in which the volume is determined. The volume will include the volume of mineral aggregate, bituminous material, mineral admixture, and any necessary blending material.

409-5.02 Reduction for Noncompliance:

A reduction in payment to the contractor for asphaltic concrete will be made for asphalt cement (bituminous material) that do not meet the requirements of Section 1005 as determined by corresponding test results. Adjustments in payment will be made in accordance with the requirements of Table 1005-1.

(416ACES, 06/19/25)

SECTION 416 ASPHALTIC CONCRETE – END PRODUCT: of the Standard Specifications is revised to read:

416-1 Description:

The work under this section shall consist of constructing Asphaltic Concrete-End Product, hereinafter asphaltic concrete, by furnishing all materials, mixing at a plant, hauling and placing a mixture of aggregate materials, 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.

Reclaimed asphalt pavement (RAP), as defined in Subsection 416-3.04 of the specifications, may be used in the mixture provided all requirements of the specifications are met. References to the use of RAP in this section apply only if RAP is utilized as part of the mixture. ADOT Materials Practice and Procedure Directive No. 20, “Guidance on the Use of Reclaimed Asphalt Pavement (RAP) in Asphaltic Concrete”, shall be used in conjunction with the requirements of the specifications.

Warm Mix Asphalt (WMA) technologies may be used in the mixture at the option of the contractor provided all requirements of the specifications are met. WMA is defined as asphaltic concrete that is produced within the temperature range of 215 to 275 degrees F. WMA can be produced by one or a combination of several WMA technologies including plant water foaming processes, mineral additives, and chemical additives. The requirements for incorporating WMA technologies in the mixture are given in these specifications and in Materials Practice and Procedure Directive No. 23, “Requirements for the Use of Warm Mix Asphalt (WMA) Technologies in Asphaltic Concrete”.

The contractor shall acquire and make all arrangements for a source or sources of material, furnish a mix design which will meet the design criteria specified hereinafter, and provide all the equipment, materials, and labor necessary to complete the work.

416-2 Asphaltic Concrete Mix Design Criteria:

Mix designs shall be developed utilizing a minimum ratio of three (3) for the lift thickness to nominal maximum aggregate size.

Mix designs shall be developed by the contractor on the basis of the following criteria and tested in accordance with the requirements of the following test methods:

Criteria	Requirements	Arizona Test/AASHTO
	3/4” Mix	Method
1. Voids in Mineral Aggregate: %, Range	15.0 - 18.0	Note (2)
2. Effective Voids: %, Range	4.0 ± 0.2	Note (2)

3. Absorbed Asphalt: %, Range	0 - 1.0	Note (2)
4. Index of Retained Strength: %, Minimum	60 (Note 1)	Note (3)
5. Wet Strength: psi, Minimum	150	Note (3)
6. Stability: pounds, Minimum	2,000	Note (2)
7. Flow: 0.01-inch, Range	8 - 16	Note (2)
8. Mix Design Grading Limits		AASHTO T 11, T 27

	Percent Passing	
Sieve Size	**3/4 inch Mix**	
	Without Admix.	**With Admix.**
1-1/4 inch		
1 inch	100	100
3/4 inch	90 - 100	90 - 100
1/2 inch	---	---
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

Notes:

(7) If the average elevation of the project is above 3,500 feet, the index of retained strength shall be a minimum of 70 percent.

(8) For mixes without RAP, Arizona Test Method 815. For mixes with RAP, Arizona Test Method 833.

(9) For mixes without RAP, Arizona Test Method 802 (as modified by Arizona Test Method 815). For mixes with RAP, Arizona Test Method 802 (as modified by Arizona Test Method 833).

The ratio of the mix design composite gradation target for the No. 200 sieve, including mineral admixture, to the effective asphalt content shall be within the range 0.7 to 1.3.

416-3 Materials:

For comparative purposes, quantities shown in the bidding schedule have been calculated based on the following data:

Special Mixes	**3/4" Mix**
Unit Weight, (lb./cu. ft.)	150

416-3.01 Mineral Aggregate:

(A) General:

Mineral aggregate shall consist of virgin aggregate, or a combination of virgin aggregate and aggregate from RAP (RAP aggregate). When the terms “mineral aggregate” or “aggregate” are used without being further described as “virgin” or “RAP”, the intended meaning is the total aggregate material used in the mixture.

No individual stockpile or hot bin usage of either virgin aggregate or RAP aggregate shall be less than 3 percent of the total mineral aggregate.

(B) Virgin Mineral Aggregate:

The contractor shall provide a source in accordance with the requirements of Section 1001 of the specifications.

Coarse virgin mineral aggregate shall consist of crushed gravel, crushed rock, or other approved inert material with similar characteristics, or a combination thereof, conforming to the requirements of these specifications.

For areas or applications where Special Mix is not called for on the plans, fine virgin mineral aggregate shall consist of natural sand or of sand prepared from rock, or other approved inert materials, or a combination thereof, conforming to the requirements of these specifications.

For areas or applications where Special Mix is called for on the project plans, the following shall apply:

Fine virgin 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 virgin 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 virgin 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 virgin aggregate up to a maximum of 15 percent of the total aggregate for mixes not containing RAP, or up to a maximum of 10 percent of the total aggregate for mixes containing RAP. The total composite of virgin fine aggregate shall meet the requirement for uncompacted void content. The uncrushed fine virgin aggregate shall be 100 percent passing the 1/4 inch sieve and contain not 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.

(C) RAP Mineral Aggregate:

RAP aggregate shall conform with Materials Practice and Procedure Directive No. 20 “Guidance on the Use of Reclaimed Asphalt Pavement (RAP) in Asphaltic Concrete”.

(D) Mineral Aggregate Characteristics:

Aggregates shall be free of deleterious materials, clay balls, and adhering films or other material that prevent the thorough coating with the asphalt cement.

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 (1)	Arizona Test Method 251	2.350 - 2.850
Combined Water Absorption (1)	Arizona Test Method 251	0 – 3.0%
Sand Equivalent (1)	AASHTO T 176 (After thoroughly sieving the sample, no additional cleaning of the fines from the plus No. 4 material is required.)	Minimum 55
Abrasion (2)	AASHTO T 96	100 Rev., Max. 9% 500 Rev., Max. 40%
Fractured Coarse Aggregate Particles (3)	AASHTO T 335	Minimum 70% (4) (at least one fractured face, determined on plus No. 4 material)
Uncompacted Void Content (1) (Special Mix Only)	AASHTO T 304 Method A	Minimum 45%
Carbonates (3) and (5)	Arizona Test Method 238	Maximum 20%

Notes:

(1) When the mix design contains RAP, the requirements shall be for the virgin aggregate portion only.

(2) Abrasion shall be performed separately on materials from each source of mineral aggregate, including RAP aggregate. All sources shall meet the requirements for abrasion.

(3) When the mix design contains RAP, the requirements shall be for the composite of virgin and RAP aggregate.

(4) When Special Mix is called for on the project plans, this value shall be minimum 85% with at least two fractured faces and minimum 92% with at least one fractured face, determined on plus No. 4 material.

(5) 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.

Tests on aggregates outlined above, except for abrasion, shall be performed on materials furnished for mix design purposes and composited to the mix design gradation. When RAP is used in the mixture, RAP aggregates for testing shall be obtained from the RAP material using Method A of AASHTO T 164, prior to combining with the virgin aggregate.

416-3.02 Mineral Admixture:

Mineral admixture will be required. The amount used shall be 1.0 percent, by weight of the mineral aggregate, unless testing demonstrates that additional admixture is required in order to meet the mix design criteria for Wet Strength and Index of Retained Strength. A maximum of 2.0 percent admixture will be permitted. The exact amount of admixture required shall be specified in the mix design. Mineral admixture shall be either Portland cement, blended hydraulic cement or hydrated lime conforming to the following requirements.

Material	Requirement
Portland Cement, Type I, or Type II	ASTM C150
Blended Hydraulic Cement, Type IP or IL	ASTM C595
Hydrated Lime	ASTM C1097

The certification and acceptance of Portland cement, blended hydraulic cement, and hydrated lime shall be in accordance with ADOT Materials Practice and Procedure Directive No. 13, "Certification and Acceptance of Hydraulic Cement, Fly Ash, Natural Pozzolan, Silica Fume, and Lime".

416-3.03 Bituminous Material:

(A) General:

Bituminous material shall consist of performance grade (PG) asphalt binder (virgin binder), or a combination of virgin binder and binder from RAP (RAP binder). When the terms “bituminous material”, “asphalt cement”, “asphalt binder”, or “binder” are used without being further described as “virgin” or “RAP”, the intended meaning is the total bituminous material used in the mixture.

The percent of asphalt cement used shall be based on the weight of total mix (asphalt cement, mineral aggregate, and mineral admixture).

(B) Virgin Bituminous Material:

Virgin asphalt cement shall be a performance grade (PG) asphalt binder, conforming to the requirements of Section 1005 of the specifications. The type of virgin asphalt binder shall be PG 76-22 PM or, if RAP is used in the mixture, the virgin asphalt binder shall be as required to meet the blending requirements in Subsection 416-3.03(C) of the specifications and Arizona Test Method 833.

The contractor shall provide the laboratory mixing and compaction temperature ranges to the mix design laboratory for each PG asphalt binder used for mix design purposes. The laboratory mixing temperature range is defined as the range of temperatures where the un-aged virgin asphalt binder has a rotational viscosity of 0.17 $\pm$ 0.02 Pascal·seconds, measured in accordance with AASHTO T 316. The laboratory compaction temperature range is defined as the range of temperatures where the un-aged virgin asphalt binder has a rotational viscosity of 0.28 $\pm$ 0.03 Pascal·seconds, measured in accordance with AASHTO T 316. The testing required in AASHTO T 316 shall be performed at 275 degrees F and 350 degrees F, and a viscosity-temperature curve developed in accordance with ASTM D2493. The viscosity-temperature curve shall be included in the mix design report. For PG asphalt binders that have a maximum laboratory mixing temperature exceeding 325 degrees F or a maximum laboratory compaction temperature exceeding 300 degrees F, the laboratory mixing and compaction temperature ranges shall be specified in writing by the virgin asphalt binder supplier. A viscosity-temperature curve will meet this requirement for written documentation if the viscosity-temperature curve is developed and submitted by the binder supplier and includes language that the recommended laboratory mixing and compaction temperatures are within acceptable ranges, and the submittal includes a statement indicating the maximum laboratory mixing temperature to which the binder can be heated without damage. The laboratory mixing and compaction temperature ranges, as well as the actual laboratory mixing and compaction temperatures used, shall be reported on the mix design. The contractor shall ensure that the asphalt binder supplier information required in this paragraph is provided to all appropriate parties in a timely manner, and that copies are included in the mix design report. The laboratory mixing and compaction temperatures are for mix design purposes only. Field mixing and compaction temperatures are specified in Subsections 416-6 and 416-7 of the specifications.

(C) RAP Bituminous Material:

RAP binder content shall be determined by AASHTO T 308. RAP binder shall consist of the asphalt binder portion of the reclaimed asphaltic pavement. A maximum of 30 percent RAP binder, by weight of total binder in the mix, may be used in mixes placed in a lower lift (minimum 2 inches below finished surface). A maximum of 24 percent RAP binder, by weight of total binder in the mix, may be used at all other locations.

When less than or equal to 17 percent RAP binder is used, by weight of total binder in the mix, no testing is required on the RAP binder. When greater than 17 percent RAP binder is

used, by weight of total binder in the mix, the RAP binder shall be extracted, recovered, and tested in accordance with the requirements of Arizona Test Method 833. The virgin binder grade shall be modified if necessary to ensure the blend of virgin and RAP binder meets the PG grade specified in the Subsection 416-3.03(B) of the specifications. However, a change of only one virgin PG binder grade (6 degrees C on either or both the high and low temperatures) will be allowed from that shown in Subsection 416-3.03(B) of the specifications.

416-3.04 Reclaimed Asphalt Pavement (RAP):

RAP shall consist of salvaged, milled, pulverized, broken, or crushed asphalt pavement. If RAP is generated by milling, the minimum removal depth shall be 1-1/2 inches. The source of RAP may be from ADOT or other projects. The contractor shall be responsible for determining the suitability of the RAP for use in the mixture, regardless of its source.

RAP material shall pass the 1-1/4 inch sieve. For asphaltic concrete containing greater than 17 percent RAP binder, as determined by Ignition Furnace AASHTO T308, the RAP material shall be processed by one of the following: RAP material shall pass the 1-1/4 inch sieve and be fractionated into uniform coarse and fine stockpiles such that there will be a minimum amount of fines or formation of a single uniform RAP material stockpile passing the 5/8 inch sieve.

RAP shall be stockpiled so that segregation is minimized. When two RAP stockpiles are used, acceptable methods to prevent intermingling of stockpiles shall be provided.

The Engineer reserves the right to reject obviously defective salvaged material or salvaged material that is not representative of the material used in the mix design.

416-3.05 Warm Mix Asphalt Technologies:

Warm Mix Asphalt (WMA) technologies include plant water foaming processes, mineral additives, and chemical additives. WMA technologies shall be approved prior to their use in accordance with Materials Practice and Procedure Directive No. 23, “Requirements for the Use of Warm Mix Asphalt (WMA) Technologies in Asphaltic Concrete”.

416-4 Mix Design:

Utilizing mineral aggregate and RAP which has been crushed, processed, separated and stockpiled, a mix design shall be formulated and submitted by the contractor to the Engineer. The mineral aggregate and RAP samples used for mix design purposes shall be representative of materials to be used during production.

The mix design shall be based on the mix design criteria and other requirements hereinbefore specified, utilizing asphalt cement and mineral admixture of the type and from the sources proposed for use in the production of asphaltic concrete.

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. 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”.

The contactor may propose the use of a mix design that has been developed for a previous project that is less than a year old with no additional requirements. The proposed mix design shall meet the requirements of these specifications. If the proposed mix design is greater than one year old but less than two years old, the contractor shall provide evidence that the type and source of bituminous material, the type of mineral admixture, and the source and methods of producing virgin mineral aggregate and RAP have not changed since the formulation of the previous mix design. The contractor shall also provide current test results for all specified characteristics of the mineral aggregate and RAP proposed for use. The Engineer will determine if the previously used mix design is suitable for the intended use and if the previous use of the mix design was satisfactory to the Department. The Engineer will either approve or disapprove the proposed mix design. Should the Engineer disapprove the use of the previously used mix design, the contractor shall prepare and submit a new mix design proposal in accordance with the requirements of these specifications.

A previously used mix design older than two years from the date it was formulated, sealed, signed, and dated shall not be allowed for use. Once approved for use on a project, a mix design may be used for the duration of that project.

The mix design shall contain as a minimum:

(A) The name and address of the testing organization and the person responsible for the mix design testing;

(B) The specific location(s) of the source(s) of mineral aggregate;

(C) The supplier, refinery, type of asphalt cement, and any modifiers including polymers. The source and type of mineral admixture. The percentage of asphalt cement and mineral admixture to be used;

(D) The anticipated mineral aggregate gradation in each stockpile;

(E) Mix design gradation. The mix design shall contain the mineral aggregate gradation, and also the gradation with mineral admixture;

(F) The results of all testing, determinations, etc., such as: specific gravity of each component, water absorption, sand equivalent, loss on abrasion, fractured coarse aggregate particles, uncompacted void content (for Special Mix), percent carbonates (if required), immersion compression

results (Index of Retained Strength, wet and dry strengths), Marshall stability and flow, asphalt absorption, percent air voids, voids in mineral aggregate, and bulk density; and **p**

(G) Viscosity-temperature curve along with the laboratory mixing and compaction temperature ranges, as well as the actual laboratory mixing and compaction temperatures used.

When RAP is used in the mixture, the following additional information shall be included in the mix design:

(H) The specific location(s) of the source(s) of RAP;

(I) The anticipated RAP gradation, RAP aggregate gradation, and RAP binder content in each stockpile;

(J) If greater than 17 percent RAP binder is used in the mixture, the results of all tests on the recovered RAP binder, as well as all tests on the blend of virgin binder and recovered RAP binder;

(K) The percent RAP binder, virgin binder, and total binder in the mixture;

(L) The composite gradation of virgin and RAP aggregates, with and without mineral admixture. The composite gradation of the virgin aggregate and RAP, with and without mineral admixture;

(M) The results of all testing, determinations, etc., for the RAP, virgin aggregate, RAP aggregate, and composite of virgin and RAP aggregates as required, such as: specific gravity, water absorption, sand equivalent, loss on abrasion, fractured coarse aggregate particles, uncompacted void content (for Special Mix), and percent carbonates; and**c**

(N) The viscosity-temperature curve along with the laboratory mixing and compaction temperature ranges for the blended binder, if greater than 17 percent RAP binder is used in the mixture, as well as the actual laboratory mixing and compaction temperatures used.

When Warm Mix Asphalt (WMA) technologies are used in the mixture, the additional mix design requirements specified in Materials Practice and Procedure Directive No. 23, “Requirements for the Use of Warm Mix Asphalt (WMA) Technologies in Asphaltic Concrete”, shall also be included in the mix design.

Test results used in the formulation of the mix design shall be from testing performed no earlier than 45 days prior to the date the mix design is signed by the mix design engineer. Historical abrasion values may be supplied on sources provided the testing was conducted within the past two years.

The mix design shall be submitted to the Engineer under a cover letter signed by an authorized representative of the contractor.

A copy of the mix design and representative samples of the materials used in the mix design shall be submitted to the Engineer for calibration of the ignition furnace, and for the determination of sand equivalent and fractured coarse aggregate particles. When Special Mix is used, the uncompacted void content shall also be determined. Approximately 300 pounds of virgin mineral aggregate (proportional to the mix design gradation), 3 gallons of asphalt cement, and 1 gallon of mineral admixture shall be submitted. When RAP is used, a minimum of 40 pounds of representative RAP material and a minimum of 10 pounds of solvent-extracted RAP aggregate, per AASHTO T 164, Method A, shall be submitted. If RAP is fractionated, the RAP and RAP aggregate from each stockpile shall be kept separate. The Engineer shall witness the sampling of the virgin mineral aggregate and RAP. 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 (for Special Mix) uncompacted void content shall meet the requirements specified in Subsection 416-3.01 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 Engineer will review the mix design to assure that it contains all required information. If it does not, it will be returned within two working days of receipt of all samples and mix design information, for further action and resubmission by the contractor.

If the contractor elects to change its source(s) of mineral aggregate or RAP, or adds or deletes the use of a stockpile(s) regardless of source, the contractor shall furnish the Engineer with a new mix design which meets the requirements specified hereinbefore.

If changes are made in the source or type of bituminous material, or the type of mineral admixture, the contractor shall provide verification testing results. Verification testing shall be performed at the original mix design asphalt content using the original mineral aggregate and RAP (if used), the proposed bituminous material, and/or the proposed mineral admixture. Three specimens shall be fabricated and tested for bulk density, maximum theoretical density, and effective voids. The percent effective voids shall be within $\pm$ 0.2 of the percent effective voids in the original design and also be within the current effective voids mix design specification limits. Verification testing results shall not replace target values shown in the original mix design. All target values from the original design shall be used in future production with the exception of any self-directed target value changes that are requested. The verification process does not ensure that the contractor can meet the target values during production.

In addition to the verification testing specified above, verification testing for immersion compression may also be required. If there is a change in the type of mineral admixture, immersion compression testing is required. If there is a change in the source or type of bituminous material, immersion compression testing is required if the Index of Retained Strength of the original mix design is less than 10 percentage points greater than the specified minimum, or if the Wet Strength is less than 100 pounds per square inch greater than the specified minimum.

The contractor may make self-directed target changes to the approved mix design within the limits shown below. Requests for self-directed target changes shall be made in writing and acknowledged by the Engineer prior to start of production for a lot. Self-directed target changes shall meet contract requirements for mix design criteria and grading limits.

MEASURED CHARACTERISTICS	ALLOWABLE SELF-DIRECTED TARGET CHANGES
Gradation (sieve size): 3/8 inch No. 8 No. 40	 ±4% from mix design target value ±4% from mix design target value ±2% from mix design target value
Asphalt Cement Content	Within range of +0.4% to -0.2% from mix design target value
Effective Voids	None

The contractor may propose target changes to the approved mix design for the Engineer's approval. The Engineer will determine if the proposed target change will result in mix production that meets the contract requirements for mix design criteria and grading limits. For acceptance purposes, target 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.

Should a mix design prove unsatisfactory to the contractor during production, the contractor shall furnish the Engineer with a revised mix design. For acceptance purposes, the revised mix design will not be retroactive.

The contractor shall not change its methods of crushing, screening, washing, or stockpiling from those used during production of material used for mix design purposes without approval of the Engineer or without preparing a new mix design.

416-5 Contractor Quality Control:

The contractor shall perform the quality control measures described in Subsection 106.04(C) of the specifications. At the weekly meeting, the contractor shall be prepared to explain and discuss how the following processes will be employed:

(A) Aggregate production, including crusher methods, pit extraction, and washing;

(B) RAP production, including milling, crushing, screening, and handling methods;

(C) Stockpile management, including stacking methods, separation technique, plant feed technique, stockpile pad thickness, and segregation prevention;

(D) Proportioning and plant control, including plant scale calibration, mix temperature control, storing method, and addition of admixture;

(E) Transporting and placing, including hauling distance and temperature control, segregation and non-uniform placement control, and joint placement and technique; and

(F) Compaction, including types and weight of rollers, establishing and monitoring of roller patterns, and temperature controls.

The contractor shall obtain samples and perform the tests specified in the following table:

<table>
<tr><th colspan="4">CONTRACTOR QUALITY CONTROL TESTING REQUIREMENTS</th></tr>
<tr><th>Type of Test</th><th>Test Method</th><th>Sampling Point</th><th>Minimum Testing Frequency</th></tr>
<tr><td colspan="4">Virgin Mineral Aggregate</td></tr>
<tr><td>Gradation</td><td>AASHTO T 27</td><td>Crusher Belt or Stockpile</td><td>1 per stockpile per day</td></tr>
<tr><td>Sand Equivalent</td><td>AASHTO T 176</td><td rowspan="3">Crusher Belt or Stockpile</td><td rowspan="3">1 per 2,000 Tons of total virgin aggregate (1)</td></tr>
<tr><td>Fractured Coarse Aggregate Particles</td><td>AASHTO T 335</td></tr>
<tr><td>Uncompacted Void Content (2)</td><td>AASHTO T 304 Method A</td></tr>
<tr><td colspan="4">Reclaimed Asphalt Pavement</td></tr>
<tr><td>Gradation, Moisture Content, and Binder Content</td><td>AASHTO T 308</td><td>Crusher Belt or Stockpile</td><td>1 per stockpile per day</td></tr>
<tr><td colspan="4">RAP Aggregate</td></tr>
<tr><td>Gradation</td><td>AASHTO T 11, T 27</td><td rowspan="2">Crusher Belt or Stockpile</td><td>1 per stockpile per day</td></tr>
<tr><td>Fractured Coarse Aggregate Particles</td><td>AASHTO T 335</td><td>1 per stockpile every other day</td></tr>
<tr><td colspan="4">Asphaltic Concrete</td></tr>
<tr><td>Gradation</td><td>AASHTO T 27 or T 308 (for both Non-Rap and RAP mixes)</td><td>Cold Feed, Hot Bins, Roadway, or Plant</td><td>1 per 1,000 Tons</td></tr>
<tr><td>Asphalt Content</td><td>AASHTO T 287, T 308 (for both Non-RAP and RAP</td><td>Roadway or Plant</td><td>1 per 1,000 Tons</td></tr>
</table>

CONTRACTOR QUALITY CONTROL TESTING REQUIREMENTS			
Type of Test	**Test Method**	**Sampling Point**	**Minimum Testing Frequency**
	mixes), or other approved methods		
Voids	AASHTO R 68, T 166, T 209, T245, T 269		1 per 1,000 Tons each day. Maximum of 4 per day.
Compaction	AASHTO T 355	Roadway	1 per 300 tons

Notes:

(1) Prior to the completion of the mix design, quality control tests on mineral aggregate shall be performed based on the anticipated percent use of each stockpile. Samples taken from individual stockpiles may be composited prior to performing the required tests, or testing may be performed on material from each stockpile and the composite test result for each required test determined mathematically.

(2) For Special Mix.

416-6 Construction Requirements:

The contractor shall be responsible for the proportioning of all materials, for the hauling, placing, loading, spreading, and finishing of asphaltic concrete and for the applying of bituminous material, such as tack coats, prime coats, and provisional seals, all in accordance with the appropriate portions of the specifications.

The asphaltic concrete hot plant shall conform to the requirements of Section 403 of the specifications.

During production, the percent RAP aggregate and percent RAP binder shall not exceed the maximum allowed in Subsections 416-3.01(C), 416-3.03(C), and 416-3.04 of the specifications. In addition, the percent RAP material shall be maintained to within plus 2 percent and minus 5 percent of the mix design value(s). When two RAP stockpiles are used, this tolerance shall apply to the total percent RAP material in the mixture, as well as the percent RAP material from each stockpile.

The temperature of asphaltic concrete or mineral aggregate upon discharge from the drier shall not exceed 325 degrees F unless a higher temperature is recommended in writing by the asphalt binder supplier and approved by the Engineer.

All courses of asphaltic concrete shall be placed and finished by means of self-propelled paving machines except under certain conditions or at certain locations where the Engineer deems the use of self-propelled paving machines impractical.

Self-propelled paving machines shall spread the mixture within the specified tolerances, without segregation or tearing, true to the line, grade, and crown indicated on the project

plans. Pavers shall be equipped with hoppers and augers which shall distribute the mixture uniformly in front of adjustable screeds.

Pavers shall be equipped with a screed for the full width being paved, heated if necessary, and capable of spreading and finishing all courses of asphaltic concrete.

Pavers shall be equipped with automatic screed controls with sensors for either or both sides of the paver, capable of sensing grade from an outside reference line, sensing the transverse slope of the screed, and providing the automatic signals which operate the screed to maintain the desired grade and transverse slope.

Failure of the control system to function properly shall be cause for the suspension of the placing of asphaltic concrete.

The base or subgrade upon which asphaltic concrete is to be placed shall be prepared and maintained in a firm condition until asphaltic concrete is placed. It shall not be frozen or excessively wet.

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 asphaltic concrete.

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:

RELEASE AGENT TEST	REQUIREMENT
Asphalt Stripping Test Diluted Non-Diluted (Full Strength)	 No Stripping No Stripping
Asphalt Performance Test	Less than or equal to 10.0% after the third cycle

Release agents which degrade, dissolve, or in any way damage the bituminous material shall not be used. Diesel fuel shall not be used as a release agent.

Longitudinal joints of each course shall be staggered a minimum of 1 foot with relation to the longitudinal joint of any immediate underlying course.

When surfacing courses are placed on 10 foot or wider shoulders which are to receive rumble strips, the contractor shall place any longitudinal joints approximately 1 foot away from the travel lane side of the rumble strip.

Longitudinal joints shall be located within 1 foot of the center of a lane or within 1 foot of the centerline between two adjacent lanes. Joints shall be formed by a slope shoe or hot-lapped, and shall result in an even, uniform surface.

Before a surface course is placed in contact with a cold transverse construction joint, the cold existing asphaltic concrete shall be trimmed to a vertical face by cutting the existing asphaltic concrete back for its full depth of the lift and exposing a fresh face. After placement and finishing of the new asphaltic concrete, both sides of the joint shall be dense and the joint shall be well sealed. The surface in the area of the joint shall conform to the requirements hereinafter specified for surface tolerances when tested with the straightedge placed across the joint.

All locations where plate samples are taken from the roadway shall be immediately repaired by the contractor utilizing hot asphaltic concrete. All holes where cores are taken shall be repaired within 48 hours after coring using a material approved by the Engineer. All holes shall be in a dry condition prior to repair. The patching material shall be thoroughly compacted in the holes by the contractor.

The handling of asphaltic concrete shall at all times be such as to minimize segregation. Any asphaltic concrete which displays segregation shall be removed and replaced.

Before asphaltic concrete is placed, the surface to be paved shall be cleaned of all objectionable material and tacked in accordance with the requirements of Section 404 of the specifications. The cleaning of the surface, the tacking of the surface, and the type of bituminous material used shall be acceptable to the Engineer. The amount of bituminous material used shall be as directed by the Engineer.

A light coat of bituminous material shall be applied to edges or vertical surfaces against which asphaltic concrete is to be placed.

The contractor shall schedule its paving operations to minimize exposed longitudinal edges. Unless otherwise approved by the Engineer, the contractor shall limit the placement of asphaltic concrete courses, in advance of adjacent courses, to one shift of asphaltic concrete production. The contractor shall schedule its paving operations in such a manner to eliminate exposed longitudinal edges over weekends or holidays.

The moisture content of the asphaltic concrete immediately behind the paver shall not exceed 0.5 percent. The moisture content will be determined in accordance with AASHTO T 329.

When Warm Mix Asphalt (WMA) technologies are used, the contractor shall comply with the manufacturer’s recommendations for incorporating additives and WMA technologies into the mixture. The contractor shall comply with the manufacturer’s recommendations regarding transporting, storage, and delivery of additives and water foaming processes. The contractor shall maintain a copy of the manufacturer’s recommendations on file at the asphalt mixing plant and make those recommendations available for reference while using WMA technologies.

416-7 Acceptance:

416-7.01 General:

In addition to the random acceptance samples taken from each lot, the Engineer may sample and reject material which appears to be defective. Such rejected material shall not be used in the work. The results of tests run on rejected material will not be included with the lot acceptance tests.

Acceptance will be on the basis of the following:

(A) Sand equivalent;

(B) Fractured coarse aggregate particles;

(C) Uncompacted void content (for Special Mix);

(D) Material spread;

(E) Gradation;

(F) Asphalt cement content;

(G) Effective voids;

(H) Stability;

(I) Compaction; and

(J) Smoothness

416-7.02 Sand Equivalent, Fractured Coarse Aggregate Particles, and Uncompacted Void Content of Mineral Aggregate:

During asphaltic concrete production, the Engineer shall obtain and test samples of material for the determination of the sand equivalent and fractured coarse aggregate particles. When Special Mix is used, the uncompacted void content shall also be determined. When RAP is used in the mixture, the sand equivalent and uncompacted void content shall be determined on the composite of virgin aggregates only. Samples shall be obtained from the cold feed belt prior to the addition of mineral admixture, or from the stockpiles when sampling from the cold feed belt is not possible.

When RAP is used in the mixture, the material for determining the fractured coarse aggregate particles shall come from an asphaltic concrete sample taken and tested in accordance with AASHTO T 308, as specified in Subsection 416-7.04(A) of the specifications. However, if the Engineer determines that excessive breakdown of the aggregate has occurred due to the use of the ignition furnace, the fractured coarse aggregate particles testing shall be performed on

the combination of RAP aggregate, as obtained in accordance with AASHTO T 308, and virgin mineral aggregate.

Virgin mineral aggregate will be acceptable for sand equivalent if it meets the minimum requirements specified in Subsection 416-3.01 of the specifications.

The fractured coarse aggregate particles shall meet the minimum requirements specified in Subsection 416-3.01 of the specifications.

For Special Mix, the uncompacted void content shall meet the minimum requirements specified in Subsection 416-3.01 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, operations shall cease and the contractor shall have the option of submitting a revised mix design conforming to the requirements of Subsection 416-4 of the specifications or correcting deficiencies in the aggregate stockpiles.

416-7.03 Material Spread:

A spread lot shall be considered to be one-half shift of production. Lots encompassing more than one project shall be separated in accordance with Subsection 416-9(D) of the specifications.

The contractor shall record information pertaining to each spread lot on forms provided by the Engineer. Information shall include the project number, date and period of time that each spread lot was placed, the spread lot number, beginning and ending station, the plans thickness, and tons placed in each lot. Completed spread lot forms shall be signed by the contractor and given to the Engineer at the end of each shift.

The Engineer will calculate the quantity required in each spread lot using the mix design bulk density unless a request is made by the contractor to use a production bulk density. If a request is made to use production bulk density, the first three non-rejected lots following the test lot will be used to determine the average production bulk density. All lots placed prior to establishing the average production bulk density shall be calculated using the mix design bulk density. For each new mix design used on the project, a new production bulk density may be requested by the contractor. In addition, if conditions warrant during asphalt production, the contractor may request establishment of a new average production bulk density. All requests to use a production bulk density shall be made in writing and approved by the Engineer prior to use. The same procedure will be used for determining average production bulk density in all cases. Changes to the bulk density for calculating spread quantities will not be retroactive.

The calculated quantity required in each spread lot will be compared to the actual quantity placed. A lot will be considered to be acceptable, with a zero pay factor, if the actual quantity placed varies by no more than -2.0 to +5.0 percent from the required quantity.

If the quantity in a lot is found to vary from the required quantity by -2.1 to -12.0 percent, the appropriate pay factor will be determined in accordance with Table 416-1. This pay factor will be utilized in determining the pay adjustment as outlined in Subsection 416-9 of the specifications.

416-7.04 Gradation, Asphalt Cement Content, Effective Voids and Stability:

(A) General:

A mixture properties lot shall be considered to be one shift's production. In the event a shift's production is less than 1,200 tons, multiple shifts may be combined to form a lot. When a lot consists of production from more than one shift, the following conditions apply: at least one sample shall be taken each shift, at least one sample shall be taken every 500 tons, and no mix design or target value changes shall be made within the lot. If changes are made in the mix design or target values, new lots will be established.

Four samples of the asphaltic concrete shall be taken for each lot by the contractor, under the observation of the Engineer, at random locations designated by the Engineer. Samples will be taken in accordance with the requirements of AASHTO R 97 Plate Method and delivered to the Engineer immediately after being taken. The minimum weight of the sample shall be 75 pounds. The Engineer will split the sample and save one-half for 15 days after written notification to the contractor of test results for that lot has been made. The material will be tested by the Engineer for the following properties:

Test Property	Test Method
Asphalt Cement Content	AASHTO T 308 (for both Non-RAP and RAP mixes) (See Notes 1 and 2 below)
Gradation	
Marshall Density and Stability	AASHTO R 68, T 245
Maximum Theoretical Density	AASHTO T 209
Effective Voids	AASHTO T 269

Notes:

(1) A new calibration of the ignition furnace shall be performed for each mix design, and at any other time the Engineer directs.

(2) Ignition furnace results will be corrected for asphalt cement content in accordance with Subsection 416-7.04(B) as required.

Acceptance testing results will be furnished to the contractor within four working days of receipt of samples by the Engineer.

A mixture properties lot placed with an average stability below 2,500 pounds for base mixes, or 1,750 pounds for 1/2 inch or 3/4 inch mixes shall be rejected, and shall be subject to an engineering analysis of anticipated performance in accordance with Subsection 416-9(E) of the specifications. Production shall cease until the contractor proposes a corrective action

the Engineer finds acceptable. If the Engineer rejects the proposed corrective action, the contractor shall submit a revised mix design.

The target values for gradation, Asphalt Cement Content, and Effective Voids are given in the contractor's mix design. The Upper Limits (UL) and Lower Limits (LL) of acceptable production of each of the measured characteristics are as follows:

Measured Characteristics	**LL** (Note 1)	**UL** (Note 1)
Gradation (Sieve size):		
3/8 inch	TV - 8.0	TV + 8.0
No. 8	TV - 8.0	TV + 8.0
No. 40	TV - 5.0	TV + 5.0
No. 200	TV - 2.0	TV + 2.0
Asphalt Cement Content	TV - 0.50	TV + 0.50
Effective Voids	TV - 2.0	TV + 2.0

Notes:

(1) The limits are used in the statistical calculations for Quality Index. Acceptance is controlled by the variability of the produced material and every effort should be made to strive for the applicable target value (TV).

The Engineer will determine the PT for each measured characteristic in accordance with Subsection 416-9(H) of the specifications, and utilizing Table 416-1 will determine the pay factor for each measured characteristic.

In the event the contractor elects to question the mixture property test results, the contractor may request referee testing in accordance with Subsection 416-9(I) of the specifications.

(B) Ignition Furnace Correction:

Ignition furnace testing results shall be corrected in accordance with ADOT Materials Practice and Procedure Directive No. 20, "Guidance on the Use of Reclaimed Asphalt Pavement (RAP) in Asphaltic Concrete".

416-7.05 Compaction:

(A) Courses 1-1/2 Inches or Less in Nominal Thickness:

(1) General Requirements:

Asphaltic concrete shall be placed only when the temperature of the surface on which the asphaltic concrete is to be placed is at least 65 degrees F and the ambient temperature at the beginning of placement is at least 65 degrees F and rising. The placement shall be stopped when the ambient temperature is 70 degrees F or less and falling.

When Warm Mix Asphalt (WMA) technologies are not used in the mixture, asphaltic concrete immediately behind the laydown machine shall be a minimum of 275 degrees F.

When Warm Mix Asphalt (WMA) technologies are used in the mixture, the recommended temperature range for compaction during production shall be shown on the mix design and shall be approved by the Engineer.

All edges shall be rolled with a pneumatic tired compactor, or other methods approved by the Engineer, while the mixture is still hot.

(2) Equipment:

Compacting and smoothing shall be accomplished by the use of self-propelled equipment. Compactors shall be pneumatic-tired and/or steel wheel.

Compactors shall be operated in accordance with the manufacturer's recommendations. Compactors shall be designed and properly maintained so that they are capable of accomplishing the required compaction.

Steel wheel compactors shall weigh not less than 8 tons.

Pneumatic-tired compactors shall be the oscillating type with at least seven pneumatic tires of equal size and diameter. Wobble-wheel compactors will not be permitted. The tires shall be spaced so that the gaps between adjacent tires will be covered by the following tires. The tires shall be capable of being inflated to 90 pounds per square inch and maintained so that the air pressure will not vary more than 5 pounds per square inch from the designated pressure. Pneumatic-tired compactors shall be constructed so that the total weight of the compactor will be varied to produce an operating weight per tire of not less than 5,000 pounds. Pneumatic-tired compactors shall be equipped with skirt-type devices mounted around the tires so that the temperature of the tires will be maintained during the compaction process.

(3) Rolling Method Procedure:

Compaction shall consist of an established sequence of coverage using specified types of compactors. A pass shall be defined as one movement of a compactor in either direction. Coverage shall be the number of passes as are necessary to cover the entire width being paved.

The rolling sequence, the type of compactor to be used, and the number of coverages required shall be as follows:

Rolling Sequence	Type of Compactor		No. of Coverages	
	Option No. 1	Option No. 2	Option No.1	Option No. 2
Initial	Static Steel	Vibrating Steel	1	1
Intermediate	Pneumatic Tired	Vibrating Steel	4	2-4*
Finish	Static Steel	Static Steel	1-3	1-3

Note:

* Based on the roller pattern which exhibits the best performance.

The Engineer shall select the option for compaction and, when pneumatic-tired compactors are used, will designate the tire pressure.

One pneumatic-tired roller shall be furnished for each 300 tons of asphaltic concrete per hour.

Steel wheel compactors shall not be used in the vibratory mode for courses of 1 inch or less in thickness nor when the temperature of the asphaltic concrete falls below 180 degrees F.

Initial and intermediate compaction shall be accomplished before the temperature of the asphaltic concrete falls below 200 degrees F.

Compaction will be deemed to be acceptable on the condition that the asphaltic concrete is compacted using the type of compactors specified, ballasted and operated as specified, and with the number of coverages of the compactors as specified.

(B) Courses Greater than 1-1/2 Inches in Nominal Thickness:

Compaction control shall be the responsibility of the contractor. The number and types of rollers shall be the contractor's responsibility and shall be sufficient to meet these requirements.

All edges shall be rolled with a pneumatic tired compactor, or other methods approved by the Engineer, while the mixture is still hot.

A compaction lot shall be identical to the mixture properties lot described in Subsection 416-7.04 of the specifications. Lots encompassing more than one project shall be separated in accordance with Subsection 416-9(D) of the specifications. Each lot shall be tested for acceptance.

Twenty cores shall be taken for each lot by the contractor, under the observation of the Engineer. The Engineer will designate 10 random locations within the lot, and the contractor shall take two cores at each location; however, if more than one shift constitutes a lot, two cores shall be taken from a minimum of two random locations each shift, or as directed by the Engineer. The Engineer will save one core from each location for 15 days after written notification to the contractor of test results for the lot has been made. Randomly selected locations will be determined to the nearest 0.5 foot in the transverse direction and to the nearest foot in the longitudinal direction of the pavement course; however, the outside 1 foot of the unconfined pavement course will be excluded from testing as shown in Materials ADOT Practice and Procedure Directive (P.P.D.) No. 18, “Determining Sample Times and Locations for End Product Asphaltic Concrete”. Unless otherwise indicated in the project plans, shoulders shall be excluded from compaction lot testing on rehabilitation projects. Unless otherwise indicated in the project plans, placements without constant width including gore areas, tapers, and turn radii shall be excluded from compaction lot testing on all projects. P.P.D. No. 18 also addresses areas to be excluded relative to longitudinal joints. Areas excluded from testing will be compacted in accordance with Subsection 416-7.05(A) of the specifications. Cores shall be taken utilizing mechanical coring equipment in accordance with

the requirements of AASHTO R 97. Cores shall be a minimum of 4 inches in diameter and shall be taken not later than two working days after placement of the asphaltic concrete. The cores shall be delivered to the Engineer immediately upon being taken. The bulk density of each core will be determined by the Engineer in accordance with the requirements of AASHTO T 166. The test results will be furnished to the contractor within four working days of receipt of cores by the Engineer. In areas where more than one lift is placed in the same lot, coring shall be accomplished through the full depth of the lifts after the final lift is placed, and the compaction density shall be based on the full depth of the lifts.

The target value for compaction shall be 5.5 percent in-place air voids. In-place air voids shall be determined in accordance with AASHTO T 269. The maximum theoretical density used in the determination of air voids will be the average of the four maximum theoretical densities determined for the lot in Subsection 416-7.04 of the specifications.

The Upper Limit (UL) is 8.0 percent in-place air voids and the Lower Limit (LL) is 3.0 percent in-place air voids. The Engineer will determine the PT for compaction in accordance with Subsection 416-9(H), and utilizing Table 416-1 of the specifications will determine the compaction pay factor.

In the event the contractor elects to question the core test results, the contractor may request referee testing in accordance with Subsection 416-9(I) of the specifications.

416-7.06 Smoothness and Surface Tolerances:

Asphaltic concrete shall be compacted as required, smooth and true to the required lines, grades, and dimensions.

The Special Provisions may require the smoothness of the final pavement surface to be tested in accordance with Subsection 109.13 of the specifications.

Regardless of whether testing in accordance with Subsection 109.13 of the specifications is specified or not, the following requirements shall be met:

(A) The surface of any lift of asphaltic concrete placed under this section of the specifications, shall be tested and shall not vary by more than 1/4 inch from the lower edge of a 10-foot straightedge when it is placed in the longitudinal direction (including across transverse joints), and when it is placed in the transverse direction across longitudinal joints; and**f**

(B) All deviations exceeding the specified tolerances above shall be corrected by the contractor, to the satisfaction of the Engineer.

416-8 Method of Measurement:

Asphaltic concrete will be measured by the ton for the asphaltic concrete actually used, which will include the weight of mineral aggregate, asphalt cement, and mineral admixture. Measurement will include any quantity used in construction of intersections, turnouts, or other miscellaneous items or surfaces.

No separate measurement or payment will be made for mineral admixture, the cost being considered as included in the cost of the asphaltic concrete.

416-9 Basis of Payment:

The accepted quantities of asphaltic concrete, measured as provided above, will be paid for at the contract unit price adjusted by the appropriate pay factors as hereinafter provided.

When Warm Mix Asphalt (WMA) technologies are used in the mixture, no separate payment will be made for WMA additives or technologies, necessary hot plant modifications, or other associated costs.

For the purpose of determining acceptability and appropriate pay factors, each unit of asphaltic concrete will be included in three separate lots: a "spread lot", a "mixture properties lot", and a "compaction lot". The total unit price for any unit of accepted asphaltic concrete will be the contract unit price, adjusted by the applicable spread lot pay factor, mixture properties lot pay factor, and compaction lot pay factor.

The contractor may request to place the first lot of each mix type as a test strip. Requests to place a test strip shall be made in writing and acknowledged by the Engineer prior to start of production. A test strip shall be limited to 1,000 tons and may only be placed on shoulders, ramps, cross roads, or other areas approved by the Engineer. A test strip shall be excluded from the mixture properties lot pay factor and the compaction lot pay factor; however, all other provisions of Subsection 416-9 of the specifications shall still apply to such areas.

The Engineer may exclude asphaltic concrete from the spread lot and from the spread lot pay factor calculations if the Engineer determines that the proposed use of the material or the existing surface conditions are not conducive to the use of spread lots.

The Engineer may exclude certain locations from the mixture properties lot and/or the compaction lot and from the random sampling used in determining the mixture properties lot pay factor and/or the compaction lot pay factor should the Engineer determine that the location of the work precludes normal construction operations.

(A) Spread Lot Pay Factor:

The spread lot pay factor will be determined in accordance with Subsection 416-7.03 of the specifications. If the quantity in a spread lot is found to vary by more than +5.0 percent from the required quantity, no payment will be made for the material which exceeds +5.0 percent, including asphalt cement and mineral admixture. If the quantity is found to vary by more than -12.0 percent from the required quantity, the spread lot will be rejected.

(B) Mixture Properties Lot Pay Factor:

The mixture properties lot pay factor shall be determined in accordance with the following procedure:

(1) The individual PT values and pay factors for Gradation, Asphalt Cement Content, and Effective Voids shall be determined as set forth in Subsection 416-7.04 of the specifications.

(2) A single pay factor shall be determined for Gradation and Asphalt Cement Content. that pay factor shall be the lowest pay factor for the individual measured characteristics for Gradation and Asphalt Cement Content.

(3) If no individual PT value in (1) above is less than 50, the mixture properties lot pay factor shall be the sum of the pay factor determined in (2) above and the Effective Voids pay factor. The negative pay factor for mixture properties shall not exceed $3.00 per ton. If any individual PT value is less than 50, the lot is in reject and the provisions in Subsection 416-9(E) of the specifications shall apply.

(C) Compaction Lot Pay Factor:

The compaction lot pay factor shall be determined as set forth in Subsection 416-7.05(B) of the specifications.

(D) Determination of Lot Pay Factors on Contracts Involving Multiple Projects:

When more than one project is included in a single contract, placement during a shift or half shift of production may encompass more than one project. In such case, the applicable spread lot pay factor, mixture properties lot pay factor, and compaction lot pay factor for each project shall be determined as follows:

(1) Spread lot pay factors will be determined separately for each project utilizing the procedure set forth in Subsection 416-7.03 of the specifications.

(2) The individual PT values and pay factors for Gradation, Asphalt Cement Content, and Effective Voids will be determined from the results of the random samples taken and tested in accordance with Subsection 416-7.04 of the specifications, regardless of which project(s) the samples fall within.

(3) PT values and pay factors for compaction, for those areas subject to Subsection 416-7.05(B) of the specifications, shall be determined from separate sets of core samples for each project utilizing the procedure set forth in that Subsection.

(4) The mixture properties lot pay factor shall be determined separately for each project in accordance with Subsection 416-9(B) of the specifications, utilizing the individual pay factors determined in (2) above.

(5) The compaction lot pay factor shall be determined separately for each project in accordance with Subsection 416-9(C) of the specifications, utilizing the pay factor determined in (3) above.

(E) Acceptability:

Asphaltic concrete included in any mixture properties lot possessing an individual PT value lower than 50 for Gradation, Asphalt Cement Content, or Effective Voids will be rejected. Asphaltic concrete included in any compaction lot possessing a PT value lower than 50 will be rejected.

Within 25 days, or as agreed upon by the Engineer, after receiving notice that a spread lot, mixture properties lot, or compaction lot of asphaltic concrete has been rejected by the Engineer, the contractor may submit a written proposal to accept the material in place at the applicable maximum negative pay factor(s). Maximum negative pay factors are defined as a minus $1.00 per ton for spread lots, minus $5.00 per ton for compaction lots, 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. Positive mixture properties lot pay factors become zero when the compaction lot is in reject and the material is allowed to be left in place. In addition, for any mixture properties lot that is in reject due to Asphalt Cement Content but allowed to remain in place, payment shall not be made for asphalt cement quantities in excess of the upper limit (UL) as determined in Subsection 416-7.04(A) of the specifications.

The proposal shall contain an engineering analysis of the anticipated performance (i.e. reduction in serviceability, in years) of the asphaltic concrete if left in place. The engineering analysis shall also detail the potential root cause of the problem, any proposed corrective action, and the anticipated effect of such corrective action on the performance. The engineering analysis shall only include acceptance or referee test results, as applicable to the standards specifications. The engineering analysis shall include the expected additional cost to the Department (over original performance life) to maintain the pavement at an acceptable condition. The engineering analysis shall include supporting information such as pictures of the area, control charts, plant and field records, etc. The engineering analysis shall be performed by an independent professional engineer experienced in asphaltic concrete testing and the development of asphaltic concrete mix designs. If a rejected mixture properties lot or a rejected compaction lot is submitted for referee testing by the contractor, the 25 days allowed to prepare an engineering analysis will begin upon notification of referee test results.

The contractor may submit a written proposal without an engineering analysis for Engineer’s evaluation and approval, that a mixture properties lot with a PT value lower than 50 on gradation and/or asphalt cement content be allowed to remain in place if the application of a Self-Directed Target Change as outlined in Subsection 416-4 of the specifications would bring the PT value to 50 or greater. This written request shall also include the proposed revised PT calculations. Upon Engineer’s verification and approval of the request, the material shall remain in place at the maximum negative pay factor(s) specified in this subsection for the mixture properties lot in reject.

Within three working days, the Engineer will determine whether or not to accept the contractor's proposal. 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. If the proposal is accepted, the asphaltic concrete shall remain in place at the applicable maximum negative pay factor(s), and any necessary corrective action shall be performed at no additional cost to the Department.

The Department reserves the right to suspend the work should any of the following conditions occur:

(1) The occurrence of two or more rejected lots within any 10 consecutive production lots.

(2) The occurrence of three consecutive negative mixture properties lot pay factors or three consecutive negative compaction lot pay factors.

(3) The occurrence of five or more pay factors that are negative either for a mixture properties lot or for a compaction lot within any 10 consecutive production lots.

If the Department elects to suspend the work for any of these conditions, the contractor shall either submit a revised mix design in accordance with Subsection 416-4 of the specifications, or submit for the Engineer's approval a written engineering analysis. The engineering analysis shall detail the course of action necessary to correct deficiencies in the contractor's present production methods such that further production can be accomplished without excessive amounts of asphaltic concrete in penalty or rejection. If approved by the Engineer, the revised mix design, or the course of action proposed in the engineering analysis, shall be implemented, and the work may continue. Costs or delays due to the provisions of this subsection are not compensable.

(F) Asphalt Cement:

No separate measurement or payment will be made for asphalt cement (bituminous material), the cost being considered as included in the cost of the asphaltic concrete.

A reduction in payment to the contractor for asphaltic concrete will be made for quantities of asphalt cement (bituminous material) that do not meet the requirements of Section 1005 as determined by corresponding test results. Adjustments in payment shall be made in accordance with the requirements of Section 1005 of the specifications.

(G) Smoothness:

When required in the Special Provisions, payment for smoothness shall be made in accordance with the requirements of Subsection 109.13 of the specifications.

(H) Statistical Acceptance:

The “Total Percentage of Lot within UL and LL (PT)” shall be determined in accordance with Subsection 109.11 of the specifications.

Pay Factors (PF) shall be determined by entering Table 416-1 with PT.

TABLE 416-1
PAY FACTORS

Material Spread		Mixture Properties and Compaction			
			Pay Factors (Dollars per Ton)		
Negative Variance %	Pay Factor (Dollars per Ton)	PT	Gradation and Asphalt Cement Content	Effective Voids	Compaction
2.1 - 3.0	- 0.10	100	0.00	+ 2.00	+ 2.00
3.1 - 4.0	- 0.20	95 - 99	0.00	+ 1.00	+ 1.00
4.1 - 5.0	- 0.30	90 - 94	0.00	0.00	0.00
5.1 - 6.0	- 0.40	85 - 89	0.00	- 0.25	- 0.25
6.1 - 7.0	- 0.50	80 - 84	- 0.25	- 0.50	- 0.50
7.1 - 8.0	- 0.60	75 - 79	- 0.50	- 0.75	- 0.75
8.1 - 9.0	- 0.70	70 - 74	- 0.75	- 1.00	- 1.00
9.1 - 10.0	- 0.80	65 - 69	- 1.00	- 1.25	- 1.25
10.1 - 11.0	- 0.90	60 - 64	- 1.50	- 1.50	- 1.75
11.1 - 12.0	- 1.00	55 - 59	- 2.00	- 2.00	- 2.25
More than 12.0	Reject	50 - 54	- 2.50	- 2.50	- 3.00
See Subsections 416-9(A) and (E)		Less than 50	Reject-See Subsection 416-9(E)		

(I) Referee Testing:

(1) Referee Testing Performed for Mixture Properties Only:

Within 15 days after written notification to the contractor of test results for a particular mixture properties lot, the contractor may make a written request for referee testing. The referee testing shall be performed by an independent approved laboratory designated by the Department. The testing of the samples will be performed by the independent testing laboratory without knowledge of the specific project conditions such as the identity of the contractor or mix design laboratory, the test results by the Department, or the mix design targets for gradation and effective voids. The asphaltic concrete samples previously saved will be tested for the following properties:

Test Property	Test Method
Asphalt Cement Content	AASHTO T 308 (for both Non-RAP and RAP mixes)
Gradation	
Marshall Density and Stability	AASHTO R 68, T 245
Maximum Theoretical Density	AASHTO T 209
Effective Voids	AASHTO T 269

The results of the referee testing will be binding on both the contractor and the Department.

Using the referee testing results, the Engineer will determine new PT's for all characteristics.

When referee testing is performed on a mixture properties lot, the referee test result for the average maximum theoretical density will be used to determine a new PT for compaction.

The Department will pay for the referee testing; however, if the combined pay factor of the lot (mixture properties plus compaction) does not improve or is reduced, or if either the mixture properties lot or compaction lot remains in reject or is placed in reject, payment to the contractor for asphaltic concrete shall be reduced by the amount of the cost of the referee testing for the mixture properties of that particular lot.

(2) Referee Testing Performed for Compaction Only:

Within 15 days after written notification to the contractor of test results for a particular compaction lot, the contractor may make a written request for referee testing. The bulk density of each of the cores previously saved will be determined in accordance with the requirements of AASHTO T 166 by an independent testing laboratory designated by the Department. The testing of the cores will be performed by the independent testing laboratory without knowledge of the specific project conditions, such as the identity of the contractor or mix design laboratory, or the test results by the Department. The percent air voids will be determined in accordance with AASHTO T 269. The maximum theoretical density used in the determination of air voids will be the average of the four maximum theoretical densities determined for the lot in Subsection 416-7.04 of the specifications.

The results of the referee testing will be binding on both the contractor and the Department.

When referee testing is performed on the compaction lot, the Engineer will determine a new PT for compaction using the referee testing results.
The Department will pay for the referee testing; however, if the pay factor of the compaction lot does not improve or is reduced, or the compaction lot remains in reject or is placed in reject, payment to the contractor for asphaltic concrete will be reduced by the amount of the cost of referee testing for the compaction of that particular lot.

(3) Referee Testing Performed for Both Mixture Properties and Compaction:

When referee testing is performed, as described above, for both the mixture properties lot and the compaction lot, the Engineer will use the referee test results to determine new PT's as specified in Subsections 416-9(I)(1) and 416-9(I)(2) of the specifications.

The Department will pay for the referee testing; however, if the combined pay factor of the lot (mixture properties plus compaction) does not improve or is reduced, or if either the mixture properties lot or compaction lot remains in reject or is placed in reject, payment to the contractor for asphaltic concrete shall be reduced by the amount of the cost of the referee testing for the mixture properties and compaction of that particular lot.

(501QCDRN, 07/15/05)

SECTION 501 PIPE CULVERT AND STORM DRAINS:

501-3 Construction Requirements: of the Standard Specifications is modified to add:

501-3.01(A) Contractor Quality Control:

The contractor shall perform the quality control measures described in Subsection 106.04(C). At the weekly meeting, the contractor shall be prepared to explain and discuss how the following processes will be employed:

(a) Bedding and backfill production, including crusher methods, pit extraction, and washing.

(b) Stockpile management, including stacking methods, separation techniques, stockpile pad thickness, and segregation prevention.

(c) Transporting and placing, including transport technique, lift thickness, processing and mixing technique, and compaction methods.

The contractor shall obtain samples and perform the tests specified in the following table:

CONTRACTOR QUALITY CONTROL TESTING REQUIREMENTS			
TYPE OF TEST	TEST METHOD	SAMPLING POINT	MINIMUM TESTING FREQUENCY
Backfill Material			
Gradation	ARIZ 201	Stockpile	1 per 500 CY per Source
PI	AASHTO T 89 AASHTO T 90		

CONTRACTOR QUALITY CONTROL TESTING REQUIREMENTS			
TYPE OF TEST	TEST METHOD	SAMPLING POINT	MINIMUM TESTING FREQUENCY
Proctor Density	ARIZ 225 ARIZ 226 ARIZ 245	Stockpile	1 per Source and as needed
Field Density	ARIZ 227 ARIZ 230 ARIZ 232 ARIZ 235 ARIZ 246	In-place	1 per 200 CY, minimum 1 per lift
Bedding Material			
Gradation	ARIZ 201	Stockpile	1 per 300 CY per Source
PI	AASHTO T 89 AASHTO T 90		
Proctor Density	ARIZ 225 ARIZ 226 ARIZ 245	Stockpile	1 per Source and as needed
Field Density	ARIZ 227 ARIZ 230 ARIZ 232 ARIZ 235 ARIZ 246	In-place	1 per 50 CY

(501PIPE, 01/20/22)

SECTION 501 PIPE CULVERTS AND STORM DRAINS:

501-3.02(A)(1) GENERAL: the last paragraph of the Standard Specifications is revised to read:

Bedding material for all metal pipe shall have a value of resistivity not less than 2,000 ohm-centimeters unless otherwise specified or approved by the Engineer. Bedding material shall have a pH value between 6.0 and 10.0, inclusive, for all metal pipe installations except aluminum. Bedding material for aluminum pipe installations shall have a pH value between 6.0 and 9.0, inclusive. Bedding material shall have a pH value between 6.0 and 12.0, inclusive, for all concrete or plastic pipe installations. Tests for pH and resistivity shall be in accordance with the requirements of Arizona Test Method 236.

ITEM 5030702 - JUNCTION STRUCTURE (DETAIL DJ):

Description:

The work under this item shall consist of constructing junction structures at the locations shown on the project plans, and in accordance with these specifications.

Materials:

Portland cement concrete shall conform to the requirements of Section 1006 for Class S concrete of the specifications.

Reinforcing steel bars shall conform to the requirements of Section 1003 of the specifications. All reinforcing steel bars shall be Grade 60.

Frame and cover for junction structure shall conform to the requirements of Section 505-2.05 of the specifications.

Mortar shall conform to the requirements of Subsection 503-2.03 of the specifications.

Bolt material shall conform to ASTM A307. Bolts shall be galvanized to conform to ASTM A153.

Construction Requirements:

The junction structure shall be constructed in accordance with the requirements of Sections 505 and 601 of the specifications.

Method of Measurement:

Junction structure will be measured as a unit for each junction structure furnished and constructed.

Basis of Payment

The accepted quantities of junction structure, measured as provided above, will be paid for at the contract unit price per each, which price shall be full compensation for the work complete in place, including excavation, and backfill.

(601BDCFA, 02/19/26)

SECTION 601 CONCRETE STRUCTURES:

601-2.01 General: of the Standard Specifications is modified to add:

For cast-in place concrete used in bridge deck placement, fiber additives shall be incorporated into the concrete mix for plastic shrinkage control. Fiber additive shall be Polyolefin,

conforming to the requirements of ASTM D7508/D7508M and applicable requirements of Section 1006 of the specifications. The specific type, size, and quantity of fiber additive shall be determined by the mix designer. The contractor shall submit the results from ASTM C1579, along with the proposed concrete mix design, to the Engineer for review and approval. Fiber additive shall be composed of 100 percent virgin materials and shall be non-corrosive, non-magnetic, and entirely alkali-free.

601-6 Basis of Payment: of the Standard Specifications is modified to add:

No separate measurement or payment will be made for fiber additive, the cost being considered as included in the cost of the Class S or Class B concrete, which price shall be full compensation for the work, complete in place, including excavation, and backfill.

(601CSDF, 02/19/26)

SECTION 601 CONCRETE STRUCTURES:

601-3.02(A) Design and Drawings: the twenty fourth paragraph of the Standard Specifications is revised to read:

In the application and design of deck falsework systems, all bridge girders, new or existing, shall be braced or tied to resist any forces that would cause rotation and torsion in the girders caused by the placing of concrete for diaphragms or decks. The bracing system shall be included in the deck falsework design and shown on the deck falsework drawings. The contractor may choose not to provide a bracing system only when calculations demonstrate that the existing bridge components already provide adequate resistance to rotation and torsion. The calculations shall include this check and clearly show that the bridge girders can resist rotation and torsion without additional bracing.

601-3.04(B)(3)(b) Fabrication: the second paragraph of the Standard Specifications is revised to read:

The deck joint assemblies' fabrication plant shall be certified under the AISC Quality Certification program as a Certified Bridge Fabricator-Simple (SBR), or higher.

601-3.05(D)(1) General: the first paragraph of the Standard Specifications is revised to read:

Bridge decks that will receive an overlay, sawed grooves, diamond grinding or waterproofing membrane shall be lightly textured with a burlap drag, broom finish, or other engineer approved drag type texturing during the plastic concrete state, after the finishing operation and smoothness test, as specified below, and prior to the curing process. Bridge decks exposed directly to traffic shall be grooved or tined as specified in Subsection 601-3.05(D)(2) of the specifications.

601-4.04 Opening to Traffic: the first paragraph of the Standard Specifications is revised to read:

No vehicular traffic will be allowed on the structure until at least 10 days after the last concrete has been placed in each continuous portion of a structure and until the compressive strength of all placed concrete has reached the required 28-day compressive strength on structures in which cast-in-place concrete has been used. For bridge deck joints and closure pours with specified early strength concrete intended to meet an accelerated traffic opening, the engineer may allow opening bridge to traffic, provided the specified early concrete strength specified in the contract document has been met.

(601PCC, 09/21/23)

SECTION 601 CONCRETE STRUCTURES:

601-3.03(C) Pumping Concrete: of the Standard Specifications is revised to read:

Where concrete is conveyed and placed by mechanically applied pressure, the equipment shall be of suitable type and shall have adequate capacity for the work. The concrete shall not flow either over or through any piping, fittings or equipment which is fabricated of aluminum or aluminum alloys. The operation of the pump shall be such that a continuous stream of concrete without air pockets is produced. Excessive segregation due to high velocity discharge of the concrete will not be permitted. When pumping is completed, the concrete remaining in the pipeline, if it is to be used, shall be ejected in such a manner that there is no contamination of the concrete or segregation of the ingredients. Standby equipment shall be readily available to replace initial pumping equipment should breakdown occur.

SECTION 601 CONCRETE STRUCTURES:

601-5 Method of Measurement: of the Standard Specifications is modified to add:

Concrete headwalls will be measured as a unit for each concrete headwall furnished and constructed.

601-6 Basis of Payment: of the Standard Specifications is modified to add:

The accepted quantities of concrete headwall, measured as provided above, will be paid for at the contract unit price per each, which price shall be full compensation for the work, complete in place, including excavation, and backfill.

ITEM 6010508 - BRIDGE REPAIR (TIGHTEN SPLICE BOLTS)

Description:

Recent inspection reports for the existing Matthie RR OP bridge identify a loose bolt at the southern splice connection of girder 4 at the bottom flange splice plate. The work under this

item shall consist of furnishing all labor and equipment required for checking nuts and bolts at all girder splice connections for tightness and tightening loose nuts and bolts to the specified tension force.

Construction Requirements:

Nuts and bolts at all girder splice connections shall be checked for tightness. Any loose nuts and bolts shall be tightened to a minimum tension of 36 kips.

Method of Measurement:

Payment for this work will be measured on a lump sum basis.

Basis of Payment:

The accepted quantities of Bridge Repair (Tighten Splice Bolts), measured as provided above, will be paid for at the contract lump sum price, which shall be full compensation for the work, complete in place, as described and specified herein and as shown on the plans.

ITEM 6011190 - REPLACE BRIDGE DECK JOINT SEAL (3x3 COMPRESSION SEAL)

Description:

The work under this item shall consist of removing the existing joint seals and replacing them with new joint seals at the locations shown on the project plans.

Materials:

The seals shall conform to the requirements of Subsection 1011-5 of the specifications.

Construction Requirements:

Prior to removing any bridge deck joint seals, the contractor shall verify with the Engineer the test results for asbestos-containing material (ACM >1%) and lead contamination (lead>HUD/EPA thresholds), as specified in Subsection 202-3.05 of these specifications.

After the removal of the existing joint seals and immediately prior to the installation of the new joint seals, the metal contact surfaces of the joint armor shall be clean, dry and free of oil, rust, paint, or foreign material. Any perforation or tearing of the bridge deck joint seal due to installation procedures or construction activities will be cause for rejection of the installed bridge deck joint seal.

The removed joint seal shall become the property of the contractor.

Method of Measurement:

Replace bridge deck joint seal will be measured by the linear foot along the centerline of the deck joint and at the surface of the roadway to the nearest linear foot.

Basis of Payment:

The accepted quantities of replace bridge deck seal, measured as provided above, will be paid for at the contract unit price per linear foot, which price shall be considered full compensation for the work, complete in place, including the removal and disposal of the existing joint seal.

(605STRF, 8/21/25)

SECTION 605 STEEL REINFORCEMENT:

605-3.01 General: the sixth paragraph of the Standard Specifications is revised to read:

Reinforcement shall be accurately fabricated and placed as shown on the plans and shall be firmly held in place by wire ties at all intersections and splices with 16 gauge or heavier tie wires and with precast mortar blocks or ferrous metal chairs, spacers, metal hangers, supporting wires, or other approved supports at the spacing necessary to maintain the specified clearance of the rei n forcing steel. The use of pebbles, broken stone, concrete masonry blocks, brick, metal pipe, or wood blocks will not be permitted for the purpose of spacing or support.

The contractor has the option to submit a request detailing the use of contract or buried bars, including supporting drawings, for review and approval by the Engineer.

For reinforcement spacing is greater than or equal to 12 inches in either the longitudinal or transverse directions, the reinforcement shall be tied at a minimum every alternate intersection.

Where reinforcement spacing is less than 12 inches in either the longitudinal or transverse directions, the reinforcement shall be tied at a minimum, every third intersection.

The contractor may submit a request detailing an alternative tying plan for review and approval by the Engineer.

(608 PANEL, 06/19/25)

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: the title and the text of the Standard Specifications are revised to read:

608-2.10 Digital Printing of Signs:

Digital printing of signs shall utilize a matched component system, including appropriate software and drivers in accordance with an APL certified retroreflective sheeting manufacturer's warranty requirements. Finished signs shall consist of a UV-protective clear overlay applied to the entire face of the sign. Any overlays shall also be compatible with the retroreflective sheeting manufacturer's matched component system and warranty. Digitally printed signs shall conform to the requirements of ASTM D4956 for daytime and nighttime requirements, as well as the requirements of the Department's Traffic Engineering Guidelines and Processes (TGP) 380 and Section 1007 of the specifications.

ITEM 6080055 - SIGN PANEL (RELOCATE):

Description:

The work under this item shall consist of relocating sign panels and removing sign posts and foundations at the locations shown on the project plans and as specified herein.

Construction Requirements:

Construction shall conform to the requirements of Section 608 of the specifications.

The contractor shall remove the sign panels and reinstall the panels on new posts with new hardware as shown on the project plans.

The sign designated for relocating shall be removed and stored in such a manner that it is not damaged. Any sign panel damaged resulting from the contractor's operation shall be replaced at no additional cost to the Department.

The sign posts and foundations shall be removed in accordance with the requirements of Section 202 of the specifications.

Method of Measurement:

Sign Panel (Relocate) will be measured on a per each basis.

Basis of Payment:

The accepted quantity of sign panel relocation, measured as provided above, will be paid for at the contract unit price per each, which price shall be full compensation for the work, complete in place, including the removal and disposal of the posts and foundations.

The new posts and foundations will be measured and paid for under their respective bid items.

(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 C.

(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.

(610PNT, 8/21/25)

SECTION 610 PAINTING:

610-3.02 (A)(2) Steam Cleaning: the first paragraph of the Standard Specifications is revised to read:

All dirt, grease, loose chalky paint, and other foreign material which has accumulated on previously painted surfaces shall be removed with a steam cleaning apparatus prior to all other phases of cleaning. It is not intended that sound paint be removed by this process. After steam cleaning, any paint which has become loose, curled, lifted, or loses its bond to the

preceding coat or coats shall be removed to sound paint or metal surface by the contractor a t no additional cost to the Department.

610-3.02 (A)(3) Hand Cleaning: of the Standard Specification is revised to read:

Manual or powered wire brushes, hand scraping tools, power grinders, or sandpaper shall be used to remove all dirt, loose rust, mill scale, and paint which is not firmly bonded to the surfaces.

610-3.05 (A)(1) General: the second paragraph of the Standard Specifications is revised to read:

All paints used shall be appropriately chosen from among the types described in Subsection 1002-2 of the specifications and shall conform to the requirements given therein.

610-3.05 (B) Concrete Surfaces: the first paragraph of the Standard Specifications is revised to read**:**

When painting is specified on the plans or in the special provisions, paint conforming to the requirements of Subsection 1002-2.03 of the specifications, shall be applied to the exposed concrete surfaces tabulated below, except that sidewalks, appurtenant curbs, downdrains, and bridge deck surfaces shall be excluded.

ITEM 6110200 - METAL HANDRAIL (DETAIL DO):

Description:

The work under this item shall consist of installing metal handrail at the locations and in conformance to the details shown on the project plans, in accordance with the specifications and as directed by the Engineer.

Materials:

Materials shall conform to the requirements specified on Detail DO of the project plans and in the specifications.

Concrete shall conform to the requirements of Section 922 of the specifications.

The epoxy materials shall conform to the requirements of Section 1015 of the specifications.

The metal handrail shop drawings and submittals shall conform to the requirements of Subsection 105.03 of the specifications. Details that deviate from Detail DO shall be approved by the Engineer and sealed by a Licensed Professional Engineer registered in the State of Arizona.

The contractor shall furnish copies of all mill reports on steel materials furnished.

Certificates of Compliance conforming to the requirements of Subsection 106.05 shall be submitted for the metal handrail.

The color of the exterior paint shall match the type, texture, color, hue, shade and quality of Sherwin Williams Color Palette No. SW 6095 Toasty – Gloss. The Sherwin Williams color number is included for reference only. Any paint provider shall match this color. Only paints and paint systems approved in accordance with Section 1002 of the specifications and shown on the Department's Approved Products List (APL) shall be allowed for use.

Construction Requirements:

Prior to beginning any work on the fabrication of the railing, the contractor shall submit shop drawing for approval, showing complete details.

The railing shall be carefully erected, true to line and grade. Posts shall be vertical and parallel with the deviation from the vertical from the full height of the panel not exceeding 1/8".

Welding shall be performed in accordance with the requirements of Subsection 604-3.06 of the specifications and the current edition of the American Welding Society, Structural Welding Code, D1.1. All butt welds on exposed surfaces shall be ground flush with adjacent surfaces. After erecting the railing, any abrasion or exposed steel shall be repaired in accordance with Sections 604 and 610 of the specifications.

The railing shall be painted in accordance with the requirements of Section 610 of the specifications. Any paint that has been damaged during handling, transporting or welding shall be repaired by the contractor at no additional cost to the Department. Paint coverage for items to be embedded in concrete shall be extended a minimum of 2 inches below the finished concrete surface.

After erecting the railing, any damage or abrasion to painted surfaces or exposed steel shall be repaired in accordance with Section 610 of the specifications.

Method of Measurement:

Metal handrail will be measured by the linear foot from end post to end post along the face of the railing including terminal sections.

Basis of Payment:

The accepted quantities of metal handrail, measured as provided above, will be paid for at the contract unit price per linear foot, which price shall be full compensation for the work, complete in place, including railing, posts, fittings, anchorages, and painting, as shown on the plans and specified herein.

(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.

(701EATERM, 08/19/21)

ITEM 7010025 - TEMPORARY IMPACT ATTENUATION DEVICE (IN-LINE ENERGY ABSORBING TERMINAL):
ITEM 7010026 - TEMPORARY IMPACT ATTENUATION DEVICE (IN-LINE ENERGY ABSORBING TERMINAL) (IN USE):

Description:

The work under these items shall consist of furnishing, installing, maintaining, and removing in-line energy absorbing terminals in conformance with the details shown on the project plans, and in accordance with the special provisions.

Materials:

In-line energy absorbing terminals shall meet the evaluation criteria for Test Level 3 per MASH (AASHTO Manual for Assessing Safety Hardware) for a speed of 62 miles per hour.

The delineation for the terminals shall conform to the requirements of the Standard Drawing M-34 or in accordance with the manufacturer's recommendations. The retroreflective sheeting type shall conform to the requirements of Section 1007 of the specifications.

The contractor shall provide, at the preconstruction conference, a certificate of compliance, conforming to the requirements of Subsection 106.05 of the specifications. The contractor shall include the project number on the submittal. The contractor shall submit the certification at least two weeks prior to the intended use of the terminal.

In regions that are subject to cold weather conditions, if the water filled In-line energy absorbing terminals elements that are prone to freezing are used, appropriate antifreeze agents shall be used in accordance with the manufacturer's recommendations. The antifreeze materials must be approved by the ADOT Environmental Planning and may require a leak containment as part of the system. If required by the ADOT Environmental Planning, system components containing chemicals must be labeled per OSHA requirements.

Construction Requirements:

The contractor shall install the in-line energy absorbing terminal at the locations shown on the project plans, in accordance with the manufacturer's instructions and to the satisfaction of the Engineer.

Any traffic control device which will require in-line energy absorbing terminal shall be installed by the contractor only after the Engineer's approval of the terminal's use.

At the preconstruction conference meeting, the contractor shall provide in writing, a plan to repair and/or replace any damaged unit during the construction for the Engineer's approval.

Any unit which has been excessively damaged prior to installation, as determined by the Engineer, shall not be used.

Any unit damaged during or after the installation by the contractor's operations shall be repaired or replaced with an undamaged unit by the close of that work shift, at no additional cost to the Department. Any unit damaged by the travelling public; the contractor shall replace the unit within 36 hours of identifying the damage.

Method of Measurement:

Temporary Impact Attenuation Device (In-Line Energy Absorbing Terminal) will be measured by the unit for each in-line energy absorbing terminal furnished and installed.

Temporary Impact Attenuation Device (In-Line Energy Absorbing Terminal) (In Use) will be measured by the each-day for each 24-hour day that an in-line energy absorbing terminal is in place and functional for the “in use” condition as specified in Subsection 701-4.01(B) of the specifications.

Basis of Payment:

The accepted quantities of Temporary Impact Attenuation Device (In-line Energy Absorbing Terminal), measured as provided above, will be paid for at the contract unit price per each, which price shall be full compensation for the work including delineation, maintenance, and removal of the terminal, complete in place.

Fifty percent of the contract unit price for the in-line energy absorbing terminal will be paid upon satisfactory installation and fifty percent of the contract unit price will be paid upon final removal of the installed terminal.

Measurement and payment for an in-line energy absorbing terminal which is damaged by the traveling public will be made in accordance with the requirements of Subsection 109.04 of the specifications.

The accepted quantities of Temporary Impact Attenuation Device (In-line Energy Absorbing Terminal) (In Use), measured as provided above, will be paid for at the contract unit price per each-day, which price shall be full compensation for the work, complete in place.

ITEM 7017030 SEQUENTIAL FLASHING WARNING LIGHTS:

Description:

The work under this item shall consist of installing Sequential Flashing Warning Lights (SFWL) on the channelizing devices at the locations shown on the project plans and as specified herein.

Materials:

(A) Sequential Flashing Warning Lights:

The SFWL shall conform to the requirements for warning lights of the current edition of the Manual on Uniform Traffic Control Devices (MUTCD). The SFWL shall be portable, lens directed, enclosed lights emitting a yellow color. Lights shall be in accordance with the current requirements of the Institute of Transportation Engineers (ITE) Standard for Flashing and Steady Burn Warning Lights. The complete assembly shall be certified as crashworthy in accordance with the requirements of the Subsection 701-2.01 of the specifications, when firmly affixed to the channelizing device.

Each light shall be capable of operating fully and continuously for a minimum of 200 hours. Each device shall be equipped with a photodetector that activates the lamp during evening

hours and turns the lamp off during sunlight hours. In addition, the photodetector shall sense ambient light such that the lamps continue to flash during fog and dark cloudy days.

Each light in the sequence shall flash at a rate of not less than 55 times per minute and not more than 75 times per minute. The flash rate and flash duration shall be consistent throughout the sequence.

Unless otherwise shown in the plans or directed by the Engineer, SFWL shall be visible from one side only. The SFWL shall be visible on a clear night from a distance of 3,000 feet.

A Type 3 Certification (Independent Test Lab results) shall be submitted documentation for all the results for the specified parameters contained in the ITE's Purchase Specification for Flashing and Steady Burn Warning Lights. The certification shall also identify all manufacturer codes and part numbers for the incandescent lamp or LED clusters, lenses, battery, and circuitry, and indicate the total width of the light with the battery in place.

The contractor shall submit all necessary literature and certifications to the Engineer for approval prior to use.

(B) Remote Monitors:

The SFWL shall be equipped with remote monitoring. The remote monitoring shall monitor functions of the SFWL and control the functions of each light deployed.

The monitor shall have the capability to make changes to the flash rate of each SFWL, controlling the number of times the "moving" light sequences through the merge taper in a given period of time.

When lane closures are not in effect during certain times of the project schedule, the SFWL shall be deactivated either via remote radio signal or control from a single lamp that controls all the lamps.

The contactor shall be responsible for remote monitoring and shall respond to the Engineer within one hour of notification of a system or equipment failure.

Construction Requirements:

The successive flashing of the lights shall occur from the upstream end of the merging taper to the downstream end of the merging taper in order to identify the desired vehicle path.

The number of lights used shall be equal to the number of channelizing devices used in the taper. The SFWL shall be weather independent, and visual obstructions shall not interfere with the operation of the lights.

The SFWL shall automatically sequence when placed in line in an open area with a distance of 10 to 100 feet between them. A 10 foot stagger in the line of lights shall have no adverse effect on the operation of the lights. If one light fails, the flashing sequence shall continue. If

more than one light fails, all of the lights shall be automatically turned to the “off” mode. Non-Sequential flashing is prohibited.

When lane closures are not in effect at night, the SFWL shall be deactivated.

(A) SFWL Interruptions:

If SFWL malfunction, the contractor shall implement the operational plan malfunction protocol and notify the Engineer immediately. The SWFL shall be repaired or replaced within 12 hours after notification.

If the SFWL are not repaired or replaced within 12 hours, the contractor shall submit a plan and schedule for how and when the SFWL signals will be operational to the Engineer. The plan shall explain the reasons for the repair and replacement to exceed 12 hours.

Method of Measurement:

Sequential Flashing Warning Lights will be measured on a per each basis by the unit for each 24-hour per day for each device furnished and installed.

Basis of Payment:

The accepted quantities of Sequential Flashing Warning Lights, measured as provided above, will be paid for at the contract unit price for each 24-hour per day, which price shall be full compensation for the work, complete in place.

No measurement or direct payment will be made for the preparation of the operational plan, any reports, calibration, or removal, the cost being considered as included in the cost of the contract item.

(704TPMF, 10/17/24)

SECTION 704 THERMOPLASTIC PAVEMENT MARKINGS:

704-2.02(C) Filler: of the Standard Specifications is revised to read:

The filler shall be a white calcium carbonate or equivalent filler.

(705PVMRK, 09/21/23)

SECTION 705 PREFORMED PLASTIC PAVEMENT MARKING: the title and text of the Standard Specifications are revised to read:

SECTION 705 PREFORMED POLYMER PAVEMENT MARKING:

705-1 Description:

(A) General:

The work under this section shall consist of furnishing all materials, preparing the pavement surface and applying preformed reflectorized pavement marking tape, or preformed thermoplastic longitudinal edge lines, skip lines, stop lines, yield lines cross walks, legends and symbols to the pavement in accordance with the details shown on the project plans and the requirements of the specifications.

All markings shall be reflectorized with glass beads or other retroreflective particles uniformly distributed throughout the entire cross section and bonded to the top surface of the material. All markings shall comply with the retroreflectance requirements of Subsection 705-2.05 of the specifications. When glass beads are used to reflectorize markings, the glass bead properties shall also comply with Subsection 705-2.06 of the specifications.

Certificates of Compliance conforming to the requirements of Subsection 106.05 of the specifications shall be submitted.

Preformed pavement marking tape or preformed thermoplastic longitudinal edge lines, skip lines, stop lines, yield lines, cross walks, legends, and symbols shall be limited to the following applications unless otherwise specified in the contract documents:

A list of approved manufacturers and distributors of Type I, II, III, and IV preformed pavement marking materials is shown on the Department's Approved Product Lists (APL). The most recent version is available on the Department's website from the ADOT Research Center, through its Product Evaluation Program.

(B) Preformed Pavement Markings - Type I (Permanent):

Type I shall be a general purpose high durability retroreflective, pliant, polymer layer for preformed long line and short line striping, symbols, and legends to be used for final permanent pavement markings. Type I shall be capable of performing as specified herein when subjected to high traffic volumes and severe wear conditions such as repeated shear action from crossover or encroachment on edge and channelization lines, starting, stopping, and turning movements.

(C) Preformed Pavement Markings - Type II (Temporary – Removable):

Type II shall be a removable preformed retroreflective pavement marking capable of performing as temporary pavement markings for long line and short line striping, symbols, and legends for the duration of a normal construction season. It shall be a nonmetallic mixture of durable materials and shall be capable of being removed intact or in large pieces either manually or with a recommended roll up device. Type II shall be used on finished pavement surfaces where traffic control or channelization through the construction zone is temporary requiring removal prior to final pavement markings.

(D) Preformed Pavement Markings - Type III (Temporary –Nonremovable):

Type III shall be a nonremovable preformed retroreflective layer on a conformable metallic backing capable of performing as temporary long line pavement markings for the duration of a normal construction season. Type III shall be used in construction zones where removal is unnecessary due to placement of future paving courses or where pavement will be removed, obliterated or abandoned at the completion of the project.

(E) Preformed Thermoplastic Pavement Markings - Type IV (Permanent):

Type IV shall be a high durability, retroreflective, pliant, preformed thermoplastic product to be used for final permanent symbols, legends, and short line (transverse) stripes. Type IV shall be capable of performing as specified herein when subjected to high traffic volumes and severe wear conditions.

705-2 Materials:

705-2.01 Preformed Pavement Markings - Type I (Permanent):

(A) General:

Type I preformed pavement marking material shall consist of a prefabricated white or yellow layer of specified thickness and width that shall be capable of being affixed to Portland Cement Concrete or non-bleeding bituminous pavements per the manufacturer's requirements, either on the pavement surface or, when specified on the plans, inlaid into a cutout groove. The preformed polymer layer shall be weather resistant and through normal traffic wear shall show no appreciable fading, lifting, loss of skid resistance, or shrinkage or significant tearing, roll back, or other signs of poor adhesion throughout the useful life of the marking.

The polymer layer without adhesive shall be a minimum of 0.065 inch thick. The polymer layer as supplied shall be of good appearance, free of cracks and discolorations, and the edges shall be clean-cut and well-defined. The polymer layer shall have a precoated, factory-applied pressure sensitive adhesive backing. A surface preparation primer shall also be applied if recommended by the manufacturer. Whether the adhesive is precoated or supplied separately, the adhesive shall allow the polymer layer to be repositioned on the pavement surface to which it is applied before permanently fixing it in its final position with a downward pressure.

When an Oreo typecontrast pavement marking material is to be used as shown on the plans, the entire length of the pavement marking shall have 2 inch-wide borders on each side across the width of the reflective base pavement marking (white, yellow or other color). These borders shall be non-reflective and black in color. The contrast pavement marking material, including the borders, shall conform to the requirements for durability, skid resistance, thickness, and adhesion specified in Subsection 705-2.01(C) of the specifications.

When a Lead-lag type contrast pavement marking material is to be used as shown on the plans, Lead-lag pavement markings shall be used only on Portland Cement Concrete pavement surfaces, or as directed by the Engineer.

All white and yellow Type I pavement markings shall be warrantied by the manufacturer to retain color and adherence to the pavement, and to retain a minimum retroreflectance of 100 millicandelas/m^2/lux for a minimum of two years for symbols, legends, and transverse pavement markings, and six years for longitudinal pavement markings. The warranty period shall begin after all pavement markings are installed and accepted by the Department. Failure to meet the specified retroreflectance on at least 90 percent of the longitudinal pavement marking in any 1000-foot segment, or 90 percent of a legend, symbol, or transverse pavement marking shall be considered a complete failure of that marking. The warranty shall state that the manufacturer will provide new material to replace defective Type I markings at no additional cost to the Department. The warranty shall also state that the replacement material shall conform to these specifications. The contractor shall submit a copy of the manufacturer's warranty to the Engineer along with the certificate of compliance required in Subsection 705-1(A) of the specifications.

(B) Composition Requirements:

The preformed pavement marking material shall consist of the following components:

Minimum Percent by Weight	
Resins and Plasticizers	20
Reflective Glass Beads*	20*
*Applicable only when glass beads are used to reflectorize Type I markings.	

(C) Physical Requirements:

(1) Color:

The pigments shall be selected and blended to provide a white or yellow marking layer which conforms to standard highway colors, when tested according to ASTM D6628, throughout the expected life of the layer.

(2) Bend Test:

The polymer layer shall be sufficiently flexible so that at a temperature of 78 to 82 degrees F an unmounted piece of material (without adhesive and paper backing), 3 by 6 inches in size, may be bent over a 1 inch mandrel until the end faces are parallel and 1 inch apart without showing any fracture lines in the uppermost surface.

(3) Tensile Strength:

The polymer layer (without adhesive or paper backing) shall have a minimum tensile strength of 40 pounds per square inch when a specimen 6 inches long by 1 inch wide is tested in

accordance with the requirements of ASTM D638. The rate of pull of the test shall be 0.25 of an inch per minute. The test shall be conducted at a temperature between 70 and 80 degrees F. The elongation shall be no greater than 75 percent.

(4) Pull Test:

A 6-inch long by 1-inch wide section of the polymer layer (without adhesive and paper backing) shall support a dead load weight of 4 pounds for not less than five minutes at a temperature between 70 and 80 degrees F.

(5) Abrasion Resistance:

The polymer layer shall have a maximum loss in weight of 0.25 grams in 500 revolutions when abraded according to ASTM D4060.

(6) Skid Resistance:

The surface of the material shall provide a minimum resistance value of 45 British Pendelum Number (BPN) when tested according to ASTM E303.

705-2.02 Preformed Pavement Markings - Type II (Temporary - Removable):

Type II preformed pavement markings shall be a nonmetallic mixture of conformable materials and pigments intended for marking applications where removability is required. The marking material shall be white or yellow retroreflective layer conforming to standard highway colors.

The markings shall be precoated with a pressure sensitive adhesive capable of adhering to roadway surfaces under climatic and traffic conditions normally encountered in the construction work zone when applied in accordance with the manufacturer's instructions and without the use of heat, solvents or other additional adhesives. Newly applied markings shall be capable of being immediately exposed to traffic without pickup or distortion by vehicles. The markings shall be weather resistant and through normal traffic wear shall show no appreciable fading, lifting, shrinkage, tearing, and loss of skid resistance, roll back or other signs of poor adhesion throughout the useful life of the marking.

Temporary pavement markings shall be removable from asphalt and concrete pavement intact or in large sections by following the manufacturer's instructions. It shall be removable, either manually or with a rollup device, at pavement temperatures above 40 degrees F without the use of heat, solvents, grinding or sand blasting. Visible adhesive residue remaining after removal of temporary pavement markings shall be easily removable without damaging or scarring the pavement surface and without the use of solvents or grinding.

Pavement marking material without adhesive shall be a minimum of 0.045 inches thick. When supplied, the material shall be of good appearance, free from cracks, and edges shall be true, straight, and unbroken.

705-2.03 Preformed Pavement Markings - Type III (Temporary – Nonremovable):

Type III preformed pavement markings shall be a retroreflective layer on a conformable metallic backing intended for marking applications where removal is not a requirement. The marking material shall be white or yellow conforming to standard highway colors.

The markings shall be precoated with a pressure sensitive adhesive capable of adhering to roadway surfaces under climatic and traffic conditions normally encountered in the construction work zone when applied in accordance with the manufacturer's instructions and without the use of heat, solvents or other additional adhesives. Newly applied markings shall be capable of being immediately exposed to traffic without pickup or distortion by vehicles. The markings shall be weather resistant and through normal traffic wear shall show no appreciable fading, lifting, shrinkage, tearing, loss of skid resistance, roll back or other signs of poor adhesion throughout the useful life of the marking.

705-2.04 Preformed Thermoplastic Pavement Markings - Type IV (Permanent):

(A) General:

Preformed thermoplastic pavement markings shall be a resilient white, yellow, or other color thermoplastic material, composed of an ester-modified resin in conjunction with pigments, binders and glass beads that have been factory-produced as a finished product. The markings shall be resistant to the detrimental effects of motor fuels, lubricants, hydraulic fluids, and antifreeze. Preformed thermoplastic pavement markings shall be weather resistant and, through normal traffic wear, shall show no appreciable fading, lifting, or shrinkage or significant tearing, roll back, loss of skid resistance, or other signs of poor adhesion throughout the useful life of the marking.

The markings shall be capable of conforming to pavement contours, breaks and faults through the action of traffic at normal pavement temperatures. The marking shall have resealing characteristics, such that it is capable of fusing with itself or previously applied, worn thermoplastic pavement markings when heated with a common propane torch. The material shall not be brittle and must be sufficiently cohesive and flexible for one person to carry without danger of fracturing the material prior to application. Surface preparation primer shall also be applied if recommended by the manufacturer.

The material shall be supplied at a minimum thickness of 0.090 inches (90 mils). Symbols, legends, and short lines shall be capable of being affixed to bituminous and Portland cement concrete pavements by the use of the heat of a common propane torch. Any preheating requirements shall also be met by the use of the heat of a common propane torch and as recommended by the manufacturer.

Type IV preformed thermoplastic markings shall be suitable for use for one year after the date of manufacture when stored in accordance with the manufacturer’s recommendation. Type IV marking materials supplied to the jobsite shall clearly display the date of manufacture, and shall be applied within one year of this date.

(B) Composition Requirements:

The preformed thermoplastic pavement marking material shall consist of the following components:

Component	Percent by Weight	
	White	Yellow
Binder (Min.)	18	18
Titanium dioxide (Min.)	10	-----
Yellow Lead-Free Pigment (Min.)	-----	1.5
Reflective glass intermix beads	30 – 45	30 – 45

(C) Physical Requirements:

(1) Color:

The pigments shall be selected and blended to provide a white or yellow preformed marking that conforms to standard highway colors, when tested according ASTM D6628, throughout the expected life of the preformed marking.

(2) Bend Test:

The preformed thermoplastic shall have flexibility at 50 degrees F such that when a specimen, measuring 6 inches long by 1 inch wide, is bent through an arc of 90 degrees at a uniform rate in 10 seconds (9 degrees per second) over a 1 inch mandrel, no cracking occurs in the test specimen. The specimen shall be conditioned prior to testing at 50 ± 2 degrees F for a minimum of four hours. At least two specimens tested shall meet the flexibility requirements at 50 degrees F for a passing result.

(3) Tensile Strength:

The preformed thermoplastic material shall have a minimum tensile strength of 150 pounds per square inch when tested in accordance with the requirements of ASTM D638. The rate of pull of the test shall be 10 to 12 inches per minute. The test shall be conducted at a temperature between 70 and 80 degrees F. The elongation shall be no greater than 20 percent.

(4) Bond Test:

The material shall exhibit a bond strength to Portland Cement Concrete pavement equal to or exceeding 180 pounds per square inch when tested at 73 ± 3 degrees F in accordance with the ASTM D4796.

(5) Abrasion Resistance:

The plastic film shall have a maximum loss in weight of 0.25 grams in 500 revolutions when abraded according to ASTM D4060.

(6) Skid Resistance:

The surface of the material shall provide a minimum resistance value of 45 BPN when tested according to ASTM E303.

(7) Impact Resistance:

When tested in accordance with ASTM D256, Method A, a 1 inch by 1 inch by 6 inch sample shall not break when an impact energy of at least 1.0 joule is applied. The test specimen shall be prepared in accordance with ASTM D4960 and shall not be notched.

705-2.05 Retroreflectance:

All white and yellow pavement marking materials shall have the following minimum retroreflectance values when measured by the Department, using an LTL-X Delta Retrometer or similar device, within 30 days after application to the roadway surface:

Table 1	
Long Line Markings	**Retroreflectance (millicandelas/m^2/lux)**
White	500
Yellow	300

Table 2	
Symbols, Legends, Short Lines	**Retroreflectance (millicandelas/m^2/lux)**
White	350
Yellow	200

For sections determined to be deficient in retroreflectivity, the pavement markings shall be removed in a manner approved by the Engineer, and new markings shall be re-applied in accordance with the manufacturer's recommendations. For long lines, the limits of reapplication shall start from the location of a passing test, across the failure area(s), to the next passing test location. The minimum length of reapplication shall be 0.4 miles. For symbols, legends and short lines, the entire defective unit shall be reapplied.

705-2.06 Glass Bead Properties:

(A) General Requirements:

When glass beads are used to achieve retroreflectivity, the beads shall be manufactured from glass of a composition designed to be highly resistant to traffic wear and to the effects of weathering.

(B) Physical Requirements:

(1) Roundness:

The roundness of the glass beads shall be determined in accordance with the requirements of ASTM D1155. A minimum of 75 percent of the beads shall be waterwhite true spheres free from imperfections of all types including air inclusions, film, scratches, clusters, and surface scoring.

(2) Refractive Index:

The glass beads used with the preformed pavement marking material shall have a minimum refractive index of 1.50 when tested by a liquid immersion method (Becke Line Method or equivalent, as specified in ASTM C1648) at a temperature of 25 $\pm$ 5 °C.

(3) Gradation:

The gradation of the glass beads shall conform to AASHTO M 247 Type 1 and Type 3.

(4) Heavy Metal Concentration:

Heavy metal concentration in glass beads shall be as specified in the following table, when tested by an independent laboratory, approved by the Engineer, using EPA Method 3052 and EPA Method 6010B. A Certificate of Analysis conforming to Subsection 106.05 of the specifications shall be furnished to the Engineer prior to use.

Heavy Metal	Concentration
Arsenic	< 75 ppm
Antimony	< 75 ppm
Lead	< 100 ppm

705-3 Construction Requirements:

The contractor shall install preformed pavement markings at the locations shown on the project plans, as specified in the Special Provisions, or as directed by the Engineer. Preformed marking tape shall be applied manually or with the tape applicators approved by the tape manufacturer. All markings shall be applied in accordance with the manufacturer's recommendations and as specified herein. Preformed pavement markings shall not be applied over other markings or old paint unless specified in the project plans, directed by the Engineer, or allowed by the manufacturer and approved by the Engineer prior to application.

Preformed pavement markings shall be applied to surfaces that are free of moisture and thoroughly cleaned of loose, foreign or other material that may adversely affect bonding. The contractor shall remove all dirt, dust, grease, oil or other detrimental material from the road

surface. The method of cleaning the surface is subject to approval by the Engineer and shall include sweeping and the use of high pressure air spray.

When preformed markings are to be applied to new Portland Cement Concrete pavement, any curing compound present shall be removed by means of a high pressure water jet or sandblasting, followed by sweeping and high pressure air spray. The curing compound shall be removed at least 2 inches beyond the entire perimeter of each marking to be installed. In addition, a manufacturer approved primer-sealer shall be applied to both old and new Portland cement concrete pavement prior to application of preformed markings. The primer-sealer shall be applied at the manufacturer's recommended application rates prior to placing the preformed marking. The primer-sealer shall be allowed to set up for the manufacturer's specified cure or evaporation time, and shall be free of solvent and water when the preformed marking is applied.

Preformed pavement markings shall be applied immediately after the surface has been prepared or as soon as possible after placement and completion of new pavement. When Type I, II, or III markings are used, the road surface temperature, at the time of application, shall not be less than 60 degrees F and rising and the pavement surface shall be absolutely dry. For Type III temporary markings, the weather conditions noted above may be waived, at the Engineer's discretion, to obtain a traffic stripe prior to allowing traffic to traverse the roadway. Type II markings shall not be installed within 24 hours of any rainfall. In addition, if the possibility of rain is anticipated, as predicted by the National Weather Service, during the time required by the Engineer for installation of Type II markings, the contractor shall apply primer-sealer prior to application of the marking, regardless of the type or age of pavement surface. Type IV markings shall be applied in accordance with the manufacturer’s recommendations for minimum temperature.

Despite the specified or recommended minimum surface temperature and surface condition, the Engineer may, at any time, 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 preformed pavement marking.

The contractor shall use butt splices only and shall not overlap the marking material. All markings shall be thoroughly tamped with approved mechanical tampers.

For preformed thermoplastic pavement markings requiring heat application on asphaltic concrete surfaces, the materials shall be applied using the propane torch method recommended by the manufacturer.

The contractor shall immediately correct all misalignments when so ordered by the Engineer. The misaligned portions shall be removed and reinstalled in accordance with these specifications. All areas marked with preformed pavement markings shall be ready for traffic immediately after application.

Type II or Type III temporary pavement markings shall be maintained and replaced when necessary by the contractor until they are covered with the next overlay course or are removed because they are no longer applicable. The temporary pavement markings shall be

removed immediately when no longer needed for traffic control or when the temporary pavement markings will be in conflict with the succeeding traffic pattern. This removal includes the removal of pronounced markings caused by the adhesive across lanes, transitions or tapers. Removable temporary marking material shall not be burned or ground off. Preformed pavement markings shall be removed by methods recommended by the manufacturer and approved by the Engineer. Residual adhesive, ghosting, shadows or pavement scarring which might cause confusion during darkness or adverse weather conditions shall be removed immediately by the contractor when so ordered by the Engineer.

When Type I permanent pavement markings for final symbols, legends, and short lines are specified, Type I or Type IV pavement markings may be used, at the option of the contractor.

For the contrast pavement markings, the lead (white) reflective pavement markings shall be placed in 10-foot sections followed by 10-foot lag (non-reflective black) pavement markings. Lead-lag pavement markings shall be aligned longitudinally. Maximum gaps between the white and black reflective pavement markings shall not exceed 1 inch. All raised pavement markers should be placed midway between two white skip lines. Lead-lag pavement markings may be used only on the main line for lane line markings.

When the plans require Type I preformed long line or short line pavement markings to be placed in a groove, the contractor shall construct the sawcut groove in accordance with the requirements of the special provisions.

The application of preformed pavement markings shall be in accordance with the recommendations of the manufacturer of the material and these specifications. After application the pavement markings shall be immediately ready for exposure to traffic.

705-4 Method of Measurement:

Measurement of preformed pavement marking long lines and short lines will be made by the linear foot along the centerline of the pavement line and will be based on a 4-inch wide stripe. Measurement for pavement lines with a plan width greater or less than the basic 4 inches will be made by the following method:

$$\frac{\text{Plan Width of Striping (inches)} \times \text{Linear Feet}}{\text{4 (inches)}}$$

If Oreo type contrast pavement markings are used, the Plan Width of Striping (inches) will be the width of the reflective base pavement marking (white, yellow or other color) plus the 2 inch-wide borders on each side across the width of the reflective base pavement marking. Measurement for Oreo type pavement markings will be based on the combined width of the black and white markings.

Preformed pavement marking symbols, such as diamonds; single, double, or triple arrows; or freeway arrows, will be measured by each unit applied, regardless of configuration. Each pavement symbol, as shown on the plans, will be considered a unit.

Preformed pavement marking legends, defined as a complete letter grouping such as "SCHOOL," "XING," "STOP," “RR,” or "ONLY", will be measured by each unit applied. Each pavement legend, as shown on the plans, will be considered a unit.

Preformed pavement route-to-route freeway legends, defined as complete number and directional letter groupings, will be measured by each unit applied. Each complete route-to-route freeway legend, as shown on the plans, will be considered a unit.

Removal of curing compound from new Portland cement concrete pavement and the application of primer-sealer shall each be measured by the linear foot for striping lines regardless of width, or unit each for symbols and legends, and in accordance with the items of work established in the bid schedule.

705-5 Basis of Payment:

The accepted quantities of preformed pavement markings, measured as provided above, will be paid for at the contract unit price for the type specified in the bidding schedule, which price shall be full compensation for the item, complete in place, including necessary pavement cleaning, primer, removal of Type II temporary markings, and maintaining Types II and III temporary markings in construction work zones.

No additional payment will be made for placement of Type I long line and short line pavement markings in sawcut grooves, the costs being considered as included in the contract price for the marking. Measurement and payment for sawcut grooves shall be in accordance with the special provisions.

Payment will be made for Type I and Type IV permanent pavement symbols, legends and short lines at the contract unit price, regardless of whether Type I or Type IV pavement markings are used.

The accepted quantities for removal of curing compound from new Portland cement concrete pavement and the application of primer-sealer, measured as provided above, will be paid for at the respective contract unit prices, under the items of work established in the bid schedule.

When Type II or III temporary preformed pavement markings are required for maintaining traffic through a construction work zone and are approved for use by the Engineer, but are not listed as pay items in the bidding schedule, they will be paid for in accordance with the provisions of Subsection 109.04 of the specifications.

Additional payment will be made for replacement of Type II or Type III temporary preformed pavement markings when the contractor is required by the Engineer to install marking materials on distressed pavements or during adverse weather conditions and subsequent failure occurs. Distressed pavement conditions are defined as alligator cracking, bleeding, or spalling of bituminous pavements and spalling of PCC pavements. Adverse weather conditions are defined as any occurrence where application is required at pavement temperatures less than 60 degrees F or when precipitation occurs within 24 hours before or

after application. The Department will pay for the replacement, where failures occur, at the contract unit price for the initial occurrence.

In the event a second failure occurs when markings have been reapplied on distressed pavements or under weather conditions described above, the Engineer shall determine if conditions require primer, alternate methods of marking, or reapplication of preformed markings. Preformed markings will be paid for at the contract unit price. Primers or other methods of markings deemed necessary by the Engineer to remedy second failures will be paid for in accordance with the provisions of Subsection 109.04 of the specifications.

(706REFPMR, 11/21/24)

SECTION 706 RAISED PAVEMENT MARKERS:

706-2.02 Reflective Pavement Markers: the title and text of the Standard Specifications is revised to read:

706-2.02 Raised Retroreflective Pavement Markers:

The type of the raised retroreflective pavement markers shall be as shown on the plans.

Permanent raised retroreflective pavement markers shall conform to the performance requirements of ASTM D4280, Type A, B, or E, and shall meet the ASTM D4280 requirements for pavement markers with designation H for abrasion resistance and designation F for flexural strength. A list of approved permanent raised retroreflective pavement markers is shown on the Department's Approved Products List. Copies of the most recent version of the APL are available on the internet from the ADOT Research Center, through its Product Evaluation Program.

Temporary raised retroreflective pavement markers shall conform to the performance requirements of ASTM D4280, Type A, B, or E. Temporary raised retroreflective pavement markers, or permanent raised retroreflective pavement markers used as temporary, shall not be required to meet the ASTM D4280 designation H requirements for abrasion resistance.

706-2.03 Non-Reflective Pavement Markers and Reflectorized Dagmars: the title and text of the Standard Specifications is revised to read:

706-2.03 Non-Reflective Pavement Markers and Retroreflectorized Channel Markers:

Non-reflective pavement markers shall be of the following types:

Type	Color
A	White
AY	Yellow
M	White
MY	Yellow

Retroreflectorized Channel Markers shall be of the following types:

Type	**Color**
J	White
JY	Yellow

Non-reflective pavement markers and retroreflectorized channel markers shall consist of a heat-fired, vitreous ceramic base and a heat-fired, opaque glazed surface which will produce the required properties. Markers shall be produced from any suitable combination of intimately mixed clays, shales, flints, feldspars, or other inorganic material which will meet the properties herein required. Markers shall be thoroughly and evenly matured and free from defects which will affect appearance or serviceability.

The top surface of the marker shall be in reasonably close conformity with the configuration shown on the plans. Markers shall be convex and the radius of curvature shall be between 3-1/2 and 6 inches, except that the radius of the 1/2 inch nearest the edge may be less. All edges shall be rounded and any change in curvature shall be gradual. The top and sides shall be smooth and free of mold marks, pits, indentations, air bubbles, or other objectionable marks or discolorations.

Non-reflective pavement markers and retroflectorized channel markers shall meet the following requirements:

Glaze Thickness: Inches	0.005 Minimum
Moh Hardness:	6 Minimum
Directional Reflectance: (White Only) Glazed Surface Body of Marker	 75 Minimum 70 Minimum
Yellowness Index: (White Only) Glazed Surface Body of Marker	 0.07 Maximum 0.12 Maximum
Color (Yellow Only): Purity: percent, range Dominant Wave Length: mu, range Total Luminous Reflectance (Y valve)	 75 - 96 579 - 585 0.41 Minimum
Compressive Strength: pounds	1,500 Minimum
Water Absorption: percent	2.0 Maximum
Autoclave	Glaze shall not spall, craze or peel

Retroreflectorized channel markers shall have encapsulated lens reflectors conforming to standard manufacturing practices.

706-2.05 Bituminous Adhesive: of the Standard Specifications is revised to read:

The bituminous adhesive for pavement markers shall be a hot-melt adhesive, and shall conform to the requirements of ASTM D4280, Annex A1. A list of approved adhesives is shown on the Department's Approved Products List (APL). Copies of the most current version of the APL are available on the internet from the ADOT Research Center, through its Product Evaluation Program.

706-4 Method of Measurement: of the Standard Specifications is revised to read:

Raised pavement markers will be measured as a unit for each marker furnished and placed.

706-5 Basis of Payment: of the Standard Specifications is revised to read:

The accepted quantities of raised pavement markers, measured as provided above, will be paid for at the contract unit price for the type designated in the bidding schedule, complete in place, including adhesive and surface preparation.

(708 PTVCT, 07/17/25)

SECTION 708 WATERBORNE PAVEMENT MARKINGS:

708-2.01(D) Quantitative Requirements of Mixed Paints: the viscosity row of the Table 708-1 of the Standard Specifications is revised to read:

Table 708-1

	White	Yellow
Viscosity: Krebs Units at 77 ± 1˚ F, ASTM D562	70 - 95	70 - 95

ITEM 7080301 - PAINT BULL NOSE:

Description:

The work under this item shall consist of painting the ends of median islands yellow or white and place raised pavement markers as shown in the details and at the locations in the project plans and as specified herein.

Materials:

The yellow or white paint shall conform to the requirements of Section 708 of the specifications.

The raised pavement markers shall conform to the requirements of Section 706 of the specifications.

Construction Requirements:

The bull nose shall be painted in accordance with ADOT Standard Drawing M-1. The work shall consist of preparing the curb, applying waterborne, lead free, rapid drying traffic paint and reflectorized glass beads to the top and face of the curb, and applying reflective raised pavement markers to the top of the curb.

The reflective raised pavement markers shall be placed so that the reflective face of the marker is facing and perpendicular to traffic.

Method of Measurement:

Paint Bull Nose will be measured on a per each basis.

Basis of Payment:

The accepted quantities for Paint Bull Nose, measured as provided above, shall be paid for at the contract unit price per each, which price shall be full compensation for the work, complete in place, including the raised pavement markers.

(731STRSUP, 03/18/21)

SECTION 731 STRUCTURAL SUPPORTS AND FOUNDATIONS FOR TRAFFIC SIGNAL AND HIGHWAY LIGHTING:

731-1 Description: of the Standard Specifications is revised to read:

The work under this section shall consist of furnishing all materials and constructing new supports and foundations for traffic signal and highway lighting systems or modifying poles and mast arms of existing systems at the locations shown on the plans, and in accordance with the details shown on the plans and the requirements of these specifications.

Pole foundations shall include all conduits, elbows, anchor bolts, grounding wires and reinforcing steel. Cabinet foundations shall include conduits, elbows, anchor bolts and clearance pads.

731-2 Materials: of the Standard Specifications is revised to read:

Excavation and backfill shall conform to the requirements of Section 203-5.03 of the specifications. Concrete shall conform to the requirements of Sections 601 and 1006 of the specifications. Reinforcing steel and wire mesh shall conform to the requirements of Sections 605 and 1003 of the specifications.

Concrete for all foundations shall be Class S and shall have a required 28-day compressive strength of 3,500 pounds per square inch.

731-2.01 BLANK: the title and text of the Standard Specifications is revised to read:

731-2.01 Aluminum Poles and Mast Arms:

(A) General:

Standard aluminum poles assemblies for highway lighting shall include pole shafts, pole bases, and mast arms. Aluminum components of the pole, mast arm, base, and hardware shall conform to the details shown on the plans and in these specifications.

Each aluminum pole and mast arm shall be designed and manufactured as a complete assembly. The assembly shall be furnished and installed as a complete unit that is configured to the necessary dimensions with all the required components including mounting brackets and assembly, ground lugs, rain caps, hand hole covers, anchor bolts, nuts, washers and related hardware and accessories.

The design of the pole assembly (pole, mast arm, and luminaire attachment portion) shall be per the requirements of the 2013 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 6th edition with 2015 interim revisions. The design of the poles, mast arms and luminaire mounting brackets shall be based on a wind speed of 90 miles per hour with a luminaire having an effective projected area of 1.5 square feet and a weight of 55 pounds.

The design shall also be based upon the worst case loading, derived by combining the loads caused by a 20 foot truss mast arm, except for S and T poles, design luminaire, design wind speed and other dead loads, as appropriate. Secondary deflections shall be accounted for in all designs.

Aluminum poles shall have a minimum design life of 50 years.

The pole and mast arm shall be supplied from the same manufacturer and of similar metal properties providing a uniform appearance.

(B) Pole and Mast Arm Assembly Design Parameters:

(1) Pole Shafts:

The tapered pole shaft shall be fabricated from a one-piece, seamless, round tapered tube of Aluminum Alloy 6063-T6, conforming to the requirements of ASTM B221, and shall be full-length heat treated after tapering and welding on the base and hand hole reinforcing to produce a T6 temper. The pole shafts shall either maintain a uniform taper rate from the base of the pole to the pole top or shall be non-tapered. The base plate shall be constructed to match the foundation bolt pattern for standard poles shown in the Standard Drawings for Aluminum Light Poles. No field splices of pole shafts shall be allowed. The pole shaft shall have an internal vibration damper.

The pole shaft shall be smooth with a uniform brushed sheen finish that is free from all dents, scratches, and shipping/handling marks. Poles that have a finish that is not uniform or that fails to meet the requirements of this specification will be rejected by the Engineer and shall be repaired or replaced to the satisfaction of the Engineer at no expense to the Department in accordance with Subsection 105 of the specifications.

All aluminum poles shall have a hand hole in the base of the poles and shall conform to the details shown on the Standard Drawings, with the exception that the hand hole shall use aluminum components and stainless steel screws.

An aluminum tag shall be permanently attached to the pole above the hand hole. The tag shall state the manufacturer's name, pole type, ADOT standard drawing number, pole length, and gage number.

(2) Truss Mast Arms:

The aluminum truss mast arms shall be fabricated by the same manufacturer as the aluminum pole manufacturer and from Aluminum Alloy 6063-T6 conforming to the requirements of ASTM B221.

The aluminum truss mast arms shall be smooth with a uniform brushed sheen finish that is free from all dents, scratches, and shipping/handling marks. Aluminum truss mast arms that have a finish that is not uniform or that fails to meet the requirements of this specification will be rejected by the Engineer and shall be repaired or replaced by the contractor to the satisfaction of the Engineer at no expense to the Department in accordance with Subsection 105 of the specifications.

(3) Welding:

Welding of all components of aluminum light poles shall conform to the American Welding Society (AWS) D1.2 Specifications for Class I Structures. All aluminum components and welding shall be identified and included in the Certificate of Analysis, which shall state compliance to AWS Specifications.

(4) Break-away Transformer Bases:

Break-away bases for light poles and flasher poles shall be a frangible pole mounting pedestal (base). Break-away bases shall be used on Type A, G, H, I, S, and T poles when indicated on the plans or specifications. Break-away bases shall be fabricated from 356 T6 aluminum alloys and shall have a stainless steel wheel abraded finish. The break-away bases shall have all the necessary hardware to make a complete and functional unit.

Bolts, nuts, and washers connecting the pole to the break-away base shall be fabricated from steel conforming to the requirements of ASTM F3125 Grade A325. Bolts shall be galvanized in accordance with the requirements of ASTM F2329. The 2-3/4 inch x 1/2-inch thick washers shall be zinc mechanically coated per ASTM B695-85 Class 50 or shall be galvanized per the requirements of ASTM F2329.

Welding of all components of aluminum break-away bases shall conform to the AWS D1.2 Specifications

Break-away bases shall be certified by the manufacturer to meet or exceed the change in momentum requirements of the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, and to be acceptable for use on Federal Aid projects. The manufacturer shall also certify that the break-away base has been tested and approved by the Federal Highway Administration (FHWA) and that the casting has the same chemistry, mechanical properties, and geometry as the casting used in the tests.

(5) Anchor Bolts, Nuts, and Washers:

All anchor bolts shall be fabricated from steel conforming to the requirements of ASTM F1554 Grade 55, shall be fully galvanized in accordance with the requirements of ASTM F2329, and shall conform to the requirements shown on the Standard Drawings. All anchor bolts shall be submitted for approval and a certificate of analysis shall be provided from the manufacturer that is in accordance with the requirements of Subsection 106.05 of the specifications.

(C) Submittals:

The contractor shall submit a Certificate of Analysis for all aluminum components in accordance with the requirements of Section 106.05 of the specifications. The contractor shall also submit shop drawings that have been sealed and signed by a registered professional engineer that show all the details of the poles assembly units to be furnished and installed. The shop drawings shall be complete in every aspect, including all dimensions, material specifications and appropriate details. The details shall include the configuration of the pole shaft, mast arm and mast arm mounting bracket, base plates, luminaire mounting bracket and the hand hole. All welds shall be shown and identified with standard AWS symbols. The submittal shall include structural calculations along with the name of the engineer(s) who sealed the drawings and performed the calculations.

The contractor shall submit the supporting documents for review by the Engineer. The principal purpose of the review is to verify that suitable structural calculations have been made in the design of the pole and mast arm assembly. The contractor's engineer shall utilize accepted standard engineering principles. If a computer program is utilized, the contractor shall furnish the Engineer with all necessary information, such as formulas and assumptions, to conduct a meaningful review.

The Engineer shall provide written review comments to the contractor. The contractor shall respond to these comments and resubmit the calculations, if required. Fabrication shall not take place until the shop drawings have been approved.

If the contractor utilizes a pre-approved design from ADOT’s Approved Product List (APL), submittal of the structural calculations is not required. Shop drawings for APL designs shall be submitted. Drawing numbers for the pre-approved designs found in the APL are available at https://azdot.gov/business/engineering-and-construction/product-evaluation-program.

731-2.02 Standard Steel Poles: the title and text of the Standard Specifications is revised to read:

731-2.02 Steel Poles and Mast Arms:

(A) General:

Standard steel pole~~s~~ assemblies for traffic signals and highway lighting shall include pole shafts, mast arms, and pole bases. Steel components of the pole, mast arm, base, and hardware shall conform to the details shown on the plans and in these specifications.

Each steel pole and mast arm shall be designed and manufactured as a complete assembly. The assembly shall be furnished and installed as a complete unit that is configured to the necessary dimensions with all the required components including mounting brackets and assembly, ground lugs, rain caps, hand hole covers, anchor bolts, nuts, washers and related hardware and accessories.

The design of the traffic signal and lighting supports shall be per the requirements of the 2013 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 6th edition, with the 2015 interim revisions.

All pole lighting supports and mast arms shall be designed to withstand 90 miles per hour wind, and a 3-second Gust. Fatigue analysis is to be per Fatigue Category 2, without galloping. Truck Induced velocity shall be 55 mph wind speed.

Metal parts of standard steel poles and hardware shall conform to the details shown on the plans and the following specifications. Welding shall conform to the requirements of the American Welding Society, Structural Welding Code - Steel, D1.1, latest edition.

(B) Pole and Mast Arm Assembly Design Parameters:

(1) Poles Shafts:

Tapered pole shafts shall be fabricated from sheet steel of weldable grade which shall meet a minimum yield stress, after fabrication, of 50,000 pounds per square inch. A taper rate of approximately 0.14 inches in diameter per linear foot shall be required unless otherwise specified.

Standard pipe pole shafts shall be fabricated from standard weight structural steel which conforms to the minimum strength requirements of ASTM A53, or A500 Grade B. Each section shall be fabricated from not more than two pieces of sheet steel. When two pieces are used, the longitudinal welded seams shall be directly opposite one another. When the sections are butt-welded, seams shall be directly opposite one another. When the sections are butt-welded together, the longitudinal welded seams on adjacent sections shall be placed to form continuous straight seams from base to top of pole. Pole shafts shall be straight, with a permissive variation not to exceed one inch measured at the midpoint.

Pole shafts shall be galvanized in accordance with the requirements of ASTM A123. The visual appearance of the galvanized finish shall be uniform. Discoloration of the galvanized finish such as dark areas, dark streaks, dark rings or transportation handling marks which are considered excessive by the Engineer shall not be allowed. Pole shafts that have a finish unacceptable to the Engineer shall either be repaired or replaced to the satisfaction of the Engineer at no additional cost to the Department.

All steel poles shall have a hand hole in the base of the poles and shall conform to the details shown on the Standard Drawings. All welds shall be continuous and any exposed welds, except fillet welds, shall be ground flush with the base metal.

A metal tag shall be permanently attached to the pole above the hand hole stating the manufacturer's name, pole type per the Department's plans, pole drawing number, shaft length and gage number.

(2) Mast Arms:

Tapered mast arms for all pole types shall be fabricated from sheet steel with a minimum yield stress of 50,000 pounds per square inch after fabrication. Mast arms shall be fabricated according to the thickness requirements shown on the plans.

A taper rate of approximately 0.14 inches change in diameter per linear foot shall be required unless otherwise specified. All bolts, washers, and nuts for mast arms shall be high strength, shall be fabricated from steel which meets the requirements of ASTM F3125 GR A325, and shall be electro-galvanized in accordance with the requirements of ASTM F2329.

Mast arms shall be galvanized in accordance with the requirements of ASTM A123. The visual appearance of the galvanized finish shall be uniform. Discoloration of the galvanized finish such as dark areas, dark streaks, dark rings or transportation handling marks which are considered excessive by the Engineer shall not be allowed. Mast arms that have a finish unacceptable to the Engineer shall either be repaired or replaced to the satisfaction of the Engineer at no additional cost to the Department.

A metal tag shall be permanently attached on the side of the mast arm near the base stating the manufacturer's name, pole type and name as shown on the plans, mast arm or pole drawing number, length, and gage number.

(3) Steel Pole Extensions and Twin Luminaire Brackets:

Pole extensions and twin luminaire brackets shall be fabricated from new pipe conforming to the requirements of ASTM A53 or A500 Grade B. All welding shall conform to the requirements of the American Welding Society, Structural Welding Code - Steel, D1.1, latest edition. Pole extensions and twin luminaire brackets shall be fully galvanized in accordance with the requirements of ASTM A123. Fabrication of the pole extensions and twin luminaire brackets shall be in accordance with the dimensions as specified in the plans.

(4) Standard Bases:

Poles shall have standard bases fabricated from structural steel plates conforming to the minimum strength requirements of ASTM A36. Exposed surfaces shall be finished smooth and all exposed edges shall be neatly rounded to a 1/8-inch radius. Standard bases shall be galvanized in accordance with the requirements of ASTM A123.

(5) Anchor Bolts, Nuts and Washers:

Standard anchor bolts, washers, and nuts shall be fabricated from steel conforming to the requirements of ASTM F1554 Grade 55. Anchor bolts, washers, and nuts shall be fully galvanized in accordance with the requirements of ASTM F2329. Anchor bolts shall conform to the requirements shown on Standard Drawings.

Welding shall not be performed on any portion of the body of these bolts. Certificates of Analysis conforming to the requirements of Subsection 106.05 of the specifications shall be submitted for high strength bolts, washers and nuts.

(C) Submittals:

The contractor shall submit a Certificate of Analysis for all steel components and welding in accordance with the requirements of Section 106.05 of the specifications. The contractor shall also submit shop drawings that have been sealed and signed by a registered professional engineer that show all the details of the poles assembly units to be furnished and installed. The shop drawings shall be complete in every aspect, including all dimensions, material specifications and appropriate details. The details shall include the configuration of the pole shaft, mast arm and mast arm mounting bracket, base plates, luminaire mounting bracket and the hand hole. All welds shall be shown and identified with standard AWS symbols. The submittal shall include structural calculations along with the name of the engineer(s) who sealed the drawings and performed the calculations.

The contractor shall submit the supporting documents for review by the Engineer. The principal purpose of the review is to verify that suitable structural calculations have been made in the design of the pole and mast arm assembly. The contractor's engineer shall utilize accepted standard engineering principles. If a computer program is utilized, the contractor shall furnish the Engineer with all necessary information, such as formulas and assumptions, to conduct a meaningful review.

The Engineer shall provide written review comments to the contractor. The contractor shall respond to these comments and resubmit the calculations, if required. Fabrication shall not take place until the shop drawings have been approved.

If the contractor utilizes a pre-approved design from ADOT’s Approved Product List (APL), submittal of the structural calculations is not required. Shop drawings for APL designs shall be submitted. Drawing numbers for the pre-approved designs found in the APL are available at https://azdot.gov/business/engineering-and-construction/product-evaluation-program.

731-2.04 **Mast Arms and Tie Rods:** of the Standard Specifications is hereby deleted:

731-3.02 **Foundations:** the sixth paragraph of the Standard Specifications is revised to read:

Signal and lighting pole foundations shall be set flush with the existing or new curb and sidewalk or flush with the finished grade where there is no curb or sidewalk, except in sloped areas they shall be as shown on the plans. The dimensions and locations of foundations shall be as specified on the plans; however, the Engineer may direct that changes be made in locations due to obstructions or other existing conditions. The contractor shall verify top of foundation elevations with the Engineer prior to foundation construction.

731-3.02 **Foundations:** the tenth paragraph of the Standard Specifications is revised to read:

Anchor bolts and conduit stubs shall be placed and held in proper alignment, position, and height during the placing and vibrating of concrete. All pole foundations shall set for seven days prior to pole installation.

731-3.02 **Foundations:** of the Standard Specifications is modified to add:

The stations and offsets for traffic signal poles shown on the plans and in the pole/equipment schedule are approximate. The final location of each pole shall be staked in the field by the contractor and approved by the Engineer, to ensure that the edge of pole foundation is immediately adjacent (1-inch maximum) to the back of sidewalk, back of wheelchair ramp, or integrated into the sidewalk ramp design. The intent of these criteria is to ensure that the pedestrian push button assemblies are accessible to wheelchair-bound pedestrians.

ITEM 7320456 – PULL BOX (NO. 4B):
ITEM 7320459 – PULL BOX (NO. 6B):

Description:

The work under these items shall consist of furnishing and installing pull boxes with locking mechanism at the locations shown on the plans.

Materials:

Pull Boxes shall conform to the requirements of Subsection 732-2.03 of the specifications.

Pull Box (No. 4B) and Pull Box (No. 6B) shall be per ADOT Standard Drawing T.S. 1-12, lids shall bear the words “ADOT Electrical High Voltage” unless otherwise specified. Markings shall be clearly defined and placed parallel to the long side of the cover.

All pull boxes shall be with locking mechanism

Construction Requirements:

Prior to installation, pull boxes shall be field-located and approved by the Engineer to avoid drainage swales, extreme slopes, maintenance vehicle pathways, repeating wheel loads, and low-lying areas with poor drainage. The plans depict pull box locations in general form only; therefore, the contractor shall determine final locations based on actual field conditions at the time of construction, including ARIZONA 811 utility markings, to ensure there are no conflicts with existing utilities. Final placement of all pull boxes shall be approved by the Engineer prior to installation.

Pull Box (No. 4B) and Pull Box (No. 6B) shall be installed per ADOT Standard Drawing T.S. 1-4.

The contractor shall be responsible for restoring the surrounding surface conditions back to their original condition.

Compaction around pull boxes shall not subject the pull box to more than 400 lbs. per square foot of lateral pressure causing the sides to deflect or the box or lid to crack or become dented. The contractor shall replace pull boxes damaged due to its activities and by excessive forces during installation at no additional cost to the Department.

Removable caps shall be placed on unused conduits within pull boxes.

Voids resulting from entrance of conduit into pull box shall be completely filled with hydraulic cement grout or duct sealant.

The maximum lateral slope adjacent to pull box shall be 2:1.

The contractor shall install ADOT locks on all Pull Boxes prior to substantial completion. Locks type shall be coordinated and approved by ADOT and paid by the contractor

All non-metallic conduit entering pull boxes shall have a bell-end to protect the conductor or fiber optic cable from damage.

Method of Measurement:

Pull box will be measured as a unit for each type of pull box installed. Decomposed granite, landscape restoration and interception of existing conduits are considered as part of the work and will not be measured separately.

Basis of Payment:

The accepted quantity of pull box, measured as provided above, will be paid for at the contract unit price, which price shall be considered as full compensation for the work, complete in place, including ground rods, grounding conductors, grounding lugs, excavating, backfilling, surface

restoration, conduit adjustment, and brick and stone sump, and other materials necessary to complete the work.

ITEM 7350040 LOOP DETECTOR (SPEED/CLASSIFICATION) (RELOCATE):

Description:

The work under this item consists of relocating an existing speed/classification system at the location and as shown on the plans.

Materials:

The pole-mounted control cabinet and Type A pole shall be salvaged from the existing location for reuse. All other materials required for the complete and operational relocation of the system shall conform to the requirements of Subsection 735-2 of the specifications.

Construction Requirements:

The construction of the relocated system shall conform to the requirements of Subsection 735-3 of the specifications.

The contractor shall carefully remove the existing pole-mounted control cabinet and Type A pole and reinstall them at the new location on a new foundation. Any damage to the pole or cabinet during removal, transport, storage, or reinstallation shall be repaired or replaced by the contractor to the satisfaction of the Engineer at no additional cost to the Department.

The contractor shall remove and dispose of the existing pull box, pole foundation, and other existing materials that will not be incorporated into the new work, in accordance with Section 202 of the specifications.

Method of Measurement:

Relocation of the speed/classification system will be measured per each, as a complete and operational unit.

Basis of Payment:

The accepted quantity of the speed/classification system relocation, measured as provided above, will be paid for at the contract unit price per each, which price shall be full compensation for the work, complete in place, including removing and disposing of the existing materials as specified herein and as shown on the plans.

ITEM 7360105 – LUMINAIRE (HORIZONTAL MOUNT) (25L)(LED):
ITEM 7360112 – LUMINAIRE (HORIZONTAL MOUNT)(15L) (LED):

Description:

The work under these items consists of installing horizontal mount light emitting diode (LED) luminaires at the locations shown on the project plans and as specified herein.

Materials:

Luminaires shall conform to the requirements of Subsection 736-2.05 of the specifications and be selected from the current ADOT Approved Products List.

The horizontal mount LED luminaires 25L shall be 120-277-volt fixtures with a 3,000K correlated color temperature, shall be supplied with manual dimming control shorting cap

The horizontal mount LED luminaires 15L shall be 480-volt fixtures with a 3,000K correlated color temperature, and be supplied with a shorting cap.

Construction Requirements:

The luminaire shop drawings and submittals shall be in accordance with Subsection 105.03 of the specifications.

The LED luminaire shall be installed in accordance with Subsection 736-3 of the specifications.

The contractor shall test all luminaires in accordance with Subsection 732-3.02(D)(2) of the specifications.

Method of Measurement:

Luminaire (LED) will be measured on a per each basis.

Basis of Payment:

The accepted quantities of Luminaire (LED), measured as provided above, will be paid for at the contract unit price per each, which price shall be full compensation for the work, complete in place.

ITEM 7360235 – LOAD CENTER CABINET (TYPE II) (120/240 VOLT, METERED):

Description:

The work under this item consists of the installation of Type II Load Center at the locations identified in the project plans.

Materials:

Type II Load Center Cabinets shall be single door enclosures conforming with T.S. 3-0, T.S. 3-1, T.S. 3-3, Subsection 736-2.07, with modifications as shown on the project plans, and Special Provisions. Load center cabinets shall include circuit breakers, internal wiring, and appropriate hardware. Photo electric control equipment shall be installed at these cabinets.

Cabinets shall be designed for mounting on a concrete foundation using anchor bolts of size and placement as shown in the Signals and Lighting Standard Drawing T.S. 2-1.

Electrical components shall be UL listed. The electrical service section and meter socket shall meet the requirements of the utility company providing service, including strapping of the riser conduit.

There shall be no shelves in the interior of the cabinet.

The cabinet and door shall be constructed from 5052-H32 sheet aluminum alloy with a thickness of 0.125-inches. All welds shall be neatly formed and free of cracks, blow holes, and other irregularities. All inside and outside edges of the cabinet shall be free of burrs. The cabinet shall be designed with a sloped top to prevent the accumulation of water on its top surface. The outside surface of the cabinet shall have a smooth, uniform, natural, aluminum finish. The doors shall have signs stating "Danger High Voltage".

The door opening(s) shall be double flanged on all four sides to increase strength around openings and keep dirt and liquids from entering the enclosure when the door is opened. A two-position door restraint on each door shall be provided, to hold the door open at 90 degrees in a 60 mph wind acting at an angle perpendicular to the plane of the door. The restraint shall hold the door open at 90 ±10 degrees and at 180 ±10 degrees. The door shall be furnished with a gasket that satisfies the physical properties as found in UL508 Table 21.1 and shall form a weather tight seal between the cabinet and door.

Door hinges shall be continuous and welded to the inside of the door and cabinet and bolted to the outside of the cabinet and door using twenty 0.125-inch stainless steel carriage bolts and nylon insert lock nuts. The hinges shall be made of 0.093-inch thick aluminum and shall have a 3-inch open width with a 0.25-inch diameter stainless steel hinge pin. The hinge pin shall be capped top and bottom by weld to render it tamper proof.

The latching mechanism shall be a 3-point draw roller type. The center catch and push- rods shall be cadmium plated, Type II Class 1. Push-rods shall be turned edgewise at the outward supports and shall be 0.25-inch by 0.75-inch steel, minimum. Rollers shall have a minimum diameter of 0.75-inches and shall be made of nylon. The center catch shall be fabricated from 0.140-inch steel, minimum.

A stainless steel handle with a 0.75-inch diameter shank shall be furnished. The latching handle shall have a provision for padlocking in the closed position. The lock shall be consistent and compatible with current ADOT maintenance keys. The key shall be removable

only in the locked position. One key shall be furnished with each lock. All parts of the locking mechanism shall be stainless steel. The locks shall have rectangular spring-loaded bolts.

Cabinet ventilation shall be provided, with ventilation holes as shown in the Signals and Lighting Standard Drawing TS 3.1 or other referenced sources, the project plans and Special Provisions. A cabinet exhaust fan meeting the requirements of Subsection 734-2.03 (D) shall be mounted on top.

Load center cabinets shall have a dead front panel to isolate all live electrical circuitry. The panel shall be fabricated from 14-gage sheet steel. The dead front panels shall be hinged on one side and securely fastened on the other with bolts. Switches, breakers and other components shall have openings to operate from the front panel.

Construction Requirements:

The contractor shall coordinate with the electrical service provider at project initiation to identify service locations, determine electrical service addresses, comply with electrical service provider requirements, and verify electrical service provider approval of the load center cabinet equipment and installation methods proposed.

The load center cabinet shall be installed at locations as shown on the project plans, and as directed by the Engineer. The contractor shall survey and stake the locations of the load center cabinets for the approval of the Engineer. The contractor shall give a minimum of 2 working days advance notice to the Engineer prior to staking the locations.

Removable caps shall be placed on unused conduits within the cabinet.

The contractor shall furnish and install silicone caulking or other approved sealant around the base of the cabinet to form a watertight and dust-proof seal.

The contractor shall furnish and install pressure-sensitive, permanent identification decals on load center cabinets, as shown in ITS Standard Drawing FM-3.13. The decals shall be 3- inch tall, Series C, Gothic letters and shall be top-grade, glass-beaded, reflective black letters on a silver or chrome background.

Method of Measurement:

Load Center Cabinet (Type II) (120/240 Volt, Metered) will be measured as a unit for each type of cabinet unit furnished and installed.

Basis of Payment:

The accepted quantity of Load Center Cabinet (Type II) (120/240 Volt, Metered), measured as provided above, will be paid for at the contract unit price per each, which price shall be full compensation for the work complete in place.

ITEM 7360240 – LOAD CENTER CABINET FOUNDATION:

Description:

The work under this item consists of the installation of Load Center Foundations at the locations identified in the plans.

Materials:

Foundations shall conform to the requirements of Subsection 731-2. Foundations shall include conduit, conduit fittings and elbows, anchor bolts, conductors, connectors, ground rods, grounding conductors, grounding lugs, and other incidental materials necessary to connect equipment incorporated in, or connected through the foundation, to the cabinet, to form a fully functional system.

Concrete shall be 3,000 pound per square inch Class S concrete conforming to the requirements of Section 1006. Anchor bolts shall conform to the requirements of Section 606-2.05. Grounding conductors shall conform to the requirements of Subsection 732-2.01.
Equipment lists and equipment submittals shall conform to the general requirements of the Special Provisions.

Construction Requirements:

The Load Center Cabinet Foundations shall be constructed at the locations designated on the project plans and in accordance with the ADOT Standard Drawing T.S. 2-1 as shown on the plans and the requirements of the specifications.

The contractor shall install wire, cable, connectors, and other incidental materials necessary to connect equipment to be incorporated in, or connected to the work through the foundation, to the cabinet, to form a fully functional system which meets the requirements of Subsection 731-3.02.

The contractor shall receive the Engineer's approval of location and orientation prior to excavation and placement of the foundation. If the cabinet will be located on a slope steeper than 2:1, the foundation shall be offset from the pull box along the mainline conduit or other structure so that their locations do not lie on a line perpendicular to the roadway.

Foundations shall be monolithic with the exposed surfaces formed and finished to present a neat, smooth appearance. The bottom of each foundation shall rest on undisturbed earth and the top shall be level. Adjacent concrete maintenance pads shall also meet these requirements.

Forms for the concrete shall be rigid and securely braced in place. Templates shall be used to properly position and hold in place conduit, anchor bolts, and the ground rod. Immediately prior to pouring the concrete, both forms and the earth shall be thoroughly moistened. The concrete shall be allowed to cure at least 12 hours and shall be hardened sufficiently to

prevent damage before the forms are removed. The contractor shall backfill and build slope in accordance with the plans and restore the landscaping.

Grounding shall meet the requirements of Subsection 732-3.03. Cabinet foundations shall have a copper clad steel ground rod with a minimum diameter of 5/8 inch. The ground rod shall be driven into place through a sleeve in the foundation. The ground rod shall be installed so that it extends into the surrounding undisturbed earth a minimum of 9 feet. The ground rod shall extend approximately 3 inches above the foundation. The ground rod shall be connected to the grounding system using ground clamps on the rod and an approved lug connector in the cabinet. The cabinet shall be grounded with a 8 AWG solid copper wire.

If the contractor prefers to use an electrolytic grounding system, it shall be 100 percent self-activating, sealed, and maintenance free. The electrolytic grounding system shall be UL listed with a minimum life rating of 30 years. The electrolytic grounding system shall hydroscopically extract moisture from the air to activate the electrolytic process without additions of chemicals or water. The electrolytic grounding system shall not use hazardous material.

Method of Measurement:

The Load Center Cabinet Foundations will be measured as a unit for each type of foundation furnished and installed.

Basis of Payment:

The accepted quantity of Load Center Cabinet Foundations, measured as provided above, will be paid for at the contract unit price per each, which price shall be full compensation for the work complete in place.

ITEM 8030092 GRANITE MULCH (1 ¼" MINUS):

Description:

The work under this item shall consist of furnishing and installing granite mulch at the locations shown on the project plans and as specified herein.

Materials:

Decomposed granite/granite mulch shall be approved for color and gradation requirements before final placement/installation on site in accordance with the project plans and/or these Special Provisions. Unless otherwise directed by the Construction Professional Landscape Architect (PLA) through the Engineer, the color to be used on the project shall match the existing adjacent decomposed granite/granite mulch color and shall be approved by a Construction PLA in coordination with IDO Roadside Development Section prior to any processing or placement/installation.

Granite Mulch supplied for use on the project shall meet the gradation requirements as shown in the following table. The supplier of the Granite Mulch shall modify the screening equipment to supply the gradation of Granite Mulch to meet the requirements of the gradation tables shown below. Other gradations of Granite Mulch that do not meet these requirements will not be considered.

ADOT Right-of-Way (1 ¼" Minus)	
Sieve Size	**Percent Passing**
1-1/4 inch	100
3/4 inch	60-80
1/2 inch	45-65
No. 40	5 – 20

The contractor shall be responsible for all granite supplied to the project meets the gradation requirements shown. Any material supplied that does not meet the gradation specification shall be removed and replaced at no additional cost to the Department.

At the pre-construction conference, the following information shall be provided to the Engineer for all granite material proposed to be used on the project:

- One copy of the environmental permit for each granite source pit.
- Written acknowledgement from each supplier that they can provide the quantity of Granite Material required to complete the project.

The contractor shall provide a 1-ton sample for each color required on the project and for each proposed substitute color.

All 1-ton samples provided shall be cleaned and washed and shall be leveled and cover an area of about 10 feet by 10 feet and shall be identified with a sign labeling the product, color and source.

Construction Requirements:

The salvage and reuse of existing granite material from the project area or outside the project will not be allowed. All granite mulch material shall be new.

Before placement of the Granite Mulch, the designated locations shall be completely free of all trash, debris, grass, weeds, and other unwanted vegetative growth and the subgrade shall be graded and compacted to promote proper drainage

A pre-emergent herbicide (Gallery, Surflan, Barricade or equivalent) shall be applied to all granite material areas in the manner recommended by the manufacturer to prevent germination of noxious weeds. The grading work shall be approved by the Engineer. Where

drainage outlets occur, the contractor shall adjust finished grade 2 inches below bottom of each drainage outlet.

The contractor shall repair all erosion features damaged on the project site during construction operations at no additional cost to the Department.

At the designated locations shall be placed to a minimum depth of 3 inches after compaction, except as otherwise specified.

After rough spreading and placement of the granite material, it shall be raked evenly and thoroughly to blend the different gradation sizes of the material together.

During the final spreading and final grading operation, the surface of the granite material shall be passed over by spreading and grading equipment a minimum of two times with one set of wheels with flotation tires having a minimum width of 18 inches, to allow for equal compaction of the granite material. Compaction and thickness testing shall be performed per the direction of the Engineer for compliance to project requirements.

The use of conveyor belt type of equipment for placing granite material shall not relieve the contractor from the requirements for compacting the granite material as described herein.

After the final spreading, final grading and compaction operations, the contractor shall water settle the total thickness of the granite material to remove fines from the surface. The water settling operation shall be completed by applying water over the entire granite material surface area by the use of a water truck or other means as approved by the Engineer. Water for water settling shall be applied in the amounts required by the Engineer.

The contractor shall apply one application of an approved pre-emergent herbicide in accordance with the manufacturer’s recommendations to prevent the germination of noxious weeds, or at a minimum of one pound per acre on all granite material areas following placement of the granite material and water settling. Water to activate the pre-emergent herbicide shall be applied to the areas of the herbicide application as recommended by the manufacturer's label or at a minimum equivalent to ½ inch per acre. The amount of water specified by the manufacturer may be adjusted due to rainfall, as determined by the Engineer.

When using herbicides, the contractor shall comply with all applicable portions of Subsection 803-3.02 of the specifications and report all herbicide applications to the Engineer. The contractor shall remove and dispose of all dead grass and weeds.

Method of Measurement:

Granite Mulch will be measured on a per square yard basis.

Basis of Payment:

The accepted quantities of the Granite Mulch, measured as provided above, will be paid for at the contract unit price per square yard, which price shall be considered as full compensation for the work, complete in-place.

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 for use in 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
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

NOXIOUS / INVASIVE WEEDS WATCH LIST FOR THE CONTAMINATED SEED LOTS	
SCIENTIFIC NAME	**COMMON NAME**
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-a and 1-b below**:**

The diversified SEED MIX H1 is estimated to be 34 Acres applied for all unpaved disturbed project areas NOT covered by Decomposed Granite **/** Granite Mulch within the traffic clear zone/recovery area as defined in ADOT Roadway Design Guidelines **(**303**.**2 to 303**.**3 Roadside Recovery Area**)** in reference to the project plans. This includes the unpaved-construction-disturbed areas from the shoulder wedge to centerline of ditch along cuts or to the limits of the recovery areas at fills, median areas, new shoulder build-up areas, and all unpaved disturbed soil areas within 20 feet behind the guardrails**/**barrierwalls. Seed Mix **H1** shall also be applied to the unpaved disturbed dry areas within the Waters of the U**.**S**.** and roadside ditches outside of the inlets **/** outlets of drainage facilities acceptable by the Environmental Permit and as directed by the Engineer. Seed Mix **H1** areas shall NOT overlap

with the Seed Mix H2 areas. The Engineer in consultation with a Construction PLA shall evaluate**/**approve the SEED MIX H1 areas proposed by the contractor.

TABLE 1—a			
SEED MIX H1 (low-height seeded vegetation primarily anticipated for all unpaved disturbed project area and/or designated area within the traffic clear zone/recovery area or within 20 feet behind the guardrails/barrierwalls)			
Botanical Name	**Common Name**	**PLS Rate (Pounds Per Acre)**	**Per Pound Value for Substitution (see text)**
Aristida purpurea	Purple Threeawn	3	$40
Asclepias tuberosa	Butterfly Milkweed	1	$250
Aster tanacetifolius	Purple Prairie Aster	1	$50
Abronia villosa	Sand Verbena	0.5	$100
Baileya multiradiata	Desert Marigold	2	$80
Bouteloua barbata	Sixweeks Grama	0.3	$30
Bothriochloa barbinodis	Cane Beardgrass	1	$50
Bouteloua curtipendula cv. Vaughn *	Sideoats Grama	1	$25
Bouteloua gracilis cv. Hachita	Blue Grama	1	$20
Bouteloua rothrockii	Rothrock Grama	0.2	$60
Coreopsis tinctoria	Plains Coreopsis	1	$20
Digitaria californica	Arizona Cottontop	1	$50
Dalea purpurea	Violet Prairie Clover	2	$50
Distichlis stricta **(syn.** Distichlis spicata**)**	Desert Saltgrass	1	$65
Encelia farinosa	Incienso Brittlebush	4	$40
Ericameria laricifolia	Turpentine Bush	0.2	$60
Eschscholtzia mexicana	Mexican Poppy	1	$40
Gaillardia aristata	Blanket Flower	2	$20
Glandularia gooddingii	Gooding Verbena	0.5	$140
Gaillardia pulchella	Firewheel	1	$20
Hilaria berlangeri	Curly Mesquitegrass	3	$50
Lesquerella gordonii	Gordon's Bladderpod	1	$40
Lupinus bicolor	Miniature Lupine	3	$60
Lupinus sparsiflorus	Desert Lupine	1	$90

TABLE 1—a			
SEED MIX H1 (low-height seeded vegetation primarily anticipated for all unpaved disturbed project area and/or designated area within the traffic clear zone/recovery area or within 20 feet behind the guardrails/barrierwalls)			
Botanical Name	**Common Name**	**PLS Rate (Pounds Per Acre)**	**Per Pound Value for Substitution (see text)**
Lupinus succulentus	Arroyo Lupine	3	$30
Nassella pulchra **(syn.** Stipa pulchra**)**	Purple Needlegrass	3	$90
Psilostrophe cooperi	Paper Flower	0.25	$120
Phacelia crenulata	Arizona Desert Bluebell	0.2	$50
Penstemon parryi	Parry's Beardtongue	2	$90
Pascopyrum smithii	Western Wheatgrass	2	$15
Sporobolus airoides	Alkali Sacaton	0.2	$30
Sphaeralcea ambigua	Desert Globemallow	1	$55
Senna covesii	Coues' Cassia	4	$50
Setaria macrostachya	Plains Bristlegrass	1	$30
Zinnia acerosa	Dwarf White Zinnia	0.5	$150
Estimated Per Acre Subtotal Value for Seeds Only			**$ 2,759.00**

The diversified SEED MIX H2 is estimated to be 40 Acres applied to revegetation areas beyond the traffic clear zone**/**recovery areas within right-of-way line, as well as all unpaved disturbed non-H1 areas NOT covered by Decomposed Granite**/**Granite Mulch in reference to the project plans. Seed Mix H2 shall NOT be placed within the traffic clear zone/recovery area as defined in ADOT Roadway Design Guidelines **(**303**.**2 to 303**.**3 Roadside Recovery Area**).** Seed Mix H2 shall NOT be used within 20 feet behind guardrails**/**barrierwalls, or within 20 feet of the inlets and outlets of drainage facilities. Seed Mix H2 shall NOT be applied to the dry flow paths of the inlets and outlets of drainage facilities. Seed Mix H2 shall promote functional landscape ecological restoration of disturbed site including earthen retention**/**detention basin(s) as evaluated**/**directed by a Construction PLA through the Engineer. The Engineer in consultation with a Construction PLA shall evaluate**/**approve the SEED MIX H2 areas proposed by the contractor.

TABLE 1—b			
SEED MIX H2 (tall, seeded vegetation primarily anticipated for all unpaved disturbed project area and designated area outside of the traffic clear zone/recovery area within right-of-way line)			
Botanical Name	**Common Name**	**PLS Rate (Pounds Per Acre)**	**Per Pound Value for Substitution (see text)**
Acacia greggii	Catclaw Acacia	1	$20
Aristida purpurea	Purple Threeawn	2	$40
Atriplex polycarpa	Desert Saltbush	0.2	$30
Asclepias tuberosa	Butterfly Milkweed	0.5	$250
Bothriochloa barbinodis	Cane Beardgrass	0.5	$50
Bouteloua curtipendula cv. Vaughn *	Sideoats Grama	1	$25
Bouteloua gracilis cv. Hachita	Blue Grama	1	$20
Baileya multiradiata	Desert Marigold	0.5	$80
Bouteloua rothrockii	Rothrock's Grama	0.3	$60
Calliandra eriophylla	Fairy Duster	2	$100
Chilopsis linearis	Desert Willow	0.3	$70
Dalea purpurea	Violet Prairie Clover	3	$50
Encelia farinosa	Incienso Brittlebush	3	$40
Encelia frutescens	Button Brittlebush	3	$40
Ericameria laricifolia	Turpentine Bush	0.3	$60
Ephedra nevadensis	Nevada Mormon Tea	2.5	$30
Hilaria berlangeri	Curly Mesquitegrass	2	$50
Lesquerella gordonii	Gordon's Bladderpod	1	$40
Lupinus sparsiflorus	Desert Lupine	1	$90
Lupinus succulentus	Arroyo Lupine	3	$30
Lycium exsertum	Arizona Desert Thorn	1	$55
Mimosa aculeaticarpa	Catclaw Mimosa	0.5	$26
Nolina microcarpa	Bear Grass	2	$40
Nassella pulchra **(syn.** Stipa pulchra**)**	Purple Needlegrass	2	$90
Oryzopsis hymenoides **(syn.** Achnatherum hymenoides**)**	Indian Ricegrass	3.4	$10
Olneya tesota	Desert Ironwood	3	$30

TABLE 1—b			
SEED MIX H2 (tall, seeded vegetation primarily anticipated for all unpaved disturbed project area and designated area outside of the traffic clear zone/recovery area within right-of-way line)			
Botanical Name	**Common Name**	**PLS Rate (Pounds Per Acre)**	**Per Pound Value for Substitution (see text)**
Sphaeralcea ambigua	Desert Globemallow	1	$55
Phacelia crenulata	Arizona Desert Bluebell	0.5	$50
Psilostrophe cooperi	Paper Flower	0.5	$120
Penstemon parryi	Parry's Beardtongue	1.5	$90
Prosopis pubescens	Screwbean Mesquite	1	$70
Pascopyrum smithii	Western Wheatgrass	3	$15
Rhus ovata	Sugar Sumac	1	$50
Rhus trilobata	Three-Leaf Sumac	0.2	$55
Sporobolus airoides	Alkali Sacaton	0.3	$30
Senna covesii	Coues' Cassia	5	$50
Sporobolus cryptandrus	Sand Dropseed	0.3	$10
Simmondsia chinensis	Jojoba	7	$13
Sitanion hystrix (syn. Elymus elymoides)	Squirrel-tail Grass	1	$45
Zinnia acerosa	Dwarf White Zinnia	0.5	$150
Estimated Per Acre Subtotal Value for Seeds Only			**$ 2,759.00**

* 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 not 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 <u>not</u> 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.

SECTION 806 TREES, SHRUBS AND PLANTS:

806-1 Description: of the Standard Specifications is modified to add:

The work under this section shall include preparation of a Transplanting Plan, removal, move-once salvage, transport, and the replanting of all local stock within the clearing limits as required per the landscape revegetation plans. The Transplanting Plan shall be submitted at the preconstruction conference and approved by the Engineer prior to the start of salvage operations.

806-2.01 Nursery Stock: of the Standard Specifications is modified to add:

Nursery stock will only be considered for use when additional local stock cannot be acquired to meet replacement plant requirements. The use of nursery stock shall require the approval of the Engineer after it has been shown that additional local stock cannot be obtained.

806-2.03 Local Stock: of the Standard Specifications is modified to add:

Local stock shall be defined as those identified in the native plant inventory plans and listed in the Attachments of the Special Provisions to be salvaged within the clearing limits of the project. Plants that are growing as clumps in their in-situ location shall be harvested as a clump; no splitting of plants into smaller units will be accepted. Fishhook Pincushion growing in clusters (up to four individual plants) shall be harvested and measured for payment as a single plant.

The Arizona Queen of the Night shall be excavated manually. Exercise special care when digging at the base of the plant. Begin excavation a minimum of one foot from the stem to avoid damage to the underground tuber. Carefully remove the entire tuber with as many attached roots as possible..

To be eligible for salvaging, nursery storage and replanting, local stock not inventoried or identified in the project plans shall meet the following requirements:

Species	**Requirement**
Desert Christmas Cactus	> 12 inch height and five live branches
Buckhorn Cholla	> 12 inch height and five live branches
Ocotillo	> 3 feet height and three canes
Barrel Cactus	> 6 inch diameter
Fishhook Pincushion Cactus	> 2 inch diameter
Banana Yucca	> 12 inch height
Soaptree Yucca	> 12 inch height
Desert Prickly Pear	two live pads
Pancake Prickly Pear	two live pads
Arizona Queen of the Night	>12 inch height

The total quantities shown on the bidding schedule of all local stock to be transplanted by the contractor is inclusive of the acceptable mortality quantities (AMQ).

806-2.05 Prepared Soil: of the Standard Specifications is modified to add:

Soil sulfur shall be in powdered form, agricultural grade, containing 90% sulfur and 10% inert ingredients.

Three to four pounds of soil sulfur shall be uniformly mixed into each cubic yard of prepared soil or as needed to meet the requirements herein.

Existing soil removed from the plant pit shall be amended with soil sulfur for backfilling of the plant pits. Excavated material shall be considered usable for prepared soil provided that it meets the requirements herein. Prepared soil shall be free of any deleterious material or contaminants.

Large rocks shall not be buried in the plant pit but shall be wasted on the site by the contractor as approved by the Engineer. Large soil clumps shall not be used to support the plants or be permitted in the planting pit.

If the existing material removed from the plant pit is insufficient for backfill quantities, the contractor shall collect and prepare additional existing surface soil from within the clearing limits of the project, at no additional cost to the Department.

Prepared soil can be manufactured in bulk from the existing surface soil within the clearing limits of the project. The soil shall be collected to a depth no greater than 18 inches from the original grades. If this bulk method is pursued, the contractor shall provide a plan for review and approval by the Engineer. The contractor shall provide the Engineer with surveys before and after excavation of the surface soil. The mixing or collection of the material in bulk shall not commence until the clearing and grubbing are completed as determined by the Engineer.

806-2.07 Water: of the Standard Specifications is modified to add:

Water used during plant salvaging, temporary nursery, and for landscape establishment as described in Section 807 of these Special provisions, to salvage the plants, and to properly plant, maintain and care for the plant material throughout the term of the contract shall be furnished by the contractor. Water shall be delivered to the nursery and installed plants as described in Sections 807 and 808 of these Special Provisions. It shall be the contractor's responsibility to secure an approved water source and any necessary permits and approvals.

806-2.10 Hardware: of the Standard Specifications is modified to add:

All hardware materials shall be as approved in the Transplanting Plan.

Shade screens in physical contact with cactus shall be made of burlap, hemp or other breathable fiber material as approved by the Engineer.

All water distribution materials shall comply with Section 808 of the Standard Specifications and these Special Provisions.

806-2 Materials: of the Standard Specifications is modified to add:

806-2.12 Insecticide:

Insecticide shall be a commercially-prepared product suitable for the intended purpose and as approved by the Engineer.

806-3.01 General: of the Standard Specifications is modified to add:

The contractor performing the work shall have a minimum of three years experience in relocating native plants and cacti similar to those shown in the project plans and special provisions. The contractor shall have a proven record of successful cactus salvage that demonstrates an 80% survival rate three years after being transplanted.

The contractor shall meet the following requirements and shall submit the following Transplanting Plan documentation to the Engineer at the preconstruction conference as herein specified:

1. Shall be an Arizona licensed landscape contractor in good standing.

2. Submit a list of a minimum of two native plants salvaging projects satisfactorily completed which involve relocation of a minimum of 100 total cacti including prickly pear, cholla, fishhook cactus and/or hedgehogs on a single project.

3. The list shall include the dates of the project work, type of equipment used, description of the project and work performed, the name and phone number of a contact person representing the agency, company or owner for which the work was completed.

4. The contractor shall submit seven copies of the proposed Transplanting Plan for the review and approval of the Engineer prior to the beginning of any ground breaking work by the contractor. The Transplanting Plan shall contain, but not be limited to, the following items and shall conform to the details shown on the project plans and these Special Provisions:

    a. Methods for coordinating the salvage and replanting of all local stock with anticipated phasing and sequencing of construction per stationing limits and the development of planting lots. Planting lots shall consist of a minimum quantity of two hundred plants;

    b. Stock quantities and AMQ per species per lot;

    c. Existing and final location of each local stock (if different than shown on the plans;

    d. Sources of nursery stock (if required to supply the materials for the project);

    e. List of mechanical and hand equipment to be used to accomplish all local stock work;

    f. A description in detail of the hardware and materials, stock removal and replanting procedures, bracing, protecting and transporting methods;

g. A description of the excavation process that provides the minimum acceptable root lengths and procedures for cutting and root treatment

h. A description of the maintenance activities and total quantity of water to be supplied during the landscape establishment period. Additional documentation requirements for landscape establishment activities are contained in Section 807 of these Special Provisions.

i. A watering plan showing applicable drawings, and details demonstrating how the plant material (lots) will be watered from the initiation of the salvaging activities through the landscape establishment period. The Transplanting Plan shall identify the source of water; its capability to deliver water in sufficient quantity to meet the project needs; the proposed layout of piping for delivering water from the source to the stored and replanted plants; the total quantity of water anticipated to be used on the project; daily estimates of water consumption by species type (in replanted condition) including, at a minimum, a breakout of monthly adjustments for seasonal conditions; and protection of the watering method from damage by animals, insects and/or other detrimental conditions. The plan will also contain a statement from an independent certified laboratory that the proposed water source quality is acceptable for the intended use.

The Engineer will notify the contractor within 21 days of the Transplanting Plan submittal of the acceptability of the plan and proposed changes.

The Transplanting Plan shall be contained in a three ring binder(s) and shall be typed on 8 1/2 inch x 11 inch sheets.

The contractor shall adhere to the Subsection 701-3.01 with respect to parking of all vehicles. The contractor is advised that the local stock to be salvaged are located in limited, sometimes constrained, portions of the right-of-way. Pioneering of access roads and/or overland traversing of natural areas may be required to gain access to locations for the removal of local stock. Access used for salvage operations shall only occur within the approved clearing limits and shall not occur outside of the approved clearing limits without the approval of the Engineer.

The contractor shall be responsible for keeping a daily log of all activities on the project. The daily log shall contain a record of the number of plants that are moved, and when moving takes place.

The transporting of any plant materials for the project shall be in compliance with all State and local requirements. Copies of the issued permits and tags shall be made available to the Engineer upon request.

The contractor shall provide adequate water to each plant to maintain optimum health from the initiation of the transplanting operations to the completion of the landscape establishment period.

The AMQ for each species is determined by multiplying the assigned AMP (acceptable mortality percentage) by the total species quantity (rounded down to the nearest whole number). The AMQ of each species will be calculated by the Engineer and the contractor, and shall be represented on the Transplanting Plan. The AMP assigned to each species of the local stock to be transplanted is as follows:

SPECIES	COMMON NAME	AMP
Fouquieria splendens	Ocotillo	25%
Ferocactus cylindraceus	Barrel Cactus	5%
Mammillaria microcarpa	Fishhook Pincushion Cactus	10%
Peniocereus greggii	Arizona Queen of the Night	10%
Opuntia engelmannii	Desert Prickly Pear	10%
Opuntia leptocaulis	Desert Christmas cactus	10%
Opuntia chorotica	Pancake Prickly Pear	10%
Cylindropuntia acanthocarpa	Buckhorn Chollo	10%
Yucca elata	Soaptree Yucca	10%
Yucca baccata	Banana Yucca	10%

If it is required that nursery stock shall be added to the Transplanting Plan, it shall adhere to these Special Provisions, the project plans and be approved by the Engineer.

The project plans indicate the quantities of plants identified for salvage. The contractor shall review the plants with the Engineer by means of a site walk-through to evaluate the health of local stock and prepare an adjusted plant inventory to delete those plants deemed unsalvageable by the contractor. During the site visit, specific adjustments shall be made by the contractor and the Engineer to eliminate transplanting of unsalvageable local stock and to tag additional local stock that will be included in the design inventory and to make any other adjustments as required. The contractor shall be required to remove, protect in place, transplant and maintain all local stock identified in the final adjusted inventory per the approved Transplanting Plan.

Additional local stock shall be added to the project quantities as determined by the Engineer during field inspections of the staked alignment of any new right-of-way fence built as a part of this project. It is preferable that plant types identified in the attached Native Plant Inventory that are discovered during the field review remain in place. However, if a viable plant (of the species identified in these Special Provisions) is located within the fence alignment such that the installation of the fence would require the destruction of the plant, or the amount of pruning required to bypass the plant, would substantially reduce the plant’s potential survivability, the Engineer may elect to include the plant in the local stock quantities for the project. The contractor shall provide the Engineer at least three days notice prior to the requested field review.

The contractor shall perform an investigation of underground soil, rock, and surrounding area conditions near the plants using approved methods and equipment. If a plant is found to have a decreased chance of being successfully relocated, the contractor shall inform the Engineer

of the field conditions during the site visit. A decision will be made for each plant in question. Substitutions such as using local stock from within the project limits or nursery stock shall be considered. If the contractor is directed to salvage another plant, the contractor shall document the conditions of the substituted plant. Removal of the substituted plant shall not commence until the Engineer has approved the alternative plant. The Transplanting Plan shall be amended as described in these Special Provisions.

Damage or destruction of any local stock to be salvaged (as identified on the adjusted inventory plan) during pioneering, clearing or other means shall be replaced with equal-sized like-kind local stock at no cost to the Department.

806-3.02 Excavation: of the Standard Specifications is modified to add:

Removal of local stock or locating the local stock's roots by applying force to the trunk and/or branches of the local stock shall be prohibited.

The excavation and removal for all local stock shall be accomplished in accordance with the Transplanting Plan method as approved by the Engineer. The method shall demonstrate that the excavation process for the local stock will provide the minimum acceptable root lengths as specified herein; locate and expose the roots without damaging the local stock with the equipment or machinery used for the excavating; expose the roots to appropriate lengths by the use of hand tools prior to cutting the roots.

Planting pits shall be excavated to a depth and width that ensures all tap, buttress and lateral roots of the local stock have a minimum clearance of six inches from the sides and bottom (undisturbed subgrade) of the plant pit.

806-3.03 Shipping and Handling Plants: of the Standard Specifications is modified to add:

The Transplanting Plan as approved by the Engineer shall represent the materials and methods required to appropriately protect, remove and transport all local stock. The methods and/or materials shall not damage and/or mar the surface or internal structure of any local stock.

806-3.04(A) General: of the Standard Specifications is modified to add:

Local stock shall be replanted at their original growing depth to not more than two inches deeper than their original growing depth. The root collars of all local stock transplanted deeper than their original growing depth shall be in a callused condition. Saguaros, if applicable, are to be replanted in the same solar orientation and as near as possible to their vertical growth habit found prior to their initial removal and transport.

Cacti (all species) shall not be excavated, transported or removed during rainy weather conditions as determined by the Engineer. This work shall resume with the written approval by the Engineer.

806-3.04(C) Collected Stock and Local Stock: of the Standard Specifications is modified to add:

Planting shall not be done in soil that is excessively moist or otherwise in a condition not satisfactory for planting in accordance with accepted horticultural practice.

Plants shall be planted plumb and shall be centered in the planting pit or trench. All planting pits shall have vertical sides and flat bottoms.

Backfill material shall be prepared soil conforming to the requirements of Subsection 806-2.05 of these Special Provisions or prepared topsoil conforming to the requirements of Subsection 806-2.04 of the Standard Specifications. Backfill shall be carefully firmed around the roots or the ball of the plant so as to eliminate all air pockets and shall not be compacted around the roots or ball of the plants during or after planting operations.

Clods or stones exceeding two inches in diameter and foreign matter deemed objectionable by the Engineer will not be allowed. All excess soil that has objectionable stones shall be disposed of off the project site in a manner acceptable to the Engineer at no additional cost to the Department.

Plants shall be set to a depth such that, after backfilling and watering, the top of the root ball and the level of the backfill will match the surrounding grade as shown on the project plans. Any plant that settles more than 1 ½” inches below the specified grade shall be reset or replaced. Any additional backfill material required shall be as specified in the Special Provisions and on the project plans.

Immediately after planting, all plants shall be thoroughly irrigated until the backfill soil around and below the roots or the root ball of each plant is saturated.

The contractor shall supply, install and compact any prepared soil lost due to settling, the work and materials is considered incidental to the item.

806-3.05 Pruning and Staking: of the Standard Specifications is modified to add:

Final cuts to local stock roots during each transplanting shall be accomplished to provide the minimum acceptable root lengths by the use of lopping shears, pruning saw and/or by the method approved in the Transplanting Plan. After the final cut, the remaining root attached to the local stock shall be structurally intact with no signs of splintering or shredding. Final cuts to roots less than one inch in diameter shall leave the attached roots with a minimum length three inches from the buttress of the trunk or lateral support root. Ocotillo roots greater than one inch in diameter shall leave the attached roots with a minimum length of 12 inches from the buttress of the trunk or lateral support root. Buttress roots for saguaros, if applicable, greater than three inches in diameter shall leave the attached roots with a minimum length of 24 inches minimum root length from buttress or lateral support root. All wounds and/or cuts made to the roots shall be treated with powdered sulfur or bactericide on the same day that the cut and/or wound was made.

All final cuts to local stock made above the root collar shall be accomplished by the use of lopping shears, pruning saw, and/or by the method in the approved Transplanting Plan. All wounds and/or cuts made to the stock shall be treated with powdered sulfur or bactericide on the same day that the cut and/or wound was made.

No guying, staking, or bracing is required for the project.

806-3.06 Care and Protection of Trees, Shrubs and Plants: of the Standard Specifications is modified to add:

The Engineer will perform visual inspections each month in the presence of the contractor, unless the Engineer and the contractor agree to other arrangements in writing.

Local stock will be deemed acceptable if they meet the requirements of these Special Provisions and show evidence of overall health and vigor when reviewed by the Engineer. Local stock that does not display a healthy vigorous appearance in close conformity to its appearance prior to its initial removal and transplant, and/or displays poor health symptoms as specified in these Special Provisions, shall be determined as unacceptable by the Engineer.

No further payment will be made to the contractor for any local stock determined as unacceptable by the Engineer until the unacceptable local stock quantities are replaced with other local and/or nursery stock as specified in the Standard Specifications and these Special Provisions to meet the acceptable mortality quantities.

The contractor is required to replace the unacceptable local stock that exceeds the AMQ assigned to each species per lot with local stock and/or nursery stock as specified in the Standard Specifications and these Special Provisions. Unacceptable plants shall be removed from the site within seven days of notice from the Engineer. Planting of local stock, as required to meet the survivability requirements, shall be completed within 10 days of the notice of unacceptability of the replanted material.

After transplanting, all local stock within a species that becomes unacceptable as determined by the Engineer shall be cumulatively added to any previous totals of unacceptable local stock for a new cumulative total per planting lot. The new total shall then be used to determine the additional quantities of local stock to be replaced by the contractor as per the details shown on the project plans and as specified in the Standard Specifications and these Special Provisions.

The contractor shall obtain the Engineer’s approval prior to the removal of additional local stock from its original location or at the supplier’s yard when nursery stock is used as replacement plants.

For existing vegetation outside of designated clearing limits that is damaged, the contractor shall replace damaged trees, shrubs and cacti on a two-for-one, like size basis. The contractor shall use nursery stock per Section 806-2.01 of the specifications and these Special

Provisions for replacement plants. No seed substitution will be accepted for shrub replacements.

The contractor shall protect the existing plants and salvaged plants during drill seeding, hydroseeding, or temporary soil stabilization operations which includes protecting the plants from being sprayed with tackifier and mulching materials. The contractor shall be responsible for the replacement of plants sprayed or damaged during seeding and temporary soil stabilization activities.

The contractor shall be responsible for providing irrigation water through a temporary irrigation system for all replacement plants (per Sections 806, 807, and 808 of these Special Provisions) and shall be responsible for initiating the restoration work during the following growing season if conditions are not conducive to a successful planting within the current year.

806-4 **Method of Measurement:** of the Standard Specifications is modified to add:

Plants identified and described in this section shall not be subject to, nor eligible for, value engineering.

806-5 **Basis of Payment:** of the Standard Specifications is modified to add:

No measurement or direct payment will be made for the Transplanting Plan preparation, adjustment to stock inventory, and site visits, the cost being considered included in the contract items.

No measurement or direct payment will be made for pioneering of access roads or traversing overland for the salvaging of local stock within the project limits, the costs being considered included in the cost of contract items.

The contractor shall obtain all necessary permits and tags for transporting plant materials on public roadways. No measurement or direct payment will be made for these items; the costs being considered included in the cost of contract items.

SECTION 807 LANDSCAPING ESTABLISHMENT:

807-1 **Description:** the first paragraph of the Standard Specifications is revised to read:

The work under landscaping establishment shall consist of the care of all local and/or collected stock salvaged and installed as part of the project in accordance with accepted horticultural practices; supplying and applying all irrigation water; repairing public or weather damage; furnishing and applying sprays, dust and/or cages to combat vandalism, disease, insects and other pests; pruning as required by the Engineer; and the reconfiguring, maintaining, and operating the temporary drip irrigation system; in accordance with the requirements of Section 807 and these Special Provisions.

The work shall be divided into two phases. Phase I shall consist of the work to be done under all contract items except that under the references to landscape establishment. The time for Phase II Landscape Establishment is identified in Subsection 108.08. Until submittal of the SWPPP Notice of Termination, the requirements of Subsections 104.09 and 104.10 of the Standard Specifications and these Special Provisions shall apply.

The landscape establishment activities shall include providing sufficient water to keep the installed plants in a healthy condition and the reconfiguration, modification, maintenance, repair, replacement and operation of the temporary water distribution system specified in Section 808 to meet the landscape establishment needs of the project. Some equipment required for Section 806 may not be required for all or portions of the landscape establishment period and shall be removed as directed by the Engineer. The remaining system shall be reconfigured as agreed to by the Engineer.

The contractor shall be responsible for keeping a log of all Phase II activities. The log shall contain a record of the time and date of field inspections, watering time durations and dates, fertilizer applications, repairs, re-plantings, and other operations conducted by the contractor. The contractor shall provide for approval the format for recording these activities prior to undertaking the work.

807-2 Materials: of the Standard Specifications is modified to add:

The water used during Landscaping Establishment to properly maintain the plant material will be furnished by the contractor, as described in the Transplanting Plan and Subsection 806-2.07 of these Special Provisions. The contractor shall notify the Engineer and obtain prior approval for the use of any chemicals for weed eradication or control.

Materials used in the landscape establishment work shall be as identified in Subsections 805-2, 806-2, and 808-2 of the specifications and these Special Provisions. Replacements shall be governed by the applicable requirements herein as if they were new materials.

Plant material replacement for losses in excess of the total AMQ for the project (by species) shall be considered incidental to the landscaping establishment and shall be made at no charge to the Department. The contractor shall obtain the Engineer’s approval prior to the removal of the nursery stock from the supplier’s yard.

807-3.01 General: of the Standard Specifications is modified to add:

The landscape subcontractor shall be the only contractor that performs the work under Phase II. Subcontracting of this work shall not be permitted, except, if needed, for weed eradication with herbicides which requires special licensing.

All landscape plants shall be provided protection which shall include, but not be limited to, eradication or control of insects, mites, fungi, and non-fungus diseases. The application of appropriate insecticide, miticide, and fungicide may only be used with the prior approval of the Engineer.

No insecticides, fungicides, and miticides employed during the term of the contract shall cause the extermination of any landscape plant material, or cause damage to the growth characteristics such that plants will not be able to recover in a normal manner.

No chemical shall stain or cause damage to any portion of the site or improvements, including landscape plant materials. If staining or damage occurs, repairs or replacements shall be made at the contractor's expense to the satisfaction of the Engineer.

Application of chemicals shall be in such a manner so as not to cause injury to the personal health of anyone working on the project, observing, or passing by. Care shall be taken such that no puddles or pools of water which may contain toxic amounts of chemicals shall remain after completion of operations. Chemicals shall not be allowed to fall on or migrate to areas other than the work site. All laws and local codes shall be followed regarding application methods and personnel.

The landscape establishment period for all local and/or collected stock will begin upon the completion of the approved, final planting of a particular planting lot at the discretion of the Engineer.

The contractor shall provide adequate water to each installed plant to maintain optimum health through the completion of the landscapeestablishment period. However, it is the intent of the Department that the volume of water supplied to the installed plants in the last 6 months of the Phase II landscape establishment period is gradually reduced to near zero without jeopardizing the long-term survivability of the plants. At least one reduced watering cycle must be provided in the final month of the establishment period. The contractor shall identify how this objective will be achieved in the Transplanting Plan submittal. The rate of reduction of supplemental watering may be modified by the Engineer during the course of the establishment period based on climatic factors, seasonal considerations, and the success of the replanting. If in the opinion of the Engineer, additional landscape establishment activities are required beyond those required in these Special Provisions or as approved in the Transplanting Plan, the work will be authorized through a supplemental agreement between the Department and the contractor.

The Engineer will perform visual inspections, while in the presence of the contractor each month of the establishment period, unless the Engineer and the contractor agree to other arrangements in writing. The contractor shall modify the maintenance practices and water delivery to the plants to maintain optimum growing conditions as directed by the Engineer.

The contractor shall note that freezing temperatures occur on the project and winterizing the water distribution system may be required to avoid damage. No additional cost shall be incurred by the Department for this work and/or damage caused thereby.

Acceptance by the Engineer of transplanted stock re-plantings at the completion of the landscape establishment period will constitute the final acceptance of work for these materials.

During the landscape establishment period, the contractor shall provide the necessary care to keep local and/or collected stock equal in health and vigor under the use of standard horticultural practice to combat detriments known as; rodents, mammals, pest, disease, bacteria, mites, fungi, nutrient deficiency, harmful exposure to sunlight, and drought conditions.

In addition to inspecting local and/or collected stock for damage to its appearance in health and/or vigor resulting from any of the previously mentioned detriments, the Engineer will also inspect the local and/or collected stock for symptoms that indicate poor health. Poor health symptoms will include items such as; wrinkled, loose or damaged cambium layers; evidence of transplant ‘shock’, i.e. leaf drop and discolored foliage; no observable improvement to the condition of the local and/or collected stock after it has received adequate irrigation or rain; change in color not consistent with color changes to identical species existing in the project vicinity; failure to leaf out when identical species of the project vicinity are consistently found in leaf; and appropriate moisture content in the soil. The previously mentioned criteria shall be used by the Engineer to determine if the local and/or collected stock is in close conformity in health and/or vigor and acceptable for payment or determined unacceptable for no payment by the Department.

The contractor shall replace the unacceptable stock that exceeds the AMQ assigned to each species. No further payment will be made to the contractor for maintenance of any stock determined as unacceptable by the Engineer until the unacceptable stock quantities that make up the AMQ are replaced with collected stock as specified in the Standard Specifications and these Special Provisions.

All stock within a species that becomes unacceptable as determined by the Engineer shall be cumulatively added to any previous totals of unacceptable local stock for a new cumulative total per planting lot. The new total shall then be used to determine the additional quantities of stock to be replaced by the contractor as per the details shown on the project plans and as specified in the Standard Specifications and these Special Provisions.

The contractor shall record and document nursery stock replacements installed on the project as described in Subsection 806-3.01 of these Special Provisions.

Upon completion of the establishment period, or as agreed upon by the Engineer, the irrigation system equipment shall be removed from the project site as directed by the Engineer and become the property of the contractor. Tank and irrigation equipment locations shall be re-graded to conform to the pre-construction natural grades and/or the typical section of the site and seeded with the applicable native seed mix as described in Item 8050003. No separate measurement or payment will be made for these restoration activities, the cost being considered incidental to the landscape establishment item.

SECTION 808 WATER DISTRIBUTION:

808-1 Description: of the Standard Specifications is modified to add:

The work under this section shall consist of designing, furnishing, installing, testing, maintaining, repairing and operating a complete and functional temporary gravity flow irrigation system. The work includes the layout of the system, testing, furnishing all materials and installing the temporary system in accordance with the requirements of Section 808 of the specifications and these Special Provisions. Water shall be provided through a temporary irrigation system installed under this contract; watering the installed plants by water truck or by dragging a small diameter hose to each plant will not be allowed. Water installed plants under this contract as required to result in healthy specimens through the Landscape Establishment period.

The contractor shall prepare a shop drawing layout of irrigation equipment and details as needed to adequately water local and/or collected stock from the time of replanting through the landscape establishment period as described in Sections 806 and 807 f these Special Provisions and as approved in the Transplanting Plan. The contractor shall identify the location of any proposed sleeving, the proposed number of storage tanks required, and their stabilization support installations, tank capacities, points of connection for supply lines to the water distribution system, securing details for the supply lines, distribution flow control mechanisms, lateral lines with accompanying securing details, monthly and total quantity of water to be supplied to the plants, anticipated daily watering requirement calculations per lot or planting area, anticipated daily water requirement per plant species, proposed emitters, emitter placement locations and protection from damage by cold and freezing temperatures. The location of water supply truck parking and the proposed means for protecting public safety during the water tank filling shall also be identified in the Transplanting Plan. The contractor shall make modifications to the Transplanting Plan as requested by the Engineer at any time during the contract period.

Once the Transplanting Plan is approved, changes in the work can only be made with the written approval by the Engineer of the submitted changes to the Transplanting Plan. No replanting of the stock shall commence until the Transplanting Plan is approved.

The temporary irrigation equipment including the tanks used to water the plants shall be placed outside the vehicle recovery area.

808-2.01 Components: of the Standard Specifications is modified to add:

Irrigation tanks shall be clean and free of cracks, leaks, holes or other defects, and shall be furnished as required based on the approved Transplanting Plan.

Tanks shall be furnished with secured covers with a fill inlet and outlet as approved in the Transplanting Plan. Any substitutes or alternatives shall be approved by the Engineer.

All Polyvinyl chloride (PVC) pipe and fittings shall be in accordance with Subsection 808-2.01 (l) (1) of the Standard Specifications. Sleeving shall be Schedule 80, sized as required.

All polyethylene pipe shall be as specified in the approved Transplanting Plan. All polyethylene fittings shall be molded fittings of plastic material. Fittings shall be compression-type designed or sized for use with the specific brand of pipe used for construction.

All pipe shall be homogenous throughout and free from visible cracks, holes, foreign materials, blisters, deleterious wrinkles, dents and variation. Emitters, check valves, filters, adapters and fittings shall be designed and manufactured for use with the specific brand of pipe used for construction. Emitters shall be pressure compensating. Used materials will not be allowed on the project.

The contractor shall provide sufficient quantity of materials to meet the project needs. The recommended materials list for all irrigation system components shall be identified in the pre-construction submittal.

808-3.03 General Requirements: of the Standard Specifications is modified to add:

The contractor shall maintain, repair, make replacements and operate the temporary water distribution system specified herein from the initial planting of the selected stock through the acceptance of the Construction Phase landscape installation and the Landscape Establishment Phase.

Irrigation tanks shall be located as shown on the approved Transplanting Plan. Field adjustment of the tanks may be required but they shall not be located at an elevation lower than the highest plant to be watered. The tank locations shall be staked by the contractor and approved by the Engineer prior to installation. Locations of all other equipment, pipe, tubing and emitters as shown on the Transplanting Plan shall also have their locations approved in the field prior to installation.

The irrigation system shall be complete and operative, giving 100 percent coverage to all plants. All irrigation work shall be coordinated with the planting operations in order to provide water to the plants the same day they are planted.

The contractor shall report to the Engineer any deviations between drawings, specifications, Special Provisions and the site that will substantially alter layout, location or construction of the irrigation system. Failure to do so shall result in relocations, corrections, or replacements to be performed at the contractor’s expense.

All PVC and polyethylene pipe shall be installed above ground and anchored to the ground with acceptable staples or attachments which will not damage the pipe, as approved in the Transplanting Plan. Piping shall be placed so that it is hidden from the roadway view to the maximum extent practical. Pipes shall be ganged in common lines where possible. Random placement of piping is not acceptable. The Engineer is the sole judge of the acceptability of the placement of the surface run pipes.

The proposed maximum length of polyethylene pipe runs shall be identified in the Transplanting Plan. The maximum length of emitter distribution tubing run shall be 6 feet, unless the Engineer approves other dimensions. All pipe shall be cut with an approved irrigation pipe cutter to ensure a square cut.

If at any time during the workday pipe installation is stopped, the contractor shall plug the ends of all lines to prohibit the entrance of any foreign matter of any kind into the pipe. Plugs designed for this purpose shall be used as approved by the Engineer. No cardboard, plastic, burlap, duct tape, wood or rocks shall be used for this purpose.

The Engineer will inspect the irrigation system within a lot prior to substantial completion. The contractor shall notify the Engineer at least 24 hours in advance of the time when such inspection is ready. The irrigation lines shall be tested (without emitters) for a period of not less than one hour and shall show no loss of water through the fittings. Pipe ends shall be plugged as approved by the Engineer for the inspection and testing. All defects evident or occurring during testing shall be repaired or replaced promptly, and the tests repeated. No caulking or taping of joints, cracks or holes will be permitted.

After all irrigation piping and equipment is in place, prior to installation of emitters, a full head of water shall be used to flush out the system for a period of 10 minutes. The contractor shall repair erosion from the flushing activities. After the system has been thoroughly flushed, emitters shall be installed as approved on the Transplanting Plan. Emitters shall be placed on the uphill side of the plant to provide optimum root coverage. Care shall be taken prior to emitter and emitter line installation to keep polyethylene pipe free of foreign matter. Planting of selected materials may commence upon approval of the irrigation system.

808-4 Method of Measurement: of the Standard Specifications is modified to add:

No measurement or direct payment for the work under this section, the work shall be considered incidental to the work under Sections 806 and 807.

808-5 Basis of Payment: of the Standard Specifications is modified to add:

No measurement or direct payment will be made for preparation of and revisions to the shop drawings, excavating for and installing tanks, installing sleeving as needed, furnishing and installing polyethylene piping and emitters, testing, maintaining, making repairs, and operating the temporary irrigation system from the start of planting activities through the Landscape Establishment Phase, the cost of which shall be included in the unit prices for work under Sections 806 and 807.

No adjustment in compensation will be made for any increase or decrease in the work required to install and maintain the temporary irrigation system or for any increase or decrease in the time duration of the contract resulting from the failure of the contractor to meet the requirements of these Special Provisions.

SECTION 810 EROSION CONTROL AND POLLUTION PREVENTION:

810-2.03 Riprap and Rock Mulch: the Gradation C Rock Mulch table of the Standard Specifications is revised to read:

Gradation C Rock Mulch (fractured/crushed rocks in angular shape)	
Sieve Size	**Percent Passing**
3.75 Inch	100
3 Inch	55 - 85
2 Inch	15 - 55
1 Inch	0 - 15

810-3.06(B) Sediment Wattles: of the Standard Specifications is revised to read:

Sediment wattles shall be installed on slopes as directed by the Engineer, and in accordance with the manufacturer's instructions. The ends of adjacent wattles shall be abutted tightly together.

ITEM 8101018 – EROSION CONTROL (STABILIZED CONSTRUCTION ENTRANCE/EXIT GRAVEL PAD):

Description:

The work under this item shall consist of installing the Erosion/Sediment Control Gravel Pad Best Management Practice (BMP) for Stabilized Construction Entrance/Exit as shown on the project plans, specified herein or determined in the field.

Materials:

The rock mulch shall be Gradation C, angular in shape and conform to the requirements of Subsections 803-2.03 and 810-2.03 of the Specifications. The Bulk Specific Gravity (Saturated Surface Dry) shall be determined in accordance with the requirements of AASHTO T 85 and shall be a minimum of 2.4. Unless otherwise directed by the Engineer, natural river-run materials, especially the rounded natural river rocks/cobblestones and pebbles are not acceptable.

The nonwoven very high survivability geotextile fabric shall conform to the requirements of Subsection 1014-4.04(A) of the Specifications.

Construction Requirements:

The bed for the rock mulch shall be shaped and leveled to provide even surfaces and at a depth to accommodate the rock size and depth of rock mulch as specified on the project plans.

The contractor shall install geotextile fabric when water is applied for construction vehicle**/**equipment cleaning on gravel pad.

If called out in the plans**/**details or as directed by the Engineer, the contractor shall add track-out control measure of panel(s) **/** plate(s) **/** grate(s) such as corrugated steel panel(s), shaker plate(s), rumble plate(s), rattle grate(s), rumble grate(s), or rattle plate(s), on top of gravel pad, at no additional cost to the Department. When installed, the contractor shall maintain the track-out plate(s) **/** grate(s) control measure in a stable and safe working condition for the duration of the contract time.

The contractor shall remove and dispose of all rock mulch and geotextile fabric when project gravel pad is no longer in use. The gravel pad area shall be backfilled, graded and compacted in accordance with the requirements of Subsection 202-3 of the Specifications.

Method of Measurement:

Erosion Control (Stabilized Construction Entrance**/**Exit Gravel Pad) will be measured by the square yard installed.

Basis of Payment:

The accepted quantities of Erosion Control (Stabilized Construction Entrance**/**Exit Gravel Pad), measured as provided above, will be paid for at the contract price per square yard, which price shall be full compensation for the work including excavation, backfill, grading, and compaction, complete in place.

No measurement of direct payment will be made for removal of the gravel pad and re-grading of the area to pre-construction conditions, the cost considered as included in the cost of contract item.

ITEM 9080085 - CONCRETE CURB AND GUTTER (C-05.10) (TYPE G, W=1')(DETAIL A):
ITEM 9080086 - CONCRETE CURB AND GUTTER (C-05.10) (TYPE G, W=2')(DETAIL A):

Description:

The work under these items shall consist of constructing concrete curb and gutter at the locations shown on the project plans and as specified herein.

Materials:

Concrete shall be Class S (f'c = 4,000 pounds per square inch) conforming to the requirements of Section 1006 of the specifications.

Expansion joint filler shall be 1/2-inch bituminous or non-bituminous preformed strips and conform to the requirements of Subsection 1011-6 of the specifications.

Construction Requirements:

The concrete curb and gutter shall be constructed in accordance with Subsection 908-3 of the specifications.

Method of Measurement:

Concrete Curb and Gutter will be measured on a linear foot basis along the flow line.

Basis of Payment:

The accepted quantities of Concrete Curb and Gutter, measured as provided above, will be paid for at the contract unit price per linear foot, which price shall be full compensation for the work, complete in place.

ITEM 9080245 – CONCRETE (TRUCK APRON - DETAIL A):

Description:

The work under this item consists of constructing concrete truck aprons for the roundabouts at the locations shown on the plans per Detail A, and in accordance with these Special Provisions.

Materials:

Portland cement concrete shall conform to the requirements of Section 1006. Concrete shall be Class S, with size 57 coarse aggregate as designated in AASHTO M 43 and shall have a minimum 28-day compressive strength of 4,000 psi.

Materials furnished for silicone joint sealant shall conform to the requirements of Subsection 1011-8 of the specifications.

The concrete stain shall be a technically advanced and environmentally safe product manufactured for permanent color mitigation and penetrate the concrete surface. The following colors have been selected:

Roundabout - Truck Apron:	Stain Color: ‘Quail Gray’
Truck Apron - Chevrons:	Stain Color: ‘Paprika’

The contractor shall not place the concrete material until the mix design has been approved by the Engineer.

Construction Requirements:

Construction of the concrete truck aprons shall be in accordance with requirements of Subsection 908-3 and as specified herein.

Expansion joints (Type H, Standard C-07.01) shall be constructed at a maximum spacing of 60-foot intervals and constructed radially. Expansion joints shall match as nearly as possible to the joints in the adjacent concrete curb and gutter. Expansion joints (Type H) shall also be constructed between the curb and the truck apron on both sides of the apron. Joint filler shall be placed vertically and extend full depth beginning 3/16 inch below the surface of the concrete being placed. During the placing and tamping of concrete, the filler shall be restrained in its proper position.

Edges of the concrete at expansion joints shall be tooled to a 1/4-inch radius.

Contraction joints (Type TWP, Standard C-07.01) shall be constructed at a maximum of 15 - foot intervals and constructed radially. Contraction joints shall coincide with contraction joints in adjacent concrete curb and gutter.

Longitudinal contraction joints (TWP, Standard C-07.01) shall be constructed in the center of truck apron. Contraction joints shall either be formed or sawed. Formed contraction joints shall be constructed by parting the large aggregates in the fresh concrete with a straight edge to a depth of 3 inches. The final joint finishing shall be accomplished with a jointer tool having a radius of 1/4 inch leaving a finished joint depth of a minimum of 3/4 inch. Sawed joints shall be sawed to a depth of 3 inches or one-third the thickness of the concrete, whichever is greater.

The surface of concrete truck apron shall be tested with a 10-foot straightedge. The surface shall not vary in any direction by more than 1/4 inch, except at longitudinal and transverse construction joints. The surface shall not vary by more than 1/4 inch across any longitudinal or transverse construction joint. Grinding will be required to ensure that these requirements are satisfied. The grinding, if needed, shall be done in a manner that does not form a smooth or polished pavement surface.

Prior to construction of the truck apron, the contractor shall prepare three colored concrete samples of each of the colors for approval by the Engineer. Each sample shall be 3 feet by 3 feet by six inches.

The concrete stain color shall be applied in an even and consistent application in accordance with manufacturer’s recommendations.

The surface on which the truck apron is to be constructed shall be smooth and free of debris, loose rock exceeding one inch in diameter and other foreign material.

Method of Measurement:

Concrete truck apron will be measured by the square yard of surface area of concrete truck apron placed.

Basis of Payment:

The accepted quantities of concrete truck apron, 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, including grading, expansion and contraction joints, joint filler and sealant, curing compound, surface finishing, staining and concrete samples.

ITEM 9080512 – SCUPPER (DETAIL DN):

Description:

The work under this item shall consist of constructing new concrete scuppers including spillways per Detail DN, as shown on the project plans and the requirements of these specifications.

Materials:

Materials shall conform to the requirements of Subsection 503-2 of the specifications.

Construction Requirements:

Construction requirements shall conform to the requirements of Subsection 503-3 of the specifications.

Work shall be done at the locations designated on the project plans and in accordance with the details shown on the plans and the requirements of these Special Provisions.

Method of Measurement:

Scupper will be measured by the unit each for each scupper constructed.

Basis of Payment:

The accepted quantities of scupper, measured as provided above, will be paid for at the contract unit price each, which price shall full compensation for the work, complete in place, including concrete, steel, excavation, and backfill.

(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 9100053 – CONCRETE BRIDGE BARRIER TRANSITION

Description:

The work under this item shall consist of furnishing all materials and constructing new barrier transitions at the locations shown on the project plans and in accordance with the details shown on the plans and the requirements of these specifications.

Materials:

Materials shall conform to the requirements of Subsection 910-2 of the specifications.

Construction Requirements:

Construction shall be in accordance with the details shown on the plans and the requirements of Subsection 910-3 of the specifications.

An approved bonding agent, as shown on the Department’s Approved Products List, shall be applied to the interface surface, as shown in the project plans.

Method of Measurement:

Concrete Bridge Barrier Transition will be measured as a unit for each concrete barrier transition.

Basis of Payment:

The accepted quantities of Concrete Bridge Barrier Transition, measured as provided above, will be paid for at the contract price per each, which shall be full compensation for the work, complete in place, including concrete, steel, and dowels.

No measurement or direct payment will be made for barrier markers, the cost being considered as included in the cost of the concrete bridge barrier transition.

SECTION 912 SHOTCRETE:

912-1 Description: of the Standard Specifications is revised to read:

The work under this section shall consist of furnishing all materials, placing backfill in gullies to restore the embankment to a near original shape, and applying shotcrete on prepared surfaces at the locations and in accordance with the details shown on the plans and the requirements of the specifications.

Shotcrete shall be mortar or concrete conveyed through a hose and pneumatically applied using the wet mix process.

The wet mix process shall consist of premixing by mechanical methods a proportional combination of Portland cement, supplementary cementitious material, aggregate, and water required to produce mortar or concrete; conveying the mortar or concrete through the delivery hose to the special nozzle where additional compressed air is added at the nozzle prior to its discharge.

912-2.03 Admixtures: of the Standard Specifications is revised to read:

Admixtures shall conform to the requirements of Subsection 1006-2.04 of the specifications.

Air-entraining admixtures will be required for shotcrete placed at an elevation of 3,000 feet or above and the air content shall be 7 percent plus or minus 2 percent, when measured prior to pumping. At other elevations, air entraining admixtures may be used at the discretion of the contractor/mix designer and shall conform to the approved mix design. Air content will be measured in accordance with AASHTO T 152.

912-2 Materials and Equipment: of the Standard Specifications is modified to add:

912-2.07 Synthetic Fiber:

Microfiber may be used for control of plastic shrinkage. Macrofiber may be used to provide the residual strength. The dosage rate of either product shall be as specified by the mix design.

Fibers shown on the Department's Approved Product List (APL) and meeting the requirements specified herein shall be used as reinforcement. Copies of the most current version of the APL are available on the internet from the ADOT Research Center through its Product Evaluation Program. Fibers other than those listed on the APL that meet with the requirements specified herein may be considered for use as specified in Subsection 106.14 of the specifications, upon Engineer's approval.

Fiber reinforcement shall conform to the requirements of ASTM C1116 and ASTM D7508. Fiber reinforcement shall be polymeric, made from 100 percent virgin materials, non-corrosive, non-magnetic, and 100 percent alkali free.

Microfiber shall have a diameter of less than 0.012 in. (0.3 mm) and be clearly defined as a microfiber on the manufacturers technical data sheets.

Macrofiber shall have a minimum diameter of 0.012 in. (0.3 mm) and be clearly defined as a macrofiber on the manufacturers technical data sheets

The specific type, size, and quantity of fiber shall be determined by the mix designer and approved by the Engineer.

912-2.08 Backfill:

Soil taken from the slope layback may be used for gully backfill soil. Provided gully backfill soil shall approximate the composition & compactness of the existing embankment soil, as reviewed and accepted by the Geotechnical Engineer. Refer to subsection 203-10.03 of the specifications for additional compaction requirements. At the contractor's option, slurry backfill may be used as backfill material and shall conform to the requirements of Subsection 501-3.02(A)(3). Slurry backfill shall be one sack slurry.

912-2.09 Bituminous Joint Filler:

Preformed bituminous joint filler shall conform to the requirements of Subsection 1011-6.01 of the specifications.

912-3.01 Proportioning and Mixing: of the Standard Specifications is revised to read:

(A) Wet Mix Process:

(1) Premixed Mortar:

Premixed mortar shall consist of not less than 564 pounds of combined Portland cement and supplementary cementitious material per cubic yard, fine aggregate, chemical and/or air-entraining admixtures, and water mixed to a desired consistency, generally to a slump in the range of 1-1/4 to 4 inches.

The material may be mixed at a central mixing plant or at the project site. If mixing is done at the project site, the mixer shall be capable of thoroughly mixing the specified materials in sufficient quantity to maintain continuous placing of the mortar.

(2) Concrete:

The contractor shall determine the mix proportions and shall furnish concrete for pneumatic placement which contains a minimum of 658 pounds of combined Portland cement and supplementary cementitious material per cubic yard of concrete and which attains a minimum 28-day compressive strength of 3,000 pounds per square inch, unless otherwise specified. Fine aggregate and coarse aggregate shall conform to the requirements of Subsection 912-2.02. The total mix shall contain 15 to 20 percent coarse aggregate, by weight. The water/cementitious material ratio shall not exceed 0.50. In no case shall the slump be greater than 4 inches.

If ready-mixed concrete is used, it shall conform to the requirements of ASTM C 94.

If microfiber is used in the mix design, the dosage rate shall be determined to provide a minimum of 40% reduction in plastic shrinkage cracking when tested in accordance with ASTM C1579.

If macrofiber is used in the mix design, the dosage rate shall be determined to meet either the average equivalent flexural strength, or residual strength at a deflection of L/150, fd150 determined in accordance with ASTM C1609, using a load support apparatus compliant with the requirements of ASTM C1812.

912-3.02 Preparation of Surfaces: of the Standard Specifications is revised to read:

Existing soil slopes shall be regraded to the lines shown on the plans or established by the Engineer and compacted to the requirements of Subsection 912-2.08. Gullies shall be filled with compacted backfill prior to shotcrete placement. Soil surfaces in contact with slope paving shall be uniformly moistened so that water will not be drawn from the freshly placed shotcrete.

912-3.04 Steel Reinforcement: of the Standard Specifications is revised to read:

Reinforcement shown on the plans shall consist of continuous steel reinforcement conforming to the requirements of Section 605 of the specifications or synthetic fiber reinforcement meeting requirements of Subsection 912-3.01 of the specifications which meet or exceed the performance of the steel required in Section 605 of the specifications.

912-3.08 Finishing: of the Standard Specifications is revised to read:

The shotcrete shall be placed as nearly as practicable to the required thickness and shape outlined by forms and ground wires. Unless otherwise specified, the surface of the shotcrete shall have a natural gun finish.

912-3.10 Placement of Slurry Backfill: is hereby added to the Standard Specifications:

If the contractor opts to use the slurry backfill, it shall be placed in two-foot lifts and allowed to set prior to placing subsequent lifts. Areas where runoff has formed a ditch greater than six inches in depth shall be filled with slurry backfill material within the limits shown on the project plans.

912-5 Basis of Payment: of the Standard Specifications is revised to read:

Payment for shotcrete will be made at the contract unit price per square yard, complete in place, including excavating, backfilling, fine grading, compaction, reinforcement, gully backfilling and bituminous joint fillers.

(913BKPRT, 02/18/21)

SECTION 913 - BANK PROTECTION: of the Standard Specifications is revised to read:

913-1 Description:

The work under this section shall consist of furnishing all materials and constructing bank protection in accordance with the details shown on the plans and the requirements of the specifications.

Bank protection shall be dumped riprap, grouted riprap, wire tied riprap, riprap in wire baskets or gabions, soil-cement, and other types of bank protection and shall be constructed at the locations and as shown on the plans.

913-2 Materials:

913-2.01 Riprap Bank Protection:

(A) Rock:

Rock shall be sound and durable, free from clay or shale seams, cracks or other structural defects.

The bulk (SSD) specific gravity of the rock shall be a minimum of 2.4 as determined in accordance with the requirements of Arizona Test Method 210.

Rock used to construct dumped riprap shall be angular in shape. Rock used to construct other types of bank protection may be rounded stones or boulders. Rock shall have a least dimension not less than one-third of its greatest dimension and a gradation in reasonable conformity with that shown herein for the various types of bank protection. Control of the gradation will be by visual inspection.

When a source of rock is designated by the Department, it shall be the contractor's responsibility to negotiate for the material, obtain the right-of-way, and pay all royalties and damages.

The acceptability of the rock will be determined by the Engineer by visual inspection and/or testing. If testing is required, suitable samples of rock shall be taken in the presence of the Engineer at least 25 days in advance of its expected use. The approval of some rock fragments from a particular quarry site shall not be construed as constituting the approval of all rock fragments taken from that quarry.

During construction of the bank protection, the contractor shall provide two samples of rock for the intended use. The amount of each sample for dumped riprap and riprap (slope mattress) shall be at least five tons. The amount of each sample for grouted riprap, wire tied riprap, gabions, and rail bank protection shall be at least 500 pounds. One sample shall be provided at the construction site and may be a part of the finished bank protection. The other sample shall be provided at the quarry. These samples will be used as a frequent reference for judging the gradation of the rock supplied. Any difference of opinion between the Engineer and the contractor shall be resolved by checking the gradation of two random samples of the rock.

Material that is deemed unacceptable by the Engineer shall be replaced with acceptable material at no additional cost to the Department.

(1) Grouted Riprap:

Gradation of the rock for grouted riprap shall be as specified in the Special Provisions or as shown on the plans.

(2) Wire Tied Riprap:

Rock for wire tied riprap shall be well graded with at least 95 percent exceeding the least dimension of the wire mesh opening. The maximum size rock, measured normal to the mat, shall not exceed the mat thickness.

(3) Dumped Riprap:

Gradation of the rock for dumped riprap shall be as shown on the plans or as specified in the Special Provisions.

All equipment, sorting sites, and labor needed to check gradation shall be provided by the contractor at no additional cost to the Department.

(4) Gabions:

Rock for gabions shall be well graded, varying in size from 4 to 8 inches.

(5) Riprap (Slope Mattress):

Rock for slope mattress shall be well graded with 70 percent exceeding three inches. The maximum dimension of a single rock shall not exceed the least dimension of the gabion.

(6) Rail Bank Protection:

Rail bank protection rock shall be well graded, varying in size from 4 to 12 inches.

(B) Metal Items:

(1) Wire Fabric:

Welded wire fabric shall be galvanized and shall conform to the requirements of AASHTO M 336, except that the minimum weight of the zinc coating shall be 0.15 ounces per square foot of actual surface.

Woven wire fabric shall be galvanized and shall conform to the requirements of ASTM A116, except that the minimum weight of the zinc coating shall conform to the requirements of ASTM A641, Class 3.

Wire fabric shall be of the diameter, spacing, pattern, and dimensions shown on the plans. The selvage on each sheet of mesh shall be galvanized steel wire with a minimum diameter 25 percent larger than that used in the body of the mesh.

Certificates of Compliance conforming to the requirements of Subsection 106.05 of the specifications shall be submitted to the Engineer.

(2) Miscellaneous Fittings and Hardware:

Miscellaneous fittings and hardware shall be of the type and size provided by the manufacturer of the major item to which they apply and shall be galvanized in accordance with the requirements of AASHTO M 232.

Certificates of Compliance conforming to the requirements of Subsection 106.05 of the specifications shall be submitted to the Engineer.

(3) Tie Wires:

Tie wires shall be of good commercial quality and the size shall be as shown on the plans, except that the minimum weight of the zinc coating shall conform to the requirements of ASTM

A641, Class 3. The contractor may use approved wire fasteners on gabions, slope mattresses, or wire fabric in lieu of tie wires.

Certificates of Compliance conforming to the requirements of Subsection 106.05 of the specifications shall be submitted to the Engineer.

(4) Steel Cable:

Steel cable shall be zinc-coated steel structural wire rope conforming to the requirements of ASTM A475, seven-wire strand, Class A, for the diameter shown on the plans.

Certificates of Compliance conforming to the requirements of Subsection 106.05 of the specifications shall be submitted to the Engineer.

(5) Railroad Rail:

Railroad rails may be new or used. If used rails are furnished, they shall be free from rust and equal to at least 95 percent of the original section.

(6) Soil Anchor Stakes:

Soil anchor stakes shall be made of steel and of the length shown on the plans. When not specified to be railroad rails, the following items may be used: crane rails with a weight of at least 40 pounds per linear foot, 2-inch diameter steel pipe conforming to the requirements of ASTM A53, or 3-inch by 3-inch by 3/8-inch structural steel angles conforming to the requirements of ASTM A36. Used rails, pipes or angles may be used provided the material is not rusted or damaged to the extent that the strength of the item is reduced to less than 90 percent of a new item of the same type and size.

Certificates of Compliance conforming to the requirements of Subsection 106.05 of the specifications shall be submitted to the Engineer.

(C) Bedding Material:

Bedding material shall consist of granular material having a maximum dimension of 2 inches and shall be free of clay or organic material.

(D) Grout:

Grout shall consist of Portland cement, aggregate, and water. It may also contain supplementary cementitious material. Portland cement, aggregate, water, and supplementary cementitious material shall conform to the requirements of Section 1006 of the specifications. Chemical admixtures may be used and shall conform to the requirements of Subsection 1006-2.04 of the specifications, except no admixtures containing chlorides or nitrates shall be used. Air-entraining admixtures, conforming to the requirements of

Subsections 1006-2.04 and 1006-3.01(E) of the specifications, shall be required for grout placed at elevations of 3000 feet or above.

The grout shall meet the requirements shown in table 1:

Table 1

Minimum Cementitious Material Content: Lbs per CY (See Note 1)	**Maximum Water/Cementitious Material Ratio (w/cm): Lb./Lb.**	**Slump: Inches** (See Note 2)	**Air Content: Percent** (See Note 3)
850	0.60	9 ± 2	0 – 8

Notes:

(1) A maximum of 25 percent of the cementitious material, by weight, may consist of an approved Class F fly ash, conforming to the requirements of ASTM C618.

(2) The slump shall be in the appropriate range to permit gravity flow into the interstices with limited spading and brooming. The consistency of the grout shall be as approved by the Engineer.

(3) For placement of grout at elevations of 3000 feet or above, the air content shall be a minimum of 4 percent and a maximum of 8 percent.

The mix shall consist of fine aggregate; however, the contractor may use No. 8 coarse aggregate in the grout. If No. 8 coarse aggregate is used, the volume shall be a maximum of 35 percent of the total aggregate volume.

For plant-mixed grout, the proportioning, mixing, and placing shall be in accordance with the applicable requirements in Section 1006 of the specifications.

For on-site mixing, grout that has been mixed more than one hour shall not be used.

Retempering of grout will not be permitted.

(E) Bank Protection Fabric:

Fabric shall be supplied in accordance with and conform to the material requirements of Subsections 1014-1 and 1014-5 of the specifications, respectively. Special attention shall be given to the required survivability of the fabric.

The identification, packaging, handling, and storage of the geotextile fabric shall be in accordance with ASTM D4873. Fabric rolls shall be furnished with suitable wrapping for protection against moisture and extended ultraviolet exposure prior to placement. Each roll

shall be labeled or tagged to provide product identification sufficient to determine the product type, manufacturer, quantity, lot number, roll number, date of manufacture, shipping date, and the project number and name to which it is assigned. Rolls shall be stored on-site or at another storage location in a manner which protects them from the elements. If stored outdoors, rolls shall be elevated and protected with a waterproof, light colored, opaque cover. At no time, shall the fabric be exposed to sunlight for a period exceeding 14 days.

(F) Sacked Concrete:

Sacked concrete shall be utility concrete conforming to the requirements of Section 922 of the specifications, except that the minimum cement content shall be 376 pounds per cubic yard; the slump shall be from 3 to 5 inches; and the aggregate shall conform to the gradation requirements shown in table 2 when tested in accordance with the requirements of Arizona Test Method 201:

Table 2	
Sieve Size	**Percent Passing**
2 inch	100
1/4 inch	45 - 89
No. 200	0 -12

Sacks for sacked concrete riprap shall be made of at least AASHTO M 182, Class 3, burlap and shall be approximately 19-1/2 by 36 inches measured inside the seams when the sack is laid flat, with an approximate capacity of 1-1/4 cubic feet. Sound, reclaimed sacks may be used.

913-2.02 Soil-Cement Bank Protection:

(A) Hydraulic Cement, Fly Ash, and Water:

Hydraulic cement, fly ash, and water shall conform to the requirements of Subsection 1006-2 of the specifications.

(B) Soil-Aggregate:

The source of soil-aggregate materials shall be the responsibility of the contractor. The contractor shall be solely responsible for the construction of the stockpile(s), including monitoring for quality and uniformity of the material placed therein. The soil-aggregate used in the soil-cement mixture shall consist of stones, gravel or other approved inert material of similar characteristics, and shall be clean and free from vegetable matter and other deleterious substances. Soil-cement aggregate shall conform to the gradation requirements shown in table 3 when tested in accordance with Arizona Test Method 201:

Table 3	
Soil-Cement Aggregate	
Sieve Size	**Percent Passing**
1-1/2 in	98 - 100
No. 4	60 - 90
No. 200	5 - 15

Class 2 ABC may be used in-lieu of aggregate meeting the requirements of the table 3. The contractor may submit a request to use alternate material to the Engineer for review and approval.

The Plasticity Index shall be a maximum of seven when tested in accordance with the requirements of AASHTO T 90.

Clay lumps larger than 1 inch shall be removed.

When soil-aggregates are stored on the ground, the sites for the stockpiles shall be clear of all vegetation and level. The bottom six inch layer of aggregate stored on the ground shall not be disturbed or used.

The debris or waste material resulting from the clearing and preparing of the site shall be disposed of in accordance with Subsection 201-3.02 of the specifications.

(C) Mix Design Requirements for Soil-Cement Bank Protection:

Utilizing soil-aggregate, cementitious material, and water, a mix design conforming to the requirements specified herein shall be formulated and submitted by the contractor to the Engineer for approval prior to incorporating any of the material into the work.

The amount of cement shall be determined by laboratory testing by the contractor in accordance with Arizona Test Method 220. For mix design purposes only, the cement content of the soil-cement mixture shall be determined as the cement content which yields a seven day compressive strength of 1250 psi for the soil-cement mixture.

The percent of cement to be used in the mix shall be calculated to be the weight of cement divided by the total weight of the dry compacted soil-cement.

Included in the mix design data shall be the grade of cement, brand of fly ash, and the source of aggregate. A new mix design shall be submitted for approval any time the contractor requests a change in soil-aggregate source from that given in the approved mix designs.

913-3 Construction Requirements:

913-3.01 Riprap Bank Protection:

Areas on which bank protection is to be constructed shall be cleared, grubbed, and excavated or backfilled in accordance with the requirements of the appropriate sections of Division II to

produce a ground surface in reasonable conformance with the lines and grades shown on the plans or established by the Engineer.

Placement through water will not be permitted unless otherwise approved by the Engineer.

Areas which are excavated for installation of rail bank protection shall be backfilled to original ground or to the lines and grades shown on the plans.

(A) Bank Protection Fabric:

When fabric is required, it shall be placed in the manner and at the locations shown on the plans. The surface to receive the fabric shall be free of obstructions, depressions and debris. The fabric shall be loosely laid and not placed in a stretched condition.

The strips shall be placed to provide a minimum 24 inches of overlap for each joint. On horizontal joints, the uphill strip shall overlap the downhill strip. On vertical joints, the upstream strip shall overlap the downstream strip. The fabric shall be protected at all times during construction from extensive exposure to sunlight.

When the maximum size of the rock to be placed on fabric exceeds 18 inches, the fabric shall be protected during the placement of the rock by a layer of bedding material. The bedding material shall be spread uniformly on the fabric to a depth of 4 inches and shall be free of mounds, dips or windrows. Compaction of the bedding material will not be required.

Rock shall be carefully placed on the bedding material and fabric in such a manner as not to damage the fabric. If, in the opinion of the Engineer, the fabric is damaged or displaced to the extent that it cannot function as intended, the contractor shall remove the rock, regrade the area if necessary, and replace the fabric.

(B) Dumped Riprap:

The rock shall be placed to its specified thickness in one operation and in a manner which will produce a reasonably well graded mass with a minimum amount of voids and with the larger rock evenly distributed throughout the mass.

No method of placing the rock that will cause segregation will be allowed. Hand placing or rearranging of individual rock may be necessary to obtain the specified results.

(C) Wire Tied Riprap:

After installation of the lower portion of the wire mesh, rock shall be placed in accordance with the requirements of Subsection 913-3.01(B) of the specifications.

After placement of the rock, the upper portion of the wire mesh shall be placed, laced, and tied in accordance with the details shown on the plans.

(D) Grouted Riprap:

Rock for grouted riprap shall be placed in accordance with the requirements of Subsection 913-3.01(B). The stones shall be thoroughly moistened and any excess of fines shall be sluiced to the underside of the stone blanket before grouting.

The grout may be delivered to the place of final deposit by any means that will ensure uniformity and prevent segregation of the grout. If penetration of grout is not obtained by gravity flow into the interstices, the grout shall be spaded or rodded to completely fill the voids in the stone blanket. Pressure grouting shall not unseat the stones, and during placing by this method, the grout shall be spaded or rodded into the voids.

Penetration of the grout shall be to the depth specified on the plans. When a rough surface is specified, stones shall be brushed until 25 to 50 percent of the depth of the maximum size stone is exposed. For a smooth surface, grout shall fill the interstices to within 1/2 inch of the surface.

Grout shall not be placed when the descending air temperature falls below 40 degrees Fahrenheit nor until the ascending air temperature rises above 35 degrees Fahrenheit. Temperatures shall be taken in the shade away from artificial heat.

Curing of the grout shall be in accordance with the requirements of Subsection 912-3.09 of the specifications.

The contractor may use shotcrete conforming to the requirements of Section 912 of the specifications in lieu of grout.

(E) Slope Mattress Riprap:

The mattress bed shall be excavated to the width, line and grade as shown on the plans. The mattress shall be founded on this bed and laid to the lines and dimensions required.

Excavation for toe or cut-off walls shall be made to the neat lines of the wall.

Mattresses shall be fabricated in such a manner that the sides, ends, lid and diaphragms can be assembled at the construction site into rectangular units of the specified sizes. Mattresses are to be of single unit construction, the base, ends and sides either to be woven into a single unit or one edge of these members connected to the base section of the unit in such a manner that strength and flexibility at the point of connection is at least equal to that of the mesh.

All perimeter edges of the mattresses are to be securely selvaged or bound so that the joints formed by tying the selvages have at least the same strength as the body of the mesh.

Mattresses shall be placed to conform to the details shown on the plans. Stones shall be placed in close contact within the unit so that maximum fill is obtained. The units may be filled by machine with sufficient hand work to accomplish the requirements of this specification.

Broken concrete shall not be used in slope mattresses.

Before the mattress units are filled, the longitudinal and lateral edge surfaces of adjoining units shall be tightly connected by means of wire ties placed every four inches or by a spiral tie having a complete loop every four inches. The lid edges of each unit shall be connected in a similar manner to adjacent units. The slope mattress shall be anchored as shown on the plans. Each anchor stake shall be fastened to the cover mesh with a tie wire.

(F) Gabions:

The gabion bed shall be excavated to the width, line and grade as shown on the plans. The gabions shall be founded on this bed and laid to the lines and dimensions required.

Excavation for toe or cut-off walls shall be made to the neat lines of the wall.

Gabions shall be fabricated in such a manner that the sides, ends, lid and diaphragms can be assembled at the construction site into rectangular units of the specified sizes. Gabions are to be of single unit construction, the base, ends and sides either to be woven into a single unit or one edge of these members connected to the base section of the unit in such a manner that strength and flexibility at the point of connection is at least equal to that of the mesh.

Where the length of the gabion exceeds its horizontal width, the gabion is to be equally divided by diaphragms, of the same mesh type as the body of the gabions, into cells whose length does not exceed the horizontal width. The gabion shall be furnished with the necessary diaphragms secured in proper position on the base section in such a manner that no additional tying at this juncture will be necessary.

All perimeter edges of gabions are to be securely selvaged or bound so that the joints formed by tying the selvages have at least the same strength as the body of the mesh.

Gabions shall be placed to conform to the details shown on the plans. Stones shall be placed in close contact in the unit so that maximum fill is obtained. The units may be filled by machine with sufficient hand work to accomplish requirements of this specification.

The exposed face or faces shall be hand-placed using selected stones to prevent bulging of the gabion cell and to improve appearance. Each cell shall be filled in three lifts.

Two connecting tie wires shall be placed as shown on the plans between each lift in each cell.

Care shall be taken to protect the vertical panels and diaphragms from being bent during filling operations.

The last lift of stones in each cell shall be level with the top of the gabion in order to properly close the lid and provide an even surface for the next course.

All gabion units shall be tied together each to its neighbor along all contacting edges in order to form a continuous connecting structure.

Empty gabions stacked on filled gabions shall be laced to the filled gabion at the front, side and back.

(G) Sacked Concrete Riprap:

The sacks shall be filled with concrete, loosely packed so as to leave room for folding or tying at the top. Approximately one cubic foot of concrete shall be placed in each sack. Immediately after filling, the sacks shall be placed according to the details shown on the plans and lightly trampled to cause them to conform with the earth face and to adjacent sacks in place.

The first two courses shall provide a foundation of double thickness. The first foundation course shall consist of a double row of stretchers laid level and adjacent to each other in a neatly trimmed trench. The trench shall be cut back into the slope a sufficient distance to enable proper subsequent placement of the riprap. The second foundation course shall consist of a row of headers placed directly above the double row of stretchers. The third and remaining courses shall consist of a double row of stretchers and shall be placed in such a manner that joints in succeeding courses are staggered.

All dirt and debris shall be removed from the top of the sacks before the next course is laid thereon. Stretchers shall be placed so that the folded ends will not be adjacent. Headers shall be placed with the folds toward the earth face. Not more than four vertical courses of sacks shall be placed in any tier until initial set has taken place in the first course of any such tier.

When there will not be proper bearing or bond for the concrete because of delays in placing succeeding layers of sacks, a small trench shall be excavated back of the row of sacks already in place, and the trench shall be filled with fresh concrete before the next layer of sacks is laid. The size of the trench and the concrete used for this purpose shall be approved by the Engineer. The Engineer may require header courses at any level to provide additional stability to the riprap.

Sacked concrete riprap shall be cured by being covered with a blanket of wet earth or by being sprinkled with a fine spray of water every two hours during the daytime for a period of four days.

(H) Rail Bank Protection:

Excavation, where required for rock fill, shall be performed in reasonably close conformity to the lines and grades established or shown on the plans.

Rails shall be driven at the locations and to the minimum penetrations shown on the plans. Driving equipment shall be capable of developing sufficient energy to drive the rails to the specified minimum penetration and be approved by the Engineer.

If hard material is encountered during driving before minimum penetration is reached and it has been demonstrated to the satisfaction of the Engineer that additional attempts at driving would result in damage to the rails, the Engineer may order additional work to be performed, such as jetting or drilling, in order that minimum penetration may be obtained or the Engineer may order the minimum penetration to be reduced as required by the conditions encountered.

Wire fabric shall be securely fastened to the rails, placed in the trenches and laid on the slopes. The rock backfill shall then be carefully placed so as not to displace the wire fabric or rails. The wire fabric shall entirely enclose the rock backfill.

The completed rock fill shall be backfilled as necessary and the waste material disposed of as directed by the Engineer.

913-3.02 Soil-Cement Bank Protection:

Soil-cement bank protection construction shall include excavating, backfilling, and grading the wash bed and banks to the lines, grades and cross sections shown on the plans or established by the Engineer; furnishing and mixing aggregate, cement, fly ash and water; and spreading, compacting, and curing the mixture.

The contractor shall investigate for ground water as soon as possible. If there is a need for dewatering, the contractor shall provide to the Engineer for review a comprehensive dewatering plan a minimum of two weeks before construction starts. The dewatering plan shall address any water quality requirements of the Corps of Engineers permit and ADEQ certification. Dewatering activities shall not begin until the Engineer has approved the plan.

The dewatering shall comply with all laws and permit requirements.

If changes to the approved dewatering plan are required, the contractor shall submit a revised plan to the Engineer for approval.

For soil-cement bank protection, the contractor shall be responsible for quality control as necessary to meet the requirements established herein. The contractor shall monitor the complete mix during construction of soil-cement, including the amounts of cement and fly ash used.

(A) Required Contractor Submittals:

Two weeks prior to the start of the soil-cement bank protection construction, the contractor shall submit in writing to the Engineer for approval, the following items:

(1) The type of spreading and compaction equipment to be used.

(2) The number and type of watering equipment to be used.

(3) The method used to keep surfaces continuously moist until subsequent layers of soil-cement are placed.

(4) The method used to cure permanently exposed surfaces.

(5) The proposed source of soil-aggregate.

(6) The proposed source(s) of Portland cement and fly ash (if used).

(7) The approximate length of soil-cement bank protection or area of soil-cement to be placed each day prior to starting placement and compaction operations, on a daily basis.

(8) The soil-cement mix design.

Such submittals shall not relieve the contractor of the responsibility for achieving the desired result of constructing sound soil-cement, free from defects, according to the specifications and plans, or as directed by the Engineer. Changes in the source(s) of cement or fly ash will not be permitted without the prior approval of the Engineer.

(B) Preparation of Subgrade:

Before placement of the soil-cement, the area to be treated shall be graded and shaped to the lines and grades as shown on the plans. The subgrade shall be compacted to a minimum of 95 percent of the maximum dry density determined in accordance with Arizona Test Method 225. The subgrade shall be compacted at a moisture content within two percentage points of the optimum moisture content determined in accordance with Arizona Test Method 225.

When the embankment material is composed predominantly of rock such that these compaction control procedures will not indicate the density achieved, the Engineer will determine the amount of compaction required and the adequacy of equipment used in obtaining the required compaction. Immediately prior to placement of the soil-cement mixture, the subgrade within the lines and grades of the plans shall be moistened and any soft or yielding subgrade shall be corrected and made stable before construction proceeds in accordance with requirements of Subsection 203-5.03(A) of the specifications. Any additional subgrade reparations required outside of the lines and grades shown on the plans, as determined by the Engineer, shall be repaired by the contractor and paid for by Force Account.

(C) Mixing Plant:

Aggregate and cementitious materials for the soil-cement shall be proportioned and mixed in a central mixing plant. The mixing plant shall be either of the batch-mixing type using revolving blade, rotary drum mixers, or of the continuous mixing type using a stationary twin shaft pug mill mixer. The aggregate, fly ash, and cement shall be proportioned by weight. The mixing plant shall be designed, coordinated, and operated to produce a soil-cement mixture of the proportions specified within required tolerances.

If the soil-cement temperatures measured at the mixer are 85 degrees Fahrenheit or less, the placing and compaction shall be completed within 1-1/2 hours of the batch time. If soil-

cement temperatures measured at the mixer are greater than 85 degrees Fahrenheit but less than 96 degrees Fahrenheit, placing and compaction shall be completed within 1 hour of the batch time. If soil-cement temperatures are 96 degrees Fahrenheit or greater when measured at the mixer, the contractor shall take immediate steps to lower the batch plant mix temperature to 95 degrees Fahrenheit or below, and follow the above time limits as mix temperature dictates, prior to further placement and compaction of soil-cement materials.

The water shall be proportioned by weight or volume and there shall be means by which the Engineer may readily verify the amount of water utilized per batch or the rate of water flow utilized for continuous mixing.

(1) Measuring Devices:

The mixing plant shall record the quantity of the material, shall have a digital readout, and shall provide daily printed record such that the total discharged quantity per hour and the cumulative total quantity are displayed.

Measuring devices shall be calibrated and approved by the Engineer.

Each weight measuring device shall be calibrated to an accuracy of 0.2 percent and shall be inspected and calibrated as often as the Engineer deems necessary to assure their accuracy.

Each volume measuring device shall be calibrated to an accuracy of ± 1.5 percent and shall be inspected and calibrated as often as the Engineer deems necessary to assure their accuracy.

(2) Batch Mixing:

The mixer shall be equipped with a sufficient number of paddles of a type and arrangement to produce a uniformly mixed batch. The mixer shall be equipped with a timing device which will indicate, by a definite audible or visual signal, the expiration of the mixing period. The device shall be accurate to within two seconds. The allowable tolerance for weight batching of aggregates and cementitious material shall be two percent and 0.5 percent, respectively, for each batch.

The batch mixing plants shall provide sampling facilities which are satisfactory to the Engineer and which allow representative samples of the soil-aggregate mixture prior to the addition of water and cementitious material to be obtained easily and safely. Samples of the soil-aggregate will be taken at this point to determine conformance to the gradation and plasticity requirements listed in Subsection 913-2.02(B) of the specifications.

(3) Continuous Mixing:

Aggregates shall be drawn from the storage facility by a feeder or feeders which will continuously supply the correct amount of soil-aggregate in proportion to the cementitious material.

A control system shall be provided that will automatically close down the plant when material in any storage facility approaches the strike off capacity of the feed gate. The plant will not be permitted to operate unless this automatic control system is in good working condition. The feeder for the soil-aggregate shall be mechanically or electrically driven.

Continuous mix plants shall provide sampling facilities which are satisfactory to the Engineer and which allow representative samples of the soil-aggregate mixture prior to the addition of water and cementitious material to be obtained easily and safely. Samples of the soil-aggregate will be taken at this point to determine conformance to the gradation and plasticity requirements listed in Subsection 913-2.02(B) of the specifications.

(4) Blending of Cement and Fly Ash:

The blending procedure shall be sufficient to provide a uniform, thorough, and consistent blend of cement and fly ash. The blending method and operation shall be approved by the Engineer prior to the commencement of soil-cement production. During blending of the cementitious materials, the percent of fly ash content shall not vary by more than ± 0.5 percent of the content approved by the Engineer.

Weight measuring devices are required at both the cement and fly ash feeds. At the direction of the Engineer, an additional measuring device may also be required when the cement and fly ash are pre-blended at the site. In the production of the soil-cement mixture, the percent of cementitious material shall not vary by more than ± 0.5 percent of the contents approved by the Engineer.

Silos and feeders shall be equipped and operated so as to provide uniform rates of feed and prevent caking. The charge in the batch mixer or rate of feed to the continuous mixer shall not exceed that which will permit complete mixing of all the mix material. Provisions shall be made to allow for ready sampling of the cementitious materials.

(D) Transporting, Spreading, and Compaction:

The soil-cement mixture shall be transported from the mixing plant to the construction site in clean hauling equipment vehicles outfitted with suitable covers to protect the mixture in unfavorable weather.

Spreading of the soil-cement mixture shall be accomplished using equipment that will produce uniform layers of the width and thickness necessary to provide for adequate compaction in conformance with the required dimensions shown on the plans for completed soil-cement layers. Where the soil-cement is to be placed in confined areas, the lifts may be spread by other methods as approved by the Engineer.

The layers of soil-cement shall not exceed 12 inches after compaction, or be less than four inches thick after compaction, unless the contractor can demonstrate the ability to place thicker layers with the equipment being utilized in the control strip. If potholing is performed to allow testing of each lift, the recompacted material used to repair the pothole shall also be tested and meet the requirements of this specification. Each successive layer shall be placed

as soon as practicable after the preceding layer is completed, and approved by the Engineer. The maximum depth of compacted soil-cement that shall be placed per day in each location is four feet, unless approved by the Engineer.

Prior to spreading new material on a previously compacted lift which has cured for more than 1-1/2 hours, or if the surface has dried due to temperature and/or wind effects, scarification of the lift shall be performed parallel with the direction of placement using equipment approved by the Engineer. The scarification shall be performed to a depth of at least two inches, spaced between 18 and 24 inches. The Engineer may waive requirements for scarification if compaction is performed by means which provide an appropriate surface for bonding with the subsequent layer.

All construction equipment, including water spray trucks, shall be restricted from entering scarified surface areas during the interim between spreading and compaction operations.

If the surface cannot be scarified, the surface shall have cement grout slurry applied to ensure a proper bonding between lifts. The cement slurry shall have a water/cement ratio between 0.70 and 0.80 and be approved for use by the Engineer prior to placement of any additional soil-cement mixture.

All soil-cement surfaces that will be in contact with succeeding layers of soil-cement shall be kept continuously moist by fog spraying until placement of the subsequent layer, provided that the contractor will not be required to keep such surfaces continuously moist for a period longer than seven days. Mixing and placing shall not proceed when the soil-aggregate or the area on which the soil-cement is to be placed is frozen. Soil-cement shall be mixed and placed when the air is at least 40 degrees Fahrenheit and rising.

(E) Monitoring Moisture Content in the Field:

Control of water content by the contractor in the field shall be accomplished in two ways:

(1) The moisture-density relationship for the soil-cement mixture shall be determined in accordance with Arizona Test Method 221 on a routine basis, or when any significant gradation shift or rock content change occurs.

(2) The actual moisture content of the mixture at the time of compaction, or shortly thereafter, shall be determined in accordance with Arizona Test Method 235 to determine if the optimum moisture content as determined by Arizona Test Method 221 is being maintained. The water content in the soil-cement mixture is to be continuously monitored, and the mixing water shall be adjusted at the plant as necessary to achieve the compressive strength and compaction requirements specified herein.

(F) Quality Control Compaction Testing:

Soil-cement shall be uniformly compacted to a minimum of 98 percent of the maximum dry density determined in accordance with Arizona Test Method 221. A running average of five consecutive in place density tests shall not be less than 100 percent of maximum density as monitored by nuclear density tests in accordance with Arizona Test Method 235. Compaction shall be performed within 2 percentage points of the optimum moisture content as determined in accordance with Arizona Test Method 221. Quality control density and moisture tests shall be performed in accordance with Arizona Test Method 235 at a minimum frequency as specified in table 4:

Table 4	
Quality Control Minimum Requirements for Compaction	
Moisture/Density	1 test / 500 sy/lift

(G) Control Strips:

A control strip shall be constructed at the beginning of work on the soil-cement to be compacted. The control strip construction shall be required to establish equipment and procedures required to attain densities for the specified course.

Each control strip, constructed to acceptable density and surface tolerances shall remain in place and become a section of the completed embankment. Once control strip is complete and accepted, production may begin on the same shift for the remainder of project.

Unacceptable control strips shall be corrected or removed and replaced at the contractor's expense. A control strip shall have an area of approximately 100 square yards and shall be of the same depth specified for the construction of the course which it represents.

The materials used in the construction of the control strip shall conform to the specification requirements. They shall be furnished from the same source and shall be of the same type used in the remainder of the course represented by the control strip. The underlying surface upon which a control strip is to be constructed shall have prior approval of the Engineer.

The equipment used in the construction of the control strip shall be approved by the Engineer and shall be of the same type and weight to be used on the remainder of the course represented by the control strip.

Compaction of control strips shall commence immediately after the course has been placed to the specified thickness, and shall be continuous and uniform over the entire surface. Compaction of the control strip shall be continued until no discernable increase in density can be obtained by additional compaction effort.

Upon completion of the compaction, the mean density of the control strip will be determined by averaging the results of ten nuclear density tests taken at randomly selected sites within the control strip.

If the mean density of the control strip is less than 100 percent of the density of laboratory compacted specimens as determined by testing procedures appropriate for the material being placed, the Engineer may order the construction of another control strip.

A new control strip may also be ordered by the Engineer or requested by the contractor when:

(1) A change in the material or mix design is made.

(2) A control strip density is not representative of the material being placed.

(H) Power Tampers and Small Vibratory Rollers:

Small vibratory rollers which are capable of operating within 6 inches of a vertical face shall be used for compaction adjacent to the guide banks, next to the utilities and drainage conduit; at transitions to constructed levee protection, and at other areas where larger vibratory rollers cannot maneuver. The amount of rolling and tamping required shall be whatever is necessary for the particular equipment to provide the same degree of compaction as would be attained with larger self-propelled vibratory rollers. Standby replacement equipment shall be available within 1 hour if needed.

(I) Finishing/Trimming:

After compaction, the soil-cement shall be further shaped, if necessary, to the required lines, grades, and cross-sections and rolled to a reasonably smooth surface. Shaping of the face of the soil-cement bank protection shall be conducted daily at the completion of each day's production.

The exposed face of the soil-cement bank protection shall be trimmed to a neat line as shown on the plans. The resulting soil-cement bank protection width shall not be less than 8 feet after trimming unless specified on the plans.

(J) Curing:

Whenever the atmospheric temperatures are expected to drop below 30 degree Fahrenheit, the soil-cement shall be protected from freezing for seven days, after its construction by a covering of straw, earth, or other suitable material approved by the Engineer.

Temporarily exposed surfaces shall be kept moist as previously set forth. Care must be exercised to ensure that no curing material other than water is applied to the soil-cement surface that will be in contact with succeeding layers.

Permanently exposed surfaces shall be kept in a moist condition for seven days, or they may be covered with bituminous curing material, subject to the Engineer's approval. Any damage

to the protective covering within seven days shall be repaired to the satisfaction of the Engineer at no additional cost to the Department.

Regardless of the curing material used, the permanently exposed surfaces shall be kept moist until the protective cover is applied. Such protective cover is to be applied as soon as practicable, with a maximum time limit of 24 hours between the finishing of the surface and the application of the protective cover or membrane.

(K) Backfill:

Backfill shall not be placed against the soil-cement until the contractor has achieved the compaction requirement.

(L) Maintenance:

The contractor shall maintain and protect the soil-cement in good condition until all work is completed and accepted. Maintenance shall include immediate repairs of any defects that may occur. This work shall be done at no cost to the Department and repeated as often as necessary. Faulty work shall be replaced for the full depth of the layer. The contractor shall take all necessary precautions to avoid damage to the completed soil-cement by equipment, and to avoid the deposition of raw earth or foreign materials between layers of soil-cement. Where ramps are constructed over soil-cement layers which are not to grade, all foreign materials and the uppermost one inch of the previously placed soil-cement mixture must be removed prior to continuation of the soil-cement construction.

(M) Construction Joints:

Construction joints are to be provided at the end of each day's work or when work is to be halted for 90 minutes or more. The joints shall be trimmed to a 15 degree minimum skew, transverse construction joint shall be formed by cutting back into the completed work to form a vertical face to the full depth of the previous lift. Before resuming placement of new material, the joints shall be roughened and loose material shall be removed by power broom.

(N) Acceptance of Soil-Cement:

The Engineer will cast, transport, cure, and test specimens in accordance with Arizona Test Method 241 for each 1,500 cubic yards of soil cement placed. Three cylinders will be tested at seven days. The average compressive strength of the three cylinders shall achieve a minimum compressive strength of 750 psi.

Any early strength testing for the purpose of correlating seven day strength results to provide an early indicator of potentially low strength material shall be the responsibility of the contractor.

913-4 Method of Measurement:

Riprap, except gabions and sacked concrete, will be measured by the cubic yard of protection constructed by computing the surface area measured parallel to the protection surface and the total thickness of the riprap measured normal to the protection surface.

Riprap (gabions) will be measured by the cubic yard by computing the volume of the rock-filled wire baskets used.

Riprap (sacked concrete) will be measured by the cubic yard of concrete placed in the completed work. The measurement will be based on mixer volumes.

Rail bank protection will be measured by the linear foot. Measurement will be made from top of rail to top of rail (longest rail where rails of two or more lengths are used) and the distance measured will be from end rail to end rail.

Where two parallel rows of vertical rails are used, the measurement for payment will be the average of the distance along the two rows. Rail bank protection will be measured along the bank protection control line from end rail to end rail.

Soil-cement will be measured per cubic yard of soil-cement furnished and placed per the specified lines, grades, and cross-sections shown on the plans.

913-5 Basis of Payment:

The accepted quantities of riprap and rail bank protection, measured as provided above, will be paid for at the contract unit price per cubic yard or linear foot, which price shall be full compensation for the work, complete in place, including excavation; preparing the ground area; furnishing and installing the rock, filter fabric, bedding material, metal items, concrete, sacks and grout; and backfilling as required.

Materials, labor and equipment necessary to perform additional work such as jetting or drilling, as specified under Subsection 913-3.01(H) of the specifications, will be paid for in accordance with the provisions of Subsection 109.04 of the specifications.

The accepted quantities of soil-cement, measured as provided above, will be paid for at the contract unit price per cubic yard of soil-cement bank protection. Such payment shall constitute full reimbursement for all work necessary to complete the soil-cement bank protection including:

(1) Surface Preparation;
(2) Providing and Stockpiling Soil-Aggregate;
(3) Cementitious Material, Watering, Mixing;
(4) Placing;
(5) Compacting;
(6) Shaping and Finishing;
(7) Curing;
(8) Quality Control Testing; and
(9) Other Incidental Operations.

Any waste and non-compacted soil-cement material not used on the final soil-cement bank protection will not be measured for payment.

Excavation and backfill associated with the soil-cement construction will be measured and paid under the Structural Excavation and Structure Backfill items respectively.

Construction of Gabion Mattress associated with the soil-cement work will be measured and paid under the Riprap (Gabion Mattress) item.

Payment for additional excavation, where determined by the Engineer to remove unsuitable material, per the requirements of Subsection 203-5.03(A) of the specifications, will be made in accordance with the provisions of Subsection 109.04 of the specifications.

Payment for Dewatering will be made on a Force Account basis in accordance with the requirements of Subsection 109.04 of the specifications.

ITEM 9210012 – MEDIAN PAVING (C-05.40) (STAMPED CONCRETE)

Description:

The work under these items shall consist of constructing stamped concrete median paving at the locations shown on the plans.

Materials:

All materials shall conform to Section 921-2 of the specifications.

Construction Requirements:

Construction of stamped median pavement shall conform to Section 921-3 of the specifications.

The concrete stamp shall be a brick pattern, with the brick measuring 3.5”” wide by 7.5” long.

Prior to installation, the contractor shall submit a sample of the concrete stamp to the Engineer for approval

Method of Measurement:

Stamped concrete median paving will be measured by the square yard of concrete placed.

Basis of Payment:

The accepted quantities of stamped concrete median paving, measured as provided above, will be paid for at the contract unit price per square yard, which shall be full compensation for the work complete in place, including, excavation, aggregate base, Portland cement concrete, joint filler and curing compound.

(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 6,600 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.

The 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 (REMOVAL OF CONTAMINATED WASTE MATERIAL):

Description:

The work under this item shall also include testing, and disposal of lead and/or asbestos contaminated waste material if required in accordance with all applicable federal, state, and local regulations.

Construction Requirements:

The contractor shall submit a plan to the Engineer, detailing the process to collect, test, and dispose the lead and/or asbestos contaminated waste material.

Measurement and Payment:

The removal of lead and/or asbestos contaminated waste material will be measured and paid for in accordance with the requirements of Subsection 109.04 of the specifications.

ITEM 9240012 - FORCE ACCOUNT WORK (RAILROAD FLAGGING SERVICES):

Description:

Pursuant to FRA Regulation 49 CFR Part 214, flagging protection is required in accordance with the railroad's standard safety procedures. The necessity for flagging protection is determined by the railroad and, when necessary, the railroad may require one, or more, flaggers to be present when the contractor is on the railroad ROW.

The work under this item consists of coordination with the BNSF Railway (BNSF) to provide flaggers. BNSF /or their preferred flagging company will furnish all flagging services required by the Railroad for the contractor's work within the BNSF right-of-way, as specified in the Subsection 104.07 of the specifications.

The contractor shall reimburse BNSF for Railroad-provided flaggers. The Department will reimburse the contractor for such costs as specified below. The contractor shall provide written notice to BNSF Manager of Industry and Public Projects when flagging services are no longer needed.

Construction Requirements:

The contractor is required to communicate to BNSF its activities that may affect safety or railroad operations. Any work to be performed by the contractor that requires flagging protection shall be deferred until flagging protection is available at the job site. The contractor is required to coordinate with BNSF with respect to construction schedule and work-related items for the safe and effective progress of the work.

Railroad-provided flagging service will be required during construction of any element of the project, either temporary or permanent, that occurs when the contractor personnel or equipment will be within 25-feet of the track centerline, when cranes or similar equipment are positioned outside of 25-feet horizontally from track centerline but could tip and impact the track, or as specified in the Right of Entry Agreement. There is a minimum 12-foot horizontal clearance requirement for any temporary construction. Temporary vertical clearances as measured from the top of the highest rail shall not be less than 21-feet. The contractor shall be required to notify the Manger Track Maintenance and the Engineer whenever the 25-foot horizontal and 21-foot vertical clearances would be violated.

Examples of activities which could trigger railroad notification include (but are not limited to) crane boom violations, the placement and removal of the temporary shoring or formwork, grading of the south side access roads and their subsequent removal, regarding and revegetation, track crossings and pier construction. The contractor shall identify those elements of work anticipated to require flagging as part of the Bridge Protection Plan as discussed in the General Requirements Section of these Special Provisions.

Notification of such work shall be made at least 15 business days in advance of the date the work is to be performed. The contractor shall communicate all activities to the Manger Track Maintenance that may affect safety or railroad operations. Any work to be performed by the contractor, which requires flagging protection, shall be deferred until flagging protection is available at the job site.

The Department has estimated 154 days as the number of days flagging and 50 days as number of Railroad inspections may be required for the work within the BNSF Railroad right of way.

The contractor shall schedule its work such that all work within the Railroad right of way to be completed safely within the estimated 154 days. The railroad flagging operations shall not exceed this duration and any compensation for any additional railroad flagging work

beyond the estimate 154 day period shall be borne by the contractor. The contractor shall coordinate with the Engineer when ordering flagging service.

Flagging cost is estimated $1,500 per day and the inspection cost is estimated $1,500 a day as well.

Measurement and Payment:

Payment for Railroad Flagging Services and inspection will be the actual cost as shown on the invoice provided by the contractor plus a five percent mark-up, as follows:

Sub-total = Invoice x 1.05

Also, an amount equal to 65 percent of the Sub-total, as determined above, multiplied by the applicable sales tax rate will be added to the Sub-total. Finally, an amount equal to 0.50 percent of the Sub-total will be added for the Performance and Payment Bond.

The total contractor payment (TCP) will be as follows:

TCP = (Sub-total) + (0.65 x Sub-total x sales tax rate) + (0.005 x Sub-total).

Such payment shall be full compensation for the work, complete in place as specified herein.

The contractor shall provide copies of all invoices from the BNSF to the Engineer.

No additional payment will be made for coordination with the railroad, the costs being considered as included in contract items.

ITEM 9240014 - FORCE ACCOUNT WORK (BIOLOGIST):

Description:

The work under this item consists of hiring a qualified biologist and a licensed wildlife rehabilitator to perform a survey of migratory bird nests, relocate nesting birds from the project area, and remove inactive nests identified during the survey prior to any vegetation removal. The qualified biologist shall also perform preconstruction surveys for bats and Sonoran Desert tortoises.

Construction Requirements:

The work shall be performed in accordance with Subsection 104.16 of the specifications and Section 10 of the EPIC sheet. The qualified biologist shall meet the requirements as outlined on ADOT's website:
https://azdot.gov/sites/default/files/2019/06/biology_qualifications_for_biologists.pdf

Measurement and Payment:

Measurement and Payment for Force Account Work (Provide Biologist) will be made on a Force Account basis in accordance with the requirements of Subsection 109.04 of the specifications.

ITEM 9240020 - FORCE ACCOUNT WORK (ELECTRICAL SERVICE):

Description:

The work under this item shall coordinate with and pay all necessary fees to the local utility company to install a new complete functioning electrical service to power the lighting. The purpose the force account is to create a funding source for any necessary permits, connection fees, foundations, junction boxes, conduits, conductors, conduit sweeps, coordination, and/or protection required when working near overhead or underground lines owned by Unisource.

The contractor shall provide to the Engineer, for review and approval, copies of all agreements between the utility company and the contractor. The contractor shall proceed with those agreements only after receiving Engineer's approval. If the contractor proceeds before or without Engineer approval, the Engineer may withhold reimbursement to the contractor. The contractor shall submit the paid invoice; with the allowable force account mark up as specified in the Standard Specs Subsection 109.04, for the utility company service modification to the Engineer for reimbursement during the normal project billing cycle.

Construction Requirements:

All work shall conform to the requirements of APS. The contractor shall contact the APS representative at 602-809-3611 through the Engineer to coordinate construction requirements. The contractor shall not backfill the trench until it has been inspected and approved by the Utility and the Engineer.

Measurement and Payment:

Measurement will be as a single, complete unit of work. Payment will be made in accordance with the requirements of Subsection 109.04 of the Standard Specifications and as directed by the Engineer.

The Department will reimburse the contractor for all direct expenses billed to the contractor by the utility companies. Payment for the billing invoices will be the actual cost as shown on the invoice(s) submitted by the contractor plus a five percent mark-up, as follows:

Sub-total = Invoice x 1.05

Also, an amount equal to 65 percent of the Sub-total, as determined above, multiplied by the applicable sales tax rate will be added to the Sub-total. Finally, an amount equal to 0.50

percent of the Sub-total will be added for the Performance and Payment Bond. The total contractor payment (TCP) will be as follows:

TCP = (Sub-total) + (0.65 x Sub-total x sales tax rate) + (0.005 x Sub-total).

Such payment shall be full compensation for each utility service, complete in place as specified herein.

ITEM 9240118 - MISCELLANEOUS WORK (PIER PROTECTION WALL)

Description:

The work under this item shall consist of constructing pier protection walls at both piers of the existing Matthie RR OP bridge (structure number 780) at the locations shown on the project plans, and in accordance with these Special Provisions.

Materials:

Portland cement concrete shall conform to the requirements of Section 1006 of the specifications for Class S concrete.

Reinforcing steel bars shall conform to the requirements of Section 1003 of the specifications and ASTM Specification A615, Grade 60.

Backfill material shall conform to the requirements of Subsection 203-5.03(B) of the specifications.

Slope paving shall be separated from the pier protection wall by a continuous ½-inch wide strip of bituminous joint filler. Joint filler shall conform to the requirements of Subsection 1011-6.01 of the specifications.

Construction Requirements:

Pier protection walls shall be constructed in accordance with the requirements of Section 601-3 and 601-4 of the specifications, the details as shown on the project plans and as directed by the Engineer.

Structural Excavation shall conform to the limits shown on the wingwalls detail of ADOT SD 5.01 and to the requirements of Subsection 203-5.03(A) of the specifications.

Structural backfill shall conform to the limits shown on the wingwalls detail of ADOT SD 5.02 and to the requirements of Subsection 203-5.03(B) of the specifications

Dowels shall be placed in accordance with Section 605-3.04 of the specifications.

Backfill needed for slope paving behind pier protection walls shall be placed in conformance to the limits shown on the wingwalls detail of ADOT SD 5.02. Backfill placement and compaction shall conform to the requirements of Subsection 203-5.03(B) of the specifications. Backfill near the walls shall be placed and compacted prior to slope paving construction.

Method of Measurement:

Pier Protection Wall will be measured by the square foot of constructed wall and will be measured along the front face of the wall from the bottom of wall to the top of wall.

Basis of Payment:

The accepted quantities of Pier Protection Wall, 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 including excavation and backfilling.

ITEM 9240121 - MISCELLANEOUS WORK (RELOCATE CLUSTER MAILBOX):

Description:

The work under this item shall consist of removing existing cluster mailboxes and relocating them to new locations as shown in the plans and in accordance with the requirements of the plans and these specifications. This work shall include removal of existing foundations, constructing new concrete foundations including excavation, backfilling, concrete and reinforcing.

Materials:

Portland cement concrete shall be class B and conform to the requirements of Section 1006 of the specifications.

Reinforcing steel bars shall conform to the requirements of section 1003 of the specifications.

Anchor bolts, nuts and washers shall be galvanized in accordance with the requirements of ASTM A153. The weight of the coating shall be as specified in ASTM A1 53.

Construction Requirements:

Mailboxes shall be kept operational at all times.

The contractor shall notify the Engineer a minimum of 14 days prior to the removal/relocation of cluster mailboxes serving multiple properties.

The contractor shall unbolt and remove the cluster mailboxes with the posts from the existing concrete foundations and relocate them to the new concrete foundation at the locations shown

on the plans. Each mailbox shall be installed with its original post and a new foundation as a complete unit.

Mailboxes damaged as a result of the contractor's operation during the removal and relocation process shall be replaced by the contractor at no additional cost to the Department. The mailboxes replaced by the contractor shall be in compliance with the U.S. Postal Service regulations and be the same size as the existing mailboxes or as approved by the Engineer.

The holes resulting from removal of post foundations shall be backfilled with suitable material and compacted to a density of not less than 95 percent of the maximum density, as determined in accordance with section 202-3.01 of the standard specifications.

New foundations shall be constructed before removing the existing cluster mailboxes to allow the cluster mailboxes to be removed and installed on the new foundation on the same day while remaining in service

Method of Measurement:

Relocate (Cluster Mailbox), will be measured by the unit each for each cluster mailbox removed and installed.

Basis of Payment:

The accepted quantities of Relocate (Cluster Mailbox), measured as provided above, will be paid for at the contract unit price for each, which price shall be full compensation, for the work, complete in place, including concrete, excavation and backfill, and mounting hardware.

ITEM 9240122 - MISCELLANEOUS WORK (RELOCATE MAILBOXES):

Description:

The work under this item shall consist of relocating existing mailboxes to the new locations as shown in the plans, in Detail H and in accordance with the requirements of the plans, these Special Provisions and the specifications.

Materials:

New steel posts shall be in accordance with the requirements of ASTM A 53, Type E or S, Grade B (Fy=35ksi).

Post shall be galvanized in accordance with ASTM A 123.

New wood posts shall be 4"x4" S4S redwood posts.

Construction Requirements:

Mailboxes shall be kept operational at all times.

Three different types of posts will be used for the mailbox relocations. The post types and locations are designated in Detail H.

The contractor shall remove the existing mailboxes with the existing posts and relocate them to the locations shown on the plans. The contractor shall salvage the existing steel posts. If there is an existing concrete footer, the concrete shall be removed. The mailboxes identified with existing steel posts shall be installed per Detail H with its original post as a complete unit. If the existing post is wood, the contractor shall install the mailbox with a new wood post. At the two locations called out in Detail H with new steel posts, the mailboxes shall be installed with new anti-twist plates.

Mailboxes damaged as a result of the contractor's operation during the removal and relocation process shall be replaced by the contractor at no additional cost to the Department. The mailboxes replaced by the contractor shall be in compliance with the U.S. Postal Service regulations and be the same size as the existing mailboxes or as approved by the Engineer.

The holes resulting from removal of post foundations shall be backfilled with suitable material and compacted to a density of not less than 95 percent of the maximum density, as determined in accordance with Section 202-3.01 of the standard specifications.

Mailboxes that need to be temporarily relocated during construction shall be placed in five-gallon buckets filled with rocks (as required due to contractor's schedule) in a location that mail carriers will have access to. Buckets shall have addresses identified on the side with paint for easy identification. For the permanent installation, the contractor shall video the existing mailbox both before and after relocation.

Method of Measurement:

Relocate Mailboxes will be measured by the unit each for each mailbox relocated.

Basis of Payment:

The accepted quantities of Relocate Mailboxes 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, including posts excavation and backfill, and temporary installation in buckets with rocks.

ITEM 9240128 - MISCELLANEOUS WORK (PIPE CULVERT PLUG)(DETAIL DC):

Description:

The work under this item shall consist of installing the pipe culvert plugs, and filling the abandoned pipe with cement-treated slurry mix at the locations shown on the project plans per Detail DC, and in accordance with the requirements of the plans and these specifications.

Materials:

Cement-treated slurry shall conform to the requirements of Subsection 501-3.02(A)(3) of the Standard Specifications.

Portland cement concrete shall conform to the requirements of Section 1006 for Class B concrete of the specifications.

Construction Requirements:

Excavation and backfill shall be performed in accordance with the requirements of Subsection 203-5 of the specifications.

Pipe Culvert Plugs shall be constructed in accordance with Detail DC and as directed by the Engineer.

Method of Measurement:

Pipe culvert plug will be measured per cubic foot placed.

Basis of Payment

The accepted quantities of pipe culvert plugs, measured as provided above, will be paid for at the contract unit price per cubic foot, which price shall be full compensation for the work, complete in place, including concrete, steel, cement treated slurry, excavation, and backfill, and as described herein and on the project plans.

ITEM 9240129 – MISCELLANEOUS WORK (COMPACTED MILLED AC TREATMENT)

Description:

The work under this item shall include furnishing, placing and compaction of AC milling materials for unpaved median crossover treatment, as shown on the project plans.

Materials:

The AC milling materials shall be obtained from within the project limits. The AC milling materials shall be screened to pass the 1½ inch sieve, unless otherwise directed by the Engineer.

Bituminous material shall be CSS-1 and shall conform to the requirements of Section 1005 of the specifications. The CSS-1 shall be diluted with 1-part water to 1-part CSS-1.

Construction Requirements:

Prior to placing the milling materials, the contractor shall excavate, scarify, regrade, and compact the subgrade in accordance with the requirements of Section 205 of the specifications and as approved by the Engineer.

The milling materials shall be placed on the prepared subgrade in two uniform lifts, spread to a sufficient loose depth so that the final compacted thickness of each lift is approximately 4.0 inches, the total compacted thickness being 8 inches. The thickness may be reduced based on field condition as approved by the Engineer. Prior to the compaction of the milling materials for each lift, an application of emulsified asphalt (CSS-1) shall be applied at a rate of 0.20 gallon per square yard. The CSS-1 shall be given time to penetrate and soften the existing milling material. Compaction of each lift of the AC millings shall be performed using an established rolling method and equipment approved by the Engineer.

Method of Measurement:

The accepted quantities of Compacted Milled AC Treatment will be measured by the square yard of milled AC placed and compacted.

Basis of Payment:

The accepted quantities of milled AC treatment, 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, including excavating, grading, scarifying and compacting the existing subgrade.

Furnishing and placing CSS-1 will be measured and paid for under the fog coat bid item.

ITEM 9240134 - MISCELLANEOUS WORK (CONTRA COSTA ENERGY DISSIPATOR - DETAIL DL):

Description:

The work under this item shall consist of constructing the contra costa energy dissipator at the locations shown on the project plans per Detail DL, and in accordance with these Special Provisions.

Materials:

Portland cement concrete shall conform to the requirements of Section 1006 of the specifications for Class S concrete.

Reinforcing steel bars shall conform to the requirements of Section 1003 of the specifications.

Construction Requirements:

Construction requirements shall be per Detail DL and as directed by the Engineer.

Excavation and backfill shall be placed in accordance with Section 203-5 of the specifications.

Concrete shall only be placed on solid compacted material in accordance with Section 601 of the specifications.

Reinforcing steel shall be placed in accordance with Section 605-3 of the specifications.

Contra costa energy dissipator shall be dowelled and anchored to the new concrete box culvert in accordance with Detail B as shown in ADOT Drawing SD 6.01.

Method of Measurement:

Contra costa energy dissipator will be measured as a unit for each energy dissipator.

Basis of Payment

The accepted quantities of contra costa energy dissipator, 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, including concrete, steel, excavation, and backfill.

ITEM 9240167 - MISCELLANEOUS WORK (PIPE SLEEVE) (12”) (PLASTIC):
ITEM 9240168 - MISCELLANEOUS WORK (PIPE SLEEVE) (18”) (STEEL):
ITEM 9240169 - MISCELLANEOUS WORK (PIPE SLEEVE) (24”) (STEEL):

Description:

The work under these items shall consist of installing pipe sleeves with end caps and markers at both ends of pipe sleeves at the locations as shown on the project plans and specified herein.

Materials:

The pipe sleeve shall conform to the requirements of per Section 1010 of the specifications and all joints shall be watertight and conform to the requirements of Subsection 501-3.03(B)(2) of the specifications.

The end caps shall conform to the requirements of the manufacturer's recommendations.

Construction Requirements:

The pipe sleeve shall be installed in a trench condition and in accordance with Subsection 501-3 of the specifications.

Method of Measurement:

The pipe sleeve will be measured on a per linear foot basis of pipe along the spring line of the element.

Basis of Payment:

The accepted quantities of pipe sleeve, measured as provided above, will be paid at the contract unit price per lineal foot, which price shall be full compensation for the work, complete in place.

(924SMA, 01/15/26)

ITEM 9240140 - MISCELLANEOUS WORK (STONE MATRIX ASPHALTIC CONCRETE):
ITEM 9240141 - MISCELLANEOUS WORK (STABILIZING ADDITIVE):

STONE MATRIX ASPHALTIC CONCRETE:

1.0 Description:

The work under these items shall consist of constructing Asphaltic Concrete Stone Matrix Asphalt (SMA), hereinafter asphaltic concrete, by furnishing all materials, mixing at a plant, hauling and placing a mixture of aggregate materials, 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 special provisions.

All stone matrix asphaltic concrete shall be placed as a surface course. Surface courses are defined as courses placed to serve either as the traffic course or as a surface upon which a finishing course is to be placed. Recycled Asphalt Pavement (RAP) shall not be allowed in Stone Matrix Asphalt (SMA).

The contractor shall acquire and make all arrangements for a source or sources of material, furnish a mix design which will meet the design criteria specified hereinafter, and provide all the equipment, materials, and labor necessary to complete the work.

The type of asphaltic concrete shall be 1/2-inch mix.

2.0 Asphaltic Concrete Mix Design Criteria:

The Department will follow the Stone Matrix Asphalt mix design procedure contained in the AASHTO R 46, and the AASHTO M 325 except as revised herein.

Mix designs shall be developed by the contractor. Each mix design shall meet the criteria in Table 1 and the grading requirements in Table 2 when tested in accordance with Arizona Test Method 815, with the noted exceptions.

TABLE 1
ASPHALTIC CONCRETE MIX DESIGN CRITERIA

Criteria	Requirements
Voids in Mineral Aggregate: %	17.0 Minimum
Effective Voids: %	4.0 +/-0.1
Absorbed Asphalt: %, Range	0 - 1.0
Asphalt Binder Content: %	6.0% Minimum (Lower Limit)
Draindown at Production Temperature,%	0.3 Maximum
VCA_{MIX} ,%	Less than VCA_{DRC}
TSR	0.8 Minimum
Dust to Binder Ratio	0.8 to 1.5

Where:

VCA_{MIX} = Voids in Coarse Aggregate
VCA_{DRC}= Dry-Rodded Voids in Coarse Aggregate
TSR = Tensile strength ratio per T283

Notes:

(1) Mix design laboratory compacted test specimens shall be prepared using a gyratory compactor in accordance with AASHTO T 312, except the mix design shall be determined at the Ndesign gyrations of 75 using the Superpave gyratory compactor. Ninitial and Nmax are not required for SMA design.

(2) Refer to AASHTO R 46 for instructions on calculating VCA_{MIX} and VCA_{DRC}. The dry- rodded VCA of the coarse aggregate is determined per AASHTO T 19.

(3) The tensile strength ratio (TSR) of the SMA shall be at least 0.80, at 6.0 ± 1.0 percent air voids, when tested in accordance with AASHTO T 283.

(4) Draindown sensitivity shall be determined on the SMA mixture in accordance with AASHTO T 305 at the anticipated plant-production temperature and shall not exceed 0.3 percent.

TABLE 2
MIX DESIGN GRADING LIMITS

Sieve Size	1/2 inch
3/4 inch	100
1/2 inch	85 - 100
3/8 inch	45 - 78
No. 4	20 - 28
No. 8	16 - 24
No. 30	12 - 18
No. 50	11 - 14
No. 200	7 - 9

3.0 Materials:

For comparative/estimating purposes, quantities shown in the bidding schedule have been calculated based on the following data:

	1/2" MIX
Unit Weight, (lb./cu. ft.)	144
Asphalt Cement, %	6.5
Stabilizing Additive, %	0.3

3.01 Mineral Aggregate:

(A) General:

The contractor shall provide a source in accordance with the requirements of Section 1001 of the specifications.

Coarse mineral aggregate shall be 100% crushed gravel, crushed rock, or other approved inert material with similar characteristics, or a combination thereof, conforming to the requirements of this special provision.

Fine mineral aggregate shall be 100% 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 liquid limit for fine aggregate shall not exceed 25 and the fine aggregate shall conform to all the requirements of this special provision.

The contractor shall notify the Engineer a minimum of 48 hours in advance of crushing the material to be used as virgin 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 virgin mineral aggregate has been crushed. Any material inspected by the Department as crushed material shall be separated from the contractor's other stockpiles and reserved for use throughout the project duration.

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.

The mineral admixture shall be added and thoroughly mixed with the mineral aggregate by means of a mechanical mixing device prior to the mineral aggregate and mineral admixture entering the dryer. The moisture content of the combined mineral aggregate shall be a minimum of 3 percent by weight of the aggregate during the mixing process

(B) Mineral Aggregate Characteristics:

Aggregates shall be free of deleterious materials, clay balls, and adhering films or other material that prevent the thorough coating with the asphalt cement.

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%
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 50
Abrasion	AASHTO T 96	100 Rev., Maximum 9% 500 Rev., Maximum 30%
Fractured Coarse Aggregate Particles	AASHTO T 335	Minimum 95% with at least two fractured faces and 100% with at one fractured face (plus No. 4 material)

MINERAL AGGREGATE CHARACTERISTICS	TEST METHOD	REQUIREMENT
Flat and Elongated Particles	ASTM D4791 (except test shall be performed on plus No. 4 material)	Maximum 10% (of the plus No. 4 material) 5:1
Uncompacted Void Content	AASHTO T 304 Method A	Minimum 45.0%
Flakiness Index	Arizona Test Method 233	Maximum 20%
Carbonates	Arizona Test Method 238	Maximum 20%
Soundness (Sodium Sulfate)	AASHTO T 104	Maximum 10% loss with five cycles
Plasticity Index	AASHTO T 90	Non-Plastic

Notes:

(1) Abrasion shall be performed separately on materials from each source of mineral aggregate. All sources shall meet the requirements for abrasion.

(2) 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.

Tests on aggregates outlined above, except for abrasion, shall be performed on materials furnished for mix design purposes and composited to the mix design gradation.

3.02 Mineral Admixture:

Mineral admixture will be required. The amount used shall be minimum 1.0 percent, by weight of the mineral aggregate, unless testing demonstrates that additional admixture is required in order to meet the mix design criteria. A maximum of 2.0 percent admixture will be permitted. The exact amount of admixture required shall be specified in the mix design. Mineral admixture shall be either Portland cement, blended hydraulic cement, or hydrated lime conforming to the following requirements:

MATERIAL	REQUIREMENT
Portland Cement, Type I or II	ASTM C150
Blended Hydraulic Cement, Type IP	ASTM C595
Hydrated Lime	ASTM C1097

The certification and acceptance of Portland cement, blended hydraulic cement, and hydrated lime shall be in accordance with ADOT Materials Practice and Procedure Directive No. 13, "Certification and Acceptance of Hydraulic Cement, Fly Ash, Natural Pozzolan, Silica Fume, and Lime".

3.03 Bituminous Material:

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 76-22 PM.

The contractor shall follow the recommendations of the supplier for laboratory mixing and compaction temperatures for mix design purposes.

3.04 Mineral Filler:

Mineral filler shall consist of finely divided mineral matter such as crusher fines, rock dust, Class F fly ash, or Class N natural pozzolan meeting the requirements of ASTM C618. At the time of use, it should be sufficiently dry to flow freely and essentially free from agglomerations. Filler shall be free from organic impurities and have a plasticity index not greater than four. The mineral filler shall be added at the same point the asphalt cement is added to the aggregate.

Mineral filler shall meet the following grading requirements:

SIEVE SIZE	PERCENT PASSING
No. 30	100
No. 50	95 - 100
No. 200	55 - 100

3.05 Stabilizing Additive:

Stabilizing additives shall be made from virgin basalt, diabase, slag, or cellulose treated with a cationic sizing agent to enhance disbursement of the fiber as well as increase adhesion of the fiber surface with the asphalt binder and control draindown. The stabilizing additive shall conform to the requirements of AASHTO M 325.

A certificate of analysis meeting the requirements of Subsection 106.05 of the specifications with the manufacturer’s most recent test data conforming to the requirements shown in the table below shall be submitted along with mix design submittal. Certificate of Compliance

conforming to the requirements of Subsection 106.05 of the specifications shall be submitted for each shipment of stabilizing additive.

Mineral Fiber	
Property Description:	**Requirement**
Dosage Rate:	0.3 – 0.6% by weight of total mix
Average Fiber Length (Max.):	0.25 inch
Average Fiber Thickness (Max.):	0.0002 inch
Shot Content (ASTM C612)	
Passing No. 60 Sieve:	90 - 100%
Passing No. 230 Sieve:	65 - 100%
Cellulose Fiber	
Property Description:	**Requirement**
Dosage Rate:	0.2 – 0.4% by weight of total mix
Using Alpine Sieve Analysis, Fiber Length (Max.):	0.25 inch
Passing No. 100 Sieve:	60 - 80%
Using a Mesh Screen Analysis	
Ash Content:	13 - 23%
Oil Absorption:	4.0 - 6.0%
Moisture Content (Max.):	5%

3.06 Warm Mix Asphalt Technologies:

Warm Mix Asphalt (WMA) technologies include plant water foaming processes, mineral additives, and chemical additives. WMA technologies shall be approved prior to their use in accordance with Materials Practice and Procedure Directive No. 23, “Requirements for the Use of Warm Mix Asphalt (WMA) Technologies in Asphaltic Concrete”. Only ADOT approved Warm Mix Asphalt (WMA) technologies will be allowed. Refer to ADOT Approved Warm Mix Asphalt (WMA) Technologies List.

4.0 Mix Design:

Utilizing mineral aggregate which has been crushed, processed, separated, and stockpiled, a mix design shall be formulated and submitted by the contractor to the Engineer. The mineral

aggregate samples used for mix design purposes shall be representative of materials to be used during production.

The mix design shall be based on the mix design criteria and other requirements hereinbefore specified, utilizing asphalt cement, mineral admixture, mineral filler and stabilizing additive of the type and from the sources proposed for use in the production of asphaltic concrete.

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. 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”.

The mix design shall contain as a minimum:

(A) The name and address of the testing organization and the person responsible for the mix design testing.

(B) The specific location(s) of the source(s) of mineral aggregate.

(C) The supplier, refinery, type of asphalt cement and any modifiers including polymers. The source and type of mineral admixture. The percentage of asphalt cement and mineral admixture to be used.

(D) The anticipated mineral aggregate gradation in each stockpile.

(E) Mix design gradation and mix test results from all trial gradations. The mix design shall contain the mineral aggregate gradation, and also the gradation with mineral admixture.

(F) The results of all testing, determinations, etc., such as: specific gravity of each component, water absorption, sand equivalent, loss on abrasion, fractured coarse aggregate particles, flat and elongated particles, uncompacted void content, percent carbonates (if required), immersion compression results (Index of Retained Strength, wet and dry strengths), asphalt absorption, percent air voids, voids in mineral aggregate, and bulk density.

(G) Viscosity-temperature curve along with the laboratory mixing and compaction temperature ranges, as well as the actual laboratory mixing and compaction temperatures used. For modified binders follow the recommendations of the supplier.

When Warm Mix Asphalt (WMA) technologies are used in the mixture, the additional mix design requirements specified in Materials Practice and Procedure Directive No. 23, “Requirements for the Use of Warm Mix Asphalt (WMA) Technologies in Asphaltic Concrete”, shall also be included in the mix design.

Test results used in the formulation of the mix design shall be from testing performed no earlier than 45 days prior to the date the mix design is signed by the mix design engineer. Historical abrasion values may be supplied on sources provided the testing was conducted within the past two years.

The mix design shall be submitted to the Engineer under a cover letter signed by an authorized representative of the contractor.

A copy of the mix design and representative samples of the materials used in the mix design shall be submitted to the Engineer for calibration of the ignition furnace, and for the determination of the sand equivalent, Abrasion, Fractured Coarse Aggregate Particles, Flat and Elongated Particles, Flakiness Index, Uncompacted Void Content and VCA_{DRC}. Approximately 400 pounds of mineral aggregate and mineral filler (proportional to the mix design gradation), stabilizing additives, 2 gallons of asphalt cement, and 1 gallon of mineral admixture shall be submitted. 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 mineral aggregate shall meet the requirements specified in Subsection 3.01 of this specification.

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 Engineer will review the mix design to assure that it contains all required information. If it does not, it will be returned within two working days of receipt of all samples and mix design information for further action and resubmission by the contractor.

If the contractor elects to change its source(s) of mineral aggregate or mineral filler or stabilizing additives, or adds or deletes the use of a stockpile(s) regardless of source, the contractor shall furnish the Engineer with a new mix design which meets the requirements specified hereinbefore.

If changes are made in the source or type of bituminous material, type of mineral admixture, stabilizing additives or mineral filler the contractor shall provide verification testing results. Verification testing shall be performed at the original mix design asphalt content using the original mineral aggregate, the proposed bituminous material, and/or the proposed mineral admixture. Three specimens shall be fabricated and tested for VCA_{MIX}, bulk density, maximum theoretical density, and effective voids. The percent effective voids shall be within

± 0.2 of the percent effective voids in the original design and also be within the current effective voids mix design specification limits. Verification testing results shall not replace target values shown in the original mix design. All target values from the original design shall be used in future production with the exception of any self-directed target value changes that are requested. The verification process does not ensure that the contractor can meet the target values during production.

In addition to the verification testing specified above, verification testing for TSR is also required. If there is a change in the type of mineral admixture or mineral filler, TSR testing is required.

The contractor may make self-directed target changes to the approved mix design within the limits shown below. Requests for self-directed target changes shall be made in writing and acknowledged by the Engineer prior to start of production for a lot. Self-directed target changes shall meet contract requirements for mix design criteria and grading limits.

MEASURED CHARACTERISTICS	ALLOWABLE SELF-DIRECTED TARGET CHANGES
Gradation (Sieve Size):	
3/8 inch	± 4% from mix design target value
No. 4	± 3% from mix design target value
No. 8	± 3% from mix design target value
No. 50	± 2% from mix design target value
No. 200	± 0.5% from mix design target value
Asphalt Cement Content	± 0.5% from mix design target value
Effective Voids	None

The contractor may propose target changes to the approved mix design for the Engineer's approval. The Engineer will determine if the proposed target change will result in mix production that meets the contract requirements for mix design criteria and grading limits. For acceptance purposes, target 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.

Should a mix design prove unsatisfactory to the contractor during production, the contractor shall furnish the Engineer with a revised mix design. For acceptance purposes, the revised mix design will not be retroactive.

The contractor shall not change its methods of crushing, screening, washing, or stockpiling from those used during production of material used for mix design purposes without approval of the Engineer or without preparing a new mix design.

5.0 Contractor Quality Control:

The contractor shall perform the quality control measures described in Subsection 106.04(C) of the specifications. At the weekly meeting, the contractor shall be prepared to explain and discuss how the following processes will be employed.

(A) Aggregate production, including crusher methods, pit extraction, and washing.

(B) Stockpile management, including stacking methods, separation technique, plant feed technique, stockpile pad thickness, and segregation prevention.

(C) Proportioning and plant control, including plant scale calibration, mix temperature control, storing method, and addition of admixture.

(D) Transporting and placing, including hauling distance and temperature control, segregation and non-uniform placement control, and joint placement and technique.

(E) Compaction, including types and weight of rollers, establishing and monitoring of roller patterns, and temperature controls.

(F) Feeding of mineral filler and fibers into the mix.

The contractor shall obtain samples and perform the tests specified in the following table:

CONTRACTOR QUALITY CONTROL TESTING REQUIREMENTS			
TYPE OF TEST	TEST METHOD	SAMPLING POINT	MINIMUM TESTING FREQUENCY
Virgin Mineral Aggregate			
Gradation	AASHTO T 11, T 27	Crusher Belt or Stockpile	1 per stockpile per day
Sand Equivalent	AASHTO T 176		1 per 2000 Tons of total virgin aggregate (1)
Fractured Coarse Aggregate Particles	AASHTO T 335		
Uncompacted Void Content	AASHTO T 304 Method A		
Asphaltic Concrete			
Gradation	AASHTO T 11, T 27 or T 308	Cold Feed, Hot Bins, Roadway, or Plant	1 per 1000 Tons
Asphalt Content	AASHTO T 287, T 308	Roadway or Plant	1 per 1000 Tons
Voids	AASHTO T 312,	Roadway or Plant	1 per 1000 Tons each day. Maximum of 4 per day.

	T 166, T 209, T 269		
Compaction	AASHTO T 355	Roadway	1 per 300 tons
VCA_{MIX} less than VCA_{DRC}	AASHTO T 19	Cold Feed and Roadway	1 per 1000 Tons

Notes:

(1) Prior to the completion of the mix design, quality control tests on mineral aggregate shall be performed based on the anticipated percent use of each stockpile. Samples taken from individual stockpiles may be composited prior to performing the required tests, or testing may be performed on material from each stockpile and the composite test result for each required test determined mathematically.

6.0 Construction Requirements:

The contractor shall be responsible for the proportioning of all materials, for the hauling, placing, loading, spreading, and finishing of asphaltic concrete, and for the applying of bituminous material, such as tack coats, prime coats, and provisional seals, all in accordance with the appropriate portions of the specifications.

The asphaltic concrete hot plant shall conform to the requirements of Section 403 of the Specifications.

The temperature of asphaltic concrete or mineral aggregate upon discharge from the drier shall not exceed 350 degrees F unless a higher temperature is recommended in writing by the asphalt binder supplier and approved by the Engineer.

A Material Transfer Vehicle (MTV) shall be used for placing the SMA on all travel lanes and may be used at the contractor's option in other areas. The contractor shall not place more than one truckload of hot mix in a windrow in front of the MTV at any time. The contractor shall use a MTV with storage and remixing capabilities on all mainline construction. The MTV will independently remix and deliver mixture from the hauling Equipment to the paving Equipment.

The contractor shall furnish an MTV with the following capabilities:

- An unloading system to receive mixtures from the hauling Equipment.
- A minimum storage capacity of 13 tons with a remixing system in the MTV storage bin.
- A discharge conveyor to deliver the mixture to the paver hopper.
- The MTV system cannot exceed maximum legal loading on Structures.
- Pick-up machines, hopper inserts and Material transfer devices are not considered MTVs.

In the event the MTV malfunctions during paving operations, the contractor may finish the Day without the MTV. The Contractor shall not resume further mainline mix placement until the MTV is operational.

All courses of asphaltic concrete shall be placed and finished by means of self-propelled paving machines except under certain conditions or at certain locations where the Engineer deems the use of self-propelled paving machines impractical.

Self-propelled paving machines shall spread the mixture within the specified tolerances, without segregation or tearing, true to the line, grade, and crown indicated on the project plans. Pavers shall be equipped with hoppers and augers which shall distribute the mixture uniformly in front of adjustable screeds.

Pavers shall be equipped with a screed for the full width being paved, heated if necessary, and capable of spreading and finishing all courses of asphaltic concrete.

Pavers shall be equipped with automatic screed controls with sensors for either or both sides of the paver, capable of sensing grade from an outside reference line, sensing the transverse slope of the screed, and providing the automatic signals which operate the screed to maintain the desired grade and transverse slope.

Failure of the control system to function properly shall be cause for the suspension of the placing of asphaltic concrete.

The base or subgrade upon which asphaltic concrete is to be placed shall be prepared and maintained in a firm condition until asphaltic concrete is placed. Asphalt paving mixtures shall not be placed when surfaces are wet or when the surface temperature is 55 degrees F or lower. When the surface temperature is between 40°F and 55°F, the contractor may elect to place asphaltic concrete mixture, at no additional cost to the Department, provided an approved warm-mix additive is used as a compaction aid. Placement of asphaltic concrete shall not be allowed when the surface temperature is below 40°F.

The contractor shall utilize an approved warm-mix additive, regardless of surface temperature, when the haul distance exceeds 50 miles.

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 asphaltic concrete.

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 TP 102, shall conform to the requirements shown in the table below:

RELEASE AGENT TEST	REQUIREMENT
Asphalt Stripping Test Diluted Non-Diluted (Full Strength)	 No stripping No stripping
Asphalt Performance Test	Less than or equal to 10.0% after the third cycle

Release agents which degrade, dissolve, or in any way damage the bituminous material shall not be used. Diesel fuel shall not be used as a release agent.

Longitudinal joints of each course shall be staggered a minimum of 1 foot with relation to the longitudinal joint of any immediate underlying course.

When surfacing courses are placed on 10 foot or wider shoulders which are to receive rumble strips, the contractor shall place any longitudinal joints approximately 1 foot away from the travel lane side of the rumble strip.

Longitudinal joints shall be located within 1 foot of the center of a lane or within 1 foot of the centerline between two adjacent lanes. Joints shall be formed by a slope shoe or hot-lapped, and shall result in an even, uniform surface.

Before a surface course is placed in contact with a cold transverse construction joint, the cold existing asphaltic concrete shall be trimmed to a vertical face by cutting the existing asphaltic concrete back for its full depth of the lift and exposing a fresh face. After placement and finishing of the new asphaltic concrete, both sides of the joint shall be dense and the joint shall be well sealed. The surface in the area of the joint shall conform to the requirements hereinafter specified for surface tolerances when tested with the straightedge placed across the joint.

All holes where cores are taken shall be repaired within 48 hours after coring using a material approved by the Engineer. All holes shall be in a dry condition prior to repair. The patching material shall be thoroughly compacted in the holes by the contractor.

The handling of asphaltic concrete shall at all times be such as to minimize segregation. Any asphaltic concrete which displays segregation shall be removed and replaced.

Before asphaltic concrete is placed, the surface to be paved shall be cleaned of all objectionable material and tacked in accordance with the requirements of Section 404. The cleaning of the surface, the tacking of the surface, and the type of bituminous material used shall be acceptable to the Engineer. The amount of bituminous material used shall be as directed by the Engineer.

A light coat of bituminous material shall be applied to edges or vertical surfaces against which asphaltic concrete is to be placed.

The contractor shall schedule its paving operations to minimize exposed longitudinal edges. Unless otherwise approved by the Engineer, the contractor shall limit the placement of asphaltic concrete courses, in advance of adjacent courses, to one shift of asphaltic concrete production. The contractor shall schedule its paving operations in such a manner to eliminate exposed longitudinal edges over weekends or holidays.

The moisture content of the asphaltic concrete immediately behind the paver shall not exceed 0.5 percent. The moisture content will be determined in accordance with AASHTO T 329.

When Warm Mix Asphalt (WMA) technologies are used, the contractor shall comply with the manufacturer's recommendations for incorporating additives and WMA technologies into the mixture. The contractor shall comply with the manufacturer's recommendations regarding transporting, storage, and delivery of additives and water foaming processes. The contractor shall maintain a copy of the manufacturer's recommendations on file at the asphalt mixing plant and make those recommendations available for reference while using WMA technologies.

7.0 Acceptance:

7.01 General:

In addition to the random acceptance samples taken from each lot, the Engineer may sample and reject material which appears to be defective. Such rejected material shall not be used in the work. The results of tests run on rejected material will not be included with the lot acceptance tests.

Acceptance will be on the basis of the following:

(A) Sand Equivalent;
(B) Fractured Coarse Aggregate Particles;
(C) Flakiness Index;
(D) Flat and Elongated Particles;
(E) Uncompacted Void Content;
(F) Material Spread;
(G) Plastic Index (PI) for Mineral Filler;
(H) Smoothness;
(I) VCA_{MIX};
(J) Gradation;
(K) Asphalt Cement Content;
(L) Effective Voids; and
(M) Compaction

7.02 Sand Equivalent, Fractured Coarse Aggregate Particles, Flakiness Index, Flat and Elongated Particles, and Uncompacted Void Content of Mineral Aggregate:

During asphaltic concrete production, the Engineer will obtain and test samples of material for the determination of the sand equivalent, fractured coarse aggregate particles, flat and elongated particles, flakiness index and uncompacted void content of mineral aggregate. Samples shall be obtained from the cold feed belt prior to the addition of mineral admixture, or from the stockpiles when sampling from the cold feed belt is not possible.

Mineral aggregate will be accepted if it meets the minimum requirements specified in Subsection 3.01 of this specification.

The plastic index (PI) for the mineral filler shall be determined in accordance with the requirements of AASHTO T 89 & T 90.

If the mineral aggregate fails to meet these requirements, operations shall cease and the contractor shall have the option of submitting a revised mix design conforming to the requirements of Subsection 4.0 of this specification or correcting deficiencies in the aggregate stockpiles.

7.03 Material Spread:

A spread lot shall be considered to be one-half shift of production. Lots encompassing more than one project shall be separated in accordance with Subsection 9(D) of this specification.

The contractor shall record information pertaining to each spread lot on forms provided by the Engineer. Information shall include the project number, date and period of time that each spread lot was placed, the spread lot number, beginning and ending station, the plans thickness, and tons placed in each lot. Completed spread lot forms shall be signed by the contractor and given to the Engineer at the end of each shift.

The Engineer will calculate the quantity required in each spread lot using the mix design bulk density unless a request is made by the contractor to use a production bulk density. If a request is made to use production bulk density, the first three non-rejected lots following the test lot will be used to determine the average production bulk density. All lots placed prior to establishing the average production bulk density shall be calculated using the mix design bulk density. For each new mix design used on the project, a new production bulk density may be requested by the contractor. In addition, if conditions warrant during asphalt production, the contractor may request establishment of a new average production bulk density. All requests to use a production bulk density shall be made in writing and approved by the Engineer prior to use. The same procedure will be used for determining average production bulk density in all cases. Changes to the bulk density for calculating spread quantities will not be retroactive.

The calculated quantity required in each spread lot will be compared to the actual quantity placed. A lot will be considered to be acceptable, with a zero pay factor, if the actual quantity placed varies by no more than -2.0 to +5.0 percent from the required quantity.

If the quantity in a lot is found to vary from the required quantity by -2.1 to -12.0 percent, the appropriate pay factor will be determined in accordance with Table 3. This pay factor will be utilized in determining the pay adjustment as outlined in Subsection 9.0 of this specification.

7.04 Gradation, Asphalt Cement Content, Effective Voids, and VCA_{MIX}:

(A) General:

A mixture properties lot shall be considered to be one shift's production. In the event a shift's production is less than 1200 tons, multiple shifts may be combined to form a lot. When a lot consists of production from more than one shift, the following conditions apply: at least one sample shall be taken each shift, at least one sample shall be taken every 500 tons, and no mix design or target value changes shall be made within the lot. If changes are made in the mix design or target values, new lots will be established.

Four samples of the asphaltic concrete shall be taken for each lot by the contractor, under the observation of the Engineer, at random locations designated by the Engineer. Samples shall be collected by the contractor, under observation by the Engineer, in accordance with AASHTO R97 from windrows on the ground at the jobsite or from the back of trucks at the plant from an elevated rack. Samples shall be delivered to the Engineer immediately after being taken. The minimum weight of the sample shall be 130 pounds. The Engineer will split the sample and save one-half for 15 days after written notification to the contractor of test results for that lot has been made. The material will be tested by the Engineer for the following properties:

TEST PROPERTY	TEST METHOD
Asphalt Cement Content Gradation	AASHTO T 308 (See Note)
Gyratory Density	AASHTO T 312
Maximum Theoretical Density	AASTHO T 209
Effective Voids	AASHTO T 269
VCA_{MIX}	AASHTO T 19 (Refer to AASHTO R 46 for guidance)
Note: A new calibration of the ignition furnace shall be performed for each mix design, and at any other time the Engineer directs.	

Acceptance testing results will be furnished to the contractor within four working days of receipt of samples by the Engineer.

The target values for gradation, asphalt cement content, and effective voids are given in the contractor's mix design. The Upper Limits (UL) and Lower Limits (LL) of acceptable production of each of the measured characteristics are as follows:

MEASURED CHARACTERISTICS FOR 1/2" AND 3/8" MIXES		
Gradation (Sieve Sizes)	LL	UL
3/8 inch	TV – 5.0	TV + 5.0
No. 4	TV – 4.0	TV + 4.0

No. 8	TV – 3.0	TV + 3.0
No. 50	TV – 3.0	TV + 3.0
No. 200	TV – 2.0	TV + 1.5
Asphalt Cement Content	TV – 0.5	TV + 0.5
Effective Voids	TV –2.0	TV + 2.0
Note: The limits are used in the statistical calculations for Quality Index. Acceptance is controlled by the variability of the produced material and every effort should be made to strive for the center of the applicable Target Valve (TV).		

The Engineer will determine the PT for each measured characteristic in accordance with Subsection 9(I) of this specification and utilizing Table 3 will determine the pay factor for each measured characteristic.

In the event the contractor elects to question the mixture property test results, the contractor may request referee testing in accordance with Subsection 9(J) of this specification.

(B) Ignition Furnace Correction:

Ignition furnace corrections shall be made in accordance with the requirements of AASHTO T 308.

7.05 Compaction:

Compaction control shall be the responsibility of the contractor. The number and types of rollers shall be the contractor's responsibility and shall be sufficient to meet the requirements specified herein.

Pneumatic-tired rollers will not be permitted.

Compactors shall be operated in accordance with the manufacturer’s recommendations. Compactors shall be designed and properly maintained so that they are capable of accomplishing the required compaction.

Steel wheel compactors shall weigh not less than 12 tons.

A compaction lot shall be identical to the mixture properties lot described in Subsection 7.04 of this specification. Lots encompassing more than one project shall be separated in accordance with Subsection 9 (D) of this specification. Each lot shall be tested for acceptance.

Twenty cores shall be taken for each lot by the contractor, under the observation of the Engineer. The Engineer will designate 10 random locations within the lot, and the contractor shall take two cores at each location; however, if more than one shift constitutes a lot, two cores shall be taken from a minimum of two random locations each shift, or as directed by the

Engineer. The Engineer will save one core from each location for 15 days after written notification to the contractor of test results for the lot has been made. Randomly selected locations will be determined to the nearest 0.5 foot in the transverse direction and to the nearest foot in the longitudinal direction of the pavement course; however, the outside 1 foot of the unconfined pavement course will be excluded from testing as shown in ADOT Materials Practice and Procedure Directive (P.P.D.) No. 18, “Determining Sample Times and Locations for End Product Asphaltic Concrete”. P.P.D. No. 18 also addresses areas to be excluded relative to longitudinal joints. Cores shall be taken utilizing mechanical coring equipment in accordance with the requirements of AASHTO R 97. Cores shall be a minimum of 4 inches in diameter and shall be taken not later than two working days after placement of the asphaltic concrete. The cores shall be delivered to the Engineer immediately upon being taken. The bulk density of each core will be determined by the Engineer in accordance with the requirements of AASHTO T 166. The test results will be furnished to the contractor within four working days of receipt of cores by the Engineer. In areas where more than one lift is placed in the same lot, coring shall be accomplished through the full depth of the lifts after the final lift is placed, and the compaction density shall be based on the full depth of the lifts.

The target value for compaction shall be 5.0 percent in-place air voids. In-place air voids shall be determined in accordance with AASHTO T 269. The maximum theoretical density used in the determination of air voids will be the average of the four maximum theoretical densities determined for the lot in Subsection 7.04 of this specification.

The Upper Limit (UL) is 8.0 percent in-place air voids and the Lower Limit (LL) is 2.5 percent in-place air voids. The Engineer will determine the PT for compaction in accordance with Subsection 9(I) of this specification, and utilizing Table 3 will determine the compaction pay factor.

In the event the contractor elects to question the core test results, the contractor may request referee testing in accordance with Subsection 9(J) of this specification.

7.06 Smoothness and Surface Tolerances:

Asphaltic concrete shall be compacted as required, smooth and true to the required lines, grades, and dimensions.

The Special Provisions may require the smoothness of the final pavement surface to be tested in accordance with Subsection 109.13 of the specifications.

Regardless of whether testing in accordance with Subsection 109.13 of the specifications is specified or not, the following requirements shall be met:

(A) The surface of the final lift of asphaltic concrete placed under this section of the specifications shall be tested and shall not vary by more than 1/8 inch from the lower edge of a 10-foot straightedge when it is placed in the longitudinal direction (including across transverse joints), and when it is placed in the transverse direction across longitudinal joints.

(B) The surface of any lift of asphaltic concrete placed under this section of the specifications, other than the final lift, shall be tested and shall not vary by more than 1/4 inch from the lower edge of a 10-foot straightedge when it is placed in the longitudinal direction (including across transverse joints), and when it is placed in the transverse direction across longitudinal joints.

(C) All deviations exceeding the specified tolerances above shall be corrected by the contractor, to the satisfaction of the Engineer.

8.0 Method of Measurement:

(A) Asphaltic Concrete:

Asphaltic concrete will be measured by the ton for the asphaltic concrete actually used, which will include the weight of mineral aggregate, asphalt cement, and mineral admixture. Measurement will include any quantity used in construction of intersections, turnouts, or other miscellaneous items or surfaces.

(B) Stabilizing additives:

Stabilizing additives (Cellulose or Mineral fibers) will be measured by the ton.

(C) Asphalt Cement:

Asphalt cement will be measured by the ton on the basis of the asphalt cement content determined in accordance with Subsections 7.04(B) of this specification for each lot of asphaltic concrete accepted. The average asphalt cement content will be multiplied by the number of tons of asphaltic concrete in that lot to determine the amount of asphalt cement. If the contractor has requested referee testing, the average asphalt cement content will come from the independent testing laboratory results. At the discretion of the Engineer, asphalt cement may be measured by invoice quantities, adjusted as necessary for waste. Waste generated from startup of the asphalt plant will be considered to have a binder content of 5.0 percent. In no case shall the measured amount of asphalt cement for payment be greater than the total of the invoice quantities, adjusted for waste.

9.0 Basis of Payment:

The accepted quantities of asphaltic concrete, measured as provided above, will be paid for at the contract unit price adjusted by the appropriate pay factors as hereinafter provided.

When Warm Mix Asphalt (WMA) technologies are used in the mixture, no separate payment will be made for WMA additives or technologies, necessary hot plant modifications, or other associated costs.

For the purpose of determining acceptability and appropriate pay factors, each unit of asphaltic concrete will be included in three separate lots: a “spread lot,” a “mixture properties lot,” and a “compaction lot.” The total unit price for any unit of accepted asphaltic concrete

will be the contract unit price, adjusted by the applicable spread lot pay factor, mixture properties lot pay factor, and compaction lot pay factor.

The contractor may request to place the first lot of each mix type as a test strip. Requests to place a test strip shall be made in writing and acknowledged by the Engineer prior to start of production. A test strip shall be limited to 1,000 tons and may only be placed on shoulders, ramps, cross roads, or other areas approved by the Engineer. A test strip shall be excluded from the mixture properties lot pay factor and the compaction lot pay factor; however, all other provisions of Subsection 9.0 specified herein shall still apply to such areas.

The Engineer may exclude asphaltic concrete from the spread lot and from the spread lot pay factor calculations if the Engineer determines that the proposed use of the material or the existing surface conditions are not conducive to the use of spread lots.

The Engineer may exclude certain locations from the mixture properties lot and/or the compaction lot and from the random sampling used in determining the mixture properties lot pay factor and/or the compaction lot pay factor should the Engineer determine that the location of the work precludes normal construction operations.

(A) Spread Lot Pay Factor:

The spread lot pay factor will be determined in accordance with Subsection 7.03 of this specification. If the quantity in a spread lot is found to vary by more than + 5.0 percent from the required quantity, no payment will be made for the material which exceeds + 5.0 percent, including asphalt cement and mineral admixture. If the quantity is found to vary by more than - 12.0 percent from the required quantity, the spread lot will be rejected.

(B) Mixture Properties Lot Pay Factor:

The mixture properties lot pay factor shall be determined in accordance with the following procedure:

(A) The individual PT values and pay factors for Gradation, Asphalt Cement Content, and Effective Voids shall be determined as set forth in Subsection 7.04 of this specification.

(B) A single pay factor shall be determined for Gradation and Asphalt Cement Content. That pay factor shall be the lowest pay factor for the individual measured characteristics for Gradation and Asphalt Cement Content.

(C) If no individual PT value in (1) above is less than 50, the mixture properties lot pay factor shall be the sum of the pay factor determined in (2) above and the Effective Voids pay factor. The negative pay factor for mixture properties shall not exceed $3.00 per ton. If any individual PT value is less than 50, the lot is in reject and the provisions in Subsection 9(E) of this specification shall apply.

(C) Compaction Lot Pay Factor:

The compaction lot pay factor shall be determined as set forth in Subsection 7.05 of this specification.

(D) Determination of Lot Pay Factors on Contracts Involving Multiple Projects:

When more than one project is included in a single contract, placement during a shift or half shift of production may encompass more than one project. In such case, the applicable spread lot pay factor, mixture properties lot pay factor, and compaction lot pay factor for each project shall be determined as follows:

Spread lot pay factors will be determined separately for each project utilizing the procedure set forth in Subsection 7.03 of this specification.

(A) The individual PT values and pay factors for Gradation, Asphalt Cement Content, and Effective Voids will be determined from the results of the random samples taken and tested in accordance with Subsection 7.04 of this specification, regardless of which project(s) the samples fall within.

(B) PT values and pay factors for compaction, for those areas subject to Subsection 7.05(B) of this specification, shall be determined from separate sets of core samples for each project utilizing the procedure set forth in that Subsection.

(C) The mixture properties lot pay factor shall be determined separately for each project in accordance with Subsection 9(B) specified herein, utilizing the individual pay factors determined in (B) above.

(D) The compaction lot pay factor shall be determined separately for each project in accordance with Subsection 9(C) specified herein, utilizing the pay factor determined in (C) above.

(E) Acceptability:

Asphaltic concrete included in any mixture properties lot possessing an individual PT value lower than 50 for Gradation, Asphalt Cement Content, or Effective Voids will be rejected. Asphaltic concrete included in any compaction lot possessing a PT value lower than 50 will be rejected.

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 4.0 of this specification would have brought the failing test result(s) to within the specified tolerances. This proposal shall 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.

Within 25 days after receiving notice that a spread lot, mixture properties lot, or compaction lot of asphaltic concrete has been rejected by the Engineer, the contractor may submit a written proposal to accept the material in place at the applicable maximum negative pay factor(s). Maximum negative pay factors are defined as a minus $1.00 per ton for spread lots, minus $5.00 per ton for compaction lots, 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. Positive mixture properties lot pay factors become zero when the compaction lot is in reject and the material is allowed to be left in place.

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 experienced in asphaltic concrete testing and the development of asphaltic concrete mix designs. If a rejected mixture properties lot or a rejected compaction lot is submitted for referee testing by the contractor, the 25 days allowed to prepare an engineering analysis will begin upon notification of referee test results.

Within three working days, the Engineer will determine whether or not to accept the contractor’s proposal. 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. If the proposal is accepted, the asphaltic concrete shall remain in place at the applicable maximum negative pay factor(s), and any necessary corrective action shall be performed at no additional cost to the Department.

The Department reserves the right to suspend the work should any of the following conditions occur:

(A) The occurrence of two or more rejected lots within any 10 consecutive production lots.

(B) The occurrence of three consecutive negative mixture properties lot pay factors or three consecutive negative compaction lot pay factors.

(C) The occurrence of five or more pay factors that are negative either for a mixture properties lot or for a compaction lot within any 10 consecutive production lots.

If the Department elects to suspend the work for any of these conditions, the contractor shall either submit a revised mix design in accordance with Subsection 4, or submit for the Engineer’s approval a written engineering analysis. The engineering analysis shall detail the

course of action necessary to correct deficiencies in the contractor's present production methods such that further production can be accomplished without excessive amounts of asphaltic concrete in penalty or rejection. If approved by the Engineer, the revised mix design or the course of action proposed in the engineering analysis, shall be implemented and the work may continue. Costs or delays due to the provisions of this subsection are not compensable.

(F) Asphalt Cement:

The accepted quantity of the asphalt binder, measured as provided above, will be paid for under the respective contract item for asphalt binder shown on the bidding schedule at the contract unit price per ton, which price shall be full compensation for the work, complete in place, as specified herein. Adjustments in payment will be made in accordance with the requirements of Subsection 1005-3.01 of the specifications.

(G) Mineral Admixture:

No separate measurement or payment will be made for mineral admixture, the cost being considered as included in the cost of the asphaltic concrete.

(H) Smoothness:

When required in the Special Provisions, payment for smoothness will be made in accordance with the requirements of Subsection 109.13 of the specifications.

(I) Statistical Acceptance:

The "Total Percentage of Lot within UL and LL (PT)" will be determined in accordance with Subsection 109.11 of the specifications.

Pay Factors (PF) will be determined by entering Table 3 with PT.

TABLE 3
PAY FACTORS

Material Spread		Mixture Properties and Compaction			
			Pay Factors (Dollars per Ton)		
Negative Variance %	Pay Factor (Dollars per Ton)	PT	Gradation and Asphalt Cement Content	Effective Voids	Compaction
2.1 - 3.0	- 0.10	100	0.00	+ 2.00	+ 2.00
3.1 - 4.0	- 0.20	95 - 99	0.00	+ 0.50	+ 0.50
4.1 - 5.0	- 0.30	90 - 94	0.00	0.00	0.00
5.1 - 6.0	- 0.40	85 - 89	0.00	- 0.25	- 0.25
6.1 - 7.0	- 0.50	80 - 84	- 0.25	- 0.50	- 0.50

TABLE 3 PAY FACTORS					
Material Spread		**Mixture Properties and Compaction**			
Negative Variance %	**Pay Factor (Dollars per Ton)**	**PT**	**Pay Factors (Dollars per Ton)**		
			Gradation and Asphalt Cement Content	**Effective Voids**	**Compaction**
7.1 - 8.0	- 0.60	75 - 79	- 0.50	- 0.75	- 0.75
8.1 - 9.0	- 0.70	70 - 74	- 0.75	- 1.00	- 1.00
9.1 - 10.0	- 0.80	65 - 69	- 1.00	- 1.25	- 1.25
10.1 - 11.0	- 0.90	60 - 64	- 1.50	- 1.50	- 1.75
11.1 - 12.0	- 1.00	55 - 59	- 2.00	- 2.00	- 2.25
More than 12.0	Reject	50 - 54	- 2.50	- 2.50	- 3.00
See Subsections 9 (A) and (E)		Less than 50	Reject-See Subsection 9 (E)		

(J) Referee Testing:

(1) Referee Testing Performed for Mixture Properties Only:

Within 15 days after written notification to the contractor of test results for a particular mixture properties lot, the contractor may make a written request for referee testing. The referee testing shall be performed by an independent approved laboratory designated by the Department. The testing of the samples will be performed by the independent testing laboratory without knowledge of the specific project conditions such as the identity of the contractor or mix design laboratory, the test results by the Department, or the mix design targets for gradation and effective voids. The asphaltic concrete samples previously saved will be tested for the following properties:

Test Property	Test Method
Asphalt Cement Content (See Note 1 Below)	AASHTO T 308
Gradation	
Gyratory Density	AASHTO T 312 (See Note 2 Below)
Maximum Theoretical Density	AASHTO T 209
Effective Voids	AASHTO T 269

Notes:

(1) Correction to the asphalt cement content by ignition furnace testing is made in accordance with Subsection 7.04(B) of this specification.

(2) Except compaction shall be performed to the number of gyrations specified in Table 1.

The results of the referee testing will be binding on both the contractor and the Department.

Using the referee testing results, the Engineer will determine new PT's for all characteristics.

When referee testing is performed on a mixture properties lot, the referee test result for the average maximum theoretical density will be used to determine a new PT for compaction.

The Department will pay for the referee testing; however, if the combined pay factor of the lot (Mixture Properties plus Compaction) does not improve or is reduced, or if either the mixture properties lot or compaction lot remains in reject or is placed in reject, payment to the contractor for asphaltic concrete shall be reduced by the amount of the cost of the referee testing for the mixture properties of that particular lot.

(2) Referee Testing Performed for Compaction Only:

Within 15 days after written notification to the contractor of test results for a particular compaction lot, the contractor may make a written request for referee testing. The bulk density of each of the cores previously saved will be determined in accordance with the requirements of AASHTO T 166 by an independent testing laboratory designated by the Department. The testing of the cores will be performed by the independent testing laboratory without knowledge of the specific project conditions, such as the identity of the contractor or mix design laboratory, or the test results by the Department. The percent air voids will be determined in accordance with AASHTO T 269. The maximum theoretical density used in the determination of air voids will be the average of the four maximum theoretical densities determined for the lot in Subsection 7.04 of this specification.

The results of the referee testing will be binding on both the contractor and the Department.

When referee testing is performed on a compaction lot, the Engineer will determine a new PT for compaction using the referee testing results.

The Department will pay for the referee testing; however, if the pay factor of the compaction lot does not improve or is reduced, or the compaction lot remains in reject or is placed in reject, payment to the contractor for asphaltic concrete will be reduced by the amount of the cost of referee testing for the compaction of that particular lot.

(3) Referee Testing Performed for Both Mixture Properties and Compaction:

When referee testing is performed, as described above, for both the mixture properties lot and the compaction lot, the Engineer will use the referee test results to determine new PT's as specified herein in Subsections 9(J)(1) and 9(J)(2).

The Department will pay for the referee testing; however, if the combined pay factor of the lot (Mixture Properties plus Compaction) does not improve or is reduced, or if either the mixture properties lot or compaction lot remains in reject or is placed in reject, payment to the contractor for asphaltic concrete will be reduced by the amount of the cost of the referee testing for the mixture properties and compaction of that particular lot.

(K) Stabilizing Additives:

The accepted quantity of the stabilizing additives, measured as provided above, will be paid for at the contract unit price per ton, which price shall be full compensation for the work, complete in place, as specified herein.

(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.

ITEM 9240181 — MISCELLANEOUS WORK (CONTROL OF NOXIOUS PLANTS) (MANUAL / MECHANICAL METHODS):
ITEM 9240182 — MISCELLANEOUS WORK (CONTROL OF NOXIOUS PLANTS) (HERBICIDE):

Description:

The work under these items shall consist of surveying, as well as controlling noxious and invasive plant species manually **/** mechanically and**/**or with the application of herbicides, in the areas designated by the Engineer, and throughout the duration of the contract, as required in a Noxious Species Control Plan **(**NSCP**)** prepared by the contractor as specified herein. When noxious or invasive plant species are determined to be present within the project limits

or all anticipated construction zones, the control procedures in the NSCP shall be implemented with the approved weed management measures achieved prior to earth moving activities of infested areas.

Weed control procedures in the NSCP shall also be implemented during all stages of construction and in advance of seeding. Control of Noxious Plants through herbicide methods shall be accomplished between fourteen (14) and twenty-one (21) calendar days prior to Clearing and Grubbing, as well as construction excavations. Control of Noxious Plants through manual / mechanical methods shall be accomplished within seven (7) calendar days prior to Clearing and Grubbing, as well as construction excavations. Repeated treatments shall resume after Clearing and Grubbing when noxious/invasive plants occur during construction. In addition, all construction-related equipment, materials, and personnel moving in and/or out of the project site shall be inspected and cleaned of noxious and invasive plant species (seeds, seed heads / pods) at no additional cost to the Department.

For projects that include Landscape Establishment, as specified in Section 807 of the specifications and these Special Provisions, control of noxious and invasive plant species will also be required throughout the Landscape Establishment phase, and shall be included in the contractor's NSCP.

The contractor shall conduct repeated applications for Control of Noxious Plants throughout the entire contract time including the Landscape Establishment phase when noxious/invasive plants occur. Successive treatments along with multiple mobilizations for Control of Noxious Plants shall be conducted in accordance with invasive weeds' growing seasons at no additional cost to the Department.

The control of plant species not on the State or Federal Noxious or Invasive lists – especially Forest Service Regional/BLM lists noted below will be paid only when control is directed by the Engineer based on the original or amended NSCP approved by an ADOT construction Professional Landscape Architect (PLA) licensed in the State of Arizona.

The areas to be designated by the Engineer for Control of Noxious Plants shall be coordinated with an ADOT construction PLA. Unless the project site presents sizable monocultures or pure stands of high-density noxious and invasive plant species, the contractor shall not perform broadcast applications of glyphosate and/or other broad spectrum non-selective herbicides within the project limits. Spot-treating of identified noxious and invasive plant species patches with appropriate selective herbicides shall be conducted.

For unpaved project areas that will ultimately be seeded with desirable native plant species, the contractor shall avoid persistent herbicide residue contamination in the soil. The application of plant growth regulator (PGR) herbicides including Pyridine Carboxylic Acid (PCA) herbicides, which do not break down easily, shall be approved by the Engineer in accordance with an ADOT construction PLA's evaluation. Soil sterilant herbicides, especially bare-ground herbicides with long-lasting soil persistence, shall be prohibited for use in all unpaved project areas that will be seeded. Soil sterilant herbicides including bare-ground herbicides shall be prohibited for use in all unpaved and/or unstabilized project areas that are

prone to soil erosion and/or dust emission. Pre-emergence herbicides shall be prohibited for use in unpaved project areas that will eventually be seeded.

All glyphosate, as well as formulations of glyphosate-based herbicides and/or such products under the brand name / trade name of Roundup shall be cautiously evaluated for use by an ADOT construction PLA and approved by the Engineer in accordance with environmental commitments, along with site specific concerns of sensitive biological resources for native species and habitats.

The selection of appropriate treatment method(s) between herbicide versus manual/mechanical or in combination shall be proposed by the contractor within NSCP and approved by an ADOT construction PLA through the Engineer consistent with type(s), life stage(s), growing season(s), and existing condition(s) of plant species, as well as environmental commitments. The contractor may apply the herbicide method to exterminate noxious plants first and remove the dead noxious plants by using the manual / mechanical method after herbicide treatment is successful. Clearing and Grubbing shall not be applied to remove the dead noxious/invasive plants, as well as contaminated soil seed bank if the method will spread the reproducible components of noxious/ invasive plants. Manual / mechanical method shall be applied instead. The reproducible components of noxious/ invasive plants shall include, but are not limited to roots, stems, seeds, seed heads, or seed pods according to various types and life stages of plant species.

Materials:

General

The contractor shall accurately follow all applicable herbicide label requirements and prevent adverse environmental effects. The herbicides to be used and the methods of application shall conform to U. S. Environmental Protection Agency (EPA), Arizona Department of Agriculture, and/or Arizona Department of Environmental Quality (ADEQ) requirements, and the product's label instructions, as approved by the Engineer. If herbicides are to be applied to potential or delineated Waters of the US as defined under Section 404 of the Clean Water Act, the contractor shall file a Notice of Intent (NOI) and Notice of Termination (NOT) to EPA and/or ADEQ for compliance with the National Pollutant Discharge Elimination System (NPDES) Pesticide General Permit and/or Arizona Pollutant Discharge Elimination System (AZPDES) Pesticide General Permit (PGP).

All herbicides used on the project, including stump treatment herbicide(s), shall be in compliance with NPDES and/or AZPDES PGP(s). The PGP NOI(s) shall be filed for herbicide(s) utilized within the Ordinary High-Water Mark (OHWM) of Jurisdictional Waters of the U.S.

All materials to be used shall be listed and protocol information provided in the Noxious Species Control Plan, as specified below. The contractor shall provide the herbicides container with the original chemical label for inspection and confirmation of the chemicals used. All containers shall be disposed of as recommended by the manufacturer.

Herbicides proposed in the plan for use on projects within transportation easements on BLM and/or USFS Lands shall be in conformance with the following current environmental documents including: "Environmental Assessment for ADOT Herbicide Treatment Program on Bureau of Land Management Lands in Arizona", which is available at ***https://eplanning.blm.gov/eplanning-ui/project/34810/510*** or the "Environmental Assessment for Management of Noxious Weeds and Hazardous Vegetation on Public Roads on National Forest System Lands in Arizona" which is available at: ***http://www.fs.usda.gov/main/r3/landmanagement/projects*** . The Environmental Documents include a list of approved Herbicides, Mitigations and Best Management Practices (BMPs), which shall be included, as appropriate, by the contractor in the submitted NSCP.

Web links to environmental documents for noxious weeds and invasive plant species treatment for the six (6) National Forests within Arizona**:**

(1) Final EIS **(**Environmental Impact Statement**)** and Record of Decision for Noxious Weed Treatment on the Coconino, Kaibab, and Prescott National Forests: ***http://www.fs.usda.gov/project/?project=30***

(2) Coronado National Forest EA (Environmental Assessment) for Noxious Weed Treatments: ***http://www.fs.usda.gov/detail/coronado/landmanagement/resourcemanagement/?cid=stelprdb5123160***

(3) Apache-Sitgreaves National Forest Integrated Forest-Wide Noxious Terrestrial and Aquatic Weed Management Plan: ***https://www.fs.usda.gov/project/?project=4967***

(4) Tonto National Forest Integrated Treatment of Noxious and Invasive Weeds: ***https://www.fs.usda.gov/project/?project=4454*****;** Additional information on invasive species requirements for the Tonto National Forest is available at: ***http://www.fs.usda.gov/detail/tonto/landmanagement/resourcemanagement/?cid=fsbdev3_018789*** .

Arizona Department of Agriculture NOXIOUS WEEDS **(**under the authority of Arizona Revised Statutes, Administrative Code R3-4-244 Regulated and Restricted Noxious Weeds, as well as R3-4-245 Prohibited Noxious Weeds**)** web link: ***https://agriculture.az.gov/pestspest-control/agriculture-pests/noxious-weeds***

Furthermore, the USDA Southwestern Region Weed Field Guides web link is accessible below: ***https://www.fs.usda.gov/detail/r3/forest-grasslandhealth/invasivespecies/?cid=stelprd3813522***

The USDA New Invaders of the Southwest is attainable within the web link below: ***https://docslib.org/doc/7815112/new-invaders-of-the-southwest***

The USDA Field Guide for Managing Buffelgrass in the Southwest is obtainable through the web link below:
https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd563017.pdf

All materials used shall be in accordance with the approved NSCP and Pesticide Use Proposal **(**PUP**)**.

Construction Requirements:

The contractor shall develop a NSCP for state and federal listed noxious and invasive plant species, and other undesirable plant species shown on the list posted on the Roadside Development web site **(** ***https://azdot.gov/node/5372*** **)**, for approval by an ADOT construction PLA. Four (4) copies of the proposed NSCP in standard three (3) ring binders shall be submitted to the Engineer within seven (7) calendar days after the Execution of Contract. The ADOT construction PLA shall review and respond to the proposed NSCP within ten (10) calendar days upon receiving the submittal. If requested, additional copies may be submitted for review and comments by Native American Community governing body designated representative as approved by the Engineer. Native American Community governing body designated representative shall also review and comment the proposed NSCP within thirty (30) calendar days upon receiving the submittal. The contractor proposed NSCP shall include as minimum the following information applicable to the project area, location and conditions listed below:

(1) A list of Noxious and Invasive Species and other Roadside Development approved plant species that would be anticipated for control based on existing vegetation and the project biotic communities. The weed species shall include but not be limited to the TABLE **– I** listed below**:**

TABLE – I	
Scientific Name	**Common Name**
Baccharis sarothroides	Desertbroom **/** Greasewood **/** Broom Baccharis **/** Rosin Bush
Brassica tournefortii	Sahara Mustard **/** Mediterranean Mustard **/** Prickly Turnip **/** Asian Mustard
Salsola kali subsp**.** *tragus* **(syn.** *Salsola iberica***)**	Russian Thistle **/** Tumbleweed

(2) The methods of control of noxious and invasive plant species including herbicide stump treatment shall be determined based on the species present within the project limits prior to earth moving activities as well as subsequent project construction phases before seeding. Pre**-**emergent herbicide shall NOT be applied to all project seeding areas. The contractor shall provide information **/** methods on how the application of herbicides will

NOT harm the expected desirable seed species germination and establishment as specified in Section 805 of these Special Provisions.

(3) The proposed method(s) of control and extermination treatment between herbicide versus manual**/**mechanical or in combination to be utilized for each anticipated plant species suitable for the specific stage of plant development.

(4) The herbicides, method and frequency of application, and rates to be used for each listed plant species.

(5) Copies of herbicide and surfactant labels and Safety Data Sheet (SDS) for all chemicals proposed for use.

(6) Procedure for collection, removal, containment, and disposal of noxious and invasive plants. All components of noxious and invasive plants such as roots, stems, leaves, flowers, seeds, seed heads, or seed pods shall be subject to collection, removal, containment, and disposal at no additional cost to the Department.

(7) Methods and procedures to be followed to protect existing, transplanted, and new emerging vegetation in seeded areas.

(8) Responsible Applicator and required Arizona Department of Agriculture Pest Management Division Licensing information, as specified in Section 806.

(9) Record procedures to be followed to document control work completed.

(10) Record procedures to be followed for reporting all chemicals used annually within transportation easements on BLM or USFS Lands within two (2) months or September 30th of each calendar year (whichever is sooner) to an ADOT construction PLA.

(11) Projects on transportation easements on BLM or USFS Lands shall include a completed Pesticide Use Proposal (PUP) form for all proposed herbicide uses prepared for submittal to the appropriate BLM Field Office or National Forest for approval. An example of a completed PUP for the project area will be provided to the contractor for use in preparing their PUP upon request to the ADOT construction PLA.

(12) Projects on transportation easements within Native Americans (Tribal) Land shall include a completed PUP form for all proposed herbicide uses prepared for submittal to the appropriate representative of tribal government (governing body) for approval. An example of a completed PUP for the project area will be provided to the contractor for use in preparing their PUP upon request to the ADOT construction PLA.

(13) When applicable, other information and explanations are required in the PUP or to implement the NSCP.

(14) Process to be used for amending the NSCP to add additional plants or treatments that may be required as the project progresses.

(15) A copy of the original Special Provisions for Control of Noxious Plants that the contractor bid on shall be attached to the NSCP.

(16) Plans and methods to protect Threatened and Endangered Species in accordance with the Environmental Mitigations section of the contract documents.

(17) Plans and methods for controlling of noxious**/**invasive plants in riparian and aquatic areas:

I – Prevention of herbicide drifted by wind onto non-target native plants or nearby wetlands**/**watercourses by using low pressure systems and coarse-spray nozzles.

II – Safe and effective use of herbicide chemicals labeled for the vicinity of wetlands**/**watercourses in prevention of water quality contamination.

The NSCP submitted to the Engineer shall not be implemented until it is approved by an ADOT construction PLA, and the contractor is so directed by the Engineer.

The contractor shall keep a copy of the approved NSCP and furnish the Engineer a copy of the approved NSCP for record keeping. The NSCP copy of the contractor and Engineer shall be maintained up to date with the contractor providing submittals of completed work activities within five (5) working days following completion of the work for each area directed by the Engineer for control. The NSCP shall be maintained up to date with submittals of the above completed NSCP information for the duration of the project.

The Engineer in consultation with an ADOT construction PLA shall designate**/**approve the location of the areas to be treated, and when required the frequency of treatment as per the NSCP. Payment will be made for the initial treatment of each area, whether with manual **/** mechanical methods or using herbicides, and for each subsequent treatment ordered and approved by the Engineer.

The contractor shall document the location and size of the project treatment areas, as well as noxious and invasive plant species that have been treated by the end of each working day. Furthermore, the contractor shall mark up the project layout plans (engineering drawings) with location and size of the project treatment areas, as well as noxious and invasive plant species that have been treated. Such documentation shall be submitted to an ADOT construction PLA for inspection**/**evaluation through the Engineer.

The contractor shall begin control of the designated areas within ten (10) working days of the Engineer’s notice and complete the treatment within fifteen (15) working days of the notice approved by the Engineer.

If other plant species listed in the Arizona Noxious Weed List, the Forest Service Regional**/**BLM lists, or the ADOT Invasive and Noxious Plant Species Lists (available electronically at the following Roadside Development web address**:**

https://apps.azdot.gov/files/roadway-engineering/roadside-dev/adot-invasive-noxious-plant-species-list-for-construction-projects.pdf) occur within the project area that are not included in the NSCP, the contractor shall modify the Noxious Species Control Plan to add such species, including acceptable control measures and where applicable a PUP, and submit this information as an amendment of the NSCP to the Engineer and ADOT construction PLA for acceptance. No herbicide Control of Noxious Plants work shall be commenced on Federal lands until the PUP has been entirely completed and approved.

The project areas will be surveyed by an ADOT construction PLA, with the approval of the Engineer, prior to earthmoving activities and following rainfall events and during plant germination and growth periods for listed noxious and invasive plant species. To update NSCP, the contractor shall also furnish field inspection**/**observation reports for new growth of noxious**/**invasive plant species between four (4) weeks to six (6) weeks after each rainfall event of 0**.**5 inches (**≥** 12**.**7 mm) or more. When surveys determine that noxious, invasive, or other designated plants species listed in the NSCP for control are found to be present within the project right-of-way, the contractor shall treat the areas designated by the Engineer in accordance with the approved NSCP. Such treatments shall be completed and approved by the Engineer before ground disturbing or earthmoving activities occur from those areas.

The contractor shall mark those areas receiving manual **/** mechanical control with an application of a photosensitive dye. Herbicides shall be mixed with a photosensitive dye which will produce a contrasting color when sprayed upon the ground. The color shall disappear between three (3) and five (5) days after being applied. The dye shall not stain any surfaces nor injure non-target plant or animal species when applied at the manufacturer's recommended application rate.

Application of herbicide shall be in accordance with the manufacturer's instructions and the approved NSCP. Responsible herbicide applicators shall be licensed under the appropriate category as required by State Law.

Mowing shall be allowed if it is proven to be a successful permanent control method of annual noxious **/** invasive plant species as approved by the Engineer. If approved, mowing shall be performed before the annual noxious **/** invasive plant species are able to set seed. Mowing shall NOT be operated in areas where there are perennial noxious **/** invasive plant species. Mowing shall NOT be utilized for noxious **/** invasive plant species that carry existing seeds **(**seed heads **/** pods**)**. All project areas and plant species to be mowed shall be carefully evaluated **/** identified by an ADOT construction PLA with approval from the Engineer.

Unless otherwise called out in the plans**/**details specified in these Special Provisions, or as directed by the Engineer, the contractor shall remove the identified noxious **/** invasive woody vegetation to the finished grade level without uprooting it (flush cutting). In order to stop stump regrowth, the applicable remaining stumps shall be promptly treated with suitable herbicide so the identified noxious **/** invasive woody vegetation will not sprout new growth from the stumps. Herbicide stump treatment shall NOT be conducted to plant species such as common evergreen coniferous shrubs and trees, which will unlikely generate stump regrowth. Manual **/** mechanical removal of remaining woody vegetation stumps and rootballs in erosive areas

shall be avoided to maximum extent practicable (MEP). The removal method and process shall be evaluated by an ADOT construction PLA with approval from the Engineer.

Removal of soil seed bank that has been contaminated by the natural storage of seeds from noxious **/** invasive plant species shall be required for projects involving soil **/** ground disturbance from construction excavations or as designated by the Engineer. The contractor shall remove the top three **(**3**)** inches of the existing undisturbed surface soil from the project areas infested with noxious **/** invasive plant species as evaluated **/** identified by an ADOT construction PLA with approval from the Engineer. All removed contaminated soil seed bank shall be properly disposed of or placed (buried) below the top two feet **(**2**'-**0**")** of the final finished grade as directed by the Engineer. The removal, stockpile, burial, or disposal of contaminated soil seed banks shall be well contained **/** concealed during construction. The contractor shall then return all soil-seed-bank removal disturbed areas, to an acceptable surface condition **(**finished grade**)**, as approved by the Engineer.

No earthmoving activities to the treated areas shall be approved until the employed weed management measures have been inspected to be successfully achieved with the approval of the Engineer.

For projects within transportation easements on BLM, USFS, or Tribal Lands, PUPs shall be prepared and submitted to the Engineer and ADOT construction PLA as required in the NSCP. The PUPs will be submitted by the Department to the appropriate BLM Field Office, National Forest, or appropriate representative of tribal government (governing body) and must be approved by the BLM, National Forest, or tribal government (governing body) before being approved by the Engineer.

The contractor shall keep records of all herbicide applications. A copy of this record shall be added to the NSCP and also submitted to the Engineer after each application. The contractor shall be responsible for the proper transport, storage, and application of all materials necessary for herbicide control treatments.

As a part of the integrated management approach, all areas to be treated for noxious and invasive plant species shall ultimately be seeded, landscaped, or permanently stabilized to minimize and prevent weed re-invasion **/** re-infestation, as specified in these Special Provisions.

Method of Measurement:

Control of noxious and invasive plant species, either manually **(**mechanically**)** or with herbicides, will be measured by the square yard (SQ**.**YD**.**) of each treated area, as directed and approved by the Engineer.

Basis of Payment:

Listed bid quantities for CONTROL OF NOXIOUS PLANTS are for estimating and bidding purposes. They shall not be guaranteed to the contractor. The intensity for scope of work, project-specific present conditions, particular stages of noxious and invasive plant

development, as well as annual rainfall patterns shall be considered **/** evaluated by the construction PLA and approved by the Engineer in determining final quantities and unit costs to be paid for.

During pre-construction meeting, the contractor in conjunction with Engineer shall verify and be in agreement with the quantity of areas to be treated as evaluated by an ADOT construction PLA. The quantity of areas to be treated shall be in compliance with environmental requirements.

The accepted quantities of control of noxious and invasive plant species, either manually **(**mechanically**)** or with herbicides measured as provided above, will be paid for at the contract unit price for each soil treatment directed and approved by the Engineer. Such price will be considered to include all labor, materials, equipment, and multiple mobilization costs required to complete the work as specified herein. Such price shall also cover collection, removal, containment, and disposal of noxious and invasive plant species. Up to four (4) mobilizations may be required to accomplish control of noxious and invasive plant species as specified herein. The Department will consider the cost of such multiple mobilizations to be included in the price bid for control of noxious and invasive plant species. Adjustments may be made to the contract through negotiation for more than four (**>** 4) mobilization activities as per the approval of the Engineer.

No measurement or payment will be made for treatment of those areas, manually **/** mechanically or with herbicides, not authorized and approved by the Engineer. No payment will be made for treatment areas not in compliance with the approved PUP**/**NSCP. No payment will be made for areas treated by herbicide products not in compliance with the approved PUP**/**NSCP. No measurement or payment will be made for the removal and proper disposal of waste materials; the cost being considered is included in contract items.

No measurement or payment will be made for preparation of the NSCP and, when applicable, the PUP, including the initial submittal and modifications, or for monitoring, the costs being considered are included in contract items.

No separate measurement or direct payment will be made for Control of Noxious Plants under Landscape Establishment as specified in Section 807 of the specifications and these Special Provisions; the cost being considered is included in the respective contract item of Landscape Establishment.

For projects engaging extensive excavations**/**backfills, no separate measurement or direct payment will be made for the removal, stockpile, burial, or disposal of contaminated soil seed banks, as well as returning all soil-seed-bank removal areas to an acceptable surface condition (finished grade); the cost being considered is included in the respective contract item(s) of excavations**/**backfills.

(925SRVY, 08/16/19)

SECTION 925 CONSTRUCTION SURVEYING AND LAYOUT:

925-5 Basis of Payment: the second 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

(928LONG, 09/16/21)

SECTION 928 GROUND-IN RUMBLE STRIP: the title and text of the Standard Specifications are revised to read:

SECTION 928 LONGITUDINAL GROUND-IN RUMBLE STRIP:

928-1 Description:

The work under this item shall include furnishing all tools, equipment and labor necessary to install longitudinal ground-in rumble strips of the size and at the locations specified on the project plans or as directed by the Engineer.

928-2 Blank:

928-3 Construction Requirements:

Longitudinal ground-in rumble strips shall be constructed by mechanically milling or grinding grooves into new or existing asphalt concrete pavements. The grooves shall be constructed with a cylindrical configuration in the direction of the traffic flow, and shall be placed in accordance with the details shown on the project plans. Exceptions in longitudinal ground-in rumble strips not shown on the plans will be designated by the Engineer.

The grooves shall be constructed with equipment specifically designed to remove such material by means of grinding to a controlled line and grade. The equipment used shall be capable of removing the existing asphaltic concrete to the dimensions and tolerances specified on the plans. The removals shall be accomplished in a manner which does not scar the surface of the adjacent pavement. Grooves shall not be constructed in new asphaltic concrete pavements for a minimum of three days after placement, or 10 days after placement of new asphaltic concrete pavements with asphalt-rubber. Construction of the grooves may be allowed in less time if the contractor can demonstrate that the pavements are sufficiently cured.

The contractor shall place a continuous control line as a guide for installation. The milling machine shall also be equipped with an approved guide that is clearly visible to the operator so that proper alignment of the grooves will be obtained. Lateral deviation of the milled rumble strips shall not exceed one inch in any 100 foot interval.

The contractor shall also use high pressure air to remove any millings and debris remaining after the use of the equipment's vacuum recovery system. Such debris shall be removed to the shoulder and disposed of in a manner approved by the engineer.

928-4 Method of Measurement:

Longitudinal ground-in rumble strips will be measured by linear foot at the locations shown in the project plans and in accordance with the specifications.

Gaps in the pattern and exceptions in the longitudinal ground-in rumble strips will not be included in the measurement.

No measurement will be made for the removal and disposal of milling and debris.

928-5 Basis of Payment:

The accepted quantities of longitudinal ground-in rumble strips, measured as provided above, will be paid for at the contract unit price per linear foot, which price shall be full compensation for the work complete in place as shown on the project plans and as specified herein.

No additional payment will be made for the removal and disposal of milling and debris, the cost being considered as included in the price of the contract item.

(929MSEW, 07/18/24)

SECTION 929 MECHANICALLY STABILIZED EARTH (MSE) WALLS: of the Standard Specifications is modified to add:

929-1 Description:

929-1.01 General:

The work under this section consists of designing, furnishing all materials and constructing Mechanically Stabilized Earth (MSE) retaining walls in accordance with these specifications

and in compliance with the lines and grades, dimensions and details shown on the project plans and as directed by the Engineer.

The contractor shall provide the MSE wall designer with a complete set of project plans and specifications and shall ensure that the wall design is compatible with all other project features that can impact the design and construction of the wall.

The terms used in this specification for identification of various entities responsible for MSE Wall designs are defined in table 929-1:

TABLE 929-1

Term	Entity Responsibilities
Wall Manufacturer/Supplier	The entity contractually retained by the contractor to provide materials and construction support services for an accepted MSE wall system as identified in Subsection 929-1.03.
Wall Designer	The entity contractually retained by the contractor to provide internal design of an accepted MSE wall system as identified in Subsection 929-1.03. The Wall Designer is also responsible for evaluating certain aspects of external stability as discussed herein using the geotechnical information provided by the Geotechnical Engineer. The Wall Designer may be a representative of the Wall Manufacturer/Supplier. Internal design includes evaluation of compound stability, which is defined as a failure mode passing through the reinforced soil mass and the retained fill and/or foundation. Geotechnical properties for the retained fill and foundation are to be obtained from the Geotechnical Engineer. The aspects of external stability as discussed below for Geotechnical Engineer that are the responsibility of the Wall Designer to evaluate are as follows: (1) Verify the bearing pressures do not exceed the bearing resistance of the foundation soils shown on the bearing resistance charts provided by the Geotechnical Engineer. (2) Estimate the settlements along the length of the accepted MSE wall system, as identified in Subsection 929-1.03, using the Service I limit state settlement curves shown on the bearing resistance charts provided by the Geotechnical Engineer.

TABLE 929-1	
Term	Entity Responsibilities
	(3) Evaluate limited eccentricity and sliding of the accepted MSE wall system, as identified in Subsection 929-1.03, using the geotechnical properties for the retained fill and foundation material provided by the Geotechnical Engineer.
Geotechnical Engineer	The entity responsible to evaluate or provide geotechnical information needed for the Wall Designer to evaluate certain aspects of external stability of the accepted MSE wall system as identified in Subsection 929-1.03. External stability includes the analysis of: 1. Bearing Capacity 2. Settlement (short term and post construction) 3. Limited Eccentricity 4. Sliding 5. Global slope stability The bearing capacity and settlement (short term) shall be evaluated by the Geotechnical Engineer and provided to the Wall Designer in the form of a bearing resistance chart developed in accordance with ADOT SF-1 (2010) Memorandum (3). Bearing resistance charts shall be developed for each boring advanced along the length of the proposed MSE walls. Long-term settlements (post construction) shall be evaluated by the Geotechnical Engineer and provided to the Wall Designer so that the Wall Designer can account for such settlements in their design. Geotechnical properties of the retained fill and foundation material shall be provided by the Geotechnical Engineer to the Wall Designer to allow the Wall Designer to evaluate limited eccentricity and sliding of the accepted MSE wall system, as identified in Subsection 929-1.03.
Notes: (1) For design build (DB)/ CMAR/ P3 projects, both the Wall Designer and Geotechnical Engineer shall be contractually retained by the contractor to provide the responsibilities defined herein. (2) The geotechnical properties for the retained fill provided by the Geotechnical Engineer to the Wall Designer are minimum properties based on global stability	

TABLE 929-1	
Term	Entity Responsibilities
analysis performed by the Geotechnical Engineer, and the Wall Designer may elect to use material exceeding those minimum property values for design. In such case, the geotechnical properties used by the Wall Designer exceeding those provided by the Geotechnical Engineer shall become the required geotechnical properties for the retained fill during construction. (3) ADOT SF-1 (2010): Development of Factored Bearing Resistance Chart by a Geotechnical Engineer for Use by a Bridge Engineer to Size Spread Footings on Soils for Service and Strength Limit States Based on Load and Resistance Factor Design (LRFD) Methodology, Memorandum from N. H. Wetz and J. D. Wilson to J. Lawson, Dated March 19, 2008 (Revision 1).	

929-1.02 Certifications:

(A) Certification of Review of Geotechnical Report(s):

The contractor shall be responsible to review all available geotechnical investigation reports, and the contractor's signature on the proposal form shall certify that this review has been performed and that this specification and any relevant geotechnical information has been provided to the firms designing and supplying the MSE wall.

The geotechnical investigation reports are available on the Contracts and Specifications Section current advertisement website.

(B) Certification of Design Parameters:

See Subsection 929-2.01 herein specified.

(C) Certification of Materials:

See Subsections 929-3.04, 929-3.06 and 929-3.09 herein specified.

929-1.03 Accepted Systems:

The contractor shall select one of the appropriate ADOT pre-approved earth retaining systems to be constructed for the MSE walls designated on the plans.

Pre-approved systems are listed on the ADOT Bridge Group website:

https://azdot.gov/business/engineering-and-construction/bridge/guidelines/geotech-services

The features of the system(s) furnished, including design and configuration of precast elements, fasteners, connections, soil reinforcements, joint fillers, geotextile filter, and other necessary components shall be those that meet the requirements of Subsection 929-2.

Heights and lengths of earth retaining MSE walls may vary from, but shall not be less than, those shown on the plans. The height and length to be used for any system shall be the minimum for that system that will effectively retain the earth behind the wall for the loading conditions and the contours, profile, or slope lines shown on the plans, in accordance with all relevant internal and external stability design criteria.

929-1.04 Unlisted Systems Acceptance Process:

If the contractor elects to use an earth retaining systems not listed on the ADOT Bridge Group website, the approval process for such systems is as follows:

(1) No consideration will be given to a request for approval of an unlisted system prior to contract award. After award, and in time to allow for consideration without delaying work, the contractor shall submit a written request for approval of a new system.

(2) If the contractor wishes to propose multiple systems, separate written requests shall be submitted for each system. All requests must be received within the timeframes specified herein.

(3) The contractor's progress schedule shall indicate when the proposed system is to be used on the project. The schedule shall include time for the Department to evaluate the proposed system and shall demonstrate that there will be no impacts to the critical path. If, in the opinion of the Engineer, the schedule shows that the evaluation and approval timeframe of the proposed system is not reasonable, the Department will not consider the proposed system.

(4) A request for the use of an unlisted system shall include all information necessary to determine that a system is an equal, including samples for testing, if required. Unlisted systems will not be entertained as Value Engineering (VE) Proposals.

(5) The Department will evaluate the information submitted, perform tests when necessary and make comparisons. The Engineer will then make the final decision as to whether the proposed system is an equal. The Department will neither be liable for any delay in acting upon any request nor for any failure to approve a request pursuant to the use of an unlisted system.

(6) The Department will review the contractor's request for the use of an unlisted system within 45 days of the contractor's submittal and inform the contractor in writing if the request is rejected, approved, or if the Department will take additional time for evaluation. Any additional information needed to evaluate the proposed system shall be submitted in a timely manner. Untimely submittals of additional information shall result in rejection of the proposed system.

(7) The contractor shall not be entitled to additional compensation or an extension of contract time resulting from the Department's acceptance or rejection of a proposed system. Bid prices shall not to be based on the anticipated approval of a proposed system.

929-1.05 Manufacturer's Field Representative:

The manufacturer's field representative performing the work described in this specification shall have, in the past three years, successfully installed at least four MSE retaining walls of heights, lengths and complexity similar to those shown on the plans and meeting the tolerances specified herein. The manufacturer's field representative may make field changes subject to the approval of the Engineer. Any such changes shall be documented in writing within 24 hours of the approved changes. This written document shall be sealed by the manufacturer's design engineer, who is registered as a Civil Engineer in the State of Arizona.

929-1.06 MSE Pre-Activity Meeting:

A pre-activity meeting will be scheduled prior to commencement of MSE wall construction activity. As a minimum, this meeting shall be attended by the Engineer, contractor (including wall construction crew chiefs), the MSE wall sub-contractor, MSE wall manufacturer's and MSE Wall designer's representatives. No wall construction activity shall be performed until the contractor's final submittals have been approved as having satisfactorily resolved all review comments and the pre-activity meeting has been held.

929-1.07 Wall Aesthetics:

Wall aesthetics shall be as specified in the project plans and special provisions.

929-2 Submittals (Working Drawings and Design):

929-2.01 Submittals:

The submittals required shall include working drawings, construction procedures, supporting design calculations, verification of experience, and a transmittal letter. The transmittal letter shall only list the documents included in the submittal. No technical information shall be included in the transmittal letter.

Working drawings and calculations shall be signed and sealed by a Professional Engineer, who is registered as a Civil Engineer in the State of Arizona. The MSE wall designer/supplier shall document on the working drawings all assumptions made in the design. The following statement shall be included near the P.E. seal on the first sheet of the working drawings: "All design assumptions are validated through notes or details on these drawings".

Working drawings, design calculations, and MSE wall supplier's construction procedures modified as necessary by the contractor and wall designer for site-specific conditions shall be submitted to the Engineer for review. The Engineer shall have 15 calendar days after receiving the submittal to finish a review. The revised package shall be resubmitted to the

Engineer for review. The Engineer shall have 5 calendar days to complete this review. This review process shall be repeated until the entire submittal is accepted by the Engineer.

The Department assumes no responsibility for errors or omissions in the working drawings. Acceptance of the final working drawings submitted by the contractor shall not relieve the contractor of any responsibility under the contract for the successful completion of the work.

Construction of the wall shall not commence until the contractor receives a written Notification to Proceed (NTP) from the Engineer. The NTP will be issued once the complete wall package (drawings, calculations, and construction procedures) is accepted. Fabrication of any of the wall components before the NTP shall be at the sole risk of the contractor.

929-2.02 Working Drawings:

The contractor shall submit complete working drawings and specifications for each installation of the system in accordance with the requirements of Subsection 105.03 as modified herein.

Working drawings shall include the following at a minimum:

(1) Layout of the wall including plan and elevation views;

(2) All design parameters and assumptions including design life;

(3) Existing ground elevations and utilities impacted by the wall shall be field verified by the contractor for each location;

(4) Complete details of all elements and component parts required for the proper construction of the system at each location and any required accommodations for drainage systems, foundation subgrades or other facilities shown on the contract documents;

(5) The working drawing submittal shall clearly detail any special design requirements. These special design requirements may include, but are not limited to; structural frames to place reinforcements around obstructions such as deep foundations and storm drain crossings, drainage systems within the reinforced backfill, placement sequence of drainage and unit core fill with respect to reinforced (structure) fill behind a wall face using modular block facing units, guardrail post installation, scour protection, foundation subgrade modification, all corner details (acute, obtuse and 90 degrees), slip joints, connection details of MSE walls with other cast-in-place structures, wedges, shims and other devices such as clamps and bracing to establish and maintain vertical and horizontal wall facing alignments;

(6) A complete listing of components and materials specifications; and

(7) Other site-specific or project specific information required by the contract.

929-2.03 MSE Wall Design:

(A) General:

The working drawings shall be supplemented with all design calculations for the particular installation as required herein.

The proposed design shall satisfy the design parameters shown on the project plans and listed in these specifications, and comply with the design requirements of the following documents:

- FHWA (2009), “Design and Construction of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes; Publication No. FHWA-NHI-10-024 and FHWA-NHI-10-025; Authors: Berg, R. R., Christopher, B. R., and Samtani, N. C.

- AASHTO (2017), “AASHTO LRFD Bridge Design Specifications”, 8th Edition, including latest Interims.

All references made to AASHTO (2017) herein shall mean “AASHTO LRFD Bridge Design Specifications”, 8th Edition, including latest Interims.

Maximum reinforcement loads shall be calculated using the “Simplified Method” as presented in AASHTO (2017) and as per the requirements specified herein. No other design method will be allowed.

Sample analyses and hand-calculations shall be submitted, if requested by the Engineer, to verify the output from software used by the MSE wall designer. Sample analyses and hand calculations shall be required for complex walls having geometries and loading conditions that are not readily amenable to computer analysis. Failure modes, including circular, non-circular, and multi-part wedge shall be analyzed for compound stability to verify the most critical failure case (slip surface with lowest factor of safety) within each section of the wall where the length of the reinforcement changes. For compound stability, all potential slip surfaces for each failure mode passing through all Three Search Zones shown in Appendix D of these Special Provisions shall be analyzed to determine the most critical failure case. Each failure mode shall be analyzed individually and not be forced to mimic the results of other failure modes. The compound stability analyses are required for all wall geometries including walls with level ground in front of wall and level backfill behind wall. Global stability requirements are contained in the MSE wall design summary plan sheet.

The contractor and wall designer shall identify the specific locations on working drawing plan and profiles based on subgrade evaluation and at other key locations to control the deformation along the wall. The soil reinforcement attached to the slip joints shall be oriented perpendicular to the slip joint panels and shall be the full design length. Special connection and compaction details shall be provided on the working drawings.

At all corners formed by two MSE walls, the leveling pad along the shorter wall forming the corner shall be at the same elevation as the leveling pad for the taller wall for a distance of at least 80 percent of the height of the taller wall or a distance of 10 feet, whichever is greater.

Unless otherwise specified in the contract, all structures shall be designed to conform to the requirements shown in Table 929-2 and other requirements specified herein.

TABLE 929-2
DESIGN PARAMETERS

Description	Limit State	Value	Note
1. Design Life	All limit states	75 Years	
2. Effective (Drained) Friction Angle			
a. Retained Backfill	All limit states	(Project specific as detailed in the MSE wall design summary sheet)	1
b. Reinforced Backfill	All limit states	34^o ,110 pcf	1
3. Length of soil reinforcement, B	All limit states	0.7H min or 8-ft whichever is more	2
4. Limiting eccentricity	Strength (all)	B/3 (soil), 0.45B (rock)	
	Service I	B/6 (soil), B/4 (rock)	
5. Coefficient of Sliding Friction	Strength (all)	$\tan[\min(\phi_r, \phi_f, \phi_i)]$	3
6. Resistance factors			
a. Sliding	Strength (all)	1.0	4
b. Bearing	Strength (all)	0.65	5
c. Overall (slope) stability			
I. Deep Seated Stability	Service I	0.65	6
II. Compound Stability	Service I	0.65	6
d. Pullout resistance			
I. Static	Strength (all)	0.90	7
II. Combined static/earthquake	Strength (all)	1.20	7
e. Tensile resistance of metallic reinforcements and connectors			
I. Static - Strip reinforcement - Grid reinforcement	 Strength (all) Strength (all)	 0.75 0.65	 8 8,9
II. Combined static/earthquake - Strip reinforcement - Grid reinforcement	 Strength (all) Strength (all)	 1.00 0.85	 8 8,9
f. Tensile resistance of geosynthetic			

TABLE 929-2			
DESIGN PARAMETERS			
Description	**Limit State**	**Value**	**Note**
reinforcements and connectors			
I. Static	Strength (all)	0.90	
II. Combined static/earthquake	Strength (all)	1.20	

Notes:

1	Retained backfill requirements shall be project specific as noted on the MSE wall summary plan sheet developed by the Geotechnical Engineer.
2	H is the design height of the wall and is defined as the difference in elevation between the finished grade at top of wall and the top of leveling pad. The top of the leveling pad shall always be below the minimum embedment reference line as indicated on the plans for that location. The length of the soil reinforcement, B, is measured from the backface of the wall facing unit. In case of grid type reinforcements the length of the soil reinforcement is measured from the backface of the wall to the last full transverse member. For modular block facing units, the total length of the reinforcement, BT, as measured from the front face of the wall is the length B as defined above plus the width of the modular block unit (the horizontal dimension of the block unit measured perpendicular to the wall face). Depending on the configuration of the reinforcements and properties of the various actual fills selected by the contractor, the minimum length of the reinforcement may need to be increased to satisfy the required resistance factors for compound stability analyses.
3	ϕ_r= friction angle of reinforced wall fill. ϕ_f = friction angle of foundation soil (As reported on the MSE wall design summary plan sheet). ϕ_I = friction angle of the interface between reinforcement and soil for cases of sheet reinforcement such as geotextiles. All friction angles are effective (drained) friction angles. Refer to the MSE wall design summary plan sheet for friction angle and unit weight of foundation soil.
4	Passive resistance shall not be considered in evaluation of sliding resistance.
5	For all limit states, the design loading for the MSE retaining wall system shall not exceed the factored general and local bearing resistances specified in the Geotechnical Report(s).
6	For earthquake loading condition, a resistance factor of 0.90 shall be used.
7	Live load due to vehicular traffic shall be included in the computations to determine the maximum tensile forces in reinforcement layers, but shall be neglected in the computations for pullout resistance. Intensity of live load shall be considered as a uniform surcharge using the equivalent height of soil in accordance with Section Article 3.11.6.4 of AASHTO (2017).
8	Apply to gross cross-section less sacrificial area. For sections with holes, reduce gross area in accordance with Article 6.8.3 of AASHTO (2017) and apply to net section less sacrificial area.

TABLE 929-2				
DESIGN PARAMETERS				
	Description	**Limit State**	**Value**	**Note**
9	Applies to grid reinforcements connected to a rigid facing element, e.g., a concrete panel or block. For grid reinforcements connected to a flexible facing mat or which are continuous with the facing mat, use the resistance factor for strip reinforcements.			
10	Unless otherwise specified, all resistance factors shall be taken as 1.0 when investigating an extreme event limit state.			

(B) Subsurface Drainage Systems:

Walls shall be provided with subsurface drainage measures as shown on the project plans and specifications. As a minimum, an underdrain system shall be provided for leading subsurface and surface water away from the backfill and outside the limits of the wall. Geocomposite drains, if used for subsurface drainage, shall be in accordance with Subsection 203-5.02 and 203-5.03(C) of the specifications.

The Wall Designer is responsible for drainage measures within the reinforced backfill. Drainage measures outside the MSE wall backfill shall be designed by the project civil designer.

(C) Obstructions in Backfill:

(1) General:

Where obstructions, such as deep foundations or storm drains crossings, are located in the reinforced backfill zone, cutting of reinforcements to avoid obstructions shall not be permitted. A minimum offset of one diameter but not less than 3 feet shall be maintained between the face of any pipe crossings and the back face of MSE retaining wall panels. A minimum clearance of 3 feet shall be maintained between the face of any other obstruction and the back face of MSE retaining wall panels.

(2) Horizontal Deflection of Reinforcements:

In the horizontal plane at a reinforcing level, a deviation up to 15 degrees from normal to the face of the wall may be allowed for strip reinforcement and bolted connection. This deviation is herein referred to as the splay angle. Grid reinforcements may not be splayed, unless connection has been specifically fabricated to accommodate a splay and connection detail has been approved by the Department. If used, the splay in grid reinforcements is limited to five degrees. For obstructions that cannot be accommodated with splayed reinforcement, structural frames and connections shall be required, and shall be designed in accordance with Section 10 (“Steel Structures”) of AASHTO (2017) for the maximum tension in the reinforcements. The structural frame design shall be such that bending moments are not

generated in the soil reinforcement or the connection at the wall face. The design, along with supporting calculations, shall be included in the working drawings.

(3) Vertical Deflection of Reinforcements:

Vertical deflection of the reinforcement to avoid obstructions such as utilities along the wall face shall be limited to a maximum of 15 degrees from normal to face of wall. Bends in the reinforcement shall be smooth and gradual to ensure that galvanization remains intact.

(D) Hydrostatic Pressures:

As determined by the Engineer and/or as noted on the plans, for walls potentially subject to inundation, such as those located adjacent to rivers, canals, detention basins or retention basins, a minimum hydrostatic pressure equal to three feet shall be applied at the high-water level for the design flood event. Effective unit weights shall be used in the calculations for internal and external stability beginning at levels just below the equivalent surface of the pressure head line. Where the wall is influenced by water fluctuations, the wall shall be designed for rapid drawdown conditions which could result in differential hydrostatic pressure greater than 3 feet. As an alternative to designing for rapid drawdown conditions, Size 57 coarse aggregate, as specified in AASHTO M 43, shall be provided as reinforced backfill for the full length of the wall and to the maximum height of submergence of the wall. Separation fabric shall be class I needle-punched polypropylene non-woven geotextile with the highest permittivity shown in AASHTO M 288. The fabric shall be provided at the interface of the Size 57 coarse aggregate and reinforced backfill above it, and at the interface of the retained backfill behind it. Adjoining sections of separation fabric shall be overlapped by a minimum of 12 inches.

(E) Acute Angle Corners:

Wall corners with an included angle of less than 70 degrees shall be designed for bin-type lateral pressures for the extent of the wall where the full length of the reinforcement cannot be installed without encountering a wall face. Acute angle corner structures shall not be stand-alone separate structures. Computations shall be provided that demonstrate deformation compatibility between the acute angle corner structure and the rest of the MSE wall. Full-height vertical slip joints shall be provided at the acute angle corner and after the last column of panels where full length of the reinforcements can be placed. The soil reinforcement attached to the slip joints shall be oriented perpendicular to the slip joint panels and shall be the full design length. Special connection and compaction details shall be provided on the working drawings.

(F) Slip Joints:

For walls with precast concrete panels, vertical slip joints shall be included in the wall face at the following locations and as shown on the plans, whichever is more stringent:

(1) Boundaries of limits where differential settlement exceeds 1/100.

(2) All locations where a wall height changes by more than 5 feet.

(3) All corners within an MSE wall.

(4) Each side of a stiff element such as a reinforced concrete box culvert (RCBC), abutment wing walls, or any other wall face penetration larger than 5 feet.

(5) Each side of a drilled shaft foundation constructed prior to and within 8 feet of the face of wall. Approximate locations of slip joints are shown on the project plans.

(G) Spacing of Metallic Reinforcement for Flexible Face Wall Systems:

For permanent walls, vertical and horizontal spacing of metallic reinforcements for flexible face (welded wire or similar) wall systems shall not exceed 18 inches. The stiffness of the facing and spacing of reinforcements shall be such that the maximum local deformation between soil reinforcement layers shall be limited to less than 1½ inches. Facing elements shall not yield in bending and tension.

For temporary walls, i.e., walls with less than 36 months service life, the contractor may adjust the stiffness of the facing and spacing of the reinforcements such that the local deformation between the reinforcement is within the elastic range in bending and tension, and the overall geometry meets the line and grade requirements for the temporary walls.

(H) Soil Reinforcement for Modular Block Wall (MBW) Systems:

The soil reinforcement lengths and percent coverage at a given reinforcement level shall be in accordance with the plans. All soil reinforcement shall be positively connected to the modular block facing units by a connection that is capable of resisting 100 percent of the maximum tension in the soil reinforcements at any level within the wall. Detailed documentation for connection strength shall be submitted as noted in Subsection 929-3.09. The vertical spacing of the soil reinforcement for walls with modular block facing units shall be as follows:

(1) The first (bottom) layer of soil reinforcement shall be no further than 16 inches above the top of the leveling pad.

(2) The last (top) layer of soil reinforcement shall be no further than 20 inches on the average below the top of the uppermost MBW unit.

(3) The maximum vertical spacing between layers of adjacent soil reinforcement shall not exceed 24 inches. For walls deriving any part of their connection capacity by friction the maximum vertical spacing of the reinforcement shall be limited to two times the block depth (front face to back face) to assure construction and long-term stability. The top row of reinforcement shall be placed at a depth no more than two times the block height from the top of finished grade.

(I) Initial Batter of Wall:

The initial batter of the wall, both during construction and upon completion, shall be within the vertical and horizontal alignment tolerances included in this specification. The initial batter of the wall at the start of construction and the means and methods necessary to achieve the batter shall be provided on the working drawings. Subject to Engineer's approval, the initial batter may be modified at the start of construction by the manufacturer's field representative based on the evaluation of the backfill material selected by the contractor. Any such changes shall be documented in writing within 24 hours of the approved changes. This written document shall be sealed by the manufacturer's design engineer who is registered as a Civil Engineer in the State of Arizona. Details of the wedges or shims or other devices, such as clamps and external bracing used to achieve or maintain the wall batter, shall be as shown on the working drawings and/or accompanying construction manual. Permanent shims shall comply with the design life criteria, and shall maintain the design stress levels required for the walls.

929-3 Material Requirements:

929-3.01 Precast Concrete Elements:

Precast concrete elements shall conform to the requirements for precast minor structures in Sections 601 and 1006. The concrete shall be Class S with minimum design strength of 4,000 pounds per square inch. The mix design shall conform to the requirements of Subsection 1006-3.

Prior to casting, all embedded components shall be set in place to the dimensions and tolerances designated in the plans and specifications. Rustication for wall aesthetics shall be in accordance with project plans, special provisions, and applicable requirements of Sections 601, 610, 1002 and 1006.

(A) Concrete Testing and Inspection:

Precast concrete elements shall be subjected to compressive strength testing in accordance with Subsection 1006-7, and inspected for surface conditions and dimensional tolerances in accordance with Subsections 601-3.05 and 601-4.02 respectively. Panels delivered to the site without the ADOT acceptance stamp will be rejected.

(B) Casting:

Precast concrete face panels shall be cast on a horizontal surface with the front face of the panel at the bottom of the form. Connection hardware shall be set in the rear face. The concrete in each precast concrete panel shall be placed without interruption and shall be consolidated by deploying an approved vibrator, supplemented by such hand tamping as may be necessary to force the concrete into the corner of the forms, and to eliminate the formation of stone pockets or cleavage planes. Form release agents as specified in Subsection 601-3.02(C)(1) shall be used on all form faces for all casting operations.

The contractor shall advise the Engineer of the starting date for concrete panel casting at least 14 calendar days prior to beginning the operation if the casting operation is within the State of Arizona, or 21 calendar days if the casting operation is outside the State of Arizona.

(C) Finish:

(1) Non-Exposed Surfaces:

Rear faces of precast concrete panels shall receive a Class I finish in accordance with Subsection 601-3.05.

(2) Exposed Surfaces:

The type of finish required on exposed surfaces shall be as shown in the plans.

(a) Exposed Aggregate Finish:

(i) Prior to placing concrete, a set retardant shall be applied to the casting forms in accordance with the manufacturer's instructions.

(ii) After removal from the forms and after the concrete has set sufficiently to prevent its dislodging, the aggregate shall be exposed by a combination of brushing and washing with clear water. The depth of exposure shall be between ⅜ inch and ½ inch.

(iii) An acrylic resin sealer consisting of 80 percent thinner and 20 percent acrylic solids by weight shall be applied to the exposed aggregate surface at a rate of 1 gallon per 250 square feet.

(b) Concrete Panel Finish:

Concrete panel finish shall be in accordance with Subsection 601-3.05.

(D) Tolerances:

Precast concrete elements shall comply with Subsection 601-4.02(B)(1) and 601-4.02(B)(4). Connection device placement shall be within ± ⅜ inch of the dimensions shown on the drawings. Panel squareness as determined by the difference between the two diagonals shall not exceed ½ inch.

(E) Identification and Markings:

The date of manufacture, the production lot number, and the piece mark shall be inscribed on a non-exposed surface of each element.

(F) Handling, Storage, and Shipping:

All panels shall be handled, stored, and shipped in such a manner to eliminate the dangers of chipping, discoloration, cracks, fractures, and excessive bending stresses. Panels in storage shall be supported in firm blocking to protect panel connection devices and the exposed exterior finish. Storing and shipping shall be in accordance with the manufacturer's recommendations.

(G) Compressive Strength:

Precast concrete elements shall not be shipped or placed in the wall until a compressive strength of 3,400 pounds per square inch has been attained. The facing elements shall be cast on a flat and level area and shall be fully supported until a compressive strength of 1,000 pounds per square inch has been attained.

(H) Precast Concrete Panel Joints:

(1) General:

Where the wall wraps around an inside corner, a corner block panel shall be provided with flange extensions that will allow for differential movement without exposing the panel joints. The back face of vertical and horizontal joints shall be covered with geotextile filter. Joint filler, bearing pads, and geotextile filter shall be as recommended by the wall manufacturer and shall meet the requirements shown on the approved working drawings.

If required, as indicated on the plans, flexible open-cell polyurethane foam strips shall be used for filler for vertical joints between panels, and in horizontal joints where pads are used.

All joints between panels on the back side of the wall shall be covered with a geotextile meeting the requirements for filtration applications as specified by AASHTO M 288. The minimum width shall be foot.

(2) Bearing Pads:

All horizontal and diagonal joints between panels shall include bearing pads. Bearing pads shall meet or exceed the following material requirements:

(a) Preformed EPDM (Ethylene Propylene Diene Monomer) rubber pads conforming to ASTM D2000 Grade 2, Type A, Class A with a Durometer Hardness of 70.

(b) Preformed HDPE (High Density Polyethylene) pads with a minimum density of 0.946 grams per cubic centimeter in accordance with ASTM D1505.

The stiffness (axial and lateral), size, and number of bearing pads shall be determined such that the final joint opening shall be ¾ inches within -1/8 inch unless otherwise shown on the plans. The MSE wall designer shall submit substantiating calculations verifying the stiffness (axial and lateral), size, and number of bearing pads assuming, as a minimum, a vertical

loading at a given joint equal to 2.5 times the weight of facing panels directly above that level. As part of the substantiating calculations, the MSE wall designer shall submit results of certified laboratory tests in the form of vertical load-vertical strain and vertical load-lateral strain curves for the specific bearing pads proposed by the MSE wall designer. The vertical load-vertical strain curve shall extend beyond the first yield point of the proposed bearing pad.

929-3.02 Steel Components:

Steel components shall conform to the applicable requirements of Sections 605 and 1003.

(A) Galvanization:

Soil reinforcement steel shall be hot-dip galvanized in accordance with AASHTO M 111 (ASTM A123). Connection hardware steel can be galvanized by hot-dipping or other means, provided the method satisfies the requirements of AASHTO M 111 (ASTM A123). A minimum galvanization coating of 2.0 oz./ft^2 (605 g/m^2) or 3.4 mils (85 µm) thickness is required. Soil reinforcement steel shall be adequately supported while lifting and placing such that the galvanization remains intact. Steel members with damaged (peeled) galvanization shall be repaired according to ASTM A780 and as specified in approved working drawings, at no additional cost to the Department.

(B) Metallic Reinforcing Strips and Tie Strips:

Reinforcing strips shall be hot-rolled from bars to the required shape and dimensions. The strips' physical and mechanical properties shall conform to the requirements of ASTM A572, Grade 65 minimum.

Tie strips shall be shop fabricated of hot-rolled steel conforming to the requirements of ASTM A1101, Grade 50 minimum. The minimum bending radius of the tie strips shall be ⅜ inch. Galvanization shall be applied after the strips are fabricated, inclusive of punch holes for bolts as shown on approved drawings.

(C) Metallic Reinforcing Mesh:

Reinforcing mesh shall be shop fabricated of cold-drawn steel wire conforming to the requirements of AASHTO M 32, and shall be welded into the finished mesh fabric in accordance with AASHTO M 55. Galvanization shall be applied after the mesh is fabricated. A minimum galvanization coating of 2.0 oz./ft^2 (605 g/m^2) or 3.4 mils (85 µm) thickness is required.

(D) Connector Pins:

Connector pins and mat bars shall be fabricated and connected to the soil reinforcement mats as shown in the approved working drawings. Connector bars shall be fabricated of cold drawn steel wire conforming to the requirements of AASHTO M 32.

(E) Welded Wire Fabric:

All welded wire fabric shall conform to the requirements of AASHTO M 32, AASHTO M 55, and the approved working drawings. Welded wire fabric shall be galvanized in conformance with the requirements of ASTM A123.

(F) Fasteners:

Connection hardware shall conform to the requirements shown in the approved working drawings. Connection hardware shall be cast in the precast concrete panels such that all connectors are in alignment and able to transfer full and even load to the soil reinforcement. Once the reinforcement is connected to the panel, the amount of slack shall not exceed ⅛ inch between the connector and the reinforcement during field installation. Fasteners shall be galvanized and conform to the requirements of AASHTO M 164 or equivalent.

929-3.03 Geosynthetic Reinforcement:

Geosynthetic soil reinforcement shall be limited to geosynthetics manufactured from polypropylene, high density polyethylene, and polyester. Geosynthetic reinforcement shall be evaluated through the AASHTO Product Evaluation & Audit Solutions (formerly NTPEP) REGEO (AASHTO Product Evaluation & Audit Solutions – Geosynthetic Reinforcements) for installation damage reduction factor RF_{ID} and creep reduction factor RF_{CR}. The geogrid shall be a regular network of integrally connected polymer tensile elements, with aperture geometry sufficient to permit significant mechanical interlock with the surrounding soil. Geogrid structure shall be dimensionally stable and able to retain its geometry under manufacture, transport, and installation. Geosynthetic reinforcements other than geogrids may be utilized if an independent evaluation has been performed through AASHTO Product Evaluation & Audit Solutions (formerly NTPEP) REGEO.

The nominal long-term tensile design strength (T-AL) of specific geosynthetic material shall meet or exceed the creep and durability reduction factors required by the wall manufacturer, as well as those required by AASHTO (2017). The wall designer may not select installation damage reduction factor RF_{ID} and creep reduction factor RF_{CR} to be less than the results obtained through the AASHTO Product Evaluation & Audit Solutions (formerly NTPEP) REGEO program.

929-3.04 Certificate of Analysis for Soil Reinforcements:

The contractor shall furnish the Engineer with a Certificate of Analysis conforming to the requirements of Subsection 106.05 for all materials.

For geosynthetics, the Certificate of Analysis shall verify that the supplied geosynthetic is the type approved by the Engineer and as measured in full accordance with all test methods and standards specified herein. The manufacturer’s certificate shall state that the furnished geosynthetics meet the requirements of the specifications, as evaluated by the AASHTO Product Evaluation & Audit Solutions (formerly NTPEP) REGEO program.

For metallic wall reinforcement, a mill test report containing the ultimate tensile strength for the soil reinforcement shall be included in the certification. For metallic wall reinforcement, a mill test report containing the galvanization coverage shall be included in the certification. For metallic mesh wall reinforcement, a mill test report containing the ultimate weld strength for the soil reinforcement shall be included in the certification.

929-3.05 Reinforced and Retained Backfill Material:

(A) General:

Reinforced backfill material shall be free of shale, organic matter, mica, gypsum, smectite, montmorillonite, or other soft poor durability particles. No salvaged material, such as asphaltic concrete millings or Portland Cement Concrete rubble, etc., will be allowed.

Retained backfill material shall be project specific as noted on the MSE wall summary plan sheet developed by the Geotechnical Engineer.

(B) Soundness:

The reinforced backfill material shall have a soundness loss of 30 percent or less when tested in accordance with AASHTO T 104 using a magnesium sulfate solution with test duration of four cycles. Alternatively, the material shall have a soundness loss of 15 percent or less when tested in accordance with AASHTO T 104 using a sodium sulfate solution with test duration of five cycles. Aggregate sources with recent testing data within the past year may submit previous testing results for soundness determination.

(C) Gradation and Fractured Coarse Aggregates:

Gradations will be determined by Arizona Test Method 201 and shall be in accordance with Table 929-3, unless otherwise specified.

Material retained on the #4 and larger sieves must have a minimum of 50 percent particles with two or more mechanically induced crushed faces when tested by Arizona Test Method 212.

Table 929-3
BACKFILL GRADATION REQUIREMENTS

Sieve Size	Percent Passing
1 ½ inch	100
1 inch	95-100
½ inch	25-60
No. 4	0 - 10
No. 8	0 - 5

(D) Separation Fabric:

A class I needle-punched polypropylene non-woven separation geotextile fabric, meeting the minimum requirements for filtration applications specified in AASHTO M 288 and Subsection 1014-4 shall encapsulate the rock backfill. Adjoining sections of separation fabric shall be overlapped by a minimum of 12 inches.

(E) Limits of Reinforced Backfill:

For all walls, except back-to-back walls, the reinforced backfill shall extend to at least 2 feet beyond the free end of the reinforcement. For back-to-back walls wherein the free ends of the reinforcement of the two walls are spaced apart less than or equal to one-half the design height of the taller wall, reinforced wall fill shall be used for the space between the free ends of the reinforcements as well. The design height of the wall is defined as the difference in elevation between the top of coping and the top of leveling pad. The top of the leveling pad shall always be below the minimum embedment reference line as indicated on the plans for the location under consideration.

929-3.06 Certificate of Analysis for Reinforced Backfill Materials:

At least three weeks prior to construction of the MSE wall, the contractor shall furnish the Engineer with an 80 pound representative sample of the reinforced backfill material, and a Certificate of Analysis conforming to the requirements of Subsection 106.05 certifying that the reinforced backfill material comply with the requirements specified herein. During construction, the reinforced backfill material shall be sampled and tested by the contractor for acceptance and quality control testing in accordance with the requirements stated in Table 929-4. A new sample and Certificate of Analysis shall be provided any time the reinforced backfill material changes as noted in Table 929-4.

Table 929-4
Sampling Frequency for Reinforced Backfill Material

Test	Frequency
Gradation (Arizona Test Method 201), Plasticity Index (AASHTO T 90) Fractured Coarse Aggregate Particles (ARIZ 212)	One per 500 CY At production facility

929-3.07 Cast-in-Place Concrete:

Cast-in-place concrete shall conform to the requirements of Sections 601 and 1006. Unless otherwise approved, all cast-in-place concrete shall be Class S with a minimum compressive strength of 4,000 pounds per square inch.

929-3.08 Modular Block (Segmental) Facing Units:

This section covers dry cast hollow and solid wet cast concrete masonry structural retaining wall units, machine made from Portland cement, water, and suitable mineral aggregates. The units are intended for use as facing units in the construction of mortarless, modular block

walls (MBW) also known as segmental retaining walls (SRW). Metallic or geosynthetic reinforcement specified in Section 929-3.02 and 929-3.03, respectively, may be used as soil reinforcement in the reinforced (structure) backfill zone.

(A) Casting:

Cementitious material in the modular block facing unit shall be Portland cement conforming to the requirements of ASTM C150. If fly ash is used it shall not exceed 20 percent by weight of the total cement content, and shall conform to ASTM C618. Aggregates used in concrete blocks shall conform to ASTM C33 for normal weight concrete aggregate. Efflorescence control agent shall be used in concrete mix design to prevent efflorescence on the block.

The contractor shall advise the Engineer of the starting date for concrete panel casting at least 14 calendar days prior to beginning the operation if the casting operation is within the State of Arizona, or 21 calendar days if the casting operation is outside the State of Arizona.

(B) Physical Requirements:

At the time of delivery to the work site, the modular block facing units shall conform to the following physical requirements:

(1) Minimum required compressive strength of 4,000 psi (average 3 coupons)

(2) Minimum required compressive strength of 3,500 psi (individual coupon)

(3) Minimum oven dry unit weight of 125 pcf

(4) Maximum water absorption of 5 percent after 24 hours

(5) Maximum number of blocks per lot of 2,000. Tests on blocks shall be submitted at the frequency of one set per lot.

Acceptance of the concrete block, with respect to compressive strength, water absorption and unit weight, will be determined on a lot basis. The lot shall be randomly sampled and tested in accordance with ASTM C140. As no additional expense to the Department, the manufacturer shall perform the tests at an ADOT approved laboratory and submit the results to the Engineer for approval. Compressive strength test specimens shall be cored or shall conform to the saw-cut coupon provisions of ASTM C140. Block lots represented by test coupons that do not reach an average compressive strength of 4,000 psi will be rejected.

(C) Freeze-Thaw Durability:

In areas above 3000 feet, where repeated freezing and thawing under saturated conditions occur, the units shall be tested to demonstrate freeze-thaw durability in accordance with Test Method ASTM C1262. Freeze-thaw durability shall be based on tests from five specimens made with the same materials, concrete mix design, manufacturing process, and curing

method, conducted not more than 18 months prior to delivery. Specimens used for absorption testing shall not subsequently be used for freeze-thaw testing. Specimens shall comply with either or both of the following acceptance criteria depending on the severity of the project location as determined by the Department:

(1) The weight loss of four out of five specimens at the conclusion of 150 cycles shall not exceed 1 percent of its initial weight when tested in water.

(2) The weight loss of each of four out of the five test specimens at the conclusion of 50 cycles shall not exceed 1.5 percent of its initial mass when tested in a saline (3 percent sodium chloride by weight) solution.

(D) Tolerances for Modular Block Dimensions:

Modular blocks shall be manufactured within the following tolerances:

(1) The length and width of each individual block shall be within ± ⅛ inch of the specified dimension. Hollow units shall have a minimum wall thickness of 1¼ inches.

(2) The height of each individual block shall be within ± 1/16 inch of the specified dimension.

(3) When a broken (split) face finish is required, the dimension of the front face shall be within ± 1.0 inch of the theoretical dimension of the unit.

(E) Finish and Appearance:

Units that indicate imperfect molding, honeycomb or open texture concrete and color variation on front face of block due to excess form oil or other reasons shall be rejected. All units shall be visually efflorescence free. All units shall be sound and free of cracks or other defects that would interfere with the proper placing of the unit or significantly impair the strength or permanence of the construction. Minor cracks (e.g. no greater than 1/50 inch in width and no longer than 25 percent of the unit height) incidental to the usual method of manufacture or minor chipping resulting from shipment and delivery, are not grounds for rejection.

The exposed faces shall be free of chips, cracks or other imperfections when viewed from a distance of 30 feet under diffused lighting. Up to 5 percent of a shipment may contain slight cracks or small chips not larger than 1.0 inch.

Color and finish shall be as shown on the plans and shall be erected with a running bond configuration.

(F) Pins:

If pins are required to align modular block facing units, they shall consist of a non-degrading polymer or hot-dipped galvanized steel and be made for the express use with the modular

block units supplied. Connecting pins shall be capable of holding the geogrid in the proper design position during backfilling.

(G) Cap Units and Adhesive:

The cap unit connection to the block unit immediately under it shall be of a positive interlocking type and not frictional. Cap units shall be cast to or attached to the top of modular block facing units in strict accordance with the requirements of the manufacturer of the blocks and the adhesive. The surface of the block units under the cap units shall be clear of all debris and standing water before the approved adhesive is placed. The contractor shall provide the owner in writing an acceptable 10-year warranty that the integrity of the materials used to attach the cap blocks will preclude separation and displacement of the cap blocks for the warranty period.

(H) Unit (Core) Fill:

Unit (core) fill is defined as free draining, coarse grained material that is placed within the empty cores of the modular block facing units. Unit (core) fill shall be a crushed stone or granular fill.

929-3.09 Certificate of Analysis for Modular Block Connection

For modular block facing units, a certification shall be provided with detailed calculations according to AASHTO (2017) and the results of laboratory test results performed in accordance with Section A.3 in Appendix A of FHWA NHI-00-043, dated March 2001 (“Mechanically Stabilized Earth Walls and Reinforced Soil Slopes”). Such certification shall demonstrate that all connections, including block-to-reinforcement and block-to-block connections, and all related components meet or exceed the current AASHTO 75 year design life requirements and are capable of resisting 100 percent of the maximum tension in the soil reinforcements at any level within the wall. Long-term connection testing for extensible reinforcements is also required. The effect of wall batter and normal pressures representative of the full range of wall configurations and heights shall be incorporated in the tests.

929-4 Construction Requirements:

929-4.01 Excavation:

The contractor shall ensure that temporary slopes are safe during the period of wall construction, and shall adhere to all applicable local, state, and federal regulations. During construction of the MSE walls, the contractor shall design, construct, maintain, and when called for, remove temporary excavation support systems (shoring). Temporary excavation support systems may be left in place if approved by the Engineer. The back slope of the excavation shall be benched. Where shoring is required, the contractor shall submit to the Engineer the shoring design, and a plan outlining construction and removal procedures for review and approval prior to proceeding with the work. Shoring plans shall be prepared and submitted as part of the working drawings, as specified in Subsection 105.03, and shall bear the seal and signature of a licensed Professional Civil or Structural Engineer, registered in the State of Arizona. All shoring design shall include appropriate input and review by the contractor's Professional Engineer.

929-4.02 Foundation Preparation:

(A) General:

In the absence of specific ground improvement requirements in the plans and special provisions, the following applies:

The foundation for the reinforced and retained wall fill shall be graded level for the entire area of the base of such backfills, plus an additional 12 inches on all sides, or to the limits shown in the plans.

If soil reinforcement components are to be positioned on native soil, the top 1 foot of native soil shall meet the requirements of the reinforced backfill material specified in Subsection 929-3.05.

If soil reinforcement components are to be positioned on native rock mass, the rock mass shall be classified as at least Class II rock mass in accordance with Subsection 10.4.6.4 of AASHTO LRFD Bridge Design Specifications, 6th edition (2012).

(B) Proof-Rolling:

Proof-rolling shall be performed to evaluate the stability and uniformity of the subgrades on which retaining wall structures will be constructed. Proof-rolling shall be performed on the entire areas at the following locations and at other locations shown on the project plans:

(1) At the bottom of the overexcavation and recompaction zones if specified;

(2) At the bottom of the overexcavation and replacement zones if specified;

(3) At the base of all retaining walls;

(4) At the base of all concrete box culverts;

(5) At the top of native soil layers that have been scarified, moisture conditioned and recompacted (if different from the bottom of the overexcavation and recompaction or overexcavation and replacement zones).

The proof-rolling shall be done immediately after subgrade compaction while the moisture content of the subgrade soil is near optimum or at the moisture content that achieved the required compaction.

If proof-rolling is performed after installation of pipe underdrains, do not use the proof-roller within 1.5 feet of the underdrains. Proof-rolling shall be performed with a pneumatic tired tandem axle roller with at least 3 wheels on each axle, a gross weight of 25 tons (50 kips) (This weight shall be determined on a project by project bases, depending on the soils and purpose of the proof-rolling), a minimum tire pressure of 75 psi and a minimum rolling width of 75 inches. A Caterpillar PS-300B (or PF-300B), Ingersoll-Rand PT-240R, BOMAG BW24R, Dynapac CP271 or equipment with equivalent capabilities shall be used for proof-rolling. The use of water trucks, scrapers, or other equipment for proof-rolling of the subgrades is not allowed.

Proof-rolling equipment shall be operated at a speed between 1.5 to 3 miles per hour or slower as required by the Engineer to permit measurements of ruts and/or pumping deformations.

Proof-rolling shall be carried out in two directions at right angles to each other with no more than 24 inches between tire tracks of adjacent passes. In cases where proof-rolling perpendicular to the wall alignment is not possible due to space constraints, proof-rolling shall be performed parallel to the wall with minimum 6-inches overlap between the tracks of adjacent passes. The contractor shall operate the proof-roller in a pattern that readily allows for the recording of deformation data and complete coverage of the subgrade.

The following actions shall be taken based on the results of the proof-rolling activity:

If rutting is less than ¼ inch; the grade is acceptable.

If rutting is greater than ¼ inch and less than 1½ inches; the grade needs to be scarified and re-compacted.
If rutting is greater than 1½ inches; the compacted area shall be removed and reconstructed.

If pumping (deformation which rebounds or materials are squeezed out of wheel’s path) is greater than 1 inch; remediate as directed by the Engineer.

The contractor is responsible for maintaining the condition of the approved proof-rolled soils throughout the duration of the retaining MSE wall construction. Wall construction shall not commence until the subgrade has been approved by the Engineer.

929-4.03 Concrete Leveling Pad:

Leveling pads shall be constructed of unreinforced concrete as shown on the working drawings. Gravel leveling pads shall not be allowed. As a minimum, the concrete for leveling pads shall meet the requirements of Section 922. The elevation of the top of leveling pad shall be within ⅛ inch from the design elevation when measured by a straightedge over any 10-foot run of the leveling pad.

The minimum width of the leveling pad shall be the width of the facing unit plus 8 inches. The centerline of the leveling pad shall be within ½ inch from design location. When the facing units are centered on the leveling pad, the leveling pad shall extend approximately 4 inches beyond the limits of the facing unit as measured in the direction perpendicular to the face of the wall.

Cast-in-place leveling pads shall be cured for a minimum of 24 hours before placement of wall facing units. A geotextile shall be applied over the back of the area of any openings between the facing units and leveling pad steps. The geotextile shall extend a minimum of 6 inches beyond the edges of the opening. The opening shall be filled with concrete, conforming to Section 1006, or shall be concurrently backfilled on both sides with soil.

929-4.04 Subsurface Drainage:

Prior to wall erection, the contractor shall install a subsurface drainage system as shown on the working drawings.

929-4.05 Wall Erection:

(A) General:

Walls shall be erected in accordance with the manufacturer’s written instructions. The contractor shall be responsible for ensuring that a field representative from the manufacturer is available at the site during construction of the initial 10-foot height of the full length of wall, and as called upon thereafter by the Engineer, to assist the contractor and Engineer at no additional cost to the Department. All temporary construction aids (e.g., wedges, clamps, etc.) shall be in accordance with the manufacturer’s recommendations.

(B) Placement Tolerances for Walls with Rigid (Precast) Facing:

For walls with rigid facing, such as precast concrete panels, the panels shall be placed such that their final position is vertical or battered as shown on the working drawings. As wall fill material is placed, the panels shall be maintained in the correct vertical alignment by means of temporary wedges, clamps, or bracing as recommended by the manufacturer. A minimum of two, but not more than three, rows of panel wedges shall remain in place at all times during wall erection. Wedges shall be removed from lower rows as panel erection progresses, so as to prevent chipping or cracking of concrete panels. The contractor shall repair any damage to erected concrete panels as directed by the Engineer and to the Engineer’s satisfaction. No external wedges in front of the wall shall remain in place when the wall is complete.

Erection of walls with rigid facing shall be in accordance with the following tolerances:

(1) Vertical and horizontal alignment of the wall face shall not vary by more than ¾ inch when measured along a 10 foot straightedge.

(2) The overall vertical tolerance (plumbness) of the finished wall shall not exceed ½ inch per 10 feet of wall height. Negative (outward leaning) batter is not acceptable.

(3) The maximum permissible out-of-plane offset at any panel joint shall not exceed ⅜ inch.

(4) The final horizontal and vertical joint gaps between adjacent facing panel units shall be within -⅛ inch and ±1/4 inch, respectively, of the design final joint opening per the approved calculations required in Subsection 929-3.01(H).

Wall sections not conforming to these tolerances shall be reconstructed at no additional cost to the Department.

(C) Placement Tolerances for Permanent Walls with Flexible Facing:

Erection of permanent walls with flexible facing (such as welded wire mesh) shall be in accordance with the following tolerances:

(1) Vertical and horizontal alignment of the wall face shall not vary by more than 2 inches when measured along a 10-foot straightedge, or as shown in the plans and specifications.

(2) The overall vertical tolerance (plumbness) of the wall shall not exceed 1 inch per 10 feet of wall height. Negative (outward leaning) batter is not acceptable.

(3) The offset limit between consecutive rows of facing shall not exceed 1 inch from planned offset.

Wall sections not conforming to these tolerances shall be reconstructed at no additional cost to the Department.

(D) Placement Tolerances for Modular Block Units:

Erection of walls with Modular Block Units shall be as per the following requirements:

(1) Vertical and horizontal alignment of the wall face shall not vary by more than ¾ of an inch when measured along a 10-foot straightedge.

(2) Overall vertical tolerance (plumbness) of the wall shall not exceed 1¼ inch per 10 feet of wall height from the final wall batter. Negative (outward leaning) batter is not acceptable.

(3) The first row of units shall be level from unit-to-unit and from front-to-back. Use the tail of the units for alignment and measurement.

(4) All units shall be laid snugly together and parallel to the straight or curved line of the wall face.

(5) Unless otherwise noted, all blocks shall be dry-stacked and placed with each block evenly spanning the joint in the row below (running bond). Shimming or grinding shall control the elevations of any two adjacent blocks within 1/16 of an inch.

(6) The top of blocks shall be checked with a straight edge bubble level that is at least 3 feet long. Any high points identified by the straight edge shall be ground flat. Block front to back tilting shall be checked frequently; however correction by shimming shall be done no later than 3 completed courses.

Wall sections not conforming to these tolerances shall be reconstructed at no additional cost to the Department.

(E) Placement of Metallic Reinforcement Elements:

Metallic reinforcement elements shall be placed normal (perpendicular) to the face of the wall, unless otherwise shown on the approved plans. All reinforcement shall be structurally connected to the wall face.

At each level of the soil reinforcement, the reinforced wall fill material shall be roughly leveled and compacted before placing the next layer of reinforcement. The reinforcement shall bear uniformly on the compacted reinforced soil from the connection to the wall to the free end of the reinforcing elements. The reinforcement placement elevation shall be at the connection elevation to 2 inches higher than the connection elevation.

For geosynthetic reinforcement where overlapping of reinforcing may occur, such as at corners, reinforcing connections to panels shall be adjusted to maintain at least 6 inches of vertical separation between overlapping reinforcement.

(F) Placement of Geotextile Fabric:

All joints between precast concrete panels shall be covered with geotextile fabric on the back side of the wall. Adhesive shall be applied to panels only. Adhesive shall not be applied to geotextile fabric or within 2 inches of a joint. The contractor shall provide geotextile fabric having a minimum width of 12 inches, and shall overlap the fabric a minimum of 4 inches. For modular block walls, the placement of the geotextile fabric shall be in accordance with the plans.

(G) Joint Pads and Fillers:

The contractor shall install joint pads and fillers as shown on the working drawings.

(H) Placement of Geosynthetic Reinforcement:

Geosynthetic reinforcement shall be installed in accordance with the manufacturer's site-specific wall erection instructions.

The geosynthetic reinforcement shall be rolled out with the stronger direction perpendicular to the wall face. The reinforcement shall be continuous for their full length. Joints parallel to the wall shall not be permitted, except as shown on the working drawings.

Reinforcement coverage shall be 100 percent of embedment area unless otherwise shown in the working drawings. Adjacent sections of geosynthetic reinforcement need not be overlapped except when exposed in a wrap-around face system, at which time the reinforcement rolls shall be overlapped or mechanically connected per the manufacturer's requirements.

Geosynthetic reinforcement shall be placed to lay flat and pulled tight prior to backfilling. After a layer of geosynthetic reinforcement has been placed, suitable means, such as pins or small piles of soil, shall be used to hold the geosynthetic reinforcement in position until the subsequent soil layer can be placed.

During construction, the surface of the fill shall be kept approximately horizontal. Geosynthetic reinforcement shall be placed directly on the compacted horizontal fill surface. The reinforcement shall bear uniformly on the compacted reinforced soil from the connection to the wall to the free end of the reinforcing elements. The reinforcement placement elevation shall be at the connection elevation to 2 inches higher than the connection elevation.

929-4.06 Reinforced Wall Fill Placement:

(A) General:

Reinforced wall fill placement shall closely follow erection of each course of facing panels. Backfill shall be placed in such a manner to avoid damage or disturbance of the wall materials, misalignment of facing panels, or damage to soil reinforcement or facing members. The contractor shall place backfill to the level of the connection and in such a manner as to ensure that no voids exist directly beneath reinforcing elements.

For walls with modular block facing units, the backfill shall not be advanced more than the height of a modular block unit until the drainage fill, core fill and all fill in all openings within the blocks at that level have been placed. The filled units shall be swept clean of all debris before installing the next level of units and/or placing the geogrid materials.

For walls with flexible facing with gabion style facing, the rock near the wall face shall be hand-placed in accordance with the recommendations of the wall manufacturer.

The maximum lift thickness before compaction shall not exceed 12 inches.

For geosynthetic reinforcements, the fill shall be spread by moving the machinery parallel to or away from the wall facing and in such a manner that the geogrid remains taut. Construction equipment shall not operate directly on the geogrid. A minimum fill thickness of ~~six~~ 6 inches over the geogrid shall be required prior to operation of vehicles. Sudden braking and sharp turning shall be avoided.

For metallic reinforcements, the fill shall be spread by moving the machinery parallel to or away from the wall facing and in such a manner that the steel reinforcement remains normal to the face of the wall. Construction equipment shall not operate directly on the steel reinforcement. A minimum fill thickness of 3 inches over the steel reinforcement shall be required prior to operation of vehicles. Sudden braking and sharp turning shall be avoided.

Wall materials which are damaged during backfill placement shall be removed and replaced by the contractor, at no additional cost to the Department. The contractor may submit alternative corrective procedures to the Engineer for consideration. Proposed alternative corrective procedures shall have the concurrence of the MSE wall supplier and designer, in writing, prior to submission to the Engineer for consideration. All corrective actions shall be at no additional cost to the Department.

(B) Compaction:

Reinforced wall fill compaction requires a minimum of 2 roller passes of a vibratory roller having a minimum dynamic force of 6,000 pounds impact per vibration, and a minimum frequency of 1,000 vibrations per minute.

The vibratory roller shall be operated at speeds less than 3 feet per second.

Backfill within 3 feet of the wall face shall be compacted utilizing a hand operated vibratory plate.

Retained backfill shall be compacted and tested per section 203-10.03 (Embankment Construction Requirements) which require 100 percent of the maximum density for an additional 50 feet beyond the limits of approach slabs.

(C) Protection of the Work:

The contractor shall not allow surface runoff from adjacent areas to enter the wall construction site at any time during construction operations. In addition, at the end of each day's operation, the contractor shall slope the last lift of backfill away from the wall facing so that runoff is directed away from the structure. If the subgrade is damaged due to water or otherwise, such that it does not meet the requirements of Subsection 929-4.02, then as directed by the Engineer, the contractor shall rework and repair the damaged subgrade at no additional

expense to the Department. The criteria in Subsection 929-4.02 shall be used to judge the adequacy of the repair. Rework and repair shall extend to a depth where undamaged work is encountered.

929-5 Method of Measurement:

Mechanically Stabilized Earth (MSE) retaining walls will be measured by the square foot of completed wall, based on the vertical height and length of the retaining wall shown on the plans. The vertical height will be taken as the difference in elevation measured from the top of wall to the minimum embedment reference line as indicated on the plans.

The entire surface of retaining walls shown on the plans, including all wall terminations and cast-in-place coping, will be measured as MSE retaining wall.

929-6 Basis of Payment:

The accepted quantities of Mechanically Stabilized Earth (MSE) retaining walls, measured as provided above, will be paid for at the contract unit price per square foot of wall, complete in place. Such price shall include full compensation for furnishing all designs, design revisions, associated working drawings, engineering calculations, labor, materials, tools, equipment, and incidentals. Such price shall also include provision of manufacturer's field representative, and all work involved in constructing the MSE retaining walls, including foundation preparation, proof-rolling, footings, drainage features, wall facing, slip joints, concrete or shotcrete caps and aprons, rustication, paint or stain, grout, tendons, cables, anchors, fabric, and all hardware and reinforcing steel, complete in place as shown on the plans and as specified herein.

No separate measurement or payment will be made for excavation, reinforced backfill, and retained backfill associated with MSE retaining walls, the cost of such work being considered as included in the price paid for the MSE retaining wall.

No separate measurement or payment will be made for the design, construction, or removal of temporary excavation support systems (shoring), or associated geotechnical review, the cost of such work being considered as included in the price paid for the MSE retaining wall.

(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.

(1002PAINT, 06/19/25)

SECTION 1002 PAINT: of the Standard Specifications is revised to read:

1002-1 General Requirements:

All paints specified herein shall be ready-mixed at the manufacturer's plant, except for inorganic zinc rich primer, which shall be mixed by the fabricator or at the project site just prior to application. All paints shall be standard paint products of the manufacturer with published product data sheets and shall comply in all details with the specifications.

Ready-mixed paint shall be homogeneous, free of contaminants, and shall be of a consistency suitable for the use for which it is specified. The pigment shall be finely ground and properly dispersed in the vehicle, according to the requirements for the type of paint, and this dispersion shall be such that the pigment does not settle appreciably, does not cake or thicken in the paint container, and does not become granular, jelled, or curdled. Any settlement of pigment in the paint shall be easily dispersed with a paddle so as to produce a smooth uniform paint of the proper consistency. The manufacturer shall include in the paint the necessary additives for control of sagging, leveling, drying, drier absorption, and skinning.

Lead, lead compounds, soluble barium compounds, or hexavalent chromium compounds shall not be used as raw materials in the paint formulas specified under this section, and shall not be added to any paint formulas specified under this section.

The use of halogenated solvents is not permitted.

Paint shall be furnished in new, unopened air-tight containers, which are clearly labeled with the exact title of the paint, Federal Specification number when applicable, name and address

of the manufacturer, product code, date of paint manufacture, and the lot or batch number. The containers shall meet U.S. Department of Transportation Hazardous Materials Shipping Regulations. Precautions concerning the handling and the application of the paint shall be shown on the label of the paint containers.

All of the paints of any coating system consisting of individual paints (such as a primer, intermediate coat, and topcoat), shall be made by the same manufacturer, and shall be designed and sold to be used together as a system.

Only paints and paint systems approved in accordance with Subsection 1002-3 of the specifications and shown on the Department's Approved Products List (APL) will be allowed for use. Copies of the most current version of the APL are available on the Department's website from the ADOT Research Center, through its Product Evaluation Program. Paint supplied by an approved manufacturer with a different product code from that which was previously evaluated and approved will require evaluation to determine if it is acceptable.

The contractor shall submit to the Engineer a Certificate of Compliance for each lot or batch of paint supplied, in accordance with Subsection 106.05 of the specifications, prior to its use. Product data sheets listing the paint constituents and their proportions as well as Materials Safety Data Sheets (MSDS) are required for each paint material supplied prior to its use.

All applicable governmental environmental regulations shall be adhered to during cleanup and for the disposal of unused paint.

1002-2 Paint Types:

1002-2.01 Three-Paint Coating System:

(J) General:

A three-paint coating system shall be for use on metallic surfaces, and shall include a primer (Paint Number 1), intermediate coat (Paint Number 2), and topcoat (Paint Number 3) from the same system. All three paints shall be water-based, 100 percent acrylic (acrylic latex) paints, unless a non water-based primer is specified, in which case, the topcoat and intermediate coat must be a water-based acrylic paint.

Each individual paint shall conform to all of the chemical and physical characteristics and properties as declared on the manufacturer's product data sheet. In addition, the paint color shall be as specified in the project plans, and the consistency shall be in accordance with the manufacturer's recommendations. The contractor shall use the checking and calibration procedures found in ASTM D4212 and verify the paint consistency with the Engineer prior to each application.

Each coating is intended for spray application. Limited application can be made by brushing or rolling if approved by the Engineer.

(K) Paint Number 1 - Primer:

This paint shall be used on blast cleaned steel surfaces for the first coat of a three-paint coating which must include Paint Number 2 and Paint Number 3 from the same system.

(L) Paint Number 2 - Intermediate Coat:

This paint for intermediate coats shall be used on primed steel surfaces as the second coat of a three-paint coating system which must include Paint Number 1 and Paint Number 3 from the same system. The paint shall be appropriately tinted to contrast with the prime coat.

(M) Paint Number 3 - Topcoat:

Paint for topcoats shall be used as the third coat of a three-paint coating system which must include Paint Number 1 and Paint Number 2 from the same system.

For topcoats, the gloss shall be as specified on the project plans. The available colors for topcoats shall provide visual matches to the colors given in the Federal Standard No. 595. The colors shall be available in high-gloss enamels, if required.

1002-2.02 Zinc Rich Primer:

Zinc-rich primer shall be a solvent based, one-part, epoxy ester, zinc-rich coating made to contain no less than 89 percent by weight of zinc dust in the dried film. Zinc-rich primer is suitable for limited use on cuts, welds, or damaged galvanized surfaces, as needed to restore the continuity of cathodic protection. Zinc-rich primer shall be certified by the manufacturer to be compatible with any suitable water-based acrylic finish paint.

Zinc-rich primer shall be used where zinc paint is called for elsewhere in the specifications.

1002-2.03 Inorganic Zinc-Rich Primer:

Inorganic zinc-rich primer shall be a solvent-based three-component, inorganic, ethyl silicate, zinc-rich coating for use on steel surfaces which will be exposed to severely corrosive environments. The primer shall be mixed in accordance with the manufacturer's directions by the fabricator or at the project site just prior to application. Inorganic zinc-rich primer shall be made to contain no less than 80 percent by weight of zinc dust in the dried film, and shall be certified by the manufacturer to form a strong bond to properly cleaned and prepared steel surfaces, either sandblasted or galvanized. This primer shall also be certified by the manufacturer to be compatible with any suitable water-based acrylic finish paint.

1002-2.04 Alkyd Primer:

Alkyd primer shall be solvent-based, and shall be designed for ferrous metal surfaces where there are rusting issues which rule out the use of a water-based primer. Such surfaces may include ornamental iron, tanks, fabricated parts, handrails, and objects referred to as "black steel." Alkyd primer shall be certified by the manufacturer to be compatible with any suitable water-based acrylic finish paint.

1002-2.05 Direct-to-Metal (DTM) Combination Primer and Finish Paint:

This paint shall be a water-based acrylic paint specially designed for use as a direct-to-metal (DTM) primer or combination primer and finish. The product shall be certified by the manufacturer to form a strong bond to properly cleaned and prepared surfaces of structural steel and other metallic products such as metal buildings, tanks, and pipes. It shall also be certified to bond with other properly cleaned and prepared surfaces such as galvanized steel, oil-based paints, and alkyd enamels. When used on ferrous metal surfaces where there are rusting issues, the paint shall be rust-inhibitive. Direct-to-metal combination primer and finish paints shall be designed to be usable as a complete two or three coat system. When used as a primer only, the paint shall be certified by the manufacturer to be compatible with any suitable water-based acrylic finish paint.

1002-2.06 Acrylic Emulsion Paint:

Acrylic emulsion paint shall be used on concrete and masonry surfaces, and shall be a water-based, 100 percent acrylic (acrylic latex) paint.
This paint may be tinted by using “Universal” or “all purpose” concentrates.
The color of the final coat of paint shall be as indicated on the project plans. If no color is specified on the plans, the paint color shall approximate that of paint color chip No. 30318, as specified by Federal Test Standard Number 595, when applied to either a concrete test specimen measuring 2 feet by 2 feet, or to the surface of the concrete structure to be painted. The Engineer will determine color acceptance by visual inspection.

1002-3 Sampling and Testing:

(N) General:

Any lot or batch of paint may, at any time, be sampled and tested for conformance to the specifications and the chemical and physical characteristics and properties as declared by the manufacturer on the product data sheets submitted with the original samples used in the evaluation and approval of the product. Also, complete coating system samples may be required at any time for follow-up evaluation using the performance test method employed in the original evaluation for approval of the system.

Coating Systems for Structural Steel and Other Metallic Surfaces :

Coating systems composed of the paints specified in Subsections 1002-2.01 through 1002-2.05 of the specifications will be tested as complete systems applied to steel panels and weathered in accordance with ASTM G154, and exposure cycle number 4 of ASTM D4587, in the Q-U-V Accelerated Weathering Tester, utilizing UVB 313 lamps. Each system shall have an evaluation rating of 100 or greater after 2000 hours of weathering. The procedure is as follows:

(1) Paint coatings will be applied to cold rolled steel panels (ASTM D609, Type 3, ASTM A366). The paint will be thinned to 75 ± 2 Ku consistency using

demineralized water. Three coats, each approximately 2 mils thickness are applied to each of four panels according to ASTM D823. The fourth coated panel from each set will be inscribed with an “X” cut to the steel substrate and extending across the entire coated area;

(2) The exposure cycle used with the weathering tester shall be D = 8 h UV/60 degree C followed by 4 h CON/45 degree C. One panel from each set of four shall be removed at 1000 hours and another at 1500 hours. The last two panels shall be removed at 2000 hours;

(3) Paint systems will be evaluated on the basis of six measures of degradation which may be found to occur under the conditions of exposure. For each measure, a rating scale of one to five points will be applied. A rating of one point indicates the poorest performance and five points indicate the best performance. The rating from each measure is multiplied by a weighting factor which represents the relative importance of that measure. The product is a score for that measure. The sum of the scores for all measures is the overall score for the system. To be acceptable, paint systems shall have an overall score of 100 or higher;

(c) Cracking/Flaking: ASTM D660, ASTM D661, and ASTM D772 are used in combination to determine the rating scale. A weighting factor of three will be applied to the results of these tests;

(d) Blistering/Flaking: ASTM D714 and ASTM D772 are used in combination to determine the rating scale. A weighting factor of three will be applied to the results of these tests;

(e) Corrosion: A rating scale is derived from ASTM D610 for evaluating the degree of rusting. A weighting factor of three will be applied to the results of this test;

(f) Chalking/Erosion: ASTM D4214 and ASTM D662 are used in combination to determine the rating scale. A weighting factor of three will be applied to the results of these tests;

(g) Adhesion: The tape test is based on ASTM D3359 and the rating scale is from the Classification of Adhesion Test Results under Test Method B. A weighting factor of five will be applied to the results of this test; and

(h) Flexibility: ASTM D522, using a 1-1/4 inch mandrel, is employed to determine flexibility. The degree of cracking observed after bending is used to determine the rating scale. A weighting factor of five will be applied to the results of this test.

(O) Paint for Concrete and Masonry Surfaces:

Paint for concrete and masonry surfaces will be tested in accordance with the following procedures:

(1) Resistance to Accelerated Weathering:

The paint will be applied to concrete mortar panels and weathered in a Q-U-V accelerated weathering tester, according to ASTM G154, for 2000 hours utilizing UVB-313 lamps, and exposure cycle number 4 of ASTM D4587. The paint weathered in this manner shall show no appreciable change in color or appearance due to fading, chalking, or material reaction.

(2) Adhesion:

The paint shall be applied to a concrete or masonry test surface approved by the Engineer, in accordance with the application plan specified in Subsection 610-3.03 of the specifications. After a minimum period of 30 days of outdoor exposure, the adhesion of the paint will be measured. Testing will be performed in accordance with the requirements of ASTM D4541, Method E, with a strength of at least 100 pounds per square inch being required. In addition, testing will also be performed in accordance with the requirements of ASTM D3359, Method A, with a rating of 3A or higher being required.

(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, 06/19/25)

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, Polyphosphoric 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 asphaltic concrete will be adjusted by the percentage shown in Table 1005-1. Should the asphalt cement be in reject status, the contractor may, within 25 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 1005-1, 1005-1a, and 1005-1b of the Standard Specifications are revised to read:

TABLE 1005-1 ASPHALT BINDER ADJUSTMENT TABLE			
Test Property	**AASHTO Test Method**	**Test Result**	**Percent of Contract Unit Price Allowed**
Dynamic Shear of Original Binder: G*/Sin δ, kPa	T 315	≥ 1.00 0.90-0.99 0.70-0.89 < 0.70	100 98 95 88 (1)
Dynamic Shear of RTFO Binder: G*/Sin δ, kPa	T 315	≥ 2.20 2.00-2.19 1.60-1.99 < 1.60	100 98 95 88 (1)
Dynamic Shear of PAV Binder: G*Sin δ, kPa	T 315	≤ 5000 5001-5500 5501-7000 7001-8000 > 8000	100 98 95 89 87 (1)
Creep Stiffness of PAV Binder: S, Mpa	T 313	≤ 300 301-330 331-450 451-600 > 600	100 98 95 89 87 (1)
m-value at 60 sec.	T 313	≥ 0.300 0.270-0.299 0.230-0.269 < 0.230	100 98 90 87 (1)

Notes:

(3) Reject Status: The pay adjustment applies if allowed to remain in place.

(4) Specified properties in AASHTO M 320 for flash point, viscosity at 135 °C, and mass loss are not considered performance related. Specification deficiencies for these properties shall be cause for a work stoppage until specification properties are met, but will not be cause for a pay adjustment.

(5) Should the bituminous material be deficient on more than one property, the pay adjustment will be the greatest reduction to the contract unit price specified considering individual test results.

(6) The information presented in this table does not apply to asphalt cement used for tack coats.

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 89 87 (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 @ 10ºC, %, minimum	AASHTO T 301	75	≥ 75 70 - 74 < 70	100 89 87 (1)
(1) Reject Status: The pay adjustment applies if allowed to remain in place.				

TABLE 1005-1b Polymer Modified Asphalt Binder (XX-XXPM)				
Test Property	**Test Method**	**Requirement**	**Test Result**	**Percent of Contract Unit Price Allowed**
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	AASHTOT 59		Pos.		Pos.		Pos. (2)
Demulsiability: 35 mL, 0.02 N calcium chloride %, minimum	AASHTO T 59	60		60			

TABLE 1005-3							
EMULSIFIED ASPHALTS							
Tests On Emulsion	**Test Method**	**Requirement**					
		RS-1	**CRS-1**	**RS-2**	**CRS-2**	**SS-1**	**CSS-1**
Classification: Uncoated particles, %, minimum	Arizona Test Method 502				55		
Residue: (3)		55	60	63	65	57	57
Residue, %,							
minimum (4)							

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
229			232
PG 70-22 PM			233
230			
PG 64-28 PM			

(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

(1006QCPC, 07/12/05)

SECTION 1006 PORTLAND CEMENT CONCRETE:

1006-4.01 General Requirements: of the Standard Specifications is modified to add:

1006-4.01(A) Contractor Quality Control:

The contractor shall perform the quality control measures described in Subsection 106.04(C). At the weekly meeting, the contractor shall be prepared to explain and discuss how the following processes will be employed.

(a) Aggregate Production, including crusher methods, pit extraction, and washing.

(b) Stockpile Management, including stacking methods, separation technique, plant feed technique, stockpile pad thickness, and segregation prevention.

(c) Mixing and Transport, including mixing time and revolutions, water and concrete temperature, integrity of mixing equipment, sight glass for water, slump meters, batch ticket, and travel time.

(d) Proportioning, including scale calibration, water added, water meter moisture correction, and bin loading.

The contractor shall obtain samples and perform the tests specified in the following table:

CONTRACTOR QUALITY CONTROL TESTING REQUIREMENTS			
TYPE OF TEST	TEST METHOD	SAMPLING POINT	MINIMUM TESTING FREQUENCY
Fine Aggregate for PCC (Class S or Class P)			
Gradation	ARIZ 201	Crusher Belt or Stockpile	1 per 750 CY of Concrete
Sand Equivalent	AASHTO T 176		
Coarse Aggregate for PCC (Class S or Class P)			
Gradation	ARIZ 201	Crusher Belt or Stockpile	1 per 750 CY of Concrete
Class S Portland Cement Concrete			
Entrained Air	AASHTO T 152	At Point of Discharge	1 per 40 CY of Concrete
Slump	AASHTO T 119		

(1010PIPE, 03/16/23)

SECTION 1010 DRAINAGE PIPE:

1010-6 Reinforced Concrete Pipe: the sixth paragraph of the Standard Specifications is revised to read:

Precast, reinforced concrete flared end sections shall conform to the requirements of the previously cited specifications to the extent to which they apply. The area of steel reinforcement per linear foot of the flared end section shall be at least equal to the minimum steel requirement for the reinforcement in that portion of the flared end section which abuts the pipe. Flared end sections may utilize in lieu of steel reinforcement a minimum of 5.0 pounds of macro fibers, conforming to ASTM C1116, per cubic yard of concrete mix.

(1011APEAS, 07/18/24)

SECTION 1011 JOINT MATERIALS:

1011-8.03 Field Performance: of the Standard Specifications is revised to read:

The manufacturer of the joint sealant shall demonstrate satisfactory field performance in Arizona, or by AASHTO Product Evaluation & Audit Solutions (formerly NTPEP) field evaluation, of less than 1 percent total failure (either within the material or the adhesive bond to the joint face) after one year of service, before the material shall be used.

(1013BRPD, 01/20/22)

SECTION 1013 BEARING PADS: of the Standard Specifications is revised to read:

1013-1 Preformed Fabric Pads:

Preformed fabric pads shall be composed of multiple layers of 8-ounce cotton duck impregnated and bound with high quality natural rubber or of equivalent and equally suitable materials compressed into resilient pads of uniform thickness. The number of plies shall be such as to produce the specified thickness, after compression and vulcanizing. The finished pads shall withstand compression loads perpendicular to the plane of the laminations of not less than 10,000 pounds per square inch without detrimental reduction in thickness or extrusion.

Preformed fabric pad samples will be tested by the Department.

The manufacturer certification and sampling shall conform to the requirements of Subsection 1013-3 of the specifications.

1013-2 Elastomeric Bearing Pads:

1013-2.01 General:

The work shall consist of furnishing and installing elastomeric bearing pads. Bearings shall be constructed in accordance with the details shown on the plans and as specified in these specifications.

Prior to shipment from the point of manufacture, bearings shall be packaged in such manner to ensure that during shipment and storage the bearings will be protected against damage from handling, weather, or any normal hazard. All bearings shall be stored at the work site in an area that provides protection from environmental and physical damage. When installed, bearings shall be clean and free of all foreign substances.

Bearings shall be installed to the positions and orientations shown on the plans. Bearings shall be set level, in exact positions, and must have full and even bearing on all bearing planes. Bearings surfaces located at improper elevations or set not level and true to plane shall be corrected prior to placement of bearings. Elastomeric bearing pads shall be set directly on properly prepared concrete surfaces without bedding material.

Elastomeric bearing pads shall include unreinforced pads (consisting of elastomer only) and reinforced bearings with steel or fabric laminates.

Bearings shall be furnished with the dimensions, material properties and elastomer grade required by the plans. Unless otherwise specified on the plans, bearings which have thicknesses greater than 1/2 inch shall be reinforced with steel or fabric laminates. The design method (A or B) and the design load shall also be shown on the plans, and testing shall be performed accordingly. In the absence of more specific information, bearings shall be Grade 3, shall be an elastomer with 130 pounds per square inch shear modulus (55 durometer hardness).

1013-2.02 Material Properties:

The sole polymer in the elastomeric compound shall be neoprene and shall be not less than 60 percent, by volume, of the total compound. The elastomer compound shall be classified as being of low temperature Grade 0, 2, or 3. The grades are defined by the testing requirements in Table 1013-1. A higher grade of elastomer, signified by a larger grade number, may be substituted for a lower one.

The elastomer compound shall meet the minimum requirements of Table 1013-1, except as otherwise specified by the Engineer. Test requirements may be interpolated for intermediate hardness. The material will be specified by its shear modulus whose measured value shall lie within 15 percent of the specified value. A consistent value of hardness shall also be supplied for the purpose of defining limits for the tests in Table 1013-1. Laminated bearings shall have a shear modulus not greater than 200 pounds per square inch. When test specimens are cut from the finished product, the physical properties shall be permitted to vary by 10 percent from those specified in Table 1013-1. All material tests shall be carried out at

73 ± 4 degrees F, unless otherwise noted. Shear modulus tests shall be carried out using the apparatus and procedures described in Annex A1 of ASTM D4014.

Certification, sampling, and testing shall conform to the requirements of Subsection 1013-3 of the specifications.

Table 1013-1
ELASTOMERIC COMPOUND REQUIREMENTS

Note that ASTM D1043 refers to "modulus of rigidity" while ASTM D4014 refers to "shear modulus." The word "stiffness" is used here to cover both terms.				
Physical Properties				
D2240	Hardness: Shore A Durometer	45 to 75		
		45 to 55	56 to 65	66 to 75
D412	Ultimate Elongation: min. %	400	350	300
	Tensile Strength: min. psi	2250		
Heat Resistance				
D573: 70 hours at 212 °F	Change in Durometer Hardness: maximum points	15		
	Change in Tensile Strength: maximum %	-15		
	Change in Ultimate Elongation: maximum %	-40		
Compression Set				
ASTM D395, Method B	22 hr at 212°F: maximum %	35		
Ozone				
ASTM D1149	100 pphm ozone in air by vol., 20 % strain, 100 ± 2°F, 100 hr, mounting IAW ASTM D1149 (Procedure A)	No Cracks		
Low Temperature Brittleness				
D746 Procedure B	Grade 0: No Test Required Grade 2: No Test Required Grade 3: Brittleness at -40°F	- - No Failure		
Instantaneous Low Temperature Thermal Stiffening				
ASTM D1043	Grade 0: Tested at -25°F Grade 2: Tested at -25°F Grade 3: Tested at -40°F	(1) (1) (1)		
Low Temperature Crystallization				

ASTM D4014 Quad Shear Test As Described in Annex A	Grade 0: No Test Required Grade 2: 7 Days at 0°F Grade 3: 14 Days at -15°F	(2) (2) (2)

Notes:

(7) Stiffness at test temperature shall not exceed four times the stiffness measured at 73 °F.

Stiffness at test time and temperature shall not exceed four times the stiffness measured at 73°F with no time delay. The stiffness shall be measured with a quad shear test rig in an enclosed freezer unit. The test specimens shall be taken from a randomly selected bearing. A ± 25 % strain cycle shall be used, and a complete cycle of strain shall be applied with a period of 100 seconds. The first 3/4 cycle of strain shall be discarded, and the stiffness shall be determined by the slope of the force deflection curve for the next 1/2 cycle of loading.

1013-2.03 Plain and Fabric-Reinforced Elastomeric Bearing Pads:

Pads less than or equal to 1/2 inch in thickness shall be all elastomer. Pads greater than 1/2 inch thick shall be laminated.

Laminated pads shall consist of alternate layers of elastomer and fabric reinforcement bonded together. The top and bottom layers of reinforcement shall be uniformly covered with a layer of elastomer. The thickness of elastomer cover shall be allowed per tolerances listed in Table 1013-2.

Laminated pads shall have reinforcement every 1/2 inch through the entire thickness. Fabric reinforcement shall be single-ply at top and bottom surfaces of the pad and double-ply within the pad. Fabric shall be free of folds and ripples and shall be parallel to the top and bottom surfaces. Variations in the location of the reinforcement from its theoretical location in excess of the specified Fabrication Tolerances will be cause for rejection.

Pads of all-elastomer or with fabric reinforcement may be cut from large sheets. Cutting shall be performed in such a manner as to avoid heating of the material, to produce a smooth edge with no tears or other jagged areas, and to cause as little damage to the material as possible. The cutting method shall not cause any separation of the fabric from the elastomer for laminated bearings.

Flash tolerance, finish, and appearance shall meet the requirements of the latest edition of the Rubber Handbook published by the Rubber Manufacturers Association, Inc., RMA F3 and T.063 for molded bearings and RMA F2 for extruded bearings.

The bond between elastomer and fabric shall be such that when a sample is tested for separation, it shall have a minimum peel strength of 30 pounds per inch of width.

Fabric reinforcement shall be woven from 100 percent glass fibers of E-type yarn with continuous fibers. The minimum thread count in either direction shall be 25 threads per inch. The fabric shall have either a crowfoot or an 8 Harness Satin weave. Each ply of fabric shall have a breaking strength of not less than 800 pounds per inch of width in each thread direction when 3 inch by 36 inch samples are tested on split drum grips. The bond between double plies shall have a minimum peel strength of 20 pounds per inch of width. Holes in the fabric will not be permitted.

At the contractor's option, steel-reinforced elastomeric bearing pads may be furnished in lieu of fabric-reinforced elastomeric bearing pads that are 1/2 inch and over in thickness.

1013-2.04 Steel Reinforced Elastomeric Bearing Pads:

For steel-reinforced elastomeric bearings, the edges of the steel shall be protected at all times from corrosion. Steel-reinforced elastomeric bearing pads shall conform to the requirements for steel-laminated elastomeric bearings as specified in ASTM D4014 and the following:

(A) The thickness of each bearing pad shall be as shown on the project plans. The bearings shall consist of (N-1) internal elastomer laminates and N steel laminates, where N is equal to the bearing pad thickness in inches shown on the project plans divided by 1/2 inch. The steel laminates shall be 11 gage and shall be spaced every 1/2 inch, center-to-center. The top and bottom steel laminates shall have 1/4 inch of elastomer cover as measured from the center of the steel laminate to the pad surface;

(B) The elastomer clear cover thickness from the surface to the steel laminates at the sides of the bearings shall be 1/8 inch. If guide pins or other devices are used to control the side cover over the steel laminates, any exposed portions of the steel laminates shall be sealed by vulcanized patching;

(C) Steel laminates used for reinforcement shall be made from rolled mild steel conforming to ASTM A36, ASTM A1011, or ASTM A1008, Grade 40. Holes in plates for manufacturing purposes will not be permitted unless they have been accounted for in the design, as shown on the plans;

(D) Bearings with steel laminates shall be cast as a unit in a mold and shall be bonded and vulcanized under heat and pressure. The mold finish shall conform to standard shop practice. The internal steel laminates shall be sandblasted and cleaned of all surface coatings, rust, mill scale, and dirt before bonding, and shall be free of sharp edges and burrs. External load plates (sole plates) shall be

protected from rusting by the manufacturer, and, preferably, shall be hot bonded to the bearing during vulcanization. Bearings that are designed to act as a single unit with a given shape factor must be manufactured as a single unit; and**i**

(E) Steel laminated bearings shall develop a minimum peel strength of 40 pounds per inch of width.

1013-2.05 Fabrication Tolerances:

Plain and laminated bearing pads shall be built to the specified dimension within the tolerances listed in Table 1013-2.

Table 1013-2
FABRICATION TOLERANCES

Parameters	Tolerances	
	Minus	**Plus**
1. Overall Height: Design Thickness 1-1/4 inch or less Design Thickness over 1-1/4 inch	 0 0	 +1/8 inch +1/4 inch
2. Overall Horizontal Dimensions: 36 inches or Less Over 36 inches	 0 0	 +1/4 inch +1/2 inch
3. Thickness of Individual Layers of Elastomer at any Point within the Bearing	± 20 % of Design Value but no more than ± 1/8 inch	
4. Parallelism with Opposite Face: Top and Bottom Sides	 0.005 Radians 0.02 Radians	
5. Position of Exposed Connection Members, Holes, Slots, or Inserts	± 1/8 inch	
6. Edge Cover: Embedded Laminates or Connection Members	0	+1/8 inch
7. Thickness: Top and Bottom Cover Layer (if required)	0	+1/8 inch
8. Size: Holes, Slots, or Inserts	± 1/8 inch	

1013-3 Certification and Testing:

1013-3.01 General Requirements:

(A) General:

A lot shall consist of a single type of bearing of the same design, material and thickness, delivered to the project site at the same time. Unless otherwise specified on the plans, certification and testing shall be as described in Subsections 1013-3.01(B) and (C) of the specifications.

(B) Quality Control Testing by Manufacturer:

The contractor shall furnish the Engineer with Certificates of Analysis from the manufacturer, conforming to the requirements of Subsection 106.05 of the specifications.

Each reinforced bearing shall be marked in indelible ink or flexible paint. The marking shall consist of the order number, lot number, bearing identification number, and elastomer type and grade number. The marking shall be on the face that is visible after erection of the bridge structures.

The ambient temperature tests on the elastomer described in Subsection 1013-3.02(A) of the specifications shall be conducted for the materials used in each lot of bearings. In lieu of performing a shear modulus test for each batch of material, the manufacturer may elect to provide certificates from tests performed within the preceding year on identical formulations.

All three low temperature tests described in Subsection 1013-3.02(C) of the specifications shall be conducted on Grade 3 material used in each lot of bearings, with the following exception. In lieu of the low temperature crystallization tests on each lot of bearings to be used, the manufacturer may choose to provide Certificates of Analysis from low-temperature crystallization tests performed within the preceding year on identical Grade 3 material.

Every finished bearing shall be visually inspected in accordance with Subsection 1013-3.02(C) of the specifications.

Every steel reinforced bearing shall be subjected to the short-term load test described in Subsection 1013-3.02(D) of the specifications.

From each lot of bearings designed by Method B of AASHTO LRFD Bridge Specifications Article 14.7.5, a random sample shall be subjected to the long-term load test described in Subsection 1013-3.02(E) of the specifications. The sample shall consist of at least one bearing chosen randomly from each size and material batch and shall comprise at least 10 percent of the lot. If one bearing of the sample fails, all the bearings of that lot shall be rejected, unless the manufacturer elects to test each bearing of the lot at no additional cost to the Department. In lieu of this random sampling procedure, the Engineer may require every bearing of the lot to be tested.

(C) Acceptance Testing:

A minimum of two sample pads from every 100 pads furnished, or portion thereof, will be selected at random by the Engineer at the project site for testing. A minimum of one sample pad will be selected from each lot. Bearing pads marked or otherwise presented to the Department as being test pads shall not be tested. Samples shall consist of complete pads as detailed on the project plans and as specified herein. The contractor shall furnish additional complete pads to replace those taken for testing. Pads shall be available for testing at least three weeks in advance of intended use.

Acceptance testing shall be performed by a laboratory listed in the ADOT Directory of Approved Testing Laboratories on the Department's website.

The contractor shall, at no additional cost to the Department, have the elastomeric bearing pad samples tested by an approved testing laboratory. The testing laboratory shall be approved by the Engineer, shall not be affiliated with the bearing pad manufacturer, and shall be under the supervision of a registered professional engineer.

The contractor shall furnish the Engineer with Certificates of Analysis, conforming to the requirements of Subsection 106.05 of the specifications, from the approved testing laboratory certifying that the bearings tested conform to the specified requirements for dimensional tolerances and material properties. The following tests shall be performed as appropriate and be supported with Certificates of Analysis:

(1) Ambient temperature test;
(2) Heat resistance test;
(3) Visual inspection;
(4) Shear modulus test; and
(5) Bond and peel strength tests

The heat resistance tests shall be performed in accordance with Subsection 1013-3.02(B) of the specifications.

Shear stiffness tests shall be performed on material from a random sample of the finished bearings in accordance with Subsection 1013-3.02(F) of the specifications.

1013-3.02 Testing Requirements:

(A) Ambient Temperature Tests on the Elastomer:

The elastomer used shall satisfy the limits prescribed in Table 1013-1 for durometer hardness, tensile strength, and ultimate elongation. The bond to the reinforcement, if any, shall also satisfy the bond requirements in Subsection 1013-2.03 or 1013-2.04 of the specifications and shall be tested in accordance with ASTM D429, Method B. The shear modulus of the material shall be tested at 73 degrees F using the apparatus and procedure described in Annex A1 of ASTM D4014. The shear modulus shall fall within 15 percent of the specified value.

(B) Heat Resistance Tests on the Elastomer:

The elastomer shall satisfy the limits prescribed in Table 1013-1 for the change in durometer hardness, change in tensile strength, and change in ultimate elongation, as well as for compression set and ozone.

(C) Visual Inspection of the Finished Bearing:

Every finished bearing shall be inspected for compliance with dimensional tolerances and for overall quality of manufacturing.

(D) Short-Duration Compression Tests on Bearings:

The bearing shall be loaded in compression to 1.5 times its maximum design load. That load shall be held constant for five minutes, removed, and reapplied for another five minutes. The bearing shall be examined visually while under the second loading. If the bulging pattern suggests layer thickness or parallelism outside the specified tolerances or a poor laminate bond, the bearing shall be rejected. If there are three or more separate surface cracks greater than 0.08 inches wide and 0.08 inches deep, the bearing shall be rejected.

(E) Long-Duration Compression Tests on Bearings:

The bearing shall be loaded in compression to 1.5 times its maximum design load for a minimum period of 15 hours. If, during the test, the load falls below 1.3 times the maximum design load, the test duration shall be increased by the period of time for which the load is below this limit. The bearing shall be examined visually at the end of the test while it is still under load. If the bulging pattern suggests layer thickness or parallelism outside the specified tolerances or a poor laminate bond, the bearing shall be rejected. If there are three or more separate surface cracks greater than 0.08 inches wide and 0.08 inches deep, the bearing shall be rejected.

(F) Shear Modulus Tests on Material From Bearings:

The shear modulus of the material in the finished bearing shall be evaluated by testing a specimen cut from it using the apparatus and procedures described in Annex A1 of ASTM D4014, or, if directed by the Engineer, a comparable nondestructive stiffness test may be conducted on a pair of finished bearings. The shear modulus shall fall within 15 percent of the specified value. If the test is conducted on finished bearings, the material shear modulus shall be computed from the measured shear stiffness of the bearings, taking account of the influence on shear stiffness of bearing geometry and compressive load.

(G) Bond and Peel Strength Tests:

Cold bonding between individual laminated pads, if used, shall be tested in accordance with the requirements of California Test Method 663.

The peel strength test shall be performed in accordance with ASTM D429, Method B, for both fabric and steel reinforced pads.

1013-4 Installation:

Bearings shall be placed on surfaces that are plane to within 1/16 inch and horizontal to within 0.01 radians. Exterior plates of the bearing shall not be welded unless at least 1-1/2 inches of steel exists between the weld and the elastomer. In no case shall the elastomer or the bond be subjected to temperatures higher than 400 degrees F.

(1014GEOSYN, 07/18/24)

SECTION 1014 GEOSYNTHETICS:

1014-1 General Requirements: of the Standard Specifications is revised to read:

Certificates of Analysis, conforming to the requirements of Subsection 106.05 of the specifications, shall be submitted.

Geosynthetic materials, excluding biaxial geogrid, must be on the DataMine list for geotextiles and geosynthetics on the AASHTO Product Evaluation & Audit Solutions (formerly NTPEP) website. The product line evaluation report from AASHTO Product Evaluation & Audit Solutions (formerly NTPEP) shall be provided to the Engineer prior to use on the project.

Fibers, yarns, and filaments used in the manufacture of geotextile fabric, and the threads used in joining by sewing, shall consist of long-chain synthetic polymers, composed at least 95 percent, by weight, of polyolefins or polyesters. They shall be formed into a stable network such that the filaments or yarns retain their dimensional stability relative to each other, including selvages.

Geosynthetic materials shall be furnished in protective covers capable of protecting the materials from harmful environmental conditions such as ultraviolet rays, abrasion, extreme heat, and water. Storage of the materials shall be in a manner that prevents damage, contamination, or deterioration.

Geotextile fabric shall be resistant to chemical attack, rot, and mildew, and shall have no tears or defects which will adversely alter its physical properties.

All numeric values in the following tables, except for apparent opening size (AOS), represent minimum average roll values (MARV) in the weaker principal direction. Numeric values for (AOS) represent maximum average roll values.

Woven slit film geosynthetics will not be allowed for use in Subsections 1014-5, 1014-6, 1014-7, and 1014-9 of the specifications.

(1015EPOX, 02/16/23)

SECTION 1015 EPOXY MATERIALS: the title and text of the Standard Specifications is revised to read:

SECTION 1015 EPOXY RESIN ADHESIVES:

1015-1 General Requirements:

Certificates of Compliance, conforming to the requirements of Subsection 106.05 of the specifications, shall be submitted to the Engineer by the contractor for any epoxy resin

adhesives used on a specific project. Only those epoxy resin adhesives shown on the Department's Approved Products List (APL), or equal, will be allowed for use. Approved products may only be used in accordance with the limitations stated in the manufacturer's instructions, the APL, and the International Code Council Evaluation Service (ICC-ES) evaluation report for the product, if applicable. Copies of the most current version of the APL are available on the internet from the ADOT Research Center, through its Product Evaluation Program.

Epoxy resin adhesives shall be a two-component system that meets the requirements of ASTM C881, shall be furnished in the type, grade, and class specified, and shall meet all the requirements specified herein. For pre-packaged cartridge kits, the epoxy resin adhesive shall meet the requirements of ASTM C881 when mixed according to the manufacturer's instructions, utilizing the manufacturer's mixing nozzle. When a grade or class is not specified, an appropriate grade and class shall be selected for the particular application and approved by the Engineer. Epoxy resin adhesives for patching external concrete shall be gray in color.

All epoxy resin adhesives shall be resistant to the action of weathering, moisture, acids, alkalis, and other environmental factors.

The contractor shall submit product literature and Safety Data Sheets (SDS). The literature shall identify the recommended product use or applications for which it is intended, and the directions for use.

1015-1.01 Packaging, Labeling, and Storing:

Each component of epoxy resin adhesive shall be packaged in containers of size proportional to the amount of that component in the mix so that one container of each component is used in mixing one batch of epoxy resin adhesive.

The containers shall be of such design that all of the contents may be readily removed, and shall be well sealed to prevent leakage. The containers and labeling shall meet U.S. Department of Transportation Hazardous Material Shipping Regulations, and the containers shall be of a material, or lined with a material, of such character as to resist any action or breakdown by the components.

Each container shall be clearly labeled with the product type and identification code, component designation (A or B), manufacturer's name, date of manufacture, batch or lot number, all directions for use, and such warnings or precautions concerning the contents as may be required by State or Federal Laws and Regulations.

Epoxy resin adhesives shall be stored in accordance with the manufacturer's recommendations at all times. Attention is directed to the characteristic of some epoxy resin components to crystallize or thicken excessively prior to use when stored at temperatures below 35 degrees F. Any material which shows evidence of crystallization or a permanent increase in viscosity or settling of pigments which cannot be readily dispersed with a paddle shall not be used.

1015-1.02 Directions for Use:

Use of epoxy resin adhesives shall be in accordance with the manufacturer's recommendations unless otherwise specified by the Engineer. Use of epoxy resin adhesives shall be allowed for only those uses as shown on the ADOT Approved Products List.

At the time of mixing, the two components of the epoxy resin adhesive shall be at a temperature between 60 and 85 degrees F, unless otherwise specified or approved by the Engineer. Any heating of the epoxy resin components shall be done by application of indirect heat.

Immediately prior to mixing, each component shall be thoroughly mixed with a paddle, unless otherwise specified. Separate paddles shall be used to stir each component.

Immediately prior to use, the components of the epoxy resin adhesive shall be mixed together in the specified ratios according to the manufacturer's recommendations. When mixed, all epoxy resin adhesive shall have a uniform color without streaks. No solvent shall be added to any epoxy resin adhesive.

Surfaces on which the epoxy resin adhesive is to be placed shall be free of rust, paint, grease, asphalt and loose or otherwise deleterious materials. The surface shall be dry unless otherwise allowed according to the manufacturer's recommendations for use. Any overlay or inserted material which is to be bonded to the underlying surface shall be placed before thickening of the epoxy resin adhesive has begun.

When epoxy resin adhesive is used as a binder to make mortar, the components of the epoxy resin adhesive shall be thoroughly mixed together before the sand or fine aggregate is added. The type, gradation, and proportion of sand or fine aggregate added and mixed with the epoxy resin adhesive to make mortar shall be as specified or recommended by the manufacturer. The sand or fine aggregate moisture content shall not be more than 0.5 percent as determined in accordance with AASHTO T 265. All surfaces against which mortar is to be placed shall be primed with a coat of the epoxy resin adhesive just prior to placing the mortar.

1015-2 Anchoring Adhesives - Steel to Concrete:

Epoxy resin adhesive anchoring systems shall be used for bonding anchors and rebar dowels into hardened concrete or masonry. Applications shall be limited to horizontal and down hole orientations. Epoxy resin adhesives shall not be used in any overhead vertical application, or permanently sustained purely axial tension application.

The anchoring adhesive shall consist of a two component epoxy resin adhesive formula that is packaged in a dual-cylinder cartridge that can automatically combine the constituents in the proper proportions. Manual proportioning of the components shall not be used for anchoring applications. The adhesive shall not be used beyond the expiration date shown on the packaging.

For horizontal applications where flow out of the anchoring hole is a problem, high viscosity or non-sag anchoring adhesives shall be used. Low and medium viscosity anchoring adhesives may be utilized in down holes which open upward. The product shall only be used for the application and limitations for which it was designed according to the manufacturer's product literature. Post-installed anchoring adhesives shall be installed in accordance with the manufacturer's printed installation instructions (MPII). Installation of adhesive anchors shall be performed by personnel trained to install adhesive anchors.

(A) Structural Applications:

Structural applications are defined as those requiring the anchoring adhesive system to develop a minimum tensile and shear strength resistance to an applied load. Post-installed anchoring adhesives shall have been tested in accordance with ICC-ES Acceptance Criteria for Post-Installed Adhesive Anchors in Concrete (AC308), which incorporates the requirements found in ACI 355.4. A current ICC-ES evaluation report for the anchoring adhesive shall be submitted to the Engineer, who will review the conditions of use listed in the report before it is approved for use on a project. The conditions of use include limitations on base material temperature since higher temperatures affect adhesive bond tension and shear load strength. The anchoring adhesive shall only be used for the broad category (un-cracked concrete, cracked concrete, or masonry) for which it has been designated in the ICC-ES report.

Horizontal applications where a component of the applied load will be in sustained tension shall be installed by an individual who has a current ACI/CRSI Adhesive Anchor Installer Certification.

(B) Load Transfer Dowel and Tie-Bar Applications:

Applications for load transfer dowels and tie-bars are defined as those required to transfer load across joints in concrete slabs, walls and other concrete and masonry members. Epoxy resin adhesive shall meet the requirements of ASTM C881 Type IV. The anchors shall be installed, using the anchoring adhesive in the concrete or masonry member in strict accordance with the manufacturer's instructions. The anchoring adhesive shall only be used for the broad category (un-cracked concrete, cracked concrete, or masonry) for which it has been designated in the manufacturer's product literature.

1015-3 Concrete to Concrete Bonding Adhesives:

(C) General:

The grade of the epoxy resin adhesive system shall match the proposed use as identified in the product literature provided by the manufacturer. The product shall specifically be designed for this application according to the manufacturer's product literature. The pot life of the material shall be determined in accordance with AASHTO T 237, Part I.

(D) Hardened Concrete to Hardened Concrete

Epoxy resin base adhesive to be used for adhering or bonding hardened concrete to hardened concrete and other materials shall conform to the requirements of ASTM C881, Type I for non-load bearing applications and Type IV for load bearing applications.

(E) Hardened Concrete to Fresh Concrete

Epoxy resin base materials to be utilized for adhering or bonding freshly mixed concrete materials to hardened concrete, shall conform to the requirements of ASTM C881, Type II, for non-load bearing applications and Type V for load bearing applications.

1015-4 Epoxy Resin Adhesive for Mortar:

Epoxy resin adhesive to be used for binder in mortar, shall conform to the requirements of ASTM C881, Type I, for non-load bearing applications and Type IV for load bearing applications. The grade of the epoxy resin adhesive system shall match the proposed use as identified in the product literature provided by the manufacturer. The product shall specifically be designed for this application according to the manufacturer's product literature.

When epoxy resin adhesive is used as a binder to make mortar, the components of the epoxy resin adhesive shall be thoroughly mixed together before the sand or fine aggregate is added. The type, gradation, and proportion of sand or fine aggregate added and mixed with the epoxy resin adhesive to make mortar shall be as specified or recommended by the manufacturer. The sand or fine aggregate moisture content shall not be more than 0.5 percent as determined in accordance with AASHTO T 265. All surfaces against which mortar is to be placed shall be primed with a coat of the epoxy resin adhesive just prior to placing the mortar.

1015-5 Epoxy Resin Adhesive for Crack Repair:

Epoxy resin adhesive to be used for crack repair in concrete, shall be furnished as two components which shall be mixed together at or just before the point of injection.

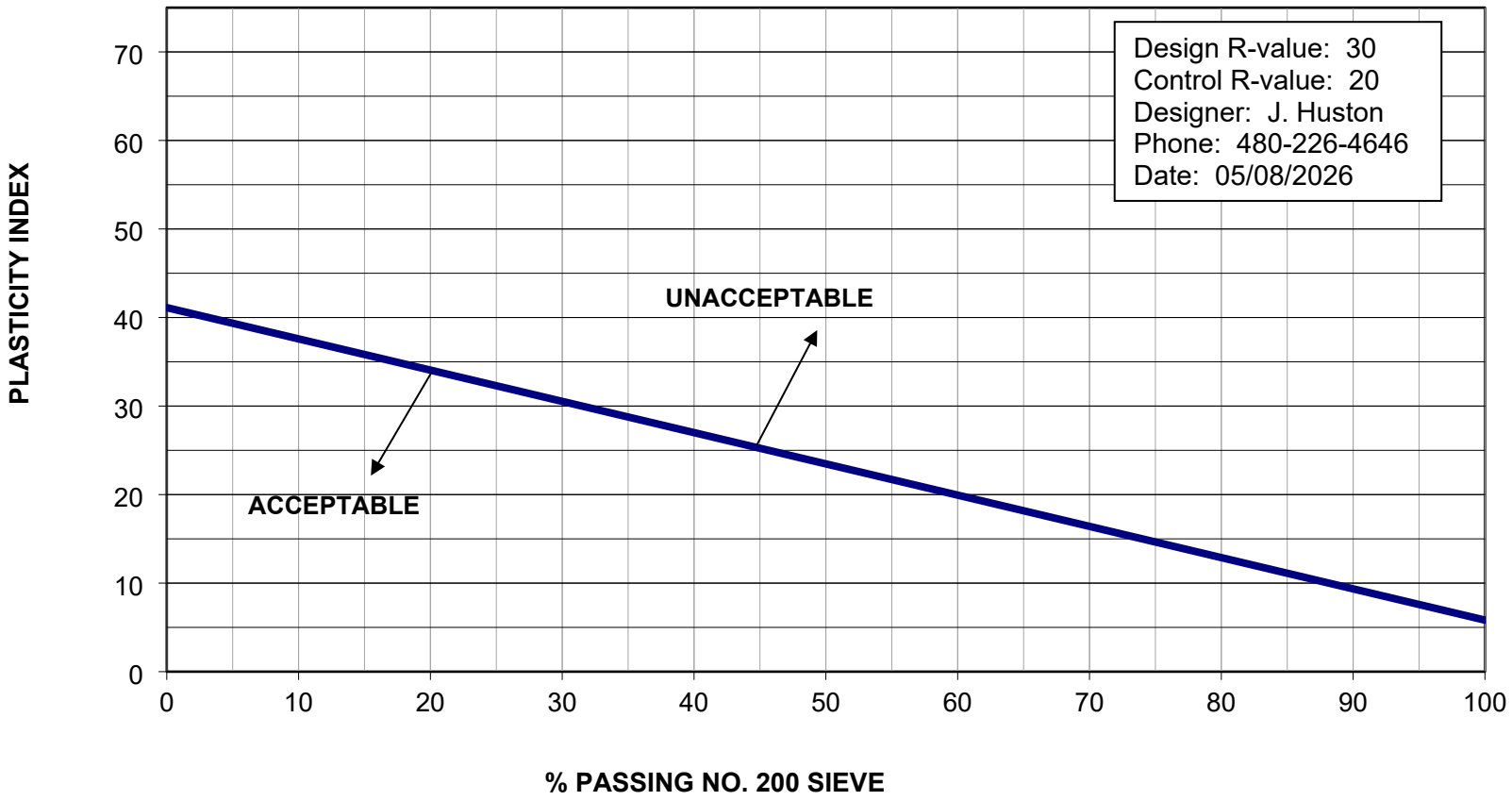
The epoxy resin adhesive shall conform to the requirements of ASTM C881, Type I, for use in non-load bearing applications and Type IV for use in load bearing applications. The grade of the epoxy resin adhesive system shall normally be Grade 1, low viscosity. Grade 2, medium viscosity epoxy adhesive systems may be used in larger width cracks. The product shall specifically be designed for this application according to the manufacturer's product literature.

Immediately prior to injection, usually at or near the injection tip, the two components shall be brought together as part of the injection process. The injection equipment and process utilized shall be in accordance with the manufacturer's recommendations. No solvents shall be utilized to thin the material.

Appendix A

Subgrade Acceptance Chart

FIGURE 2 - SUBGRADE ACCEPTANCE CHART



Appendix B

Guidelines for Handling Sonoran Desert Tortoises Encountered on Development Projects & Sonoran Desert Tortoise Awareness Program Handout

GUIDELINES FOR HANDLING SONORAN DESERT TORTOISES ENCOUNTERED ON DEVELOPMENT PROJECTS

Arizona Game and Fish Department
Revised September 22, 2014

The Arizona Game and Fish Department (Department) has developed the following guidelines to reduce potential impacts to desert tortoises, and to promote the continued existence of tortoises throughout the state. These guidelines apply to short-term and/or small-scale projects, depending on the number of affected tortoises and specific type of project.

The Sonoran desert tortoise occurs south and east of the Colorado River. Tortoises encountered in the open should be moved out of harm's way to adjacent appropriate habitat. If an occupied burrow is determined to be in jeopardy of destruction, the tortoise should be relocated to the nearest appropriate alternate burrow or other appropriate shelter, as determined by a qualified biologist. Tortoises should be moved less than 48 hours in advance of the habitat disturbance so they do not return to the area in the interim. Tortoises should be moved quickly, kept in an upright position parallel to the ground at all times, and placed in the shade. Separate disposable gloves should be worn for each tortoise handled to avoid potential transfer of disease between tortoises. Tortoises must not be moved if the ambient air temperature exceeds 40□Celsius (105□Fahrenheit) unless an alternate burrow is available or the tortoise is in imminent danger.

A tortoise may be moved up to one-half mile, but no further than necessary from its original location. If a release site or alternate burrow is unavailable within this distance, and ambient air temperature exceeds 40□Celsius (105□Fahrenheit), contact the Department for guidance. Tortoises salvaged from projects which result in substantial permanent habitat loss (e.g. housing and highway projects), or those requiring removal during long-term (longer than one week) construction projects, may be placed in the Department's tortoise adoption program. *Managers of projects likely to affect desert tortoises should obtain a scientific collecting license from the Department to facilitate handling or temporary possession of tortoises.* Likewise, if large numbers of tortoises (>5) are expected to be displaced by a project, the project manager should contact the Department for guidance and/or assistance.

Please keep in mind the following points:

- Use the Department's Environmental On-Line Review Tool Department during the planning stages of any project that may affect desert tortoise habitat.

- Unless specifically authorized by the Department, or as noted above, project personnel should avoid disturbing any tortoise.

- Take is prohibited by state law.

- These guidelines do not apply to Mojave desert tortoises (north and west of the Colorado River). Mojave desert tortoises are listed as threatened under the Endangered Species Act, administered by the U.S. Fish and Wildlife Service.

- These guidelines are subject to revision at the discretion of the Department.

Sonoran Desert Tortoise

Gopherus morafkai

Awareness Program Handout

Why does ADOT protect tortoises?

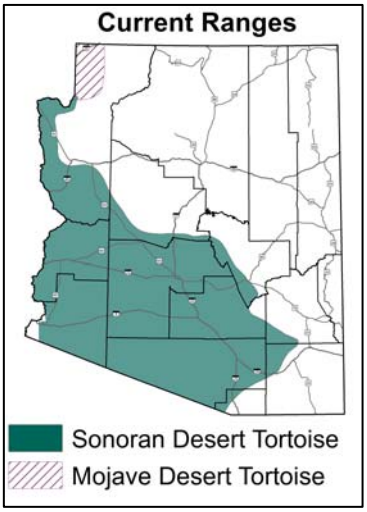
ADOT, along with the Arizona Game and Fish Department (AGFD) and several federal agencies, are signatory members of a Candidate Conservation Agreement (CCA) for the Sonoran Desert Tortoise (SDT). The CCA was developed to help preclude the listing of SDT under the Endangered Species Act. It is a cooperative effort to provide effective conservation for the SDT in Arizona. Under the agreement, ADOT has committed to enact avoidance, minimization, and mitigation measures for projects occurring within and adjacent to suitable habitat for SDT. This includes surveying proactively for tortoise habitat ahead of projects, collecting information on sightings, and training staff and contractors on methods to protect the tortoise during construction and maintenance work.

Legal Status

The SDT is protected under a CCA as described above. At the state level, wildlife are protected from collection and sale under Title 17 (ARS 17–309). AGFD classifies the SDT as a Tier 1A Species of Greatest Conservation Need and SDT are specifically restricted from collection under the AGFD Commission Rule R12-4-406.

Where are they found?

Two separate and distinct populations of desert tortoise occur in Arizona. The Mojave Desert Tortoise occurs west and north of the Colorado River within open, flat expanses of desert. The Sonoran Desert Tortoise occurs primarily in rocky and boulder strewn mountains and hills east of the Colorado River throughout western and central Arizona.



This handout applies ONLY to the Sonoran Desert Tortoise. Separate guidelines/measures are required for the Mojave Desert Tortoise due to its listing as Threatened under the Endangered Species Act.

THE GOAL IS TO AVOID NEGATIVE ENCOUNTERS!

How?

1. ALWAYS check under your vehicle and construction equipment **before** operating.
2. Drive slowly, especially on unpaved roads or off-road.
3. Cover any holes/pits/trenches at the end of each construction day.

Sonoran Desert Tortoise

Gopherus morafkai

Awareness Program Handout

If you encounter a tortoise:

1. Stop work immediately and turn off all equipment.
2. Notify your superintendent and the Resident Engineer.
3. Is the tortoise in imminent danger?

- **No**: Stay back at least 10 feet from the animal. Allow the animal to leave. PLEASE BE PATIENT!
  - If the animal is located within your work area and is not leaving in a timely manner, then move your operation to a different location at least 1,000 feet away.
- **Yes**: Move it out the way by following the attached AGFD "*Guidelines for Handling Sonoran Desert Tortoises Encountered on Development Projects*" dated September 22, 2014.
  - Tortoises should be moved less than 48 hours in advance of the habitat disturbance so they do not return to the area in the interim.
  - Tortoises should be moved quickly, kept in an upright position parallel to the ground at all times, and placed in the shade.
  - Separate disposable gloves should be worn for each tortoise handled to avoid potential transfer of disease between tortoises.
  - Tortoises must not be moved if the ambient air temperature exceeds 40°C (105°F) unless an alternate burrow is available or the tortoise is in imminent danger.
  - A tortoise may be moved up to one-half mile, but no further than necessary from its original location.

---If you don't know or are unsure of what to do, ASK!---

4. Fill out the attached ADOT Sonoran Desert Tortoise Observation Form and submit to the ADOT Biology Team (jfife@azdot.gov) within 24 hours of any encounter. Photograph the animal if possible.

If you encounter a **sick, dying, injured, or dead tortoise** or if the ambient air temperature exceeds 105° F, please contact Joshua Fife (602.622.9622) immediately with the location of the animal. These animals will be collected either by trained ADOT personnel or by AGFD.

If you observe poaching, collecting, selling, or any other illegal activities, contact AGFD's OPERATION GAME THIEF at **1-800-352-0700,** 24 hours a day or on the internet at http://www.azgfd.gov/ogt.shtml

Additional information for SDT life history and habitat requirements is available at:
Arizona Game and Fish Department:
https://www.azgfd.com/wildlife/nongamemanagement/tortoise/
US Fish and Wildlife Service:
https://www.fws.gov/southwest/es/arizona/Sonoran_Tort.htm

Arizona Department of Transportation
Sonoran Desert Tortoise Observation Form

Date of Observation

Time

Observed By

Location- Route

Location- Milepost

ADOT District

Description of Encounter

Photo(s)

GPS (if available)

Email completed form
to: ADOT Biology Team
jfife@azdot.gov

Appendix C

Slump Loss 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)

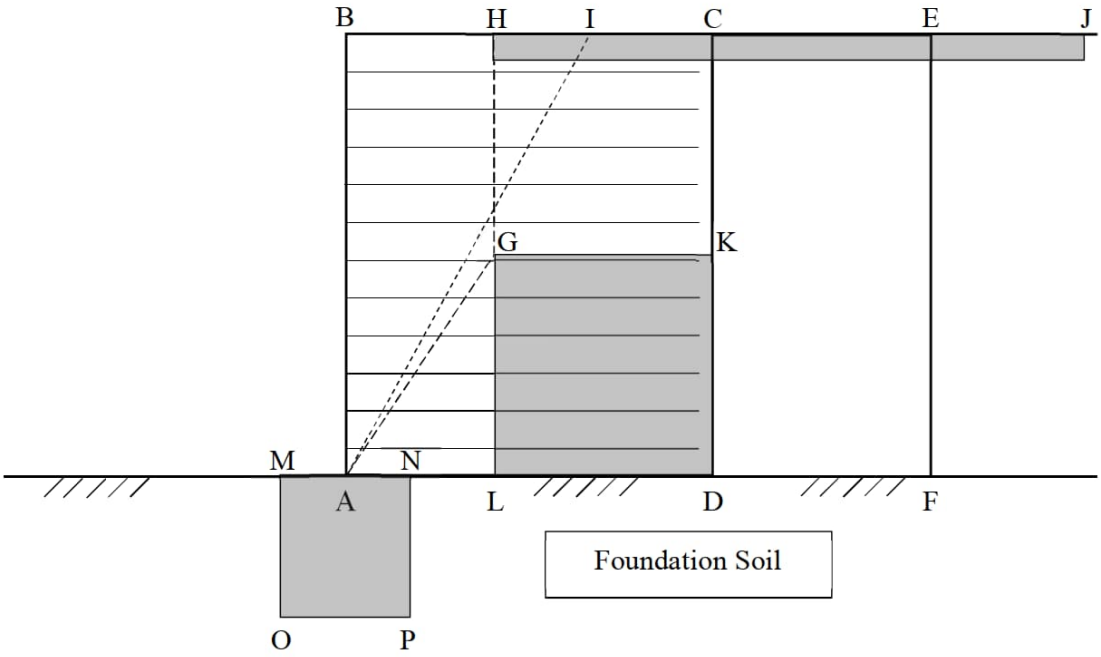
The graphical form shall depict time versus each of the tests performed. The contractor shall also submit the type (hole, form or suitable container) and its respective dimensions used for the simulated in place testing.

The Engineer may require additional testing after review of the results.

Appendix D

MSE Wall Compound Stability Search Zone Locations to Verify the Most Critical Failure Case for an MSE Wall with Level Backfill.

MSE Wall Compound Stability Search Zone Locations to Verify the Most Critical Failure Case for an MSE Wall with Level Backfill.



Where:

AB = Wall Height = h, where A is at the Bottom of the Leveling Pad and B is at the Top of the Wall

ABCD = Reinforced Soil Zone

DCEF = Retained Soil Zone

To the Right of Plane EF = Common Embankment Fill

AGH = Failure Surface for Internal Stability Design of MSE Walls with Inextensible Reinforcements

AI = Failure Surface for Internal Stability Design of MSE Walls with Extensible Reinforcements

OMNP = Search Zone 1 (Search Area At and Below the Toe of the MSE Wall).

Search Zone Limits:

Search Zone Height (OM = NP) = A Minimum of h/2 or 5 feet, whichever is Greater

Search Zone Width (MN = OP) = A Minimum of 10 feet Centered Around Point A

LGKD = Search Zone 2 (Search Area in Reinforced Soil Zone of the MSE Wall).

Search Zone Limits:

Search Zone Height (LG = KD) = A Minimum of h/2

Search Zone Width (GK = LD) = A Minimum of the Reinforcement Length within the Resistance Zone of the Reinforced Soil Zone at the Middle Elevation of the Wall Height (i.e., the Reinforcement Length Beyond the Failure Surface for Internal Stability Design at the Middle Elevation of the Wall Height)

HJ or IJ = Search Zone 3 (Search Area Near the Top of the MSE Wall). HJ is Applicable to Inextensible Reinforcements. IJ is Applicable to Extensible Reinforcements.

Search Zone Limits:

Search Zone Width (HJ or IJ) = A Minimum Distance Beyond the Reinforced Soil Zone Equivalent to the Wall Height, h

REQUIRED CONTRACT PROVISIONS
FEDERAL-AID CONSTRUCTION CONTRACTS

I. General
II. Nondiscrimination
III. Non-segregated Facilities
IV. Davis-Bacon and Related Act Provisions
V. Contract Work Hours and Safety Standards Act Provisions
VI. Subletting or Assigning the Contract
VII. Safety: Accident Prevention
VIII. False Statements Concerning Highway Projects
IX. Implementation of Clean Air Act and Federal Water Pollution Control Act
X. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion
XI. Certification Regarding Use of Contract Funds for Lobbying
XII. Use of United States-Flag Vessels:

ATTACHMENTS

A. Employment and Materials Preference for Appalachian Development Highway System or Appalachian Local Access Road Contracts (included in Appalachian contracts only)

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: AZ20260049 05/18/2026

State: Arizona

Construction Types: Highway

Counties: Arizona Counties of
Yavapai

Modification Number	Publication Date
0	01/02/2026
1	05/18/2026

CARP1912-002 07/01/2024

	Rates	Fringes
CARPENTER	$ 35.89	14.98

ENGI0012-046 12/01/2024

	Rates	Fringes
POWER EQUIPMENT OPERATOR: BULLDOZER	$ 35.56	18.12

ENGI0012-051 12/01/2024

	Rates	Fringes
POWER EQUIPMENT OPERATOR: PAVER/SPREADER/FINISH EQUIPMENT (ASPHALT, AGGREGATE, & CONCRETE)	$ 35.56	18.12

ENGI0012-052 12/01/2024

	Rates	Fringes

POWER EQUIPMENT OPERATOR: SCRAPER.....$ 35.56
18.12

ENGI0012-053 12/01/2024

Rates
Fringes
POWER EQUIPMENT OPERATOR: TRACTOR.....$ 35.56
18.12

ENGI0012-057 12/01/2024

Rates
Fringes
POWER EQUIPMENT OPERATOR: (DRILL RIG/AUGER).....$ 36.64
18.12

ENGI0012-064 12/01/2024

Rates
Fringes
POWER EQUIPMENT OPERATOR: BOBCAT/SKID STEER/SKID
LOADER.....$ 32.29
18.12

ENGI0012-066 12/01/2024

Rates
Fringes
POWER EQUIPMENT OPERATOR: BACKHOE/BACKHOE & LOADER
COMBO/TRACK BACKHOE.....$ 35.56
18.12

ENGI0012-067 12/01/2024

Rates
Fringes
POWER EQUIPMENT OPERATOR: COMPACTOR/ROLLER.....$ 35.56
18.12

ENGI0012-069 12/01/2024

Rates
Fringes
POWER EQUIPMENT OPERATOR: LOADER/FRONT END LOADER...$ 35.56
18.12

ENGI0012-070 12/01/2024

	Rates	Fringes
TRUCK DRIVER: OFF ROAD TRUCK	$ 35.56	18.12

ENGI0012-071 12/01/2024

	Rates	Fringes
POWER EQUIPMENT OPERATOR: CRANE/DERRICK	$ 36.64	18.12

ENGI0012-072 12/01/2024

	Rates	Fringes
POWER EQUIPMENT OPERATOR: EXCAVATOR/TRACKHOE (GREATER THAN 1/2 CUBIC YARD)	$ 36.64	18.12
POWER EQUIPMENT OPERATOR: EXCAVATOR/TRACKHOE (1/2 CUBIC YARD OR SMALLER)	$ 35.56	18.12

ENGI0012-074 12/01/2024

	Rates	Fringes
POWER EQUIPMENT OPERATOR: MOTOR GRADER/BLADE	$ 36.64	18.12

ENGI0012-075 12/01/2024

	Rates	Fringes
POWER EQUIPMENT OPERATOR: MECHANIC	$ 37.67	18.12

LABO1184-016 06/01/2025

	Rates	Fringes
POWER EQUIPMENT OPERATOR: HORIZONTAL DIRECTIONAL DRILL	$ 31.98	9.26

LABO1184-017 06/01/2025

	Rates	Fringes
LABORER: FENCE ERECTOR	$ 27.41	9.26

LABO1184-018 06/01/2025

	Rates	Fringes
LABORER: GRADE SETTER	$ 27.41	9.26

LABO1184-021 06/01/2025

	Rates	Fringes
TRAFFIC CONTROL	$ 27.41	9.26

LABO1184-025 06/01/2025

	Rates	Fringes
LABORER: ASPHALT, INCLUDES RAKER, SHOVELER, SPREADER AND DISTRIBUTOR	$ 29.91	9.26

LABO1184-033 06/01/2025

	Rates	Fringes
POWER EQUIPMENT OPERATOR: TRENCHER	$ 30.88	9.26

LABO1184-039 06/01/2025

	Rates	Fringes
LABORER: GENERAL	$ 27.41	9.26

LABO1184-041 06/01/2025

	Rates	Fringes
LABORER: MASON TENDER	$ 27.41	9.26

LABO1184-044 06/01/2025

	Rates	Fringes
POWER EQUIPMENT OPERATOR: FORKLIFT	$ 30.88	9.26

LABO1184-047 06/01/2025

	Rates	Fringes
TRUCK DRIVER: CONCRETE	$ 30.88	9.26

LABO1184-048 06/01/2025

	Rates	Fringes
TRUCK DRIVER: DUMP	$ 30.88	9.26

LABO1184-049 06/01/2025

	Rates	Fringes
TRUCK DRIVER: WATER	$ 30.88	9.26

SUAZ2023-026 11/19/2024

	Rates	Fringes
TRUCK DRIVER: SWEEPER	$ 20.24	5.48
TRUCK DRIVER: OIL DISTRIBUTOR	$ 29.75	8.04
POWER EQUIPMENT OPERATOR: OILER	$ 31.56	10.69
POWER EQUIPMENT OPERATOR: MILLING MACHINE	$ 30.09	6.45
POWER EQUIPMENT OPERATOR: GRADE CHECKER	$ 29.74	13.07
POWER EQUIPMENT OPERATOR: FIELD EQUIPMENT SERVICEPERSON	$ 35.39	11.50
POWER EQUIPMENT OPERATOR: CONCRETE SCREED	$ 25.70	7.15

POWER EQUIPMENT OPERATOR: CONCRETE PUMP TRUCK.....$ 43.11
10.87
POWER EQUIPMENT OPERATOR: BROOM/SWEEPER.....$ 26.47
7.26
POWER EQUIPMENT OPERATOR: BOOM/CRANE TRUCK.....$ 43.11
10.87
PAINTER: SIGN AND DISPLAY ERECTOR.....$ 18.03
0.00
PAINTER: PAVEMENT MARKING.....$ 24.60
6.34
LABORER: PIPELAYER.....$ 25.85
7.09
LABORER: LANDSCAPE LABORER.....$ 18.03
0.00
LABORER: CONCRETE SAW (HAND HELD/WALK BEHIND).....$ 25.22
5.08
IRONWORKER.....$ 33.15
18.57
ELECTRICIAN.....$ 29.00
7.58
CEMENT MASON/CONCRETE FINISHER.....$ 30.09
0.00

WELDERS - Receive rate prescribed for craft performing
operation to which welding is incidental.
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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.

Note: Executive Order 13658 generally applies to contracts subject to the Davis-Bacon Act that were awarded on or between January 1, 2015 and January 29, 2022, and that have not been renewed or extended on or after January 30, 2022. Executive Order 13658 does not apply to contracts subject only to the Davis-Bacon Related Acts regardless of when they were awarded. If a contract is subject to Executive Order 13658, the contractor must pay all covered workers at least $13.65 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract from May 11, 2026, through December 31, 2026. The applicable Executive Order minimum wage rate will be adjusted annually. Additional information on contractor requirements and worker protections under Executive Order 13658 is available at www.dol.gov/whd/govcontracts.

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.

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END OF GENERAL DECISION

"

ARIZONA DEPARTMENT OF TRANSPORTATION
PROJECT DELIVERY AND OPERATIONS DIVISION
CONTRACTS AND SPECIFICATIONS GROUP

BID SCHEDULE

CONTRACT # 2026028

TRACS No.	Project No.	Item	County	District	Gross Length	Net Length	Prepared By:
093 YV 189 F073801C	093-B-(230)T	103024	YAVAPAI	NORTHWEST	4.7		Zarghami Ata

Highway Termini	Location	Work Description
• KINGMAN – WICKENBURG HIGHWAY (US 93)	• WICKENBURG RANCH WAY TO VISTA	• New Facilities (Construction of New Roads)

BID SCHEDULE

093 YV 189 F073801C

Item No.	Item Description	Unit	Quantity	Unit Price	Extended Amount
2010011	CLEARING AND GRUBBING	ACRE	135		
2020019	REMOVAL OF EMBANKMENT CURB	L.FT.	1,814		
2020020	REMOVAL OF CONCRETE CURB	L.FT.	544		
2020025	REMOVAL OF CONCRETE SIDEWALKS, DRIVEWAYS AND SLABS	SQ.FT.	1,335		
2020029	REMOVAL OF ASPHALTIC CONCRETE PAVEMENT	SQ.YD.	74,313		
2020041	REMOVAL OF PIPE	L.FT.	1,400		
2020047	REMOVAL OF SIGNS	EACH	138		
2020051	REMOVE (SPILLWAY OUTLET)	CU.YD.	1		
2020052	REMOVE (SPILLWAY)	L.FT.	46		
2020053	REMOVE (DOWNDRAIN INLET)	EACH	2		
2020054	REMOVE (GUARDRAIL END TERMINAL)	EACH	9		
2020071	REMOVE GUARD RAIL	L.FT.	3,973		
2020072	REMOVE AND SALVAGE GUARD RAIL	L.FT.	450		
2020083	REMOVE BITUMINOUS PAVEMENT (MILLING) (2")	SQ.YD.	27,228		
2020084	REMOVE BITUMINOUS PAVEMENT (MILLING) (2 1/2")	SQ.YD.	42,575		

BID SCHEDULE

093 YV 189 F073801C

Item No.	Item Description	Unit	Quantity	Unit Price	Extended Amount
2020085	REMOVE BITUMINOUS PAVEMENT (MILLING) (3")	SQ.YD.	612		
2020115	REMOVE (DELINEATOR)	EACH	61		
2020116	REMOVE (HEADWALL)	EACH	5		
2020117	REMOVE (SPILLWAY INLET)	EACH	3		
2020118	REMOVE (GUARDRAIL END ANCHOR)	EACH	1		
2020120	REMOVE (BARBED WIRE FENCE)	L.FT.	15,743		
2020121	REMOVE (CHAIN LINK FENCE)	L.FT.	364		
2020122	REMOVE (PIPE RAIL FENCE)	L.FT.	4,251		
2020123	REMOVE (RAIL BANK)	L.FT.	25		
2020153	REMOVE (REINFORCED CONCRETE BOX CULVERT)(DETAIL D1)	L.SUM	1		
2020155	REMOVE (SIGN PANEL)	EACH	3		
2020156	REMOVE (CATTLE GUARD)	EACH	3		
2020159	REMOVE (CATCH BASIN)	EACH	6		
2020173	REMOVE (MAILBOX)	EACH	1		
2020183	REMOVE (GATE)	EACH	13		

BID SCHEDULE

093 YV 189 F073801C

Item No.	Item Description	Unit	Quantity	Unit Price	Extended Amount
2020185	REMOVE (BRIDGE BARRIER TRANSITION)	EACH	4		
2020350	REMOVE (WOODY VEGETATION)	ACRE	7		
2030112	SHOULDER BUILD-UP (MILLED AC)	L.FT.	13,600		
2030113	SHOULDER BUILD-UP (COMPACTION)	HOUR	48		
2030301	ROADWAY EXCAVATION	CU.YD.	270,022		
2030401	DRAINAGE EXCAVATION	CU.YD.	59,400		
2080001	SEPARATION GEOTEXTILE FABRIC	SQ.YD.	7,172		
3030022	AGGREGATE BASE, CLASS 2	CU.YD.	61,252		
3030023	AGGREGATE BASE, CLASS 3	CU.YD.	141		
3060001	GEOGRID BASE REINFORCEMENT	SQ.YD.	7,172		
4040073	EMULSIFIED ASPHALT (CRS-2P)	TON	2		
4040111	BITUMINOUS TACK COAT	TON	125		
4040116	APPLY BITUMINOUS TACK COAT	HOUR	222		
4040125	FOG COAT	TON	1		
4040159	COVER MATERIAL	SQ.YD.	555		

Item No.	Item Description	Unit	Quantity	Unit Price	Extended Amount
4040165	BLOTTER MATERIAL	SQ.YD.	555		
4040230	ASPHALT BINDER (PG 76-22 PM) (SMA)	TON	1,237		
4090006	ASPHALTIC CONCRETE (MISCELLANEOUS STRUCTURAL) (SPECIAL MIX)	TON	2,701		
4160024	ASPHALTIC CONCRETE MIX (3/4")(END PRODUCT)(SPECIAL)	TON	64,613		
5010007	PIPE, CORRUGATED METAL, 18"	L.FT.	49		
5010011	PIPE, CORRUGATED METAL, 24"	L.FT.	849		
5010017	PIPE, CORRUGATED METAL, 30"	L.FT.	39		
5010025	PIPE, CORRUGATED METAL, 36"	L.FT.	214		
5010030	PIPE, CORRUGATED METAL, 42"	L.FT.	281		
5010035	PIPE, CORRUGATED METAL, 48"	L.FT.	636		
5010204	PIPE, CORRUGATED METAL, 28" X 20"	L.FT.	191		
5010211	PIPE, CORRUGATED METAL, 42" X 29"	L.FT.	216		
5010212	PIPE, CORRUGATED METAL, 49" X 33"	L.FT.	196		
5012518	STORM DRAIN PIPE, 18"	L.FT.	954		

BID SCHEDULE

093 YV 189 F073801C

Item No.	Item Description	Unit	Quantity	Unit Price	Extended Amount
5012524	STORM DRAIN PIPE, 24"	L.FT.	2,002		
5012536	STORM DRAIN PIPE 36"	L.FT.	1,180		
5012542	STORM DRAIN PIPE, 42"	L.FT.	244		
5014018	FLARED END SECTION, 18" (C-13.25)	EACH	2		
5014024	FLARED END SECTION, 24" (C-13.25)	EACH	14		
5014030	FLARED END SECTION, 30" (C-13.25)	EACH	1		
5014228	FLARED END SECTION, 28" X 20" (C-13.25)	EACH	2		
5014518	FLARED END SECTION, 18" (C-13.20 OR C-13.25)	EACH	6		
5014524	FLARED END SECTION, 24" (C-13.20 OR C-13.25)	EACH	8		
5014536	FLARED END SECTION, 36" (C-13.20 OR C-13.25)	EACH	12		
5030021	CONCRETE CATCH BASIN (C-15.20) ONE 3.5' WING, H=8' OR LESS	EACH	3		
5030023	CONCRETE CATCH BASIN (C-15.20) ONE 7.5' WING, H=8' OR LESS	EACH	4		
5030025	CONCRETE CATCH BASIN (C-15.20) ONE 11.5' WING, H=8' OR LESS	EACH	1		
5030031	CONCRETE CATCH BASIN (C-15.20) SUMP ONLY, H=8' OR LESS	EACH	4		

BID SCHEDULE

093 YV 189 F073801C

Item No.	Item Description	Unit	Quantity	Unit Price	Extended Amount
5030070	CONCRETE CATCH BASIN (C-15.30) SINGLE, H=8' OR LESS	EACH	4		
5030142	CONCRETE CATCH BASIN (MEDIAN) (C-15.80)	EACH	12		
5030604	CONCRETE CATCH BASIN (C-15.90)	EACH	7		
5030606	CONCRETE CATCH BASIN (DETAIL DT)	EACH	4		
5030607	CONCRETE CATCH BASIN (DETAIL DG)	EACH	2		
5030608	CONCRETE CATCH BASIN (DETAIL DI)	EACH	2		
5030609	CONCRETE CATCH BASIN (C-15.81)	EACH	2		
5030610	CONCRETE CATCH BASIN (DETAIL DU)	EACH	1		
5030611	CONCRETE CATCH BASIN (DETAIL DF)	EACH	3		
5030613	CONCRETE CATCH BASIN (C-15.75) (DOUBLE)	EACH	1		
5030702	JUNCTION STRUCTURE (DETAIL DJ)	EACH	3		
5050013	MANHOLE (C 18.10) (FOR PIPES 6" TO 36")	EACH	7		
6010508	BRIDGE REPAIR (TIGHTEN SPLICE BOLTS)	L.SUM	1		
6011190	REPLACE BRIDGE DECK JOINT SEAL (3x3 COMPRESSION SEAL)	L.FT.	96		

BID SCHEDULE

093 YV 189 F073801C

Item No.	Item Description	Unit	Quantity	Unit Price	Extended Amount
6016088	HEADWALL (24") (SD 6.30)	EACH	4		
6016089	HEADWALL (42") (SD 6.30)	EACH	1		
6016090	HEADWALL (2-36") (SD 6.30)	EACH	1		
6016091	HEADWALL (2-42") (SD 6.30)	EACH	2		
6016092	HEADWALL (2-42"x29") (SD 6.30)	EACH	1		
6016093	HEADWALL (2-49"x33") (SD 6.30)	EACH	1		
6016095	HEADWALL (3-36") (OUTLET) (DETAIL DH)	EACH	1		
6016096	HEADWALL (48") (SD 6.30)	EACH	1		
6016097	HEADWALL (3-48") (SD 6.30)	EACH	2		
6016099	HEADWALL (48") (DETAIL DW)	EACH	1		
6070002	BREAKAWAY SIGN POST S4X7.7	L.FT.	20		
6070004	BREAKAWAY SIGN POST W6X12	L.FT.	202		
6070006	BREAKAWAY SIGN POST W8X18	L.FT.	108		
6070022	FOUNDATION FOR BREAKAWAY SIGN POST S4X7.7	EACH	2		
6070024	FOUNDATION FOR BREAKAWAY SIGN POST W6X12	EACH	13		

Item No.	Item Description	Unit	Quantity	Unit Price	Extended Amount
6070026	FOUNDATION FOR BREAKAWAY SIGN POST W8X18	EACH	6		
6070038	SLIP BASE	EACH	151		
6070054	SIGN POST (PERFORATED) (2 S)	L.FT.	44		
6070055	SIGN POST (PERFORATED) (2 1/2 S)	L.FT.	723		
6070057	SIGN POST (PERFORATED) (2 1/2 T)	L.FT.	1,357		
6070060	FOUNDATION FOR SIGN POST (CONCRETE)	EACH	167		
6080005	REGULATORY, WARNING, OR MARKER SIGN PANEL	SQ.FT.	1,042		
6080018	EXTRUDED ALUMINUM SIGN PANEL	SQ.FT.	1,157		
6080025	FLAT SHEET ALUMINUM SIGN PANEL	SQ.FT.	162		
6080055	SIGN PANEL (RELOCATE)	EACH	4		
6110200	METAL HANDRAIL (DETAIL DO)	L.FT.	429		
7010025	TEMPORARY IMPACT ATTENUATION DEVICE (IN-LINE ENERGY ABSORBING TERM.)	EACH	57		
7010026	TEMPORARY IMPACT ATTENUTION DEVICE (IN-LINE ENERGY ABSORBING TERM.) (IN USE)	EACH-DAY	8,473		
7015010	TEMPORARY CONCRETE BARRIER (INSTALLATION AND REMOVAL)	L.FT.	16,414		

BID SCHEDULE

093 YV 189 F073801C

Item No.	Item Description	Unit	Quantity	Unit Price	Extended Amount
7015036	TEMPORARY PREFORMED MARKING (ARROW, SYMBOL OR LEGEND)	EACH	8		
7015052	OBLITERATE PAVEMENT MARKING (STRIPE)	L.FT.	40,037		
7015091	SPECIALTY SIGNS	SQ.FT.	110		
7016020	TEMPORARY CONCRETE BARRIER (IN USE)	L.FT.-DAY	2,256,688		
7016030	BARRICADE (TYPE 1, TYPE 2, VERT.PANEL, TUBULAR MARKER)	EACH-DAY	293,961		
7016031	BARRICADE (TYPE 3, HIGH LEVEL FLAG TREE)	EACH-DAY	2,979		
7016032	PORTABLE SIGN STAND (RIGID)	EACH-DAY	3,469		
7016033	PORTABLE SIGN STAND (SPRING TYPE)	EACH-DAY	22,145		
7016035	WARNING LIGHT (TYPE A)	EACH-DAY	41,854		
7016037	WARNING LIGHT (TYPE C)	EACH-DAY	291,217		
7016039	EMBEDDED SIGN POST	EACH-DAY	27,170		
7016050	TRUCK-MOUNTED ATTENUATOR	EACH-DAY	939		
7016051	TEMPORARY SIGN (LESS THAN 10 S.F.)	EACH-DAY	16,485		
7016052	TEMPORARY SIGN (10 S.F. OR MORE)	EACH-DAY	24,461		

BID SCHEDULE

093 YV 189 F073801C

Item No.	Item Description	Unit	Quantity	Unit Price	Extended Amount
7016061	FLASHING ARROW PANEL	EACH-DAY	263		
7016067	CHANGEABLE MESSAGE BOARD (CONTRACTOR FURNISHED)	EACH-DAY	1,942		
7016071	PILOT VEHICLE WITH DRIVER	HOUR	72		
7016075	FLAGGING SERVICES (CIVILIAN)	HOUR	1,120		
7016081	FLAGGING SERVICES (DPS)	HOUR	621		
7016082	FLAGGING SERVICES (LOCAL ENFORCEMENT OFFICER)(WITH AGENCY VEHICLE)	HOUR	621		
7017030	SEQUENTIAL FLASHING WARNING LIGHT	EACH-DAY	1,796		
7030080	OBJECT MARKER (M-23) (TYPE 3)	EACH	14		
7030084	OBJECT MARKER (M-23) (TYPE 1 OR 4)	EACH	5		
7030095	MILEPOST MARKER (S-10)	EACH	10		
7040005	PAVEMENT MARKING (WHITE EXTRUDED THERMOPLASTIC) (0.090")	L.FT.	130,294		
7040006	PAVEMENT MARKING (YELLOW EXTRUDED THERMOPLASTIC) (0.090")	L.FT.	91,635		
7040072	PAVEMENT MARKING (TRANSVERSE) (THERMOPLASTIC) (ALKYD) (0.090")	L.FT.	144		

BID SCHEDULE

093 YV 189 F073801C

Item No.	Item Description	Unit	Quantity	Unit Price	Extended Amount
7050060	PAVEMENT MARKING, PREFORMED, LEGEND, TYPE IV	EACH	13		
7050062	PAVEMENT MARKING, PREFORMED, WHITE STRIPE, TYPE IV	L.FT.	454		
7050067	PAVEMENT MARKING, PREFORMED, SYMBOL, TYPE IV	EACH	46		
7050069	PAVEMENT MARKING, PREFORMED, TRANSVERSE, TYPE IV	L.FT.	2,715		
7060013	PAVEMENT MARKER, RAISED, TYPE C	EACH	1,262		
7060017	PAVEMENT MARKER, RAISED, TYPE E	EACH	176		
7080201	WATERBORNE-TYPE I PAVEMENT MARKING (PAINTED) (WHITE)	L.FT.	90,998		
7080202	WATERBORNE-TYPE I PAVEMENT MARKING (PAINTED) (YELLOW)	L.FT.	61,085		
7080203	WATERBORNE-TYPE I PAVEMENT MARKING (PAINTED) (WHITE OR YELLOW)	L.FT.	137,935		
7080204	WATERBORNE-TYPE I PAVEMENT MARKING (PAINTED SYMBOL)	EACH	46		
7080208	WATERBORNE-TYPE I PAVEMENT MARKING (PAINTED LEGEND) (ONLY)	EACH	13		
7080301	PAINT BULL NOSE	EACH	5		

Item No.	Item Description	Unit	Quantity	Unit Price	Extended Amount
7310092	POLE (TYPE H) (ALUMINUM, BREAKAWAY BASE)	EACH	43		
7310197	BREAKAWAY BASE FOR LIGHTING POLE OR SIGNAL FLASHER	EACH	2		
7310201	BREAKAWAY BASE FOR LIGHTING POLES (OVER 30')	EACH	43		
7310276	POLE FOUNDATION (TYPE H) (BREAKAWAY)	EACH	43		
7310650	MAST ARM (10 FT.) (ALUMINUM)	EACH	43		
7320040	ELECTRICAL CONDUIT (1 1/2") (PVC)	L.FT.	120		
7320050	ELECTRICAL CONDUIT (2") (PVC)	L.FT.	7,430		
7320060	ELECTRICAL CONDUIT (2 1/2") (PVC)	L.FT.	120		
7320456	PULL BOX (NO. 4B)	EACH	46		
7320459	PULL BOX (NO. 6B)	EACH	3		
7320476	JUNCTION BOX (TYPE II)	EACH	2		
7320500	CONDUCTOR (NO. 12)	L.FT.	6,470		
7320510	CONDUCTOR (NO. 10)	L.FT.	2,500		
7320520	CONDUCTOR (NO. 8)	L.FT.	12,830		
7320530	CONDUCTOR (NO. 6)	L.FT.	3,700		

Item No.	Item Description	Unit	Quantity	Unit Price	Extended Amount
7320570	CONDUCTOR (NO. 1)	L.FT.	102		
7320581	CONDUCTOR (BARE BOND) (NO.6)	L.FT.	40		
7320586	CONDUCTOR (NO.8)	L.FT.	7,280		
7330410	POLE FLASHER	EACH	2		
7350021	LOOP DETECTOR (SPEED/CLASSIFICATION)	EACH	1		
7350040	LOOP DETECTOR (SPEED/CLASSIFICATION) (RELOCATE)	EACH	1		
7360105	LUMINAIRE (HORIZONTAL MOUNT) (25L) (LED)	EACH	18		
7360112	LUMINAIRE (HORIZONTAL MOUNT) (15L) (LED)	EACH	25		
7360235	LOAD CENTER CABINET (TYPE II) (120/240V METERED)	EACH	2		
7360240	LOAD CENTER CABINET FOUNDATION	EACH	2		
7370452	MISCELLANEOUS ELECTRICAL (RECORD DRAWINGS)	L.SUM	1		
8030092	GRANITE MULCH (1 1/4 MINUS)	SQ.YD.	12,792		
8050003	SEEDING (CLASS II)	ACRE	74		
8061626	CACTUS (BARREL)	EACH	21		
8061630	CACTUS (BUCKHORN)	EACH	89		

BID SCHEDULE

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Item No.	Item Description	Unit	Quantity	Unit Price	Extended Amount
8061632	CACTUS (FISHHOOK PINCUSHION)	EACH	1		
8061633	CACTUS (DESERT CHRISTMAS CACTUS)	EACH	4		
8061634	CACTUS (PANCAKE PRICKLY PEAR)	EACH	9		
8061635	CACTUS (DESERT PRICKLY PEAR)	EACH	6		
8061636	CACTUS (ARIZONA QUEEN OF THE NIGHT)	EACH	1		
8061637	CACTUS (SOAPTREE YUCCA)	EACH	2		
8061639	CACTUS (BANANA YUCCA)	EACH	54		
8061656	OCOTILLO (OVER 8' IN HEIGHT)	EACH	1		
8070011	LANDSCAPING ESTABLISHMENT (	MONTH	12		
8080006	WATER DISTRIBUTION SYSTEM	L.SUM	1		
8101005	EROSION CONTROL (CHECK DAM) (CHECK DAM) (DETAIL ES5)	CU.YD.	528		
8101016	EROSION CONTROL (ROCK MULCH)	CU.YD.	480		
8101018	EROSION CONTROL (STABILIZED CONSTRUCTION ENTRANCE/EXIT GRAVEL PAD)	SQ.YD.	739		
8101021	EROSION CONTROL (WATTLES) (9")	L.FT.	53,988		

BID SCHEDULE

093 YV 189 F073801C

Item No.	Item Description	Unit	Quantity	Unit Price	Extended Amount
8101035	EROSION CONTROL (SEDIMENT LOGS) (20")	L.FT.	562		
8101050	EROSION CONTROL (WATTLES) (20")	L.FT.	33,035		
9010001	MOBILIZATION	L.SUM	1		
9020028	CHAIN LINK FENCE (FOR EXISTING STRUCTURE)	L.FT.	271		
9020030	CHAIN LINK FENCE (FOR STRUCTURE)	L.FT.	484		
9030012	BARBED WIRE FENCE, TYPE 2	L.FT.	11,580		
9030025	GAME FENCE (DETAIL F)	L.FT.	4,965		
9030100	FENCE GATE, TYPE 1, SINGLE	EACH	3		
9030103	FENCE GATE, TYPE 2	EACH	9		
9030112	FLOOD GATE (FOR ITEM 9030012)	L.FT.	74		
9030125	FLOOD GATE (FOR ITEM 9030025)	L.FT.	331		
9040001	CHAIN LINK CABLE BARRIER	L.FT.	60		
9050005	GUARD RAIL, W-BEAM, SINGLE FACE (MASH)	L.FT.	4,175		
9050025	GUARD RAIL TERMINAL (MASH)	EACH	5		
9050036	GUARD RAIL, ANCHOR ASSEMBLY	EACH	5		

BID SCHEDULE

093 YV 189 F073801C

Item No.	Item Description	Unit	Quantity	Unit Price	Extended Amount
9050419	GUARD RAIL TRANSITION (STD 10.30)	EACH	8		
9060051	CATTLE GUARD (5 UNIT)	EACH	4		
9060071	CATTLE GUARD (7 UNIT)	EACH	1		
9080001	CONCRETE CURB (C-05.10) (TYPE A)	L.FT.	3,586		
9080042	CONCRETE CURB (C-05.10) (TYPE A1)	L.FT.	9,490		
9080084	CONCRETE CURB AND GUTTER (C-05.10) (TYPE D)	L.FT.	8,200		
9080085	CONCRETE CURB AND GUTTER (C-05.10) (TYPE G, W=1')(DETAIL A)	L.FT.	371		
9080086	CONCRETE CURB AND GUTTER (C-05.10) (TYPE G, W=2')(DETAIL A)	L.FT.	519		
9080087	CONCRETE CURB AND GUTTER (C-05.10) (TYPE D-3)	L.FT.	1,297		
9080201	CONCRETE SIDEWALK (C-05.20)	SQ.FT.	3,098		
9080245	CONCRETE (TRUCK APRON) (DETAIL A)	SQ.YD.	971		
9080286	CONCRETE SIDEWALK RAMP (C-05.30) (TYPE C)	EACH	8		
9080289	CONCRETE SIDEWALK RAMP (C-05.30) (TYPE F)	EACH	4		
9080512	SCUPPER (DETAIL DN)	EACH	4		

BID SCHEDULE

093 YV 189 F073801C

Item No.	Item Description	Unit	Quantity	Unit Price	Extended Amount
9100053	CONCRETE BRIDGE BARRIER TRANSITION	EACH	4		
9120002	SHOTCRETE (3" SLOPE PAVING, FIBER REINFORCED)	SQ.YD.	1,269		
9130051	RIPRAP (DUMPED) (D50 = 6-INCH)	CU.YD.	1,138		
9130052	RIPRAP (DUMPED) (D50 = 9-INCH)	CU.YD.	203		
9130053	RIPRAP (DUMPED) (D50 = 12-INCH)	CU.YD.	243		
9160001	EMBANKMENT CURB	L.FT.	3,534		
9170003	EMBANKMENT SPILLWAY	L.FT.	11		
9170011	EMBANKMENT DOWNDRAINS (C-4.20)	L.FT.	118		
9170021	INLET (C-4.10) (SINGLE)	EACH	3		
9170031	INLET (C-4.20) (SINGLE)	EACH	3		
9170042	OUTLET (C-4.20)	EACH	3		
9210012	MEDIAN PAVING (C-05.40) (STAMPED CONCRETE)	SQ.YD.	3,488		
9210013	MEDIAN PAVING (C-05.40) (5' NOSE TAPER)	SQ.YD.	28		
9230003	ON-THE-JOB TRAINING WITH GOALS	HOUR	6,600	$3.00	$19,800.00
9240010	FORCE ACCOUNT WORK (REMOVAL OF CONTAMINATED WASTE MATERIAL)	L.SUM	1	$10,000.00	$10,000.00

BID SCHEDULE

093 YV 189 F073801C

Item No.	Item Description	Unit	Quantity	Unit Price	Extended Amount
9240012	FORCE ACCOUNT WORK (RAILROAD FLAGGING SERVICES)	L.SUM	1	$342,000.00	$342,000.00
9240014	FORCE ACCOUNT WORK (BIOLOGIST)	L.SUM	1	$30,000.00	$30,000.00
9240020	FORCE ACCOUNT WORK (ELECTRICAL SERVICE)	L.SUM	1	$40,000.00	$40,000.00
9240118	MISCELLANEOUS WORK (PIER PROTECTION WALL)	SQ.FT.	1,181		
9240121	MISCELLANEOUS WORK (RELOCATE CLUSTER MAILBOX)	EACH	4		
9240122	MISCELLANEOUS WORK (RELOCATE MAILBOXES)	EACH	12		
9240128	MISCELLANEOUS WORK (PIPE CULVERT PLUG) (DETAIL DC)	CU.FT.	173		
9240129	MISCELLANEOUS WORK (COMPACTED MILLED AC TREATMENT)	SQ.YD.	113		
9240134	MISCELLANEOUS WORK (CONTRA COSTA ENERGY DISSIPATOR - DETAIL DL)	EACH	1		
9240140	MISCELLANEOUS WORK (STONE MATRIX ASPHALTIC CONCRETE)	TON	20,187		
9240141	MISCELLANEOUS WORK (STABILIZING ADDITIVE)	TON	73		
9240167	MISCELLANEOUS WORK (PIPE SLEEVE) (12”) (PLASTIC)	L.FT.	261		

BID SCHEDULE

093 YV 189 F073801C

Item No.	Item Description	Unit	Quantity	Unit Price	Extended Amount
9240168	MISCELLANEOUS WORK (PIPE SLEEVE) (18”) (STEEL)	L.FT.	80		
9240169	MISCELLANEOUS WORK (PIPE SLEEVE) (24”) (STEEL)	L.FT.	228		
9240170	CONTRACTOR QUALITY CONTROL	L.SUM	1		
9240181	MISCELLANEOUS WORK (CONTROL OF NOXIOUS PLANTS) (MANUAL/MECHANICAL METHODS)	SQ.YD.	261,400		
9240182	MISCELLANEOUS WORK (CONTROL OF NOXIOUS PLANTS) (HERBICIDE)	SQ.YD.	392,200		
9250001	CONSTRUCTION SURVEYING AND LAYOUT	L.SUM	1		
9280036	GROUND-IN RUMBLE STRIP (8 INCH)	L.FT.	19,017		
9280037	GROUND-IN RUMBLE STRIP (12 INCH)	L.FT.	56,248		
9290001	MECHANICALLY STABILIZED EARTH RETAINING WALLS	SQ.FT.	7,420		

BID SCHEDULE

093 YV 189 F073801C

Item No.	Item Description	Unit	Quantity	Unit Price	Extended Amount
12x8 Box Cluvert - CBC No 196					
2020009 A	REMOVAL OF STRUCTURAL CONCRETE	CU.YD.	77		
2030501 A	STRUCTURAL EXCAVATION	CU.YD.	1,079		
2030506 A	STRUCTURE BACKFILL	CU.YD.	418		
6010002 A	STRUCTURAL CONCRETE (CLASS S) (F'C = 3,000)	CU.YD.	340		
6050002 A	REINFORCING STEEL	LB.	43,266		
6050101 A	PLACE DOWELS	EACH	10		

BID SCHEDULE

093 YV 189 F073801C

Item No.	Item Description	Unit	Quantity	Unit Price	Extended Amount
2x8x6 Box Culvert - CBC No 277					
2020009 B	REMOVAL OF STRUCTURAL CONCRETE	CU.YD.	55		
2030501 B	STRUCTURAL EXCAVATION	CU.YD.	1,122		
2030506 B	STRUCTURE BACKFILL	CU.YD.	603		
6010002 B	STRUCTURAL CONCRETE (CLASS S) (F'C = 3,000)	CU.YD.	249		
6050002 B	REINFORCING STEEL	LB.	36,764		
6050101 B	PLACE DOWELS	EACH	25		

BID SCHEDULE

093 YV 189 F073801C

Item No.	Item Description	Unit	Quantity	Unit Price	Extended Amount
2x6x4 Box Culvert - CBC No 339					
2020009 C	REMOVAL OF STRUCTURAL CONCRETE	CU.YD.	12		
2030501 C	STRUCTURAL EXCAVATION	CU.YD.	169		
2030506 C	STRUCTURE BACKFILL	CU.YD.	113		
6010002 C	STRUCTURAL CONCRETE (CLASS S) (F'C = 3,000)	CU.YD.	35		
6050002 C	REINFORCING STEEL	LB.	4,811		
6050101 C	PLACE DOWELS	EACH	10		

BID SCHEDULE

093 YV 189 F073801C

Item No.	Item Description	Unit	Quantity	Unit Price	Extended Amount
2x6x7 Box culvert - CBC No BE1					
2020009 D	REMOVAL OF STRUCTURAL CONCRETE	CU.YD.	2		
2030501 D	STRUCTURAL EXCAVATION	CU.YD.	177		
2030506 D	STRUCTURE BACKFILL	CU.YD.	385		
6010002 D	STRUCTURAL CONCRETE (CLASS S) (F'C = 3,000)	CU.YD.	279		
6050002 D	REINFORCING STEEL	LB.	44,253		
6050101 D	PLACE DOWELS	EACH	11		

BID SCHEDULE

093 YV 189 F073801C

Item No.	Item Description	Unit	Quantity	Unit Price	Extended Amount
3x10x7 Box Culvert - Structure No 5004					
2020009 E	REMOVAL OF STRUCTURAL CONCRETE	CU.YD.	95		
2030501 E	STRUCTURAL EXCAVATION	CU.YD.	3,194		
2030506 E	STRUCTURE BACKFILL	CU.YD.	1,353		
6010002 E	STRUCTURAL CONCRETE (CLASS S) (F'C = 3,000)	CU.YD.	601		
6050002 E	REINFORCING STEEL	LB.	96,584		
6050101 E	PLACE DOWELS	EACH	59		

BID SCHEDULE

093 YV 189 F073801C

Item No.	Item Description	Unit	Quantity	Unit Price	Extended Amount
4x10x6 Box Culvert - Structure No 5003					
2020009 F	REMOVAL OF STRUCTURAL CONCRETE	CU.YD.	90		
2030501 F	STRUCTURAL EXCAVATION	CU.YD.	3,222		
2030506 F	STRUCTURE BACKFILL	CU.YD.	1,304		
6010002 F	STRUCTURAL CONCRETE (CLASS S) (F'C = 3,000)	CU.YD.	564		
6050002 F	REINFORCING STEEL	LB.	88,799		
6050101 F	PLACE DOWELS	EACH	65		

BID SCHEDULE

093 YV 189 F073801C

Item No.	Item Description	Unit	Quantity	Unit Price	Extended Amount
Bridge Structure					
2030501 G	STRUCTURAL EXCAVATION	CU.YD.	70		
2030506 G	STRUCTURE BACKFILL	CU.YD.	45		
6010003 G	STRUCTURAL CONCRETE (CLASS S) (F'C = 3,500)	CU.YD.	419		
6010005 G	STRUCTURAL CONCRETE (CLASS S) (F'C = 4,500)	CU.YD.	631		
6011150 G	SINGLE SLOPE BRIDGE CONCRETE BARRIER AND TRANSITION (38")	L.FT.	726		
6011343 G	DECK JOINT ASSEMBLY (FLANGELESS STRIP SEAL)	L.FT.	104		
6011371 G	APPROACH SLAB (SD 2.01)	SQ.FT.	1,348		
6014978 G	PRECAST, P/S MEMBER (BULB TEE GIRDER 66")	L.FT.	1,623		
6015101 G	RESTRAINERS, VERTICAL EARTHQUAKE (FIXED)	EACH	16		
6015102 G	RESTRAINERS, VERTICAL EARTHQUAKE (EXPANSION)	EACH	8		
6050002 G	REINFORCING STEEL	LB.	219,920		

BID SCHEDULE

093 YV 189 F073801C

Item No.	Item Description	Unit	Quantity	Unit Price	Extended Amount
Drilled Shafts					
6090060 H	DRILLED SHAFT FOUNDATION (60")	L.FT.	133		
6090066 H	DRILLED SHAFT FOUNDATION (66")	L.FT.	230		

BID TOTAL :

PROPOSAL

TO THE ARIZONA DEPARTMENT OF TRANSPORTATION:

Gentlemen:

The following Proposal is made for constructing project

093 YV 189 F073801C 093-B(230)T
KINGMAN-WICKENBURG HIGHWAY (US 93)
(WICKENBURG RANCH WAY TO VISTA ROYALE)

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.

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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.

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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

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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.

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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.

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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